



Evergreen Resources Management
2 Righter Parkway, Suite 120
Wilmington, DE 19803

September 27, 2022

VIA ELECTRONIC SUBMISSION

Lisa Strobridge, P.G.
Environmental Cleanup & Brownfields Program
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street, Norristown, PA 19401

**Re: PFAS Soil Sampling Results
Former Philadelphia Refining Complex
3144 W. Passyunk Avenue, Philadelphia, Pennsylvania**

Dear Ms. Strobridge:

In June 2022, Sanborn Head & Associates (Sanborn Head) completed soil sampling at one hundred twenty-six locations across Area of Interest (AOI) 1, AOI 2, AOI 3, AOI 5, AOI 6, AOI 7, AOI 9 and AOI 10 for per- and polyfluorinated alkyl substances (PFAS) in accordance with the May 6, 2022, PFAS Soil Sampling Workplan. The results of the PFAS soil sampling are below Statewide Health Standard (SHS) Medium Specific Concentrations (MSCs) in all one hundred twenty-six locations sampled.

Please see the attached memorandum from Sanborn Head that presents more detail on the June 2022 PFAS soil sampling results.

If you have any questions regarding this submittal, please do not hesitate to contact me at your convenience.

Regards,

Evergreen Resources Management Operations

Tiffani L. Doerr, P.G.

Cc:

Scott Cullinan, P.E., Evergreen Resources Management Operations
Kevin Bilash, EPA
Patrick O'Neill, City of Philadelphia
Colleen Costello, P.G., Sanborn Head & Associates, Inc.
Andrew Buchy, Sanborn Head & Associates, Inc.

MEMORANDUM

To: Tiffani Doerr, P.G. – Evergreen Resources Management Operations
From: Andrew Buchy and Colleen Costello (Sanborn Head & Associates, Inc.)
File: 4796.01
Date: September 27, 2022
Re: June 2022 PFAS Soil Sampling Results
cc: Scott Cullinan – Evergreen Resources Management Operations

This memorandum presents the results of the June 2022 soil sampling event at the former Philadelphia Refinery site (Site) in Philadelphia, Pennsylvania for per- and polyfluorinated alkyl substances (PFAS).

1.0 INTRODUCTION

At the request of the Pennsylvania Department of Environmental Protection (PADEP), soil samples were collected for PFAS analyses at the Site. One hundred twenty-six soil samples were collected in accordance with the PFAS Soil Sampling Workplan for PFAS submitted by Evergreen to the PADEP on May 6, 2022 (**Attachment A**). The PFAS sampling activities are being completed at the request of the PADEP but are not part of Evergreen's Act 2 investigation and reporting for the Site.

2.0 PFAS IN GROUNDWATER RESULTS

Groundwater sampling for PFAS was conducted by Evergreen in the lower aquifer in July 2021 and in the shallow aquifer in January 2022. The lower aquifer sampling resulted in eight of the twenty-nine monitoring wells above PADEP non-residential statewide health standard (SHS) medium specific concentrations (MSCs). The shallow aquifer sampling resulted in twelve of the forty-two monitoring wells above SHS MSCs. The wells above SHS MSCs are identified on **Figure 1**.

3.0 JUNE 2022 PFAS SOIL SAMPLING METHODOLOGY

The soil locations for this event were selected based on the following rationale:

- The results of the July 2021 PFAS sampling event in the lower aquifer wells.
- The results of the January 2022 PFAS sampling event in the shallow aquifer wells.
- The locations of the potential Aqueous Film Forming Foam (AFFF) release areas identified in Evergreen's June 30, 2021 Desktop Review and Sampling Plan (DRSP) (**Attachment B**).

Figure 1 depicts the potential AFFF release areas identified during the desktop review. **Figure 1** also includes the PFAS results from the shallow and lower aquifer monitoring well sampling events as described in Section 2.0. Where necessary, the identified sample location was relocated away from impervious features to facilitate field collection of the samples.

From June 20 to June 30, 2022, Sanborn Head collected 126 soil samples from a depth of 0 to 1-foot below ground surface (bgs) in accordance with the May 6, 2022 sampling plan. The PFAS soil samples were collected in accordance with the PFAS field procedures included in **Attachment A**. The PFAS sampling procedures were developed to avoid potential PFAS cross-contamination from the sampling equipment and materials. The samples were analyzed for the Unregulated Contaminant

Monitoring Rule (UCMR) 3 list of PFAS compounds that include PFOA, PFOS, Perfluorononanoic Acid (PFNA), Perfluorohexanesulfonic Acid (PFHxS), Perfluoroheptanoic Acid (PFHpA), and Perfluorobutanesulfonic Acid (PFBS) consistent with the shallow and lower aquifer groundwater sampling analyses.

For soil sample collection, a non-dedicated stainless steel hand auger was advanced to a depth of 1-foot bgs at each location. Recovered soil from the hand auger was transferred onto PFAS-free plastic sheeting which was used to prevent contact with potentially contaminated soil and other surfaces. Collected soil was then transferred into one, 4-ounce (oz) high-density polypropylene (HDPE) jar. The jars were labeled and immediately stored on ice within a cooler. The required information for each sample was recorded on a chain-of-custody form. After sampling each location, non-dedicated sampling equipment, such as the stainless-steel hand auger, was thoroughly washed in a Liquinox and deionized water solution and rinsed with laboratory-provided PFAS-free water.

Quality Assurance/Quality Control (QA/QC) samples collected during the June 2022 sampling event included four field duplicates, six field blanks, and one equipment rinsate blank. For the four field duplicate samples, an additional 4-oz jar was collected concurrently from sampling locations AOI1_B010, AOI6_B035, AOI7_B002, and AOI9_B014. Six total field blanks were collected by transferring PFAS-free water into two, 250 milliliter (ml) HDPE bottles while on-site. One total equipment rinsate blank was collected by pouring PFAS-free water through the non-dedicated sampling equipment into two, 250 ml HDPE bottles. All QA/QC samples were documented and handled in the same manner as the soil samples.

All samples from the June 2022 sampling event were submitted to SGS, Inc. (NELAP Identification Number 68-00408) located in Orlando, Florida for analysis of Unregulated Contaminant Monitoring Rule (UCMR) 3 via USEPA Modified Method 537.1 Isotope Dilution. Analytes on the UCMR 3 list of PFAS compounds include PFOA, PFOS, PFNA, PFHxS, PFHpA, and PFBS.

4.0 ANALYTICAL RESULTS FROM JUNE 2022 SOIL SAMPLING

The current PADEP non-residential SHS MSCs for soil are:

Analyte	PADEP SHS MSC (mg/kg) Non-Residential Surface Soil
PFOA	64
PFAS	64
PFBS	960

Notes:

mg/kg = milligrams per kilogram

The results of the June 2022 sampling event are summarized on **Table 1** and shown on **Figures 2 through 8**. **Figure 2** shows the historical fire activity onsite from the June 30, 2021 DRSP, the sampled shallow and lower aquifer wells, and soil location PFAS results by color dots. The green symbol at a soil sampling location on **Figure 2** indicates that the sample had at least one of the analyzed PFAS substances at a concentration higher than laboratory detection limits but below the applicable MSC and a gray dot indicates that all results were below laboratory detection limits. **Figures 3 through Figure 8** presents the data in databox format. Analytical data packages are included in **Attachment C**.

These results are also summarized below:

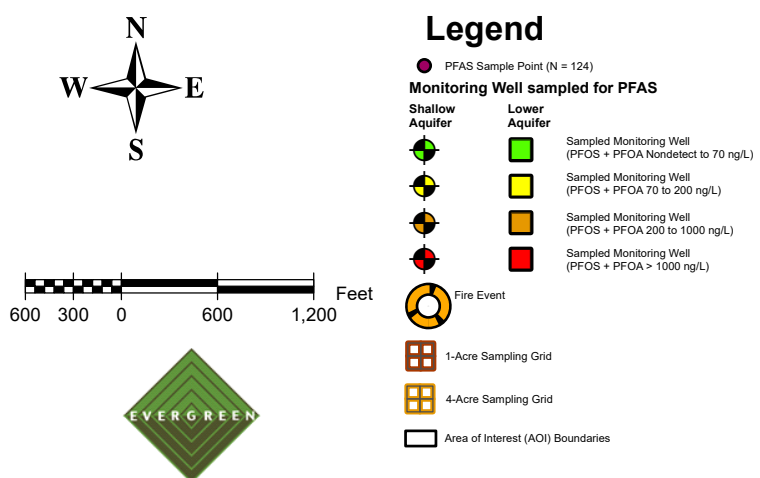
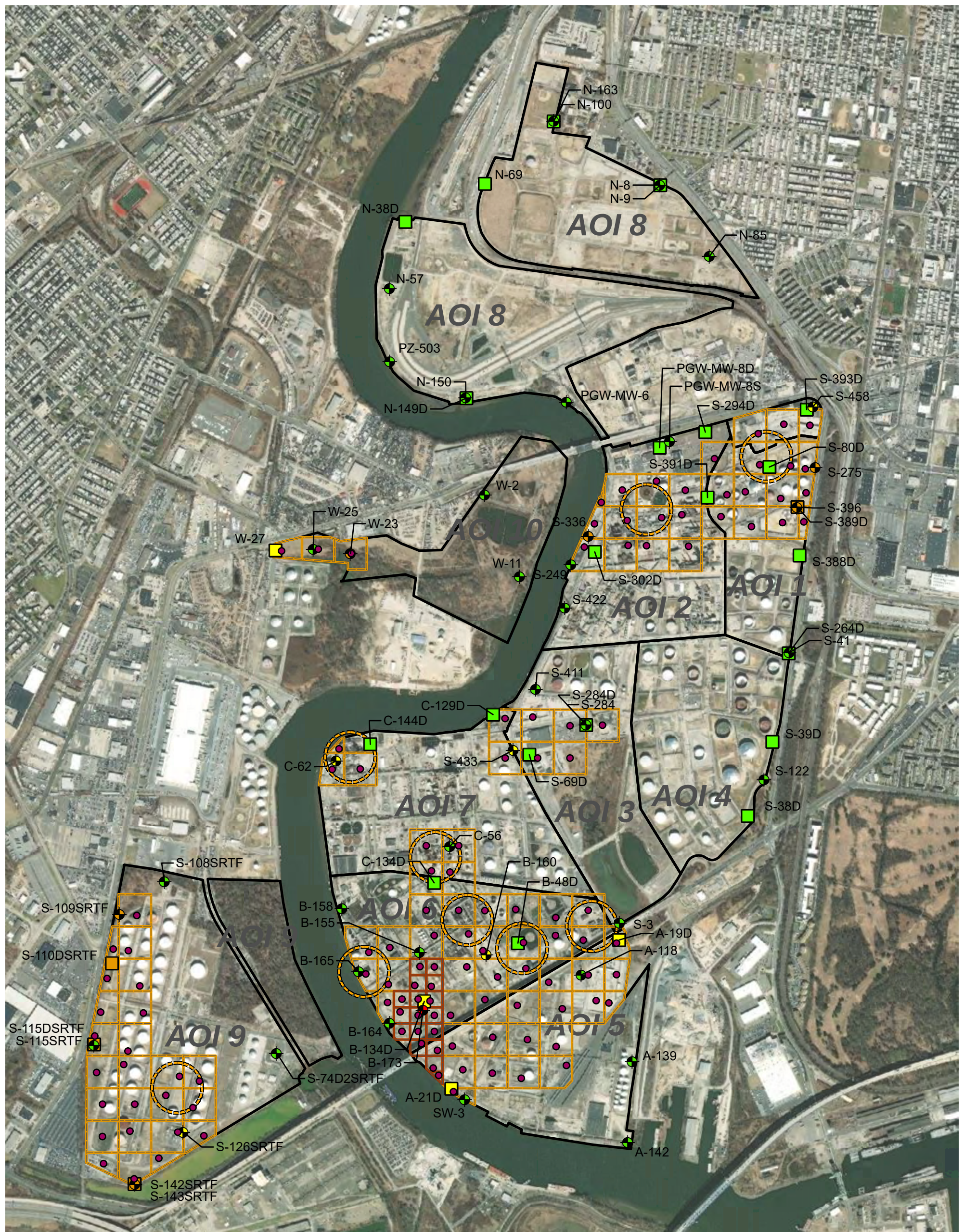
- All soil samples collected had concentrations below the SHS MSCs for PFOA, PFAS and PFBS.
- Thirty-eight of one hundred twenty-six samples had no detections for any of the analyzed compounds.
- Ninety-five of one hundred twenty-six samples had no detections for PFOA.
- Fifty-one of one hundred twenty-six samples had no detections for PFOS.
- No samples had detections for PFBS.
- One hundred fourteen of one hundred twenty-six samples had no detections for PFHpA.
- One hundred fourteen of one hundred twenty-six samples had no detections for PFHxS.
- Sixty-five of one hundred twenty-six samples had no detections for PFNA.
- All QA/QC samples had no detected concentrations of PFAS.

5.0 CLOSING

One hundred twenty-six soil samples were collected across AOI 1, AOI 2, AOI 3, AOI 5, AOI 6, AOI 7, AOI 9, and AOI 10 based on proximity to historical fire activity areas and proximity to shallow and/or lower aquifer wells with PFAS results above SHS MSCs for groundwater. All sample results were below applicable SHS MSCs for PFAS and limited detections were noted for PFAS compounds without MSCs. Based on the results of the June 2022 soil sampling event, there is no observed correlation with the PFAS compounds detected in groundwater or the potential sources of PFAS identified in Evergreen's DRSP.

Enclosures

Figure 1	June 2022 PFAS Soil Sample Locations and Grids based on Shallow and Lower Aquifer PFAS Results and Historical Fire Activity
Figure 2	June 2022 PFAS Soil Sample Location Results in Color Dots – Site Wide
Figure 3	June 2022 PFAS Soil Sample Results in Data Boxes – AOI 1 and AOI 2
Figure 4	June 2022 PFAS Soil Sample Results in Data Boxes – AOI 3 and AOI 7
Figure 5	June 2022 PFAS Soil Sample Results in Data Boxes – AOI 5
Figure 6	June 2022 PFAS Soil Sample Results in Data Boxes – AOI 6
Figure 7	June 2022 PFAS Soil Sample Results in Data Boxes – AOI 9
Figure 8	June 2022 PFAS Soil Sample Results in Data Boxes – AOI 10
Table 1	Summary of PFAS Analytical Results
Attachment A	Evergreen PFAS Soil Sampling Workplan – Former Philadelphia Refining Complex
Attachment B	Evergreen Desktop Review and Sampling Plan
Attachment C	Laboratory Analytical Data Packages



Notes

1. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
2. ng/L = nanograms per liter

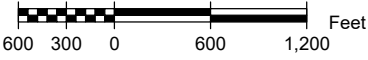
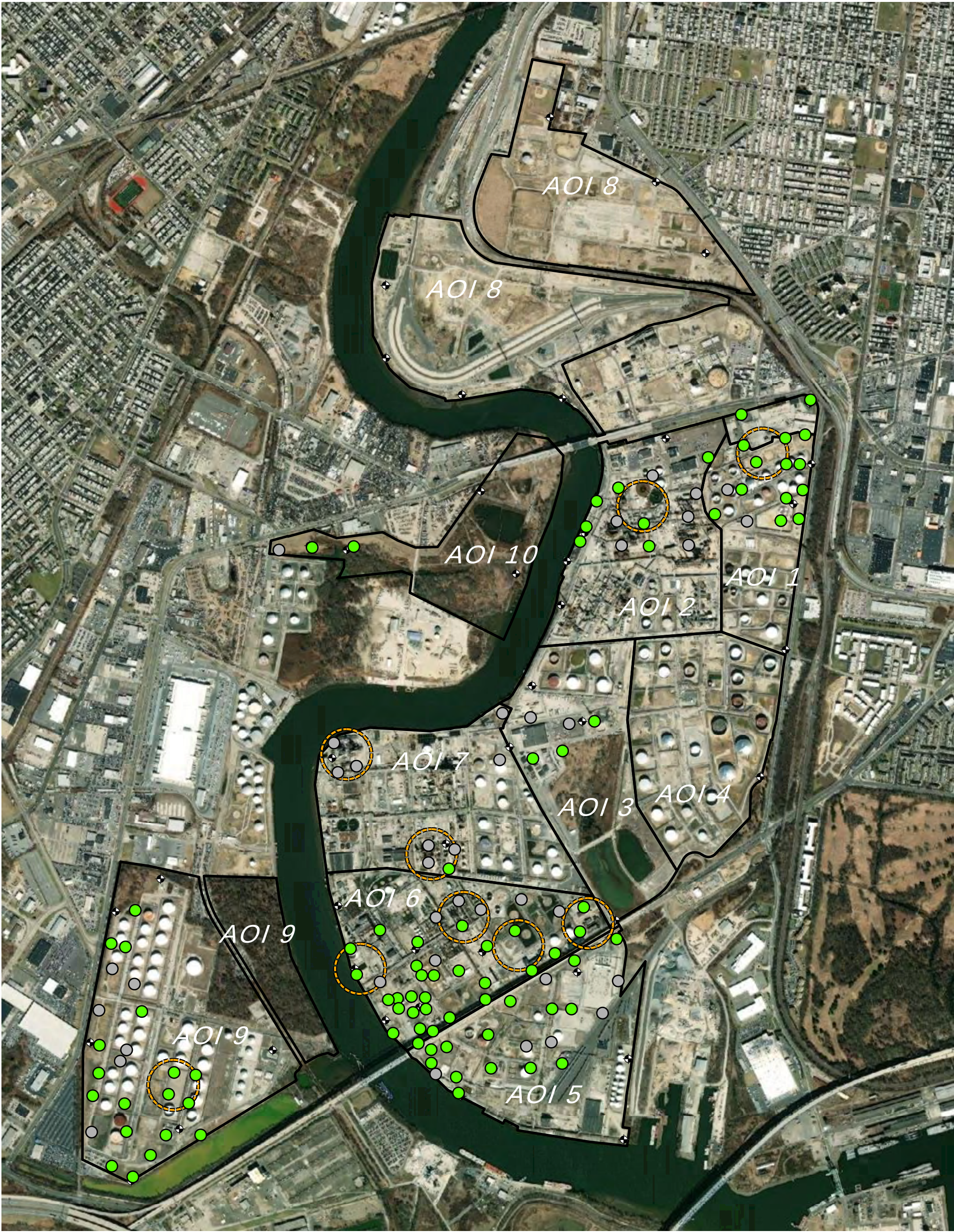
Figure 1

PFAS Soil Sample Locations and Grids based on Shallow and Lower Aquifer PFAS Results and Historical Fire Activity

PFAS Soil Sampling Workplan

Evergreen Resources Group
Philadelphia, PA

Drawn By: M. Fuerte
Designed By: A. Buchy
Reviewed By: A. Buchy
Project No: 4796.00
Date: September 2022



Legend

- PFAS Sample Point
- ⬮ Sampled Monitoring Well Location*
- Area of Interest (AOI) Boundaries
- Sampled Soil Location was Non-detect
- Sampled Soil Location with at least one detection of a PFAS substance but below applicable MSCs
- Fire Event

Notes

1. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.
2. All sampling locations results were below applicable PADEP MSCs.
3. mg/kg – milligrams per kilogram

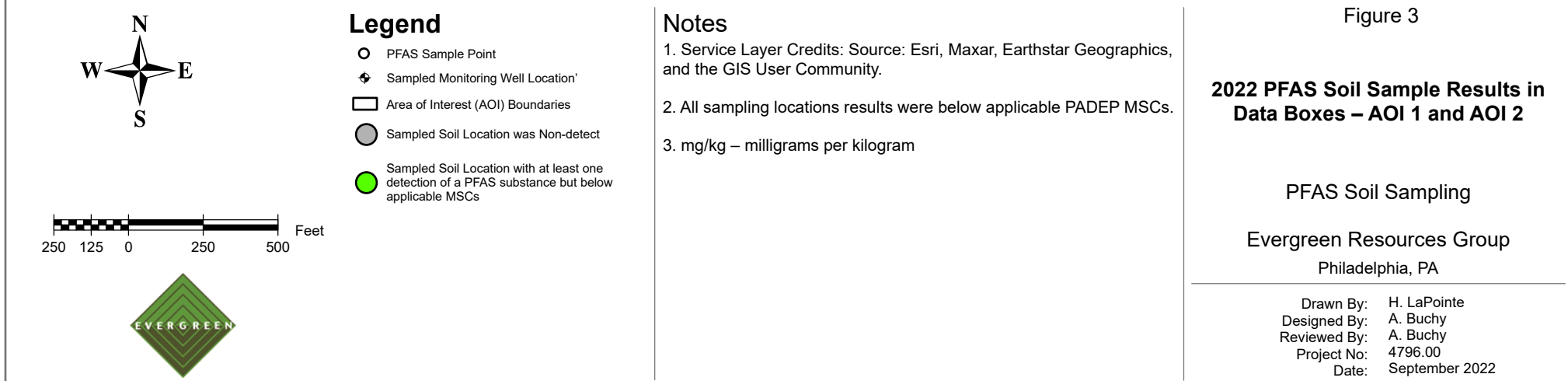
Figure 2

2022 PFAS Soil Sample Results in
Color Dots - Site Wide

PFAS Soil Sampling

Evergreen Resources Group
Philadelphia, PA

Drawn By: H. LaPointe
Designed By: A. Buchy
Reviewed By: A. Buchy
Project No: 4796.00
Date: September 2022





Legend

- PFAS Sample Point
- ⬮ Sampled Monitoring Well Location*
- Area of Interest (AOI) Boundaries
- Sampled Soil Location was Non-detect
- Sampled Soil Location with at least one detection of a PFAS substance but below applicable MSCs

Notes

- Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.
- All sampling locations results were below applicable PADEP MSCs.
- mg/kg – milligrams per kilogram

Figure 4

2022 PFAS Soil Sample Results in Data Boxes – AOI 3 and AOI 7

PFAS Soil Sampling

Evergreen Resources Group
Philadelphia, PA

Drawn By: H. LaPointe
Designed By: A. Buchy
Reviewed By: A. Buchy
Project No: 4796.00
Date: September 2022



Notes

1. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.
2. All sampling locations results were below applicable PADEP MSCs.
3. mg/kg – milligrams per kilogram

Figure 5

2022 PFAS Soil Sample Results in Data Boxes – AOI 5

PFAS Soil Sampling

Evergreen Resources Group
Philadelphia, PA

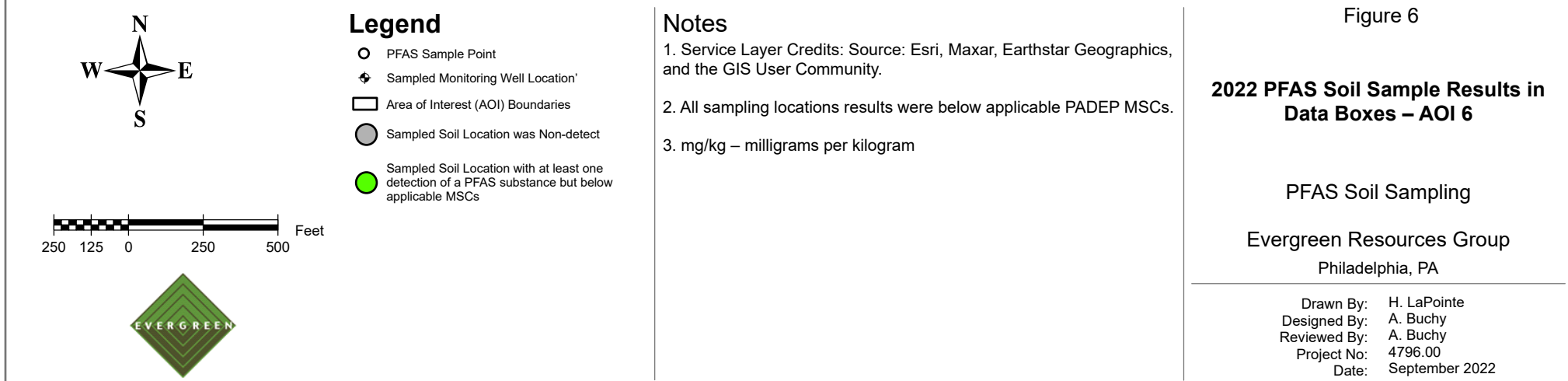
Drawn By: H. LaPointe

Designed By: A. Buchy

Reviewed By: A. Buchy

Project No: 4796.00

Date: September 2022





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250

125

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Legend

○

PFAS Sample Point

⬮

Sampled Monitoring Well Location*

□

Area of Interest (AOI) Boundaries

○

Sampled Soil Location was Non-detect

●

Sampled Soil Location with at least one detection of a PFAS substance but below applicable MSCs

Notes

1. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.

2. All sampling locations results were below applicable PADEP MSCs.

3. mg/kg – milligrams per kilogram

Figure 7

2022 PFAS Soil Sample Results in Data Boxes – AOI 9

PFAS Soil Sampling

Evergreen Resources Group

Philadelphia, PA

Drawn By: H. LaPointe

Designed By: A. Buchy

Reviewed By: A. Buchy

Project No: 4796.00

Date: September 2022

EVERGREEN

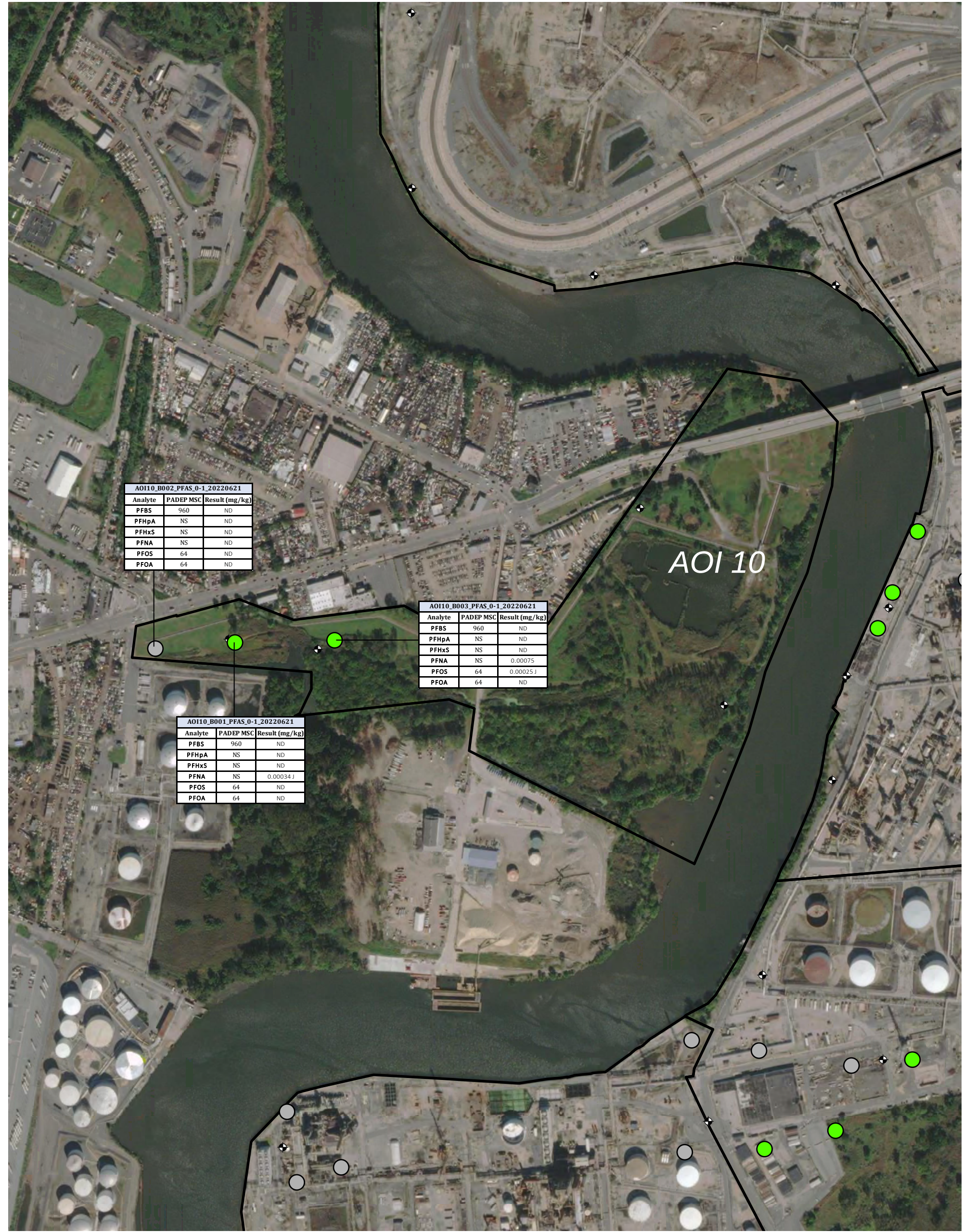


Figure 8

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2501250500

Feet

Legend

○

PFAS Sample Point

◆

Sampled Monitoring Well Location*

□

Area of Interest (AOI) Boundaries

○

Sampled Soil Location was Non-detect

●

Sampled Soil Location with at least one detection of a PFAS substance but below applicable MSCs

Notes

1. Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.

2. All sampling locations results were below applicable PADEP MSCs.

3. mg/kg – milligrams per kilogram

2022 PFAS Soil Sample Results in Data Boxes– AOI 10

PFAS Soil Sampling

Evergreen Resources Group

Philadelphia, PA

Drawn By: H. LaPointe

Designed By: A. Buchy

Reviewed By: A. Buchy

Project No: 4796.00

Date: September 2022

DRAFT
Table 1
Summary of PFAS Analytical Results
Former Philadelphia Refinery
Philadelphia, Pennsylvania

Sample Name	Sample Date	Sample Depth (ft)	Sample Type	Units	PFBS ⁴	PFHpA ⁵	PFHxS ⁶	PFNA ⁷	PFOS ⁸	PFOA ⁹
PADEP MSC					960	NS	NS	NS	64	64
AOI1_B001	6/23/2022	0-1	N	mg/kg	<0.00058	0.00041 J	<0.00058	0.00068	<0.00058	0.00042 J
AOI1_B002	6/23/2022	0-1	N	mg/kg	<0.00057	0.0024	0.00032 J	0.0190	0.0023	0.0231
AOI1_B003	6/23/2022	0-1	N	mg/kg	<0.00059	0.00031 J	<0.00059	0.00050 J	0.00048 J	<0.00059
AOI1_B004	6/23/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	0.0019	0.00055 J	0.00040 J
AOI1_B005	6/23/2022	0-1	N	mg/kg	<0.00058	<0.00058	0.0014	<0.00058	0.0067	<0.00058
AOI1_B006	6/23/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
AOI1_B007	6/23/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	0.0011	0.0012	<0.0006
AOI1_B008	6/23/2022	0-1	N	mg/kg	<0.00064	<0.00064	0.00042 J	0.0011	0.00067	0.00038 J
AOI1_B009	6/23/2022	0-1	N	mg/kg	<0.00058	<0.00058	<0.00058	0.00039 J	0.0179	0.00038 J
AOI1_B010	6/23/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	0.00094	<0.0006	<0.0006
AOI1_B010	6/23/2022	0-1	FD	mg/kg	<0.0006	<0.0006	<0.0006	0.0016	<0.0006	0.00041 J
AOI1_B011	6/23/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
AOI1_B012	6/22/2022	0-1	N	mg/kg	<0.00056	<0.00056	0.0015	0.0016	0.0135	0.00040 J
AOI1_B013	6/22/2022	0-1	N	mg/kg	<0.00055	<0.00055	0.00091	<0.00055	0.0023	<0.00055
AOI1_B014	6/23/2022	0-1	N	mg/kg	<0.00053	<0.00053	<0.00053	<0.00053	0.00070	<0.00053
AOI1_B015	6/27/2022	0-1	N	mg/kg	<0.00063	<0.00063	<0.00063	0.0032	0.0038	0.00053 J
AOI1_B016	6/27/2022	0-1	N	mg/kg	<0.00068	0.00053 J	<0.00068	0.0037	0.0038	0.00091
AOI2_B001	6/20/2022	0-1	N	mg/kg	<0.00061	0.0028	<0.00061	0.0021	0.0020	0.0037
AOI2_B002	6/20/2022	0-1	N	mg/kg	<0.00051	<0.00051	<0.00051	<0.00051	<0.00051	<0.00051
AOI2_B003	6/20/2022	0-1	N	mg/kg	<0.00056	<0.00056	0.0011	<0.00056	0.0098	<0.00056
AOI2_B004	6/20/2022	0-1	N	mg/kg	<0.00054	<0.00054	<0.00054	<0.00054	<0.00054	<0.00054
AOI2_B005	6/20/2022	0-1	N	mg/kg	<0.00053	<0.00053	<0.00053	0.0015	0.00034 J	0.00048 J
AOI2_B006	6/20/2022	0-1	N	mg/kg	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052
AOI2_B007	6/20/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	<0.00057	0.00067	<0.00057
AOI2_B008	6/20/2022	0-1	N	mg/kg	<0.00053	<0.00053	<0.00053	<0.00053	<0.00053	<0.00053
AOI2_B009	6/20/2022	0-1	N	mg/kg	<0.00054	<0.00054	<0.00054	0.0019	0.00056	<0.00054
AOI2_B010	6/20/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
AOI2_B011	6/20/2022	0-1	N	mg/kg	<0.00056	<0.00056	<0.00056	0.0015	0.00069	<0.00056
AOI2_B012	6/20/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
AOI2_B013	6/20/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	0.00036 J	<0.00055	<0.00055
AOI3_B001	6/23/2022	0-1	N	mg/kg	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052
AOI3_B002	6/23/2022	0-1	N	mg/kg	<0.00055	0.00030 J	<0.00055	0.00037 J	0.0016	<0.00055
AOI3_B003	6/23/2022	0-1	N	mg/kg	<0.00066	<0.00066	<0.00066	<0.00066	<0.00066	<0.00066
AOI3_B004	6/24/2022	0-1	N	mg/kg	<0.00066	<0.00066	<0.00066	<0.00066	0.0026	<0.00066
AOI3_B005	6/24/2022	0-1	N	mg/kg	<0.00059	<0.00059	<0.00059	0.00099	0.00040 J	<0.00059
AOI5_B001	6/30/2022	0-1	N	mg/kg	<0.00059	<0.00059	<0.00059	<0.00059	0.00026 J	<0.00059
AOI5_B002	6/30/2022	0-1	N	mg/kg	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058
AOI5_B003	6/30/2022	0-1	N	mg/kg	<0.00064	<0.00064	<0.00064	<0.00064	0.0010	<0.00064
AOI5_B004	6/29/2022	0-1	N	mg/kg	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056
AOI5_B005	6/30/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	0.00048 J	0.0011	<0.00057
AOI5_B006	6/30/2022	0-1	N	mg/kg	<0.00054	<0.00054	<0.00054	<0.00054	<0.00054	<0.00054
AOI5_B007	6/29/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	0.0016	0.0027	<0.00055
AOI5_B008	6/30/2022	0-1	N	mg/kg	<0.0007	<0.0007	<0.0007	0.00038 J	<0.0007	<0.0007
AOI5_B009	6/29/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	0.00036 J	0.0034	<0.00061
AOI5_B010	6/30/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
AOI5_B011	6/29/2022	0-1	N	mg/kg	<0.00058	0.00066	<0.00058	0.00065	0.00050 J	0.00086
AOI5_B012	6/30/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
AOI5_B013	6/29/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	0.00033 J	<0.00055
AOI5_B014	6/30/2022	0-1	N	mg/kg	<0.00055	0.0014	<0.00055	0.00093	0.00099	0.0016
AOI5_B015	6/29/2022	0-1	N	mg/kg	<0.00064	<0.00064	<0.00064	0.0014	0.0032	0.00053 J
AOI5_B016	6/30/2022	0-1	N	mg/kg	<0.00065	<0.00065	<0.00065	0.0011	0.0028	<0.00065
AOI5_B017	6/30/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	0.00032 J	0.00057 J	<0.0006
AOI5_B018	6/29/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
AOI5_B019	6/30/2022	0-1	N	mg/kg	<0.00063	<0.00063	<0.00063	0.00033 J	<0.00063	<0.00063
AOI5_B020	6/30/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	<0.00061	0.00063	<0.00061
AOI6_B001	6/27/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
AOI6_B002	6/24/2022	0-1	N	mg/kg	<0.00051	<0.00051	<0.00051	<0.00051	<0.00051	<0.00051
AOI6_B003	6/24/2022	0-1	N	mg/kg	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056
AOI6_B004	6/27/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	<0.0006	0.00058 J	<0.0006
AOI6_B005	6/27/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
AOI6_B006	6/27/2022	0-1	N	mg/kg	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056
AOI6_B007	6/27/2022	0-1	N	mg/kg	<0.00059	<0.00059	<0.00059	<0.00059	<0.00059	0.00052 J
AOI6_B008	6/28/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	<0.00061	0.00043 J	<0.00061
AOI6_B009	6/27/2022	0-1	N	mg/kg	<0.00059	<0.00059	<0.00059	0.00068	0.00070	<0.00059
AOI6_B010	6/27/2022	0-1	N	mg/kg	<0.00082	0.0013	<0.00082	0.0016	0.0021	0.0012
AOI6_B011	6/27/2022	0-1	N	mg/kg	<0.00065	<0.00065	<0.00065	<0.00065	0.00091	<0.00065
AOI6_B012	6/28/2022	0-1	N	mg/kg	<0.00056	<0.00056	<0.00056	0.0029	0.00085	0.00048 J
AOI6_B013	6/27/2022	0-1	N	mg/kg	<0.00056	<0.00056	<0.00056	<0.00056	0.00047 J	<0.00056
AOI6_B014	6/28/2022	0-1	N	mg/kg	<0.00064	<0.00064	<0.00064	<0.0032	0.0137	0.0011
AOI6_B015	6/28/2022	0-1	N	mg/kg	<0.00069	<0.00069	0.0018	0.00037 J	0.0131	<0.00069
AOI6_B016	6/27/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	<0.00061	0.00024 J	<0.00061
AOI6_B017	6/28/2022	0-1	N	mg/kg	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064
AOI6_B018	6/27/2022	0-1	N	mg/kg	<0.00058	<0.00058	0.00073	0.0019	0.0232	<0.00058
AOI6_B019	6/28/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	0.00076	0.00088	<0.0006
AOI6_B020	6/27/2022	0-1	N	mg/kg	<0.00059	<0.00059	0.00073	0.00098	0.0074	<0.00059
AOI6_B021	6/28/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
AOI6_B022	6/28/2022	0-1	N	mg/kg	<0.00061	<0.00061	<0.00061	0.0011	0.0010	<0.00061
AOI6_B023	6/28/2022	0-1	N	mg/kg	<0.0007	0.00036 J	<0.0007	0.0014	<0.0007	<0.0007
AOI6_B024	6/29/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	0.00032 J	<0.00055
AOI6_B025	6/28/2022	0-1	N	mg/kg	<0.00053	0.00030 J	<0.00053	0.00042 J	<0.00053	0.00030 J
AOI6_B026	6/27/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	0.00036 J	0.0021	<0.00055
AOI6_B027	6/28/2022	0-1	N	mg/kg	<0.00063	<0.00063	0.00095	0.00055 J	0.0324	0.00046 J
AOI6_B028	6/28/2022	0-1	N	mg/kg	<0.00062	<0.00062	<0.00062	<0.00062	0.00033 J	<0.00062
AOI6_B029	6/29/2022	0-1	N	mg/kg	<0.00064	<0.00064	<0.00064	<0.00064	0.00032 J	<0.00064
AOI6_B030	6/29/2022	0-1	N	mg/kg	<0.00059	<0.00059	0.0020	0.0032	0.0093	0.00033 J
AOI6_B031	6/28/2022	0-1	N	mg/kg	<0.00056	<0.00056	0.0068	0.0025	0.0422	0.0012
AOI6_B032	6/28/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	<0.0006	0.00045 J	<0.0006
AOI6_B033	6/29/2022	0-1	N	mg/kg	<0.00074	<0.00074	<0.00074	0.00058 J	0.0044	<0.00074
AOI6_B034	6/29/2022	0-1	N	mg/kg	<0.00063	<0.00063	<0.00063	0.00062 J	0.0011	<0.00063
AOI6_B035	6/29/2022	0-1	N	mg/kg	<0.00063	<0.00063	<0.00063	<0.00063	0.0032	<0.00063
AOI6_B035	6/29/2022	0-1	FD	mg/kg	<0.00064	<0.00064	<0.00064	<0.00064	0.0032	<0.00064
AOI6_B036	6/29/2022	0-1	N	mg/kg	<0.00067	<0.00067	<0.00067	0.0013	0.0054	<0.00067

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Table 1
Summary of PFAS Analytical Results
Former Philadelphia Refinery
Philadelphia, Pennsylvania

Sample Name	Sample Date	Sample Depth (ft)	Sample Type	Units	PFBS ⁴	PFHpA ⁵	PFHxS ⁶	PFNA ⁷	PFOS ⁸	PFOA ⁹
PADEP MSC					960	NS	NS	NS	64	64
AOI7_B001	6/24/2022	0-1	N	mg/kg	<0.00051	<0.00051	<0.00051	<0.00051	<0.00051	<0.00051
AOI7_B002	6/28/2022	0-1	N	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
AOI7_B002	6/28/2022	0-1	FD	mg/kg	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058
AOI7_B003	6/24/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
AOI7_B004	6/24/2022	0-1	N	mg/kg	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052
AOI7_B005	6/24/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
AOI7_B006	6/24/2022	0-1	N	mg/kg	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056
AOI7_B007	6/24/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
AOI7_B008	6/24/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
AOI7_B009	6/24/2022	0-1	N	mg/kg	<0.00058	<0.00058	<0.00058	0.00062	0.00034 J	<0.00058
AOI9_B001	6/21/2022	0-1	N	mg/kg	<0.00086	<0.00086	<0.00086	0.0037	<0.00086	<0.00086
AOI9_B002	6/21/2022	0-1	N	mg/kg	<0.00061	0.00035 J	<0.00061	0.0024	0.00092	0.00046 J
AOI9_B003	6/21/2022	0-1	N	mg/kg	<0.00064	<0.00064	<0.00064	0.00057 J	<0.00064	<0.00064
AOI9_B004	6/21/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
AOI9_B005	6/21/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
AOI9_B006	6/21/2022	0-1	N	mg/kg	<0.00069	<0.00069	<0.00069	<0.00069	<0.00069	<0.00069
AOI9_B007	6/21/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	<0.00057	0.00024 J	<0.00057
AOI9_B008	6/21/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	0.00098	0.00029 J	<0.00057
AOI9_B009	6/22/2022	0-1	N	mg/kg	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
AOI9_B010	6/22/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
AOI9_B011	6/21/2022	0-1	N	mg/kg	<0.00065	0.00079	<0.00065	0.0015	0.00078	0.0013
AOI9_B012	6/22/2022	0-1	N	mg/kg	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058	0.00029 J
AOI9_B013	6/22/2022	0-1	N	mg/kg	<0.00066	<0.00066	<0.00066	<0.00066	0.00077	<0.00066
AOI9_B014	6/22/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	<0.00057	0.00033 J	<0.00057
AOI9_B014	6/22/2022	0-1	FD	mg/kg	<0.00059	<0.00059	<0.00059	<0.00059	<0.00059	<0.00059
AOI9_B015	6/22/2022	0-1	N	mg/kg	<0.00062	<0.00062	<0.00062	0.00067	<0.00062	0.00044 J
AOI9_B016	6/21/2022	0-1	N	mg/kg	<0.00065	0.00090	<0.00065	0.0023	0.0019	0.0011
AOI9_B017	6/22/2022	0-1	N	mg/kg	<0.00069	<0.00069	<0.00069	0.00071	0.0031	0.00034 J
AOI9_B018	6/22/2022	0-1	N	mg/kg	<0.00063	<0.00063	<0.00063	<0.00063	0.00044 J	<0.00063
AOI9_B019	6/22/2022	0-1	N	mg/kg	<0.00063	<0.00063	<0.00063	0.0015	0.00035 J	0.00078
AOI9_B020	6/22/2022	0-1	N	mg/kg	<0.00064	<0.00064	<0.00064	0.0016	0.0019	0.00039 J
AOI9_B021	6/21/2022	0-1	N	mg/kg	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058
AOI9_B022	6/22/2022	0-1	N	mg/kg	<0.0007	<0.0007	<0.0007	0.00085	0.00087	<0.0007
AOI9_B023	6/22/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	0.0018	0.0020	0.00043 J
AOI9_B024	6/22/2022	0-1	N	mg/kg	<0.00058	<0.00058	<0.00058	0.0015	0.0013	0.00033 J
AOI10_B001	6/21/2022	0-1	N	mg/kg	<0.00057	<0.00057	<0.00057	0.00034 J	<0.00057	<0.00057
AOI10_B002	6/21/2022	0-1	N	mg/kg	<0.00053	<0.00053	<0.00053	<0.00053	<0.00053	<0.00053
AOI10_B003	6/21/2022	0-1	N	mg/kg	<0.0006	<0.0006	<0.0006	0.00075	0.00025 J	<0.0006
Field QA/QC										
Equipment Blank	6/30/2022	–	EB	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Field Blank	6/22/2022	–	FB	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Field Blank	6/23/2022	–	FB	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Field Blank	6/24/2022	–	FB	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Field Blank	6/28/2022	–	FB	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Field Blank	6/29/2022	–	FB	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Field Blank	6/30/2022	–	FB	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9

- Notes:
1. Samples were collected by Sanborn, Head & Associates, Inc. personnel on the dates indicated and analyzed by SGS North America, Inc. (SGS) of Orlando, Florida for per- and polyfluorinated alkyl substances (PFAS) compounds by United States Environmental Protection Agency (USEPA) Method 537 (modified) with isotope dilution.
 2. Concentrations are presented in milligrams per kilogram (mg/kg), unless otherwise noted.
 3. PADEP medium-specific concentrations (MSCs) for organic regulated substances in surface soil (0-2 feet) from Appendix A, Table 3 (<http://www.pacodeandbulletin.gov/Display/pabull?file=/secure/pabulletin/data/vol50/50-7/238.html&d=reduce>).
 4. Perfluorobutanesulfonic Acid (PFBS)
 5. Perfluoroheptanoic Acid (PFHpA)
 6. Perfluorohexanesulfonic Acid (PFHxS)
 7. Perfluorononanoic Acid (PFNA)
 8. Perfluorooctanesulfonic Acid (PFOS)
 9. Perfluorooctanoic Acid (PFOA)
 10. "EB" indicates equipment blank
 - "FB" indicates field blank
 - "FD" indicates field duplicate of parent sample
 - "N" indicates normal sample
 - "QA/QC" indicates Quality Assurance/Quality Control



Evergreen Resources Management
2 Righter Parkway, Suite 120
Wilmington, DE 19803

May 6, 2022

VIA ELECTRONIC SUBMISSION

Lisa Strobridge, P.G.
Environmental Cleanup & Brownfields Program
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street, Norristown, PA 19401

**Re: PFAS Soil Sampling Workplan
Former Philadelphia Refining Complex
3144 Passyunk Avenue, Philadelphia, Pennsylvania**

Dear Ms. Strobridge:

At the request of the Pennsylvania Department of Environmental Protection (PADEP), Evergreen Resources Management Operations (Evergreen) completed lower aquifer groundwater sampling in July 2021 and shallow aquifer sampling in January 2022 for per- and polyfluoroalkyl substances (PFAS) at the former Philadelphia Refinery (Site). The results of the lower aquifer sampling were discussed with the PADEP and the United States Environmental Protection Agency (USEPA) on September 1, 2021, the City of Philadelphia (City) on September 14, 2021, and sent to the PADEP on September 30, 2021. Shallow aquifer sampling results were sent to PADEP on April 11, 2022.

