

Chemical Analysis Report

SE-DIST-2020-09-02-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **C-23 PFAS August 2020**

Request ID: **RQ-2020-08-24-27**

Customer: **SE-DIST**

Project ID: **DISTRICT**

Send Reports to:

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Date Certified: 24-SEP-2020 14:50



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical group are included in this report: Pesticides.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Eastern Canal Outfall

Collection Date/Time: 09/01/2020 10:10

Field ID: Eastern Canal Outfall

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193531	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	6.9		ng/L	P386776	
		Perfluorodecanoic acid (PFDA)**	2.2	I	ng/L	P386776	
		Perfluorododecanoic acid (PFDoA)**	1.0	U	ng/L	P386776	
		Perfluoroheptanoic acid (PFHpA)**	44		ng/L	P386776	
		Perfluorohexanesulfonic acid (PFHxS)**	49		ng/L	P386776	
		Perfluorohexanoic acid (PFHxA)**	45		ng/L	P386776	
		Perfluorononanoic acid (PFNA)**	13		ng/L	P386776	
		Perfluorooctanoic acid (PFOA)**	100		ng/L	P386776	
		Perfluorooctanesulfonic acid (PFOS)**	170		ng/L	P386776	
		Perfluoropentanoic acid (PFPeA)**	41		ng/L	P386776	
		Perfluorotetradecanoic acid (PFTeA)**	0.40	U	ng/L	P386776	
		Perfluorotridecanoic acid (PFTriA)**	0.40	U	ng/L	P386776	
		Perfluoroundecanoic acid (PFUnA)**	1.0	U	ng/L	P386776	
		N-Me perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		N-Et perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	2.0	UJ	ng/L	P386776	MS
		Perfluoropentanesulfonic acid (PFPeS)**	4.5		ng/L	P386776	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	4.0	U	ng/L	P386776	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	2.0	U	ng/L	P386776	
		Perfluoroheptanesulfonic acid (PFHpS)**	4.1		ng/L	P386776	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P386776	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P386776	
		Hexafluoropropylene oxide dimer acid**	1.0	U	ng/L	P386776	
2193537	SM 2540 G (20th)	% Solid	78.1		%	P387432	
2193543	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	0.14	U	ug/Kg	P387530	
		Perfluorodecanoic acid (PFDA)**	0.14	U	ug/Kg	P387530	
		Perfluorododecanoic acid (PFDoA)**	0.14	U	ug/Kg	P387530	
		Perfluoroheptanoic acid (PFHpA)**	0.28	U	ug/Kg	P387530	
		Perfluorohexanesulfonic acid (PFHxS)**	0.14	U	ug/Kg	P387530	
		Perfluorohexanoic acid (PFHxA)**	0.28	U	ug/Kg	P387530	
		Perfluorononanoic acid (PFNA)**	0.14	U	ug/Kg	P387530	
		Perfluorooctanesulfonic acid (PFOS)**	0.28	U	ug/Kg	P387530	
		Perfluorooctanoic acid (PFOA)**	0.14	U	ug/Kg	P387530	
		Perfluorotetradecanoic acid (PFTeA)**	0.14	U	ug/Kg	P387530	
		Perfluorotridecanoic acid (PFTriA)**	0.14	U	ug/Kg	P387530	
		Perfluoroundecanoic acid (PFUnA)**	0.14	U	ug/Kg	P387530	
		N-Me perfluorooctanesulfonamidoAc acid**	0.14	U	ug/Kg	P387530	
		N-Et perfluorooctanesulfonamidoAc acid**	0.14	U	ug/Kg	P387530	
		Perfluoropentanoic acid (PFPeA)**	0.57	U	ug/Kg	P387530	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	0.28	U	ug/Kg	P387530	

Field ID: Eastern Canal Outfall

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193543	EPA 8321B	Perfluoropentanesulfonic acid (PFPeS)**	0.14	U	ug/Kg	P387530	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	0.57	U	ug/Kg	P387530	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	0.28	U	ug/Kg	P387530	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.14	U	ug/Kg	P387530	
		Perfluorononanesulfonic acid (PFNS)**	0.14	U	ug/Kg	P387530	
		Perfluorodecanesulfonic acid (PFDS)**	0.14	U	ug/Kg	P387530	
		Hexafluoropropylene oxide dimer acid**	0.14	U	ug/Kg	P387530	

Ref. Method and Comment:

EPA 8321B: MS accuracy for some analytes could not be assessed due to a high concentration of parameters in the spiked sample. Refer to the Lab Analysis Report for an explanation of QC Codes.

Sample Location: Eastern Canal #2

Collection Date/Time: 09/01/2020 10:40

Field ID: Eastern Canal #2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193532	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	5.4		ng/L	P386776	
		Perfluorodecanoic acid (PFDA)**	1.4	I	ng/L	P386776	
		Perfluorododecanoic acid (PFDoA)**	1.0	U	ng/L	P386776	
		Perfluoroheptanoic acid (PFHpA)**	45		ng/L	P386776	
		Perfluorohexanesulfonic acid (PFHxS)**	43		ng/L	P386776	
		Perfluorohexanoic acid (PFHxA)**	41		ng/L	P386776	
		Perfluorononanoic acid (PFNA)**	11		ng/L	P386776	
		Perfluorooctanoic acid (PFOA)**	110		ng/L	P386776	
		Perfluorooctanesulfonic acid (PFOS)**	140		ng/L	P386776	
		Perfluoropentanoic acid (PFPeA)**	39		ng/L	P386776	
		Perfluorotetradecanoic acid (PFTeA)**	0.40	U	ng/L	P386776	
		Perfluorotridecanoic acid (PFTriA)**	0.40	U	ng/L	P386776	
		Perfluoroundecanoic acid (PFUnA)**	1.0	U	ng/L	P386776	
		N-Me perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		N-Et perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	2.0	U	ng/L	P386776	MS
		Perfluoropentanesulfonic acid (PFPeS)**	4.4		ng/L	P386776	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	4.0	U	ng/L	P386776	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	2.0	U	ng/L	P386776	
		Perfluoroheptanesulfonic acid (PFHpS)**	3.6		ng/L	P386776	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P386776	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P386776	
		Hexafluoropropylene oxide dimer acid**	1.0	U	ng/L	P386776	
2193538	SM 2540 G (20th)	% Solid	80.6		%	P387432	
2193544	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	0.13	U	ug/Kg	P387530	
		Perfluorodecanoic acid (PFDA)**	0.13	U	ug/Kg	P387530	
		Perfluorododecanoic acid (PFDoA)**	0.13	U	ug/Kg	P387530	
		Perfluoroheptanoic acid (PFHpA)**	0.25	U	ug/Kg	P387530	
		Perfluorohexanesulfonic acid (PFHxS)**	0.13	U	ug/Kg	P387530	
		Perfluorohexanoic acid (PFHxA)**	0.25	U	ug/Kg	P387530	
		Perfluorononanoic acid (PFNA)**	0.13	U	ug/Kg	P387530	
		Perfluorooctanesulfonic acid (PFOS)**	0.25	U	ug/Kg	P387530	
		Perfluorooctanoic acid (PFOA)**	0.13	U	ug/Kg	P387530	
		Perfluorotetradecanoic acid (PFTeA)**	0.13	U	ug/Kg	P387530	
		Perfluorotridecanoic acid (PFTriA)**	0.13	U	ug/Kg	P387530	
		Perfluoroundecanoic acid (PFUnA)**	0.13	U	ug/Kg	P387530	
		N-Me perfluorooctanesulfonamidoAc acid**	0.13	U	ug/Kg	P387530	
		N-Et perfluorooctanesulfonamidoAc acid**	0.13	U	ug/Kg	P387530	
		Perfluoropentanoic acid (PFPeA)**	0.50	U	ug/Kg	P387530	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	0.25	U	ug/Kg	P387530	

