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ANALYTICAL REPORT

Eurofins Sacramento
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Tel: (916)373-5600

Laboratory Job ID: 320-90442-1
Client Project/Site: PFAS, MassDEP Biosolids

For:
Montague WPCF
34 Greenfield Road
Montague, Massachusetts 01351

Attn: Chelsey Little

Authorized for release by:
8/11/2022 9:55:43 AM

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Definitions/Glossary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

Job ID: 320-90442-1

Laboratory: Eurofins Sacramento

Narrative

Receipt
The samples were received on 7/28/2022 9:25 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 21.0º C.

Receipt Exceptions
The following samples were received at the laboratory outside the required temperature criteria: Solid Cake (320-90442-1) and Solid Cake Duplicate (320-90442-2). Samples received at 21.0º C. There was only water in the cooler, indicating the ice melted en route to the lab.

LCMS
Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: Solid Cake (320-90442-1) and Solid Cake Duplicate (320-90442-2). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was above the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte.

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

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

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

Detection Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

Client Sample ID: Solid Cake — Lab Sample ID: 320-90442-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	0.23	J	0.79	0.16	ng/g	1	☼	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.98	I	0.79	0.12	ng/g	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.60	J	0.79	0.21	ng/g	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.18	J	0.79	0.087	ng/g	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.7		0.79	0.19	ng/g	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.57	J	0.79	0.17	ng/g	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.57	J	0.79	0.12	ng/g	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	26		0.79	0.17	ng/g	1	☼	537 (modified)	Total/NA

Client Sample ID: Solid Cake Duplicate — Lab Sample ID: 320-90442-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	0.25	J	0.83	0.17	ng/g	1	☼	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.0	I	0.83	0.13	ng/g	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.61	J	0.83	0.22	ng/g	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.15	J	0.83	0.092	ng/g	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.9	I	0.83	0.20	ng/g	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.60	J	0.83	0.17	ng/g	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.65	J	0.83	0.12	ng/g	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	25		0.83	0.18	ng/g	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: Solid Cake

Lab Sample ID: 320-90442-1

Date Collected: 07/26/22 09:45
Matrix: Solid
Date Received: 07/28/22 09:25
Percent Solids: 23.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		0.79	0.18	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluoropentanoic acid (PFPeA)	**0.23**	**J**	0.79	0.16	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorohexanoic acid (PFHxA)	**0.98**	**I**	0.79	0.12	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluoroheptanoic acid (PFHpA)	ND		0.79	0.15	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorooctanoic acid (PFOA)	**0.60**	**J**	0.79	0.21	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorononanoic acid (PFNA)	**0.18**	**J**	0.79	0.087	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorodecanoic acid (PFDA)	**1.7**		0.79	0.19	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluoroundecanoic acid (PFUnA)	**0.57**	**J**	0.79	0.17	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorododecanoic acid (PFDoA)	**0.57**	**J**	0.79	0.12	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorotridecanoic acid (PFTriA)	ND		0.79	0.083	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.79	0.15	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluoropentanesulfonic acid (PFPeS)	ND		0.79	0.15	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.79	0.11	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorooctanesulfonic acid (PFOS)	**26**		0.79	0.17	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorononanesulfonic acid (PFNS)	ND		0.79	0.11	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1
Perfluorodecanesulfonic acid (PFDS)	ND		0.79	0.20	ng/g	☼	08/04/22 04:45	08/11/22 00:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*27*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C5 PFPeA	*48*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C2 PFHxA	*78*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C4 PFHpA	*68*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C4 PFOA	*71*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C5 PFNA	*71*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C2 PFDA	*65*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C2 PFUnA	*52*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C2 PFDoA	*42*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C2 PFTeDA	*17*	**5-*	*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C3 PFBS	*57*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
18O2 PFHxS	*79*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*
13C4 PFOS	*69*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:49*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**76.5**		0.1	0.1	%			08/02/22 15:10	1
Percent Solids	**23.5**		0.1	0.1	%			08/02/22 15:10	1

Client Sample ID: Solid Cake Duplicate

Lab Sample ID: 320-90442-2

Date Collected: 07/26/22 09:45
Matrix: Solid
Date Received: 07/28/22 09:25
Percent Solids: 23.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		0.83	0.19	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluoropentanoic acid (PFPeA)	**0.25**	**J**	0.83	0.17	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorohexanoic acid (PFHxA)	**1.0**	**I**	0.83	0.13	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluoroheptanoic acid (PFHpA)	ND		0.83	0.16	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorooctanoic acid (PFOA)	**0.61**	**J**	0.83	0.22	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1