The PADEP has also requested that Evergreen collect soil samples from the Site for PFAS analyses. To address this request, Evergreen is proposing to complete the following tasks.

Task 1 – Prepare a soil sampling workplan, contained herein, to evaluate potential PFAS impacts in soil at Site.

Task 2 – If requested, Evergreen will convene a meeting to discuss with the PADEP and EPA the proposed soil sampling workplan. A specific date will be chosen based on availability (anticipated in May 2022, if needed).

Task 3 – Perform soil sampling for PFAS at the Site in accordance with the agreed upon workplan. Sampling is proposed for a two-week period in June 2022, as noted in Section 2.0.

Task 4 – Submit the soil sampling PFAS results to the agencies, anticipated to be August 2022.

Task 5 – Review soil sampling PFAS results with the PADEP and EPA upon submittal.

The workplan below presents the locations selected for soil sampling, the proposed sample collection methodology, and the proposed analytical approach.

1.0 PROPOSED SAMPLING PLAN

The proposed approach is to investigate PFAS in soil with respect to potential Aqueous Film Forming Foam (AFFF) release areas based on the results of the June 2021 desktop review¹, the results of the PFAS sampling in the lower aquifer wells during the July 2021 sampling event, and the shallow aquifer wells during the January 2022 sampling event.

The following areas where firefighting foam may have been previously used and stored at the Site were identified in the desktop review:

1. Fire Training Areas
2. Past Fire Locations
3. Storage/Loading Areas and Fire Stations

Figure 1 depicts the locations identified during the desktop review where AFFF may have been used at the Site and the shallow and lower aquifer PFAS sampling results. The PFAS sampling results are compared to the Medium Specific Criteria (MSC) for Perfluorooctanesulfonic Acid (PFOS) + Perfluorooctanoic Acid (PFOA). The proposed soil sampling locations have been selected based on where the groundwater PFOA and PFOS results were greater than the MSC in groundwater and where former AFFF may have been used at the Site as the possible source to the groundwater concentrations. The spacing of the samples was based on a 4-acre sampling grid, with a finer 1-acre sampling grid used in areas where groundwater results were greater than 1000 ng/l. Where necessary, the identified sample location was relocated away from existing roads and tank locations in order to facilitate field collection of the samples. A total of 124 surface soil samples, to be collected in the 0 to 1-foot interval are proposed to be collected, as shown on **Figure 1**. The total number of samples by Area of Interest is summarized on **Table 1**.

The PFAS soil samples will be collected in accordance with the PFAS field procedures included in **Attachment A**. The proposed PFAS sampling procedures were developed to avoid potential PFAS cross-contamination from the sampling equipment and materials. The samples will be analyzed for the Unregulated Contaminant Monitoring Rule (UCMR) 3 list of PFAS compounds that include PFOA, PFOS, Perfluorononanoic Acid (PFNA), Perfluorohexanesulfonic Acid (PFHxS), Perfluoroheptanoic Acid (PFHpA), and Perfluorobutanesulfonic Acid (PFBS) consistent with the shallow and deep groundwater sampling analyses. In addition to the 124 surface soil samples, an additional 4 field duplicate, 6 field blank, and 1 equipment blank QA/QC samples will be collected.

2.0 CLOSING

As discussed in Task 2 above, if a meeting is desired by the PADEP or EPA to discuss this PFAS soil sampling workplan, Evergreen suggests the week of May 16, 2022. Evergreen has tentatively scheduled the PFAS soil sampling to occur in early June 2022 in advance of soil movement activities by Hilco Redevelopment Partners.

Regards,

Evergreen Resources Management Operations



Tiffani L. Doerr, P.G.

Cc: Scott Cullinan, PE, Evergreen Resources Management Operations
Kevin Bilash, EPA
Colleen Costello, PG, Sanborn Head & Associates, Inc.

¹ Desktop Review and Sampling Plan for PFAS at the Former Philadelphia Refinery, Evergreen, June 30, 2021.

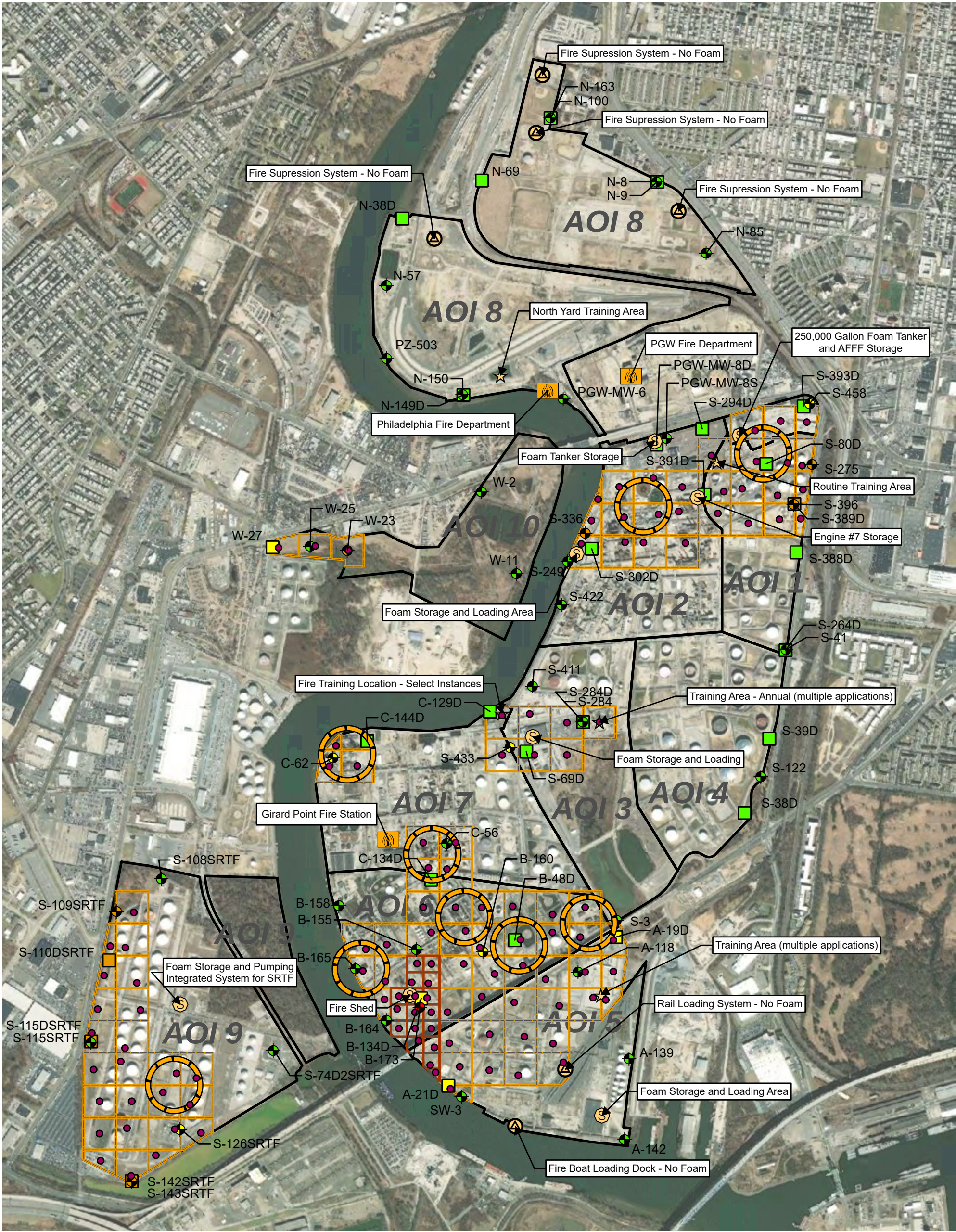


Figure 1
PFAS Soil Sample Locations and Grids based on Shallow and Lower Aquifer PFAS Results, Historical Fire Activity, and Training/Storage Areas
PFAS Soil Sampling Workplan

Evergreen Resources Group
Philadelphia, PA

Drawn By: M. Fuerte

Designed By: A. Buchy

Reviewed By: A. Buchy

Project No: 4796.00

Date: May, 2022

Notes

1. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
2. ng/L = nanograms per liter

Legend

- PFAS Sample Point (N = 124)

Monitoring Well sampled for PFAS

Shallow Aquifer

Lower Aquifer

● Sampled Monitoring Well (PFOS + PFOA Nondetect to 70 ng/L)

● Sampled Monitoring Well (PFOS + PFOA 70 to 200 ng/L)

● Sampled Monitoring Well (PFOS + PFOA 200 to 1000 ng/L)

● Sampled Monitoring Well (PFOS + PFOA > 1000 ng/L)

● Firefighting Asset - No Foam

● Fire Event

● Foam Storage and Loading Area

● Fire Department

● Foam Training Application Area

● 1-Acre Sampling Grid

● 4-Acre Sampling Grid

● Area of Interest (AOI) Boundaries

Table 1
PFAS Soil Sampling Work Plan
Former Philadelphia Refinery
Philadelphia, Pennsylvania

Area of Interest	Number of Soil Sampling Locations	Sample Depth (ft)	Sample ID	Notes
AOI 1	14	0-1	AOI1_B001_PFAS_0-1_2022MMDD	
			AOI1_B002_PFAS_0-1_2022MMDD	
			AOI1_B003_PFAS_0-1_2022MMDD	
			AOI1_B004_PFAS_0-1_2022MMDD	
			AOI1_B005_PFAS_0-1_2022MMDD	
			AOI1_B006_PFAS_0-1_2022MMDD	
			AOI1_B007_PFAS_0-1_2022MMDD	
			AOI1_B008_PFAS_0-1_2022MMDD	
			AOI1_B009_PFAS_0-1_2022MMDD	
			AOI1_B010_PFAS_0-1_2022MMDD	
			AOI1_B011_PFAS_0-1_2022MMDD	
			AOI1_B012_PFAS_0-1_2022MMDD	
			AOI1_B013_PFAS_0-1_2022MMDD	Belmont Terminal
			AOI1_B014_PFAS_0-1_2022MMDD	
			AOI1_B0##_PFAS_0-1_2022MMDD_DUP	Field Duplicate
AOI 2	13	0-1	AOI2_B001_PFAS_0-1_2022MMDD	
			AOI2_B002_PFAS_0-1_2022MMDD	
			AOI2_B003_PFAS_0-1_2022MMDD	
			AOI2_B004_PFAS_0-1_2022MMDD	
			AOI2_B005_PFAS_0-1_2022MMDD	
			AOI2_B006_PFAS_0-1_2022MMDD	
			AOI2_B007_PFAS_0-1_2022MMDD	
			AOI2_B008_PFAS_0-1_2022MMDD	
			AOI2_B009_PFAS_0-1_2022MMDD	
			AOI2_B010_PFAS_0-1_2022MMDD	
			AOI2_B011_PFAS_0-1_2022MMDD	
			AOI2_B012_PFAS_0-1_2022MMDD	
			AOI2_B013_PFAS_0-1_2022MMDD	

Table 1
PFAS Soil Sampling Work Plan
Former Philadelphia Refinery
Philadelphia, Pennsylvania

Area of Interest	Number of Soil Sampling Locations	Sample Depth (ft)	Sample ID	Notes
AOI 3	5	0-1	AOI3_B001_PFAS_0-1_2022MMDD	
			AOI3_B002_PFAS_0-1_2022MMDD	
			AOI3_B003_PFAS_0-1_2022MMDD	
			AOI3_B004_PFAS_0-1_2022MMDD	
			AOI3_B005_PFAS_0-1_2022MMDD	
AOI 5	20	0-1	AOI5_B001_PFAS_0-1_2022MMDD	
			AOI5_B002_PFAS_0-1_2022MMDD	
			AOI5_B003_PFAS_0-1_2022MMDD	
			AOI5_B004_PFAS_0-1_2022MMDD	
			AOI5_B005_PFAS_0-1_2022MMDD	
			AOI5_B006_PFAS_0-1_2022MMDD	
			AOI5_B007_PFAS_0-1_2022MMDD	
			AOI5_B008_PFAS_0-1_2022MMDD	
			AOI5_B009_PFAS_0-1_2022MMDD	
			AOI5_B010_PFAS_0-1_2022MMDD	
			AOI5_B011_PFAS_0-1_2022MMDD	
			AOI5_B012_PFAS_0-1_2022MMDD	
			AOI5_B013_PFAS_0-1_2022MMDD	
			AOI5_B014_PFAS_0-1_2022MMDD	
			AOI5_B015_PFAS_0-1_2022MMDD	
			AOI5_B016_PFAS_0-1_2022MMDD	
			AOI5_B017_PFAS_0-1_2022MMDD	
			AOI5_B018_PFAS_0-1_2022MMDD	
			AOI5_B019_PFAS_0-1_2022MMDD	
			AOI5_B020_PFAS_0-1_2022MMDD	

Table 1
PFAS Soil Sampling Work Plan
Former Philadelphia Refinery
Philadelphia, Pennsylvania

Area of Interest	Number of Soil Sampling Locations	Sample Depth (ft)	Sample ID	Notes
AOI 6	36	0-1	AOI6_B001_PFAS_0-1_2022MMDD	
			AOI6_B002_PFAS_0-1_2022MMDD	
			AOI6_B003_PFAS_0-1_2022MMDD	
			AOI6_B004_PFAS_0-1_2022MMDD	
			AOI6_B005_PFAS_0-1_2022MMDD	
			AOI6_B006_PFAS_0-1_2022MMDD	
			AOI6_B007_PFAS_0-1_2022MMDD	
			AOI6_B008_PFAS_0-1_2022MMDD	
			AOI6_B009_PFAS_0-1_2022MMDD	
			AOI6_B010_PFAS_0-1_2022MMDD	
			AOI6_B011_PFAS_0-1_2022MMDD	
			AOI6_B012_PFAS_0-1_2022MMDD	
			AOI6_B013_PFAS_0-1_2022MMDD	
			AOI6_B014_PFAS_0-1_2022MMDD	
			AOI6_B015_PFAS_0-1_2022MMDD	
			AOI6_B016_PFAS_0-1_2022MMDD	
			AOI6_B017_PFAS_0-1_2022MMDD	
			AOI6_B018_PFAS_0-1_2022MMDD	
			AOI6_B019_PFAS_0-1_2022MMDD	
			AOI6_B020_PFAS_0-1_2022MMDD	
			AOI6_B021_PFAS_0-1_2022MMDD	
			AOI6_B022_PFAS_0-1_2022MMDD	
			AOI6_B023_PFAS_0-1_2022MMDD	
			AOI6_B024_PFAS_0-1_2022MMDD	
			AOI6_B025_PFAS_0-1_2022MMDD	
			AOI6_B026_PFAS_0-1_2022MMDD	
			AOI6_B027_PFAS_0-1_2022MMDD	
			AOI6_B028_PFAS_0-1_2022MMDD	
			AOI6_B029_PFAS_0-1_2022MMDD	
			AOI6_B030_PFAS_0-1_2022MMDD	
			AOI6_B031_PFAS_0-1_2022MMDD	
			AOI6_B032_PFAS_0-1_2022MMDD	
			AOI6_B033_PFAS_0-1_2022MMDD	
			AOI6_B034_PFAS_0-1_2022MMDD	
			AOI6_B035_PFAS_0-1_2022MMDD	
			AOI6_B036_PFAS_0-1_2022MMDD	
			AOI6_B0##_PFAS_0-1_2022MMDD_DUP	Field Duplicate

Table 1
PFAS Soil Sampling Work Plan
Former Philadelphia Refinery
Philadelphia, Pennsylvania

Area of Interest	Number of Soil Sampling Locations	Sample Depth (ft)	Sample ID	Notes
AOI 7	9	0-1	AOI7_B001_PFAS_0-1_2022MMDD	
			AOI7_B002_PFAS_0-1_2022MMDD	
			AOI7_B003_PFAS_0-1_2022MMDD	
			AOI7_B004_PFAS_0-1_2022MMDD	
			AOI7_B005_PFAS_0-1_2022MMDD	
			AOI7_B006_PFAS_0-1_2022MMDD	
			AOI7_B007_PFAS_0-1_2022MMDD	
			AOI7_B008_PFAS_0-1_2022MMDD	
			AOI7_B009_PFAS_0-1_2022MMDD	
			AOI7_B###_PFAS_0-1_2022MMDD_DUP	
				Field Duplicate
AOI 9	24	0-1	AOI9_B001_PFAS_0-1_2022MMDD	
			AOI9_B002_PFAS_0-1_2022MMDD	
			AOI9_B003_PFAS_0-1_2022MMDD	
			AOI9_B004_PFAS_0-1_2022MMDD	
			AOI9_B005_PFAS_0-1_2022MMDD	
			AOI9_B006_PFAS_0-1_2022MMDD	
			AOI9_B007_PFAS_0-1_2022MMDD	
			AOI9_B008_PFAS_0-1_2022MMDD	
			AOI9_B009_PFAS_0-1_2022MMDD	
			AOI9_B010_PFAS_0-1_2022MMDD	
			AOI9_B011_PFAS_0-1_2022MMDD	
			AOI9_B012_PFAS_0-1_2022MMDD	
			AOI9_B013_PFAS_0-1_2022MMDD	
			AOI9_B014_PFAS_0-1_2022MMDD	
			AOI9_B015_PFAS_0-1_2022MMDD	
			AOI9_B016_PFAS_0-1_2022MMDD	
			AOI9_B017_PFAS_0-1_2022MMDD	
			AOI9_B018_PFAS_0-1_2022MMDD	
			AOI9_B019_PFAS_0-1_2022MMDD	
			AOI9_B020_PFAS_0-1_2022MMDD	
			AOI9_B021_PFAS_0-1_2022MMDD	
			AOI9_B022_PFAS_0-1_2022MMDD	
			AOI9_B023_PFAS_0-1_2022MMDD	
			AOI9_B024_PFAS_0-1_2022MMDD	
			AOI9_B0##_PFAS_0-1_2022MMDD_DUP	
				Field Duplicate
AOI 10	3	0-1	AOI10_B001_PFAS_0-1_2022MMDD	
			AOI10_B002_PFAS_0-1_2022MMDD	
			AOI10_B003_PFAS_0-1_2022MMDD	

Total Soil Samples 124

Total Duplicates 4

Table 1
PFAS Soil Sampling Work Plan
Former Philadelphia Refinery
Philadelphia, Pennsylvania

QA/QC Sample Types	Frequency	Sample ID Nomenclature	Description
Field Blank	6 per sample event	FB-01_YYYYMMDD	Collected by pouring an aliquot of laboratory-provided PFAS-free water into a laboratory-supplied sample container.
Equipment Blank	1 per sample event	EB-01_YYYYMMDD	Collected by pouring an aliquot of laboratory-provided PFAS-free water over decontaminated non-dedicated sampling equipment into a laboratory-supplied sample container.

Notes

1. All samples shall be analyzed using modified U.S. Environmental Protection Agency (USEPA) Method 537.1 with isotope dilution USEPA Unregulated Contaminant Monitoring Rule 3 list.
2. All samples shall be collected and analyzed in accordance with the Standard Operating Procedure (SOP) PFAS Field QA/QC and Sampling Protocol
3. Sample name will be modified based on actual sampling date.

PFAS FIELD PROCEDURES AND QA/QC PROTOCOL

TABLE OF CONTENTS

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1.0 SCOPE AND APPLICABILITY

This document provides the field procedures and Quality Assurance and Quality Control (QA/QC) procedures for soil sampling for per- and polyfluoroalkyl substances (PFAS).

2.0 LABORATORY REQUIREMENTS

The samples will be analyzed for both linear and branched PFAS isomers using a modified U.S. Environmental Protection Agency (USEPA) Method 537.1 with isotope dilution for the USEPA Unregulated Contaminant Monitoring Rule 3 list (listed below) by a laboratory accredited in accordance with Act 90 of 2002 (27 Pa. C.S. §§ 4101-4113) and 25 Pa. Code Chapter 252. Reporting limits for soil should be 0.5 micrograms per kilogram (µg/kg) or lower.

Analytical Parameter	CAS No.	Molecular Formula
Perfluoroheptanoic acid - PFHpA	375-85-9	C ₇ HF ₁₃ O ₂
Perfluorooctanoic acid - PFOA	335-67-1	C ₈ HF ₁₅ O ₂
Perfluorononanoic acid - PFNA	375-95-1	C ₉ HF ₁₇ O ₂
Perfluorobutanesulfonic acid - PFBS	375-73-5	C ₄ HF ₉ O ₃ S
Perfluorohexanesulfonic acid - PFHxS	355-46-4	C ₆ HF ₁₃ SO ₃
Perfluorooctanesulfonic acid - PFOS	1763-23-1	C ₈ HF ₁₇ SO ₃

3.0 FIELD QA/QC

The following table provides a summary of QA/QC samples that will be collected in the field and analyzed by the laboratory. PFAS-free water will be supplied by the analytical laboratory for collection of the field blank and equipment blank.

QA/QC Sample Types	Frequency	Description	Sample ID Nomenclature
Field Blank	6 per sample event	Collected by pouring an aliquot of laboratory-provided PFAS-free water into a laboratory-supplied sample container.	FB-##_YYYYMMDD
Field Duplicate	4 per sample event	Collected by filling a second set of laboratory-provided containers at a monitoring location and comparing to parent sample.	AOI#_B###_PFAS_0-1_YYYYMMDD_DUP
Equipment Rinse Blank	1 per sample event	Collected by pouring an aliquot of laboratory-provided PFAS-free water over decontaminated non-dedicated sampling equipment into a laboratory-supplied sample container.	EB-##_YYYYMMDD

Materials that potentially contain PFAS are to be avoided during sampling to avoid sample contamination. The following table provides a summary of items that are likely to contain PFAS (i.e., prohibited items) and the allowable alternatives.

Item Category	Allowable Items	Prohibited Items
Soil Sampling Equipment	- Stainless steel (SS) trowel - SS hand auger - SS bowl	Teflon®, polytetrafluoroethylene (PTFE), ethylene tetrafluoroethylene (ETFE), Viton®, perfluoroalkoxy (PFA) coating, and other fluoropolymer containing materials.
Decontamination	Alconox® and/or Liquinox®, deionized rinse, and a final PFAS-free water rinse.	Decon 90.
Sample Storage and Preservation for Groundwater/Aqueous/Soil:	Laboratory-provided sample container (HDPE or polypropylene bottles), regular ice in re-sealable plastic bags. After sampling, containers will be stored individually in re-sealable plastic bags.	LDPE or glass bottles, PTFE- or Teflon®- lined caps, chemical ice packs. Samples cannot be field filtered due to potential PFAS adsorption onto the filter.
Field Documentation	Plain paper, metal clipboard, Sharpies®, pens.	Waterproof/treated paper or field books, plastic clipboards, non-Sharpies® markers, Post-It®, and other adhesive paper products.
Field Clothing	Well-laundered (more than six times washed after purchase) clothing made of synthetic or cotton material, no fabric softener. Polyurethane and wax coated materials. Boots made with polyurethane and PVC, well-worn or untreated leather boots. PFAS-free Tyvek® material.	Clothing (including boots) made of Gore-Tex™ or other synthetic water resistant and/or stain resistant material, coated Tyvek® material. Fabric softener.
Personal Care Products (for the day of sampling)	Sunscreens – Alba Organics Natural Sunscreen, Yes to Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, Baby sunscreens that are “free” or “natural”. Insect Repellents – Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellent, Herbal Armor, California Baby Natural Bug Spray, BabyGanics. Sunscreen and insect repellent – Avon Skin So Soft Bug Guard – SPF 30 Lotion.	Cosmetics, moisturizers, hand cream, and other related products.
Food and Beverage	Bottled water and hydration drinks.	Pre-packaged food, fast food wrappers and containers.
Shelter	The use of a canopy/gazebo/tent, which can be erected over the sample location to provide shelter, may be considered. Note that the canopy is likely to have a PFAS-treated surface and must be handled with care. Gloves must be worn when setting up and moving the tent and then changed immediately afterwards. Further contact with the tent must be avoided until all PFAS samples have been collected and properly stored.	

Notes:

If an item is expected to come in direct contact with field samples, it may be necessary to have the products analyzed for PFAS to confirm that a specific batch or lot number does not contain PFAS. If an item is not expected to come into direct contact with field samples, then the product Safety Data Sheet and/or manufacturing specifications may be reviewed to

determine if the item is PFAS-containing by checking for any chemicals with “fluoro” in the name or the acronyms PTFE, TPE, FEP, ETFE, or PFA.

4.0 SAMPLING PRECAUTIONS

Sampling personnel will don a new pair of nitrile gloves for each new sampling location. Nitrile gloves should be replaced immediately before handling sample bottles, immediately before handling sampling equipment, and immediately before collecting the PFAS samples. Gloves need to be replaced more frequently than typical to limit cross-contamination potential. The sample bottle caps should not be placed on any surface during sampling and, after samples are collected, the bottles should be capped, labeled, and sealed in individual re-sealable plastic (e.g., Ziploc®) bags.

For soil sampling, an allowable sampling device (as outlined above – Teflon®/PFAS-free) will be used for field sampling. In general, non-dedicated stainless steel sampling equipment will be used for PFAS soil sample collection as listed in Section 5.0. As necessary, PFAS-free plastic sheeting will be used to prevent contact with potentially contaminated soil and other surfaces during storage and deployment of downhole sampling equipment.

5.0 SAMPLING EQUIPMENT/SUPPLIES

The following section lists equipment to be used for sampling of PFAS in soil.

- Laboratory-supplied sample containers
- PFAS-free DI water
- Laboratory-supplied cooler(s)
- Field Sampling Forms
- 5-gallon bucket
- PFAS-free Plastic Sheeting
- Spade(s), scoop(s), bowl(s)
- Hand auger
- Decontamination buckets and brushes, paper towels, non-phosphatic detergent, potable water, distilled/de-ionized water, and PFAS-free water for equipment decontamination between sampling locations
- Field documentation materials
- Personal Protective Equipment (PPE)

6.0 DATA USABILITY AND REPORTING

As analytical data packages are received from the laboratory, each package will be reviewed to ensure data usability for the objectives of the sampling event. This review will include, but is not limited to, sample hold times, lab qualifiers, surrogate recoveries, sample naming conventions, collection dates/times, analyzing data/times, etc. Final data packages will be imported into an EQUIS database for data storage. The database will be used to generate analytical data summary tables that compare the values to Pennsylvania Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSC) for PFAS. The following table provides PADEP MSCs for Perfluorobutane Sulfonate (PFBS), Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) in Non-residential

surface soil (0-2 feet). Currently, PFAS compounds on the UCMR 3 list of Perfluoroheptanoic acid (PFHpA), Perfluorononanoic acid (PFNA), and Perfluorohexanesulfonic acid (PFHxS) do not have defined PADEP MSCs.

Regulated PFAS Substance	CAS Number	PADEP MSC (mg/kg)
PFBS	375-73-5	960
PFOS	1763-23-1	64
PFOA	335-67-1	64

Notes:

PADEP MSCs derived from Table 3 – Medium-Specific Concentrations (MSCs) for Organic Regulated Substances in Soil (page 5) under 25 Pa. Code Chapter 250, Administration of the Land Recycling Program (Act 2 cleanup standards) effective November 20, 2021.

PFAS sample data will also be included in an ArcGIS data base for figure generation. Sampling activities, findings, results, conclusions, and tables/figures will be included in a future submittal to the PADEP and EPA.



Evergreen Resources Management
2 Righter Parkway, Suite 120
Wilmington, DE 19803

June 30, 2021

VIA ELECTRONIC SUBMISSION

C. David Brown, P.G.
Professional Geologist Manager
Environmental Cleanup & Brownfields Program
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street, Norristown, PA 19401

**Re: Desktop Review and Sampling Plan for PFAS
former Philadelphia Refining Complex
3144 Passyunk Avenue, Philadelphia, Pennsylvania**

Dear Mr. Brown:

At the request of the Pennsylvania Department of Environmental Protection (PADEP), Evergreen Resources Management Operations (Evergreen) completed groundwater remediation system sampling in February 2021 for per and polyfluoroalkyl substances (PFAS) at the former Philadelphia Refinery (Site). The results of this sampling were sent to the PADEP on March 22, 2021 and discussed with the PADEP, United States Environmental Protection Agency (USEPA), and the City of Philadelphia (City) on May 5, 2021. On May 14, 2021, the PADEP requested that Evergreen:

- Should research refinery records to determine the locations of all fire training areas, locations of fires where aqueous film forming foam (AFFF) was used, and any other locations where AFFF might have been discharged to the surface or subsurface, including groundwater.
- Sample deep (also referred to as lower aquifer) groundwater monitoring wells at the Site for PFAS and prepare a scope of work to identify wells for sampling based on findings of the desktop review.

The PADEP also recommended that Evergreen complete a soil investigation to characterize PFAS in potentially impacted areas. Evergreen's proposed approach to address the PADEP's May 14, 2021 request was submitted to the PADEP on May 21, 2021 and includes the following tasks:

Task 1 – Prepare a summary of the desktop review of available resources which detail historic fires, fire training areas and possible AFFF storage facilities on-site since 1960. A target date of June 30, 2021 was proposed for the report summarizing the findings of Task 1.

Task 2 – Prepare a lower aquifer groundwater sampling plan to evaluate potential PFAS impacts. A target of June 30, 2021 was proposed for a sampling plan.

Task 3 – Have a discussion with the PADEP and USEPA on the report and sampling plan from Task 1 and 2. This meeting was proposed for the week of July 12th. As noted in Section 3.0, Evergreen requests that this meeting be held on July 12, 2021.

Task 4 – Perform Task 2 groundwater sampling for PFAS subsequent to the July 12th meeting and concurrence with the sampling plan.

Task 5 – Submit lower aquifer groundwater PFAS findings to the agencies by September 30, 2021.

Task 6 – Have a discussion with PADEP and USEPA in early November 2021 to review lower aquifer groundwater findings and determine if additional investigation is warranted.

This letter presents the findings from the completion of Task 1 and a sampling plan in accordance with Task 2.

1.0 SUMMARY OF DESKTOP REVIEW

Multiple sources of information were reviewed in order to identify potential sources of PFAS at the site in accordance with Task 1, as summarized below.

- Review of readily available media articles and other publicly available information about past fires at the Site. Attachment A summarizes the fires that were covered in the media since the 1960's at the refinery.
- Review of relevant available site maps, including site operational maps (including tank numbers, refining unit numbers, and other relevant operational features) that were incorporated in historic environmental reports, existing and historic utility maps and historic site knowledge.
- Site inspection on June 2, 2021, identifying fire suppression systems, firefighting foam concentrate storage (including both labeled totes and drums) and inspection of locations of past fires (where possible). Photos from this site inspection are included in Attachment B.
- Review of Safety Data Sheets (SDS) provided by Hilco Redevelopment Partners (HRP) for firefighting foam used on site. Cross checking known databases of PFAS constituents identified in specific foam brand names.

Based on the desktop review, areas where firefighting foam may have been previously used at the Site were identified. These are summarized below and shown on Figure 1 and summarized in Table 1.

1. Fire Training Areas
 - a. Routine/Annual Training Areas – application of firefighting foam as part of fire training activities.
 - b. Select Training Areas – Less frequently used training areas.
2. Fires –Firefighting foam was reported to be used to address additional fires at the Refinery, as shown on Figure 1 and Table 1.
3. Storage/Loading Areas and Fire Stations – Though firefighting foam was present at these locations, there is no indication that AFFF containing materials came into the contact with the environment.

2.0 PROPOSED SAMPLING PLAN

An important consideration in determining a sampling plan is the direction of groundwater flow and the potential for background PFAS concentrations migrating onto the Site. Given the ubiquitous nature of PFAS in commerce and industry and the nearby potential sources (some, like Philadelphia Gas Works, with potential use of AFFF foam for fire suppression), it is possible that PFAS may have migrated onto the Site from one of these sources. Figure 1 includes lower aquifer groundwater contours to assist in selection of sampling locations representative of upgradient/background conditions. In addition, since there is no groundwater use at the Site and the majority of the Site is to be capped as part of the planned redevelopment, the proposed sampling plan also includes downgradient sampling locations to assess the potential for PFAS migration off-site.

The proposed sampling plan has been developed in response to the PADEP's request to sample for PFAS at the Site. The proposed approach is to investigate the lower aquifer wells with respect to potential AFFF release areas based on the results of the desktop study. As mentioned in Section 2.0, areas where firefighting foam may have been previously used at the Site were identified, including:

1. Fire Training Areas
2. Fires
3. Storage/Loading Areas and Fire Stations

The sampling plan includes lower aquifer sampling locations proximate to each of these areas, but with the recognition that Evergreen is including proposed sampling locations even in areas with a low potential for release of AFFF to the environment. The proposed sampling locations are shown in Figure 1 and are summarized on Table 1.

The lower aquifer groundwater samples will be collected in accordance with the PFAS-specific SOP included in Attachment C. PFAS sampling requires special considerations to avoid potential PFAS-cross contamination from the sampling equipment and a higher level of QA/QC samples to

check for sample contamination. In general, Teflon-containing materials will be avoided, and samples will be collected in containers that do not absorb PFAS.

Analytical Approach

Only three PFAS are currently regulated by PADEP under Act 2 (PFOS, PFOA, and PFBS). Evergreen proposes to report the results for these three analytes during the lower aquifer groundwater sampling event. The analyte list could be expanded; however, to include all six of the PFAS compounds that were previously analyzed the Site.

3.0 CLOSING

We would like to have a meeting with the PADEP to review the desktop study, proposed sampling locations and analyte list on July 12, 2021. We have scheduled the groundwater sampling described in the sampling plan for the end of July 2021.

Regards,

Evergreen Resources Management Operations



Tiffani L. Doerr, P.G.

Cc: Scott Cullinan, PE, Evergreen Resources Management Operations
Kevin Bilash, EPA
Colleen Costello, PG, Sanborn Head & Associates, Inc.

TABLE



TABLE 1
Proposed Lower Aquifer Sampling Locations
Former Philadelphia Refinery
Philadelphia, PA

Proposed Investigation		
Description	Detail	Monitoring Well
North Yard Training Area	Firefighting foam was reportedly applied to this area for annual training each May from 2012 to the end of operations in 2019.	N-149D
Girard Point Training Area - Annual Training	Reported multiple applications of firefighting foam for training.	S-284D
Fire Boat Loading Area - Training Area	Reportedly not consistently used as a training area	C-129D
7 Still Refining Unit Fires	Reported frequent incidental fires requiring the application of firefighting foam	C-144D
2019 Explosion	2019 explosion and fire	C-134D
1975 Gulf Refinery Platt Bridge Fire	Large multi-alarm fire with reported application of firefighting foam	B-48D
1977 Tank 291 Arco Fire	Explosion resulting in 250 Firefighters on scene - reported application of firefighting foam	S-302D
1975 Belmont Terminal 9-Alarm Fire	Terminal line and Tank 27 Fire - reported application of firefighting foam.	S-80D
Engine #7 Storage	Firefighting foam equipped fire tanker was reportedly stored at this location	S-391D
Point Breeze Visitor's Entrance Fire Engine Garage	Firefighting foam equipped fire tanker was reportedly stored at this location	PGW-MW-8D
Belmont Terminal 25,000 Foam Tanker and firefighting Storage	Firefighting foam equipped fire tanker and additional firefighting concentrate totes were reportedly stored at this location	S-80D
Girard Point Warehouse firefighting Loading and Storage	Firefighting foam concentrate was reportedly stored in totes at this location	S-69D
Girard Point Fire Equipment Storage Shed	Reported firefighting foam concentrate drum storage area	B-134D
Upgradient Background Locations	Upgradient Locations to evaluate background	N-38D
		N-69
		N-163
		N-9
		W-27
		S-110DSRTF
		S-115DSRTF
		S-294D
Downgradient Boundary Locations	Downgradient Boundary Locations	S-393D
		S-143SRTF
		A-21D
		A-19D
		S-38D
		S-39D
		S-264D
		S-388D
		S-389D

FIGURE





Proposed Sampling Locations in the Lower Aquifer

Former Philadelphia Refinery

Philadelphia, PA

Drawn By: M. Fuerte / H. Pothier
Designed By: P. Troy
Reviewed By: P. Troy
Project No: 4796.01
Date: June 23, 2021

Figure Narrative

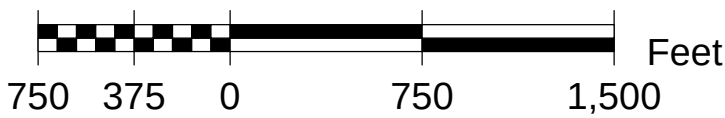
• • •

Notes

1. Aerial imagery provided by Google Earth. (2018) Philadelphia, PA, USA. 39°54'27.86"N, 75°12'00.94"W. Eye alt 24246 ft.
2. Fire Department locations identified from historical certified Sanborn Maps.
3. Onsite foam assets are approximate locations determined from Site visit on 6/2/2021.
4. Lower aquifer contours sourced from 2020 First Half Semi-Annual Remediation Status Report Figure 5.

