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ANALYTICAL REPORT

Eurofins Canton
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Barberton, OH 44203
Tel: (330)497-9396

Laboratory Job ID: 240-162299-1
Client Project/Site: Ionia Regional Utilities Authority

For:
Fishbeck Thompson Carr & Huber Inc
1515 Arboretum Drive SE
Grand Rapids, Michigan 49546

Attn: Corrine Haybarker

Authorized for release by:
2/9/2022 1:16:25 PM

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Definitions/Glossary

Client: Fishbeck Thompson Carr & Huber Inc
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Qualifiers

LCMS

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
B	Compound was found in the blank and sample.
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.
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 240-162299-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-162299-1

Comments
The Eurofins SOP Perfluorinated Hydrocarbons and ASTM Method D2216-80 Percent Solids analyses were performed at the Eurofins, Sacramento laboratory.

Receipt
The samples were received on 1/27/2022 9:10 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 0.7º C.

LCMS
Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was below the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgment was used to positively identify the analyte. Digester #1 (240-162299-1), Digester #2 (240-162299-2) and Digester #3 (240-162299-3)

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following samples: Digester #1 (240-162299-1), Digester #2 (240-162299-2) and Digester #3 (240-162299-3). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: Digester #1 (240-162299-1), Digester #2 (240-162299-2), Digester #3 (240-162299-3) and South Sludge Tank (240-162299-4). 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 sample(s).

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.

Method Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

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

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

Sample Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-162299-1	Digester #1	Solid	01/26/22 12:45	01/27/22 09:10
240-162299-2	Digester #2	Solid	01/26/22 12:48	01/27/22 09:10
240-162299-3	Digester #3	Solid	01/26/22 12:51	01/27/22 09:10
240-162299-4	South Sludge Tank	Solid	01/26/22 12:59	01/27/22 09:10