Client Sample ID: Solid Cake Duplicate

Date Collected: 07/26/22 09:45
Date Received: 07/28/22 09:25

Lab Sample ID: 320-90442-2

Matrix: Solid
Percent Solids: 23.3

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**0.15**	**J**	0.83	0.092	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorodecanoic acid (PFDA)	**1.9**	**I**	0.83	0.20	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluoroundecanoic acid (PFUnA)	**0.60**	**J**	0.83	0.17	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorododecanoic acid (PFDoA)	**0.65**	**J**	0.83	0.12	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorotridecanoic acid (PFTriA)	ND		0.83	0.087	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.83	0.16	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluoropentanesulfonic acid (PFPeS)	ND		0.83	0.15	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.83	0.12	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorooctanesulfonic acid (PFOS)	**25**		0.83	0.18	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorononanesulfonic acid (PFNS)	ND		0.83	0.12	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1
Perfluorodecanesulfonic acid (PFDS)	ND		0.83	0.22	ng/g	☼	08/04/22 04:45	08/11/22 00:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*40*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C5 PFPeA	*54*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C2 PFHxA	*78*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C4 PFHpA	*67*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C4 PFOA	*75*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C5 PFNA	*73*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C2 PFDA	*67*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C2 PFUnA	*47*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C2 PFDoA	*39*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C2 PFTeDA	*14*	**5-*	*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C3 PFBS	*63*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
18O2 PFHxS	*73*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*
13C4 PFOS	*67*		*25 - 150*	*08/04/22 04:45*	*08/11/22 00:59*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**76.7**		0.1	0.1	%			08/02/22 15:10	1
Percent Solids	**23.3**		0.1	0.1	%			08/02/22 15:10	1

Isotope Dilution Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
180-142188-E-4-B MS	Matrix Spike	73	79	83	78	83	79	80	78
180-142188-E-4-C MSD	Matrix Spike Duplicate	77	86	87	84	83	80	72	81
320-90442-1	Solid Cake	27	48	78	68	71	71	65	52
320-90442-2	Solid Cake Duplicate	40	54	78	67	75	73	67	47
LCS 320-607299/2-A	Lab Control Sample	88	93	94	91	95	92	98	106
MB 320-607299/1-A	Method Blank	86	93	88	89	99	91	88	95

		Percent Isotope Dilution Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)
180-142188-E-4-B MS	Matrix Spike	71	57	82	85	75
180-142188-E-4-C MSD	Matrix Spike Duplicate	80	65	88	88	74
320-90442-1	Solid Cake	42	17 *5-	57	79	69
320-90442-2	Solid Cake Duplicate	39	14 *5-	63	73	67
LCS 320-607299/2-A	Lab Control Sample	97	91	92	97	91
MB 320-607299/1-A	Method Blank	92	83	90	93	86

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-607299/1-A
Matrix: Solid
Analysis Batch: 608708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 607299

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		0.20	0.046	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluoropentanoic acid (PFPeA)	ND		0.20	0.041	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluoropentanesulfonic acid (PFPeS)	ND		0.20	0.037	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorononanesulfonic acid (PFNS)	ND		0.20	0.029	ng/g		08/04/22 04:45	08/10/22 23:48	1
Perfluorodecanesulfonic acid (PFDS)	ND		0.20	0.052	ng/g		08/04/22 04:45	08/10/22 23:48	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*86*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C5 PFPeA	*93*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C2 PFHxA	*88*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C4 PFHpA	*89*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C4 PFOA	*99*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C5 PFNA	*91*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C2 PFDA	*88*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C2 PFUnA	*95*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C2 PFDoA	*92*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C3 PFBS	*90*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
18O2 PFHxS	*93*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*
13C4 PFOS	*86*		*25 - 150*	*08/04/22 04:45*	*08/10/22 23:48*	*1*

Lab Sample ID: LCS 320-607299/2-A
Matrix: Solid
Analysis Batch: 608708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 607299

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	2.00	2.23		ng/g		111	76 - 136
Perfluoropentanoic acid (PFPeA)	2.00	2.09		ng/g		104	69 - 129
Perfluorohexanoic acid (PFHxA)	2.00	1.91		ng/g		96	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.11		ng/g		105	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.05		ng/g		103	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.13		ng/g		106	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	1.66		ng/g		83	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.91		ng/g		95	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.04		ng/g		102	71 - 131