Legend

-  AOI Boundary Lines
-  PGW Boundary
-  Lower Aquifer Contours
-  Lower Aquifer Monitoring Wells
-  Proposed Lower Aquifer Downgradient Boundary Well Sampling Location
-  Proposed Lower Aquifer Upgradient/Background Well Sampling Location
-  Proposed Lower Aquifer Well Sampling Location in Storage/Loading Area
-  Proposed Lower Aquifer Well Sampling based on Reported Fire or Training Area
-  Historical Fire Incident
-  Fire Department
-  Firefighting Asset - No Reported Firefighting Foam Storage
-  Reported Firefighting foam Storage and Loading Area
-  Reported Fire Training Area with Application of Firefighting Foam



ATTACHMENT A

**SUMMARY OF PUBLIC INFORMATION AND
MEDIA ARTICLES REVIEWED**



Attachment A
Summary of Public Information and Media Articles Reviewed

Date	Description	Citations		
9/9/1960	Girard Point - Gulf Refinery Fire: "Well into the second half of the 20th century, what is now the PES complex was split between several refineries. One of them was the 600-acre Girard Point Refinery, owned by the former Gulf Oil Corp. In 1960, a blaze erupted in a six-story building and raged for hours through the warm September evening. Gulf Oil Corp. estimated damage at around \$1 million — about \$8.5 million today, adjusted for inflation. No deaths or injuries were reported."	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	
5/23/1966	Girard Point - Gulf Refinery Fire - "The Philadelphia Inquirer front-page story on May 24, 1966, would sound familiar to current observers: "5-Alarm At Refinery Shoots Flames 400 Feet In the Air." This particular blaze snarled traffic and closed bridges. No one was killed or injured this time either, according to archived news reports. But such fires had become a frightening routine for emergency responders, the papers noted."	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	Ingraham, Bill. "A Spectacular Multi-Alarm Fire Hit the Gulf Oil Refinery on May 24, 1966." Billy Penn, Philadelphia, 21 June 2019.	
5/11/1970	Point Breeze - Explosion of 13-story Catalytic Unit at the ARCO Refinery.	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	
1966-1975	Girard Point - Gulf Refinery Fires - Generic mention that 8 fires that occurred at the Gulf Refinery during this time period	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.		
10/12/1975	Point Breeze - Belmont Terminal Line and Tank 27 Fire - Coordinated Foam Attack Ordered, dirt dike built around the loading racks to contain the product and fill with foam. "Engine 33, responding on the fourth alarm, brought a foam unit from the Allied Chemical Company. On the fifth alarm, Engine 125 drove the Rohm & Haas Company foam unit into the refinery. Gulf sent its newly acquired foam pumper to assist, as did the Johnsville Naval Air Station. A nearby foam manufacturer dispatched two new units destined for shipment to China to stand by."	Burns, Robert. "9-Alarm Fire Starts In Trench for Piping at Philadelphia Refinery." Fire Engineering, 3 Sept. 2019.	Bartosz, Robert C. Fire Engineering, Philadelphia, 17 Aug. 1975.	
10/20/1975	Girard Point - Gulf Refinery Fire - This fire was centered in a 125-foot-high distillation tower. Pumps had been bringing in crude oil from a Gulf storage facility at Darby Creek. At the peak of the fire, it covered an area with a 250-foot radius around the base of the tower, but the fire was confined to the lower section. "Following the sixth alarm, Rizzo issued a special call for Engine 33 to and Allied Chemical's foam unit."	Burns, Robert. "9-Alarm Fire Starts In Trench for Piping at Philadelphia Refinery." Fire Engineering, 3 Sept. 2019.		
10/30/1975	Girard Point - Gulf Refinery - 1 Alarm Fire - Contained on site, exact location unknown	Burns, Robert. "9-Alarm Fire Starts In Trench for Piping at Philadelphia Refinery." Fire Engineering, 3 Sept. 2019.		
8/17/1975 - 8/26/1975	Girard Point - Gulf Refinery - 6 Alarm Fire - Caused by overfilling of Tank 231 - "The fire had already expanded eastward in the refinery, taking with it two fire department engines - No. 160 and No.133 - and also a refinery foam pumper."	Doyle, Jack. "Burning Philadelphia: Refinery Inferno, 1975." The Pop History Dig, 15 Feb. 2015.	Philadelphia Evening Bulletin. Hidden City Philadelphia, Philadelphia, 10 Dec. 2013.	Philadelphia Inquirer, et al. The Pop History Dig, Philadelphia, 15 Feb. 2015.
1/24/1977	Point Breeze - Arco Refinery Tank 291 - "Four were injured in another Arco explosion that blasted the windows out of buildings blocks away. The fire lasted for hours, even with 250 firefighters on the scene."	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.	Cramer, Richard Ben. "4 Hurt in ARCO Blast, Fire." <i>The Philadelphia Inquirer</i> , 25 Jan. 1977, pp. 1C-9A.	
4/9/1977	Girard Point - Gulf Refinery - "an aerial photo of another blaze in 1977 in which a barge sunk, releasing oil which caught fire in the river"	Dougherty, Christopher R. "A Petaled Rose Of Hell: Refineries, Fire Risk, And The New Geography Of Oil In Philadelphia's Tidewater." Hidden City Philadelphia, 10 Dec. 2013.	D'Angelo, Ed. "Entrance to Gulf Oil Refinery Frames Fire." Temple University Libraries, Philadelphia Evening Bulletin, 9 Apr. 1977.	Philadelphia Evening Bulletin. Hidden City Philadelphia, Philadelphia, 10 Dec. 2013.
Early 1980s	Schuylkill River Tank Farm - At SR58 Tank a notable fire occurred resulting in the application of AFFF	Former employee accounts		
8/1/1982	Girard Point - Gulf Refinery - "a Gulf worker was seriously burned after a 125-foot heating tower exploded into flames in the middle of the night, leaving yet another trail of thick black smoke on the South Philly horizon."	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.		
1/11/1988	Point Breeze - "In 1988, Cherry Hill and Bucks County residents were ripped awake by another explosion at the South Philly plant, newspapers reported. A steel-welded lid blew off one of the oil tanks and flew about 150 feet in the blast. A spokesperson for the oil company acknowledged that it was a stroke of luck the lid didn't crash with one of the other tanks."	Marin, Max. "South Philly Refinery's Long History of Fires, Explosions, Deaths and Injuries." Billy Penn, 21 June 2019, 1:15 PM.	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.	
8/24/2011	Girard Point - "A small fire at Girard Point was declared under control an hour later. According to a Sunoco spokesperson, the fire began at a pump."	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.		
5/22/2015	Girard Point - "The fire broke out shortly before 6 p.m. at Philadelphia Energy Solutions on the 3100 block of Pennrose Ave. No injuries have been reported. By 6:30 p.m., the bulk of the fire appeared to have been knocked down."	Breaking News Desk, PHILLY.COM. "Fire at South Phila. Refinery Appears under Control." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 22 May 2015.		

12/10/2016	Point Breeze - "Firefighters, hazmat teams and Philadelphia police all responded to the one-alarm blaze which started on the Point Breeze side of the refinery on 3144 W. Passyunk Avenue around 10:50 p.m. Saturday. Police also closed streets in the area. Crews were eventually able to bring the flames under control at 11:49 p.m. No injuries were reported and all workers at the refinery have been accounted for. Officials have not yet revealed the exact cause of the fire."	Chang, David. "Crews Battle Fire at Philadelphia Energy Solutions Refinery." NBC10 Philadelphia, NBC Universal Media, LLC, 11 Dec. 2016.		
6/21/2019	Girard Point - Large Explosion and Fire	Rush, Mariah. "In Philly, a History of Oil Refinery Fires Going Back Decades." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 21 June 2019.	Gambardello, Joseph A., et al. "Explosions Rip through South Philadelphia Refinery, Triggering Major Fire and Injuring 5." The Philadelphia Inquirer, The Philadelphia Inquirer, LLC, 22 June 2019, 5:14 PM.	

ATTACHMENT B

SITE PHOTOS



ATTACHMENT B

PROJECT PHOTOGRAPHS



Photo 1: Drum in Fire Shed

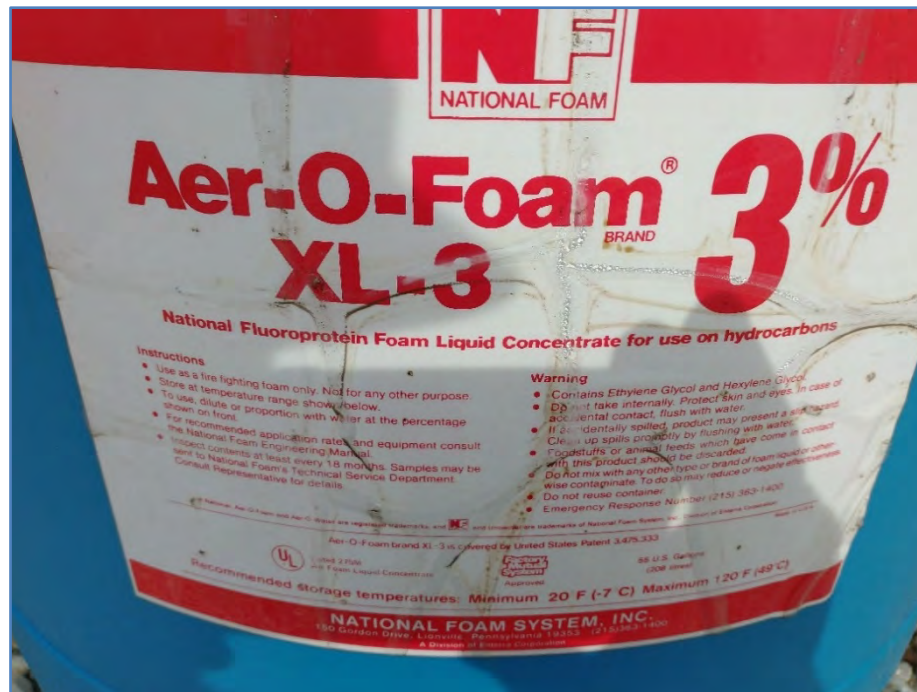


Photo 2: Drum Label



Photo 3: Foam Tote Label



Photo 4: Empty Foam Totes



Photo 5: Fire Hose



Photo 6: Fire Shed with Foam Drums



Photo 7: Fire Trailer



Photo 8: Foam Loading Area-1200 Tanks



Photo 9: Foam Loading Inspection Tag



Photo 10: Foam Nozzle

ATTACHMENT C

PFAS SAMPLING STANDARD OPERATING PROCEDURES (SOPs)



SOP
PFAS FIELD QA/QC, AND
SAMPLING PROTOCOL

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1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) provides groundwater sampling protocols for per- and polyfluoroalkyl substances (PFAS).

2.0 LABORATORY REQUIREMENTS

The samples will be analyzed for both linear and branched PFAS isomers using a modified U.S. Environmental Protection Agency (USEPA) Method 537.1 with isotope dilution for the USEPA Unregulated Contaminant Monitoring Rule 3 list (listed below) by a laboratory accredited in accordance with Act 90 of 2002 (27 Pa. C.S. §§ 4101-4113) and 25 Pa. Code Chapter 252. Undiluted reporting limits should be 5 nanograms per liter (ng/L) or lower.

Analytical Parameter	CAS No.	Molecular Formula
Perfluoroheptanoic acid - PFHpA	375-85-9	C ₇ HF ₁₃ O ₂
Perfluorooctanoic acid - PFOA	335-67-1	C ₈ HF ₁₅ O ₂
Perfluorononanoic acid - PFNA	375-95-1	C ₉ HF ₁₇ O ₂
Perfluorobutanesulfonic acid - PFBS	375-73-5	C ₄ HF ₉ O ₃ S
Perfluorohexanesulfonic acid - PFHxS	355-46-4	C ₆ HF ₁₃ O ₃ S
Perfluorooctanesulfonic acid - PFOS	1763-23-1	C ₈ HF ₁₇ O ₃ S

3.0 FIELD QA/QC

The following table provides a summary of QA/QC samples that will be collected in the field and analyzed by the laboratory. PFAS-free water will be supplied by the analytical laboratory for collection of the field blank.

QA/QC Sample Types	Frequency	Description	Nomenclature
Field Blank	1 per sample event.	Collected by pouring an aliquot of laboratory-provided PFAS-free water into a laboratory-supplied sample container.	FB-1
Blind Field Duplicate	1 per sample event	Collected by filling a second set of laboratory-provided containers at a monitoring location and comparing to parent sample.	Dup-1

The following table provides a summary of items that are likely to contain PFAS (i.e., prohibited items) and the allowable alternatives.

Item Category	Allowable Items	Prohibited Items
Pumps and Tubing	High-density polyethylene (HDPE), low-density polyethylene (LDPE), polyvinyl chloride (PVC), silicon, buna-nitrile, or stainless steel (SS) materials. - All Polyethylene (PE), PVC, or SS Bailer and nylon rope; - Peristaltic pump (with appropriate tubing); - Waterra® inertial foot valve (Acetal thermoplastic or SS); - PFAS-Free Geotech Snap Sampler®; - PFAS-Free Geotech Portable Bladder Pump; and - Proactive® SS Monsoon submersible pumps with PVC wire lead.	Teflon®, polytetrafluoroethylene (PTFE), ethylene tetrafluoroethylene (ETFE), Viton®, perfluoroalkoxy (PFA) coating, and other fluoropolymer containing materials. - Grundfos Redi-Flo Submersible Pump; - QED Well Wizard® bladder pump; - QED Sample Pro® bladder pump¹; - Standard Geotech Snap Sampler®²; - Standard Geotech Portable Bladder Pump; and - Geotech SS Geosub Pump submersible pump with PVC wire lead.
Decontamination	Alconox® and/or Liquinox®, deionized rinse, and a final PFAS-free water rinse.	Decon 90.
Sample Storage and Preservation	Laboratory-provided sample container (HDPE or polypropylene bottles), regular ice in re-sealable plastic bags. After sampling, containers will be stored individually in re-sealable plastic bags.	LDPE or glass bottles, PTFE- or Teflon®-lined caps, chemical ice packs. Samples cannot be field filtered due to potential PFAS adsorption onto the filter.
Field Documentation	Plain paper, metal clipboard, Sharpies®, pens.	Waterproof/treated paper or field books, plastic clipboards, non-Sharpies® markers, Post-It®, and other adhesive paper products.
Field Clothing	Well-laundered (more than six times washed after purchase) clothing made of synthetic or cotton material, no fabric softener. Polyurethane and wax coated materials. Boots made with polyurethane and PVC, well-worn or untreated leather boots. PFAS-free Tyvek® material.	Clothing (including boots) made of Gore-Tex™ or other synthetic water resistant and/or stain resistant material, coated Tyvek® material. Fabric softener.

¹ Laboratory data were provided by QED indicating the Sample Pro pump body, housing and check balls, LDPE bladder, Viton® O-rings, polyethylene tubing, Teflon®-lined tubing, and all Teflon® tubing did not result in PFAS greater than the 5-10 ng/l method reporting limits in water that these materials were soaked in.

² Laboratory data were provided by Geotech indicating the Snap Sampler® (including the PFA coated spring, the molded PFA “Snap Cap” and the Viton® o-ring) did not result in PFAS greater than the 1.2 ng/l method reporting limits in PFAS-free water sampled by Snap Samplers®.

Item Category	Allowable Items	Prohibited Items
Personal Care Products (for the day of sampling)	Sunscreens – Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, Baby sunscreens that are “free” or “natural”. Insect Repellents – Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellent, Herbal Armor, California Baby Natural Bug Spray, BabyGanics. Sunscreen and insect repellent – Avon Skin So Soft Bug Guard – SPF 30 Lotion.	Cosmetics, moisturizers, hand cream, and other related products.
Food and Beverage	Bottled water and hydration drinks.	Pre-packaged food, fast food wrappers and containers.
Shelter	The use of a canopy/gazebo/tent, which can be erected over the sample location to provide shelter, may be considered. Note that the canopy is likely to have a PFAS-treated surface and must be handled with care. Gloves must be worn when setting up and moving the tent and then changed immediately afterwards. Further contact with the tent must be avoided until all PFAS samples have been collected and properly stored.	

Notes:

If an item is expected to come in direct contact with field samples, it may be necessary to have the products analyzed for PFAS to confirm that a specific batch or lot number does not contain PFAS. If an item is not expected to come into direct contact with field samples, then the product Safety Data Sheet and/or manufacturing specifications may be reviewed to determine if the item is PFAS-containing by checking for any chemicals with “fluoro” in the name or the acronyms PTFE, TPE, FEP, ETFE, or PFA.

4.0 SAMPLING PRECAUTIONS

Particular care will be taken for sampling personnel to don a new pair of nitrile gloves for each new sampling location. Nitrile gloves should be replaced immediately before handling sample bottles, immediately before handling sampling equipment, and immediately before collecting the PFAS samples. Gloves need to be replaced more frequently than typical to limit cross-contamination potential. Additionally, if feasible (and PFAS concentration data are available), locations should generally be sampled in order of least anticipated PFAS concentrations to greatest anticipated PFAS concentrations.

PFAS samples should be collected first, prior to collecting samples for any other parameters into any other containers. The sample bottle caps should not be placed on any surface during sampling and, after samples are collected, the bottles should be capped, labeled, and sealed in individual re-sealable plastic (e.g., Ziploc®) bags.

4.1 Groundwater Sampling

An allowable sampling device (as outlined above – Teflon®/PFAS-free) will be used for field sampling. When feasible, peristaltic pumps with disposable PE tubing and silicone tubing are a preferred sampling method at locations with a depth to groundwater of less than approximately 25 feet because less agitation of the water column is likely compared to an inertial pumping method. Turbidity and suspended solids in samples may interfere with laboratory methods, potentially elevating reporting limits, and may also cause variation in

analytical data. Dedicated PE tubing with SS or acetal thermoplastic Waterra® inertial pumps are preferred sampling methods at locations with greater depths to groundwater and/or greater sampling depths. Dedicated or disposable all PE, PVC or SS bailers are also acceptable alternatives. As necessary, PFAS-free plastic sheeting will be used to prevent contact with potentially contaminated soil and other surfaces during storage and deployment of downhole sampling equipment.

The Waterra® hand pump may be used and will consist of ½-inch HDPE tubing and a Delrin acetal thermoplastic standard foot valve. The standard foot valve typically comes in two sizes, a Model D-25 (3-inches in length and 1-inch outside diameter) and Model D-16 (1-inch in length and 0.625-inch outside diameter). Model D-25 foot valves are anticipated for use at the site. A new foot valve will be used at each monitoring location.

5.0 EQUIPMENT/SUPPLIES

- Laboratory-supplied sample containers and PFAS-free DI water
- Field Sampling Forms
- Peristaltic pump
- Inertial pump (i.e., Waterra®-type D-16 or D-25 check valve or equivalent)
- Dedicated polyethylene bailer with new nylon rope
- Polyethylene tubing (½-inch HDPE or similar)
- Glass jar (quart or liter capacity) for field parameters
- 5-gallon bucket (with graduations)
- Silicon tubing
- Multi-parameter sonde (Hydrolab Quanta [with turbidity probe])
- Slope Indicator or QED (or equivalent) electronic water level meter
- Stainless steel spade(s), scoop(s), mixing bowl(s)
- Decontamination buckets and brushes, paper towels, non-phosphatic detergent, potable water, distilled/de-ionized water, and PFAS-free water for equipment decontamination between sampling locations
- Field documentation materials
- Personal protective equipment (PPE)

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Sunoco/Evergreen

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

4796.01

SGS Job Number: JD47196

Sampling Dates: 06/20/22 - 06/22/22



Report to:

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Total number of pages in report: 87



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



David Chastain
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD47196

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
---------------	----------------	---------	----------	-------------	------	------------------

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

JD47196-1	06/20/22	08:30 MF	06/22/22	SO	Soil	AOI2_B001_PFAS_0-1_20220620
JD47196-2	06/20/22	09:15 MF	06/22/22	SO	Soil	AOI2_B004_PFAS_0-1_20220620
JD47196-3	06/20/22	09:40 MF	06/22/22	SO	Soil	AOI2_B002_PFAS_0-1_20220620
JD47196-4	06/20/22	10:05 MF	06/22/22	SO	Soil	AOI2_B003_PFAS_0-1_20220620
JD47196-5	06/20/22	10:30 MF	06/22/22	SO	Soil	AOI2_B005_PFAS_0-1_20220620
JD47196-6	06/20/22	11:00 MF	06/22/22	SO	Soil	AOI2_B009_PFAS_0-1_20220620
JD47196-7	06/20/22	11:15 MF	06/22/22	SO	Soil	AOI2_B013_PFAS_0-1_20220620
JD47196-8	06/20/22	11:45 MF	06/22/22	SO	Soil	AOI2_B006_PFAS_0-1_20220620
JD47196-9	06/20/22	12:05 MF	06/22/22	SO	Soil	AOI2_B007_PFAS_0-1_20220620
JD47196-10	06/20/22	12:25 MF	06/22/22	SO	Soil	AOI2_B008_PFAS_0-1_20220620
JD47196-11	06/20/22	12:55 MF	06/22/22	SO	Soil	AOI2_B010_PFAS_0-1_20220620
JD47196-12	06/20/22	13:10 MF	06/22/22	SO	Soil	AOI2_B011_PFAS_0-1_20220620

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD47196

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Project No: 4796.01

Sample Number	Collected			Received	Matrix		Client Sample ID
	Date	Time	By		Code	Type	
JD47196-13	06/20/22	13:35	MF	06/22/22	SO	Soil	AOI2_B012_PFAS_0-1_20220620
JD47196-14	06/21/22	10:05	MF	06/22/22	SO	Soil	AOI9_B001_PFAS_0-1_20220621
JD47196-15	06/21/22	10:20	MF	06/22/22	SO	Soil	AOI9_B002_PFAS_0-1_20220621
JD47196-16	06/21/22	10:40	MF	06/22/22	SO	Soil	AOI9_B003_PFAS_0-1_20220621
JD47196-17	06/21/22	12:00	MF	06/22/22	SO	Soil	AOI9_B004_PFAS_0-1_20220621
JD47196-18	06/21/22	11:30	MF	06/22/22	SO	Soil	AOI9_B005_PFAS_0-1_20220621
JD47196-19	06/21/22	12:15	MF	06/22/22	SO	Soil	AOI9_B006_PFAS_0-1_20220621
JD47196-20	06/21/22	12:35	MF	06/22/22	SO	Soil	AOI9_B008_PFAS_0-1_20220621
JD47196-21	06/21/22	13:45	MF	06/22/22	SO	Soil	AOI9_B011_PFAS_0-1_20220621
JD47196-22	06/21/22	13:00	MF	06/22/22	SO	Soil	AOI9_B016_PFAS_0-1_20220621
JD47196-23	06/21/22	13:25	MF	06/22/22	SO	Soil	AOI9_B021_PFAS_0-1_20220621
JD47196-24	06/21/22	11:10	MF	06/22/22	SO	Soil	AOI9_B007_PFAS_0-1_20220621
JD47196-25	06/21/22	08:30	MF	06/22/22	SO	Soil	AOI10_B002_PFAS_0-1_20220621

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD47196

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47196-26	06/21/22	08:55 MF	06/22/22	SO	Soil	AOI10_B001_PFAS_0-1_20220621
JD47196-27	06/21/22	09:15 MF	06/22/22	SO	Soil	AOI10_B003_PFAS_0-1_20220621
JD47196-28	06/22/22	08:30 MF	06/22/22	SO	Soil	AOI9_B009_PFAS_0-1_20220622
JD47196-29	06/22/22	08:45 MF	06/22/22	SO	Soil	AOI9_B010_PFAS_0-1_20220622
JD47196-30	06/22/22	09:00 MF	06/22/22	SO	Soil	AOI9_B015_PFAS_0-1_20220622
JD47196-31	06/22/22	09:20 MF	06/22/22	SO	Soil	AOI9_B018_PFAS_0-1_20220622
JD47196-32	06/22/22	09:45 MF	06/22/22	SO	Soil	AOI9_B012_PFAS_0-1_20220622
JD47196-33	06/22/22	10:05 MF	06/22/22	SO	Soil	AOI9_B014_PFAS_0-1_20220622
JD47196-34	06/22/22	10:05 MF	06/22/22	SO	Soil	AOI9_B014_PFAS_0-1_20220622_DUP
JD47196-35	06/22/22	10:30 MF	06/22/22	SO	Soil	AOI9_B019_PFAS_0-1_20220622
JD47196-36	06/22/22	11:00 MF	06/22/22	SO	Soil	AOI9_B013_PFAS_0-1_20220622
JD47196-37	06/22/22	11:10 MF	06/22/22	SO	Soil	AOI9_B017_PFAS_0-1_20220622
JD47196-38	06/22/22	11:35 MF	06/22/22	SO	Soil	AOI9_B020_PFAS_0-1_20220622

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary
(continued)

Sunoco/Evergreen

Job No: JD47196

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JD47196-39	06/22/22	11:55 MF	06/22/22	SO	Soil	AOI9_B022_PFAS_0-1_20220622
JD47196-40	06/22/22	12:20 MF	06/22/22	SO	Soil	AOI9_B024_PFAS_0-1_20220622
JD47196-41	06/22/22	12:35 MF	06/22/22	SO	Soil	AOI9_B023_PFAS_0-1_20220622
JD47196-42	06/22/22	08:00 MF	06/22/22	AQ	Field Blank Soil	FB-01_20220622

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Job Number: JD47196

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/20/22 thru 06/22/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47196-1 AOI2_B001_PFAS_0-1_20220620

Perfluoroheptanoic acid ^a	0.0028	0.00061	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a	0.0037	0.00061	0.00030	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0021	0.00061	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0020	0.00061	0.00024	mg/kg	EPA 537M BY ID

JD47196-2 AOI2_B004_PFAS_0-1_20220620

No hits reported in this sample.

JD47196-3 AOI2_B002_PFAS_0-1_20220620

No hits reported in this sample.

JD47196-4 AOI2_B003_PFAS_0-1_20220620

Perfluorohexanesulfonic acid ^a	0.0011	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0098	0.00056	0.00022	mg/kg	EPA 537M BY ID

JD47196-5 AOI2_B005_PFAS_0-1_20220620

Perfluorooctanoic acid ^a	0.00048 J	0.00053	0.00026	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0015	0.00053	0.00026	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00034 J	0.00053	0.00021	mg/kg	EPA 537M BY ID

JD47196-6 AOI2_B009_PFAS_0-1_20220620

Perfluorononanoic acid ^a	0.0019	0.00054	0.00027	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00056	0.00054	0.00022	mg/kg	EPA 537M BY ID

JD47196-7 AOI2_B013_PFAS_0-1_20220620

Perfluorononanoic acid ^a	0.00036 J	0.00055	0.00028	mg/kg	EPA 537M BY ID
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JD47196-8 AOI2_B006_PFAS_0-1_20220620

No hits reported in this sample.

JD47196-9 AOI2_B007_PFAS_0-1_20220620

Perfluorooctanesulfonic acid ^a	0.00067	0.00057	0.00023	mg/kg	EPA 537M BY ID
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Summary of Hits

Job Number: JD47196

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/20/22 thru 06/22/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47196-10 **AOI2_B008_PFAS_0-1_20220620**

No hits reported in this sample.

JD47196-11 **AOI2_B010_PFAS_0-1_20220620**

No hits reported in this sample.

JD47196-12 **AOI2_B011_PFAS_0-1_20220620**

Perfluorononanoic acid ^a	0.0015	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00069	0.00056	0.00022	mg/kg	EPA 537M BY ID

JD47196-13 **AOI2_B012_PFAS_0-1_20220620**

No hits reported in this sample.

JD47196-14 **AOI9_B001_PFAS_0-1_20220621**

Perfluorononanoic acid ^a	0.0037	0.00086	0.00043	mg/kg	EPA 537M BY ID
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JD47196-15 **AOI9_B002_PFAS_0-1_20220621**

Perfluoroheptanoic acid ^a	0.00035 J	0.00061	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a	0.00046 J	0.00061	0.00030	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0024	0.00061	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00092	0.00061	0.00024	mg/kg	EPA 537M BY ID

JD47196-16 **AOI9_B003_PFAS_0-1_20220621**

Perfluorononanoic acid ^a	0.00057 J	0.00064	0.00032	mg/kg	EPA 537M BY ID
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JD47196-17 **AOI9_B004_PFAS_0-1_20220621**

No hits reported in this sample.

JD47196-18 **AOI9_B005_PFAS_0-1_20220621**

No hits reported in this sample.

JD47196-19 **AOI9_B006_PFAS_0-1_20220621**

No hits reported in this sample.

Summary of Hits

Job Number: JD47196

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/20/22 thru 06/22/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47196-20 AOI9_B008_PFAS_0-1_20220621

Perfluorononanoic acid ^a	0.00098	0.00057	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00029 J	0.00057	0.00023	mg/kg	EPA 537M BY ID

JD47196-21 AOI9_B011_PFAS_0-1_20220621

Perfluoroheptanoic acid ^a	0.00079	0.00065	0.00033	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a	0.0013	0.00065	0.00033	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0015	0.00065	0.00033	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00078	0.00065	0.00026	mg/kg	EPA 537M BY ID

JD47196-22 AOI9_B016_PFAS_0-1_20220621

Perfluoroheptanoic acid ^a	0.00090	0.00065	0.00033	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a	0.0011	0.00065	0.00033	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0023	0.00065	0.00033	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0019	0.00065	0.00026	mg/kg	EPA 537M BY ID

JD47196-23 AOI9_B021_PFAS_0-1_20220621

No hits reported in this sample.

JD47196-24 AOI9_B007_PFAS_0-1_20220621

Perfluorooctanesulfonic acid ^a	0.00024 J	0.00057	0.00023	mg/kg	EPA 537M BY ID
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JD47196-25 AOI10_B002_PFAS_0-1_20220621

No hits reported in this sample.

JD47196-26 AOI10_B001_PFAS_0-1_20220621

Perfluorononanoic acid ^a	0.00034 J	0.00057	0.00029	mg/kg	EPA 537M BY ID
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JD47196-27 AOI10_B003_PFAS_0-1_20220621

Perfluorononanoic acid ^a	0.00075	0.00060	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00025 J	0.00060	0.00024	mg/kg	EPA 537M BY ID

JD47196-28 AOI9_B009_PFAS_0-1_20220622

No hits reported in this sample.

Summary of Hits

Job Number: JD47196

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/20/22 thru 06/22/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47196-29 AOI9_B010_PFAS_0-1_20220622

No hits reported in this sample.

JD47196-30 AOI9_B015_PFAS_0-1_20220622

Perfluorooctanoic acid ^a	0.00044 J	0.00062	0.00031	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.00067	0.00062	0.00031	mg/kg	EPA 537M BY ID

JD47196-31 AOI9_B018_PFAS_0-1_20220622

Perfluorooctanesulfonic acid ^a	0.00044 J	0.00063	0.00025	mg/kg	EPA 537M BY ID
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JD47196-32 AOI9_B012_PFAS_0-1_20220622

Perfluorooctanoic acid ^a	0.00029 J	0.00058	0.00029	mg/kg	EPA 537M BY ID
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JD47196-33 AOI9_B014_PFAS_0-1_20220622

Perfluorooctanesulfonic acid ^a	0.00033 J	0.00057	0.00023	mg/kg	EPA 537M BY ID
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JD47196-34 AOI9_B014_PFAS_0-1_20220622_DUP

No hits reported in this sample.

JD47196-35 AOI9_B019_PFAS_0-1_20220622

Perfluorooctanoic acid ^a	0.00078	0.00063	0.00032	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0015	0.00063	0.00032	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00035 J	0.00063	0.00025	mg/kg	EPA 537M BY ID

JD47196-36 AOI9_B013_PFAS_0-1_20220622

Perfluorooctanesulfonic acid ^a	0.00077	0.00066	0.00026	mg/kg	EPA 537M BY ID
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JD47196-37 AOI9_B017_PFAS_0-1_20220622

Perfluorooctanoic acid ^a	0.00034 J	0.00069	0.00034	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.00071	0.00069	0.00034	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0031	0.00069	0.00027	mg/kg	EPA 537M BY ID

JD47196-38 AOI9_B020_PFAS_0-1_20220622

Perfluorooctanoic acid ^a	0.00039 J	0.00064	0.00032	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0016	0.00064	0.00032	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47196

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/20/22 thru 06/22/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorooctanesulfonic acid ^a		0.0019	0.00064	0.00026	mg/kg	EPA 537M BY ID
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JD47196-39 AOI9_B022_PFAS_0-1_20220622

Perfluorononanoic acid ^a		0.00085	0.00070	0.00035	mg/kg	EPA 537M BY ID
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Perfluorooctanesulfonic acid ^a		0.00087	0.00070	0.00028	mg/kg	EPA 537M BY ID
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JD47196-40 AOI9_B024_PFAS_0-1_20220622

Perfluorooctanoic acid ^a		0.00033 J	0.00058	0.00029	mg/kg	EPA 537M BY ID
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Perfluorononanoic acid ^a		0.0015	0.00058	0.00029	mg/kg	EPA 537M BY ID
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Perfluorooctanesulfonic acid ^a		0.0013	0.00058	0.00023	mg/kg	EPA 537M BY ID
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JD47196-41 AOI9_B023_PFAS_0-1_20220622

Perfluorooctanoic acid ^a		0.00043 J	0.00060	0.00030	mg/kg	EPA 537M BY ID
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Perfluorononanoic acid ^a		0.0018	0.00060	0.00030	mg/kg	EPA 537M BY ID
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Perfluorooctanesulfonic acid ^a		0.0020	0.00060	0.00024	mg/kg	EPA 537M BY ID
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JD47196-42 FB-01_20220622

No hits reported in this sample.

(a) Analysis performed at SGS Orlando, FL.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	AOI2_B001_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-1			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	81.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1735.D	1	07/14/22 09:50	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.0028	0.00061	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0037	0.00061	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.0021	0.00061	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0020	0.00061	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	86%		50-150%
13C8-PFOA	88%		50-150%
13C9-PFNA	89%		50-150%
13C3-PFBS	84%		50-150%
13C3-PFHxS	83%		50-150%
13C8-PFOS	82%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B004_PFAS_0-1_20220620	Date Sampled:	06/20/22
Lab Sample ID:	JD47196-2	Date Received:	06/22/22
Matrix:	SO - Soil	Percent Solids:	92.8
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1736.D	1	07/14/22 10:06	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00054	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00054	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00054	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00054	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00054	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00054	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	85%		50-150%
13C8-PFOA	87%		50-150%
13C9-PFNA	87%		50-150%
13C3-PFBS	82%		50-150%
13C3-PFHxS	82%		50-150%
13C8-PFOS	83%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B002_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-3			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	96.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1737.D	1	07/14/22 10:21	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00051	0.00025	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00051	0.00025	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00051	0.00025	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00051	0.00025	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00051	0.00025	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00051	0.00020	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	88%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	91%		50-150%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B003_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-4		Date Sampled:	06/20/22	
Matrix:	SO - Soil		Date Received:	06/22/22	
Method:	EPA 537M BY ID IN HOUSE		Percent Solids:	89.2	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1738.D	1	07/14/22 10:36	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0098	0.00056	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	76%		50-150%
13C8-PFOA	78%		50-150%
13C9-PFNA	78%		50-150%
13C3-PFBS	71%		50-150%
13C3-PFHxS	72%		50-150%
13C8-PFOS	70%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B005_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-5			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	95.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1739.D	1	07/14/22 10:52	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00053	0.00026	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00048	0.00053	0.00026	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0015	0.00053	0.00026	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00053	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00053	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00034	0.00053	0.00021	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	78%		50-150%
	13C9-PFNA	79%		50-150%
	13C3-PFBS	74%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	73%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B009_PFAS_0-1_20220620	Date Sampled:	06/20/22
Lab Sample ID:	JD47196-6	Date Received:	06/22/22
Matrix:	SO - Soil	Percent Solids:	90.8
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1740.D	1	07/14/22 11:07	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00054	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00054	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	0.0019	0.00054	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00054	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00054	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00056	0.00054	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	76%		50-150%
13C8-PFOA	77%		50-150%
13C9-PFNA	78%		50-150%
13C3-PFBS	75%		50-150%
13C3-PFHxS	74%		50-150%
13C8-PFOS	72%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B013_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-7			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1741.D	1	07/14/22 11:22	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.06 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.00036	0.00055	0.00028	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	79%		50-150%
	13C3-PFBS	75%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	75%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B006_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-8			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	94.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1742.D	1	07/14/22 11:38	AFL	07/06/22 07:00	F:OP91956	F:S5Q29
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00052	0.00026	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00052	0.00026	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00052	0.00026	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00052	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00052	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00052	0.00021	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	82%		50-150%
13C8-PFOA	84%		50-150%
13C9-PFNA	84%		50-150%
13C3-PFBS	81%		50-150%
13C3-PFHxS	81%		50-150%
13C8-PFOS	81%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B007_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-9			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.6
Project:	SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1790.D	1	07/15/22 03:15	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00057	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00067	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	87%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	89%		50-150%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	84%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B008_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-10			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	91.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1791.D	1	07/15/22 03:30	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.06 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00053	0.00026	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00053	0.00026	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00053	0.00026	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00053	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00053	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00053	0.00021	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	88%		50-150%
13C8-PFOA	90%		50-150%
13C9-PFNA	91%		50-150%
13C3-PFBS	86%		50-150%
13C3-PFHxS	89%		50-150%
13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B010_PFAS_0-1_20220620				
Lab Sample ID:	JD47196-11			Date Sampled:	06/20/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	80.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1792.D	1	07/15/22 03:45	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00031	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00061	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00061	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	84%		50-150%
13C8-PFOA	84%		50-150%
13C9-PFNA	85%		50-150%
13C3-PFBS	81%		50-150%
13C3-PFHxS	84%		50-150%
13C8-PFOS	81%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B011_PFAS_0-1_20220620	Date Sampled:	06/20/22
Lab Sample ID:	JD47196-12	Date Received:	06/22/22
Matrix:	SO - Soil	Percent Solids:	88.9
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1793.D	1	07/15/22 04:01	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.0015	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00069	0.00056	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	81%		50-150%
13C8-PFOA	82%		50-150%
13C9-PFNA	82%		50-150%
13C3-PFBS	79%		50-150%
13C3-PFHxS	79%		50-150%
13C8-PFOS	74%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI2_B012_PFAS_0-1_20220620	Date Sampled:	06/20/22
Lab Sample ID:	JD47196-13	Date Received:	06/22/22
Matrix:	SO - Soil	Percent Solids:	89.9
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1794.D	1	07/15/22 04:16	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	102%		50-150%
13C8-PFOA	103%		50-150%
13C9-PFNA	101%		50-150%
13C3-PFBS	99%		50-150%
13C3-PFHxS	100%		50-150%
13C8-PFOS	96%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B001_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-14			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	79.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1795.D	1	07/15/22 04:31	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.4 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00086	0.00043	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00086	0.00043	mg/kg	
375-95-1	Perfluorononanoic acid	0.0037	0.00086	0.00043	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00086	0.00043	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00086	0.00043	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00086	0.00035	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	131%		50-150%
13C8-PFOA	132%		50-150%
13C9-PFNA	132%		50-150%
13C3-PFBS	130%		50-150%
13C3-PFHxS	129%		50-150%
13C8-PFOS	125%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B002_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-15			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	79.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1800.D	1	07/15/22 05:48	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.06 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00035	0.00061	0.00030	mg/kg	J
335-67-1	Perfluorooctanoic acid	0.00046	0.00061	0.00030	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0024	0.00061	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00092	0.00061	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	89%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	86%		50-150%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	83%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B003_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-16			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	78.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1801.D	1	07/15/22 06:03	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00064	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	0.00057	0.00064	0.00032	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00064	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	91%		50-150%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	90%		50-150%
	13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B004_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-17			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	88.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1802.D	1	07/15/22 06:19	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.05 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	86%		50-150%
13C8-PFOA	88%		50-150%
13C9-PFNA	87%		50-150%
13C3-PFBS	90%		50-150%
13C3-PFHxS	90%		50-150%
13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B005_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-18			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	80.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1803.D	1	07/15/22 06:34	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.07 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	87%		50-150%
13C8-PFOA	90%		50-150%
13C9-PFNA	89%		50-150%
13C3-PFBS	87%		50-150%
13C3-PFHxS	87%		50-150%
13C8-PFOS	84%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B006_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-19			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	70.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1804.D	1	07/15/22 06:50	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00069	0.00035	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00069	0.00035	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00069	0.00035	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00069	0.00035	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00069	0.00035	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00069	0.00028	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	90%		50-150%
13C8-PFOA	91%		50-150%
13C9-PFNA	91%		50-150%
13C3-PFBS	89%		50-150%
13C3-PFHxS	89%		50-150%
13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B008_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-20			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1805.D	1	07/15/22 07:05	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.07 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	0.00098	0.00057	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00029	0.00057	0.00023	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	84%		50-150%
13C8-PFOA	85%		50-150%
13C9-PFNA	84%		50-150%
13C3-PFBS	84%		50-150%
13C3-PFHxS	82%		50-150%
13C8-PFOS	79%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B011_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-21			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	76.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1806.D	1	07/15/22 07:20	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00079	0.00065	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0013	0.00065	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid	0.0015	0.00065	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00065	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00065	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00078	0.00065	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	83%		50-150%
13C8-PFOA	85%		50-150%
13C9-PFNA	85%		50-150%
13C3-PFBS	84%		50-150%
13C3-PFHxS	85%		50-150%
13C8-PFOS	80%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B016_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-22			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	76.1
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1807.D	1	07/15/22 07:36	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00090	0.00065	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0011	0.00065	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid	0.0023	0.00065	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00065	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00065	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0019	0.00065	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	82%		50-150%
13C8-PFOA	83%		50-150%
13C9-PFNA	84%		50-150%
13C3-PFBS	82%		50-150%
13C3-PFHxS	83%		50-150%
13C8-PFOS	78%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B021_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-23			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	85.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1808.D	1	07/15/22 07:51	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00058	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	87%		50-150%
13C8-PFOA	88%		50-150%
13C9-PFNA	89%		50-150%
13C3-PFBS	87%		50-150%
13C3-PFHxS	86%		50-150%
13C8-PFOS	84%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B007_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-24			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.1
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1809.D	1	07/15/22 08:06	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.07 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00057	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00024	0.00057	0.00023	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	91%		50-150%
13C8-PFOA	94%		50-150%
13C9-PFNA	94%		50-150%
13C3-PFBS	90%		50-150%
13C3-PFHxS	90%		50-150%
13C8-PFOS	88%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI10_B002_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-25			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	89.1
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1812.D	1	07/15/22 08:52	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.11 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00053	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00053	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00053	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00053	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00053	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00053	0.00021	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	91%		50-150%
13C8-PFOA	93%		50-150%
13C9-PFNA	93%		50-150%
13C3-PFBS	89%		50-150%
13C3-PFHxS	89%		50-150%
13C8-PFOS	88%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI10_B001_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-26			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.0
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1813.D	1	07/15/22 09:08	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	0.00034	0.00057	0.00029	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	93%		50-150%
	13C3-PFBS	92%		50-150%
	13C3-PFHxS	93%		50-150%
	13C8-PFOS	88%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI10_B003_PFAS_0-1_20220621				
Lab Sample ID:	JD47196-27			Date Sampled:	06/21/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1814.D	1	07/15/22 09:23	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.00075	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00025	0.00060	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	82%		50-150%
13C8-PFOA	84%		50-150%
13C9-PFNA	84%		50-150%
13C3-PFBS	82%		50-150%
13C3-PFHxS	83%		50-150%
13C8-PFOS	80%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B009_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-28			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1815.D	1	07/15/22 09:38	AFL	07/11/22 06:00	F:OP92025	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.08 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	84%		50-150%
13C8-PFOA	88%		50-150%
13C9-PFNA	88%		50-150%
13C3-PFBS	84%		50-150%
13C3-PFHxS	84%		50-150%
13C8-PFOS	84%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B010_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-29			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	86.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1762.D	1	07/14/22 20:05	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00057	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	70%		50-150%
	13C8-PFOA	70%		50-150%
	13C9-PFNA	70%		50-150%
	13C3-PFBS	71%		50-150%
	13C3-PFHxS	69%		50-150%
	13C8-PFOS	70%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B015_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-30			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	80.0
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1763.D	1	07/14/22 20:20	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00062	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00044	0.00062	0.00031	mg/kg	J
375-95-1	Perfluorononanoic acid	0.00067	0.00062	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00062	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00062	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00062	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	83%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	85%		50-150%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	82%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B018_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-31			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	74.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1764.D	1	07/14/22 20:36	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.12 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00063	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00063	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00063	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00063	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00063	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00044	0.00063	0.00025	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	82%		50-150%
13C8-PFOA	82%		50-150%
13C9-PFNA	84%		50-150%
13C3-PFBS	81%		50-150%
13C3-PFHxS	82%		50-150%
13C8-PFOS	79%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B012_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-32		Date Sampled:	06/22/22	
Matrix:	SO - Soil		Date Received:	06/22/22	
Method:	EPA 537M BY ID IN HOUSE		Percent Solids:	84.4	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1765.D	1	07/14/22 20:51	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00029	0.00058	0.00029	mg/kg	J
375-95-1	Perfluorononanoic acid	ND	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	72%		50-150%
	13C8-PFOA	72%		50-150%
	13C9-PFNA	72%		50-150%
	13C3-PFBS	80%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	80%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B014_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-33			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	85.0
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1768.D	1	07/14/22 21:37	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.06 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00057	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00033	0.00057	0.00023	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	75%		50-150%
13C8-PFOA	76%		50-150%
13C9-PFNA	76%		50-150%
13C3-PFBS	76%		50-150%
13C3-PFHxS	74%		50-150%
13C8-PFOS	72%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B014_PFAS_0-1_20220622_DUP				
Lab Sample ID:	JD47196-34			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1769.D	1	07/14/22 21:53	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00059	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00059	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00059	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00059	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00059	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	73%		50-150%
13C8-PFOA	73%		50-150%
13C9-PFNA	73%		50-150%
13C3-PFBS	73%		50-150%
13C3-PFHxS	72%		50-150%
13C8-PFOS	71%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B019_PFAS_0-1_20220622	Date Sampled:	06/22/22
Lab Sample ID:	JD47196-35	Date Received:	06/22/22
Matrix:	SO - Soil	Percent Solids:	77.8
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1772.D	1	07/14/22 22:39	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00063	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00078	0.00063	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	0.0015	0.00063	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00063	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00063	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00035	0.00063	0.00025	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	75%		50-150%
	13C8-PFOA	75%		50-150%
	13C9-PFNA	76%		50-150%
	13C3-PFBS	74%		50-150%
	13C3-PFHxS	75%		50-150%
	13C8-PFOS	74%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B013_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-36			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	76.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1773.D	1	07/14/22 22:54	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00066	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00066	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00066	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00066	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00066	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00077	0.00066	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	87%		50-150%
13C8-PFOA	88%		50-150%
13C9-PFNA	89%		50-150%
13C3-PFBS	87%		50-150%
13C3-PFHxS	87%		50-150%
13C8-PFOS	85%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B017_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-37			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	71.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1774.D	1	07/14/22 23:09	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00069	0.00034	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00034	0.00069	0.00034	mg/kg	J
375-95-1	Perfluorononanoic acid	0.00071	0.00069	0.00034	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00069	0.00034	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00069	0.00034	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0031	0.00069	0.00027	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	85%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	86%		50-150%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	81%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B020_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-38			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	77.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1775.D	1	07/14/22 23:25	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00039	0.00064	0.00032	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0016	0.00064	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0019	0.00064	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	70%		50-150%
	13C9-PFNA	71%		50-150%
	13C3-PFBS	71%		50-150%
	13C3-PFHxS	71%		50-150%
	13C8-PFOS	68%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B022_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-39			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	70.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1776.D	1	07/14/22 23:40	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00070	0.00035	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00070	0.00035	mg/kg	
375-95-1	Perfluorononanoic acid	0.00085	0.00070	0.00035	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00070	0.00035	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00070	0.00035	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00087	0.00070	0.00028	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
---------	------------------------	--------	--------	--------