Field ID: Eastern Canal #2

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193544	EPA 8321B	Perfluoropentanesulfonic acid (PFPeS)**	0.13	U	ug/Kg	P387530	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	0.50	U	ug/Kg	P387530	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	0.25	U	ug/Kg	P387530	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.13	U	ug/Kg	P387530	
		Perfluorononanesulfonic acid (PFNS)**	0.13	U	ug/Kg	P387530	
		Perfluorodecanesulfonic acid (PFDS)**	0.13	U	ug/Kg	P387530	
		Hexafluoropropylene oxide dimer acid**	0.13	U	ug/Kg	P387530	

Ref. Method and Comment:
 EPA 8321B: MS accuracy for some analytes could not be assessed due to a high concentration of parameters in the spiked sample.

Sample Location: FRB

Collection Date/Time: 09/01/2020 10:50

Field ID: FRB

Matrix: W-FRB

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193536	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	0.40	U	ng/L	P386776	
		Perfluorodecanoic acid (PFDA)**	1.0	U	ng/L	P386776	
		Perfluorododecanoic acid (PFDoA)**	1.0	U	ng/L	P386776	
		Perfluoroheptanoic acid (PFHpA)**	2.0	U	ng/L	P386776	
		Perfluorohexanesulfonic acid (PFHxS)**	0.40	U	ng/L	P386776	
		Perfluorohexanoic acid (PFHxA)**	2.0	U	ng/L	P386776	
		Perfluorononanoic acid (PFNA)**	1.0	U	ng/L	P386776	
		Perfluorooctanoic acid (PFOA)**	1.0	U	ng/L	P386776	
		Perfluorooctanesulfonic acid (PFOS)**	2.0	U	ng/L	P386776	
		Perfluoropentanoic acid (PFPeA)**	4.0	U	ng/L	P386776	
		Perfluorotetradecanoic acid (PFTeA)**	0.40	U	ng/L	P386776	
		Perfluorotridecanoic acid (PFTriA)**	0.40	U	ng/L	P386776	
		Perfluoroundecanoic acid (PFUnA)**	1.0	U	ng/L	P386776	
		N-Me perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		N-Et perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	2.0	U	ng/L	P386776	MS
		Perfluoropentanesulfonic acid (PFPeS)**	0.40	U	ng/L	P386776	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	4.0	U	ng/L	P386776	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	2.0	U	ng/L	P386776	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.40	U	ng/L	P386776	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P386776	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P386776	
		Hexafluoropropylene oxide dimer acid**	1.0	U	ng/L	P386776	

Ref. Method and Comment:

EPA 8321B: MS accuracy for some analytes could not be assessed due to a high concentration of parameters in the spiked sample.

Sample Location: Eastern 2nd Canal

Collection Date/Time: 09/01/2020 11:00

Field ID: Eastern 2nd Canal

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193533	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	34		ng/L	P386776	
		Perfluorodecanoic acid (PFDA)**	1.0	U	ng/L	P386776	
		Perfluorododecanoic acid (PFDoA)**	1.0	U	ng/L	P386776	
		Perfluoroheptanoic acid (PFHpA)**	13		ng/L	P386776	
		Perfluorohexanesulfonic acid (PFHxS)**	4.4		ng/L	P386776	
		Perfluorohexanoic acid (PFHxA)**	11		ng/L	P386776	
		Perfluorononanoic acid (PFNA)**	2.1	I	ng/L	P386776	
		Perfluorooctanoic acid (PFOA)**	20		ng/L	P386776	
		Perfluorooctanesulfonic acid (PFOS)**	19		ng/L	P386776	
		Perfluoropentanoic acid (PFPeA)**	13	I	ng/L	P386776	
		Perfluorotetradecanoic acid (PFTeA)**	0.40	U	ng/L	P386776	
		Perfluorotridecanoic acid (PFTriA)**	0.40	U	ng/L	P386776	
		Perfluoroundecanoic acid (PFUnA)**	1.0	U	ng/L	P386776	
		N-Me perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		N-Et perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	2.0	U	ng/L	P386776	MS
		Perfluoropentanesulfonic acid (PFPeS)**	0.66	I	ng/L	P386776	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	4.0	U	ng/L	P386776	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	2.0	U	ng/L	P386776	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.72	I	ng/L	P386776	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P386776	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P386776	
		Hexafluoropropylene oxide dimer acid**	1.0	U	ng/L	P386776	
2193540	SM 2540 G (20th)	% Solid	77.3		%	P387432	
2193545	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	0.14	U	ug/Kg	P387530	
		Perfluorodecanoic acid (PFDA)**	0.14	U	ug/Kg	P387530	
		Perfluorododecanoic acid (PFDoA)**	0.14	U	ug/Kg	P387530	
		Perfluoroheptanoic acid (PFHpA)**	0.28	U	ug/Kg	P387530	
		Perfluorohexanesulfonic acid (PFHxS)**	0.14	U	ug/Kg	P387530	
		Perfluorohexanoic acid (PFHxA)**	0.28	U	ug/Kg	P387530	
		Perfluorononanoic acid (PFNA)**	0.14	U	ug/Kg	P387530	
		Perfluorooctanesulfonic acid (PFOS)**	0.28	U	ug/Kg	P387530	
		Perfluorooctanoic acid (PFOA)**	0.14	U	ug/Kg	P387530	
		Perfluorotetradecanoic acid (PFTeA)**	0.14	U	ug/Kg	P387530	
		Perfluorotridecanoic acid (PFTriA)**	0.14	U	ug/Kg	P387530	
		Perfluoroundecanoic acid (PFUnA)**	0.14	U	ug/Kg	P387530	
		N-Me perfluorooctanesulfonamidoAc acid**	0.14	U	ug/Kg	P387530	
		N-Et perfluorooctanesulfonamidoAc acid**	0.14	U	ug/Kg	P387530	
		Perfluoropentanoic acid (PFPeA)**	0.56	U	ug/Kg	P387530	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	0.28	U	ug/Kg	P387530	