Detection Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #1 — Lab Sample ID: 240-162299-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.8	J B	7.8	1.8	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.1	J	7.8	1.1	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.9	I	7.8	1.7	ug/Kg	1	☼	537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	3.6	J	7.8	0.89	ug/Kg	1	☼	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	3.1	J	7.8	1.9	ug/Kg	1	☼	537 (modified)	Total/NA
6:2 FTS	2.8	J	7.8	1.0	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: Digester #2 — Lab Sample ID: 240-162299-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.8	J B	4.1	0.95	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	9.3	I	4.1	0.89	ug/Kg	1	☼	537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	3.9	J	4.1	0.48	ug/Kg	1	☼	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	3.0	J	4.1	1.0	ug/Kg	1	☼	537 (modified)	Total/NA
6:2 FTS	3.2	J	4.1	0.56	ug/Kg	1	☼	537 (modified)	Total/NA
8:2 FTS	1.1	J	4.1	0.73	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: Digester #3 — Lab Sample ID: 240-162299-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.6	J B	4.3	0.98	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	11	I	4.3	0.92	ug/Kg	1	☼	537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	4.6		4.3	0.49	ug/Kg	1	☼	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.0	J	4.3	1.0	ug/Kg	1	☼	537 (modified)	Total/NA
6:2 FTS	3.4	J	4.3	0.57	ug/Kg	1	☼	537 (modified)	Total/NA
8:2 FTS	1.2	J	4.3	0.74	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: South Sludge Tank — Lab Sample ID: 240-162299-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.7	J B	2.8	0.65	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.66	J	2.8	0.58	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.8		2.8	0.44	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	16	I	2.8	0.61	ug/Kg	1	☼	537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	6.5		2.8	0.33	ug/Kg	1	☼	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.5		2.8	0.68	ug/Kg	1	☼	537 (modified)	Total/NA
6:2 FTS	20		2.8	0.38	ug/Kg	1	☼	537 (modified)	Total/NA
8:2 FTS	2.1	J	2.8	0.50	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #1
Date Collected: 01/26/22 12:45
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-1
Matrix: Solid
Percent Solids: 2.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.8**	**J B**	7.8	1.8	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluoropentanoic acid (PFPeA)	1.6	U	7.8	1.6	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorohexanoic acid (PFHxA)	1.2	U	7.8	1.2	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluoroheptanoic acid (PFHpA)	1.5	U	7.8	1.5	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorooctanoic acid (PFOA)	2.1	U	7.8	2.1	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorononanoic acid (PFNA)	0.85	U	7.8	0.85	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorodecanoic acid (PFDA)	1.9	U	7.8	1.9	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluoroundecanoic acid (PFUnA)	1.6	U	7.8	1.6	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorododecanoic acid (PFDoA)	1.2	U	7.8	1.2	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorotridecanoic acid (PFTriA)	0.81	U	7.8	0.81	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorotetradecanoic acid (PFTeA)	1.4	U	7.8	1.4	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorobutanesulfonic acid (PFBS)	1.5	U	7.8	1.5	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluoropentanesulfonic acid (PFPeS)	1.4	U	7.8	1.4	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	**J**	7.8	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	7.8	1.9	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorooctanesulfonic acid (PFOS)	**7.9**	**I**	7.8	1.7	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorononanesulfonic acid (PFNS)	1.1	U	7.8	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorodecanesulfonic acid (PFDS)	2.0	U	7.8	2.0	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
Perfluorooctanesulfonamide (FOSA)	1.3	U	7.8	1.3	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**3.6**	**J**	7.8	0.89	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**3.1**	**J**	7.8	1.9	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
4:2 FTS	2.0	U	7.8	2.0	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
6:2 FTS	**2.8**	**J**	7.8	1.0	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1
8:2 FTS	1.4	U	7.8	1.4	ug/Kg	☼	01/31/22 11:39	02/02/22 19:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*86*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C5-PFPeA DNU	*99*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C2 PFHxA	*100*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C4 PFHpA	*107*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C4 PFOA	*104*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C5 PFNA	*108*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C2 PFDA	*110*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C2 PFUnA	*82*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C2 PFDoA	*54*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C2 PFTeDA	*18*	**5-*	*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C3 PFBS	*107*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
18O2 PFHxS	*98*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C4 PFOS	*98*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
13C8 FOSA	*96*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
d3-NMeFOSAA	*86*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
d5-NEtFOSAA	*92*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
M2-6:2 FTS	*146*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
M2-8:2 FTS	*179*	**5+*	*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*
M2-4:2 FTS	*157*	**5+*	*25 - 150*	*01/31/22 11:39*	*02/02/22 19:40*	*1*

Client Sample Results

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #1
Date Collected: 01/26/22 12:45
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-1
Matrix: Solid
Percent Solids: 2.5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	97.5		0.1	0.1	%			01/28/22 16:39	1
Percent Solids	2.5		0.1	0.1	%			01/28/22 16:39	1

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #2
Date Collected: 01/26/22 12:48
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-2
Matrix: Solid
Percent Solids: 4.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.8**	**J B**	4.1	0.95	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluoropentanoic acid (PFPeA)	0.85	U	4.1	0.85	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorohexanoic acid (PFHxA)	0.64	U	4.1	0.64	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluoroheptanoic acid (PFHpA)	0.79	U	4.1	0.79	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorooctanoic acid (PFOA)	1.1	U	4.1	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorononanoic acid (PFNA)	0.46	U	4.1	0.46	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorodecanoic acid (PFDA)	1.0	U	4.1	1.0	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluoroundecanoic acid (PFUnA)	0.87	U	4.1	0.87	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorododecanoic acid (PFDoA)	0.62	U	4.1	0.62	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorotridecanoic acid (PFTriA)	0.44	U	4.1	0.44	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorotetradecanoic acid (PFTeA)	0.77	U	4.1	0.77	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorobutanesulfonic acid (PFBS)	0.79	U	4.1	0.79	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluoropentanesulfonic acid (PFPeS)	0.77	U	4.1	0.77	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorohexanesulfonic acid (PFHxS)	0.60	U	4.1	0.60	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	4.1	1.0	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorooctanesulfonic acid (PFOS)	**9.3**	**I**	4.1	0.89	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorononanesulfonic acid (PFNS)	0.60	U	4.1	0.60	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorodecanesulfonic acid (PFDS)	1.1	U	4.1	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
Perfluorooctanesulfonamide (FOSA)	0.68	U	4.1	0.68	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**3.9**	**J**	4.1	0.48	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**3.0**	**J**	4.1	1.0	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
4:2 FTS	1.1	U	4.1	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
6:2 FTS	**3.2**	**J**	4.1	0.56	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1
8:2 FTS	**1.1**	**J**	4.1	0.73	ug/Kg	☼	01/31/22 11:39	02/02/22 19:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*73*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C5-PFPeA DNU	*101*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C2 PFHxA	*97*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C4 PFHpA	*101*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C4 PFOA	*103*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C5 PFNA	*101*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C2 PFDA	*101*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C2 PFUnA	*74*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C2 PFDoA	*45*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C2 PFTeDA	*15*	**5-*	*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C3 PFBS	*105*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
18O2 PFHxS	*102*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C4 PFOS	*94*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
13C8 FOSA	*90*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
d3-NMeFOSAA	*82*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
d5-NEtFOSAA	*77*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
M2-6:2 FTS	*149*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
M2-8:2 FTS	*110*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*
M2-4:2 FTS	*166*	**5+*	*25 - 150*	*01/31/22 11:39*	*02/02/22 19:50*	*1*