13C4-PFHpA	82%		50-150%
13C8-PFOA	84%		50-150%
13C9-PFNA	83%		50-150%
13C3-PFBS	81%		50-150%
13C3-PFHxS	82%		50-150%
13C8-PFOS	79%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B024_PFAS_0-1_20220622			
Lab Sample ID:	JD47196-40	Date Sampled:	06/22/22	
Matrix:	SO - Soil	Date Received:	06/22/22	
Method:	EPA 537M BY ID IN HOUSE	Percent Solids:	83.5	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1777.D	1	07/14/22 23:55	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.06 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00033	0.00058	0.00029	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0015	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0013	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	71%		50-150%
	13C8-PFOA	72%		50-150%
	13C9-PFNA	70%		50-150%
	13C3-PFBS	71%		50-150%
	13C3-PFHxS	70%		50-150%
	13C8-PFOS	69%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI9_B023_PFAS_0-1_20220622				
Lab Sample ID:	JD47196-41			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/22/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	82.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1778.D	1	07/15/22 00:11	AFL	07/11/22 06:00	F:OP92026	F:S5Q30
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00043	0.00060	0.00030	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0018	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0020	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	84%		50-150%
	13C9-PFNA	82%		50-150%
	13C3-PFBS	82%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	79%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-01_20220622	Date Sampled:	06/22/22
Lab Sample ID:	JD47196-42	Date Received:	06/22/22
Matrix:	AQ - Field Blank Soil	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	6Q2299.D	1	07/17/22 03:12	AFL	07/08/22 11:00	F:OP91997	F:S6Q41
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	78%		50-150%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	72%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

VP-06922-9



CHAIN OF CUSTODY

SGS North America Inc. - Dayton
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TEL 732-329-0200 FAX 732-329-3499

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FB

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Please merge with SDG: JD47196

ED-EX Tracking #
SGS Quote # 2022 644
Bottle Order Control # VP-06922-9
SGS Job #

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)												Matrix Codes													
Company Name Sanborn Head & Associates		Project Name Evergreen Philadelphia Refinery														DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB - Rinse Blank TB-Trip Blank													
Street Address 20 Foundry St City Concord State NH Zip 03301		Street 3144 W. Passyunk Ave. City Philadelphia State PA Zip 19145																											
Project Contact Andrew Buchy Shana Whitney E-mail abuchy@sanbornhead.com swhitney@sanbornhead.com		Project # 4796.01																											
Phone # 603-415-6159		Client Purchase Order #																											
Sampler(s) Name(s) Michael Fuente		Project Manager Andrew Buchy																											
Phone 610-984-1717		Invoice Andrew Buchy (abuchy@sanbornhead.com)																											
Account Payable ap@sanbornhead.com																													
Lab Sample #		Field ID / Point of Collection		MECH/DI Vial #		Date		Time		Sampled by		Matrix		# of bottles		Number of preserved bottles												LAB USE ONLY	
1		A012-B001-PTAS-O-1-20200620				6/20/22		8:30		MF		SD		1															
2		A012-B001-PTAS-O-1-20200620				6/20/22		9:15		MF		SD		1															
3		A012-B002-PTAS-O-1-20200620				6/20/22		9:40		MF		SD		1															
4		A012-B003-PTAS-O-1-20200620				6/20/22		10:05		MF		SD		1															
5		A012-B005-PTAS-O-1-20200620				6/20/22		10:30		MF		SD		1															
6		A012-B009-PTAS-O-1-20200620				6/20/22		11:00		MF		SD		1															
7		A012-B013-PTAS-O-1-20200620				6/20/22		11:15		MF		SD		1															
8		A012-B016-PTAS-O-1-20200620				6/20/22		11:45		MF		SD		1															
9		A012-B017-PTAS-O-1-20200620				6/20/22		12:25		MF		SD		1															
10		A012-B018-PTAS-O-1-20200620				6/20/22		12:55		MF		SD		1															
11		A012-B019-PTAS-O-1-20200620				6/20/22		13:25		MF		SD		1															
12		A012-B019-PTAS-O-1-20200620				6/20/22		13:10		MF		SD		1															
13		A012-B012-PTAS-O-1-20200620				6/20/22		13:35		MF		SD		1															
14		A012-B011-PTAS-O-1-20200620				6/21/22		10:05		MF		SD		1															
15		A012-B012-PTAS-O-1-20200620				6/21/22		10:30		MF		SD		1															
Turnaround Time (Business days)		Approved by (SGS Project Manager)/Date:														Data Deliverable information												Comments / Special Instructions	
☒ Std. 10 Business Days ☐ 5 Day RUSH ☐ 3 Day RUSH ☐ 2 Day RUSH ☐ 1 Day RUSH ☐ other _____ Emergency & Rush TIA data available via LabLink		Initial Assessment <u>EA 418</u> Label Verification _____														Commercial "A" (Level 1) Commercial "B" (Level 2) ☒ FULLT1 (Level 3+4) NJ Reduced X EDD Format SHA EQUIS; Stantec EQUIS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data													
Relinquished by Sampler		Date/Time		Received By		Date/Time		Relinquished by		Date/Time		Received By		Date/Time		Sample Custody must be documented below each time samples change possession, including courier delivery.													
1		6/22/22 15:02		C. J. [Signature]		6/22/22 18:45		C. J. [Signature]		6/22/22		C. J. [Signature]		6/22/22															
3				3				4				4																	
5				5				5				5																	
Custody Seal #																Intact ☐ Tampered ☐ Preserved where applicable ☐ On Ice ☐ On Dry ☐ Cooler Temp. _____													

2.8

Sanborn, Head & Associates, Inc.





CHAIN OF CUSTODY
 SGS North America Inc. - Dayton
 2235 Route 130, Dayton, NJ 08810
 TEL. 732-329-0200 FAX 732-329-3499

Page 2 of 3
 Please merge with SDG: **JD47196**

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)										Matrix Codes													
Company Name Sanborn Head & Associates		Project Name Evergreen Philadelphia Refinery												DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WIP - Wipe FB - Field Blank EB - Equipment Blank RB - Rmase Blank TB - Trip Blank													
Street Address 20 Foundry St		Street 3144 W Passyunk Ave																									
City State Zip Concord NH 03301		City State Zip Philadelphia PA 19145																									
Project Contact Andrew Buchy Shana Whitney		Project # 4796.01																									
Phone # 603-415-6159		Client Purchase Order #																									
Sampler(s) Name(s) Michael Fuerte		Project Manager Andrew Buchy																									
Lab Sample #		Field ID / Point of Collection		MECHDI Vial #		Date		Time		Sampled by		Matrix		# of bottles		Number of preserved bottles										LAB USE ONLY	
16		A019-B001-PFAS-D-L-20220621				6/21/22		1040		MF		SO		1													
17		A019-B001-PFAS-D-L-20220621				6/21/22		1200		MF		SO		1													
18		A019-B001-PFAS-D-L-20220621				6/21/22		1150		MF		SO		1													
19		A019-B001-PFAS-D-L-20220621				6/21/22		1215		MF		SO		1													
20		A019-B001-PFAS-D-L-20220621				6/21/22		1345		MF		SO		1													
21		A019-B001-PFAS-D-L-20220621				6/21/22		1345		MF		SO		1													
22		A019-B001-PFAS-D-L-20220621				6/21/22		1300		MF		SO		1													
23		A019-B001-PFAS-D-L-20220621				6/21/22		1335		MF		SO		1													
24		A019-B001-PFAS-D-L-20220621				6/21/22		1110		MF		SO		1													
25		A019-B001-PFAS-D-L-20220621				6/21/22		830		MF		SO		1													
26		A019-B001-PFAS-D-L-20220621				6/21/22		855		MF		SO		1													
27		A019-B001-PFAS-D-L-20220621				6/21/22		915		MF		SO		1													
28		A019-B001-PFAS-D-L-20220621				6/21/22		830		MF		SO		1													
29		A019-B001-PFAS-D-L-20220621				6/21/22		815		MF		SO		1													
30		A019-B001-PFAS-D-L-20220621				6/21/22		900		MF		SO		1													
Turnaround Time (Business days)		Approved by (SGS Project Manager)/Date:																									
☒ Std. 10 Business Days ☐ 5 Day RUSH ☐ 3 Day RUSH ☐ 2 Day RUSH ☐ 1 Day RUSH ☐ Other _____ Emergency & Rush TIA data available via LabLink		Commercial "A" (Level 1) Commercial "B" (Level 2) ☒ FULLT1 (Level 3+4) NJ Reduced ☒ EDD Format SHA EQUIS; Stantec EQUIS Commercial "C" NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		Data Deliverable Information NYASP Category A NYASP Category B State Forms												Comments / Special Instructions											
Relinquished by Sampler		Date Time		Received By		Date Time		Relinquished By		Date Time		Received By		Date Time													
1 Andrew Fuerte		6/21/22 1502		1		6/21/22		2		6/21/22 1345		3		6/21/22													
Relinquished by Sampler		Date Time		Received By		Date Time		Relinquished By		Date Time		Received By		Date Time													
3				3				4				4															
Relinquished by		Date Time		Received By		Date Time		Custody Seal #		Intact Not		Preserved where applicable		On Ice		Cooler Temp											
				5						☐		☐		☐													

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Sanborn, Head & Associates, Inc.

JD47196: Chain of Custody

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SGS Sample Receipt Summary

Job Number: JD47196

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW:FORMER PHILADELPHIA RE

Date / Time Received: 6/22/2022 6:45:00 PM

Delivery Method: _____

Airbill #s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (2.8);

Cooler Temps (Corrected) °C: Cooler 1: (2.5);

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | ☒ | ☐ | 3. COC Present: | ☒ | ☐ |
| 2. Custody Seals Intact: | ☒ | ☐ | 4. Smpl Dates/Time OK | ☒ | ☐ |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | ☒ | ☐ |
| 2. Cooler temp verification: | IR Gun | |
| 3. Cooler media: | Ice (Bag) | |
| 4. No. Coolers: | 1 | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | ☐ | ☐ | ☒ |
| 2. Trip Blank listed on COC: | ☐ | ☐ | ☒ |
| 3. Samples preserved properly: | ☒ | ☐ | |
| 4. VOCs headspace free: | ☐ | ☐ | ☒ |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | ☒ | ☐ |
| 2. Container labeling complete: | ☒ | ☐ |
| 3. Sample container label / COC agree: | ☒ | ☐ |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | ☒ | ☐ |
| 2. All containers accounted for: | ☒ | ☐ |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N

N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | ☒ | ☐ | |
| 2. Bottles received for unspecified tests | ☐ | ☒ | |
| 3. Sufficient volume recvd for analysis: | ☒ | ☐ | |
| 4. Compositing instructions clear: | ☐ | ☐ | ☒ |
| 5. Filtering instructions clear: | ☐ | ☐ | ☒ |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify) _____

Comments

SM089-03
Rev. Date 12/7/17

JD47196: Chain of Custody

Page 4 of 5

Job Change Order: JD47196

Requested Date: 6/24/2022 **Received Date:** 6/22/2022
Account Name: Sunoco/Evergreen **Due Date:** 6/24/2022
Project Description: SANHPAFW: Former Philadelphia Refinery, 31.44 **Deliverable:** COMMB
C/O Initiated By: VICKYP **PM:** VP **TAT (Days):** 7

Sample #: JD47196-22 **Change:**
Revise ID to AOI9_B016_PFAS_0-1_20220621

Dept:

TAT: 7

AOI9_B016_PFAS_0-1_20220621

JD47196: Chain of Custody
Page 5 of 5

Above Changes Per: Shana Whitney

Date/Time: 6/24/2022

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

Misc. Forms

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Custody Documents and Other Forms

(SGS Orlando, FL)

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 of 4

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INITIAL ASSESSMENT

LABEL VERIFICATION

4.6 IR#

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[illegible]

j047196.xls
Rev Date: 4/10/18

JD47196: Chain of Custody

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CHAIN OF CUSTODY

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Page 3 of 4

[illegible]

j47196.xls
Rev Date 4/10/18

JD47196: Chain of Custody

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JD47196



CHAIN OF CUSTODY

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TEL: 732-329-0200 FAX: 732-329-3499/3480
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Page 4 of 4

Client / Reporting Information				Project Information				Requested Analysis												Matrix Codes																								
Company Name:				Project Name:				Requested Analysis												Matrix Codes																								
Street Address:				SANHPAFW Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA																																								
City State Zip:				Billing Information (if different from Report to)																																								
Project Contact:				Project #																																								
E-mail:				Street Address:																																								
Phone #:				Client Purchase Order #				Requested Analysis												Matrix Codes																								
Project Manager:				City State Zip:																																								
Sender(s) Name(s):				Attention:																																								
Phone:																																												
Project Manager:																																												
MF				a1				Requested Analysis												Matrix Codes																								
Field ID / Point of Collection				MECH/CD Viol #																																								
Date				Time																																								
Sampled by				Matrix																																								
# of bottles				Number of preserved bottles																																								
37				AOI9_B017_PFAAS_0-1_20220622				Requested Analysis												Matrix Codes																								
38				AOI9_B020_PFAAS_0-1_20220622																																								
39				AOI9_B022_PFAAS_0-1_20220622																																								
40				AOI9_B024_PFAAS_0-1_20220622																																								
41				AOI9_B023_PFAAS_0-1_20220622																																								
42				FB-01_20220622				Requested Analysis												Matrix Codes																								
Turnaround Time (Business days)				Data Deliverable Information																	Comments / Special Instructions																							
Approved By (SGS PHE) / Date:				Commercial "A" (Level 1)																													Comments / Special Instructions											
Standard 10 Business Days				Commercial "B" (Level 2)																																								
5 Business Days RUSH				FULLT1 (Level 3+4)																																								
3 Business Days RUSH				NJ Reduced																																								
2 Business Days RUSH				Commercial "C"																																								
1 Business Day EMERGENCY				Commercial "A" = Results Only				Comments / Special Instructions																																				
Other Due 7/6/2022				Commercial "B" = Results + QC Summary																																								
Emergency & Rush TAT data available via Lablink				Commercial "C" = Results + QC Summary + Partial Raw data																																								
Approval needed for RUSH Emergency TAT																																												
Sample Custody must be documented below each time samples change possession, including courier delivery.																																												
Relinquished by:				Date / Time:				Relinquished by:				Date / Time:				Received By:																												
1				6-25-22				2				6-25-22				2																												
Relinquished by:				Date / Time:				Relinquished by:				Date / Time:				Received By:																												
3				3				4				4				4																												
Relinquished by:				Date / Time:				Relinquished by:				Date / Time:				Received By:																												
5				5				5				5				5																												
Custody Seal #				Intact				Preserved where applicable				On line				Cooler Temp. °C																												
				Not intact				Absent																																				

1947196.xls
Rev Date: 6/10/18

JD47196: Chain of Custody

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CSR: Evita Martinez

Response Date: 7/5/2022

Response: NJ has been informed on 6/25/2022.

5.1

5

SM001
Rev. Date 05/24/17

JD47196: Chain of Custody
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MS Semi-volatiles

QC Data Summaries

(SGS Orlando, FL)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Isotope Dilution Standard Recovery Summaries

Method Blank Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP91956-MB	5Q1716.D	1	07/14/22	NG	07/06/22	OP91956	S5Q29

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-1, JD47196-2, JD47196-3, JD47196-4, JD47196-5, JD47196-6, JD47196-7, JD47196-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	80% 40-140%
	13C5-PFPeA	77% 50-150%
	13C5-PFHxA	78% 50-150%
	13C4-PFHpA	81% 50-150%
	13C8-PFOA	83% 50-150%
	13C9-PFNA	84% 50-150%
	13C6-PFDA	87% 50-150%
	13C7-PFUnDA	91% 40-140%
	13C2-PFDoDA	90% 40-140%
	13C2-PFTeDA	90% 30-130%
	13C3-PFBS	81% 50-150%
	13C3-PFHxS	80% 50-150%
	13C8-PFOS	80% 50-150%
	13C8-FOSA	95% 30-130%
	d3-MeFOSAA	130% 40-140%
	d5-EtFOSAA	113% 40-140%
	13C2-4:2FTS	77% 50-150%
	13C2-6:2FTS	80% 50-150%
	13C2-8:2FTS	84% 50-150%

Method Blank Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP91997-MB	6Q2283.D	1	07/16/22	JB	07/08/22	OP91997	S6Q41

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-42

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	90%	35-135%
	13C5-PFPeA	92%	50-150%
	13C5-PFHxA	91%	50-150%
	13C4-PFHpA	91%	50-150%
	13C8-PFOA	92%	50-150%
	13C9-PFNA	90%	50-150%
	13C6-PFDA	90%	50-150%
	13C7-PFUnDA	88%	40-140%
	13C2-PFDoDA	77%	40-140%
	13C2-PFTeDA	55%	30-130%
	13C3-PFBS	90%	50-150%
	13C3-PFHxS	91%	50-150%
	13C8-PFOS	88%	50-150%
	13C8-FOSA	75%	30-130%
	d3-MeFOSAA	93%	40-140%
	d5-EtFOSAA	89%	40-140%
	13C2-4:2FTS	88%	50-150%
	13C2-6:2FTS	93%	50-150%
	13C2-8:2FTS	90%	50-150%
	13C3-HFPO-DA	100%	50-150%

Method Blank Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92026-MB	5Q1761.D	1	07/14/22	NG	07/11/22	OP92026	S5Q30

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-29, JD47196-30, JD47196-31, JD47196-32, JD47196-33, JD47196-34, JD47196-35, JD47196-36, JD47196-37, JD47196-38, JD47196-39, JD47196-40, JD47196-41

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFHpA	104% 50-150%
	13C8-PFOA	104% 50-150%
	13C9-PFNA	105% 50-150%
	13C3-PFBS	104% 50-150%
	13C3-PFHxS	105% 50-150%
	13C8-PFOS	105% 50-150%

Method Blank Summary

Job Number: JD47196
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92025-MB	5Q1789.D	1	07/15/22	NG	07/11/22	OP92025	S5Q30

The QC reported here applies to the following samples: Method: EPA 537M BY ID

JD47196-9, JD47196-10, JD47196-11, JD47196-12, JD47196-13, JD47196-14, JD47196-15, JD47196-16, JD47196-17, JD47196-18, JD47196-19, JD47196-20, JD47196-21, JD47196-22, JD47196-23, JD47196-24, JD47196-25, JD47196-26, JD47196-27, JD47196-28

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFHpA	108% 50-150%
	13C8-PFOA	109% 50-150%
	13C9-PFNA	107% 50-150%
	13C3-PFBS	105% 50-150%
	13C3-PFHxS	106% 50-150%
	13C8-PFOS	102% 50-150%

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Job Number: JD47196**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q29-IBLK	5Q1697.D	1	07/14/22	NG	n/a	n/a	S5Q29

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47196-1, JD47196-2, JD47196-3, JD47196-4, JD47196-5, JD47196-6, JD47196-7, JD47196-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	112% 50-150%
	13C5-PFPeA	110% 50-150%
	13C5-PFHxA	111% 50-150%
	13C4-PFHpA	112% 50-150%
	13C8-PFOA	113% 50-150%
	13C9-PFNA	112% 50-150%
	13C6-PFDA	115% 50-150%
	13C7-PFUnDA	117% 50-150%
	13C2-PFDoDA	114% 50-150%
	13C2-PFTeDA	110% 50-150%
	13C3-PFBS	111% 50-150%
	13C3-PFHxS	110% 50-150%
	13C8-PFOS	109% 50-150%
	13C8-FOSA	118% 50-150%
	d3-MeFOSA	114% 50-150%
	d3-MeFOSAA	133% 50-150%
	d5-EtFOSAA	122% 50-150%
	13C2-4:2FTS	103% 50-150%
	13C2-6:2FTS	107% 50-150%
	13C2-8:2FTS	108% 50-150%
	13C3-HFPO-DA	109% 50-150%

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Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q30-IBLK	5Q1748.D	1	07/14/22	NG	n/a	n/a	S5Q30

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

JD47196-9, JD47196-10, JD47196-11, JD47196-12, JD47196-13, JD47196-14, JD47196-15, JD47196-16, JD47196-17, JD47196-18, JD47196-19, JD47196-20, JD47196-21, JD47196-22, JD47196-23, JD47196-24, JD47196-25, JD47196-26, JD47196-27, JD47196-28, JD47196-29, JD47196-30, JD47196-31, JD47196-32, JD47196-33, JD47196-34, JD47196-35, JD47196-36, JD47196-37, JD47196-38, JD47196-39, JD47196-40, JD47196-41

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	113% 50-150%
	13C5-PFPeA	107% 50-150%
	13C5-PFHxA	108% 50-150%
	13C4-PFHpA	109% 50-150%
	13C8-PFOA	110% 50-150%
	13C9-PFNA	110% 50-150%
	13C6-PFDA	115% 50-150%
	13C7-PFUnDA	115% 50-150%
	13C2-PFDoDA	100% 50-150%
	13C2-PFTeDA	112% 50-150%
	13C3-PFBS	108% 50-150%
	13C3-PFHxS	108% 50-150%
	13C8-PFOS	109% 50-150%
	13C8-FOSA	134% 50-150%
	d3-MeFOSAA	131% 50-150%
	d5-EtFOSAA	122% 50-150%
	13C2-4:2FTS	101% 50-150%
	13C2-6:2FTS	105% 50-150%
	13C2-8:2FTS	106% 50-150%
	13C3-HFPO-DA	111% 50-150%

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Page 1 of 1

Job Number: JD47196**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S6Q41-IBLK	6Q2266.D	1	07/16/22	JB	n/a	n/a	S6Q41

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47196-42

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	91% 50-150%
	13C5-PFPeA	93% 50-150%
	13C5-PFHxA	96% 50-150%
	13C4-PFHpA	95% 50-150%
	13C8-PFOA	99% 50-150%
	13C9-PFNA	99% 50-150%
	13C6-PFDA	97% 50-150%
	13C7-PFUnDA	94% 50-150%
	13C2-PFDoDA	96% 50-150%
	13C2-PFTeDA	97% 50-150%
	13C3-PFBS	94% 50-150%
	13C3-PFHxS	96% 50-150%
	13C8-PFOS	97% 50-150%
	13C8-FOSA	96% 50-150%
	d3-MeFOSA	103% 50-150%
	d3-MeFOSAA	106% 50-150%
	d5-EtFOSAA	99% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	93% 50-150%
	13C2-8:2FTS	94% 50-150%
	13C3-HFPO-DA	95% 50-150%

Blank Spike Summary

Page 1 of 1

Job Number: JD47196**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP91956-BS	5Q1715.D	1	07/14/22	NG	07/06/22	OP91956	S5Q29

The QC reported here applies to the following samples:**Method:** EPA 537M BY ID

JD47196-1, JD47196-2, JD47196-3, JD47196-4, JD47196-5, JD47196-6, JD47196-7, JD47196-8

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	10.7	107	70-130
335-67-1	Perfluorooctanoic acid	10	10.6	106	70-130
375-95-1	Perfluorononanoic acid	10	10.4	104	70-130
375-73-5	Perfluorobutanesulfonic acid	10	10.7	107	70-130
355-46-4	Perfluorohexanesulfonic acid	10	10.9	109	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	10.9	109	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	90%	40-140%
	13C5-PFPeA	86%	50-150%
	13C5-PFHxA	88%	50-150%
	13C4-PFHpA	90%	50-150%
	13C8-PFOA	90%	50-150%
	13C9-PFNA	91%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	99%	40-140%
	13C2-PFDoDA	97%	40-140%
	13C2-PFTeDA	101%	30-130%
	13C3-PFBS	87%	50-150%
	13C3-PFHxS	88%	50-150%
	13C8-PFOS	87%	50-150%
	13C8-FOSA	101%	30-130%
	d3-MeFOSAA	134%	40-140%
	d5-EtFOSAA	123%	40-140%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	91%	50-150%
	13C2-8:2FTS	95%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP91997-BS	6Q2282.D	1	07/16/22	JB	07/08/22	OP91997	S6Q41

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-42

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	0.08	0.0928	116	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0912	114	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0946	118	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0949	119	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0963	120	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0948	119	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	89%	35-135%
	13C5-PFPeA	88%	50-150%
	13C5-PFHxA	88%	50-150%
	13C4-PFHpA	87%	50-150%
	13C8-PFOA	82%	50-150%
	13C9-PFNA	78%	50-150%
	13C6-PFDA	76%	50-150%
	13C7-PFUnDA	78%	40-140%
	13C2-PFDoDA	69%	40-140%
	13C2-PFTeDA	33%	30-130%
	13C3-PFBS	85%	50-150%
	13C3-PFHxS	83%	50-150%
	13C8-PFOS	79%	50-150%
	13C8-FOSA	72%	30-130%
	d3-MeFOSAA	83%	40-140%
	d5-EtFOSAA	80%	40-140%
	13C2-4:2FTS	89%	50-150%
	13C2-6:2FTS	81%	50-150%
	13C2-8:2FTS	78%	50-150%
	13C3-HFPO-DA	94%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92026-BS	5Q1760.D	1	07/14/22	NG	07/11/22	OP92026	S5Q30

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-29, JD47196-30, JD47196-31, JD47196-32, JD47196-33, JD47196-34, JD47196-35, JD47196-36, JD47196-37, JD47196-38, JD47196-39, JD47196-40, JD47196-41

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	10.8	108	70-130
335-67-1	Perfluorooctanoic acid	10	10.8	108	70-130
375-95-1	Perfluorononanoic acid	10	10.6	106	70-130
375-73-5	Perfluorobutanesulfonic acid	10	10.7	107	70-130
355-46-4	Perfluorohexanesulfonic acid	10	10.9	109	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	10.7	107	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFHpA	100%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	101%	50-150%
	13C3-PFBS	99%	50-150%
	13C3-PFHxS	100%	50-150%
	13C8-PFOS	102%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92025-BS	5Q1788.D	1	07/15/22	NG	07/11/22	OP92025	S5Q30

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-9, JD47196-10, JD47196-11, JD47196-12, JD47196-13, JD47196-14, JD47196-15, JD47196-16, JD47196-17, JD47196-18, JD47196-19, JD47196-20, JD47196-21, JD47196-22, JD47196-23, JD47196-24, JD47196-25, JD47196-26, JD47196-27, JD47196-28

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	11.3	113	70-130
335-67-1	Perfluorooctanoic acid	10	11.2	112	70-130
375-95-1	Perfluorononanoic acid	10	11.1	111	70-130
375-73-5	Perfluorobutanesulfonic acid	10	11.0	110	70-130
355-46-4	Perfluorohexanesulfonic acid	10	11.3	113	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	11.3	113	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFHpA	91%	50-150%
	13C8-PFOA	91%	50-150%
	13C9-PFNA	91%	50-150%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	89%	50-150%
	13C8-PFOS	87%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP91956-MS	5Q1718.D	1	07/14/22	NG	07/06/22	OP91956	S5Q29
OP91956-MSD	5Q1719.D	1	07/14/22	NG	07/06/22	OP91956	S5Q29
FA96674-9	5Q1717.D	1	07/14/22	NG	07/06/22	OP91956	S5Q29

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-1, JD47196-2, JD47196-3, JD47196-4, JD47196-5, JD47196-6, JD47196-7, JD47196-8

CAS No.	Compound	FA96674-9 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
375-85-9	Perfluoroheptanoic acid	0.56 U	11.3	12.2	108	10.9	11.4	105	7	70-130/30
335-67-1	Perfluorooctanoic acid	0.56 U	11.3	12.1	107	10.9	11.2	103	8	70-130/30
375-95-1	Perfluorononanoic acid	0.56 U	11.3	11.8	105	10.9	11.1	102	6	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.56 U	11.3	12.1	107	10.9	11.4	105	6	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.36 I	11.3	12.4	107	10.9	11.4	101	8	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	4.0	11.3	15.7	104	10.9	14.5	96	8	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA96674-9	Limits
13C4-PFBA	75%	77%			40-140%
13C5-PFPeA	72%	74%			50-150%
13C5-PFHxA	74%	75%			50-150%
13C4-PFHpA	75%	76%			50-150%
13C8-PFOA	76%	77%	79%		50-150%
13C9-PFNA	76%	78%			50-150%
13C6-PFDA	79%	80%			50-150%
13C7-PFUnDA	82%	84%			40-140%
13C2-PFDoDA	78%	76%			40-140%
13C2-PFTeDA	83%	83%			30-130%
13C3-PFBS	71%	74%			50-150%
13C3-PFHxS	73%	76%			50-150%
13C8-PFOS	71%	73%	75%		50-150%
13C8-FOSA	63%	68%			30-130%
d3-MeFOSAA	112%	116%			40-140%
d5-EtFOSAA	105%	108%			40-140%
13C2-4:2FTS	73%	74%			50-150%
13C2-6:2FTS	76%	76%			50-150%
13C2-8:2FTS	80%	81%			50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP91997-MS	6Q2285.D	1	07/16/22	JB	07/08/22	OP91997	S6Q41
OP91997-MSD	6Q2286.D	1	07/16/22	JB	07/08/22	OP91997	S6Q41
FA96736-2	6Q2284.D	1	07/16/22	JB	07/08/22	OP91997	S6Q41
FA96736-2 ^a	6Q2368.D	5	07/18/22	JB	07/08/22	OP91997	S6Q42

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-42

CAS No.	Compound	FA96736-2	Spike	MS	MS	Spike	MSD	MSD	RPD	Limits
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l		%
375-85-9	Perfluoroheptanoic acid	ND	0.16	0.197	123	0.16	0.200	125	2	70-130/30
335-67-1	Perfluorooctanoic acid	ND	0.16	0.197	123	0.16	0.196	123	1	70-130/30
375-95-1	Perfluorononanoic acid	ND	0.16	0.188	118	0.16	0.197	123	5	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0068	0.16	0.199	120	0.16	0.199	120	0	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0578	0.16	0.259	126	0.16	0.258	125	0	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0561	0.16	0.258	126	0.16	0.262	129	2	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA96736-2	FA96736-2	Limits
	13C4-PFBA	84%	82%	78%	77%	35-135%
	13C5-PFPeA	85%	85%	80%	77%	50-150%
	13C5-PFHxA	88%	84%	82%	81%	50-150%
	13C4-PFHpA	84%	82%	79%	81%	50-150%
	13C8-PFOA	81%	78%	80%	83%	50-150%
	13C9-PFNA	82%	80%	74%	76%	50-150%
	13C6-PFDA	75%	83%	67%	76%	50-150%
	13C7-PFUnDA	78%	77%	62%	77%	40-140%
	13C2-PFDoDA	75%	78%	48%	76%	40-140%
	13C2-PFTeDA	65%	70%	17%* b	39%	30-130%
	13C3-PFBS	86%	82%	80%	79%	50-150%
	13C3-PFHxS	83%	80%	79%	78%	50-150%
	13C8-PFOS	77%	76%	63%	82%	50-150%
	13C8-FOSA	71%	68%	50%	54%	30-130%
	d3-MeFOSAA	87%	80%	71%	83%	40-140%
	d5-EtFOSAA	84%	79%	65%	78%	40-140%
	13C2-4:2FTS	86%	84%	77%	78%	50-150%
	13C2-6:2FTS	85%	78%	80%	81%	50-150%
	13C2-8:2FTS	77%	79%	68%	77%	50-150%
	13C3-HFPO-DA	92%	88%			50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).

(b) Outside control limits.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92026-MS	5Q1766.D	1	07/14/22	NG	07/11/22	OP92026	S5Q30
OP92026-MSD	5Q1767.D	1	07/14/22	NG	07/11/22	OP92026	S5Q30
JD47196-32	5Q1765.D	1	07/14/22	NG	07/11/22	OP92026	S5Q30

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47196-29, JD47196-30, JD47196-31, JD47196-32, JD47196-33, JD47196-34, JD47196-35, JD47196-36, JD47196-37, JD47196-38, JD47196-39, JD47196-40, JD47196-41

CAS No.	Compound	JD47196-32		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits
		ug/kg	Q	ug/kg	ug/kg	%	ug/kg	ug/kg	%		Rec/RPD
375-85-9	Perfluoroheptanoic acid	ND		11.8	12.5	106	11.8	12.8	109	2	70-130/30
335-67-1	Perfluorooctanoic acid	0.29	J	11.8	12.7	105	11.8	13.0	108	2	70-130/30
375-95-1	Perfluorononanoic acid	ND		11.8	12.2	103	11.8	12.5	106	2	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		11.8	12.3	104	11.8	12.4	105	1	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		11.8	12.4	105	11.8	12.6	107	2	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND		11.8	12.3	104	11.8	12.6	107	2	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	JD47196-32	Limits
	13C4-PFHpA	71%	73%	72%	50-150%
	13C8-PFOA	71%	73%	72%	50-150%
	13C9-PFNA	72%	74%	72%	50-150%
	13C3-PFBS	79%	75%	80%	50-150%
	13C3-PFHxS	80%	76%	83%	50-150%
	13C8-PFOS	81%	75%	80%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JD47196
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92025-MS	5Q1796.D	1	07/15/22	NG	07/11/22	OP92025	S5Q30
OP92025-MSD	5Q1797.D	1	07/15/22	NG	07/11/22	OP92025	S5Q30
JD47196-14	5Q1795.D	1	07/15/22	NG	07/11/22	OP92025	S5Q30

The QC reported here applies to the following samples: Method: EPA 537M BY ID

JD47196-9, JD47196-10, JD47196-11, JD47196-12, JD47196-13, JD47196-14, JD47196-15, JD47196-16, JD47196-17, JD47196-18, JD47196-19, JD47196-20, JD47196-21, JD47196-22, JD47196-23, JD47196-24, JD47196-25, JD47196-26, JD47196-27, JD47196-28

CAS No.	Compound	JD47196-14 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
375-85-9	Perfluoroheptanoic acid	ND	12.5	12.4	99	12.6	12.8	102	3	70-130/30
335-67-1	Perfluorooctanoic acid	ND	12.5	12.2	98	12.6	12.8	102	5	70-130/30
375-95-1	Perfluorononanoic acid	3.7	12.5	15.0	91	12.6	15.7	95	5	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND	12.5	11.9	95	12.6	12.2	97	2	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND	12.5	12.2	98	12.6	12.6	100	3	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND	12.5	12.3	99	12.6	12.7	101	3	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	JD47196-14	Limits
	13C4-PFHpA	87%	99%	131%	50-150%
	13C8-PFOA	89%	100%	132%	50-150%
	13C9-PFNA	86%	99%	132%	50-150%
	13C3-PFBS	87%	99%	130%	50-150%
	13C3-PFHxS	87%	97%	129%	50-150%
	13C8-PFOS	82%	94%	125%	50-150%

* = Outside of Control Limits.

Isotope Dilution Standard Recovery Summary

Job Number: JD47196
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47196-42	6Q2299.D	86	83	78	86	83	72
OP91997-BS	6Q2282.D	87	82	78	85	83	79
OP91997-MB	6Q2283.D	91	92	90	90	91	88
OP91997-MS	6Q2285.D	84	81	82	86	83	77
OP91997-MSD	6Q2286.D	82	78	80	82	80	76

Isotope Dilution Standards	Recovery Limits
S1 = 13C4-PFHpA	50-150%
S2 = 13C8-PFOA	50-150%
S3 = 13C9-PFNA	50-150%
S4 = 13C3-PFBS	50-150%
S5 = 13C3-PFHxS	50-150%
S6 = 13C8-PFOS	50-150%

Isotope Dilution Standard Recovery Summary

Page 1 of 2

Job Number: JD47196

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47196-1	5Q1735.D	86	88	89	84	83	82
JD47196-2	5Q1736.D	85	87	87	82	82	83
JD47196-3	5Q1737.D	88	90	91	87	87	86
JD47196-4	5Q1738.D	76	78	78	71	72	70
JD47196-5	5Q1739.D	76	78	79	74	74	73
JD47196-6	5Q1740.D	76	77	78	75	74	72
JD47196-7	5Q1741.D	77	79	79	75	76	75
JD47196-8	5Q1742.D	82	84	84	81	81	81
JD47196-9	5Q1790.D	87	89	89	86	87	84
JD47196-10	5Q1791.D	88	90	91	86	89	86
JD47196-11	5Q1792.D	84	84	85	81	84	81
JD47196-12	5Q1793.D	81	82	82	79	79	74
JD47196-13	5Q1794.D	102	103	101	99	100	96
JD47196-14	5Q1795.D	131	132	132	130	129	125
JD47196-15	5Q1800.D	89	89	86	87	87	83
JD47196-16	5Q1801.D	91	93	91	90	90	86
JD47196-17	5Q1802.D	86	88	87	90	90	86
JD47196-18	5Q1803.D	87	90	89	87	87	84
JD47196-19	5Q1804.D	90	91	91	89	89	86
JD47196-20	5Q1805.D	84	85	84	84	82	79
JD47196-21	5Q1806.D	83	85	85	84	85	80
JD47196-22	5Q1807.D	82	83	84	82	83	78
JD47196-23	5Q1808.D	87	88	89	87	86	84
JD47196-24	5Q1809.D	91	94	94	90	90	88
JD47196-25	5Q1812.D	91	93	93	89	89	88
JD47196-26	5Q1813.D	91	94	93	92	93	88
JD47196-27	5Q1814.D	82	84	84	82	83	80
JD47196-28	5Q1815.D	84	88	88	84	84	84
JD47196-29	5Q1762.D	70	70	70	71	69	70
JD47196-30	5Q1763.D	83	83	85	83	83	82
JD47196-31	5Q1764.D	82	82	84	81	82	79
JD47196-32	5Q1765.D	72	72	72	80	83	80
JD47196-33	5Q1768.D	75	76	76	76	74	72
JD47196-34	5Q1769.D	73	73	73	73	72	71
JD47196-35	5Q1772.D	75	75	76	74	75	74
JD47196-36	5Q1773.D	87	88	89	87	87	85
JD47196-37	5Q1774.D	85	85	86	83	83	81
JD47196-38	5Q1775.D	69	70	71	71	71	68
JD47196-39	5Q1776.D	82	84	83	81	82	79
JD47196-40	5Q1777.D	71	72	70	71	70	69

6.4.2

6

Isotope Dilution Standard Recovery Summary

Job Number: JD47196
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID	Matrix: SO
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47196-41	5Q1778.D	82	84	82	82	83	79
OP91956-BS	5Q1715.D	90	90	91	87	88	87
OP91956-MB	5Q1716.D	81	83	84	81	80	80
OP91956-MS	5Q1718.D	75	76	76	71	73	71
OP91956-MSD	5Q1719.D	76	77	78	74	76	73
OP92025-BS	5Q1788.D	91	91	91	89	89	87
OP92025-MB	5Q1789.D	108	109	107	105	106	102
OP92025-MS	5Q1796.D	87	89	86	87	87	82
OP92025-MSD	5Q1797.D	99	100	99	99	97	94
OP92026-BS	5Q1760.D	100	101	101	99	100	102
OP92026-MB	5Q1761.D	104	104	105	104	105	105
OP92026-MS	5Q1766.D	71	71	72	79	80	81
OP92026-MSD	5Q1767.D	73	73	74	75	76	75

Isotope Dilution Standards	Recovery Limits
S1 = 13C4-PFHpA	50-150%
S2 = 13C8-PFOA	50-150%
S3 = 13C9-PFNA	50-150%
S4 = 13C3-PFBS	50-150%
S5 = 13C3-PFHxS	50-150%
S6 = 13C8-PFOS	50-150%

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Sunoco/Evergreen

SANHPAFW: Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA 19104
4796.01

SGS Job Number: JD47400

Sampling Dates: 06/22/22 - 06/24/22



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Total number of pages in report: 77



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



David Chastain
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.