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

Lab Sample ID: LCS 320-607299/2-A
Matrix: Solid
Analysis Batch: 608708

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 607299

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Perfluorotridecanoic acid (PFTriA)			2.00	2.01		ng/g		100	71 - 131		
Perfluorobutanesulfonic acid (PFBS)			1.78	1.98		ng/g		111	69 - 129		
Perfluoropentanesulfonic acid (PFPeS)			1.88	2.00		ng/g		107	66 - 126		
Perfluorohexanesulfonic acid (PFHxS)			1.82	1.77		ng/g		97	62 - 122		
Perfluorooctanesulfonic acid (PFOS)			1.86	2.05		ng/g		110	68 - 141		
Perfluorononanesulfonic acid (PFNS)			1.92	2.10		ng/g		109	72 - 132		
Perfluorodecanesulfonic acid (PFDS)			1.93	2.02		ng/g		105	71 - 131		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*88*		*25 - 150*
13C5 PFPeA	*93*		*25 - 150*
13C2 PFHxA	*94*		*25 - 150*
13C4 PFHpA	*91*		*25 - 150*
13C4 PFOA	*95*		*25 - 150*
13C5 PFNA	*92*		*25 - 150*
13C2 PFDA	*98*		*25 - 150*
13C2 PFUnA	*106*		*25 - 150*
13C2 PFDoA	*97*		*25 - 150*
13C2 PFTeDA	*91*		*25 - 150*
13C3 PFBS	*92*		*25 - 150*
18O2 PFHxS	*97*		*25 - 150*
13C4 PFOS	*91*		*25 - 150*

Lab Sample ID: 180-142188-E-4-B MS
Matrix: Solid
Analysis Batch: 608708

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 607299

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Perfluorobutanoic acid (PFBA)	0.14	J	2.26	2.49		ng/g	☼	104	76 - 136		
Perfluoropentanoic acid (PFPeA)	0.14	J	2.26	2.57		ng/g	☼	108	69 - 129		
Perfluorohexanoic acid (PFHxA)	0.092	J	2.26	2.18		ng/g	☼	93	71 - 131		
Perfluoroheptanoic acid (PFHpA)	0.076	J	2.26	2.35		ng/g	☼	101	71 - 131		
Perfluorooctanoic acid (PFOA)	0.17	J	2.26	2.51		ng/g	☼	104	72 - 132		
Perfluorononanoic acid (PFNA)	0.15	J	2.26	2.51		ng/g	☼	105	73 - 133		
Perfluorodecanoic acid (PFDA)	0.12	J	2.26	2.09		ng/g	☼	87	72 - 132		
Perfluoroundecanoic acid (PFUnA)	0.15	J	2.26	2.37		ng/g	☼	99	66 - 126		
Perfluorododecanoic acid (PFDoA)	0.060	J	2.26	2.44		ng/g	☼	106	71 - 131		
Perfluorotridecanoic acid (PFTriA)	0.067	J	2.26	2.17		ng/g	☼	93	71 - 131		
Perfluorobutanesulfonic acid (PFBS)	ND		2.00	2.35		ng/g	☼	117	69 - 129		
Perfluoropentanesulfonic acid (PFPeS)	ND		2.12	2.15		ng/g	☼	102	66 - 126		

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

Lab Sample ID: 180-142188-E-4-B MS
Matrix: Solid
Analysis Batch: 608708

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 607299

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanesulfonic acid (PFHxS)	ND		2.06	2.21		ng/g	☼	108	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.59		2.10	2.79	I	ng/g	☼	105	68 - 141
Perfluorononanesulfonic acid (PFNS)	ND		2.17	2.38		ng/g	☼	110	72 - 132
Perfluorodecanesulfonic acid (PFDS)	ND		2.17	2.24		ng/g	☼	103	71 - 131

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFBA	*73*		*25 - 150*
13C5 PFPeA	*79*		*25 - 150*
13C2 PFHxA	*83*		*25 - 150*
13C4 PFHpA	*78*		*25 - 150*
13C4 PFOA	*83*		*25 - 150*
13C5 PFNA	*79*		*25 - 150*
13C2 PFDA	*80*		*25 - 150*
13C2 PFUnA	*78*		*25 - 150*
13C2 PFDoA	*71*		*25 - 150*
13C2 PFTeDA	*57*		*25 - 150*
13C3 PFBS	*82*		*25 - 150*
18O2 PFHxS	*85*		*25 - 150*
13C4 PFOS	*75*		*25 - 150*