Client Sample Results

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #2
Date Collected: 01/26/22 12:48
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-2
Matrix: Solid
Percent Solids: 4.8

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	95.2		0.1	0.1	%			01/28/22 16:39	1
Percent Solids	4.8		0.1	0.1	%			01/28/22 16:39	1

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #3
Date Collected: 01/26/22 12:51
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-3
Matrix: Solid
Percent Solids: 4.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.6**	**J B**	4.3	0.98	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluoropentanoic acid (PFPeA)	0.87	U	4.3	0.87	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorohexanoic acid (PFHxA)	0.66	U	4.3	0.66	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluoroheptanoic acid (PFHpA)	0.81	U	4.3	0.81	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorooctanoic acid (PFOA)	1.1	U	4.3	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorononanoic acid (PFNA)	0.47	U	4.3	0.47	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorodecanoic acid (PFDA)	1.0	U	4.3	1.0	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluoroundecanoic acid (PFUnA)	0.89	U	4.3	0.89	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorododecanoic acid (PFDoA)	0.64	U	4.3	0.64	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorotridecanoic acid (PFTriA)	0.45	U	4.3	0.45	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorotetradecanoic acid (PFTeA)	0.79	U	4.3	0.79	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorobutanesulfonic acid (PFBS)	0.81	U	4.3	0.81	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluoropentanesulfonic acid (PFPeS)	0.79	U	4.3	0.79	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorohexanesulfonic acid (PFHxS)	0.62	U	4.3	0.62	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	4.3	1.0	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorooctanesulfonic acid (PFOS)	**11**	**I**	4.3	0.92	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorononanesulfonic acid (PFNS)	0.62	U	4.3	0.62	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorodecanesulfonic acid (PFDS)	1.1	U	4.3	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
Perfluorooctanesulfonamide (FOSA)	0.70	U	4.3	0.70	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**4.6**		4.3	0.49	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**4.0**	**J**	4.3	1.0	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
4:2 FTS	1.1	U	4.3	1.1	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
6:2 FTS	**3.4**	**J**	4.3	0.57	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1
8:2 FTS	**1.2**	**J**	4.3	0.74	ug/Kg	☼	01/31/22 11:39	02/02/22 20:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*72*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C5-PFPeA DNU	*103*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C2 PFHxA	*98*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C4 PFHpA	*102*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C4 PFOA	*100*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C5 PFNA	*97*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C2 PFDA	*105*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C2 PFUnA	*75*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C2 PFDoA	*43*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C2 PFTeDA	*14*	**5-*	*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C3 PFBS	*107*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
18O2 PFHxS	*100*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C4 PFOS	*93*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
13C8 FOSA	*94*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
d5-NEtFOSAA	*74*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
M2-6:2 FTS	*143*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
M2-8:2 FTS	*139*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*
M2-4:2 FTS	*155*	**5+*	*25 - 150*	*01/31/22 11:39*	*02/02/22 20:01*	*1*