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Sample Summary

Sunoco/Evergreen

Job No: JD47400

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
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This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

JD47400-1	06/22/22	14:10 MF	06/24/22	SO	Soil	AOI1_B013_PFAS_0-1_20220622
JD47400-2	06/22/22	14:45 MF	06/24/22	SO	Soil	AOI1_B012_PFAS_0-1_20220622
JD47400-3	06/23/22	08:05 MF	06/24/22	SO	Soil	AOI1_B014_PFAS_0-1_20220623
JD47400-4	06/23/22	11:20 MF	06/24/22	SO	Soil	AOI1_B001_PFAS_0-1_20220623
JD47400-5	06/23/22	08:35 MF	06/24/22	SO	Soil	AOI1_B002_PFAS_0-1_20220623
JD47400-6	06/23/22	08:25 MF	06/24/22	SO	Soil	AOI1_B003_PFAS_0-1_20220623
JD47400-7	06/23/22	12:00 MF	06/24/22	SO	Soil	AOI1_B005_PFAS_0-1_20220623
JD47400-8	06/23/22	11:40 MF	06/24/22	SO	Soil	AOI1_B007_PFAS_0-1_20220623
JD47400-9	06/23/22	08:55 MF	06/24/22	SO	Soil	AOI1_B004_PFAS_0-1_20220623
JD47400-10	06/23/22	10:55 MF	06/24/22	SO	Soil	AOI1_B006_PFAS_0-1_20220623
JD47400-11	06/23/22	09:40 MF	06/24/22	SO	Soil	AOI1_B008_PFAS_0-1_20220623
JD47400-12	06/23/22	09:15 MF	06/24/22	SO	Soil	AOI1_B011_PFAS_0-1_20220623

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Sample Summary

(continued)

Sunoco/Evergreen

Job No: JD47400

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47400-13	06/23/22	12:50 MF	06/24/22	SO	Soil	AOI1_B010_PFAS_0-1_20220623
JD47400-14	06/23/22	12:50 MF	06/24/22	SO	Soil	AOI1_B010_PFAS_0-1_20220623_DUP
JD47400-15	06/23/22	12:30 MF	06/24/22	SO	Soil	AOI1_B009_PFAS_0-1_20220623
JD47400-16	06/23/22	14:40 MF	06/24/22	SO	Soil	AOI3_B002_PFAS_0-1_20220623
JD47400-17	06/23/22	14:00 MF	06/24/22	SO	Soil	AOI3_B003_PFAS_0-1_20220623
JD47400-18	06/23/22	13:20 MF	06/24/22	SO	Soil	AOI3_B001_PFAS_0-1_20220623
JD47400-19	06/24/22	08:10 MF	06/24/22	SO	Soil	AOI3_B005_PFAS_0-1_20220624
JD47400-20	06/24/22	08:35 MF	06/24/22	SO	Soil	AOI3_B004_PFAS_0-1_20220624
JD47400-21	06/24/22	08:45 MF	06/24/22	SO	Soil	AOI7_B003_PFAS_0-1_20220624
JD47400-22	06/24/22	09:20 MF	06/24/22	SO	Soil	AOI7_B001_PFAS_0-1_20220624
JD47400-23	06/24/22	11:20 MF	06/24/22	SO	Soil	AOI7_B006_PFAS_0-1_20220624
JD47400-24	06/24/22	09:50 MF	06/24/22	SO	Soil	AOI7_B009_PFAS_0-1_20220624
JD47400-25	06/24/22	10:15 MF	06/24/22	SO	Soil	AOI7_B008_PFAS_0-1_20220624

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary
(continued)

Sunoco/Evergreen

Job No: JD47400

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47400-26	06/24/22	10:45 MF	06/24/22	SO	Soil	AOI7_B007_PFAS_0-1_20220624
JD47400-27	06/24/22	12:20 MF	06/24/22	SO	Soil	AOI7_B004_PFAS_0-1_20220624
JD47400-28	06/24/22	12:45 MF	06/24/22	SO	Soil	AOI7_B005_PFAS_0-1_20220624
JD47400-29	06/24/22	13:35 MF	06/24/22	SO	Soil	AOI6_B003_PFAS_0-1_20220624
JD47400-30	06/24/22	13:55 MF	06/24/22	SO	Soil	AOI6_B002_PFAS_0-1_20220624
JD47400-31	06/23/22	08:00 MF	06/24/22	AQ	Field Blank Soil	FB-02_20220623
JD47400-32	06/24/22	08:00 MF	06/24/22	AQ	Field Blank Soil	FB-03_20220624

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Job Number: JD47400

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/22/22 thru 06/24/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JD47400-1 AOI1_B013_PFAS_0-1_20220622						
Perfluorohexanesulfonic acid ^a		0.00091	0.00055	0.00027	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0023	0.00055	0.00022	mg/kg	EPA 537M BY ID
JD47400-2 AOI1_B012_PFAS_0-1_20220622						
Perfluorooctanoic acid ^a		0.00040 J	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.0016	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a		0.0015	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0135	0.00056	0.00023	mg/kg	EPA 537M BY ID
JD47400-3 AOI1_B014_PFAS_0-1_20220623						
Perfluorooctanesulfonic acid ^a		0.00070	0.00053	0.00021	mg/kg	EPA 537M BY ID
JD47400-4 AOI1_B001_PFAS_0-1_20220623						
Perfluoroheptanoic acid ^a		0.00041 J	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a		0.00042 J	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.00068	0.00058	0.00029	mg/kg	EPA 537M BY ID
JD47400-5 AOI1_B002_PFAS_0-1_20220623						
Perfluoroheptanoic acid ^a		0.0024	0.00057	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a		0.0231	0.00057	0.00028	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.0190	0.00057	0.00028	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a		0.00032 J	0.00057	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0023	0.00057	0.00023	mg/kg	EPA 537M BY ID
JD47400-6 AOI1_B003_PFAS_0-1_20220623						
Perfluoroheptanoic acid ^a		0.00031 J	0.00059	0.00030	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.00050 J	0.00059	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.00048 J	0.00059	0.00024	mg/kg	EPA 537M BY ID
JD47400-7 AOI1_B005_PFAS_0-1_20220623						
Perfluorohexanesulfonic acid ^a		0.0014	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0067	0.00058	0.00023	mg/kg	EPA 537M BY ID
JD47400-8 AOI1_B007_PFAS_0-1_20220623						
Perfluorononanoic acid ^a		0.0011	0.00060	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0012	0.00060	0.00024	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47400**Account:** Sunoco/Evergreen**Project:** SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA**Collected:** 06/22/22 thru 06/24/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47400-9 AOI1_B004_PFAS_0-1_20220623

Perfluorooctanoic acid ^a	0.00040 J	0.00061	0.00031	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0019	0.00061	0.00031	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00055 J	0.00061	0.00024	mg/kg	EPA 537M BY ID

JD47400-10 AOI1_B006_PFAS_0-1_20220623

No hits reported in this sample.

JD47400-11 AOI1_B008_PFAS_0-1_20220623

Perfluorooctanoic acid ^a	0.00038 J	0.00064	0.00032	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0011	0.00064	0.00032	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	0.00042 J	0.00064	0.00032	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00067	0.00064	0.00026	mg/kg	EPA 537M BY ID

JD47400-12 AOI1_B011_PFAS_0-1_20220623

No hits reported in this sample.

JD47400-13 AOI1_B010_PFAS_0-1_20220623

Perfluorononanoic acid ^a	0.00094	0.00060	0.00030	mg/kg	EPA 537M BY ID
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JD47400-14 AOI1_B010_PFAS_0-1_20220623_DUP

Perfluorooctanoic acid ^a	0.00041 J	0.00060	0.00030	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0016	0.00060	0.00030	mg/kg	EPA 537M BY ID

JD47400-15 AOI1_B009_PFAS_0-1_20220623

Perfluorooctanoic acid ^a	0.00038 J	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.00039 J	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0179	0.00058	0.00023	mg/kg	EPA 537M BY ID

JD47400-16 AOI3_B002_PFAS_0-1_20220623

Perfluoroheptanoic acid ^a	0.00030 J	0.00055	0.00028	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.00037 J	0.00055	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0016	0.00055	0.00022	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47400

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/22/22 thru 06/24/22

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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JD47400-17 **AOI3_B003_PFAS_0-1_20220623**

No hits reported in this sample.

JD47400-18 **AOI3_B001_PFAS_0-1_20220623**

No hits reported in this sample.

JD47400-19 **AOI3_B005_PFAS_0-1_20220624**

Perfluorononanoic acid ^a	0.00099	0.00059	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00040 J	0.00059	0.00023	mg/kg	EPA 537M BY ID

JD47400-20 **AOI3_B004_PFAS_0-1_20220624**

Perfluorooctanesulfonic acid ^a	0.0026	0.00066	0.00026	mg/kg	EPA 537M BY ID
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JD47400-21 **AOI7_B003_PFAS_0-1_20220624**

No hits reported in this sample.

JD47400-22 **AOI7_B001_PFAS_0-1_20220624**

No hits reported in this sample.

JD47400-23 **AOI7_B006_PFAS_0-1_20220624**

No hits reported in this sample.

JD47400-24 **AOI7_B009_PFAS_0-1_20220624**

Perfluorononanoic acid ^a	0.00062	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00034 J	0.00058	0.00023	mg/kg	EPA 537M BY ID

JD47400-25 **AOI7_B008_PFAS_0-1_20220624**

No hits reported in this sample.

JD47400-26 **AOI7_B007_PFAS_0-1_20220624**

No hits reported in this sample.

JD47400-27 **AOI7_B004_PFAS_0-1_20220624**

No hits reported in this sample.

Summary of Hits

Job Number: JD47400
Account: Sunoco/Evergreen
Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Collected: 06/22/22 thru 06/24/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47400-28 AOI7_B005_PFAS_0-1_20220624

No hits reported in this sample.

JD47400-29 AOI6_B003_PFAS_0-1_20220624

No hits reported in this sample.

JD47400-30 AOI6_B002_PFAS_0-1_20220624

No hits reported in this sample.

JD47400-31 FB-02_20220623

No hits reported in this sample.

JD47400-32 FB-03_20220624

No hits reported in this sample.

(a) Analysis performed at SGS Orlando, FL.



Dayton, NJ

Section 3



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	AOI1_B013_PFAS_0-1_20220622				
Lab Sample ID:	JD47400-1		Date Sampled:	06/22/22	
Matrix:	SO - Soil		Date Received:	06/24/22	
Method:	EPA 537M BY ID IN HOUSE		Percent Solids:	90.7	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1865.D	1	07/16/22 01:58	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.00091	0.00055	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0023	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	94%		50-150%
13C8-PFOA	96%		50-150%
13C9-PFNA	93%		50-150%
13C3-PFBS	94%		50-150%
13C3-PFHxS	93%		50-150%
13C8-PFOS	91%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B012_PFAS_0-1_20220622				
Lab Sample ID:	JD47400-2			Date Sampled:	06/22/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	88.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1866.D	1	07/16/22 02:14	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00040	0.00056	0.00028	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0016	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0135	0.00056	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	92%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	91%		50-150%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	89%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B014_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-3			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	94.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1867.D	1	07/16/22 02:29	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00053	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00053	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00053	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00053	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00053	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00070	0.00053	0.00021	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	99%		50-150%
13C8-PFOA	99%		50-150%
13C9-PFNA	100%		50-150%
13C3-PFBS	95%		50-150%
13C3-PFHxS	97%		50-150%
13C8-PFOS	95%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B001_PFAS_0-1_20220623	Date Sampled:	06/23/22
Lab Sample ID:	JD47400-4	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	85.6
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1868.D	1	07/16/22 02:44	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00041	0.00058	0.00029	mg/kg	J
335-67-1	Perfluorooctanoic acid	0.00042	0.00058	0.00029	mg/kg	J
375-95-1	Perfluorononanoic acid	0.00068	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	87%		50-150%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	83%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B002_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-5			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	88.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1871.D	1	07/16/22 03:31	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	0.0024	0.00057	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0231	0.00057	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.0190	0.00057	0.00028	mg/kg	
PERFLUOROALKYLSULFONIC ACIDS						
375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.00032	0.00057	0.00028	mg/kg	J
1763-23-1	Perfluorooctanesulfonic acid	0.0023	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	92%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	92%		50-150%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	88%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B003_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-6			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1872.D	1	07/16/22 03:46	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00031	0.00059	0.00030	mg/kg	J
335-67-1	Perfluorooctanoic acid	ND	0.00059	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.00050	0.00059	0.00030	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00059	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00048	0.00059	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	94%		50-150%
13C8-PFOA	96%		50-150%
13C9-PFNA	95%		50-150%
13C3-PFBS	94%		50-150%
13C3-PFHxS	95%		50-150%
13C8-PFOS	91%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B005_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-7			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1873.D	1	07/16/22 04:01	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00058	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0067	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	84%		50-150%
13C8-PFOA	85%		50-150%
13C9-PFNA	82%		50-150%
13C3-PFBS	82%		50-150%
13C3-PFHxS	82%		50-150%
13C8-PFOS	76%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B007_PFAS_0-1_20220623	Date Sampled:	06/23/22
Lab Sample ID:	JD47400-8	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	82.9
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1874.D	1	07/16/22 04:16	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.0011	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0012	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	82%		50-150%
13C8-PFOA	84%		50-150%
13C9-PFNA	83%		50-150%
13C3-PFBS	82%		50-150%
13C3-PFHxS	82%		50-150%
13C8-PFOS	79%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B004_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-9			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	81.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1875.D	1	07/16/22 04:32	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00040	0.00061	0.00031	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0019	0.00061	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00055	0.00061	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	92%		50-150%
	13C3-PFBS	91%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	87%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B006_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-10			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1876.D	1	07/16/22 04:47	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00057	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	95%		50-150%
13C8-PFOA	97%		50-150%
13C9-PFNA	96%		50-150%
13C3-PFBS	94%		50-150%
13C3-PFHxS	94%		50-150%
13C8-PFOS	91%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B008_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-11			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	77.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1877.D	1	07/16/22 05:02	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00038	0.00064	0.00032	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0011	0.00064	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.00042	0.00064	0.00032	mg/kg	J
1763-23-1	Perfluorooctanesulfonic acid	0.00067	0.00064	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	102%		50-150%
13C8-PFOA	105%		50-150%
13C9-PFNA	104%		50-150%
13C3-PFBS	101%		50-150%
13C3-PFHxS	102%		50-150%
13C8-PFOS	99%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B011_PFAS_0-1_20220623	Date Sampled:	06/23/22
Lab Sample ID:	JD47400-12	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	91.5
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1878.D	1	07/16/22 05:18	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	87%		50-150%
13C8-PFOA	89%		50-150%
13C9-PFNA	89%		50-150%
13C3-PFBS	86%		50-150%
13C3-PFHxS	86%		50-150%
13C8-PFOS	83%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B010_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-13			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1879.D	1	07/16/22 05:33	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.00094	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	86%		50-150%
13C8-PFOA	89%		50-150%
13C9-PFNA	88%		50-150%
13C3-PFBS	89%		50-150%
13C3-PFHxS	89%		50-150%
13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B010_PFAS_0-1_20220623_DUP				
Lab Sample ID:	JD47400-14			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	82.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1880.D	1	07/16/22 05:49	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00041	0.00060	0.00030	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0016	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	79%		50-150%
	13C8-PFOA	81%		50-150%
	13C9-PFNA	82%		50-150%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	85%		50-150%
	13C8-PFOS	82%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B009_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-15			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	85.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1883.D	1	07/16/22 06:35	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00038	0.00058	0.00029	mg/kg	J
375-95-1	Perfluorononanoic acid	0.00039	0.00058	0.00029	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0179	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	99%		50-150%
13C8-PFOA	100%		50-150%
13C9-PFNA	99%		50-150%
13C3-PFBS	98%		50-150%
13C3-PFHxS	98%		50-150%
13C8-PFOS	94%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI3_B002_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-16			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	89.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1943.D	1	07/18/22 18:40	AFL	07/12/22 06:00	F:OP92044	F:S5Q32
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00030	0.00055	0.00028	mg/kg	J
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.00037	0.00055	0.00028	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0016	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	78%		50-150%
13C8-PFOA	78%		50-150%
13C9-PFNA	77%		50-150%
13C3-PFBS	77%		50-150%
13C3-PFHxS	77%		50-150%
13C8-PFOS	74%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI3_B003_PFAS_0-1_20220623				
Lab Sample ID:	JD47400-17			Date Sampled:	06/23/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	75.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1885.D	1	07/16/22 07:05	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00066	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00066	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00066	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00066	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00066	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00066	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	93%		50-150%
13C8-PFOA	96%		50-150%
13C9-PFNA	97%		50-150%
13C3-PFBS	97%		50-150%
13C3-PFHxS	97%		50-150%
13C8-PFOS	95%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI3_B001_PFAS_0-1_20220623			
Lab Sample ID:	JD47400-18	Date Sampled:	06/23/22	
Matrix:	SO - Soil	Date Received:	06/24/22	
Method:	EPA 537M BY ID IN HOUSE	Percent Solids:	96.4	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1886.D	1	07/16/22 07:21	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00052	0.00026	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00052	0.00026	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00052	0.00026	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00052	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00052	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00052	0.00021	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	98%		50-150%
13C8-PFOA	100%		50-150%
13C9-PFNA	98%		50-150%
13C3-PFBS	96%		50-150%
13C3-PFHxS	95%		50-150%
13C8-PFOS	94%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI3_B005_PFAS_0-1_20220624				
Lab Sample ID:	JD47400-19			Date Sampled:	06/24/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1887.D	1	07/16/22 07:36	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00059	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00059	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	0.00099	0.00059	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00059	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00040	0.00059	0.00023	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	89%		50-150%
13C8-PFOA	91%		50-150%
13C9-PFNA	90%		50-150%
13C3-PFBS	89%		50-150%
13C3-PFHxS	89%		50-150%
13C8-PFOS	88%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI3_B004_PFAS_0-1_20220624	Date Sampled:	06/24/22
Lab Sample ID:	JD47400-20	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	76.1
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	5Q1888.D	1	07/16/22 07:51	AFL	07/12/22 06:00	F:OP92044	F:S5Q31
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00066	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00066	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00066	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00066	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00066	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0026	0.00066	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	94%		50-150%
13C8-PFOA	95%		50-150%
13C9-PFNA	84%		50-150%
13C3-PFBS	93%		50-150%
13C3-PFHxS	92%		50-150%
13C8-PFOS	90%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B003_PFAS_0-1_20220624				
Lab Sample ID:	JD47400-21			Date Sampled:	06/24/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.0
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95431.D	1	07/22/22 04:35	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00057	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	106%		50-150%
13C8-PFOA	109%		50-150%
13C9-PFNA	105%		50-150%
13C3-PFBS	103%		50-150%
13C3-PFHxS	107%		50-150%
13C8-PFOS	106%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B001_PFAS_0-1_20220624	Date Sampled:	06/24/22
Lab Sample ID:	JD47400-22	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	97.2
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95434.D	1	07/22/22 05:24	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00051	0.00026	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00051	0.00026	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00051	0.00026	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00051	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00051	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00051	0.00020	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	105%		50-150%
13C8-PFOA	108%		50-150%
13C9-PFNA	105%		50-150%
13C3-PFBS	101%		50-150%
13C3-PFHxS	104%		50-150%
13C8-PFOS	101%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B006_PFAS_0-1_20220624			
Lab Sample ID:	JD47400-23	Date Sampled:	06/24/22	
Matrix:	SO - Soil	Date Received:	06/24/22	
Method:	EPA 537M BY ID IN HOUSE	Percent Solids:	88.0	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95435.D	1	07/22/22 05:41	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00056	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	108%		50-150%
13C8-PFOA	112%		50-150%
13C9-PFNA	107%		50-150%
13C3-PFBS	103%		50-150%
13C3-PFHxS	108%		50-150%
13C8-PFOS	105%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B009_PFAS_0-1_20220624				
Lab Sample ID:	JD47400-24			Date Sampled:	06/24/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	86.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95436.D	1	07/22/22 05:57	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00058	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	0.00062	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00034	0.00058	0.00023	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	94%		50-150%
13C8-PFOA	95%		50-150%
13C9-PFNA	92%		50-150%
13C3-PFBS	90%		50-150%
13C3-PFHxS	93%		50-150%
13C8-PFOS	90%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B008_PFAS_0-1_20220624	Date Sampled:	06/24/22
Lab Sample ID:	JD47400-25	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	89.8
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95437.D	1	07/22/22 06:14	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	91%		50-150%
13C8-PFOA	78%		50-150%
13C9-PFNA	59%		50-150%
13C3-PFBS	100%		50-150%
13C3-PFHxS	94%		50-150%
13C8-PFOS	73%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B007_PFAS_0-1_20220624				
Lab Sample ID:	JD47400-26			Date Sampled:	06/24/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95438.D	1	07/22/22 06:31	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	95%		50-150%
13C8-PFOA	98%		50-150%
13C9-PFNA	94%		50-150%
13C3-PFBS	93%		50-150%
13C3-PFHxS	97%		50-150%
13C8-PFOS	94%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B004_PFAS_0-1_20220624				
Lab Sample ID:	JD47400-27			Date Sampled:	06/24/22
Matrix:	SO - Soil			Date Received:	06/24/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	94.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95441.D	1	07/22/22 07:20	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00052	0.00026	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00052	0.00026	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00052	0.00026	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00052	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00052	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00052	0.00021	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	114%		50-150%
13C8-PFOA	118%		50-150%
13C9-PFNA	115%		50-150%
13C3-PFBS	111%		50-150%
13C3-PFHxS	116%		50-150%
13C8-PFOS	111%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B005_PFAS_0-1_20220624	Date Sampled:	06/24/22
Lab Sample ID:	JD47400-28	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	90.6
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95442.D	1	07/22/22 07:37	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
---------	------------------------	--------	--------	--------

13C4-PFHpA	107%		50-150%
13C8-PFOA	106%		50-150%
13C9-PFNA	93%		50-150%
13C3-PFBS	108%		50-150%
13C3-PFHxS	109%		50-150%
13C8-PFOS	95%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B003_PFAS_0-1_20220624	Date Sampled:	06/24/22
Lab Sample ID:	JD47400-29	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	87.4
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95443.D	1	07/22/22 07:53	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00056	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
---------	------------------------	--------	--------	--------

13C4-PFHpA	96%		50-150%
13C8-PFOA	98%		50-150%
13C9-PFNA	96%		50-150%
13C3-PFBS	92%		50-150%
13C3-PFHxS	97%		50-150%
13C8-PFOS	94%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B002_PFAS_0-1_20220624	Date Sampled:	06/24/22
Lab Sample ID:	JD47400-30	Date Received:	06/24/22
Matrix:	SO - Soil	Percent Solids:	97.1
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95444.D	1	07/22/22 08:10	AFL	07/12/22 06:00	F:OP92045	F:S2Q1333
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00051	0.00026	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00051	0.00026	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00051	0.00026	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00051	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00051	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00051	0.00020	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
---------	------------------------	--------	--------	--------

13C4-PFHpA	109%		50-150%
13C8-PFOA	109%		50-150%
13C9-PFNA	102%		50-150%
13C3-PFBS	103%		50-150%
13C3-PFHxS	108%		50-150%
13C8-PFOS	101%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-02_20220623	Date Sampled:	06/23/22
Lab Sample ID:	JD47400-31	Date Received:	06/24/22
Matrix:	AQ - Field Blank Soil	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95050.D	1	07/16/22 08:51	AFL	07/11/22 11:07	F:OP92019	F:S2Q1327
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	94%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	85%		50-150%
	13C3-PFBS	94%		50-150%
	13C3-PFHxS	94%		50-150%
	13C8-PFOS	65%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-03_20220624	Date Sampled:	06/24/22
Lab Sample ID:	JD47400-32	Date Received:	06/24/22
Matrix:	AQ - Field Blank Soil	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95051.D	1	07/16/22 09:08	AFL	07/11/22 11:07	F:OP92019	F:S2Q1327
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	83%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	76%		50-150%
	13C3-PFBS	82%		50-150%
	13C3-PFHxS	81%		50-150%
	13C8-PFOS	71%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

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FB

CHAIN OF CUSTODY

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Please merge with SDG:

JD47400

FED-EX Tracking # 9304 4572 0311

Bottle Order Control # VP-06972-9

Client / Reporting Information				Project Information				Requested Analysis (see TEST CODE sheet)												Matrix Codes								
Company Name Sanborn Head & Associates				Project Name Evergreen Philadelphia Refinery																DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank								
Street Address 20 Foundry St				Street 3144 W. Passyunk Ave.		Billing Information (if different from Report to)																						
City Concord		State NH		Zip 03301		City Philadelphia		State PA		Zip 19145		Company Name Sanborn Head & Associates																
Project Contact Andrew Buchy Shana Whitney				E-mail abuchy@sanbornhead.com swhitney@sanbornhead.com		Project # 4796.01		Street Address 20 Foundry Street																				
Phone # 603-415-6159				Fax #		Client Purchase Order #		City Concord		State NH		Zip 03301																
Sampler(s) Name(s) Michael Faurie				Phone 610-984-1717		Project Manager Andrew Buchy		Account Payable: ep@sanbornhead.com																				
						Andrew Buchy (abuchy@sanbornhead.com)																						
Lab Sample #		Field ID / Point of Collection		MECH/DI Vial #		Date		Time		Sampled by		Matrix		# of bottles		Number of preserved bottles												LAB USE ONLY
1		A01-L003-PFAS-01-20220623				6/23/22		1410		MF		SD		1														
2		A01-L002-PFAS-01-20220623				6/23/22		1445		MF		SD		1														
3		A01-L004-PFAS-04-20220623				6/23/22		1005		MF		SD		1														
4		A01-L001-PFAS-01-20220623				6/23/22		1120		MF		SD		1														
5		A01-L005-PFAS-01-20220623				6/23/22		1125		MF		SD		1														
6		A01-L002-PFAS-01-20220623				6/23/22		1125		MF		SD		1														
7		A01-L005-PFAS-01-20220623				6/23/22		1125		MF		SD		1														
8		A01-L002-PFAS-01-20220623				6/23/22		1125		MF		SD		1														
9		A01-L003-PFAS-01-20220623				6/23/22		1125		MF		SD		1														
10		A01-L003-PFAS-01-20220623				6/23/22		1125		MF		SD		1														
11		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
12		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
13		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
14		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
15		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
16		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
17		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
18		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
19		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
20		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
21		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
22		A01-L007-PFAS-01-20220623				6/23/22		1110		MF		SD		1														
23		A01-L007-PFAS-01-20220623				6/23/22		1110		MF																		

Sanborn, Head & Associates, Inc.

JD47400: Chain of Custody

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JD47400



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Page 2 of 3
 Please merge with SDG: **JD47400**

Client / Reporting Information Company Name: Sanborn Head & Associates Street Address: 20 Foundry St City: Concord State: NH Zip: 03301 Project Contact: Andrew Buchy (abuchy@sanbornhead.com) / Shana Whitney (shwhitney@sanbornhead.com) Phone #: 603-415-6159 Sample(s) Name(s): Michael Fuente Phone: 610-964-1717		Project Information Project Name: Evergreen Philadelphia Refinery Street: 3144 W. Passyunk Ave. City: Philadelphia State: PA Zip: 19145 Project #: 4796.01 Client Purchase Order #: Project Manager: Andrew Buchy Accounts Payable: ap@sanbornhead.com		Requested Analysis (see TEST CODE sheet) Matrix Codes: DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
Lab Sample # Field ID / Point of Collection MECHOI Vial #		Collection Date Time Sampled by Matrix # of bottles # of bottles		LAB USE ONLY	
13 AOT1-B002-PFAS-D-1-20220623 14 AOT1-B002-PFAS-D-1-20220623 15 AOT1-B002-PFAS-D-1-20220623 16 AOT1-B002-PFAS-D-1-20220623 17 AOT1-B002-PFAS-D-1-20220623 18 AOT1-B002-PFAS-D-1-20220623 19 AOT1-B002-PFAS-D-1-20220623 20 AOT1-B002-PFAS-D-1-20220623 21 AOT1-B002-PFAS-D-1-20220623 22 AOT1-B002-PFAS-D-1-20220623 23 AOT1-B002-PFAS-D-1-20220623 24 AOT1-B002-PFAS-D-1-20220623 25 AOT1-B002-PFAS-D-1-20220623 26 AOT1-B002-PFAS-D-1-20220623 27 AOT1-B002-PFAS-D-1-20220623		6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1 6/23/22 1300 MF 50 1		X X X X X X X X X X X X X X X	
Turnaround Time (Business days) ☒ Std. 10 Business Days ☐ 5 Day RUSH ☐ 3 Day RUSH ☐ 2 Day RUSH ☐ 1 Day RUSH ☐ other _____ Emergency & Rush T/A data available via LabLink		Approved by (SGS Project Manager) Date: _____ Commercial "A" (Level 1) Commercial "B" (Level 2) X FULL T1 (Level 3+4) NJ Reduced x EDO Format SHA EQuIS; Stantec EQuIS Commercial "C" NJ Date of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		Data Deliverable Information Comments / Special Instructions	
Sample Custody must be documented below each time samples change possession, including courier delivery.					
Requisitioned by Sampler: 1 Michael Fuente Date Time: 6/24/22 1300 Requisitioned by Sampler: 3 Date Time:		Received By: 1 Michael Fuente Date Time: 6-24 Received By: 3 Date Time:		Requisitioned By: 2 Michael Fuente Date Time: 6-24 Received By: 4 Date Time:	
Requisitioned by: 6 Date Time:		Received By: 6 Date Time:		Requisitioned By: 6 Date Time:	
Custody Seal #		Intact Not Intact		Preserved when Refrigerable	

Sanborn, Head & Associates, Inc.

JD47400: Chain of Custody

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SGS Sample Receipt Summary

Job Number: JD47400

Client: SANBORN HEAD & ASSOCIATES, INC.

Project: SANHPAFW:FORMER PHILADELPHIA RE

Date / Time Received: 6/24/2022 2:52:00 PM

Delivery Method: _____

Airbill #s: _____

Cooler Temps (Raw Measured) °C: Cooler 1: (3.1);

Cooler Temps (Corrected) °C: Cooler 1: (2.8);

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | ☒ | ☐ | 3. COC Present: | ☒ | ☐ |
| 2. Custody Seals Intact: | ☒ | ☐ | 4. Smpl Dates/Time OK | ☒ | ☐ |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | ☒ | ☐ |
| 2. Cooler temp verification: | IR Gun | |
| 3. Cooler media: | Ice (Bag) | |
| 4. No. Coolers: | 1 | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | ☐ | ☐ | ☒ |
| 2. Trip Blank listed on COC: | ☐ | ☐ | ☒ |
| 3. Samples preserved properly: | ☒ | ☐ | |
| 4. VOCs headspace free: | ☐ | ☐ | ☒ |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | ☒ | ☐ |
| 2. Container labeling complete: | ☒ | ☐ |
| 3. Sample container label / COC agree: | ☒ | ☐ |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | ☒ | ☐ |
| 2. All containers accounted for: | ☒ | ☐ |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N

N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | ☒ | ☐ | |
| 2. Bottles received for unspecified tests | ☐ | ☒ | |
| 3. Sufficient volume recvd for analysis: | ☒ | ☐ | |
| 4. Compositing instructions clear: | ☐ | ☐ | ☒ |
| 5. Filtering instructions clear: | ☐ | ☐ | ☒ |

Test Strip Lot #s:

pH 1-12: 231619

pH 12+: 203117A

Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JD47400: Chain of Custody

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Misc. Forms

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Custody Documents and Other Forms

(SGS Orlando, FL)

Includes the following where applicable:

- Chain of Custody



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www.sgs.com/ehsusa

Page 2 of 3

Client / Reporting Information		Project Information		Requested Analysis		Matrix Codes	
Company Name:		Project Name:					
Street Address:		SANHFAFW-Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA					
City State Zip		City State		Billing Information (if different from Report to)			
Project Contact E-mail		Project #		Company Name			
Phone #		Client Purchase Order #		Street Address			
Sample(s) Name(s)		Project Manager		City State Zip			
MF		Attention:					
Field ID / Point of Collection		MECH/ID Vial #		Collection		Number of preserved bottles	
13 AOI1_B010_PFAS_0-1_20220623		6/23/22		12:50:00 PM MF SO		X	
14 AOI1_B010_PFAS_0-1_20220623_DUP		6/23/22		12:50:00 PM MF SO		X	
15 AOI1_B009_PFAS_0-1_20220623		6/23/22		12:30:00 PM MF SO		X	
16 AOI3_B002_PFAS_0-1_20220623		6/23/22		2:40:00 PM MF SO		X	
17 AOI3_B003_PFAS_0-1_20220623		6/23/22		2:00:00 PM MF SO		X	
18 AOI3_B001_PFAS_0-1_20220623		6/23/22		1:20:00 PM MF SO		X	
19 AOI3_B005_PFAS_0-1_20220624		6/24/22		8:10:00 AM MF SO		X	
20 AOI3_B004_PFAS_0-1_20220624		6/24/22		8:35:00 AM MF SO		X	
21 AOI7_B003_PFAS_0-1_20220624		6/24/22		8:45:00 AM MF SO		X	
22 AOI7_B001_PFAS_0-1_20220624		6/24/22		9:20:00 AM MF SO		X	
23 AOI7_B006_PFAS_0-1_20220624		6/24/22		11:20:00 AM MF SO		X	
24 AOI7_B009_PFAS_0-1_20220624		6/24/22		8:50:00 AM MF SO		X	
Turnaround Time (Business days)		Data Deliverable Information		Comments / Special Instructions			
☐ Standard 10 Business Days ☐ 5 Business Days RUSH ☐ 3 Business Days RUSH ☐ 2 Business Days RUSH ☐ 1 Business Day EMERGENCY ☒ Other Due 7/8/2022		Approved By (SGS PM) / Date:		☐ Commercial "A" (Level 1) ☐ Commercial "B" (Level 2) ☐ FULLT1 (Level 3+4) ☐ NJ Reduced ☐ Commercial "C"		☐ NYASP Category A ☐ NYASP Category B ☐ State Forms ☐ EDD Format ☒ Other COMMB	
Emergency & Rush TAT data available via Lablink. Approval needed for RUSH/Emergency TAT		Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC Summary + Partial Raw data		http://www.sgs.com/en/forms-and-conditions			
Relinquished by:		Date / Time:		Received By:		Date / Time:	
1		1		2		2	
Relinquished by:		Date / Time:		Received By:		Date / Time:	
3		3		4		4	
Relinquished by:		Date / Time:		Received By:		Date / Time:	
5		5		5		5	
Custody Seal #		Isol		Preserved where applicable		Therm ID	
		Not intact		Along		On Ice	
						Cooler Temp. °C	

JS47400 JLS
Rev Date: 6/10/19

JD47400: Chain of Custody

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2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

SGS North America Inc. - Dayton

2235 Route 130, Dayton, NJ 08510

Tel: 732-329-0200 FAX: 732-329-3499/3480

www.sgs.com/usa

FED-EX Tracking #

SGS Order #

SGS Order Control #

SGS Job #

JD47400

Client / Reporting Information

Company Name:

Street Address

City State Zip

Project Contact E-mail

Phone #

Project Information

Project Name:

Street

Project #

Client Purchase Order #

Project Manager

Billing Information (if different from Report to)

Company Name

Street Address

City State Zip

Sample(s) Name(s)

MF

Field ID / Point of Collection

AO17_B008_PFAS_0_1_20220624

Collection

Date

Time

Sampled by

Matrix

of bottles

HCl

NO3H

NO3H

NO3H

NO3H

NO3H

NO3H

NO3H

NO3H

Number of preserved bottles

SGS Serial #

Field ID / Point of Collection

MECHQ3 Val #

Date

Time

Sampled by

Matrix

of bottles

HCl

NO3H

NO3H

NO3H

NO3H

NO3H

NO3H

NO3H

Turnaround Time (t business days)

Approved By (SGS PM) / Date:

Standard 10 Business Days

5 Business Days RUSH

3 Business Days RUSH

2 Business Days RUSH

1 Business Day EMERGENCY

Commercial "A" (Level 1)

Commercial "B" (Level 2)

FULLT1 (Level 3+4)

NJ Reduced

Commercial "C"

NYASP Category A

NYASP Category B

State Forms

EDD Format

Other: COMMB

Commercial "A" = Results Only

Commercial "B" = Results + QC Summary

Commercial "C" = Results + QC Summary + Partial Field data

Comments / Special Instructions

LAB USE ONLY

DW - Drinking Water

GW - Ground Water

WW - Water

SW - Surface Water

SO - Soil

SL - Sludge

SED - Sediment

OI - Oil

LIQ - Other Liquid

AIR - Air

SOL - Other Solid

WP - Wipe

FB - Field Blank

EB - Equipment Blank

RB - Rinsate Blank

TB - Trip Blank

Relinquished by:

Date / Time:

Received By:

Date / Time:

Relinquished by:

Date / Time:

Received By:

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Date / Time:

Received By:

Date / Time:

Relinquished by

jd47400.xls
Rev. Date: 4/10/18

JD47400: Chain of Custody

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SGS Sample Receipt Summary

Job Number: JD47400

Client: SGS NJ

Project: SANHPAFW

Date / Time Received: 6/29/2022 9:30:00 AM

Delivery Method: FEDEX

Airbill #s:

Therm ID: IR 1;

Therm CF: 0.4;

of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (1.8);

Cooler Temps (Corrected) °C: Cooler 1: (2.2);

Cooler Information

Y or N

1. Custody Seals Present ☒ ☐
2. Custody Seals Intact ☒ ☐
3. Temp criteria achieved ☒ ☐
4. Cooler temp verification IR Gun
5. Cooler media Ice (Bag)

Trip Blank Information

Y or N N/A

1. Trip Blank present / cooler ☐ ☐ ☒
 2. Trip Blank listed on COC ☐ ☐ ☒
- W or S N/A
3. Type Of TB Received ☐ ☐ ☒

Sample Information

Y or N N/A

1. Sample labels present on bottles ☒ ☐
2. Samples preserved properly ☒ ☐
3. Sufficient volume/containers recvd for analysis: ☒ ☐
4. Condition of sample Intact
5. Sample recvd within HT ☒ ☐
6. Dates/Times/IDs on COC match Sample Label ☒ ☐
7. VOCs have headspace ☐ ☐ ☒
8. Bottles received for unspecified tests ☐ ☒ ☐
9. Compositing instructions clear ☐ ☐ ☒
10. Voa Soil Kits/Jars received past 48hrs? ☐ ☐ ☒
11. % Solids Jar received? ☐ ☐ ☒
12. Residual Chlorine Present? ☐ ☐ ☒

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____

Number of 5035 Field Kits: _____

Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315

pH 10-12 219813A

Other: (Specify) _____

Residual Chlorine Test Strip Lot #: _____

Comments JAR RECEIVED FOR -20 HAS SAMPLE ID ON BOTTLE LABEL THAT DOES NOT MATCH ID ON COC. SAMPLE ID ON JAR FOR -20 IS "AO13_B005_PFAS_0-1_20220624" BUT ID ON COC IS "AO13_B004_PFAS_0-1_20220624". TIME ON JAR IS "0835" AND DATE IS "06/24/22", WHICH MATCHES WHAT IS LISTED ON COC FOR -20. NO DISCREPANCIES WERE NOTED WITH JAR THAT WAS RECEIVED FOR -19, ID: "AO13_B005_PFAS_0-1_20220624".

Technician: SAMUELM

Date: 6/29/2022 9:30:00 AM

Reviewer: _____

Date: _____

SM001
Rev. Date 05/24/17

JD47400: Chain of Custody

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CSR: Muna Mohammed

Response Date: 6/29/22

Response: Per NJ PM please use the sample ID listed on the chain for sample -20.