Lab Sample ID: 180-142188-E-4-C MSD
Matrix: Solid
Analysis Batch: 608708

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 607299

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	0.14	J	2.35	2.67		ng/g	☼	108	76 - 136	7	30
Perfluoropentanoic acid (PFPeA)	0.14	J	2.35	2.53		ng/g	☼	102	69 - 129	2	30
Perfluorohexanoic acid (PFHxA)	0.092	J	2.35	2.27		ng/g	☼	92	71 - 131	4	30
Perfluoroheptanoic acid (PFHpA)	0.076	J	2.35	2.56		ng/g	☼	105	71 - 131	8	30
Perfluorooctanoic acid (PFOA)	0.17	J	2.35	2.70		ng/g	☼	107	72 - 132	7	30
Perfluorononanoic acid (PFNA)	0.15	J	2.35	2.58		ng/g	☼	103	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	0.12	J	2.35	2.19		ng/g	☼	88	72 - 132	5	30
Perfluoroundecanoic acid (PFUnA)	0.15	J	2.35	2.47		ng/g	☼	99	66 - 126	4	30
Perfluorododecanoic acid (PFDoA)	0.060	J	2.35	2.42		ng/g	☼	100	71 - 131	1	30
Perfluorotridecanoic acid (PFTriA)	0.067	J	2.35	2.31		ng/g	☼	95	71 - 131	6	30
Perfluorobutanesulfonic acid (PFBS)	ND		2.09	2.37		ng/g	☼	113	69 - 129	1	30
Perfluoropentanesulfonic acid (PFPeS)	ND		2.21	2.17		ng/g	☼	98	66 - 126	1	30
Perfluorohexanesulfonic acid (PFHxS)	ND		2.15	2.24		ng/g	☼	104	62 - 122	1	30
Perfluorooctanesulfonic acid (PFOS)	0.59		2.19	2.86	I	ng/g	☼	104	68 - 141	3	30
Perfluorononanesulfonic acid (PFNS)	ND		2.27	2.54		ng/g	☼	112	72 - 132	6	30

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

Lab Sample ID: 180-142188-E-4-C MSD
Matrix: Solid
Analysis Batch: 608708

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 607299

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorodecanesulfonic acid (PFDS)	ND		2.27	2.49		ng/g	☼	110	71 - 131	11	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFBA	*77*		*25 - 150*
13C5 PFPeA	*86*		*25 - 150*
13C2 PFHxA	*87*		*25 - 150*
13C4 PFHpA	*84*		*25 - 150*
13C4 PFOA	*83*		*25 - 150*
13C5 PFNA	*80*		*25 - 150*
13C2 PFDA	*72*		*25 - 150*
13C2 PFUnA	*81*		*25 - 150*
13C2 PFDoA	*80*		*25 - 150*
13C2 PFTeDA	*65*		*25 - 150*
13C3 PFBS	*88*		*25 - 150*
18O2 PFHxS	*88*		*25 - 150*
13C4 PFOS	*74*		*25 - 150*

Method: D 2216 - Percent Moisture

Lab Sample ID: 580-116393-A-12 DU
Matrix: Solid
Analysis Batch: 607008

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	56.3		54.9		%		3	20
Percent Solids	43.7		45.1		%		3	20

QC Association Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

LCMS

Prep Batch: 607299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-90442-1	Solid Cake	Total/NA	Solid	SHAKE	
320-90442-2	Solid Cake Duplicate	Total/NA	Solid	SHAKE	
MB 320-607299/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-607299/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
180-142188-E-4-B MS	Matrix Spike	Total/NA	Solid	SHAKE	
180-142188-E-4-C MSD	Matrix Spike Duplicate	Total/NA	Solid	SHAKE	

Analysis Batch: 608708

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-90442-1	Solid Cake	Total/NA	Solid	537 (modified)	607299
320-90442-2	Solid Cake Duplicate	Total/NA	Solid	537 (modified)	607299
MB 320-607299/1-A	Method Blank	Total/NA	Solid	537 (modified)	607299
LCS 320-607299/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	607299
180-142188-E-4-B MS	Matrix Spike	Total/NA	Solid	537 (modified)	607299
180-142188-E-4-C MSD	Matrix Spike Duplicate	Total/NA	Solid	537 (modified)	607299

General Chemistry

Analysis Batch: 607008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-90442-1	Solid Cake	Total/NA	Solid	D 2216	
320-90442-2	Solid Cake Duplicate	Total/NA	Solid	D 2216	
580-116393-A-12 DU	Duplicate	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