Field ID: Eastern 2nd Canal

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193545	EPA 8321B	Perfluoropentanesulfonic acid (PFPeS)**	0.14	U	ug/Kg	P387530	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	0.56	U	ug/Kg	P387530	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	0.28	U	ug/Kg	P387530	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.14	U	ug/Kg	P387530	
		Perfluorononanesulfonic acid (PFNS)**	0.14	U	ug/Kg	P387530	
		Perfluorodecanesulfonic acid (PFDS)**	0.14	U	ug/Kg	P387530	
		Hexafluoropropylene oxide dimer acid**	0.14	U	ug/Kg	P387530	

Ref. Method and Comment:

EPA 8321B: MS accuracy for some analytes could not be assessed due to a high concentration of parameters in the spiked sample.

Sample Location: Eastern Canal #3

Collection Date/Time: 09/01/2020 11:20

Field ID: Eastern Canal #3

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193534	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	6.3		ng/L	P386776	
		Perfluorodecanoic acid (PFDA)**	1.8	I	ng/L	P386776	
		Perfluorododecanoic acid (PFDoA)**	1.0	U	ng/L	P386776	
		Perfluoroheptanoic acid (PFHpA)**	45		ng/L	P386776	
		Perfluorohexanesulfonic acid (PFHxS)**	47		ng/L	P386776	
		Perfluorohexanoic acid (PFHxA)**	44		ng/L	P386776	
		Perfluorononanoic acid (PFNA)**	12		ng/L	P386776	
		Perfluorooctanoic acid (PFOA)**	99		ng/L	P386776	
		Perfluorooctanesulfonic acid (PFOS)**	130		ng/L	P386776	
		Perfluoropentanoic acid (PFPeA)**	40		ng/L	P386776	
		Perfluorotetradecanoic acid (PFTeA)**	0.40	U	ng/L	P386776	
		Perfluorotridecanoic acid (PFTriA)**	0.40	U	ng/L	P386776	
		Perfluoroundecanoic acid (PFUnA)**	1.0	U	ng/L	P386776	
		N-Me perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		N-Et perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	2.0	U	ng/L	P386776	MS
		Perfluoropentanesulfonic acid (PFPeS)**	4.5		ng/L	P386776	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	15	I	ng/L	P386776	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	2.0	U	ng/L	P386776	
		Perfluoroheptanesulfonic acid (PFHpS)**	3.9		ng/L	P386776	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P386776	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P386776	
		Hexafluoropropylene oxide dimer acid**	1.0	U	ng/L	P386776	
2193541	SM 2540 G (20th)	% Solid	80.1		%	P387432	
2193546	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	0.13	U	ug/Kg	P387530	
		Perfluorodecanoic acid (PFDA)**	0.13	U	ug/Kg	P387530	
		Perfluorododecanoic acid (PFDoA)**	0.13	U	ug/Kg	P387530	
		Perfluoroheptanoic acid (PFHpA)**	0.26	U	ug/Kg	P387530	
		Perfluorohexanesulfonic acid (PFHxS)**	0.13	U	ug/Kg	P387530	
		Perfluorohexanoic acid (PFHxA)**	0.26	U	ug/Kg	P387530	
		Perfluorononanoic acid (PFNA)**	0.13	U	ug/Kg	P387530	
		Perfluorooctanesulfonic acid (PFOS)**	0.26	U	ug/Kg	P387530	
		Perfluorooctanoic acid (PFOA)**	0.13	U	ug/Kg	P387530	
		Perfluorotetradecanoic acid (PFTeA)**	0.13	U	ug/Kg	P387530	
		Perfluorotridecanoic acid (PFTriA)**	0.13	U	ug/Kg	P387530	
		Perfluoroundecanoic acid (PFUnA)**	0.13	U	ug/Kg	P387530	
		N-Me perfluorooctanesulfonamidoAc acid**	0.13	U	ug/Kg	P387530	
		N-Et perfluorooctanesulfonamidoAc acid**	0.13	U	ug/Kg	P387530	
		Perfluoropentanoic acid (PFPeA)**	0.52	U	ug/Kg	P387530	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	0.26	U	ug/Kg	P387530	

Field ID: Eastern Canal #3

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193546	EPA 8321B	Perfluoropentanesulfonic acid (PFPeS)**	0.13	U	ug/Kg	P387530	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	0.52	U	ug/Kg	P387530	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	0.26	U	ug/Kg	P387530	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.13	U	ug/Kg	P387530	
		Perfluorononanesulfonic acid (PFNS)**	0.13	U	ug/Kg	P387530	
		Perfluorodecanesulfonic acid (PFDS)**	0.13	U	ug/Kg	P387530	
		Hexafluoropropylene oxide dimer acid**	0.13	U	ug/Kg	P387530	

Ref. Method and Comment:

EPA 8321B: MS accuracy for some analytes could not be assessed due to a high concentration of parameters in the spiked sample.