5.1
5

SM001
Rev. Date 05/24/17



CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

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Client / Reporting Information		Project Information		Requested Analysis										Matrix Codes							
Company Name:		Project Name:		Matrix Codes										LAB USE ONLY							
Street Address		Street																			
City State Zip		City State																			
Project Contact E-mail		Project #																			
Phone #		Street Address																			
Project Contact E-mail: viktoriya.pushkova@sgs.com		Project #																			
Phone #		Client Purchase Order #																			
Sampler(s) Name(s)		Phone		Project Manager																	
MF																					
SGS Sample #		Field ID / Point of Collection		MECHDI Val #		Collection		Sampled by		Matrix		# of bottles		Number of preserved bottles							
						Date Time															
1		AOH1_B013_PFAS_0-1_20220622				6/22/22 2:10:00 PM		MF		SO						X					
2		AOH1_B012_PFAS_0-1_20220622				6/22/22 2:45:00 PM		MF		SO						X					
3		AOH1_B014_PFAS_0-1_20220623				6/23/22 8:05:00 AM		MF		SO						X					
4		AOH1_B001_PFAS_0-1_20220623				6/23/22 11:20:00 AM		MF		SO						X					
5		AOH1_B002_PFAS_0-1_20220623				6/23/22 8:35:00 AM		MF		SO						X					
6		AOH1_B003_PFAS_0-1_20220623				6/23/22 8:25:00 AM		MF		SO						X					
7		AOH1_B005_PFAS_0-1_20220623				6/23/22 12:00:00 PM		MF		SO						X					
8		AOH1_B007_PFAS_0-1_20220623				6/23/22 11:40:00 AM		MF		SO						X					
9		AOH1_B004_PFAS_0-1_20220623				6/23/22 8:55:00 AM		MF		SO						X					
10		AOH1_B006_PFAS_0-1_20220623				6/23/22 10:55:00 AM		MF		SO						X					
11		AOH1_B008_PFAS_0-1_20220623				6/23/22 9:40:00 AM		MF		SO						X					
12		AOH1_B011_PFAS_0-1_20220623				6/23/22 9:15:00 AM		MF		SO						X					
Turnaround Time (Business days)		Approved By (SGS PM): / Date:		Date Deliverable Information		Comments / Special Instructions															
☐ Standard 10 Business Days		☐ Commercial "A" (Level 1)		☐ NYASP Category A																	
☐ 5 Business Days RUSH		☐ Commercial "B" (Level 2)		☐ NYASP Category B																	
☐ 3 Business Days RUSH		☐ FULLT1 (Level 3+4)		☐ State Forms																	
☐ 2 Business Days RUSH		☐ NJ Reduced		☐ EDD Format																	
☐ 1 Business Day EMERGENCY		☐ Commercial "C"		☒ Other COMMB																	
☒ Other Due 7/8/2022																					
Emergency & Rush TAT data available via Lablink		Approval needed for RUSH/Emergency TAT		Commercial "A" = Results + QC Summary Commercial "C" = Results + QC Summary + Partial Raw data		http://www.sgs.com/en/terms-and-conditions															
Relinquished by:		Date / Time:		Received By:		Relinquished By:		Date / Time:		Received By:											
1				1		2				2											
3				3		4				4											
5				5		Custody Seal #		☐ Intact ☐ Not Intact		Preserved where applicable ☐ Absent		Therm: ID		On Ice ☐		Cooler Temp. °C					

js47400.46
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JD47400: Chain of Custody

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CHAIN OF CUSTODY

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Client / Reporting Information		Project Information		Requested Analysis												Matrix Codes							
Company Name:		Project Name:														DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment DI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank							
Street Address		Street																					
City State Zip		City State																					
Project Contact E-mail		Project #																					
Phone #		Street Address																					
Sample(s) Name(s)		Client Purchase Order #		City State Zip																			
Phone		Project Manager		Attention:																			
MF																							
SGS Sample #		Field ID / Point of Collection		MECHDI Val #		Collection		Sampled by		Matrix		# of bottles		Number of preserved bottles		LAB USE ONLY							
						Date Time																	
13		AOI1_B010_PFAS_0-1_20220623				6/23/22 12:50:00 PM		MF		SO						X							
14		AOI1_B010_PFAS_0-1_20220623_DUP				6/23/22 12:50:00 PM		MF		SO						X							
15		AOI1_B009_PFAS_0-1_20220623				6/23/22 12:30:00 PM		MF		SO						X							
16		AOI3_B002_PFAS_0-1_20220623				6/23/22 2:40:00 PM		MF		SO						X							
17		AOI3_B003_PFAS_0-1_20220623				6/23/22 2:00:00 PM		MF		SO						X							
18		AOI3_B001_PFAS_0-1_20220623				6/23/22 1:20:00 PM		MF		SO						X							
19		AOI3_B005_PFAS_0-1_20220624				6/24/22 8:10:00 AM		MF		SO						X							
20		AOI3_B004_PFAS_0-1_20220624				6/24/22 8:35:00 AM		MF		SO						X							
21		AOI7_B003_PFAS_0-1_20220624				6/24/22 8:45:00 AM		MF		SO						X							
22		AOI7_B001_PFAS_0-1_20220624				6/24/22 9:20:00 AM		MF		SO						X							
23		AOI7_B006_PFAS_0-1_20220624				6/24/22 11:20:00 AM		MF		SO						X							
24		AOI7_B009_PFAS_0-1_20220624				6/24/22 9:50:00 AM		MF		SO						X							
Turnaround Time (Business days)		Approved By (SGS PM): / Date:		Date Deliverable Information		Comments / Special Instructions																	
☐ Standard 10 Business Days ☐ 5 Business Days RUSH ☐ 3 Business Days RUSH ☐ 1 Business Day EMERGENCY ☒ Other Due 7/8/2022		☐ Commercial "A" (Level 1) ☐ Commercial "B" (Level 2) ☐ FULLT1 (Level 3+4) ☐ NJ Reduced ☐ Commercial "C"		☐ NYASP Category A ☐ NYASP Category B ☐ State Forms ☐ EDD Format ☒ Other COMMB																			
Emergency & Rush T/A data available via Lablink		Approval needed for RUSH/Emergency TAT		Commercial "A" = Results + QC Summary Commercial "C" = Results + QC Summary + Partial Raw data http://www.sgs.com/en/terms-and-conditions																			
Relinquished by:		Date / Time:		Received By:		Relinquished By:		Date / Time:		Received By:													
1				1		2				2													
3				3		4				4													
5				5		Custody Seal #		☐ Intact ☐ Not Intact		Preserved where applicable ☐ Absent		Therm: ID		On Ice ☐		Cooler Temp. °C							

j547400.06
Rev. Date: 4/10/18

JD47400: Chain of Custody

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JD47400: Chain of Custody

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MS Semi-volatiles

QC Data Summaries

(SGS Orlando, FL)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Isotope Dilution Standard Recovery Summaries

Method Blank Summary

Page 1 of 1

Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92019-MB	2Q95032.D	1	07/16/22	JB	07/11/22	OP92019	S2Q1327

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-31, JD47400-32

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	97%	35-135%
	13C5-PFPeA	100%	50-150%
	13C5-PFHxA	99%	50-150%
	13C4-PFHpA	100%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	97%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	90%	40-140%
	13C2-PFDoDA	81%	40-140%
	13C2-PFTeDA	71%	30-130%
	13C3-PFBS	97%	50-150%
	13C3-PFHxS	99%	50-150%
	13C8-PFOS	97%	50-150%
	13C8-FOSA	84%	30-130%
	d3-MeFOSAA	94%	40-140%
	d5-EtFOSAA	92%	40-140%
	13C2-4:2FTS	94%	50-150%
	13C2-6:2FTS	95%	50-150%
	13C2-8:2FTS	93%	50-150%
	13C3-HFPO-DA	78%	50-150%

Method Blank Summary

Job Number: JD47400
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92044-MB	5Q1864.D	1	07/16/22	NG	07/12/22	OP92044	S5Q31

The QC reported here applies to the following samples: Method: EPA 537M BY ID

JD47400-1, JD47400-2, JD47400-3, JD47400-4, JD47400-5, JD47400-6, JD47400-7, JD47400-8, JD47400-9, JD47400-10, JD47400-11, JD47400-12, JD47400-13, JD47400-14, JD47400-15, JD47400-16, JD47400-17, JD47400-18, JD47400-19, JD47400-20

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFHpA	96% 50-150%
	13C8-PFOA	98% 50-150%
	13C9-PFNA	97% 50-150%
	13C3-PFBS	96% 50-150%
	13C3-PFHxS	95% 50-150%
	13C8-PFOS	94% 50-150%

Method Blank Summary

Page 1 of 1

Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92045-MB	2Q95430.D	1	07/22/22	JB	07/12/22	OP92045	S2Q1333

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-21, JD47400-22, JD47400-23, JD47400-24, JD47400-25, JD47400-26, JD47400-27, JD47400-28, JD47400-29, JD47400-30

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	109%	40-140%
	13C5-PFPeA	112%	50-150%
	13C5-PFHxA	113%	50-150%
	13C4-PFHpA	115%	50-150%
	13C8-PFOA	116%	50-150%
	13C9-PFNA	114%	50-150%
	13C6-PFDA	121%	50-150%
	13C7-PFUnDA	125%	40-140%
	13C2-PFDoDA	128%	40-140%
	13C2-PFTeDA	116%	30-130%
	13C3-PFBS	110%	50-150%
	13C3-PFHxS	115%	50-150%
	13C8-PFOS	113%	50-150%
	13C8-FOSA	110%	30-130%
	d3-MeFOSAA	129%	40-140%
	d5-EtFOSAA	127%	40-140%
	13C2-4:2FTS	109%	50-150%
	13C2-6:2FTS	114%	50-150%
	13C2-8:2FTS	115%	50-150%
	13C3-HFPO-DA	85%	50-150%

Instrument Blank

Page 1 of 1

Job Number: JD47400**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q31-IBLK	5Q1829.D	1	07/15/22	NG	n/a	n/a	S5Q31

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47400-1, JD47400-2, JD47400-3, JD47400-4, JD47400-5, JD47400-6, JD47400-7, JD47400-8, JD47400-9, JD47400-10, JD47400-11, JD47400-12, JD47400-13, JD47400-14, JD47400-15, JD47400-17, JD47400-18, JD47400-19, JD47400-20

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	103% 50-150%
	13C5-PFPeA	103% 50-150%
	13C5-PFHxA	103% 50-150%
	13C4-PFHpA	103% 50-150%
	13C8-PFOA	105% 50-150%
	13C9-PFNA	104% 50-150%
	13C6-PFDA	106% 50-150%
	13C7-PFUnDA	103% 50-150%
	13C2-PFDoDA	102% 50-150%
	13C2-PFTeDA	98% 50-150%
	13C3-PFBS	105% 50-150%
	13C3-PFHxS	103% 50-150%
	13C8-PFOS	103% 50-150%
	13C8-FOSA	106% 50-150%
	d3-MeFOSA	108% 50-150%
	d3-MeFOSAA	101% 50-150%
	d5-EtFOSAA	101% 50-150%
	13C2-4:2FTS	97% 50-150%
	13C2-6:2FTS	98% 50-150%
	13C2-8:2FTS	98% 50-150%
	13C3-HFPO-DA	100% 50-150%

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Job Number: JD47400**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q1327-IBLK	2Q95027.D	1	07/16/22	JB	n/a	n/a	S2Q1327

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47400-31, JD47400-32

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C5-PFHxA	91% 50-150%
	13C4-PFHpA	93% 50-150%
	13C8-PFOA	93% 50-150%
	13C9-PFNA	93% 50-150%
	13C6-PFDA	93% 50-150%
	13C7-PFUnDA	95% 50-150%
	13C2-PFDoDA	97% 50-150%
	13C2-PFTeDA	93% 50-150%
	13C3-PFBS	90% 50-150%
	13C3-PFHxS	91% 50-150%
	13C8-PFOS	92% 50-150%
	d3-MeFOSAA	97% 50-150%
	d5-EtFOSAA	100% 50-150%

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Job Number: JD47400**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q31-IBLK	5Q1894.D	1	07/16/22	NG	n/a	n/a	S5Q31

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47400-1, JD47400-2, JD47400-3, JD47400-4, JD47400-5, JD47400-6, JD47400-7, JD47400-8, JD47400-9, JD47400-10, JD47400-11, JD47400-12, JD47400-13, JD47400-14, JD47400-15, JD47400-17, JD47400-18, JD47400-19, JD47400-20

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	98% 50-150%
	13C5-PFPeA	96% 50-150%
	13C5-PFHxA	97% 50-150%
	13C4-PFHpA	97% 50-150%
	13C8-PFOA	99% 50-150%
	13C9-PFNA	97% 50-150%
	13C6-PFDA	98% 50-150%
	13C7-PFUnDA	98% 50-150%
	13C2-PFDoDA	96% 50-150%
	13C2-PFTeDA	93% 50-150%
	13C3-PFBS	96% 50-150%
	13C3-PFHxS	95% 50-150%
	13C8-PFOS	94% 50-150%
	13C8-FOSA	106% 50-150%
	d3-MeFOSA	106% 50-150%
	d3-MeFOSAA	117% 50-150%
	d5-EtFOSAA	113% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	92% 50-150%
	13C2-8:2FTS	93% 50-150%
	13C3-HFPO-DA	96% 50-150%

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Job Number: JD47400**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q32-IBLK	5Q1934.D	1	07/18/22	NG	n/a	n/a	S5Q32

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47400-16

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	94% 50-150%
	13C5-PFPeA	92% 50-150%
	13C5-PFHxA	93% 50-150%
	13C4-PFHpA	92% 50-150%
	13C8-PFOA	93% 50-150%
	13C9-PFNA	92% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	93% 50-150%
	13C2-PFDoDA	92% 50-150%
	13C2-PFTeDA	92% 50-150%
	13C3-PFBS	91% 50-150%
	13C3-PFHxS	92% 50-150%
	13C8-PFOS	89% 50-150%
	13C8-FOSA	97% 50-150%
	d3-MeFOSA	100% 50-150%
	d3-MeFOSAA	101% 50-150%
	d5-EtFOSAA	99% 50-150%
	13C2-4:2FTS	88% 50-150%
	13C2-6:2FTS	88% 50-150%
	13C2-8:2FTS	88% 50-150%
	13C3-HFPO-DA	88% 50-150%

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Job Number: JD47400**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q32-IBLK	5Q2032.D	1	07/19/22	NG	n/a	n/a	S5Q32

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47400-16

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	90% 50-150%
	13C5-PFPeA	89% 50-150%
	13C5-PFHxA	89% 50-150%
	13C4-PFHpA	90% 50-150%
	13C8-PFOA	91% 50-150%
	13C9-PFNA	91% 50-150%
	13C6-PFDA	91% 50-150%
	13C7-PFUnDA	90% 50-150%
	13C2-PFDoDA	87% 50-150%
	13C2-PFTeDA	87% 50-150%
	13C3-PFBS	89% 50-150%
	13C3-PFHxS	88% 50-150%
	13C8-PFOS	88% 50-150%
	13C8-FOSA	96% 50-150%
	d3-MeFOSA	99% 50-150%
	d3-MeFOSAA	97% 50-150%
	d5-EtFOSAA	93% 50-150%
	13C2-4:2FTS	85% 50-150%
	13C2-6:2FTS	86% 50-150%
	13C2-8:2FTS	87% 50-150%
	13C3-HFPO-DA	85% 50-150%

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Job Number: JD47400**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q1333-IBLK	2Q95375.D	1	07/21/22	JB	n/a	n/a	S2Q1333

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47400-21, JD47400-22, JD47400-23, JD47400-24, JD47400-25, JD47400-26, JD47400-27, JD47400-28, JD47400-29, JD47400-30

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	93% 50-150%
	13C5-PFPeA	96% 50-150%
	13C5-PFHxA	96% 50-150%
	13C4-PFHpA	98% 50-150%
	13C8-PFOA	100% 50-150%
	13C9-PFNA	98% 50-150%
	13C6-PFDA	101% 50-150%
	13C7-PFUnDA	104% 50-150%
	13C2-PFDoDA	108% 50-150%
	13C2-PFTeDA	97% 50-150%
	13C3-PFBS	96% 50-150%
	13C3-PFHxS	100% 50-150%
	13C8-PFOS	99% 50-150%
	13C8-FOSA	96% 50-150%
	d3-MeFOSA	103% 50-150%
	d3-MeFOSAA	103% 50-150%
	d5-EtFOSAA	101% 50-150%
	13C2-4:2FTS	91% 50-150%
	13C2-6:2FTS	95% 50-150%
	13C2-8:2FTS	100% 50-150%
	13C3-HFPO-DA	90% 50-150%

Blank Spike Summary

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Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92019-BS	2Q95031.D	1	07/16/22	JB	07/11/22	OP92019	S2Q1327

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-31, JD47400-32

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	0.08	0.0791	99	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0794	99	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0763	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0792	99	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0777	97	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0828	104	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	95%	35-135%
	13C5-PFPeA	97%	50-150%
	13C5-PFHxA	96%	50-150%
	13C4-PFHpA	98%	50-150%
	13C8-PFOA	96%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	91%	50-150%
	13C7-PFUnDA	89%	40-140%
	13C2-PFDoDA	84%	40-140%
	13C2-PFTeDA	71%	30-130%
	13C3-PFBS	95%	50-150%
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	93%	50-150%
	13C8-FOSA	79%	30-130%
	d3-MeFOSAA	90%	40-140%
	d5-EtFOSAA	88%	40-140%
	13C2-4:2FTS	97%	50-150%
	13C2-6:2FTS	96%	50-150%
	13C2-8:2FTS	94%	50-150%
	13C3-HFPO-DA	74%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92044-BS	5Q1863.D	1	07/16/22	NG	07/12/22	OP92044	S5Q31

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-1, JD47400-2, JD47400-3, JD47400-4, JD47400-5, JD47400-6, JD47400-7, JD47400-8, JD47400-9, JD47400-10, JD47400-11, JD47400-12, JD47400-13, JD47400-14, JD47400-15, JD47400-16, JD47400-17, JD47400-18, JD47400-19, JD47400-20

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	10	100	70-130
335-67-1	Perfluorooctanoic acid	10	10.1	101	70-130
375-95-1	Perfluorononanoic acid	10	9.8	98	70-130
375-73-5	Perfluorobutanesulfonic acid	10	10.3	103	70-130
355-46-4	Perfluorohexanesulfonic acid	10	10.0	100	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	10.4	104	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFHpA	105%	50-150%
	13C8-PFOA	105%	50-150%
	13C9-PFNA	104%	50-150%
	13C3-PFBS	104%	50-150%
	13C3-PFHxS	105%	50-150%
	13C8-PFOS	102%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92045-BS	2Q95429.D	1	07/22/22	JB	07/12/22	OP92045	S2Q1333

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-21, JD47400-22, JD47400-23, JD47400-24, JD47400-25, JD47400-26, JD47400-27, JD47400-28, JD47400-29, JD47400-30

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	9.4	94	70-130
335-67-1	Perfluorooctanoic acid	10	9.4	94	70-130
375-95-1	Perfluorononanoic acid	10	9.2	92	70-130
375-73-5	Perfluorobutanesulfonic acid	10	9.3	93	70-130
355-46-4	Perfluorohexanesulfonic acid	10	9.3	93	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	9.6	96	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	113%	40-140%
	13C5-PFPeA	115%	50-150%
	13C5-PFHxA	116%	50-150%
	13C4-PFHpA	118%	50-150%
	13C8-PFOA	120%	50-150%
	13C9-PFNA	118%	50-150%
	13C6-PFDA	125%	50-150%
	13C7-PFUnDA	127%	40-140%
	13C2-PFDoDA	130%	40-140%
	13C2-PFTeDA	120%	30-130%
	13C3-PFBS	115%	50-150%
	13C3-PFHxS	117%	50-150%
	13C8-PFOS	118%	50-150%
	13C8-FOSA	112%	30-130%
	d3-MeFOSAA	130%	40-140%
	d5-EtFOSAA	127%	40-140%
	13C2-4:2FTS	117%	50-150%
	13C2-6:2FTS	121%	50-150%
	13C2-8:2FTS	126%	50-150%
	13C3-HFPO-DA	89%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92019-MS	2Q95039.D	1	07/16/22	JB	07/11/22	OP92019	S2Q1327
FA96824-1	2Q95038.D	1	07/16/22	JB	07/11/22	OP92019	S2Q1327

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-31, JD47400-32

CAS No.	Compound	FA96824-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
375-85-9	Perfluoroheptanoic acid	0.0050		0.16	0.152	92	70-130
335-67-1	Perfluorooctanoic acid	0.0099		0.16	0.157	92	70-130
375-95-1	Perfluorononanoic acid	0.0040 U		0.16	0.145	91	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0054		0.16	0.150	90	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0121		0.16	0.159	92	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0344		0.16	0.191	98	70-130

CAS No.	ID Standard Recoveries	MS	FA96824-1	Limits
	13C4-PFBA	85%		35-135%
	13C5-PFPeA	80%		50-150%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	92%	76%	50-150%
	13C8-PFOA	97%	80%	50-150%
	13C9-PFNA	99%	75%	50-150%
	13C6-PFDA	87%		50-150%
	13C7-PFUnDA	72%		40-140%
	13C2-PFDoDA	61%		40-140%
	13C2-PFTeDA	36%		30-130%
	13C3-PFBS	80%	66%	50-150%
	13C3-PFHxS	90%	75%	50-150%
	13C8-PFOS	83%	64%	50-150%
	13C8-FOSA	75%		30-130%
	d3-MeFOSAA	81%		40-140%
	d5-EtFOSAA	78%		40-140%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	106%		50-150%
	13C2-8:2FTS	92%		50-150%
	13C3-HFPO-DA	61%		50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92044-MS	5Q1889.D	1	07/16/22	NG	07/12/22	OP92044	S5Q31
OP92044-MSD	5Q1890.D	1	07/16/22	NG	07/12/22	OP92044	S5Q31
JD47400-20	5Q1888.D	1	07/16/22	NG	07/12/22	OP92044	S5Q31

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-1, JD47400-2, JD47400-3, JD47400-4, JD47400-5, JD47400-6, JD47400-7, JD47400-8, JD47400-9, JD47400-10, JD47400-11, JD47400-12, JD47400-13, JD47400-14, JD47400-15, JD47400-16, JD47400-17, JD47400-18, JD47400-19, JD47400-20

CAS No.	Compound	JD47400-20		Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q								
375-85-9	Perfluoroheptanoic acid	ND		12.8	12.4	97	13.1	13.2	101	6	70-130/30
335-67-1	Perfluorooctanoic acid	ND		12.8	12.4	97	13.1	13.1	100	5	70-130/30
375-95-1	Perfluorononanoic acid	ND		12.8	12.0	94	13.1	12.8	98	6	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		12.8	12.8	100	13.1	13.6	104	6	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		12.8	12.5	98	13.1	13.1	100	5	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	2.6		12.8	14.6	94	13.1	16.0	102	9	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	JD47400-20	Limits
	13C4-PFHpA	102%	99%	94%	50-150%
	13C8-PFOA	104%	100%	95%	50-150%
	13C9-PFNA	95%	90%	84%	50-150%
	13C3-PFBS	101%	97%	93%	50-150%
	13C3-PFHxS	101%	98%	92%	50-150%
	13C8-PFOS	99%	95%	90%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92045-MS	2Q95432.D	1	07/22/22	JB	07/12/22	OP92045	S2Q1333
OP92045-MSD	2Q95433.D	1	07/22/22	JB	07/12/22	OP92045	S2Q1333
JD47400-21	2Q95431.D	1	07/22/22	JB	07/12/22	OP92045	S2Q1333

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-21, JD47400-22, JD47400-23, JD47400-24, JD47400-25, JD47400-26, JD47400-27, JD47400-28, JD47400-29, JD47400-30

CAS No.	Compound	JD47400-21 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
375-85-9	Perfluoroheptanoic acid	ND	11.3	11.2	99	11.4	10.5	92	6	70-130/30
335-67-1	Perfluorooctanoic acid	ND	11.3	11.1	99	11.4	10.6	93	5	70-130/30
375-95-1	Perfluorononanoic acid	ND	11.3	10.7	95	11.4	10.1	89	6	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND	11.3	10.9	97	11.4	10.2	90	7	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND	11.3	10.7	95	11.4	10.1	89	6	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND	11.3	11.8	105	11.4	11.4	100	3	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	JD47400-21	Limits
13C4-PFBA	111%	99%			40-140%
13C5-PFPeA	113%	101%			50-150%
13C5-PFHxA	113%	101%			50-150%
13C4-PFHpA	115%	103%	106%		50-150%
13C8-PFOA	116%	103%	109%		50-150%
13C9-PFNA	114%	101%	105%		50-150%
13C6-PFDA	117%	103%			50-150%
13C7-PFUnDA	117%	102%			40-140%
13C2-PFDoDA	115%	100%			40-140%
13C2-PFTeDA	119%	102%			30-130%
13C3-PFBS	114%	101%	103%		50-150%
13C3-PFHxS	117%	105%	107%		50-150%
13C8-PFOS	111%	98%	106%		50-150%
13C8-FOSA	88%	83%			30-130%
d3-MeFOSAA	135%	123%			40-140%
d5-EtFOSAA	137%	124%			40-140%
13C2-4:2FTS	114%	101%			50-150%
13C2-6:2FTS	118%	107%			50-150%
13C2-8:2FTS	132%	120%			50-150%
13C3-HFPO-DA	86%	76%			50-150%

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 1

Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92019-DUP	2Q95043.D	1	07/16/22	JB	07/11/22	OP92019	S2Q1327
FA96824-2	2Q95040.D	1	07/16/22	JB	07/11/22	OP92019	S2Q1327

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47400-31, JD47400-32

CAS No.	Compound	FA96824-2 ug/l	DUP Q ug/l	Q	RPD	Limits
375-85-9	Perfluoroheptanoic acid	0.0040 U	ND		nc	30
335-67-1	Perfluorooctanoic acid	0.0040 U	ND		nc	30
375-95-1	Perfluorononanoic acid	0.0040 U	ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0040 U	ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0040 U	ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0040 U	ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA96824-2	Limits
	13C4-PFBA	94%		35-135%
	13C5-PFPeA	90%		50-150%
	13C5-PFHxA	92%		50-150%
	13C4-PFHpA	102%	83%	50-150%
	13C8-PFOA	111%	89%	50-150%
	13C9-PFNA	110%	90%	50-150%
	13C6-PFDA	102%		50-150%
	13C7-PFUnDA	97%		40-140%
	13C2-PFDoDA	91%		40-140%
	13C2-PFTeDA	37%		30-130%
	13C3-PFBS	89%	71%	50-150%
	13C3-PFHxS	102%	83%	50-150%
	13C8-PFOS	99%	82%	50-150%
	13C8-FOSA	87%		30-130%
	d3-MeFOSAA	109%		40-140%
	d5-EtFOSAA	109%		40-140%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	113%		50-150%
	13C2-8:2FTS	104%		50-150%
	13C3-HFPO-DA	70%		50-150%

* = Outside of Control Limits.

Isotope Dilution Standard Recovery Summary

Job Number: JD47400
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47400-31	2Q95050.D	94	93	85	94	94	65
JD47400-32	2Q95051.D	83	83	76	82	81	71
OP92019-BS	2Q95031.D	98	96	94	95	95	93
OP92019-DUP	2Q95043.D	102	111	110	89	102	99
OP92019-MB	2Q95032.D	100	101	97	97	99	97
OP92019-MS	2Q95039.D	92	97	99	80	90	83

Isotope Dilution Standards	Recovery Limits
S1 = 13C4-PFHpA	50-150%
S2 = 13C8-PFOA	50-150%
S3 = 13C9-PFNA	50-150%
S4 = 13C3-PFBS	50-150%
S5 = 13C3-PFHxS	50-150%
S6 = 13C8-PFOS	50-150%

Isotope Dilution Standard Recovery Summary

Page 1 of 2

Job Number: JD47400

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47400-1	5Q1865.D	94	96	93	94	93	91
JD47400-2	5Q1866.D	92	93	91	90	91	89
JD47400-3	5Q1867.D	99	99	100	95	97	95
JD47400-4	5Q1868.D	86	88	87	85	86	83
JD47400-5	5Q1871.D	92	93	92	90	91	88
JD47400-6	5Q1872.D	94	96	95	94	95	91
JD47400-7	5Q1873.D	84	85	82	82	82	76
JD47400-8	5Q1874.D	82	84	83	82	82	79
JD47400-9	5Q1875.D	91	94	92	91	91	87
JD47400-10	5Q1876.D	95	97	96	94	94	91
JD47400-11	5Q1877.D	102	105	104	101	102	99
JD47400-12	5Q1878.D	87	89	89	86	86	83
JD47400-13	5Q1879.D	86	89	88	89	89	86
JD47400-14	5Q1880.D	79	81	82	85	85	82
JD47400-15	5Q1883.D	99	100	99	98	98	94
JD47400-16	5Q1943.D	78	78	77	77	77	74
JD47400-17	5Q1885.D	93	96	97	97	97	95
JD47400-18	5Q1886.D	98	100	98	96	95	94
JD47400-19	5Q1887.D	89	91	90	89	89	88
JD47400-20	5Q1888.D	94	95	84	93	92	90
JD47400-21	2Q95431.D	106	109	105	103	107	106
JD47400-22	2Q95434.D	105	108	105	101	104	101
JD47400-23	2Q95435.D	108	112	107	103	108	105
JD47400-24	2Q95436.D	94	95	92	90	93	90
JD47400-25	2Q95437.D	91	78	59	100	94	73
JD47400-26	2Q95438.D	95	98	94	93	97	94
JD47400-27	2Q95441.D	114	118	115	111	116	111
JD47400-28	2Q95442.D	107	106	93	108	109	95
JD47400-29	2Q95443.D	96	98	96	92	97	94
JD47400-30	2Q95444.D	109	109	102	103	108	101
OP92044-BS	5Q1863.D	105	105	104	104	105	102
OP92044-MB	5Q1864.D	96	98	97	96	95	94
OP92044-MS	5Q1889.D	102	104	95	101	101	99
OP92044-MSD	5Q1890.D	99	100	90	97	98	95
OP92045-BS	2Q95429.D	118	120	118	115	117	118
OP92045-MB	2Q95430.D	115	116	114	110	115	113
OP92045-MS	2Q95432.D	115	116	114	114	117	111
OP92045-MSD	2Q95433.D	103	103	101	101	105	98

6.6.2

6

Isotope Dilution Standard Recovery Summary

Job Number: JD47400
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID	Matrix: SO
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Samples and QC shown here apply to the above method

Isotope Dilution Standards Recovery Limits

Isotope Dilution Standards Recovery Limits

S1 = 13C4-PFHpA	50-150%
S2 = 13C8-PFOA	50-150%
S3 = 13C9-PFNA	50-150%
S4 = 13C3-PFBS	50-150%
S5 = 13C3-PFHxS	50-150%
S6 = 13C8-PFOS	50-150%

6.6.2
6

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Sunoco/Evergreen

SANHPAFW: Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA 19104
4796.01

SGS Job Number: JD47653

Sampling Dates: 06/27/22 - 06/30/22



Report to:

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ATTN: Andrew Buchy

Total number of pages in report: **118**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

David Chastain
General Manager

Client Service contact: Victoria Pushkova 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA(68-00408), RI, SC, TX, UT, VA, WV

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Test results relate only to samples analyzed.



August 9, 2022

**Mr. Andrew Buchy
Sanborn Head & Associates, Inc.
1015 Virginia Drive Suite 100
Fort Washington, PA 19034**

RE: SGS – Dayton, Job # JD47653 - Reissues

Dear Mr. Buchy,

The final report for SGS job numbers JD47653 has been edited to reflect corrections to the results. These edits have been incorporated into the revised report which is attached.

Specifically, samples ID have been revised meet the client's requirement. The attached revised report incorporates these revisions.

SGS apologizes for this occurrence and for any inconvenience this situation may have caused. Please contact me if I can be of further assistance in this matter.

Sincerely,

Report Department

SGS North America Inc.

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Sample Summary

Sunoco/Evergreen

Job No: JD47653

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
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This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

JD47653-1	06/27/22	08:35 MF	06/30/22	SO	Soil	AOI6_B005_PFAS_0-1_20220627
JD47653-2	06/27/22	11:15 MF	06/30/22	SO	Soil	AOI6_B001_PFAS_0-1_20220627
JD47653-3	06/27/22	10:45 MF	06/30/22	SO	Soil	AOI6_B006_PFAS_0-1_20220627
JD47653-4	06/27/22	10:10 MF	06/30/22	SO	Soil	AOI6_B004_PFAS_0-1_20220627
JD47653-5	06/27/22	09:45 MF	06/30/22	SO	Soil	AOI6_B010_PFAS_0-1_20220627
JD47653-6	06/27/22	11:30 MF	06/30/22	SO	Soil	AOI6_B009_PFAS_0-1_20220627
JD47653-7	06/27/22	09:25 MF	06/30/22	SO	Soil	AOI6_B018_PFAS_0-1_20220627
JD47653-8	06/27/22	09:00 MF	06/30/22	SO	Soil	AOI6_B011_PFAS_0-1_20220627
JD47653-9	06/27/22	11:55 MF	06/30/22	SO	Soil	AOI6_B020_PFAS_0-1_20220627
JD47653-10	06/27/22	12:10 MF	06/30/22	SO	Soil	AOI6_B026_PFAS_0-1_20220627
JD47653-11	06/27/22	12:40 MF	06/30/22	SO	Soil	AOI6_B016_PFAS_0-1_20220627
JD47653-12	06/27/22	13:35 MF	06/30/22	SO	Soil	AOI6_B007_PFAS_0-1_20220627

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary
(continued)

Sunoco/Evergreen

Job No: JD47653

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47653-13	06/27/22	13:15 MF	06/30/22	SO	Soil	AOI6_B013_PFAS_0-1_20220627
JD47653-14	06/27/22	14:15 MF	06/30/22	SO	Soil	AOI1_B015_PFAS_0-1_20220627
JD47653-15	06/27/22	14:30 MF	06/30/22	SO	Soil	AOI1_B016_PFAS_0-1_20220627
JD47653-16	06/28/22	14:20 MF	06/30/22	SO	Soil	AOI6_B032_PFAS_0-1_20220628
JD47653-17	06/28/22	08:50 MF	06/30/22	SO	Soil	AOI6_B017_PFAS_0-1_20220628
JD47653-18	06/28/22	10:30 MF	06/30/22	SO	Soil	AOI6_B015_PFAS_0-1_20220628
JD47653-19	06/28/22	08:30 MF	06/30/22	SO	Soil	AOI6_B008_PFAS_0-1_20220628
JD47653-20	06/28/22	13:10 MF	06/30/22	SO	Soil	AOI6_B012_PFAS_0-1_20220628
JD47653-21	06/28/22	12:40 MF	06/30/22	SO	Soil	AOI6_B014_PFAS_0-1_20220628
JD47653-22	06/28/22	12:20 MF	06/30/22	SO	Soil	AOI6_B019_PFAS_0-1_20220628
JD47653-23	06/28/22	10:00 MF	06/30/22	SO	Soil	AOI6_B022_PFAS_0-1_20220628
JD47653-24	06/28/22	10:15 MF	06/30/22	SO	Soil	AOI6_B023_PFAS_0-1_20220628
JD47653-25	06/28/22	13:30 MF	06/30/22	SO	Soil	AOI6_B027_PFAS_0-1_20220628

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary
(continued)

Sunoco/Evergreen

Job No: JD47653

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47653-26	06/28/22	14:35 MF	06/30/22	SO	Soil	AOI6_B025_PFAS_0-1_20220628
JD47653-27	06/28/22	13:55 MF	06/30/22	SO	Soil	AOI6_B031_PFAS_0-1_20220628
JD47653-28	06/28/22	11:15 MF	06/30/22	SO	Soil	AOI6_B028_PFAS_0-1_20220628
JD47653-29	06/28/22	11:00 MF	06/30/22	SO	Soil	AOI6_B021_PFAS_0-1_20220628
JD47653-30	06/28/22	15:05 MF	06/30/22	SO	Soil	AOI7_B002_PFAS_0-1_20220628
JD47653-31	06/28/22	15:05 MF	06/30/22	SO	Soil	AOI7_B002_PFAS_0-1_20220628_DUP
JD47653-32	06/29/22	09:40 MF	06/30/22	SO	Soil	AOI6_B024_PFAS_0-1_20220629
JD47653-33	06/29/22	09:10 MF	06/30/22	SO	Soil	AOI6_B029_PFAS_0-1_20220629
JD47653-34	06/29/22	10:35 MF	06/30/22	SO	Soil	AOI6_B033_PFAS_0-1_20220629
JD47653-35	06/29/22	10:00 MF	06/30/22	SO	Soil	AOI6_B034_PFAS_0-1_20220629
JD47653-36	06/29/22	10:15 MF	06/30/22	SO	Soil	AOI6_B036_PFAS_0-1_20220629
JD47653-37	06/29/22	08:55 MF	06/30/22	SO	Soil	AOI6_B030_PFAS_0-1_20220629
JD47653-38	06/29/22	10:55 MF	06/30/22	SO	Soil	AOI6_B035_PFAS_0-1_20220629_DUP

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary
(continued)

Sunoco/Evergreen

Job No: JD47653

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47653-39	06/29/22	10:55 MF	06/30/22	SO	Soil	AOI6_B035_PFAS_0-1_20220629
JD47653-40	06/29/22	14:10 MF	06/30/22	SO	Soil	AOI5_B004_PFAS_0-1_20220629
JD47653-41	06/29/22	14:25 MF	06/30/22	SO	Soil	AOI5_B007_PFAS_0-1_20220629
JD47653-42	06/29/22	14:45 MF	06/30/22	SO	Soil	AOI5_B009_PFAS_0-1_20220629
JD47653-43	06/29/22	13:40 MF	06/30/22	SO	Soil	AOI5_B011_PFAS_0-1_20220629
JD47653-44	06/29/22	12:30 MF	06/30/22	SO	Soil	AOI5_B013_PFAS_0-1_20220629
JD47653-45	06/29/22	13:15 MF	06/30/22	SO	Soil	AOI5_B015_PFAS_0-1_20220629
JD47653-46	06/29/22	12:45 MF	06/30/22	SO	Soil	AOI5_B018_PFAS_0-1_20220629
JD47653-47	06/30/22	08:10 MF	06/30/22	SO	Soil	AOI5_B002_PFAS_0-1_20220630
JD47653-48	06/30/22	08:30 MF	06/30/22	SO	Soil	AOI5_B006_PFAS_0-1_20220630
JD47653-49	06/30/22	09:10 MF	06/30/22	SO	Soil	AOI5_B014_PFAS_0-1_20220630
JD47653-50	06/30/22	09:35 MF	06/30/22	SO	Soil	AOI5_B019_PFAS_0-1_20220630
JD47653-51	06/30/22	09:50 MF	06/30/22	SO	Soil	AOI5_B017_PFAS_0-1_20220630

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Summary
(continued)

Sunoco/Evergreen

Job No: JD47653

SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Project No: 4796.01

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JD47653-52	06/30/22	10:45 MF	06/30/22	SO	Soil	AOI5_B016_PFAS_0-1_20220630
JD47653-53	06/30/22	10:15 MF	06/30/22	SO	Soil	AOI5_B020_PFAS_0-1_20220630
JD47653-54	06/30/22	12:15 MF	06/30/22	SO	Soil	AOI5_B001_PFAS_0-1_20220630
JD47653-55	06/30/22	13:05 MF	06/30/22	SO	Soil	AOI5_B005_PFAS_0-1_20220630
JD47653-56	06/30/22	13:30 MF	06/30/22	SO	Soil	AOI5_B008_PFAS_0-1_20220630
JD47653-57	06/30/22	13:55 MF	06/30/22	SO	Soil	AOI5_B012_PFAS_0-1_20220630
JD47653-58	06/30/22	12:50 MF	06/30/22	SO	Soil	AOI5_B003_PFAS_0-1_20220630
JD47653-59	06/30/22	14:20 MF	06/30/22	SO	Soil	AOI5_B010_PFAS_0-1_20220630
JD47653-60	06/28/22	08:00 MF	06/30/22	AQ	Field Blank Soil	FB-04_20220628
JD47653-61	06/29/22	08:00 MF	06/30/22	AQ	Field Blank Soil	FB-05_20220629
JD47653-62	06/30/22	08:10 MF	06/30/22	AQ	Field Blank Soil	FB-06_20220630
JD47653-63	06/30/22	14:40 MF	06/30/22	AQ	Equipment Blank	EB-01_20220630

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Page 1 of 7

Job Number: JD47653**Account:** Sunoco/Evergreen**Project:** SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA**Collected:** 06/27/22 thru 06/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47653-1 **AOI6_B005_PFAS_0-1_20220627**

No hits reported in this sample.

JD47653-2 **AOI6_B001_PFAS_0-1_20220627**

No hits reported in this sample.

JD47653-3 **AOI6_B006_PFAS_0-1_20220627**

No hits reported in this sample.

JD47653-4 **AOI6_B004_PFAS_0-1_20220627**

Perfluorooctanesulfonic acid ^a	0.00058 J	0.00060	0.00024	mg/kg	EPA 537M BY ID
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JD47653-5 **AOI6_B010_PFAS_0-1_20220627**

Perfluoroheptanoic acid ^a	0.0013	0.00082	0.00041	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a	0.0012	0.00082	0.00041	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0016	0.00082	0.00041	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0021	0.00082	0.00033	mg/kg	EPA 537M BY ID

JD47653-6 **AOI6_B009_PFAS_0-1_20220627**

Perfluorononanoic acid ^a	0.00068	0.00059	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00070	0.00059	0.00024	mg/kg	EPA 537M BY ID

JD47653-7 **AOI6_B018_PFAS_0-1_20220627**

Perfluorononanoic acid ^a	0.0019	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	0.00073	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0232	0.00058	0.00023	mg/kg	EPA 537M BY ID

JD47653-8 **AOI6_B011_PFAS_0-1_20220627**

Perfluorooctanesulfonic acid ^a	0.00091	0.00065	0.00026	mg/kg	EPA 537M BY ID
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JD47653-9 **AOI6_B020_PFAS_0-1_20220627**

Perfluorononanoic acid ^a	0.00098	0.00059	0.00030	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	0.00073	0.00059	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0074	0.00059	0.00024	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47653

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/27/22 thru 06/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47653-10 AOI6_B026_PFAS_0-1_20220627

Perfluorononanoic acid ^a	0.00036 J	0.00055	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0021	0.00055	0.00022	mg/kg	EPA 537M BY ID

JD47653-11 AOI6_B016_PFAS_0-1_20220627

Perfluorooctanesulfonic acid ^a	0.00024 J	0.00061	0.00024	mg/kg	EPA 537M BY ID
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JD47653-12 AOI6_B007_PFAS_0-1_20220627

Perfluorooctanoic acid ^a	0.00052 J	0.00059	0.00030	mg/kg	EPA 537M BY ID
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JD47653-13 AOI6_B013_PFAS_0-1_20220627

Perfluorooctanesulfonic acid ^a	0.00047 J	0.00056	0.00022	mg/kg	EPA 537M BY ID
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JD47653-14 AOI1_B015_PFAS_0-1_20220627

Perfluorooctanoic acid ^a	0.00053 J	0.00063	0.00031	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0032	0.00063	0.00031	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0038	0.00063	0.00025	mg/kg	EPA 537M BY ID

JD47653-15 AOI1_B016_PFAS_0-1_20220627

Perfluoroheptanoic acid ^a	0.00053 J	0.00068	0.00034	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a	0.00091	0.00068	0.00034	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0037	0.00068	0.00034	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0038	0.00068	0.00027	mg/kg	EPA 537M BY ID

JD47653-16 AOI6_B032_PFAS_0-1_20220628

Perfluorooctanesulfonic acid ^a	0.00045 J	0.00060	0.00024	mg/kg	EPA 537M BY ID
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JD47653-17 AOI6_B017_PFAS_0-1_20220628

No hits reported in this sample.

JD47653-18 AOI6_B015_PFAS_0-1_20220628

Perfluorononanoic acid ^a	0.00037 J	0.00069	0.00034	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	0.0018	0.00069	0.00034	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0131	0.00069	0.00027	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47653
Account: Sunoco/Evergreen
Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA
Collected: 06/27/22 thru 06/30/22

Lab Sample ID	Client Sample ID	Result/ Analyte Qual	RL	MDL	Units	Method
JD47653-19 AOI6_B008_PFAS_0-1_20220628						
Perfluorooctanesulfonic acid ^a		0.00043 J	0.00061	0.00024	mg/kg	EPA 537M BY ID
JD47653-20 AOI6_B012_PFAS_0-1_20220628						
Perfluorooctanoic acid ^a		0.00048 J	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.0029	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.00085	0.00056	0.00022	mg/kg	EPA 537M BY ID
JD47653-21 AOI6_B014_PFAS_0-1_20220628						
Perfluorooctanoic acid ^a		0.0011	0.00064	0.00032	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0137	0.00064	0.00026	mg/kg	EPA 537M BY ID
JD47653-22 AOI6_B019_PFAS_0-1_20220628						
Perfluorononanoic acid ^a		0.00076	0.00060	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.00088	0.00060	0.00024	mg/kg	EPA 537M BY ID
JD47653-23 AOI6_B022_PFAS_0-1_20220628						
Perfluorononanoic acid ^a		0.0011	0.00061	0.00031	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0010	0.00061	0.00025	mg/kg	EPA 537M BY ID
JD47653-24 AOI6_B023_PFAS_0-1_20220628						
Perfluoroheptanoic acid ^a		0.00036 J	0.00070	0.00035	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.0014	0.00070	0.00035	mg/kg	EPA 537M BY ID
JD47653-25 AOI6_B027_PFAS_0-1_20220628						
Perfluorooctanoic acid ^a		0.00046 J	0.00063	0.00032	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.00055 J	0.00063	0.00032	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a		0.00095	0.00063	0.00032	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		0.0324	0.00063	0.00025	mg/kg	EPA 537M BY ID
JD47653-26 AOI6_B025_PFAS_0-1_20220628						
Perfluoroheptanoic acid ^a		0.00030 J	0.00053	0.00026	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a		0.00030 J	0.00053	0.00026	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a		0.00042 J	0.00053	0.00026	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47653**Account:** Sunoco/Evergreen**Project:** SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA**Collected:** 06/27/22 thru 06/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47653-27 AOI6_B031_PFAS_0-1_20220628

Perfluorooctanoic acid ^a	0.0012	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0025	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	0.0068	0.00056	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0422	0.00056	0.00022	mg/kg	EPA 537M BY ID

JD47653-28 AOI6_B028_PFAS_0-1_20220628

Perfluorooctanesulfonic acid ^a	0.00033 J	0.00062	0.00025	mg/kg	EPA 537M BY ID
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JD47653-29 AOI6_B021_PFAS_0-1_20220628

No hits reported in this sample.

JD47653-30 AOI7_B002_PFAS_0-1_20220628

No hits reported in this sample.

JD47653-31 AOI7_B002_PFAS_0-1_20220628_DUP

No hits reported in this sample.

JD47653-32 AOI6_B024_PFAS_0-1_20220629

Perfluorooctanesulfonic acid ^a	0.00032 J	0.00055	0.00022	mg/kg	EPA 537M BY ID
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JD47653-33 AOI6_B029_PFAS_0-1_20220629

Perfluorooctanesulfonic acid ^a	0.00032 J	0.00064	0.00025	mg/kg	EPA 537M BY ID
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JD47653-34 AOI6_B033_PFAS_0-1_20220629

Perfluorononanoic acid ^a	0.00058 J	0.00074	0.00037	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0044	0.00074	0.00030	mg/kg	EPA 537M BY ID

JD47653-35 AOI6_B034_PFAS_0-1_20220629

Perfluorononanoic acid ^a	0.00062 J	0.00063	0.00032	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0011	0.00063	0.00025	mg/kg	EPA 537M BY ID

JD47653-36 AOI6_B036_PFAS_0-1_20220629

Perfluorononanoic acid ^a	0.0013	0.00067	0.00033	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0054	0.00067	0.00027	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47653

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/27/22 thru 06/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47653-37 AOI6_B030_PFAS_0-1_20220629

Perfluorooctanoic acid ^a	0.00033 J	0.00059	0.00030	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.0032	0.00059	0.00030	mg/kg	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	0.0020	0.00059	0.00030	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0093	0.00059	0.00024	mg/kg	EPA 537M BY ID

JD47653-38 AOI6_B035_PFAS_0-1_20220629_DUP

Perfluorooctanesulfonic acid ^a	0.0032	0.00064	0.00026	mg/kg	EPA 537M BY ID
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JD47653-39 AOI6_B035_PFAS_0-1_20220629

Perfluorooctanesulfonic acid ^a	0.0032	0.00063	0.00025	mg/kg	EPA 537M BY ID
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JD47653-40 AOI5_B004_PFAS_0-1_20220629

No hits reported in this sample.