Client Sample Results

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #3
Date Collected: 01/26/22 12:51
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-3
Matrix: Solid
Percent Solids: 4.5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	95.5		0.1	0.1	%			01/28/22 16:39	1
Percent Solids	4.5		0.1	0.1	%			01/28/22 16:39	1

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: South Sludge Tank

Date Collected: 01/26/22 12:59
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-4

Matrix: Solid
Percent Solids: 6.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**1.7**	**J B**	2.8	0.65	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluoropentanoic acid (PFPeA)	**0.66**	**J**	2.8	0.58	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorohexanoic acid (PFHxA)	**3.8**		2.8	0.44	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluoroheptanoic acid (PFHpA)	0.54	U	2.8	0.54	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorooctanoic acid (PFOA)	0.75	U	2.8	0.75	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorononanoic acid (PFNA)	0.31	U	2.8	0.31	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorodecanoic acid (PFDA)	0.68	U	2.8	0.68	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluoroundecanoic acid (PFUnA)	0.60	U	2.8	0.60	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorododecanoic acid (PFDoA)	0.43	U	2.8	0.43	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorotridecanoic acid (PFTriA)	0.30	U	2.8	0.30	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorotetradecanoic acid (PFTeA)	0.53	U	2.8	0.53	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorobutanesulfonic acid (PFBS)	0.54	U	2.8	0.54	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluoropentanesulfonic acid (PFPeS)	0.53	U	2.8	0.53	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorohexanesulfonic acid (PFHxS)	0.41	U	2.8	0.41	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.70	U	2.8	0.70	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorooctanesulfonic acid (PFOS)	**16**	**I**	2.8	0.61	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorononanesulfonic acid (PFNS)	0.41	U	2.8	0.41	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorodecanesulfonic acid (PFDS)	0.74	U	2.8	0.74	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
Perfluorooctanesulfonamide (FOSA)	0.47	U	2.8	0.47	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**6.5**		2.8	0.33	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**4.5**		2.8	0.68	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
4:2 FTS	0.72	U	2.8	0.72	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
6:2 FTS	**20**		2.8	0.38	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1
8:2 FTS	**2.1**	**J**	2.8	0.50	ug/Kg	☼	01/31/22 11:39	02/02/22 20:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*78*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C5-PFPeA DNU	*104*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C2 PFHxA	*104*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C4 PFHpA	*102*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C4 PFOA	*106*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C5 PFNA	*97*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C2 PFDA	*102*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C2 PFUnA	*71*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C2 PFDoA	*38*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C2 PFTeDA	*19*	**5-*	*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C3 PFBS	*101*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
18O2 PFHxS	*97*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C4 PFOS	*91*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
13C8 FOSA	*88*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
d3-NMeFOSAA	*67*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
d5-NEtFOSAA	*61*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
M2-6:2 FTS	*129*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
M2-8:2 FTS	*129*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*
M2-4:2 FTS	*142*		*25 - 150*	*01/31/22 11:39*	*02/02/22 20:11*	*1*

Client Sample Results

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: South Sludge Tank
Date Collected: 01/26/22 12:59
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-4
Matrix: Solid
Percent Solids: 6.9

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	93.1		0.1	0.1	%			01/28/22 16:39	1
Percent Solids	6.9		0.1	0.1	%			01/28/22 16:39	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-562039/1-A
Matrix: Solid
Analysis Batch: 563130

