Maxxam
A Bureau Veritas Group Company

Your Project #: PFC
Site Location: BFTA
Your C.O.C. #: 593726-04-01

Attention:Tom Cambareri

Cape Cod Comission
Cape Cod Commission
3225 Main Street
Barnstable, MA
USA 02630

Report Date: 2017/03/16
Report #: R4393626
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B742924
Received: 2017/03/02, 13:59

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water	3	2017/03/04	2017/03/13	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Stephanie Pollen
Project Manager
16 Mar 2017 08:55:21

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Stephanie Pollen, Project Manager
Email: SPollen@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B742924
Report Date: 2017/03/16

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RESULTS OF ANALYSES OF WATER

Maxxam ID		DZN164	DZN165			DZN166			
Sampling Date		2017/03/01 09:45	2017/03/01 09:45			2017/03/01 09:45			
COC Number		593726-04-01	593726-04-01			593726-04-01			
	UNITS	INFLUENT PRW-4	MIDPOINT	RDL	MDL	EFFLUENT	RDL	MDL	QC Batch
Miscellaneous Parameters									
6:2 Fluorotelomer sulfonate	ug/L	0.29	0.14	0.020	0.0032	0.017	0.020	0.0032	4889373
8:2 Fluorotelomer sulfonate	ug/L	0.14	0.061	0.020	0.0036	<0.0036	0.020	0.0036	4889373
N-ethylperfluorooctane sulfonamide	ug/L	<0.0058	<0.0058	0.020	0.0058	<0.0058	0.020	0.0058	4889373
N-ethylperfluorooctane sulfonamidoe	ug/L	<0.0063	0.0098	0.020	0.0063	<0.0063	0.020	0.0063	4889373
N-methylperfluorooctane sulfonamide	ug/L	<0.0041	0.0060	0.020	0.0041	<0.0041	0.020	0.0041	4889373
N-methylperfluorooctanesulfonamidol	ug/L	<0.0043	<0.0043	0.020	0.0043	<0.0043	0.020	0.0043	4889373
Perfluorobutane Sulfonate (PFBS)	ug/L	0.047	0.021	0.020	0.0048	<0.0048	0.020	0.0048	4889373
Perfluorobutanoic acid	ug/L	0.064	0.041	0.020	0.0066	0.0087	0.020	0.0066	4889373
Perfluorodecane Sulfonate	ug/L	0.0049	<0.0046	0.020	0.0046	<0.0046	0.020	0.0046	4889373
Perfluorodecanoic Acid (PFDA)	ug/L	0.011	0.0051	0.020	0.0040	<0.0040	0.020	0.0040	4889373
Perfluorododecanoic Acid (PFDoA)	ug/L	<0.0028	0.0041	0.020	0.0028	<0.0028	0.020	0.0028	4889373
Perfluoroheptane sulfonate	ug/L	0.059	0.027	0.020	0.0048	0.0068	0.020	0.0048	4889373
Perfluoroheptanoic Acid (PFHpA)	ug/L	0.099	0.050	0.020	0.0033	0.011	0.020	0.0033	4889373
Perfluorohexane Sulfonate (PFHxS)	ug/L	0.69	0.29	0.020	0.0034	0.034	0.020	0.0034	4889373
Perfluorohexanoic Acid (PFHxA)	ug/L	0.27	0.14	0.020	0.0029	0.029	0.020	0.0029	4889373
Perfluoro-n-Octanoic Acid (PFOA)	ug/L	0.12	0.047	0.020	0.0046	0.0065	0.020	0.0046	4889373
Perfluorononanoic Acid (PFNA)	ug/L	0.062	0.027	0.020	0.0046	<0.0046	0.020	0.0046	4889373
Perfluorooctane Sulfonamide (PFOSA)	ug/L	0.014	0.0056	0.020	0.0036	<0.0036	0.020	0.0036	4889373
Perfluorooctane Sulfonate (PFOS)	ug/L	3.7 (1)	1.4 (1)	0.20	0.026	0.15	0.020	0.0026	4889373
Perfluoropentanoic Acid (PFPeA)	ug/L	0.22	0.12	0.020	0.0027	0.023	0.020	0.0027	4889373
Perfluorotetradecanoic Acid	ug/L	<0.0038	0.0039	0.020	0.0038	<0.0038	0.020	0.0038	4889373
Perfluorotridecanoic Acid	ug/L	<0.0033	0.0056	0.020	0.0033	<0.0033	0.020	0.0033	4889373
Perfluoroundecanoic Acid (PFUnA)	ug/L	0.10	0.032	0.020	0.0043	<0.0043	0.020	0.0043	4889373
Surrogate Recovery (%)									
13C4-Perfluorooctanesulfonate	%	88	78	N/A	N/A	85	N/A	N/A	4889373
13C4-Perfluorooctanoic acid	%	84	81	N/A	N/A	101	N/A	N/A	4889373
13C8-Perfluorooctane Sulfonamide	%	85	78	N/A	N/A	71	N/A	N/A	4889373