Sample Location: Eastern Canal #3 Replicate

Collection Date/Time: 09/01/2020 11:25

Field ID: Eastern Canal #3 Replicate

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2193535	EPA 8321B	Perfluorobutanesulfonic acid (PFBS)**	6.1		ng/L	P386776	
		Perfluorodecanoic acid (PFDA)**	1.6	I	ng/L	P386776	
		Perfluorododecanoic acid (PFDoA)**	1.0	U	ng/L	P386776	
		Perfluoroheptanoic acid (PFHpA)**	49		ng/L	P386776	
		Perfluorohexanesulfonic acid (PFHxS)**	49		ng/L	P386776	
		Perfluorohexanoic acid (PFHxA)**	44		ng/L	P386776	
		Perfluorononanoic acid (PFNA)**	12		ng/L	P386776	
		Perfluorooctanoic acid (PFOA)**	91		ng/L	P386776	
		Perfluorooctanesulfonic acid (PFOS)**	140		ng/L	P386776	
		Perfluoropentanoic acid (PFPeA)**	37		ng/L	P386776	
		Perfluorotetradecanoic acid (PFTeA)**	0.40	U	ng/L	P386776	
		Perfluorotridecanoic acid (PFTriA)**	0.40	U	ng/L	P386776	
		Perfluoroundecanoic acid (PFUnA)**	1.0	U	ng/L	P386776	
		N-Me perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		N-Et perfluorooctanesulfonamidoAc acid**	0.40	U	ng/L	P386776	
		4:2 Fluorotelomer sulfonate (4:2 FTS)**	2.0	U	ng/L	P386776	MS
		Perfluoropentanesulfonic acid (PFPeS)**	4.7		ng/L	P386776	
		6:2 Fluorotelomer sulfonate (6:2 FTS)**	6.4	I	ng/L	P386776	
		8:2 Fluorotelomer sulfonate (8:2 FTS)**	2.0	U	ng/L	P386776	
		Perfluoroheptanesulfonic acid (PFHpS)**	4.0		ng/L	P386776	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P386776	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P386776	
		Hexafluoropropylene oxide dimer acid**	1.0	U	ng/L	P386776	

Ref. Method and Comment:

EPA 8321B: MS accuracy for some analytes could not be assessed due to a high concentration of parameters in the spiked sample.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 8321B

Batch ID: P386776

Component	Result	Code	Units
4:2 Fluorotelomer sulfonate (4:2 FTS)	2.0	U	ng/L
6:2 Fluorotelomer sulfonate (6:2 FTS)	4.0	U	ng/L
8:2 Fluorotelomer sulfonate (8:2 FTS)	2.0	U	ng/L
Hexafluoropropylene oxide dimer acid	1.0	U	ng/L
N-Et perfluorooctanesulfonamidoAc acid	0.40	U	ng/L
N-Me perfluorooctanesulfonamidoAc acid	0.40	U	ng/L
Perfluorobutanesulfonic acid (PFBS)	0.40	U	ng/L
Perfluorodecanesulfonic acid (PFDS)	0.40	U	ng/L
Perfluorodecanoic acid (PFDA)	1.0	U	ng/L
Perfluorododecanoic acid (PFDoA)	1.0	U	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	0.40	U	ng/L
Perfluoroheptanoic acid (PFHpA)	2.0	U	ng/L
Perfluorohexanesulfonic acid (PFHxS)	0.40	U	ng/L
Perfluorohexanoic acid (PFHxA)	2.0	U	ng/L
Perfluorononanesulfonic acid (PFNS)	0.40	U	ng/L
Perfluorononanoic acid (PFNA)	1.0	U	ng/L
Perfluorooctanesulfonic acid (PFOS)	2.0	U	ng/L
Perfluorooctanoic acid (PFOA)	1.0	U	ng/L
Perfluoropentanesulfonic acid (PFPeS)	0.40	U	ng/L
Perfluoropentanoic acid (PFPeA)	4.0	U	ng/L
Perfluorotetradecanoic acid (PFTeA)	0.40	U	ng/L
Perfluorotridecanoic acid (PFTriA)	0.40	U	ng/L
Perfluoroundecanoic acid (PFUnA)	1.0	U	ng/L

Reference Method: EPA 8321B

Batch ID: P387530

Component	Result	Code	Units
4:2 Fluorotelomer sulfonate (4:2 FTS)	0.18	U	ug/Kg
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.37	U	ug/Kg
8:2 Fluorotelomer sulfonate (8:2 FTS)	0.18	U	ug/Kg
Hexafluoropropylene oxide dimer acid	0.092	U	ug/Kg
N-Et perfluorooctanesulfonamidoAc acid	0.092	U	ug/Kg
N-Me perfluorooctanesulfonamidoAc acid	0.092	U	ug/Kg
Perfluorobutanesulfonic acid (PFBS)	0.092	U	ug/Kg
Perfluorodecanesulfonic acid (PFDS)	0.092	U	ug/Kg
Perfluorodecanoic acid (PFDA)	0.092	U	ug/Kg
Perfluorododecanoic acid (PFDoA)	0.092	U	ug/Kg
Perfluoroheptanesulfonic acid (PFHpS)	0.092	U	ug/Kg
Perfluoroheptanoic acid (PFHpA)	0.18	U	ug/Kg
Perfluorohexanesulfonic acid (PFHxS)	0.092	U	ug/Kg
Perfluorohexanoic acid (PFHxA)	0.18	U	ug/Kg
Perfluorononanesulfonic acid (PFNS)	0.092	U	ug/Kg
Perfluorononanoic acid (PFNA)	0.092	U	ug/Kg
Perfluorooctanesulfonic acid (PFOS)	0.18	U	ug/Kg
Perfluorooctanoic acid (PFOA)	0.092	U	ug/Kg
Perfluoropentanesulfonic acid (PFPeS)	0.092	U	ug/Kg
Perfluoropentanoic acid (PFPeA)	0.37	U	ug/Kg
Perfluorotetradecanoic acid (PFTeA)	0.092	U	ug/Kg
Perfluorotridecanoic acid (PFTriA)	0.092	U	ug/Kg
Perfluoroundecanoic acid (PFUnA)	0.092	U	ug/Kg

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 8321B

Batch ID: P386776

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
4:2 Fluorotelomer sulfonate (4:2 FTS)	104		P	30 - 160
6:2 Fluorotelomer sulfonate (6:2 FTS)	106		P	30 - 160
8:2 Fluorotelomer sulfonate (8:2 FTS)	103		P	30 - 160
Hexafluoropropylene oxide dimer acid	99.5		P	30 - 160
N-Et perfluorooctanesulfonamidoAc acid	119		P	30 - 160
N-Me perfluorooctanesulfonamidoAc acid	112		P	30 - 160
Perfluorobutanesulfonic acid (PFBS)	97.0		P	30 - 160
Perfluorodecanesulfonic acid (PFDS)	89.4		P	30 - 160
Perfluorodecanoic acid (PFDA)	101		P	30 - 160
Perfluorododecanoic acid (PFDoA)	78.2		P	30 - 160
Perfluoroheptanesulfonic acid (PFHpS)	91.0		P	30 - 160
Perfluoroheptanoic acid (PFHpA)	115		P	30 - 160
Perfluorohexanesulfonic acid (PFHxS)	110		P	30 - 160
Perfluorohexanoic acid (PFHxA)	101		P	30 - 160
Perfluorononanesulfonic acid (PFNS)	102		P	30 - 160
Perfluorononanoic acid (PFNA)	130		P	30 - 160
Perfluorooctanesulfonic acid (PFOS)	107		P	30 - 160
Perfluorooctanoic acid (PFOA)	108		P	30 - 160
Perfluoropentanesulfonic acid (PFPeS)	105		P	30 - 160
Perfluoropentanoic acid (PFPeA)	112		P	30 - 160
Perfluorotetradecanoic acid (PFTeA)	84.2		P	30 - 160
Perfluorotridecanoic acid (PFTriA)	84.2		P	30 - 160
Perfluoroundecanoic acid (PFUnA)	95.0		P	30 - 160