Client Sample ID: Solid Cake
Lab Sample ID: 320-90442-1
Date Collected: 07/26/22 09:45
Matrix: Solid
Date Received: 07/28/22 09:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			607008	08/02/22 15:10	TCS	EET SAC

Client Sample ID: Solid Cake
Lab Sample ID: 320-90442-1
Date Collected: 07/26/22 09:45
Matrix: Solid
Date Received: 07/28/22 09:25
Percent Solids: 23.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.41 g	10.0 mL	607299	08/04/22 04:45	NSS	EET SAC
Total/NA	Analysis	537 (modified)		1			608708	08/11/22 00:49	K1S	EET SAC

Client Sample ID: Solid Cake Duplicate
Lab Sample ID: 320-90442-2
Date Collected: 07/26/22 09:45
Matrix: Solid
Date Received: 07/28/22 09:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			607008	08/02/22 15:10	TCS	EET SAC

Client Sample ID: Solid Cake Duplicate
Lab Sample ID: 320-90442-2
Date Collected: 07/26/22 09:45
Matrix: Solid
Date Received: 07/28/22 09:25
Percent Solids: 23.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.16 g	10.0 mL	607299	08/04/22 04:45	NSS	EET SAC
Total/NA	Analysis	537 (modified)		1			608708	08/11/22 00:59	K1S	EET SAC

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Montague WPCF
Job ID: 320-90442-1
Project/Site: PFAS, MassDEP Biosolids

Laboratory: Eurofins Sacramento

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24
ANAB	Dept. of Defense ELAP	L2468	01-20-24
ANAB	Dept. of Energy	L2468.01	01-20-24
ANAB	ISO/IEC 17025	L2468	01-20-24
Arizona	State	AZ0708	08-11-22
Arkansas DEQ	State	88-0691	06-17-22 *
California	State	2897	01-31-23
Colorado	State	CA0004	08-31-22
Florida	NELAP	E87570	06-30-23
Georgia	State	4040	01-30-23
Hawaii	State	<cert No.>	01-29-23
Illinois	NELAP	200060	03-17-24
Kansas	NELAP	E-10375	10-31-22
Louisiana	NELAP	01944	06-30-23
Louisiana (All)	NELAP	01944	06-30-23
Maine	State	CA00004	04-14-24
Michigan	State	9947	01-31-23
Nevada	State	CA00044	08-31-22
New Hampshire	NELAP	2997	04-18-23
New Jersey	NELAP	CA005	06-30-23
New York	NELAP	11666	04-01-23
Ohio	State	41252	01-29-23
Oregon	NELAP	4040	01-29-23
Texas	NELAP	T104704399-19-13	05-31-23
US Fish & Wildlife	US Federal Programs	58448	04-30-23
USDA	US Federal Programs	P330-18-00239	01-23-23
Utah	NELAP	CA000442021-12	02-28-23
Virginia	NELAP	460278	03-14-23
Washington	State	C581	05-05-23
West Virginia (DW)	State	9930C	12-31-22
Wisconsin	State	998204680	08-31-22
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
D 2216	Percent Moisture	ASTM	EET SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	EET SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

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

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Montague WPCF
Project/Site: PFAS, MassDEP Biosolids

Job ID: 320-90442-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-90442-1	Solid Cake	Solid	07/26/22 09:45	07/28/22 09:25
320-90442-2	Solid Cake Duplicate	Solid	07/26/22 09:45	07/28/22 09:25

Chain of Custody Record 589749

eurofins | Environment Testing TestAmerica

8/11/2022

Address: _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TAL-8210

Client Contact	Project Manager:	Site Contact:	Date:	COC No:
Company Name: MWPCF	Tel/Email:	Lab Contact:	Carrier:	_____ of _____ COCs
Address:	Analysis Turnaround Time			Sampler:
City/State/Zip:	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone:	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	PFC-1D4-PFAS	Sample Specific Notes:
Solid Cake	7.26.22	9:45	G	S	1			X	
Solid Cake	7.26.22	9:45	G	S	1			X	

320-90442 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact:	Custody Seal No.:	Cooler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:
☒ Yes ☐ No	164778/184779	2.0c	2.1D	140H

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	MWPCF	7.26.22 9:45		FEL MC	9/26/22 925
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Montague WPCF

Job Number: 320-90442-1

Login Number: 90442
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1847778/1847779
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	