JD47653-41 AOI5_B007_PFAS_0-1_20220629

Perfluorononanoic acid ^a	0.0016	0.00055	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0027	0.00055	0.00022	mg/kg	EPA 537M BY ID

JD47653-42 AOI5_B009_PFAS_0-1_20220629

Perfluorononanoic acid ^b	0.00036 J	0.00061	0.00031	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0034	0.00061	0.00025	mg/kg	EPA 537M BY ID

JD47653-43 AOI5_B011_PFAS_0-1_20220629

Perfluoroheptanoic acid ^a	0.00066	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanoic acid ^a	0.00086	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^a	0.00065	0.00058	0.00029	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.00050 J	0.00058	0.00023	mg/kg	EPA 537M BY ID

JD47653-44 AOI5_B013_PFAS_0-1_20220629

Perfluorooctanesulfonic acid ^a	0.00033 J	0.00055	0.00022	mg/kg	EPA 537M BY ID
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JD47653-45 AOI5_B015_PFAS_0-1_20220629

Perfluorooctanoic acid ^a	0.00053 J	0.00064	0.00032	mg/kg	EPA 537M BY ID
Perfluorononanoic acid ^b	0.0014	0.00064	0.00032	mg/kg	EPA 537M BY ID

Summary of Hits

Job Number: JD47653

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/27/22 thru 06/30/22

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorooctanesulfonic acid ^a 0.0032 0.00064 0.00026 mg/kg EPA 537M BY ID

JD47653-46 AOI5_B018_PFAS_0-1_20220629

No hits reported in this sample.

JD47653-47 AOI5_B002_PFAS_0-1_20220630

No hits reported in this sample.

JD47653-48 AOI5_B006_PFAS_0-1_20220630

No hits reported in this sample.

JD47653-49 AOI5_B014_PFAS_0-1_20220630

Perfluoroheptanoic acid ^a 0.0014 0.00055 0.00027 mg/kg EPA 537M BY ID
 Perfluorooctanoic acid ^a 0.0016 0.00055 0.00027 mg/kg EPA 537M BY ID
 Perfluorononanoic acid ^a 0.00093 0.00055 0.00027 mg/kg EPA 537M BY ID
 Perfluorooctanesulfonic acid ^a 0.00099 0.00055 0.00022 mg/kg EPA 537M BY ID

JD47653-50 AOI5_B019_PFAS_0-1_20220630

Perfluorononanoic acid ^b 0.00033 J 0.00063 0.00032 mg/kg EPA 537M BY ID

JD47653-51 AOI5_B017_PFAS_0-1_20220630

Perfluorononanoic acid ^a 0.00032 J 0.00060 0.00030 mg/kg EPA 537M BY ID
 Perfluorooctanesulfonic acid ^a 0.00057 J 0.00060 0.00024 mg/kg EPA 537M BY ID

JD47653-52 AOI5_B016_PFAS_0-1_20220630

Perfluorononanoic acid ^b 0.0011 0.00065 0.00033 mg/kg EPA 537M BY ID
 Perfluorooctanesulfonic acid ^a 0.0028 0.00065 0.00026 mg/kg EPA 537M BY ID

JD47653-53 AOI5_B020_PFAS_0-1_20220630

Perfluorooctanesulfonic acid ^a 0.00063 0.00061 0.00024 mg/kg EPA 537M BY ID

JD47653-54 AOI5_B001_PFAS_0-1_20220630

Perfluorooctanesulfonic acid ^a 0.00026 J 0.00059 0.00024 mg/kg EPA 537M BY ID

Summary of Hits

Page 7 of 7

Job Number: JD47653

Account: Sunoco/Evergreen

Project: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA

Collected: 06/27/22 thru 06/30/22

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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JD47653-55 AOI5_B005_PFAS_0-1_20220630

Perfluorononanoic acid ^a	0.00048 J	0.00057	0.00028	mg/kg	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	0.0011	0.00057	0.00023	mg/kg	EPA 537M BY ID

JD47653-56 AOI5_B008_PFAS_0-1_20220630

Perfluorononanoic acid ^a	0.00038 J	0.00070	0.00035	mg/kg	EPA 537M BY ID
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JD47653-57 AOI5_B012_PFAS_0-1_20220630

No hits reported in this sample.

JD47653-58 AOI5_B003_PFAS_0-1_20220630

Perfluorooctanesulfonic acid ^a	0.0010	0.00064	0.00026	mg/kg	EPA 537M BY ID
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JD47653-59 AOI5_B010_PFAS_0-1_20220630

No hits reported in this sample.

JD47653-60 FB-04_20220628

No hits reported in this sample.

JD47653-61 FB-05_20220629

No hits reported in this sample.

JD47653-62 FB-06_20220630

No hits reported in this sample.

JD47653-63 EB-01_20220630

No hits reported in this sample.

(a) Analysis performed at SGS Orlando, FL.

(b) Analysis performed at SGS Orlando, FL. Associated ID Standard outside control limits.



Dayton, NJ

Section 3



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	AOI6_B005_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-1			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95566.D	1	07/23/22 19:40	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	104%		50-150%
13C8-PFOA	106%		50-150%
13C9-PFNA	100%		50-150%
13C3-PFBS	99%		50-150%
13C3-PFHxS	97%		50-150%
13C8-PFOS	97%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B001_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-2			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95567.D	1	07/23/22 19:57	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	103%		50-150%
13C8-PFOA	104%		50-150%
13C9-PFNA	100%		50-150%
13C3-PFBS	97%		50-150%
13C3-PFHxS	94%		50-150%
13C8-PFOS	100%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B006_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-3			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95568.D	1	07/23/22 20:13	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00056	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	92%		50-150%
13C8-PFOA	93%		50-150%
13C9-PFNA	88%		50-150%
13C3-PFBS	89%		50-150%
13C3-PFHxS	85%		50-150%
13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B004_PFAS_0-1_20220627	Date Sampled:	06/27/22
Lab Sample ID:	JD47653-4	Date Received:	06/30/22
Matrix:	SO - Soil	Percent Solids:	83.3
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95571.D	1	07/23/22 21:03	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	1.99 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00058	0.00060	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	97%		50-150%
13C8-PFOA	98%		50-150%
13C9-PFNA	92%		50-150%
13C3-PFBS	92%		50-150%
13C3-PFHxS	92%		50-150%
13C8-PFOS	90%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B010_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-5		Date Sampled:	06/27/22	
Matrix:	SO - Soil		Date Received:	06/30/22	
Method:	EPA 537M BY ID IN HOUSE		Percent Solids:	62.2	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95572.D	1	07/23/22 21:20	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	1.97 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.0013	0.00082	0.00041	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0012	0.00082	0.00041	mg/kg	
375-95-1	Perfluorononanoic acid	0.0016	0.00082	0.00041	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00082	0.00041	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00082	0.00041	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0021	0.00082	0.00033	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	98%		50-150%
	13C8-PFOA	99%		50-150%
	13C9-PFNA	94%		50-150%
	13C3-PFBS	96%		50-150%
	13C3-PFHxS	96%		50-150%
	13C8-PFOS	92%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B009_PFAS_0-1_20220627	Date Sampled:	06/27/22
Lab Sample ID:	JD47653-6	Date Received:	06/30/22
Matrix:	SO - Soil	Percent Solids:	84.6
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95573.D	1	07/23/22 21:36	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00059	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00059	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	0.00068	0.00059	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00059	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00070	0.00059	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	82%		50-150%
13C8-PFOA	83%		50-150%
13C9-PFNA	78%		50-150%
13C3-PFBS	78%		50-150%
13C3-PFHxS	80%		50-150%
13C8-PFOS	79%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B018_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-7			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95576.D	1	07/23/22 22:26	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00058	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	0.0019	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.00073	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0232	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	97%		50-150%
13C8-PFOA	98%		50-150%
13C9-PFNA	94%		50-150%
13C3-PFBS	95%		50-150%
13C3-PFHxS	92%		50-150%
13C8-PFOS	94%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B011_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-8			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	76.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95577.D	1	07/23/22 22:42	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00065	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00065	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00065	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00065	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00065	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00091	0.00065	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	110%		50-150%
13C8-PFOA	111%		50-150%
13C9-PFNA	106%		50-150%
13C3-PFBS	105%		50-150%
13C3-PFHxS	103%		50-150%
13C8-PFOS	103%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B020_PFAS_0-1_20220627	Date Sampled:	06/27/22
Lab Sample ID:	JD47653-9	Date Received:	06/30/22
Matrix:	SO - Soil	Percent Solids:	82.9
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95578.D	1	07/23/22 22:59	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00059	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00059	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.00098	0.00059	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.00073	0.00059	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0074	0.00059	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	107%		50-150%
13C8-PFOA	108%		50-150%
13C9-PFNA	103%		50-150%
13C3-PFBS	105%		50-150%
13C3-PFHxS	104%		50-150%
13C8-PFOS	102%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B026_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-10			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	90.0
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95579.D	1	07/23/22 23:16	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.00036	0.00055	0.00028	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0021	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	108%		50-150%
	13C8-PFOA	110%		50-150%
	13C9-PFNA	104%		50-150%
	13C3-PFBS	105%		50-150%
	13C3-PFHxS	108%		50-150%
	13C8-PFOS	102%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B016_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-11			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95580.D	1	07/23/22 23:32	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	1.97 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00061	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00024	0.00061	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	102%		50-150%
13C8-PFOA	102%		50-150%
13C9-PFNA	95%		50-150%
13C3-PFBS	99%		50-150%
13C3-PFHxS	98%		50-150%
13C8-PFOS	94%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B007_PFAS_0-1_20220627	Date Sampled:	06/27/22
Lab Sample ID:	JD47653-12	Date Received:	06/30/22
Matrix:	SO - Soil	Percent Solids:	83.4
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95581.D	1	07/23/22 23:49	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00059	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00052	0.00059	0.00030	mg/kg	J
375-95-1	Perfluorononanoic acid	ND	0.00059	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00030	mg/kg
355-46-4	Perfluorohexanesulfonic acid	ND	0.00059	0.00030	mg/kg
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00059	0.00024	mg/kg

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	115%		50-150%
13C8-PFOA	115%		50-150%
13C9-PFNA	110%		50-150%
13C3-PFBS	109%		50-150%
13C3-PFHxS	112%		50-150%
13C8-PFOS	107%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B013_PFAS_0-1_20220627	Date Sampled:	06/27/22
Lab Sample ID:	JD47653-13	Date Received:	06/30/22
Matrix:	SO - Soil	Percent Solids:	89.3
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95582.D	1	07/24/22 00:05	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00047	0.00056	0.00022	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	100%		50-150%
13C8-PFOA	103%		50-150%
13C9-PFNA	98%		50-150%
13C3-PFBS	98%		50-150%
13C3-PFHxS	99%		50-150%
13C8-PFOS	97%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B015_PFAS_0-1_20220627				
Lab Sample ID:	JD47653-14			Date Sampled:	06/27/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	78.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95583.D	1	07/24/22 00:22	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00063	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00053	0.00063	0.00031	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0032	0.00063	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00063	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00063	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.00063	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	93%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	92%		50-150%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	94%		50-150%
	13C8-PFOS	89%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI1_B016_PFAS_0-1_20220627			
Lab Sample ID:	JD47653-15			Date Sampled: 06/27/22
Matrix:	SO - Soil			Date Received: 06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids: 74.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95584.D	1	07/24/22 00:38	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	1.99 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00053	0.00068	0.00034	mg/kg	J
335-67-1	Perfluorooctanoic acid	0.00091	0.00068	0.00034	mg/kg	
375-95-1	Perfluorononanoic acid	0.0037	0.00068	0.00034	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00068	0.00034	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00068	0.00034	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.00068	0.00027	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	106%		50-150%
	13C8-PFOA	108%		50-150%
	13C9-PFNA	104%		50-150%
	13C3-PFBS	104%		50-150%
	13C3-PFHxS	106%		50-150%
	13C8-PFOS	101%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B032_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-16			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95585.D	1	07/24/22 00:55	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00045	0.00060	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	100%		50-150%
13C8-PFOA	101%		50-150%
13C9-PFNA	95%		50-150%
13C3-PFBS	97%		50-150%
13C3-PFHxS	98%		50-150%
13C8-PFOS	95%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B017_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-17			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	78.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95588.D	1	07/24/22 01:45	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00064	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00064	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00064	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	89%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	71%		50-150%
	13C3-PFBS	94%		50-150%
	13C3-PFHxS	92%		50-150%
	13C8-PFOS	77%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B015_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-18			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	73.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95589.D	1	07/24/22 02:01	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	1.98 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00069	0.00034	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00069	0.00034	mg/kg	
375-95-1	Perfluorononanoic acid	0.00037	0.00069	0.00034	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00069	0.00034	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.0018	0.00069	0.00034	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0131	0.00069	0.00027	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	87%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	84%		50-150%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	82%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B008_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-19			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	80.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95590.D	1	07/24/22 02:18	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00061	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00043	0.00061	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	93%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	88%		50-150%
	13C3-PFBS	91%		50-150%
	13C3-PFHxS	92%		50-150%
	13C8-PFOS	86%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B012_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-20			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	89.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q95591.D	1	07/24/22 02:34	AFL	07/13/22 08:00	F:OP92071	F:S2Q1335
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00048	0.00056	0.00028	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0029	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00085	0.00056	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	94%		50-150%
	13C8-PFOA	96%		50-150%
	13C9-PFNA	91%		50-150%
	13C3-PFBS	92%		50-150%
	13C3-PFHxS	93%		50-150%
	13C8-PFOS	87%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B014_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-21			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	77.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92162.D	1	07/22/22 22:11	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2 ^b	Q92197.D	5	07/23/22 11:38	AFL	07/16/22 09:00	F:OP92112	F:SQ1992

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2	2.01 g	1.0 ml

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0011	0.00064	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	ND ^c	0.0032	0.0016	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0137	0.00064	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	67%	76%	50-150%
13C8-PFOA	60%	71%	50-150%
13C9-PFNA	33% ^d	52%	50-150%
13C3-PFBS	77%	80%	50-150%
13C3-PFHxS	68%	74%	50-150%
13C8-PFOS	52%	64%	50-150%

(a) Analysis performed at SGS Orlando, FL.

(b) Dilution required due to matrix interference (ID recovery standard failure). Analysis performed at SGS Orlando, FL.

(c) Result is from Run# 2

(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B019_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-22			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92163.D	1	07/22/22 22:26	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	1.97 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.00076	0.00060	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00088	0.00060	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	82%		50-150%
13C8-PFOA	77%		50-150%
13C9-PFNA	75%		50-150%
13C3-PFBS	78%		50-150%
13C3-PFHxS	77%		50-150%
13C8-PFOS	74%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B022_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-23			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	79.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92164.D	1	07/22/22 22:41	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00031	mg/kg	
375-95-1	Perfluorononanoic acid	0.0011	0.00061	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0010	0.00061	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	80%		50-150%
13C8-PFOA	71%		50-150%
13C9-PFNA	64%		50-150%
13C3-PFBS	88%		50-150%
13C3-PFHxS	76%		50-150%
13C8-PFOS	72%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B023_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-24			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	71.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92165.D	1	07/22/22 22:56	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00036	0.00070	0.00035	mg/kg	J
335-67-1	Perfluorooctanoic acid	ND	0.00070	0.00035	mg/kg	
375-95-1	Perfluorononanoic acid	0.0014	0.00070	0.00035	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00070	0.00035	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00070	0.00035	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00070	0.00028	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	64%		50-150%
	13C8-PFOA	59%		50-150%
	13C9-PFNA	57%		50-150%
	13C3-PFBS	69%		50-150%
	13C3-PFHxS	66%		50-150%
	13C8-PFOS	57%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B027_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-25			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	80.1
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92168.D	1	07/22/22 23:42	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	1.98 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00063	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00046	0.00063	0.00032	mg/kg	J
375-95-1	Perfluorononanoic acid	0.00055	0.00063	0.00032	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00063	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.00095	0.00063	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0324	0.00063	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	70%		50-150%
13C8-PFOA	67%		50-150%
13C9-PFNA	65%		50-150%
13C3-PFBS	69%		50-150%
13C3-PFHxS	65%		50-150%
13C8-PFOS	64%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B025_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-26			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	93.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92169.D	1	07/22/22 23:58	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00030	0.00053	0.00026	mg/kg	J
335-67-1	Perfluorooctanoic acid	0.00030	0.00053	0.00026	mg/kg	J
375-95-1	Perfluorononanoic acid	0.00042	0.00053	0.00026	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00053	0.00026	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00053	0.00026	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00053	0.00021	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	52%		50-150%
	13C8-PFOA	51%		50-150%
	13C9-PFNA	51%		50-150%
	13C3-PFBS	51%		50-150%
	13C3-PFHxS	51%		50-150%
	13C8-PFOS	50%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B031_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-27			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	89.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92170.D	1	07/23/22 00:13	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0012	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.0025	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.0068	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0422	0.00056	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	77%		50-150%
13C8-PFOA	72%		50-150%
13C9-PFNA	68%		50-150%
13C3-PFBS	76%		50-150%
13C3-PFHxS	72%		50-150%
13C8-PFOS	68%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B028_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-28			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	80.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92171.D	1	07/23/22 00:28	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00062	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00062	0.00031	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00062	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00062	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00062	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00033	0.00062	0.00025	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	72%		50-150%
13C8-PFOA	70%		50-150%
13C9-PFNA	68%		50-150%
13C3-PFBS	73%		50-150%
13C3-PFHxS	69%		50-150%
13C8-PFOS	68%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B021_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-29			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	82.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92174.D	1	07/23/22 01:14	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00061	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00061	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	83%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	76%		50-150%
	13C3-PFBS	82%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	76%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B002_PFAS_0-1_20220628				
Lab Sample ID:	JD47653-30			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.1
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92198.D	10	07/23/22 11:53	AFL	07/16/22 09:00	F:OP92112	F:SQ1992
Run #2							

	Initial Weight	Final Volume
Run #1	1.99 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0060	0.0030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.0060	0.0030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.0060	0.0030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0060	0.0030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0060	0.0030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0060	0.0024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	83%		50-150%
13C8-PFOA	80%		50-150%
13C9-PFNA	74%		50-150%
13C3-PFBS	96%		50-150%
13C3-PFHxS	93%		50-150%
13C8-PFOS	73%		50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure). Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI7_B002_PFAS_0-1_20220628_DUP				
Lab Sample ID:	JD47653-31			Date Sampled:	06/28/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	84.4
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92200.D	10	07/23/22 12:24	AFL	07/16/22 09:00	F:OP92112	F:SQ1992
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0058	0.0029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.0058	0.0029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.0058	0.0029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0058	0.0029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0058	0.0029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0058	0.0023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	74%		50-150%
13C8-PFOA	67%		50-150%
13C9-PFNA	68%		50-150%
13C3-PFBS	86%		50-150%
13C3-PFHxS	66%		50-150%
13C8-PFOS	64%		50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure). Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B024_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-32			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	89.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92177.D	1	07/23/22 02:00	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00032	0.00055	0.00022	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	68%		50-150%
	13C8-PFOA	64%		50-150%
	13C9-PFNA	59%		50-150%
	13C3-PFBS	69%		50-150%
	13C3-PFHxS	65%		50-150%
	13C8-PFOS	63%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B029_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-33			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	78.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92180.D	1	07/23/22 02:46	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00064	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00064	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00032	0.00064	0.00025	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	67%		50-150%
13C8-PFOA	61%		50-150%
13C9-PFNA	55%		50-150%
13C3-PFBS	68%		50-150%
13C3-PFHxS	66%		50-150%
13C8-PFOS	56%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B033_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-34			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	66.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92181.D	1	07/23/22 03:01	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00074	0.00037	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00074	0.00037	mg/kg	
375-95-1	Perfluorononanoic acid	0.00058	0.00074	0.00037	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00074	0.00037	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00074	0.00037	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0044	0.00074	0.00030	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	71%		50-150%
13C8-PFOA	72%		50-150%
13C9-PFNA	68%		50-150%
13C3-PFBS	75%		50-150%
13C3-PFHxS	68%		50-150%
13C8-PFOS	68%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B034_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-35			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	78.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92182.D	1	07/23/22 03:16	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00063	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00063	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	0.00062	0.00063	0.00032	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00063	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00063	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0011	0.00063	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	84%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	77%		50-150%
	13C3-PFBS	84%		50-150%
	13C3-PFHxS	81%		50-150%
	13C8-PFOS	80%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B036_PFAS_0-1_20220629	Date Sampled:	06/29/22
Lab Sample ID:	JD47653-36	Date Received:	06/30/22
Matrix:	SO - Soil	Percent Solids:	75.5
Method:	EPA 537M BY ID IN HOUSE		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92183.D	1	07/23/22 03:32	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	1.98 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00067	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00067	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid	0.0013	0.00067	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00067	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00067	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0054	0.00067	0.00027	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	69%		50-150%
13C8-PFOA	69%		50-150%
13C9-PFNA	66%		50-150%
13C3-PFBS	68%		50-150%
13C3-PFHxS	62%		50-150%
13C8-PFOS	67%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B030_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-37			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	83.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92184.D	1	07/23/22 03:47	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00059	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00033	0.00059	0.00030	mg/kg	J
375-95-1	Perfluorononanoic acid	0.0032	0.00059	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	0.0020	0.00059	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0093	0.00059	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	70%		50-150%
	13C8-PFOA	64%		50-150%
	13C9-PFNA	66%		50-150%
	13C3-PFBS	70%		50-150%
	13C3-PFHxS	68%		50-150%
	13C8-PFOS	64%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B035_PFAS_0-1_20220629_DUP				
Lab Sample ID:	JD47653-38			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	76.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92185.D	1	07/23/22 04:02	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.05 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00064	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00064	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0032	0.00064	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	75%		50-150%
13C8-PFOA	72%		50-150%
13C9-PFNA	68%		50-150%
13C3-PFBS	76%		50-150%
13C3-PFHxS	74%		50-150%
13C8-PFOS	69%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI6_B035_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-39			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	79.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92186.D	1	07/23/22 04:17	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00063	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00063	0.00031	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00063	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00063	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00063	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0032	0.00063	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	76%		50-150%
13C8-PFOA	74%		50-150%
13C9-PFNA	71%		50-150%
13C3-PFBS	79%		50-150%
13C3-PFHxS	72%		50-150%
13C8-PFOS	69%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B004_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-40			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	89.4
Project:	SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92187.D	1	07/23/22 04:33	AFL	07/16/22 09:00	F:OP92112	F:SQ1991
Run #2							

	Initial Weight	Final Volume
Run #1	1.98 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00056	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00056	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00056	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00056	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00056	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00056	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	80%		50-150%
13C8-PFOA	74%		50-150%
13C9-PFNA	73%		50-150%
13C3-PFBS	78%		50-150%
13C3-PFHxS	76%		50-150%
13C8-PFOS	73%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B007_PFAS_0-1_20220629			
Lab Sample ID:	JD47653-41	Date Sampled:	06/29/22	
Matrix:	SO - Soil	Date Received:	06/30/22	
Method:	EPA 537M BY ID IN HOUSE	Percent Solids:	88.6	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63492.D	1	07/29/22 21:51	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.05 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.0016	0.00055	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0027	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	72%		50-150%
13C8-PFOA	79%		50-150%
13C9-PFNA	80%		50-150%
13C3-PFBS	97%		50-150%
13C3-PFHxS	98%		50-150%
13C8-PFOS	93%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B009_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-42			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	81.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63495.D	1	07/29/22 22:47	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2 ^b	3Q63565.D	5	07/30/22 14:22	AFL	07/16/22 09:00	F:OP92111	F:S3Q870

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2	2.01 g	1.0 ml

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00031	mg/kg	
375-95-1	Perfluorononanoic acid ^c	0.00036	0.00061	0.00031	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0034	0.00061	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	73%	81%	50-150%
	13C8-PFOA	69%	83%	50-150%
	13C9-PFNA	49% ^d	73%	50-150%
	13C3-PFBS	79%	83%	50-150%
	13C3-PFHxS	77%	83%	50-150%
	13C8-PFOS	56%	73%	50-150%

(a) Analysis performed at SGS Orlando, FL.

(b) Confirmation run. Analysis performed at SGS Orlando, FL.

(c) Associated ID Standard outside control limits.

(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B011_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-43			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	86.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63498.D	1	07/29/22 23:43	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.00066	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	0.00086	0.00058	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	0.00065	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00050	0.00058	0.00023	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	73%		50-150%
13C8-PFOA	73%		50-150%
13C9-PFNA	62%		50-150%
13C3-PFBS	75%		50-150%
13C3-PFHxS	74%		50-150%
13C8-PFOS	64%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B013_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-44			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	91.8
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63499.D	1	07/30/22 00:01	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	1.98 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00055	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00055	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00055	0.00028	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00033	0.00055	0.00022	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	76%		50-150%
13C8-PFOA	77%		50-150%
13C9-PFNA	66%		50-150%
13C3-PFBS	80%		50-150%
13C3-PFHxS	81%		50-150%
13C8-PFOS	70%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B015_PFAS_0-1_20220629				
Lab Sample ID:	JD47653-45			Date Sampled:	06/29/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	78.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63500.D	1	07/30/22 00:20	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2 ^b	3Q63570.D	5	07/30/22 14:40	AFL	07/16/22 09:00	F:OP92111	F:S3Q870

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2	2.00 g	1.0 ml

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	J
335-67-1	Perfluorooctanoic acid	0.00053	0.00064	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid ^c	0.0014	0.00064	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg
1763-23-1	Perfluorooctanesulfonic acid	0.0032	0.00064	0.00026	mg/kg

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	75%	89%	50-150%
	13C8-PFOA	67%	90%	50-150%
	13C9-PFNA	48% ^d	75%	50-150%
	13C3-PFBS	84%	92%	50-150%
	13C3-PFHxS	81%	91%	50-150%
	13C8-PFOS	56%	81%	50-150%

(a) Analysis performed at SGS Orlando, FL.

(b) Confirmation run. Analysis performed at SGS Orlando, FL.

(c) Associated ID Standard outside control limits.

(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B018_PFAS_0-1_20220629			
Lab Sample ID:	JD47653-46	Date Sampled:	06/29/22	
Matrix:	SO - Soil	Date Received:	06/30/22	
Method:	EPA 537M BY ID IN HOUSE	Percent Solids:	85.9	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63501.D	1	07/30/22 00:38	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	1.92 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00061	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00061	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	75%		50-150%
13C8-PFOA	79%		50-150%
13C9-PFNA	76%		50-150%
13C3-PFBS	79%		50-150%
13C3-PFHxS	80%		50-150%
13C8-PFOS	78%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B002_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-47			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	85.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63502.D	1	07/30/22 00:57	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.02 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00058	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00058	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00058	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00058	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00058	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00058	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	76%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	76%		50-150%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	78%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B006_PFAS_0-1_20220630			
Lab Sample ID:	JD47653-48	Date Sampled:	06/30/22	
Matrix:	SO - Soil	Date Received:	06/30/22	
Method:	EPA 537M BY ID IN HOUSE	Percent Solids:	90.8	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63503.D	1	07/30/22 01:16	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00054	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00054	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00054	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00054	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00054	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00054	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	74%		50-150%
13C8-PFOA	76%		50-150%
13C9-PFNA	71%		50-150%
13C3-PFBS	76%		50-150%
13C3-PFHxS	76%		50-150%
13C8-PFOS	72%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B014_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-49			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	89.3
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63504.D	1	07/30/22 01:34	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.04 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	0.0014	0.00055	0.00027	mg/kg	
335-67-1	Perfluorooctanoic acid	0.0016	0.00055	0.00027	mg/kg	
375-95-1	Perfluorononanoic acid	0.00093	0.00055	0.00027	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00055	0.00027	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00055	0.00027	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00099	0.00055	0.00022	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	81%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	60%		50-150%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	82%		50-150%
	13C8-PFOS	64%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B019_PFAS_0-1_20220630			
Lab Sample ID:	JD47653-50	Date Sampled:	06/30/22	
Matrix:	SO - Soil	Date Received:	06/30/22	
Method:	EPA 537M BY ID IN HOUSE	Percent Solids:	78.7	
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63505.D	1	07/30/22 01:53	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2 ^b	3Q63575.D	5	07/30/22 14:59	AFL	07/16/22 09:00	F:OP92111	F:S3Q870

	Initial Weight	Final Volume
Run #1	2.01 g	1.0 ml
Run #2	2.01 g	1.0 ml

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00063	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00063	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid ^c	0.00033	0.00063	0.00032	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00063	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00063	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00063	0.00025	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	75%	86%	50-150%
	13C8-PFOA	68%	82%	50-150%
	13C9-PFNA	48% ^d	64%	50-150%
	13C3-PFBS	89%	91%	50-150%
	13C3-PFHxS	84%	91%	50-150%
	13C8-PFOS	56%	69%	50-150%

(a) Analysis performed at SGS Orlando, FL.

(b) Confirmation run. Analysis performed at SGS Orlando, FL.

(c) Associated ID Standard outside control limits.

(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B017_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-51			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	81.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63506.D	1	07/30/22 02:11	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.03 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00060	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00060	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	0.00032	0.00060	0.00030	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00060	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00060	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00057	0.00060	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	66%		50-150%
	13C8-PFOA	68%		50-150%
	13C9-PFNA	62%		50-150%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	66%		50-150%
	13C8-PFOS	63%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B016_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-52			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	76.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63507.D	1	07/30/22 02:30	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2 ^b	3Q63577.D	5	07/30/22 15:17	AFL	07/16/22 09:00	F:OP92111	F:S3Q870

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2	2.00 g	1.0 ml

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00065	0.00033	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00065	0.00033	mg/kg	
375-95-1	Perfluorononanoic acid ^c	0.0011	0.00065	0.00033	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00065	0.00033	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00065	0.00033	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0028	0.00065	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	76%	78%	50-150%
13C8-PFOA	68%	78%	50-150%
13C9-PFNA	45% ^d	64%	50-150%
13C3-PFBS	91%	81%	50-150%
13C3-PFHxS	84%	81%	50-150%
13C8-PFOS	55%	67%	50-150%

(a) Analysis performed at SGS Orlando, FL.

(b) Confirmation run. Analysis performed at SGS Orlando, FL.

(c) Associated ID Standard outside control limits.

(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B020_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-53			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	81.9
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63510.D	1	07/30/22 03:25	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00031	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00031	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00061	0.00031	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00031	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00031	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00063	0.00061	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	69%		50-150%
13C8-PFOA	71%		50-150%
13C9-PFNA	66%		50-150%
13C3-PFBS	72%		50-150%
13C3-PFHxS	71%		50-150%
13C8-PFOS	65%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B001_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-54			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	85.1
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63511.D	1	07/30/22 03:44	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2 ^b	3Q63581.D	5	07/30/22 15:36	AFL	07/16/22 09:00	F:OP92111	F:S3Q870

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2	2.00 g	1.0 ml

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00059	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00059	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid ^c	ND	0.00059	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00059	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00059	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.00026	0.00059	0.00024	mg/kg	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	67%	76%	50-150%
13C8-PFOA	65%	77%	50-150%
13C9-PFNA	49% ^d	69%	50-150%
13C3-PFBS	73%	79%	50-150%
13C3-PFHxS	71%	79%	50-150%
13C8-PFOS	55%	74%	50-150%

(a) Analysis performed at SGS Orlando, FL.

(b) Confirmation run. Analysis performed at SGS Orlando, FL.

(c) Associated ID Standard outside control limits.

(d) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B005_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-55			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	86.2
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63512.D	1	07/30/22 04:03	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.05 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00028	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00028	mg/kg	
375-95-1	Perfluorononanoic acid	0.00048	0.00057	0.00028	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00028	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00028	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0011	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	66%		50-150%
	13C8-PFOA	67%		50-150%
	13C9-PFNA	59%		50-150%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	67%		50-150%
	13C8-PFOS	60%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B008_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-56			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	71.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63513.D	1	07/30/22 04:21	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	2.00 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-85-9	Perfluoroheptanoic acid	ND	0.00070	0.00035	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00070	0.00035	mg/kg	
375-95-1	Perfluorononanoic acid	0.00038	0.00070	0.00035	mg/kg	J

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00070	0.00035	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00070	0.00035	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00070	0.00028	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	73%		50-150%
	13C8-PFOA	70%		50-150%
	13C9-PFNA	51%		50-150%
	13C3-PFBS	80%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	56%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B012_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-57			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	82.6
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63514.D	1	07/30/22 04:40	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	1.99 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00061	0.00030	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00061	0.00030	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00061	0.00030	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00061	0.00030	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00061	0.00030	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00061	0.00024	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	58%		50-150%
13C8-PFOA	61%		50-150%
13C9-PFNA	57%		50-150%
13C3-PFBS	62%		50-150%
13C3-PFHxS	62%		50-150%
13C8-PFOS	61%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B003_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-58			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	78.5
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63515.D	1	07/30/22 04:58	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	1.98 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00064	0.00032	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00064	0.00032	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00064	0.00032	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00064	0.00032	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00064	0.00032	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	0.0010	0.00064	0.00026	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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13C4-PFHpA	92%		50-150%
13C8-PFOA	88%		50-150%
13C9-PFNA	64%		50-150%
13C3-PFBS	100%		50-150%
13C3-PFHxS	98%		50-150%
13C8-PFOS	71%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	AOI5_B010_PFAS_0-1_20220630				
Lab Sample ID:	JD47653-59			Date Sampled:	06/30/22
Matrix:	SO - Soil			Date Received:	06/30/22
Method:	EPA 537M BY ID IN HOUSE			Percent Solids:	87.7
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q63516.D	1	07/30/22 05:17	AFL	07/16/22 09:00	F:OP92111	F:S3Q869
Run #2							

	Initial Weight	Final Volume
Run #1	1.99 g	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.00057	0.00029	mg/kg	
335-67-1	Perfluorooctanoic acid	ND	0.00057	0.00029	mg/kg	
375-95-1	Perfluorononanoic acid	ND	0.00057	0.00029	mg/kg	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.00057	0.00029	mg/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.00057	0.00029	mg/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.00057	0.00023	mg/kg	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
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	13C4-PFHpA	86%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	66%		50-150%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	71%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-04_20220628	Date Sampled:	06/28/22
Lab Sample ID:	JD47653-60	Date Received:	06/30/22
Matrix:	AQ - Field Blank Soil	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92206.D	1	07/23/22 13:56	AFL	07/16/22 09:00	F:OP92114	F:SQ1992
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	118%		50-150%
	13C8-PFOA	116%		50-150%
	13C9-PFNA	114%		50-150%
	13C3-PFBS	118%		50-150%
	13C3-PFHxS	115%		50-150%
	13C8-PFOS	117%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-05_20220629	Date Sampled:	06/29/22
Lab Sample ID:	JD47653-61	Date Received:	06/30/22
Matrix:	AQ - Field Blank Soil	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92207.D	1	07/23/22 14:11	AFL	07/16/22 09:00	F:OP92114	F:SQ1992
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	104%		50-150%
	13C8-PFOA	100%		50-150%
	13C9-PFNA	100%		50-150%
	13C3-PFBS	103%		50-150%
	13C3-PFHxS	97%		50-150%
	13C8-PFOS	97%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB-06_20220630	Date Sampled:	06/30/22
Lab Sample ID:	JD47653-62	Date Received:	06/30/22
Matrix:	AQ - Field Blank Soil	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92208.D	1	07/23/22 14:26	AFL	07/16/22 09:00	F:OP92114	F:SQ1992
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	113%		50-150%
	13C8-PFOA	111%		50-150%
	13C9-PFNA	109%		50-150%
	13C3-PFBS	112%		50-150%
	13C3-PFHxS	112%		50-150%
	13C8-PFOS	104%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB-01_20220630	Date Sampled:	06/30/22
Lab Sample ID:	JD47653-63	Date Received:	06/30/22
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	SANHPAFW:Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	Q92209.D	1	07/23/22 14:41	AFL	07/16/22 09:00	F:OP92114	F:SQ1992
Run #2							

	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

Perfluorinated Carboxylic Acids and Sulfonates

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	

PERFLUOROALKYLSULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFHpA	100%		50-150%
	13C8-PFOA	98%		50-150%
	13C9-PFNA	97%		50-150%
	13C3-PFBS	102%		50-150%
	13C3-PFHxS	97%		50-150%
	13C8-PFOS	95%		50-150%

(a) Analysis performed at SGS Orlando, FL.

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY
 SGS North America Inc. - Dayton
 2235 Route 130, Dayton, NJ 08810
 TEL. 732-329-0200 FAX 732-329-3499

Page 1 of 5
 Please merge with SDG:

JD47653

Client / Reporting Information Company Name: Sanborn Head & Associates Street Address: 20 Foundry St City: Concord NH Zip: 03301 Project Contact: Andrew Buchy (abuchy@sanbornhead.com) Phone: 603-415-6159		Project Information Project Name: Evergreen Philadelphia Refinery Street: 3144 W. Passyunk Ave. City: Philadelphia PA Zip: 19145 Project #: 4796.01 Project Manager: Andrew Buchy		Requested Analysis (see TEST CODE sheet) PFAS - LCID53/UCMR3		Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
Lab Sample Field ID / Point of Collection MECH/DI Val #		Collection Date Time Sampled by Matrix # of bottles		Data Deliverable Information Commercial "A" (Level 1) NYASP Category A Commercial "B" (Level 2) X NYASP Category B FULLT1 (Level 3+4) State Forms NJ Reduced X EDD Format SHA EQUIS; Stantec EQUIS Commercial "C" NJ Date of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		Comments / Special Instructions	
Turnaround Time (Business days) ☒ Std. 10 Business Days ☐ 5 Day RUSH ☐ 3 Day RUSH ☐ 2 Day RUSH ☐ 1 Day RUSH ☐ other _____ Emergency & Rush T/A data available via LabLink		Approved by (SGS Project Manager): _____ _____ _____		Date Deliverable Information Commercial "A" (Level 1) NYASP Category A Commercial "B" (Level 2) X NYASP Category B FULLT1 (Level 3+4) State Forms NJ Reduced X EDD Format SHA EQUIS; Stantec EQUIS Commercial "C" NJ Date of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		Comments / Special Instructions	

Relinquished by: Michael Rustin Relinquished by Sampler: 3 Relinquished by: 3		Received By: 1 Received By: 3 Received By: 5		Relinquished by: 4 Relinquished by: 4 Relinquished by: 4		Received By: 2 Received By: 4 Received By: 4	
Date Time: 6/29/22		Date Time: 6/29/22		Date Time: 6/29/22		Date Time: 6/29/22	
Intact: ☒ Not Intact: ☐ Preserved where applicable: ☐		Intact: ☒ Not Intact: ☐ Preserved where applicable: ☐		Intact: ☒ Not Intact: ☐ Preserved where applicable: ☐		Intact: ☒ Not Intact: ☐ Preserved where applicable: ☐	

2.4 / 2.8

Sanborn, Head & Associates, Inc.

4.1

2.4/2.8

Sanborn, Head & Associates, Inc.