Reference Method: EPA 8321B

Batch ID: P387530

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
4:2 Fluorotelomer sulfonate (4:2 FTS)	123		P	40 - 160
6:2 Fluorotelomer sulfonate (6:2 FTS)	126		P	40 - 160
8:2 Fluorotelomer sulfonate (8:2 FTS)	123		P	40 - 160
Hexafluoropropylene oxide dimer acid	125		P	40 - 160
N-Et perfluorooctanesulfonamidoAc acid	108		P	40 - 160
N-Me perfluorooctanesulfonamidoAc acid	115		P	40 - 160
Perfluorobutanesulfonic acid (PFBS)	127		P	40 - 160
Perfluorodecanesulfonic acid (PFDS)	116		P	40 - 160
Perfluorodecanoic acid (PFDA)	111		P	40 - 160
Perfluorododecanoic acid (PFDoA)	124		P	40 - 160
Perfluoroheptanesulfonic acid (PFHpS)	129		P	40 - 160
Perfluoroheptanoic acid (PFHpA)	119		P	40 - 160
Perfluorohexanesulfonic acid (PFHxS)	127		P	40 - 160
Perfluorohexanoic acid (PFHxA)	141		P	40 - 160
Perfluorononanesulfonic acid (PFNS)	112		P	40 - 160
Perfluorononanoic acid (PFNA)	118		P	40 - 160
Perfluorooctanesulfonic acid (PFOS)	112		P	40 - 160
Perfluorooctanoic acid (PFOA)	127		P	40 - 160
Perfluoropentanesulfonic acid (PFPeS)	129		P	40 - 160
Perfluoropentanoic acid (PFPeA)	122		P	40 - 160
Perfluorotetradecanoic acid (PFTeA)	134		P	40 - 160
Perfluorotridecanoic acid (PFTriA)	120		P	40 - 160
Perfluoroundecanoic acid (PFUnA)	121		P	40 - 160

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 8321B

Batch ID: P386776

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193531	4:2 Fluorotelomer sulfonate (4:2 FTS)	164	127	F/P	30 - 160
2193531	6:2 Fluorotelomer sulfonate (6:2 FTS)	117	112	P/P	30 - 160
2193531	8:2 Fluorotelomer sulfonate (8:2 FTS)	89.9	84.5	P/P	30 - 160
2193531	Hexafluoropropylene oxide dimer acid	110	96.3	P/P	30 - 160
2193531	N-Et perfluorooctanesulfonamidoAc acid	105	99.3	P/P	30 - 160
2193531	N-Me perfluorooctanesulfonamidoAc acid	91.6	104	P/P	30 - 160
2193531	Perfluorobutanesulfonic acid (PFBS)	115	77.7	P/P	30 - 160
2193531	Perfluorodecanesulfonic acid (PFDS)	77.9	74.2	P/P	30 - 160
2193531	Perfluorodecanoic acid (PFDA)	84.6	91.6	P/P	30 - 160
2193531	Perfluorododecanoic acid (PFDoA)	86.5	88.4	P/P	30 - 160
2193531	Perfluoroheptanesulfonic acid (PFHpS)	83.3	83.5	P/P	30 - 160
2193531	Perfluorononanesulfonic acid (PFNS)	95.2	89.2	P/P	30 - 160
2193531	Perfluorononanoic acid (PFNA)	77.1	95.1	P/P	30 - 160
2193531	Perfluoropentanesulfonic acid (PFPeS)	90.8	92.4	P/P	30 - 160
2193531	Perfluorotetradecanoic acid (PFTeA)	108	101	P/P	30 - 160
2193531	Perfluorotridecanoic acid (PFTriA)	99.9	91.5	P/P	30 - 160
2193531	Perfluoroundecanoic acid (PFUnA)	88.4	77.9	P/P	30 - 160

Reference Method: EPA 8321B

Batch ID: P387530

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2193543	4:2 Fluorotelomer sulfonate (4:2 FTS)	118	127	P/P	40 - 160
2193543	6:2 Fluorotelomer sulfonate (6:2 FTS)	125	122	P/P	40 - 160
2193543	8:2 Fluorotelomer sulfonate (8:2 FTS)	139	107	P/P	40 - 160
2193543	Hexafluoropropylene oxide dimer acid	129	96.9	P/P	40 - 160
2193543	N-Et perfluorooctanesulfonamidoAc acid	114	122	P/P	40 - 160
2193543	N-Me perfluorooctanesulfonamidoAc acid	122	117	P/P	40 - 160
2193543	Perfluorobutanesulfonic acid (PFBS)	122	126	P/P	40 - 160
2193543	Perfluorodecanesulfonic acid (PFDS)	111	110	P/P	40 - 160
2193543	Perfluorodecanoic acid (PFDA)	123	136	P/P	40 - 160
2193543	Perfluorododecanoic acid (PFDoA)	136	124	P/P	40 - 160
2193543	Perfluoroheptanesulfonic acid (PFHpS)	121	121	P/P	40 - 160
2193543	Perfluoroheptanoic acid (PFHpA)	127	105	P/P	40 - 160
2193543	Perfluorohexanesulfonic acid (PFHxS)	125	127	P/P	40 - 160
2193543	Perfluorohexanoic acid (PFHxA)	108	128	P/P	40 - 160
2193543	Perfluorononanesulfonic acid (PFNS)	106	112	P/P	40 - 160
2193543	Perfluorononanoic acid (PFNA)	109	126	P/P	40 - 160
2193543	Perfluorooctanesulfonic acid (PFOS)	110	121	P/P	40 - 160
2193543	Perfluorooctanoic acid (PFOA)	123	132	P/P	40 - 160
2193543	Perfluoropentanesulfonic acid (PFPeS)	129	136	P/P	40 - 160
2193543	Perfluoropentanoic acid (PFPeA)	127	125	P/P	40 - 160
2193543	Perfluorotetradecanoic acid (PFTeA)	129	120	P/P	40 - 160
2193543	Perfluorotridecanoic acid (PFTriA)	132	126	P/P	40 - 160
2193543	Perfluoroundecanoic acid (PFUnA)	148	111	P/P	40 - 160