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Due to high concentration of the target analyte, sample required 10x dilution. Detection limit was adjusted accordingly.

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Maxxam Job #: B742924
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TEST SUMMARY

Maxxam ID: DZN164
Sample ID: INFLUENT PRW-4
Matrix: Water

Collected: 2017/03/01
Shipped:
Received: 2017/03/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PFOS and PFOA in water	LCMS	4889373	2017/03/04	2017/03/13	Colm McNamara

Maxxam ID: DZN165
Sample ID: MIDPOINT
Matrix: Water

Collected: 2017/03/01
Shipped:
Received: 2017/03/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PFOS and PFOA in water	LCMS	4889373	2017/03/04	2017/03/13	Colm McNamara

Maxxam ID: DZN166
Sample ID: EFFLUENT
Matrix: Water

Collected: 2017/03/01
Shipped:
Received: 2017/03/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PFOS and PFOA in water	LCMS	4889373	2017/03/04	2017/03/13	Colm McNamara

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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4889373	CM5	Matrix Spike	13C4-Perfluorooctanesulfonate	2017/03/13		91	%	70 - 130
			13C4-Perfluorooctanoic acid	2017/03/13		111	%	70 - 130
			13C8-Perfluorooctane Sulfonamide	2017/03/13		91	%	60 - 120
			6:2 Fluorotelomer sulfonate	2017/03/13		99	%	70 - 130
			8:2 Fluorotelomer sulfonate	2017/03/13		112	%	70 - 130
			N-ethylperfluorooctane sulfonamide	2017/03/13		100	%	70 - 130
			N-ethylperfluorooctane sulfonamidoe	2017/03/13		104	%	70 - 130
			N-methylperfluorooctane sulfonamide	2017/03/13		92	%	70 - 130
			N-methylperfluorooctanesulfonamidol	2017/03/13		114	%	70 - 130
			Perfluorobutane Sulfonate (PFBS)	2017/03/13		99	%	70 - 130
			Perfluorobutanoic acid	2017/03/13		105	%	70 - 130
			Perfluorodecane Sulfonate	2017/03/13		98	%	70 - 130
			Perfluoroheptane sulfonate	2017/03/13		82	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2017/03/13		88	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2017/03/13		101	%	70 - 130
			Perfluorohexanoic Acid (PFHxA)	2017/03/13		100	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2017/03/13		104	%	70 - 130
			Perfluorooctane Sulfonamide (PFOSA)	2017/03/13		105	%	70 - 130
			Perfluoropentanoic Acid (PFPeA)	2017/03/13		95	%	70 - 130
			Perfluorotetradecanoic Acid	2017/03/13		89	%	70 - 130
			Perfluorotridecanoic Acid	2017/03/13		99	%	70 - 130
			Perfluoroundecanoic Acid (PFUnA)	2017/03/13		98	%	70 - 130
			Perfluorodecanoic Acid (PFDA)	2017/03/13		109	%	70 - 130
			Perfluorododecanoic Acid (PFDoA)	2017/03/13		106	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2017/03/13		104	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2017/03/13		96	%	70 - 130
4889373	CM5	Matrix Spike DUP	13C4-Perfluorooctanesulfonate	2017/03/13		81	%	70 - 130
			13C4-Perfluorooctanoic acid	2017/03/13		98	%	70 - 130
			13C8-Perfluorooctane Sulfonamide	2017/03/13		84	%	60 - 120
			6:2 Fluorotelomer sulfonate	2017/03/13		91	%	70 - 130
			8:2 Fluorotelomer sulfonate	2017/03/13		106	%	70 - 130