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 562039

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.111	J	0.20	0.046	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluoropentanoic acid (PFPeA)	0.041	U	0.20	0.041	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorohexanoic acid (PFHxA)	0.031	U	0.20	0.031	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluoroheptanoic acid (PFHpA)	0.038	U	0.20	0.038	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorooctanoic acid (PFOA)	0.053	U	0.20	0.053	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorononanoic acid (PFNA)	0.022	U	0.20	0.022	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorodecanoic acid (PFDA)	0.048	U	0.20	0.048	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluoroundecanoic acid (PFUnA)	0.042	U	0.20	0.042	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorododecanoic acid (PFDoA)	0.030	U	0.20	0.030	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorotridecanoic acid (PFTriA)	0.021	U	0.20	0.021	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorotetradecanoic acid (PFTeA)	0.037	U	0.20	0.037	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorobutanesulfonic acid (PFBS)	0.038	U	0.20	0.038	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluoropentanesulfonic acid (PFPeS)	0.037	U	0.20	0.037	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorohexanesulfonic acid (PFHxS)	0.029	U	0.20	0.029	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.049	U	0.20	0.049	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorooctanesulfonic acid (PFOS)	0.043	U	0.20	0.043	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorononanesulfonic acid (PFNS)	0.029	U	0.20	0.029	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorodecanesulfonic acid (PFDS)	0.052	U	0.20	0.052	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
Perfluorooctanesulfonamide (FOSA)	0.033	U	0.20	0.033	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.023	U	0.20	0.023	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.048	U	0.20	0.048	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
4:2 FTS	0.051	U	0.20	0.051	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
6:2 FTS	0.027	U	0.20	0.027	ug/Kg		01/31/22 11:39	02/02/22 19:19	1
8:2 FTS	0.035	U	0.20	0.035	ug/Kg		01/31/22 11:39	02/02/22 19:19	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*87*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C5-PFPeA DNU	*101*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C2 PFHxA	*106*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C4 PFHpA	*105*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C4 PFOA	*104*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C5 PFNA	*106*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C2 PFDA	*108*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C2 PFUnA	*119*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C2 PFDoA	*97*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C2 PFTeDA	*103*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C3 PFBS	*112*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
18O2 PFHxS	*103*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C4 PFOS	*111*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
13C8 FOSA	*103*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
d3-NMeFOSAA	*108*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
d5-NEtFOSAA	*118*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
M2-6:2 FTS	*110*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
M2-8:2 FTS	*115*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*
M2-4:2 FTS	*118*		*25 - 150*	*01/31/22 11:39*	*02/02/22 19:19*	*1*

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

Lab Sample ID: LCS 320-562039/2-A
Matrix: Solid
Analysis Batch: 563130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 562039

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	2.00	1.97		ug/Kg		99	76 - 136
Perfluoropentanoic acid (PFPeA)	2.00	1.87		ug/Kg		93	69 - 129
Perfluorohexanoic acid (PFHxA)	2.00	1.92		ug/Kg		96	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.00		ug/Kg		100	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.92		ug/Kg		96	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.88		ug/Kg		94	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.16		ug/Kg		108	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.93		ug/Kg		97	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.11		ug/Kg		105	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.03		ug/Kg		102	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.00		ug/Kg		100	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.76		ug/Kg		99	69 - 129
Perfluoropentanesulfonic acid (PFPeS)	1.88	1.89		ug/Kg		101	66 - 126
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.75		ug/Kg		96	62 - 122
Perfluoroheptanesulfonic Acid (PFHpS)	1.90	1.84		ug/Kg		96	76 - 136
Perfluorooctanesulfonic acid (PFOS)	1.86	1.84		ug/Kg		99	68 - 141
Perfluorononanesulfonic acid (PFNS)	1.92	1.86		ug/Kg		97	72 - 132
Perfluorodecanesulfonic acid (PFDS)	1.93	1.70		ug/Kg		88	71 - 131
Perfluorooctanesulfonamide (FOSA)	2.00	2.02		ug/Kg		101	77 - 137
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.05		ug/Kg		103	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.90		ug/Kg		95	72 - 132
4:2 FTS	1.87	1.93		ug/Kg		103	68 - 143
6:2 FTS	1.90	2.04		ug/Kg		108	73 - 139
8:2 FTS	1.92	1.83		ug/Kg		95	75 - 135