Quality Assurance Report Precision

Reference Method: EPA 8321B

Batch ID: P386776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193531	4:2 Fluorotelomer sulfonate (4:2 FTS)	25.3	Spike	P	0 - 30
2193531	6:2 Fluorotelomer sulfonate (6:2 FTS)	4.98	Spike	P	0 - 30
2193531	8:2 Fluorotelomer sulfonate (8:2 FTS)	6.19	Spike	P	0 - 30
2193531	Hexafluoropropylene oxide dimer acid	13.7	Spike	P	0 - 30
2193531	N-Et perfluorooctanesulfonamidoAc acid	5.68	Spike	P	0 - 30
2193531	N-Me perfluorooctanesulfonamidoAc acid	12.8	Spike	P	0 - 30
2193531	Perfluorobutanesulfonic acid (PFBS)	26.6	Spike	P	0 - 30
2193531	Perfluorodecanesulfonic acid (PFDS)	4.87	Spike	P	0 - 30
2193531	Perfluorodecanoic acid (PFDA)	6.88	Spike	P	0 - 30
2193531	Perfluorododecanoic acid (PFDoA)	2.17	Spike	P	0 - 30
2193531	Perfluoroheptanesulfonic acid (PFHpS)	0.183	Spike	P	0 - 30
2193531	Perfluoroheptanoic acid (PFHpA)	3.84	Spike	P	0 - 30
2193531	Perfluorohexanesulfonic acid (PFHxS)	7.57	Spike	P	0 - 30
2193531	Perfluorohexanoic acid (PFHxA)	14.8	Spike	P	0 - 30
2193531	Perfluorononanesulfonic acid (PFNS)	6.51	Spike	P	0 - 30
2193531	Perfluorononanoic acid (PFNA)	10.7	Spike	P	0 - 30
2193531	Perfluorooctanesulfonic acid (PFOS)	22.8	Spike	P	0 - 30
2193531	Perfluorooctanoic acid (PFOA)	11.4	Spike	P	0 - 30
2193531	Perfluoropentanesulfonic acid (PFPeS)	1.34	Spike	P	0 - 30
2193531	Perfluoropentanoic acid (PFPeA)	3.54	Spike	P	0 - 30
2193531	Perfluorotetradecanoic acid (PFTeA)	7.37	Spike	P	0 - 30
2193531	Perfluorotridecanoic acid (PFTriA)	8.78	Spike	P	0 - 30
2193531	Perfluoroundecanoic acid (PFUnA)	12.6	Spike	P	0 - 30

Reference Method: EPA 8321B

Batch ID: P387530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193543	4:2 Fluorotelomer sulfonate (4:2 FTS)	6.71	Spike	P	0 - 35
2193543	6:2 Fluorotelomer sulfonate (6:2 FTS)	2.33	Spike	P	0 - 35
2193543	8:2 Fluorotelomer sulfonate (8:2 FTS)	26.1	Spike	P	0 - 35
2193543	Hexafluoropropylene oxide dimer acid	28.2	Spike	P	0 - 35
2193543	N-Et perfluorooctanesulfonamidoAc acid	6.05	Spike	P	0 - 35
2193543	N-Me perfluorooctanesulfonamidoAc acid	4.28	Spike	P	0 - 35
2193543	Perfluorobutanesulfonic acid (PFBS)	3.11	Spike	P	0 - 35
2193543	Perfluorodecanesulfonic acid (PFDS)	0.814	Spike	P	0 - 35
2193543	Perfluorodecanoic acid (PFDA)	9.65	Spike	P	0 - 35
2193543	Perfluorododecanoic acid (PFDoA)	9.05	Spike	P	0 - 35
2193543	Perfluoroheptanesulfonic acid (PFHpS)	0.110	Spike	P	0 - 35
2193543	Perfluoroheptanoic acid (PFHpA)	18.7	Spike	P	0 - 35
2193543	Perfluorohexanesulfonic acid (PFHxS)	0.973	Spike	P	0 - 35
2193543	Perfluorohexanoic acid (PFHxA)	17.0	Spike	P	0 - 35
2193543	Perfluorononanesulfonic acid (PFNS)	5.93	Spike	P	0 - 35
2193543	Perfluorononanoic acid (PFNA)	14.9	Spike	P	0 - 35
2193543	Perfluorooctanesulfonic acid (PFOS)	9.99	Spike	P	0 - 35
2193543	Perfluorooctanoic acid (PFOA)	6.47	Spike	P	0 - 35
2193543	Perfluoropentanesulfonic acid (PFPeS)	5.57	Spike	P	0 - 35
2193543	Perfluoropentanoic acid (PFPeA)	1.18	Spike	P	0 - 35
2193543	Perfluorotetradecanoic acid (PFTeA)	7.19	Spike	P	0 - 35
2193543	Perfluorotridecanoic acid (PFTriA)	5.00	Spike	P	0 - 35

Quality Assurance Report Precision

Reference Method: EPA 8321B
Batch ID: P387530

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2193543	Perfluoroundecanoic acid (PFUnA)	28.2	Spike	P	0 - 35

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Surrogates

Lab Sample ID: 2193531
Field Sample ID: Eastern Canal Outfall

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	113	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	113	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	127	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	109	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	118	P	30 - 160

Lab Sample ID: 2193532
Field Sample ID: Eastern Canal #2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	98.4	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	112	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	101	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	114	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	121	P	30 - 160

Lab Sample ID: 2193533
Field Sample ID: Eastern 2nd Canal

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	116	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	122	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	129	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	132	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	122	P	30 - 160

Lab Sample ID: 2193534
Field Sample ID: Eastern Canal #3

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	101	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	113	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	101	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	108	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	115	P	30 - 160

Lab Sample ID: 2193535
Field Sample ID: Eastern Canal #3 Replicate

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	122	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	116	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	128	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	114	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	136	P	30 - 160

Lab Sample ID: 2193536
Field Sample ID: FRB

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	116	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	108	P	30 - 160

Quality Assurance Report Surrogates

Lab Sample ID: 2193536

Field Sample ID: FRB

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Perfluorodecanoic acid-13C	108	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	113	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	117	P	30 - 160

Lab Sample ID: 2193543

Field Sample ID: Eastern Canal Outfall

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	103	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	90.5	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	83.2	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	108	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	81.7	P	30 - 160

Lab Sample ID: 2193544

Field Sample ID: Eastern Canal #2

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	99.4	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	95.5	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	81.1	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	112	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	82.3	P	30 - 160

Lab Sample ID: 2193545

Field Sample ID: Eastern 2nd Canal

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	79.6	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	80.0	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	75.8	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	92.2	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	75.9	P	30 - 160