			N-ethylperfluorooctane sulfonamide	2017/03/13		104	%	70 - 130
			N-ethylperfluorooctane sulfonamidoe	2017/03/13		127	%	70 - 130
			N-methylperfluorooctane sulfonamide	2017/03/13		103	%	70 - 130
			N-methylperfluorooctanesulfonamidol	2017/03/13		119	%	70 - 130
			Perfluorobutane Sulfonate (PFBS)	2017/03/13		105	%	70 - 130
			Perfluorobutanoic acid	2017/03/13		110	%	70 - 130
			Perfluorodecane Sulfonate	2017/03/13		81	%	70 - 130
			Perfluoroheptane sulfonate	2017/03/13		94	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2017/03/13		98	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2017/03/13		103	%	70 - 130
			Perfluorohexanoic Acid (PFHxA)	2017/03/13		106	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2017/03/13		116	%	70 - 130
			Perfluorooctane Sulfonamide (PFOSA)	2017/03/13		101	%	70 - 130
			Perfluoropentanoic Acid (PFPeA)	2017/03/13		101	%	70 - 130
			Perfluorotetradecanoic Acid	2017/03/13		109	%	70 - 130
			Perfluorotridecanoic Acid	2017/03/13		125	%	70 - 130
			Perfluoroundecanoic Acid (PFUnA)	2017/03/13		114	%	70 - 130
			Perfluorodecanoic Acid (PFDA)	2017/03/13		101	%	70 - 130
			Perfluorododecanoic Acid (PFDoA)	2017/03/13		107	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2017/03/13		100	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2017/03/13		103	%	70 - 130
4889373	CM5	MS/MSD RPD	6:2 Fluorotelomer sulfonate	2017/03/13	8.0		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			8:2 Fluorotelomer sulfonate	2017/03/13	5.3		%	30
			N-ethylperfluorooctane sulfonamide	2017/03/13	3.1		%	30
			N-ethylperfluorooctane sulfonamidoe	2017/03/13	20		%	30
			N-methylperfluorooctane sulfonamide	2017/03/13	12		%	30
			N-methylperfluorooctanesulfonamidol	2017/03/13	4.0		%	30
			Perfluorobutane Sulfonate (PFBS)	2017/03/13	5.5		%	30
			Perfluorobutanoic acid	2017/03/13	4.6		%	30
			Perfluorodecane Sulfonate	2017/03/13	19		%	30
			Perfluoroheptane sulfonate	2017/03/13	13		%	30
			Perfluoroheptanoic Acid (PFHpA)	2017/03/13	11		%	30
			Perfluorohexane Sulfonate (PFHxS)	2017/03/13	2.2		%	30
			Perfluorohexanoic Acid (PFHxA)	2017/03/13	6.2		%	30
			Perfluorononanoic Acid (PFNA)	2017/03/13	11		%	30
			Perfluorooctane Sulfonamide (PFOSA)	2017/03/13	3.7		%	30
			Perfluoropentanoic Acid (PFPeA)	2017/03/13	6.3		%	30
			Perfluorotetradecanoic Acid	2017/03/13	20		%	30
			Perfluorotridecanoic Acid	2017/03/13	24		%	30
			Perfluoroundecanoic Acid (PFUnA)	2017/03/13	15		%	30
			Perfluorodecanoic Acid (PFDA)	2017/03/13	7.6		%	30
			Perfluorododecanoic Acid (PFDoA)	2017/03/13	0.38		%	30
			Perfluoro-n-Octanoic Acid (PFOA)	2017/03/13	4.5		%	30
			Perfluorooctane Sulfonate (PFOS)	2017/03/13	6.8		%	30
4889373	CM5	Spiked Blank	13C4-Perfluorooctanesulfonate	2017/03/13		93	%	70 - 130
			13C4-Perfluorooctanoic acid	2017/03/13		94	%	70 - 130
			13C8-Perfluorooctane Sulfonamide	2017/03/13		77	%	60 - 120
			6:2 Fluorotelomer sulfonate	2017/03/13		102	%	70 - 130
			8:2 Fluorotelomer sulfonate	2017/03/13		114	%	70 - 130
			N-ethylperfluorooctane sulfonamide	2017/03/13		99	%	70 - 130