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*88*		*25 - 150*
13C5-PFPeA DNU	*105*		*25 - 150*
13C2 PFHxA	*109*		*25 - 150*
13C4 PFHpA	*103*		*25 - 150*
13C4 PFOA	*103*		*25 - 150*
13C5 PFNA	*108*		*25 - 150*
13C2 PFDA	*105*		*25 - 150*
13C2 PFUnA	*100*		*25 - 150*
13C2 PFDoA	*102*		*25 - 150*
13C2 PFTeDA	*101*		*25 - 150*
13C3 PFBS	*104*		*25 - 150*
18O2 PFHxS	*104*		*25 - 150*

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

Lab Sample ID: LCS 320-562039/2-A
Matrix: Solid
Analysis Batch: 563130

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 562039

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFOS	108		25 - 150
13C8 FOSA	106		25 - 150
d3-NMeFOSAA	107		25 - 150
d5-NEtFOSAA	110		25 - 150
M2-6:2 FTS	106		25 - 150
M2-8:2 FTS	119		25 - 150
M2-4:2 FTS	107		25 - 150

QC Association Summary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 240-162299-1
Project/Site: Ionia Regional Utilities Authority

LCMS

Prep Batch: 562039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-162299-1	Digester #1	Total/NA	Solid	SHAKE	
240-162299-2	Digester #2	Total/NA	Solid	SHAKE	
240-162299-3	Digester #3	Total/NA	Solid	SHAKE	
240-162299-4	South Sludge Tank	Total/NA	Solid	SHAKE	
MB 320-562039/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-562039/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Analysis Batch: 563130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-162299-1	Digester #1	Total/NA	Solid	537 (modified)	562039
240-162299-2	Digester #2	Total/NA	Solid	537 (modified)	562039
240-162299-3	Digester #3	Total/NA	Solid	537 (modified)	562039
240-162299-4	South Sludge Tank	Total/NA	Solid	537 (modified)	562039
MB 320-562039/1-A	Method Blank	Total/NA	Solid	537 (modified)	562039
LCS 320-562039/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	562039

General Chemistry

Analysis Batch: 561632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-162299-1	Digester #1	Total/NA	Solid	D 2216	
240-162299-2	Digester #2	Total/NA	Solid	D 2216	
240-162299-3	Digester #3	Total/NA	Solid	D 2216	
240-162299-4	South Sludge Tank	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: Digester #1
Lab Sample ID: 240-162299-1
Date Collected: 01/26/22 12:45
Matrix: Solid
Date Received: 01/27/22 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	561632	01/28/22 16:39	JP	TAL SAC

Client Sample ID: Digester #1
Lab Sample ID: 240-162299-1
Date Collected: 01/26/22 12:45
Matrix: Solid
Date Received: 01/27/22 09:10
Percent Solids: 2.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			562039	01/31/22 11:39	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1	563130	02/02/22 19:40	S1M	TAL SAC

Client Sample ID: Digester #2
Lab Sample ID: 240-162299-2
Date Collected: 01/26/22 12:48
Matrix: Solid
Date Received: 01/27/22 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	561632	01/28/22 16:39	JP	TAL SAC

Client Sample ID: Digester #2
Lab Sample ID: 240-162299-2
Date Collected: 01/26/22 12:48
Matrix: Solid
Date Received: 01/27/22 09:10
Percent Solids: 4.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			562039	01/31/22 11:39	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1	563130	02/02/22 19:50	S1M	TAL SAC

Client Sample ID: Digester #3
Lab Sample ID: 240-162299-3
Date Collected: 01/26/22 12:51
Matrix: Solid
Date Received: 01/27/22 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	561632	01/28/22 16:39	JP	TAL SAC

Client Sample ID: Digester #3
Lab Sample ID: 240-162299-3
Date Collected: 01/26/22 12:51
Matrix: Solid
Date Received: 01/27/22 09:10
Percent Solids: 4.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			562039	01/31/22 11:39	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1	563130	02/02/22 20:01	S1M	TAL SAC

Client Sample ID: South Sludge Tank
Lab Sample ID: 240-162299-4
Date Collected: 01/26/22 12:59
Matrix: Solid
Date Received: 01/27/22 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	561632	01/28/22 16:39	JP	TAL SAC