Lab Sample ID: 2193546

Field Sample ID: Eastern Canal #3

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Hexafluoropropylene oxide dimer acid-13C	80.0	P	30 - 160
EPA 8321B	Perfluorobutanesulfonate-13C	82.5	P	30 - 160
EPA 8321B	Perfluorodecanoic acid-13C	56.9	P	30 - 160
EPA 8321B	Perfluorohexanesulfonate-13C	99.0	P	30 - 160
EPA 8321B	Perfluorohexanoic acid-13C	74.6	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A100860

Included Lab Sample IDs: 2193531, 2193532, 2193533, 2193534, 2193535, 2193536

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
4:2 Fluorotelomer sulfonate (4:2 FTS)	86.2	89.8	P/P	60 - 160
4:2 Fluorotelomer sulfonate (4:2 FTS)	88.7	90.7	P/P	60 - 160
6:2 Fluorotelomer sulfonate (6:2 FTS)	89.3	88.1	P/P	60 - 160
6:2 Fluorotelomer sulfonate (6:2 FTS)	89.9	86.3	P/P	60 - 160
8:2 Fluorotelomer sulfonate (8:2 FTS)	88.0	78.4	P/P	60 - 160
8:2 Fluorotelomer sulfonate (8:2 FTS)	92.9	85.0	P/P	60 - 160
Hexafluoropropylene oxide dimer acid	105	100	P/P	60 - 160
Hexafluoropropylene oxide dimer acid	106	96.5	P/P	60 - 160
N-Et perfluorooctanesulfonamidoAc acid	90.7	87.0	P/P	60 - 160
N-Et perfluorooctanesulfonamidoAc acid	99.4	97.0	P/P	60 - 160
N-Me perfluorooctanesulfonamidoAc acid	93.7	112	P/P	60 - 160
N-Me perfluorooctanesulfonamidoAc acid	96.3	94.0	P/P	60 - 160
Perfluorobutanesulfonic acid (PFBS)	94.2	90.5	P/P	60 - 160
Perfluorobutanesulfonic acid (PFBS)	94.7	85.4	P/P	60 - 160
Perfluorodecanesulfonic acid (PFDS)	93.8	91.5	P/P	60 - 160
Perfluorodecanesulfonic acid (PFDS)	97.5	97.6	P/P	60 - 160
Perfluorodecanoic acid (PFDA)	109	93.9	P/P	60 - 160
Perfluorodecanoic acid (PFDA)	88.0	92.3	P/P	60 - 160
Perfluorododecanoic acid (PFDoA)	90.8	75.2	P/P	60 - 160
Perfluorododecanoic acid (PFDoA)	94.3	91.5	P/P	60 - 160
Perfluoroheptanesulfonic acid (PFHpS)	79.4	93.0	P/P	60 - 160
Perfluoroheptanesulfonic acid (PFHpS)	84.1	87.1	P/P	60 - 160
Perfluoroheptanoic acid (PFHpA)	109	98.3	P/P	60 - 160
Perfluoroheptanoic acid (PFHpA)	94.0	104	P/P	60 - 160
Perfluorohexanesulfonic acid (PFHxS)	86.5	96.7	P/P	60 - 160
Perfluorohexanesulfonic acid (PFHxS)	93.8	92.7	P/P	60 - 160
Perfluorohexanoic acid (PFHxA)	90.7	95.4	P/P	60 - 160
Perfluorohexanoic acid (PFHxA)	94.8	99.4	P/P	60 - 160
Perfluorononanesulfonic acid (PFNS)	103	102	P/P	60 - 160
Perfluorononanesulfonic acid (PFNS)	92.1	96.7	P/P	60 - 160
Perfluorononanoic acid (PFNA)	127	107	P/P	60 - 160
Perfluorononanoic acid (PFNA)	88.5	110	P/P	60 - 160
Perfluorooctanesulfonic acid (PFOS)	102	96.4	P/P	60 - 160
Perfluorooctanesulfonic acid (PFOS)	96.7	92.2	P/P	60 - 160
Perfluorooctanoic acid (PFOA)	94.0	106	P/P	60 - 160
Perfluorooctanoic acid (PFOA)	94.6	98.1	P/P	60 - 160
Perfluoropentanesulfonic acid (PFPeS)	94.2	85.2	P/P	60 - 160
Perfluoropentanesulfonic acid (PFPeS)	97.9	90.0	P/P	60 - 160
Perfluoropentanoic acid (PFPeA)	100	101	P/P	60 - 160
Perfluoropentanoic acid (PFPeA)	93.1	96.1	P/P	60 - 160
Perfluorotetradecanoic acid (PFTeA)	84.3	93.3	P/P	60 - 160
Perfluorotetradecanoic acid (PFTeA)	90.4	83.3	P/P	60 - 160
Perfluorotridecanoic acid (PFTriA)	120	80.2	P/P	60 - 160
Perfluorotridecanoic acid (PFTriA)	85.3	97.3	P/P	60 - 160
Perfluoroundecanoic acid (PFUnA)	81.8	83.7	P/P	60 - 160
Perfluoroundecanoic acid (PFUnA)	90.1	113	P/P	60 - 160

Quality Assurance Report Calibration Verification

Reference Method: EPA 8321B

Run ID: A101142

Included Lab Sample IDs: 2193543, 2193544, 2193545, 2193546

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
4:2 Fluorotelomer sulfonate (4:2 FTS)	95.9	102	P/P	60 - 160
6:2 Fluorotelomer sulfonate (6:2 FTS)	77.8	75.0	P/P	60 - 160
8:2 Fluorotelomer sulfonate (8:2 FTS)	89.5	102	P/P	60 - 160
Hexafluoropropylene oxide dimer acid	100	75.4	P/P	60 - 160
N-Et perfluorooctanesulfonamidoAc acid	86.1	90.0	P/P	60 - 160
N-Me perfluorooctanesulfonamidoAc acid	98.3	101	P/P	60 - 160
Perfluorobutanesulfonic acid (PFBS)	99.7	104	P/P	60 - 160
Perfluorodecanesulfonic acid (PFDS)	98.6	88.8	P/P	60 - 160
Perfluorodecanoic acid (PFDA)	95.7	98.5	P/P	60 - 160
Perfluorododecanoic acid (PFDoA)	93.8	91.5	P/P	60 - 160
Perfluoroheptanesulfonic acid (PFHpS)	94.9	97.7	P/P	60 - 160
Perfluoroheptanoic acid (PFHpA)	93.7	94.5	P/P	60 - 160
Perfluorohexanesulfonic acid (PFHxS)	98.8	102	P/P	60 - 160
Perfluorohexanoic acid (PFHxA)	96.2	114	P/P	60 - 160
Perfluorononanesulfonic acid (PFNS)	93.7	94.5	P/P	60 - 160
Perfluorononanoic acid (PFNA)	105	103	P/P	60 - 160
Perfluorooctanesulfonic acid (PFOS)	110	87.9	P/P	60 - 160
Perfluorooctanoic acid (PFOA)	111	95.3	P/P	60 - 160
Perfluoropentanesulfonic acid (PFPeS)	104	107	P/P	60 - 160
Perfluoropentanoic acid (PFPeA)	108	101	P/P	60 - 160
Perfluorotetradecanoic acid (PFTeA)	107	109	P/P	60 - 160
Perfluorotridecanoic acid (PFTriA)	117	108	P/P	60 - 160
Perfluoroundecanoic acid (PFUnA)	104	113	P/P	60 - 160

