NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Level 2 Laboratory Report, Electronic Data Deliverable, SDG B836680

Marine Corps Ballistics Base Barstow
Barstow, California

November 2019

Maxxam
A Bureau Veritas Group Company

Your Project #: 2017031
Site Location: MCLB BARSTOW, CA
Your C.O.C. #: N/A

Attention: Orval Osborne

Oneida Total Integrated Enterprises
317 East Main Street
Ventura, CA
USA 93001

Report Date: 2018/03/05
Report #: R5029667
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B836680
Received: 2018/02/16, 13:40

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	2	2018/02/28	2018/03/01	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.
(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Encryption Key

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 Job #: B836680
Report Date: 2018/03/05

Oneida Total Integrated Enterprises
Client Project #: 2017031
Site Location: MCLB BARSTOW, CA

RESULTS OF ANALYSES OF WATER

Maxxam ID		GCK807	GCK808				
Sampling Date		2018/02/14 13:33	2018/02/14 13:32				
	UNITS	WELL#6	FRB	DL	LOD	LOQ	QC Batch
Miscellaneous Parameters							
6:2 Fluorotelomer sulfonate	ug/L	0.015 U	0.015 U	0.0066	0.015	0.020	5419640
8:2 Fluorotelomer sulfonate	ug/L	0.015 U	0.015 U	0.0066	0.015	0.020	5419640
Perfluorobutanoic acid	ug/L	0.014 J	0.015 U	0.0055	0.015	0.020	5419640
Perfluorobutane Sulfonate (PFBS)	ug/L	0.010 J	0.015 U	0.0054	0.015	0.020	5419640
Perfluorodecane Sulfonate	ug/L	0.015 U	0.015 U	0.0060	0.015	0.020	5419640
Perfluoroheptanoic Acid (PFHpA)	ug/L	0.015 U	0.015 U	0.0074	0.015	0.020	5419640
Perfluorohexanoic Acid (PFHxA)	ug/L	0.010 U	0.010 U	0.0035	0.010	0.020	5419640
Perfluorohexane Sulfonate (PFHxS)	ug/L	0.019 J	0.015 U	0.0056	0.015	0.020	5419640
Perfluorononanoic Acid (PFNA)	ug/L	0.018 U	0.018 U	0.0087	0.018	0.020	5419640
Perfluorooctane Sulfonamide (PFOSA)	ug/L	0.010 U	0.010 U	0.0034	0.010	0.020	5419640
Perfluoropentanoic Acid (PFPeA)	ug/L	0.018 U	0.018 U	0.0075	0.018	0.020	5419640
Perfluorotetradecanoic Acid	ug/L	0.010 U	0.010 U	0.0027	0.010	0.020	5419640
Perfluorotridecanoic Acid	ug/L	0.010 U	0.010 U	0.0038	0.010	0.020	5419640
Perfluoroundecanoic Acid (PFUnA)	ug/L	0.010 U	0.010 U	0.0025	0.010	0.020	5419640
Perfluorodecanoic Acid (PFDA)	ug/L	0.015 U	0.015 U	0.0061	0.015	0.020	5419640
Perfluorododecanoic Acid (PFDoA)	ug/L	0.010 U	0.010 U	0.0050	0.010	0.020	5419640
Perfluoro-n-Octanoic Acid (PFOA)	ug/L	0.024	0.010 U	0.0033	0.010	0.020	5419640
Perfluorooctane Sulfonate (PFOS)	ug/L	0.043	0.015 U	0.0060	0.015	0.020	5419640
Surrogate Recovery (%)							
13C2-6:2 Fluorotelomer sulfonate	%	91	103				5419640
13C2-8:2 Fluorotelomer sulfonate	%	89	94				5419640
13C2-Perfluorodecanoic acid	%	95	88				5419640
13C2-Perfluorododecanoic acid	%	82	77				5419640
13C2-Perfluorohexanoic acid	%	86	93				5419640
13C2-perfluorotetradecanoic acid	%	76	73				5419640
13C2-Perfluoroundecanoic acid	%	80	77				5419640
13C4-Perfluorobutanoic acid	%	80	85				5419640
13C4-Perfluoroheptanoic acid	%	83	96				5419640
13C4-Perfluorooctanesulfonate	%	81	84				5419640
13C4-Perfluorooctanoic acid	%	82	98				5419640
13C5-Perfluorononanoic acid	%	83	98				5419640
13C5-Perfluoropentanoic acid	%	87	93				5419640
13C8-Perfluorooctane Sulfonamide	%	90	81				5419640

DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
QC Batch = Quality Control Batch
N/A = Not Applicable

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 #: B836680
Report Date: 2018/03/05

Oneida Total Integrated Enterprises
Client Project #: 2017031
Site Location: MCLB BARSTOW, CA

RESULTS OF ANALYSES OF WATER

Maxxam ID		GCK807	GCK808				
Sampling Date		2018/02/14 13:33	2018/02/14 13:32				
	UNITS	**WELL#6**	**FRB**	**DL**	**LOD**	**LOQ**	**QC Batch**
18O2-Perfluorohexanesulfonate	%	87	96				5419640

DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
QC Batch = Quality Control Batch
N/A = Not Applicable

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TEST SUMMARY

Maxxam ID: GCK807
Sample ID: WELL#6
Matrix: Water

Collected: 2018/02/14
Shipped:
Received: 2018/02/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PFOS and PFOA in water by SPE/LCMS	LCMS	5419640	2018/02/28	2018/03/01	Kenneth Chu