Lab Chronicle

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Client Sample ID: South Sludge Tank

Date Collected: 01/26/22 12:59
Date Received: 01/27/22 09:10

Lab Sample ID: 240-162299-4

Matrix: Solid
Percent Solids: 6.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			562039	01/31/22 11:39	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1	563130	02/02/22 20:11	S1M	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 240-162299-1
Project/Site: Ionia Regional Utilities Authority

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	01-31-22 *
Colorado	State	CA0004	08-31-22
Florida	NELAP	E87570	06-30-22
Georgia	State	4040	01-30-23
Hawaii	State	<cert No.>	01-29-23
Illinois	NELAP	200060	03-18-22
Kansas	NELAP	E-10375	02-28-22
Louisiana	NELAP	01944	06-30-22
Maine	State	CA00004	04-14-22
Michigan	State	9947	01-29-22 *
Nevada	State	CA00044	08-31-22
New Hampshire	NELAP	2997	04-18-22
New Jersey	NELAP	CA005	06-30-22
New York	NELAP	11666	04-01-22
Ohio	State	41252	01-29-23
Oregon	NELAP	4040	01-29-22 *
Texas	NELAP	T104704399-19-13	05-31-22
US Fish & Wildlife	US Federal Programs	58448	07-31-22
USDA	US Federal Programs	P330-18-00239	07-31-24
Utah	NELAP	CA000442021-12	03-01-22
Virginia	NELAP	460278	03-14-22
Washington	State	C581	05-05-22
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.

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916-373-5600 Fax: 916-372-1059

Chain of Custody Record

eurofins | Environment Testing America

2/9/2022

Client Information	Sampler: CS / JL	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-71817-29158.1
Client Contact: Judy Van Putten	Phone: 616-523-0165	E-Mail: Kris.Brooks@Eurofinset.com	State of Origin: Michigan	Page: Page 1 of 2
Company: Fishbeck Thompson Carr & Huber Inc	PWSID:			Job #:
Address: 1515 Arboretum Drive SE	Due Date Requested:			
City: Grand Rapids	TAT Requested (days): STANDARD			
State, Zip: MI, 49546	Compliance Project: Δ Yes Δ No			
Phone: 616-464-3934(Tel)	PO #: Purchase Order not required			
Email: jevanputten@ftch.com	WO #:			
Project Name: Ionia Regional Utilities Authority	Project #: 24022883			
Site: CKenyone Ci. ionia. mi. us (Send to:)	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - PFAS, Standard List (24 Analytes)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
Digester #1	1/26/22	12:45p	G	Solid	N		24		
Digester #2	1/26/22	12:48p	G	Solid	N		24		
Digester #3	1/26/22	12:51p	G	Solid	N		24		
South Sludge trunk	1/26/22	12:59p	G	Solid	N		24		
				Solid					
				Solid					
				Solid					
				Solid					
				Solid					
				Solid					
				Solid					

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

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

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

Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Cullen Bader	1/27/22 7:30am	DLUT		1-27-22 9:10	DAL
2	U.P.S	1-27-22 3:30	DAL			
3						

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

Cooler Temperature(s) °C and Other Remarks.

Ver: 06/08/2021

Eurofins Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-148816.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@Eurofinset.com	State of Origin: Michigan	Page: Page 1 of 1
Company: Eurofins Environment Testing Northern Ca		Accreditations Required (See note):		Job #: 240-162299-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 2/9/2022			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Ionia Regional Utilities Authority	Project #: 24022883			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA/Shake_Bath_14D (MOD) PFAS, Standard List (24 Analytes)	Moisture/ Percent Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
Digester #1 (240-162299-1)	1/26/22	12:45 Eastern		Solid			X	X	1	
Digester #2 (240-162299-2)	1/26/22	12:48 Eastern		Solid			X	X	1	
Digester #3 (240-162299-3)	1/26/22	12:51 Eastern		Solid			X	X	1	
South Sludge Tank (240-162299-4)	1/26/22	12:59 Eastern		Solid			X	X	1	