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
			LCS			
EPA 8321B	4:2 Fluorotelomer sulfonate (4:2 FTS)	104	164	127		25.3
	4:2 Fluorotelomer sulfonate (4:2 FTS)	123	118	127		6.71
	6:2 Fluorotelomer sulfonate (6:2 FTS)	106	117	112		4.98
	6:2 Fluorotelomer sulfonate (6:2 FTS)	126	125	122		2.33
	8:2 Fluorotelomer sulfonate (8:2 FTS)	103	89.9	84.5		6.19
	8:2 Fluorotelomer sulfonate (8:2 FTS)	123	139	107		26.1
	Hexafluoropropylene oxide dimer acid	99.5	110	96.3		13.7
	Hexafluoropropylene oxide dimer acid	125	129	96.9		28.2
	N-Et perfluorooctanesulfonamidoAc acid	119	105	99.3		5.68
	N-Et perfluorooctanesulfonamidoAc acid	108	114	122		6.05
	N-Me perfluorooctanesulfonamidoAc acid	112	91.6	104		12.8
	N-Me perfluorooctanesulfonamidoAc acid	115	122	117		4.28
	Perfluorobutanesulfonic acid (PFBS)	97.0	115	77.7		26.6
	Perfluorobutanesulfonic acid (PFBS)	127	122	126		3.11
	Perfluorodecanesulfonic acid (PFDS)	89.4	77.9	74.2		4.87
	Perfluorodecanesulfonic acid (PFDS)	116	111	110		0.814
	Perfluorodecanoic acid (PFDA)	101	84.6	91.6		6.88
	Perfluorodecanoic acid (PFDA)	111	123	136		9.65
	Perfluorododecanoic acid (PFDoA)	78.2	86.5	88.4		2.17
	Perfluorododecanoic acid (PFDoA)	124	136	124		9.05
	Perfluoroheptanesulfonic acid (PFHpS)	91.0	83.3	83.5		0.183
	Perfluoroheptanesulfonic acid (PFHpS)	129	121	121		0.110
	Perfluoroheptanoic acid (PFHpA)	115				3.84
	Perfluoroheptanoic acid (PFHpA)	119	127	105		18.7
	Perfluorohexanesulfonic acid (PFHxS)	110				7.57
	Perfluorohexanesulfonic acid (PFHxS)	127	125	127		0.973
	Perfluorohexanoic acid (PFHxA)	101				14.8
	Perfluorohexanoic acid (PFHxA)	141	108	128		17.0
	Perfluorononanesulfonic acid (PFNS)	102	95.2	89.2		6.51
	Perfluorononanesulfonic acid (PFNS)	112	106	112		5.93
	Perfluorononanoic acid (PFNA)	130	77.1	95.1		10.7
	Perfluorononanoic acid (PFNA)	118	109	126		14.9
	Perfluorooctanesulfonic acid (PFOS)	107				22.8
	Perfluorooctanesulfonic acid (PFOS)	112	110	121		9.99
	Perfluorooctanoic acid (PFOA)	108				11.4

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
			LCS			
EPA 8321B	Perfluorooctanoic acid (PFOA)	127	123	132		6.47
	Perfluoropentanesulfonic acid (PFPeS)	105	90.8	92.4		1.34
	Perfluoropentanesulfonic acid (PFPeS)	129	129	136		5.57
	Perfluoropentanoic acid (PFPeA)	112				3.54
	Perfluoropentanoic acid (PFPeA)	122	127	125		1.18
	Perfluorotetradecanoic acid (PFTeA)	84.2	108	101		7.37
	Perfluorotetradecanoic acid (PFTeA)	134	129	120		7.19
	Perfluorotridecanoic acid (PFTriA)	84.2	99.9	91.5		8.78
	Perfluorotridecanoic acid (PFTriA)	120	132	126		5.00
	Perfluoroundecanoic acid (PFUnA)	95.0	88.4	77.9		12.6
	Perfluoroundecanoic acid (PFUnA)	121	148	111		28.2

Reference Method Descriptions

Method	Description	Associated Samples
EPA 8321B	Perfluorinated alkyl substances in sediment/solid matrices by HPLC/MS/MS	2193543, 2193544, 2193545, 2193546
EPA 8321B	Perfluorinated alkyl substances in water matrices by HPLC/MS/MS	2193531, 2193532, 2193533, 2193534, 2193535, 2193536
SM 2540 G (20th)	Percent solid determination before the other sample preparations.	2193537, 2193538, 2193540, 2193541

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 8321B	09/02/2020	09/04/2020 10:00	Pramila Ghimire	09/04/2020 19:45	Pramila Ghimire	2193536
	09/02/2020	09/04/2020 10:00	Pramila Ghimire	09/04/2020 20:29	Pramila Ghimire	2193531
	09/02/2020	09/04/2020 10:00	Pramila Ghimire	09/04/2020 22:38	Pramila Ghimire	2193532
	09/02/2020	09/04/2020 10:00	Pramila Ghimire	09/04/2020 22:49	Pramila Ghimire	2193533
	09/02/2020	09/04/2020 10:00	Pramila Ghimire	09/04/2020 23:00	Pramila Ghimire	2193534
	09/02/2020	09/04/2020 10:00	Pramila Ghimire	09/04/2020 23:10	Pramila Ghimire	2193535
	09/02/2020	09/21/2020 10:00	Hoor Shaik	09/22/2020 16:34	Pramila Ghimire	2193543
	09/02/2020	09/21/2020 10:00	Hoor Shaik	09/22/2020 16:44	Pramila Ghimire	2193544
	09/02/2020	09/21/2020 10:00	Hoor Shaik	09/22/2020 16:55	Pramila Ghimire	2193545
	09/02/2020	09/21/2020 10:00	Hoor Shaik	09/22/2020 17:06	Pramila Ghimire	2193546