SGS Sample Receipt Summary

Job Number: JD47653

Client: SANBORN HEAD & ASSOCIATES

Project: EVERGREEN PHILADELPHIA REFINERY

Date / Time Received: 6/30/2022 5:02:00 PM

Delivery Method:

Airbill #s:

Cooler Temps (Raw Measured) °C:

Cooler Temps (Corrected) °C:

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | ☒ | ☐ | 3. COC Present: | ☒ | ☐ |
| 2. Custody Seals Intact: | ☒ | ☐ | 4. Smpl Dates/Time OK | ☒ | ☐ |

Cooler Temperature

Y or N

- | | | |
|------------------------------|--------------------------|--------------------------|
| 1. Temp criteria achieved: | ☐ | ☐ |
| 2. Cooler temp verification: | N/A | |
| 3. Cooler media: | N/A | |
| 4. No. Coolers: | N/A | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | ☐ | ☐ | ☒ |
| 2. Trip Blank listed on COC: | ☐ | ☐ | ☒ |
| 3. Samples preserved properly: | ☒ | ☐ | |
| 4. VOCs headspace free: | ☐ | ☐ | ☒ |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | ☒ | ☐ |
| 2. Container labeling complete: | ☒ | ☐ |
| 3. Sample container label / COC agree: | ☒ | ☐ |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | ☒ | ☐ |
| 2. All containers accounted for: | ☒ | ☐ |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N

N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | ☒ | ☐ | |
| 2. Bottles received for unspecified tests | ☐ | ☒ | |
| 3. Sufficient volume recvd for analysis: | ☒ | ☐ | |
| 4. Compositing instructions clear: | ☐ | ☐ | ☒ |
| 5. Filtering instructions clear: | ☐ | ☐ | ☒ |

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JD47653: Chain of Custody

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Misc. Forms

5

Custody Documents and Other Forms

(SGS Orlando, FL)

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08510
TEL: 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 of 6

Client / Reporting Information		Project Information		FED-EX Tracking #		Bottle Order Control #	
Company Name:		Project Name:		SGS Order #		SGS Job #	
Street Address:		SANHPAFW Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA		Requested Analysis		Matrix Codes	
City State Zip		Billing Information (if different from Report to)		LCDD57UCMR3		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Waste FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank	
Project Contact E-mail		Company Name					
Phone #		Street Address					
Client Purchase Order #		City State Zip					
Sample(s) Name(s)		Attention:					
MF							
Field ID / Point of Collection		MEQHQI Val #		Collection		Number of preserved bottles	
1 AOI6_B005_PFAS_0-1_20220627		6/27/22		8:35:00 AM MF SO		X	
2 AOI6_B001_PFAS_0-1_20220627		6/27/22		11:15:00 AM MF SO		X	
3 AOI6_B006_PFAS_0-1_20220627		6/27/22		10:45:00 AM MF SO		X	
4 AOI6_B004_PFAS_0-1_20220627		6/27/22		10:10:00 AM MF SO		X	
5 AOI6_B010_PFAS_0-1_20220627		6/27/22		9:45:00 AM MF SO		X	
6 AOI6_B009_PFAS_0-1_20220627		6/27/22		11:30:00 AM MF SO		X	
7 AOI6_B018_PFAS_0-1_20220627		6/27/22		9:25:00 AM MF SO		X	
8 AOI6_B011_PFAS_0-1_20220627		6/27/22		9:00:00 AM MF SO		X	
9 AOI6_B020_PFAS_0-1_20220627		6/27/22		11:55:00 AM MF SO		X	
10 AOI6_B026_PFAS_0-1_20220627		6/27/22		12:10:00 PM MF SO		X	
11 AOI6_B016_PFAS_0-1_20220627		6/27/22		12:40:00 PM MF SO		X	
12 AOI6_B007_PFAS_0-1_20220627		6/27/22		1:35:00 PM MF SO		X	
Turnaround Time (Business days)		Approved By (SGS PM) / Date:		Data Obtainable Information		Comments / Special Instructions	
☐ Standard 10 Business Days ☐ 5 Business Days RUSH ☐ 3 Business Days RUSH ☐ 2 Business Days RUSH ☐ 1 Business Day EMERGENCY ☒ Other Due 7/14/2022		☐ Commercial "A" (Level 1) ☐ Commercial "B" (Level 2) ☐ FULLT1 (Level 3+4) ☐ NJ Reduced ☐ Commercial "C" ☐ Commercial "A" - Results Only ☐ Commercial "B" - Results + QC Summary ☐ Commercial "C" - Results + QC Summary + Partial Raw data		☐ NYASP Category A ☐ NYASP Category B ☐ State Forms ☐ EDD Format ☒ Other COMMB		INITIAL ASSESSMENT	
Emergency & Rush TATs are available via Lablink. Approval needed for RUSH/Emergency TAT.		Sample Custody must be documented below each time samples change possession, including courier delivery.		http://www.sgs.com/terms-and-conditions			
Relinquished By: 1 Enid Ann		Date / Time: 7/1/22 13:14		Received By: 2		Relinquished By: 3	
Relinquished By: 3		Date / Time:		Received By: 4		Relinquished By: 5	
Relinquished By: 5		Date / Time:		Received By: 6		Relinquished By: 7	
Custody Seal #		Intact ☐ Not Intact ☐		Preserved where applicable ☐ About ☐		Therm ID: ☐	
On Ice ☐		Cooler Temp: °C		1.8181			

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JD47653: Chain of Custody

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SGS Orlando, FL





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Client / Reporting Information		Project Information		Requested Analysis		Matrix Codes	
Company Name:		Project Name:		SGS Order #		JD47653	
Street Address:		SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philadelphia, PA		SGS Job #			
City State Zip:		Billing Information (if different from Report to)		Matrix Codes		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air WP - Wipe SOL - Field Blank EB - Equipment Blank RB - Rinsate Blank TB - Trip Blank	
Project Contact E-mail viktoriya.pushkova@sgs.com		Project #		City State Zip			
Phone #		Client Purchase Order #		City State Zip			
Sampler(s) Name(s)		Project Manager		Admission			
MF							
SGS Sample #	Field ID / Point of Collection	MECHNOI Val #	Collection	Sampled by	Matrix	# of bottles	Number of preserved bottles
13	AOIS_B013_PFAS_0-1_20220627		6/27/22 1:15:00 PM	MF	SO		
14	AOIS_B015_PFAS_0-1_20220627		6/27/22 2:15:00 PM	MF	SO		
15	AOIS_B016_PFAS_0-1_20220627		6/27/22 2:30:00 PM	MF	SO		
16	AOIS_B032-PFAS_0-1_20220628		6/28/22 2:20:00 PM	MF	SO		
17	AOIS_B017-PFAS_0-1_20220628		6/28/22 8:50:00 AM	MF	SO		
18	AOIS_B015-PFAS_0-1_20220628		6/28/22 10:30:00 AM	MF	SO		
19	AOIS_B008-PFAS_0-1_20220628		6/28/22 8:30:00 AM	MF	SO		
20	AOIS_B012-PFAS_0-1_20220628		6/28/22 1:10:00 PM	MF	SO		
21	AOIS_B014-PFAS_0-1_20220628		6/28/22 12:40:00 PM	MF	SO		
22	AOIS_B019-PFAS_0-1_20220628		6/28/22 12:20:00 PM	MF	SO		
23	AOIS_B022-PFAS_0-1_20220628		6/28/22 10:00:00 AM	MF	SO		
24	AOIS_B023-PFAS_0-1_20220628		6/28/22 10:15:00 AM	MF	SO		
Turnaround Time (Business days)		Data Deliverable Information		Comments / Special Instructions			
☐ Standard 10 Business Days ☐ 5 Business Days RUSH ☐ 3 Business Days RUSH ☐ 2 Business Days RUSH ☐ 1 Business Day EMERGENCY ☒ Other Due 7/14/2022		Approved By (SGS PM) / Date:		☐ Commercial "A" (Level 1) ☐ Commercial "B" (Level 2) ☐ FULLT1 (Level 3+4) ☐ NJ Reduced ☐ Commercial "C" ☐ NYASP Category A ☐ NYASP Category B ☐ State Forms ☐ EDD Format ☒ Other COMMB			
Emergency & Rush TAT data available via Lablink. Approval needed for RUSH/Emergency TAT.		Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC Summary + Partial Data only		http://www.sgs.com/en/terms-and-conditions			
Relinquished by:		Date / Time:		Relinquished By:		Date / Time:	
1		Received By:		2		Received By:	
3		Received By:		4		Received By:	
5		Received By:		Custody Seal #		On box	
				Intact		Therm ID	
				Not intact		Coden Temp. °C	
				Absent			

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Client / Reporting Information		Project Information										Requested Analysis										Matrix Codes
Company Name:		Project Name:										SGS Tracking #										Bottle Order Control #
Street Address		SANHPAFW Former Philadelphia Refinery, 3144 W. Passyunk Avenue, Philadelphia, PA										SGS Quote #										JD47653
City State Zip		Billing Information (if different from Report to)																				
Project Contact E-mail		Project #																				
viktortyja.pushkova@sgs.com		Street Address																				
Phone #		Client Purchase Order #																				
		City State Zip																				
Sample(s) Name(s)		Project Manager																				
MF		Attention																				
SGS Sample #		Collection																				
Field ID / Point of Collection		MECONDI Vial #																				
25		Date																				
AOI6_B027-PFAS_0-1_20220628		Time																				
26		Sampled by																				
AOI6_B025-PFAS_0-1_20220628		Matrix																				
27		# of bottles																				
AOI6_B031-PFAS_0-1_20220628		HCO																				
28		HCO2																				
AOI6_B028-PFAS_0-1_20220628		HCO3																				
29		HCO4																				
AOI6_B021-PFAS_0-1_20220628		HCO5																				
30		HCO6																				
AOI7_B002-PFAS_0-1_20220628		HCO7																				
31		HCO8																				
AOI7_B002-PFAS_0-1_20220628-DUP		HCO9																				
32		HCO10																				
AOI6_B024-PFAS_0-1_20220629		HCO11																				
33		HCO12																				
AOI6_B029-PFAS_0-1_20220629		HCO13																				
34		HCO14																				
AOI6_B033-PFAS_0-1_20220629		HCO15																				
35		HCO16																				
AOI6_B034-PFAS_0-1_20220629		HCO17																				
36		HCO18																				
AOI6_B036-PFAS_0-1_20220629		HCO19																				
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Client / Reporting Information				Project Information				Requested Analysis												Matrix Codes				
Company Name:				Project Name:				SGS Order Control #												JD47653				
Street Address:				Street:				SGS Quote #												SGS Job #				
City State Zip				City State Zip				Billing Information (if different from Report to)																
Project Contact E-mail				Project #				Company Name																
Phone #				Client Purchase Order #				Street Address																
Sampler(s) Name(s)				Project Manager				City State Zip																
MF				Attention:																				
Field ID / Point of Collection				MECH/DI Vial #				Collection												LAB USE ONLY				
Date				Time				Sampled by				Matrix				# of bottles								
37				6/29/22				8:55:00 AM				MF				SO				X				
38				6/29/22				10:55:00 AM				MF				SO				X				
39				6/29/22				10:55:00 AM				MF				SO				X				
40				6/29/22				2:10:00 PM				MF				SO				X				
41				6/29/22				2:25:00 PM				MF				SO				X				
42				6/29/22				2:45:00 PM				MF				SO				X				
43				6/29/22				1:40:00 PM				MF				SO				X				
44				6/29/22				12:30:00 PM				MF				SO				X				
45				6/29/22				1:15:00 PM				MF				SO				X				
46				6/29/22				12:45:00 PM				MF				SO				X				
47				6/30/22				8:10:00 AM				MF				SO				X				
48				6/30/22				8:30:00 AM				MF				SO				X				
Turnaround Time (Business days)				Data Deliverable Information				Comments / Special Instructions																
☐ Standard 10 Business Days				Approved By (SGS PM) / Date:				☐ Commercial "A" (Level 1)				☐ NYASP Category A												
☐ 5 Business Days RUSH								☐ Commercial "B" (Level 2)				☐ NYASP Category B												
☐ 3 Business Days RUSH								☐ FULLT1 (Level 3+4)				☐ State Forms												
☐ 2 Business Days RUSH								☐ NJ Reduced				☐ EDD Format												
☐ 1 Business Day EMERGENCY								☐ Commercial "C"				☒ Other COMM												
☒ Other Due 7/14/2022								Commercial "A" = Results Only																
Emergency & Rush TAT data available via Lablink. Approval needed for RUSH emergency TAT								Commercial "B" = Results + QC Summary																
Sample Custody must be documented below each time samples change possession, including courier delivery.																								
Relinquished By:				Date / Time:				Received By:				Date / Time:				Received By:								
1								2				7/1/22				2								
Relinquished By:				Date / Time:				Received By:				Date / Time:				Received By:								
3								3								4								
Relinquished By:				Date / Time:				Received By:				Date / Time:				Received By:								
5								5								4								
Custody Seal #				☐ Intact				☐ Not Intact				☐ Absent				Therm. ID								
				☐ Preserved where applicable												On Ice								
																Cooler Temp: °C								

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JD47653: Chain of Custody

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SGS Sample Receipt Summary

Job Number: JD47653 Client: DAYTON Project: SANHPAFW: FORMER PHILADELPHIA REFIN
 Date / Time Received: 7/2/2022 9:30:00 AM Delivery Method: FED EX Airbill #s:

Therm ID: IR 1; Therm CF: 0.4; # of Coolers: 1
 Cooler Temps (Raw Measured) °C: Cooler 1: (1.8);
 Cooler Temps (Corrected) °C: Cooler 1: (2.2);

Cooler Information

	Y	or	N
1. Custody Seals Present	☒		☐
2. Custody Seals Intact	☒		☐
3. Temp criteria achieved	☒		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information

	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☒
2. Trip Blank listed on COC	☐		☐	☒

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☒

Sample Information

	Y	or	N	N/A
1. Sample labels present on bottles	☒		☐	
2. Samples preserved properly	☒		☐	
3. Sufficient volume/containers recvd for analysis:	☒		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☒		☐	
6. Dates/Times/IDs on COC match Sample Label	☒		☐	
7. VOCs have headspace	☐		☐	☒
8. Bottles received for unspecified tests	☐		☒	
9. Compositing instructions clear	☐		☐	☒
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☒
11. % Solids Jar received?	☐		☐	☒
12. Residual Chlorine Present?	☐		☐	☒

Misc. Information

Number of Encores: 25-Gram 5-Gram Number of 5035 Field Kits: Number of Lab Filtered Metals:
 Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify)
 Residual Chlorine Test Strip Lot #:

Comments

SM001 Rev. Date 05/24/17 Technician: CARLOSD Date: 7/2/2022 9:30:00 AM Reviewer: Date:

JD47653: Chain of Custody

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MS Semi-volatiles

QC Data Summaries

(SGS Orlando, FL)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Isotope Dilution Standard Recovery Summaries

Method Blank Summary

Job Number: JD47653
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92071-MB	2Q95565.D	1	07/23/22	JB	07/13/22	OP92071	S2Q1335

The QC reported here applies to the following samples: Method: EPA 537M BY ID

JD47653-1, JD47653-2, JD47653-3, JD47653-4, JD47653-5, JD47653-6, JD47653-7, JD47653-8, JD47653-9, JD47653-10, JD47653-11, JD47653-12, JD47653-13, JD47653-14, JD47653-15, JD47653-16, JD47653-17, JD47653-18, JD47653-19, JD47653-20

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFHpA	108% 50-150%
	13C8-PFOA	110% 50-150%
	13C9-PFNA	106% 50-150%
	13C3-PFBS	100% 50-150%
	13C3-PFHxS	98% 50-150%
	13C8-PFOS	102% 50-150%

Method Blank Summary

Job Number: JD47653
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92112-MB	Q92161.D	1	07/22/22	NG	07/16/22	OP92112	SQ1991

The QC reported here applies to the following samples: Method: EPA 537M BY ID

JD47653-21, JD47653-22, JD47653-23, JD47653-24, JD47653-25, JD47653-26, JD47653-27, JD47653-28, JD47653-29, JD47653-30, JD47653-31, JD47653-32, JD47653-33, JD47653-34, JD47653-35, JD47653-36, JD47653-37, JD47653-38, JD47653-39, JD47653-40

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFHpA	91% 50-150%
	13C8-PFOA	87% 50-150%
	13C9-PFNA	90% 50-150%
	13C3-PFBS	88% 50-150%
	13C3-PFHxS	86% 50-150%
	13C8-PFOS	85% 50-150%

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92114-MB	Q92205.D	1	07/23/22	NG	07/16/22	OP92114	SQ1992

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-60, JD47653-61, JD47653-62, JD47653-63

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	88%	35-135%
	13C5-PFPeA	87%	50-150%
	13C5-PFHxA	89%	50-150%
	13C4-PFHpA	92%	50-150%
	13C8-PFOA	90%	50-150%
	13C9-PFNA	87%	50-150%
	13C6-PFDA	87%	50-150%
	13C7-PFUnDA	83%	40-140%
	13C2-PFDoDA	76%	40-140%
	13C2-PFTeDA	84%	30-130%
	13C3-PFBS	88%	50-150%
	13C3-PFHxS	85%	50-150%
	13C8-PFOS	90%	50-150%
	13C8-FOSA	79%	30-130%
	d3-MeFOSAA	86%	40-140%
	d5-EtFOSAA	80%	40-140%
	13C2-4:2FTS	83%	50-150%
	13C2-6:2FTS	86%	50-150%
	13C2-8:2FTS	81%	50-150%
	13C3-HFPO-DA	93%	50-150%

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92111-MB	3Q63491.D	1	07/29/22	MV	07/16/22	OP92111	S3Q869

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-41, JD47653-42, JD47653-43, JD47653-44, JD47653-45, JD47653-46, JD47653-47, JD47653-48, JD47653-49, JD47653-50, JD47653-51, JD47653-52, JD47653-53, JD47653-54, JD47653-55, JD47653-56, JD47653-57, JD47653-58, JD47653-59

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.50	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	0.50	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	0.50	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	0.50	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	0.50	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.50	0.20	ug/kg	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	78%	40-140%
	13C5-PFPeA	105%	50-150%
	13C5-PFHxA	106%	50-150%
	13C4-PFHpA	108%	50-150%
	13C8-PFOA	111%	50-150%
	13C9-PFNA	112%	50-150%
	13C6-PFDA	100%	50-150%
	13C7-PFUnDA	108%	40-140%
	13C2-PFDoDA	107%	40-140%
	13C2-PFTeDA	109%	30-130%
	13C3-PFBS	104%	50-150%
	13C3-PFHxS	108%	50-150%
	13C8-PFOS	107%	50-150%
	13C8-FOSA	118%	30-130%
	d3-MeFOSAA	128%	40-140%
	d5-EtFOSAA	131%	40-140%
	13C2-4:2FTS	100%	50-150%
	13C2-6:2FTS	110%	50-150%
	13C2-8:2FTS	114%	50-150%
	13C3-HFPO-DA	94%	50-150%

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Job Number: JD47653**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
SQ1991-IBLK	Q92126.D	1	07/22/22	NG	n/a	n/a	SQ1991

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47653-21, JD47653-22, JD47653-23, JD47653-24, JD47653-25, JD47653-26, JD47653-27, JD47653-28, JD47653-29, JD47653-32, JD47653-33, JD47653-34, JD47653-35, JD47653-36, JD47653-37, JD47653-38, JD47653-39, JD47653-40

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	98% 50-150%
	13C5-PFPeA	98% 50-150%
	13C5-PFHxA	100% 50-150%
	13C4-PFHpA	98% 50-150%
	13C8-PFOA	101% 50-150%
	13C9-PFNA	101% 50-150%
	13C6-PFDA	101% 50-150%
	13C7-PFUnDA	99% 50-150%
	13C2-PFDoDA	98% 50-150%
	13C2-PFTeDA	98% 50-150%
	13C3-PFBS	99% 50-150%
	13C3-PFHxS	97% 50-150%
	13C8-PFOS	99% 50-150%
	13C8-FOSA	103% 50-150%
	d3-MeFOSA	102% 50-150%
	d3-MeFOSAA	101% 50-150%
	d5-EtFOSAA	98% 50-150%
	13C2-4:2FTS	93% 50-150%
	13C2-6:2FTS	96% 50-150%
	13C2-8:2FTS	93% 50-150%
	13C3-HFPO-DA	100% 50-150%

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Job Number: JD47653**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
SQ1992-IBLK	Q92193.D	1	07/23/22	NG	n/a	n/a	SQ1992

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47653-21, JD47653-30, JD47653-31

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	99% 50-150%
	13C5-PFPeA	99% 50-150%
	13C5-PFHxA	100% 50-150%
	13C4-PFHpA	102% 50-150%
	13C8-PFOA	100% 50-150%
	13C9-PFNA	100% 50-150%
	13C6-PFDA	103% 50-150%
	13C7-PFUnDA	101% 50-150%
	13C2-PFDoDA	96% 50-150%
	13C2-PFTeDA	104% 50-150%
	13C3-PFBS	100% 50-150%
	13C3-PFHxS	94% 50-150%
	13C8-PFOS	106% 50-150%
	13C8-FOSA	107% 50-150%
	d3-MeFOSA	106% 50-150%
	d3-MeFOSAA	108% 50-150%
	d5-EtFOSAA	100% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	96% 50-150%
	13C2-8:2FTS	95% 50-150%
	13C3-HFPO-DA	107% 50-150%

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Job Number: JD47653**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
SQ1992-IBLK	Q92193.D	1	07/23/22	NG	n/a	n/a	SQ1992

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47653-60, JD47653-61, JD47653-62, JD47653-63

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	99%	50-150%
	13C5-PFPeA	99%	50-150%
	13C5-PFHxA	100%	50-150%
	13C4-PFHpA	102%	50-150%
	13C8-PFOA	100%	50-150%
	13C9-PFNA	100%	50-150%
	13C6-PFDA	103%	50-150%
	13C7-PFUnDA	101%	50-150%
	13C2-PFDoDA	96%	50-150%
	13C2-PFTeDA	104%	50-150%
	13C3-PFBS	100%	50-150%
	13C3-PFHxS	94%	50-150%
	13C8-PFOS	106%	50-150%
	13C8-FOSA	107%	50-150%
	d3-MeFOSA	106%	50-150%
	d3-MeFOSAA	108%	50-150%
	d5-EtFOSAA	100%	50-150%
	13C2-4:2FTS	90%	50-150%
	13C2-6:2FTS	96%	50-150%
	13C2-8:2FTS	95%	50-150%
	13C3-HFPO-DA	107%	50-150%

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Job Number: JD47653**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q1335-IBLK	2Q95560.D	1	07/23/22	JB	n/a	n/a	S2Q1335

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47653-1, JD47653-2, JD47653-3, JD47653-4, JD47653-5, JD47653-6, JD47653-7, JD47653-8, JD47653-9, JD47653-10, JD47653-11, JD47653-12, JD47653-13, JD47653-14, JD47653-15, JD47653-16, JD47653-17, JD47653-18, JD47653-19, JD47653-20

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	104% 50-150%
	13C5-PFPeA	108% 50-150%
	13C5-PFHxA	109% 50-150%
	13C4-PFHpA	112% 50-150%
	13C8-PFOA	112% 50-150%
	13C9-PFNA	110% 50-150%
	13C6-PFDA	114% 50-150%
	13C7-PFUnDA	127% 50-150%
	13C2-PFDoDA	123% 50-150%
	13C2-PFTeDA	112% 50-150%
	13C3-PFBS	104% 50-150%
	13C3-PFHxS	103% 50-150%
	13C8-PFOS	107% 50-150%
	13C8-FOSA	108% 50-150%
	d3-MeFOSA	110% 50-150%
	d3-MeFOSAA	127% 50-150%
	d5-EtFOSAA	126% 50-150%
	13C2-4:2FTS	105% 50-150%
	13C2-6:2FTS	109% 50-150%
	13C2-8:2FTS	113% 50-150%
	13C3-HFPO-DA	80% 50-150%

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Job Number: JD47653**Account:** ALNJ SGS Dayton, NJ**Project:** SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q869-IBLK	3Q63457.D	1	07/29/22	MV	n/a	n/a	S3Q869

The QC reported here applies to the following samples:**Method:** EPA 537M QSM5.3 B-15

JD47653-41, JD47653-42, JD47653-43, JD47653-44, JD47653-45, JD47653-46, JD47653-47, JD47653-48, JD47653-49, JD47653-50, JD47653-51, JD47653-52, JD47653-53, JD47653-54, JD47653-55, JD47653-56, JD47653-57, JD47653-58, JD47653-59

CAS No.	Compound	Result	RL	MDL	Units	Q
375-85-9	Perfluoroheptanoic acid	ND	1.0	0.25	ug/kg	
335-67-1	Perfluorooctanoic acid	ND	1.0	0.25	ug/kg	
375-95-1	Perfluorononanoic acid	ND	1.0	0.25	ug/kg	
375-73-5	Perfluorobutanesulfonic acid	ND	1.0	0.25	ug/kg	
355-46-4	Perfluorohexanesulfonic acid	ND	1.0	0.25	ug/kg	
1763-23-1	Perfluorooctanesulfonic acid	ND	1.0	0.25	ug/kg	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	87% 50-150%
	13C5-PFPeA	87% 50-150%
	13C5-PFHxA	88% 50-150%
	13C4-PFHpA	87% 50-150%
	13C8-PFOA	91% 50-150%
	13C9-PFNA	91% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	87% 50-150%
	13C2-PFDoDA	85% 50-150%
	13C2-PFTeDA	86% 50-150%
	13C3-PFBS	87% 50-150%
	13C3-PFHxS	89% 50-150%
	13C8-PFOS	89% 50-150%
	13C8-FOSA	95% 50-150%
	d3-MeFOSA	82% 50-150%
	d3-MeFOSAA	97% 50-150%
	d5-EtFOSAA	100% 50-150%
	13C2-4:2FTS	81% 50-150%
	13C2-6:2FTS	87% 50-150%
	13C2-8:2FTS	78% 50-150%
	13C3-HFPO-DA	100% 50-150%

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92071-BS	2Q95564.D	1	07/23/22	JB	07/13/22	OP92071	S2Q1335

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-1, JD47653-2, JD47653-3, JD47653-4, JD47653-5, JD47653-6, JD47653-7, JD47653-8, JD47653-9, JD47653-10, JD47653-11, JD47653-12, JD47653-13, JD47653-14, JD47653-15, JD47653-16, JD47653-17, JD47653-18, JD47653-19, JD47653-20

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	11.2	112	70-130
335-67-1	Perfluorooctanoic acid	10	11.1	111	70-130
375-95-1	Perfluorononanoic acid	10	10.6	106	70-130
375-73-5	Perfluorobutanesulfonic acid	10	11.0	110	70-130
355-46-4	Perfluorohexanesulfonic acid	10	11.2	112	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	11.9	119	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFHpA	104%	50-150%
	13C8-PFOA	106%	50-150%
	13C9-PFNA	104%	50-150%
	13C3-PFBS	101%	50-150%
	13C3-PFHxS	97%	50-150%
	13C8-PFOS	101%	50-150%

* = Outside of Control Limits.

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92112-BS	Q92160.D	1	07/22/22	NG	07/16/22	OP92112	SQ1991

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-21, JD47653-22, JD47653-23, JD47653-24, JD47653-25, JD47653-26, JD47653-27, JD47653-28, JD47653-29, JD47653-30, JD47653-31, JD47653-32, JD47653-33, JD47653-34, JD47653-35, JD47653-36, JD47653-37, JD47653-38, JD47653-39, JD47653-40

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	9.2	92	70-130
335-67-1	Perfluorooctanoic acid	10	9.6	96	70-130
375-95-1	Perfluorononanoic acid	10	9.1	91	70-130
375-73-5	Perfluorobutanesulfonic acid	10	9.9	99	70-130
355-46-4	Perfluorohexanesulfonic acid	10	9.7	97	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	8.9	89	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFHpA	79%	50-150%
	13C8-PFOA	75%	50-150%
	13C9-PFNA	80%	50-150%
	13C3-PFBS	79%	50-150%
	13C3-PFHxS	77%	50-150%
	13C8-PFOS	79%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92114-BS	Q92204.D	1	07/23/22	NG	07/16/22	OP92114	SQ1992

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-60, JD47653-61, JD47653-62, JD47653-63

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	0.08	0.0710	89	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0721	90	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0724	91	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0781	98	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0755	94	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0752	94	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	101%	35-135%
	13C5-PFPeA	100%	50-150%
	13C5-PFHxA	101%	50-150%
	13C4-PFHpA	104%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	100%	50-150%
	13C6-PFDA	97%	50-150%
	13C7-PFUnDA	94%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	92%	30-130%
	13C3-PFBS	102%	50-150%
	13C3-PFHxS	100%	50-150%
	13C8-PFOS	99%	50-150%
	13C8-FOSA	85%	30-130%
	d3-MeFOSAA	98%	40-140%
	d5-EtFOSAA	87%	40-140%
	13C2-4:2FTS	101%	50-150%
	13C2-6:2FTS	102%	50-150%
	13C2-8:2FTS	97%	50-150%
	13C3-HFPO-DA	96%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92111-BS	3Q63490.D	1	07/29/22	MV	07/16/22	OP92111	S3Q869

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-41, JD47653-42, JD47653-43, JD47653-44, JD47653-45, JD47653-46, JD47653-47, JD47653-48, JD47653-49, JD47653-50, JD47653-51, JD47653-52, JD47653-53, JD47653-54, JD47653-55, JD47653-56, JD47653-57, JD47653-58, JD47653-59

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
375-85-9	Perfluoroheptanoic acid	10	9.0	90	70-130
335-67-1	Perfluorooctanoic acid	10	9.0	90	70-130
375-95-1	Perfluorononanoic acid	10	9.0	90	70-130
375-73-5	Perfluorobutanesulfonic acid	10	9.1	91	70-130
355-46-4	Perfluorohexanesulfonic acid	10	9.1	91	70-130
1763-23-1	Perfluorooctanesulfonic acid	10	8.8	88	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	78%	40-140%
	13C5-PFPeA	107%	50-150%
	13C5-PFHxA	113%	50-150%
	13C4-PFHpA	114%	50-150%
	13C8-PFOA	118%	50-150%
	13C9-PFNA	120%	50-150%
	13C6-PFDA	104%	50-150%
	13C7-PFUnDA	117%	40-140%
	13C2-PFDoDA	118%	40-140%
	13C2-PFTeDA	119%	30-130%
	13C3-PFBS	105%	50-150%
	13C3-PFHxS	113%	50-150%
	13C8-PFOS	116%	50-150%
	13C8-FOSA	116%	30-130%
	d3-MeFOSAA	134%	40-140%
	d5-EtFOSAA	138%	40-140%
	13C2-4:2FTS	114%	50-150%
	13C2-6:2FTS	122%	50-150%
	13C2-8:2FTS	128%	50-150%
	13C3-HFPO-DA	99%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Page 1 of 1

Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92114-MS	Q92213.D	1	07/23/22	NG	07/16/22	OP92114	SQ1992
JD47661-2A	Q92212.D	1	07/23/22	NG	07/16/22	OP92114	SQ1992

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-60, JD47653-61, JD47653-62, JD47653-63

CAS No.	Compound	JD47661-2A ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
375-85-9	Perfluoroheptanoic acid	0.0055	0.167	0.156	90	70-130
335-67-1	Perfluorooctanoic acid	0.0134	0.167	0.173	96	70-130
375-95-1	Perfluorononanoic acid	ND	0.167	0.151	91	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0039	0.167	0.168	98	70-130
355-46-4	Perfluorohexanesulfonic acid	ND	0.167	0.163	98	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0039	0.167	0.161	94	70-130

CAS No.	ID Standard Recoveries	MS	JD47661-2A	Limits
	13C4-PFBA	101%	96%	35-135%
	13C5-PFPeA	101%	94%	50-150%
	13C5-PFHxA	95%	91%	50-150%
	13C4-PFHpA	99%	92%	50-150%
	13C8-PFOA	99%	94%	50-150%
	13C9-PFNA	103%	98%	50-150%
	13C6-PFDA	103%	102%	50-150%
	13C7-PFUnDA	103%	100%	40-140%
	13C2-PFDoDA	101%	98%	40-140%
	13C2-PFTeDA	107%	101%	30-130%
	13C3-PFBS	102%	94%	50-150%
	13C3-PFHxS	96%	86%	50-150%
	13C8-PFOS	98%	91%	50-150%
	13C8-FOSA	87%	86%	30-130%
	d3-MeFOSAA	119%	115%	40-140%
	d5-EtFOSAA	113%	109%	40-140%
	13C2-4:2FTS	106%	95%	50-150%
	13C2-6:2FTS	111%	102%	50-150%
	13C2-8:2FTS	116%	105%	50-150%
	13C3-HFPO-DA	94%		50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JD47653
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92071-MS	2Q95569.D	1	07/23/22	JB	07/13/22	OP92071	S2Q1335
OP92071-MSD	2Q95570.D	1	07/23/22	JB	07/13/22	OP92071	S2Q1335
JD47653-3	2Q95568.D	1	07/23/22	JB	07/13/22	OP92071	S2Q1335

The QC reported here applies to the following samples: Method: EPA 537M BY ID

JD47653-1, JD47653-2, JD47653-3, JD47653-4, JD47653-5, JD47653-6, JD47653-7, JD47653-8, JD47653-9, JD47653-10, JD47653-11, JD47653-12, JD47653-13, JD47653-14, JD47653-15, JD47653-16, JD47653-17, JD47653-18, JD47653-19, JD47653-20

CAS No.	Compound	JD47653-3 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
375-85-9	Perfluoroheptanoic acid	ND	11.4	11.9	104	11.5	12.4	107	4	70-130/30
335-67-1	Perfluorooctanoic acid	ND	11.4	11.9	104	11.5	12.1	105	2	70-130/30
375-95-1	Perfluorononanoic acid	ND	11.4	11.6	101	11.5	12.0	104	3	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND	11.4	11.7	102	11.5	12.1	105	3	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND	11.4	11.3	99	11.5	12.0	104	6	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND	11.4	12.2	107	11.5	12.8	111	5	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	JD47653-3	Limits
	13C4-PFHpA	113%	99%	92%	50-150%
	13C8-PFOA	114%	99%	93%	50-150%
	13C9-PFNA	109%	94%	88%	50-150%
	13C3-PFBS	108%	96%	89%	50-150%
	13C3-PFHxS	107%	92%	85%	50-150%
	13C8-PFOS	109%	94%	86%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92112-MS	Q92172.D	1	07/23/22	NG	07/16/22	OP92112	SQ1991
OP92112-MSD	Q92173.D	1	07/23/22	NG	07/16/22	OP92112	SQ1991
JD47653-28	Q92171.D	1	07/23/22	NG	07/16/22	OP92112	SQ1991

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-21, JD47653-22, JD47653-23, JD47653-24, JD47653-25, JD47653-26, JD47653-27, JD47653-28, JD47653-29, JD47653-30, JD47653-31, JD47653-32, JD47653-33, JD47653-34, JD47653-35, JD47653-36, JD47653-37, JD47653-38, JD47653-39, JD47653-40

CAS No.	Compound	JD47653-28 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
375-85-9	Perfluoroheptanoic acid	ND	12.4	11.1	89	12.2	10.8	89	3	70-130/30
335-67-1	Perfluorooctanoic acid	ND	12.4	11.2	90	12.2	11.0	90	2	70-130/30
375-95-1	Perfluorononanoic acid	ND	12.4	10.9	88	12.2	10.6	87	3	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND	12.4	11.6	93	12.2	12.3	101	6	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND	12.4	11.4	92	12.2	12.0	98	5	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.33	J 12.4	11.8	92	12.2	11.3	90	4	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	JD47653-28	Limits
	13C4-PFHpA	92%	86%	72%	50-150%
	13C8-PFOA	85%	80%	70%	50-150%
	13C9-PFNA	82%	76%	68%	50-150%
	13C3-PFBS	92%	82%	73%	50-150%
	13C3-PFHxS	87%	80%	69%	50-150%
	13C8-PFOS	80%	77%	68%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92111-MS	3Q63493.D	1	07/29/22	MV	07/16/22	OP92111	S3Q869
OP92111-MSD	3Q63494.D	1	07/29/22	MV	07/16/22	OP92111	S3Q869
JD47653-41	3Q63492.D	1	07/29/22	MV	07/16/22	OP92111	S3Q869

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-41, JD47653-42, JD47653-43, JD47653-44, JD47653-45, JD47653-46, JD47653-47, JD47653-48, JD47653-49, JD47653-50, JD47653-51, JD47653-52, JD47653-53, JD47653-54, JD47653-55, JD47653-56, JD47653-57, JD47653-58, JD47653-59

		JD47653-41	Spike	MS	MS	Spike	MSD	MSD		Limits	
CAS No.	Compound	ug/kg	Q	ug/kg	ug/kg	%	ug/kg	ug/kg	%	RPD	Rec/RPD
375-85-9	Perfluoroheptanoic acid	ND		11.3	10.0	89	11.4	10.1	89	1	70-130/30
335-67-1	Perfluorooctanoic acid	ND		11.3	10.2	90	11.4	10.2	89	0	70-130/30
375-95-1	Perfluorononanoic acid	1.6		11.3	11.6	89	11.4	11.5	87	1	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		11.3	10.2	90	11.4	10.1	89	1	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		11.3	10.4	92	11.4	10.4	91	0	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	2.7		11.3	11.9	82	11.4	12.0	82	1	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	JD47653-41	Limits
13C4-PFBA		71%	83%		40-140%
13C5-PFPeA		72%	83%		50-150%
13C5-PFHxA		75%	84%		50-150%
13C4-PFHpA		76%	86%	72%	50-150%
13C8-PFOA		79%	89%	79%	50-150%
13C9-PFNA		78%	88%	80%	50-150%
13C6-PFDA		70%	81%		50-150%
13C7-PFUnDA		80%	87%		40-140%
13C2-PFDoDA		85%	93%		40-140%
13C2-PFTeDA		89%	95%		30-130%
13C3-PFBS		86%	94%	97%	50-150%
13C3-PFHxS		87%	95%	98%	50-150%
13C8-PFOS		83%	90%	93%	50-150%
13C8-FOSA		47%	63%		30-130%
d3-MeFOSAA		86%	92%		40-140%
d5-EtFOSAA		90%	97%		40-140%
13C2-4:2FTS		83%	91%		50-150%
13C2-6:2FTS		91%	99%		50-150%
13C2-8:2FTS		88%	96%		50-150%
13C3-HFPO-DA		60%	70%		50-150%

* = Outside of Control Limits.

Duplicate Summary

Page 1 of 1

Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP92114-DUP	Q92218.D	1	07/23/22	NG	07/16/22	OP92114	SQ1992
JD47661-5A	Q92217.D	1	07/23/22	NG	07/16/22	OP92114	SQ1992

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

JD47653-60, JD47653-61, JD47653-62, JD47653-63

		JD47661-5A DUP				
CAS No.	Compound	ug/l	Q	ug/l	RPD	Limits
375-85-9	Perfluoroheptanoic acid	0.0050		0.0044	13	30
335-67-1	Perfluorooctanoic acid	0.0107		0.0118	10	30
375-95-1	Perfluorononanoic acid	ND		ND	nc	30
375-73-5	Perfluorobutanesulfonic acid	ND		ND	nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0023		0.0028	J 20	30
1763-23-1	Perfluorooctanesulfonic acid	0.0087		0.0090	3	30

CAS No.	ID Standard Recoveries	DUP	JD47661-5A Limits
	13C4-PFBA	124%	101% 35-135%
	13C5-PFPeA	122%	102% 50-150%
	13C5-PFHxA	122%	101% 50-150%
	13C4-PFHpA	129%	103% 50-150%
	13C8-PFOA	128%	101% 50-150%
	13C9-PFNA	125%	105% 50-150%
	13C6-PFDA	121%	105% 50-150%
	13C7-PFUnDA	121%	99% 40-140%
	13C2-PFDoDA	121%	94% 40-140%
	13C2-PFTeDA	112%	100% 30-130%
	13C3-PFBS	126%	97% 50-150%
	13C3-PFHxS	122%	99% 50-150%
	13C8-PFOS	121%	100% 50-150%
	13C8-FOSA	121%	103% 30-130%
	d3-MeFOSAA	125%	106% 40-140%
	d5-EtFOSAA	117%	104% 40-140%
	13C2-4:2FTS	123%	100% 50-150%
	13C2-6:2FTS	124%	98% 50-150%
	13C2-8:2FTS	114%	101% 50-150%
	13C3-HFPO-DA	115%	50-150%

* = Outside of Control Limits.

Isotope Dilution Standard Recovery Summary

Job Number: JD47653
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47653-60	Q92206.D	118	116	114	118	115	117
JD47653-61	Q92207.D	104	100	100	103	97	97
JD47653-62	Q92208.D	113	111	109	112	112	104
JD47653-63	Q92209.D	100	98	97	102	97	95
OP92114-BS	Q92204.D	104	101	100	102	100	99
OP92114-DUP	Q92218.D	129	128	125	126	122	121
OP92114-MB	Q92205.D	92	90	87	88	85	90
OP92114-MS	Q92213.D	99	99	103	102	96	98

Isotope Dilution Standards	Recovery Limits
S1 = 13C4-PFHpA	50-150%
S2 = 13C8-PFOA	50-150%
S3 = 13C9-PFNA	50-150%
S4 = 13C3-PFBS	50-150%
S5 = 13C3-PFHxS	50-150%
S6 = 13C8-PFOS	50-150%

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Isotope Dilution Standard Recovery Summary

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47653-1	2Q95566.D	104	106	100	99	97	97
JD47653-2	2Q95567.D	103	104	100	97	94	100
JD47653-3	2Q95568.D	92	93	88	89	85	86
JD47653-4	2Q95571.D	97	98	92	92	92	90
JD47653-5	2Q95572.D	98	99	94	96	96	92
JD47653-6	2Q95573.D	82	83	78	78	80	79
JD47653-7	2Q95576.D	97	98	94	95	92	94
JD47653-8	2Q95577.D	110	111	106	105	103	103
JD47653-9	2Q95578.D	107	108	103	105	104	102
JD47653-10	2Q95579.D	108	110	104	105	108	102
JD47653-11	2Q95580.D	102	102	95	99	98	94
JD47653-12	2Q95581.D	115	115	110	109	112	107
JD47653-13	2Q95582.D	100	103	98	98	99	97
JD47653-14	2Q95583.D	93	93	92	89	94	89
JD47653-15	2Q95584.D	106	108	104	104	106	101
JD47653-16	2Q95585.D	100	101	95	97	98	95
JD47653-17	2Q95588.D	89	85	71	94	92	77
JD47653-18	2Q95589.D	87	89	84	85	87	82
JD47653-19	2Q95590.D	93	94	88	91	92	86
JD47653-20	2Q95591.D	94	96	91	92	93	87
JD47653-21	Q92197.D	76	71	52	80	74	64
JD47653-21	Q92162.D	67	60	33* a	77	68	52
JD47653-22	Q92163.D	82	77	75	78	77	74
JD47653-23	Q92164.D	80	71	64	88	76	72
JD47653-24	Q92165.D	64	59	57	69	66	57
JD47653-25	Q92168.D	70	67	65	69	65	64
JD47653-26	Q92169.D	52	51	51	51	51	50
JD47653-27	Q92170.D	77	72	68	76	72	68
JD47653-28	Q92171.D	72	70	68	73	69	68
JD47653-29	Q92174.D	83	80	76	82	76	76
JD47653-30	Q92198.D	83	80	74	96	93	73
JD47653-31	Q92200.D	74	67	68	86	66	64
JD47653-32	Q92177.D	68	64	59	69	65	63
JD47653-33	Q92180.D	67	61	55	68	66	56
JD47653-34	Q92181.D	71	72	68	75	68	68
JD47653-35	Q92182.D	84	80	77	84	81	80
JD47653-36	Q92183.D	69	69	66	68	62	67
JD47653-37	Q92184.D	70	64	66	70	68	64
JD47653-38	Q92185.D	75	72	68	76	74	69
JD47653-39	Q92186.D	76	74	71	79	72	69

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Isotope Dilution Standard Recovery Summary

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Job Number: JD47653

Account: ALNJ SGS Dayton, NJ

Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JD47653-40	Q92187.D	80	74	73	78	76	73
JD47653-41	3Q63492.D	72	79	80	97	98	93
JD47653-42	3Q63565.D	81	83	73	83	83	73
JD47653-42	3Q63495.D	73	69	49* a	79	77	56
JD47653-43	3Q63498.D	73	73	62	75	74	64
JD47653-44	3Q63499.D	76	77	66	80	81	70
JD47653-45	3Q63570.D	89	90	75	92	91	81
JD47653-45	3Q63500.D	75	67	48* a	84	81	56
JD47653-46	3Q63501.D	75	79	76	79	80	78
JD47653-47	3Q63502.D	76	80	76	77	78	78
JD47653-48	3Q63503.D	74	76	71	76	76	72
JD47653-49	3Q63504.D	81	79	60	83	82	64
JD47653-50	3Q63575.D	86	82	64	91	91	69
JD47653-50	3Q63505.D	75	68	48* a	89	84	56
JD47653-51	3Q63506.D	66	68	62	67	66	63
JD47653-52	3Q63577.D	78	78	64	81	81	67
JD47653-52	3Q63507.D	76	68	45* a	91	84	55
JD47653-53	3Q63510.D	69	71	66	72	71	65
JD47653-54	3Q63581.D	76	77	69	79	79	74
JD47653-54	3Q63511.D	67	65	49* a	73	71	55
JD47653-55	3Q63512.D	66	67	59	67	67	60
JD47653-56	3Q63513.D	73	70	51	80	77	56
JD47653-57	3Q63514.D	58	61	57	62	62	61
JD47653-58	3Q63515.D	92	88	64	100	98	71
JD47653-59	3Q63516.D	86	85	66	89	88	71
OP92071-BS	2Q95564.D	104	106	104	101	97	101
OP92071-MB	2Q95565.D	108	110	106	100	98	102
OP92071-MS	2Q95569.D	113	114	109	108	107	109
OP92071-MSD	2Q95570.D	99	99	94	96	92	94
OP92111-BS	3Q63490.D	114	118	120	105	113	116
OP92111-MB	3Q63491.D	108	111	112	104	108	107
OP92111-MS	3Q63493.D	76	79	78	86	87	83
OP92111-MSD	3Q63494.D	86	89	88	94	95	90
OP92112-BS	Q92160.D	79	75	80	79	77	79
OP92112-MB	Q92161.D	91	87	90	88	86	85
OP92112-MS	Q92172.D	92	85	82	92	87	80
OP92112-MSD	Q92173.D	86	80	76	82	80	77

6.6.2

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Isotope Dilution Standard Recovery Summary

Job Number: JD47653
Account: ALNJ SGS Dayton, NJ
Project: SUNOCOSS: SANHPAFW:Former Philadelphia Refinery,3144 W. Passyunk Avenue, Philade

Method: EPA 537M BY ID	Matrix: SO
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Samples and QC shown here apply to the above method

Isotope Dilution Standards Recovery Limits

Isotope Dilution Standards Recovery Limits

S1 = 13C4-PFHpA	50-150%
S2 = 13C8-PFOA	50-150%
S3 = 13C9-PFNA	50-150%
S4 = 13C3-PFBS	50-150%
S5 = 13C3-PFHxS	50-150%
S6 = 13C8-PFOS	50-150%

(a) Outside control limits.

6.6.2
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