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

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

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: 10:35 AM

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
B Ch U.P.S	1-27-22 3:30	TAC	DHL	1/28/22	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No	Custody Seal No.: 1248950	Cooler Temperature(s) °C and Other Remarks: 0.7c

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Fishbeck Thompson Carr & Huber Inc

Job Number: 240-162299-1

Login Number: 162299
List Number: 2
Creator: Simmons, Jason C

List Source: Eurofins Sacramento
List Creation: 01/28/22 02:22 PM

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	1248958
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.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.7c
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	Received project as a subcontract.
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	

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Sacramento
Sample Receiving Notes

240-162299 Field Sheet

Job: _____

Tracking # : 12 Y3W 714 13 4069 3058

SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier

GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC.

Therm. ID: L-06 Corr. Factor: (+ / -) _____ °C

Ice b Wet b Gel _____ Other _____

Cooler Custody Seal: 1249958

Cooler ID: _____

Temp Observed: 0.7 °C Corrected: 0.7 °C

From: Temp Blank ☐ Sample ☐

Opening/Processing The Shipment	Yes	No	NA
Cooler compromised/tampered with?	☐	☒	☐
Cooler Temperature is acceptable?	☒	☐	☐
Frozen samples show signs of thaw?	☐	☐	☒

Initials: DH Date: 1/20/22

Unpacking/Labeling The Samples	Yes	No	NA
CoC is complete w/o discrepancies?	☒	☐	☐
Samples compromised/tampered with?	☐	☒	☐
Sample containers have legible labels?	☒	☐	☐
Sample custody seal?	☐	☐	☒
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided?	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Samples w/o discrepancies?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
Perchlorate has headspace? (Methods 314, 331, 6850)	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Initials: LS Date: 1/28/22

Notes: _____

Trizma Lot #(s): _____

Login Completion	Yes	No	NA
Receipt Temperature on COC?	☒	☐	☐
Samples received within hold time?	☒	☐	☐
NCM Filed?	☐	☐	☒
Log Release checked in TALS?	☐	☐	☒

Initials: LS Date: 1/28/22

Isotope Dilution Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: Ionia Regional Utilities Authority

Job ID: 240-162299-1

Method: 537 (modified) - Fluorinated Alkyl Substances

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFBA	PFPeA	PFHxA	C4PFHA	PFOA	PFNA	PFDA	PFUnA
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
240-162299-1	Digester #1	86	99	100	107	104	108	110	82
240-162299-2	Digester #2	73	101	97	101	103	101	101	74
240-162299-3	Digester #3	72	103	98	102	100	97	105	75
240-162299-4	South Sludge Tank	78	104	104	102	106	97	102	71
LCS 320-562039/2-A	Lab Control Sample	88	105	109	103	103	108	105	100
MB 320-562039/1-A	Method Blank	87	101	106	105	104	106	108	119

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFDoA	PFTDA	C3PFBS	PFHxS	PFOS	PFOSA	d3NMFOS	d5NEFOS
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
240-162299-1	Digester #1	54	18 *5-	107	98	98	96	86	92
240-162299-2	Digester #2	45	15 *5-	105	102	94	90	82	77
240-162299-3	Digester #3	43	14 *5-	107	100	93	94	81	74
240-162299-4	South Sludge Tank	38	19 *5-	101	97	91	88	67	61
LCS 320-562039/2-A	Lab Control Sample	102	101	104	104	108	106	107	110
MB 320-562039/1-A	Method Blank	97	103	112	103	111	103	108	118

		Percent Isotope Dilution Recovery (Acceptance Limits)		
		M262FTS	M282FTS	M242FTS
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)
240-162299-1	Digester #1	146	179 *5+	157 *5+
240-162299-2	Digester #2	149	110	166 *5+
240-162299-3	Digester #3	143	139	155 *5+
240-162299-4	South Sludge Tank	129	129	142
LCS 320-562039/2-A	Lab Control Sample	106	119	107
MB 320-562039/1-A	Method Blank	110	115	118

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5-PFPeA DNU
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
PFOSA = 13C8 FOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
M242FTS = M2-4:2 FTS