			N-ethylperfluorooctane sulfonamidoe	2017/03/13		114	%	70 - 130
			N-methylperfluorooctane sulfonamide	2017/03/13		101	%	70 - 130
			N-methylperfluorooctanesulfonamidol	2017/03/13		85	%	70 - 130
			Perfluorobutane Sulfonate (PFBS)	2017/03/13		109	%	70 - 130
			Perfluorobutanoic acid	2017/03/13		108	%	70 - 130
			Perfluorodecane Sulfonate	2017/03/13		93	%	70 - 130
			Perfluoroheptane sulfonate	2017/03/13		89	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2017/03/13		101	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2017/03/13		110	%	70 - 130
			Perfluorohexanoic Acid (PFHxA)	2017/03/13		100	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2017/03/13		107	%	70 - 130
			Perfluorooctane Sulfonamide (PFOSA)	2017/03/13		111	%	70 - 130
			Perfluoropentanoic Acid (PFPeA)	2017/03/13		99	%	70 - 130
			Perfluorotetradecanoic Acid	2017/03/13		95	%	70 - 130
			Perfluorotridecanoic Acid	2017/03/13		93	%	70 - 130
			Perfluoroundecanoic Acid (PFUnA)	2017/03/13		96	%	70 - 130
			Perfluorodecanoic Acid (PFDA)	2017/03/13		99	%	70 - 130
			Perfluorododecanoic Acid (PFDoA)	2017/03/13		105	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2017/03/13		104	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2017/03/13		100	%	70 - 130
4889373	CM5	Method Blank	13C4-Perfluorooctanesulfonate	2017/03/13		94	%	70 - 130
			13C4-Perfluorooctanoic acid	2017/03/13		91	%	70 - 130
			13C8-Perfluorooctane Sulfonamide	2017/03/13		81	%	60 - 120
			6:2 Fluorotelomer sulfonate	2017/03/13	<0.0032		ug/L	
			8:2 Fluorotelomer sulfonate	2017/03/13	<0.0036		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			N-ethylperfluorooctane sulfonamide	2017/03/13	<0.0058		ug/L	
			N-ethylperfluorooctane sulfonamidoe	2017/03/13	<0.0063		ug/L	
			N-methylperfluorooctane sulfonamide	2017/03/13	<0.0041		ug/L	
			N-methylperfluorooctanesulfonamidol	2017/03/13	<0.0043		ug/L	
			Perfluorobutane Sulfonate (PFBS)	2017/03/13	<0.0048		ug/L	
			Perfluorobutanoic acid	2017/03/13	<0.0066		ug/L	
			Perfluorodecane Sulfonate	2017/03/13	<0.0046		ug/L	
			Perfluoroheptane sulfonate	2017/03/13	<0.0048		ug/L	
			Perfluoroheptanoic Acid (PFHpA)	2017/03/13	<0.0033		ug/L	
			Perfluorohexane Sulfonate (PFHxS)	2017/03/13	<0.0034		ug/L	
			Perfluorohexanoic Acid (PFHxA)	2017/03/13	<0.0029		ug/L	
			Perfluorononanoic Acid (PFNA)	2017/03/13	<0.0046		ug/L	
			Perfluorooctane Sulfonamide (PFOSA)	2017/03/13	<0.0036		ug/L	
			Perfluoropentanoic Acid (PFPeA)	2017/03/13	<0.0027		ug/L	
			Perfluorotetradecanoic Acid	2017/03/13	<0.0038		ug/L	
			Perfluorotridecanoic Acid	2017/03/13	<0.0033		ug/L	
			Perfluoroundecanoic Acid (PFUnA)	2017/03/13	<0.0043		ug/L	
			Perfluorodecanoic Acid (PFDA)	2017/03/13	<0.0040		ug/L	
			Perfluorododecanoic Acid (PFDoA)	2017/03/13	<0.0028		ug/L	
			Perfluoro-n-Octanoic Acid (PFOA)	2017/03/13	<0.0046		ug/L	
			Perfluorooctane Sulfonate (PFOS)	2017/03/13	<0.0026		ug/L	

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Sin Chii Chia, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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