Maxxam ID: GCK808
Sample ID: FRB
Matrix: Water

Collected: 2018/02/14
Shipped:
Received: 2018/02/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PFOS and PFOA in water by SPE/LCMS	LCMS	5419640	2018/02/28	2018/03/01	Kenneth Chu

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	3.2°C

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
5419640	KC1	Spiked Blank	13C2-6:2 Fluorotelomer sulfonate	2018/03/01		81	%	50 - 150
			13C2-8:2 Fluorotelomer sulfonate	2018/03/01		87	%	50 - 150
			13C2-Perfluorodecanoic acid	2018/03/01		85	%	50 - 150
			13C2-Perfluorododecanoic acid	2018/03/01		78	%	50 - 150
			13C2-Perfluorohexanoic acid	2018/03/01		90	%	50 - 150
			13C2-perfluorotetradecanoic acid	2018/03/01		73	%	50 - 150
			13C2-Perfluoroundecanoic acid	2018/03/01		91	%	50 - 150
			13C4-Perfluorobutanoic acid	2018/03/01		91	%	50 - 150
			13C4-Perfluoroheptanoic acid	2018/03/01		89	%	50 - 150
			13C4-Perfluorooctanesulfonate	2018/03/01		86	%	50 - 150
			13C4-Perfluorooctanoic acid	2018/03/01		84	%	50 - 150
			13C5-Perfluorononanoic acid	2018/03/01		95	%	50 - 150
			13C5-Perfluoropentanoic acid	2018/03/01		91	%	50 - 150
			13C8-Perfluorooctane Sulfonamide	2018/03/01		74	%	50 - 150
			18O2-Perfluorohexanesulfonate	2018/03/01		93	%	50 - 150
			6:2 Fluorotelomer sulfonate	2018/03/01		115	%	68 - 133
			8:2 Fluorotelomer sulfonate	2018/03/01		109	%	70 - 130
			Perfluorobutanoic acid	2018/03/01		108	%	72 - 129
			Perfluorobutane Sulfonate (PFBS)	2018/03/01		101	%	65 - 135
			Perfluorodecane Sulfonate	2018/03/01		101	%	62 - 127
			Perfluoroheptanoic Acid (PFHpA)	2018/03/01		107	%	73 - 129
			Perfluorohexanoic Acid (PFHxA)	2018/03/01		104	%	74 - 129
			Perfluorohexane Sulfonate (PFHxS)	2018/03/01		99	%	67 - 132
			Perfluorononanoic Acid (PFNA)	2018/03/01		100	%	72 - 131
			Perfluorooctane Sulfonamide (PFOSA)	2018/03/01		109	%	71 - 132
			Perfluoropentanoic Acid (PFPeA)	2018/03/01		104	%	73 - 129
			Perfluorotetradecanoic Acid	2018/03/01		100	%	70 - 134
			Perfluorotridecanoic Acid	2018/03/01		113	%	67 - 143
			Perfluoroundecanoic Acid (PFUnA)	2018/03/01		98	%	71 - 133
			Perfluorodecanoic Acid (PFDA)	2018/03/01		106	%	71 - 133
			Perfluorododecanoic Acid (PFDoA)	2018/03/01		105	%	71 - 131
			Perfluoro-n-Octanoic Acid (PFOA)	2018/03/01		110	%	71 - 130
			Perfluorooctane Sulfonate (PFOS)	2018/03/01		103	%	72 - 131
5419640	KC1	Spiked Blank DUP	13C2-6:2 Fluorotelomer sulfonate	2018/03/01		84	%	50 - 150
			13C2-8:2 Fluorotelomer sulfonate	2018/03/01		90	%	50 - 150
			13C2-Perfluorodecanoic acid	2018/03/01		84	%	50 - 150
			13C2-Perfluorododecanoic acid	2018/03/01		78	%	50 - 150
			13C2-Perfluorohexanoic acid	2018/03/01		87	%	50 - 150
			13C2-perfluorotetradecanoic acid	2018/03/01		77	%	50 - 150
			13C2-Perfluoroundecanoic acid	2018/03/01		82	%	50 - 150
			13C4-Perfluorobutanoic acid	2018/03/01		87	%	50 - 150
			13C4-Perfluoroheptanoic acid	2018/03/01		89	%	50 - 150
			13C4-Perfluorooctanesulfonate	2018/03/01		87	%	50 - 150
			13C4-Perfluorooctanoic acid	2018/03/01		90	%	50 - 150
			13C5-Perfluorononanoic acid	2018/03/01		92	%	50 - 150
			13C5-Perfluoropentanoic acid	2018/03/01		93	%	50 - 150
			13C8-Perfluorooctane Sulfonamide	2018/03/01		79	%	50 - 150
			18O2-Perfluorohexanesulfonate	2018/03/01		95	%	50 - 150
			6:2 Fluorotelomer sulfonate	2018/03/01		110	%	68 - 133
			8:2 Fluorotelomer sulfonate	2018/03/01		98	%	70 - 130
			Perfluorobutanoic acid	2018/03/01		108	%	72 - 129
			Perfluorobutane Sulfonate (PFBS)	2018/03/01		94	%	65 - 135
			Perfluorodecane Sulfonate	2018/03/01		92	%	62 - 127

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Site Location: MCLB BARSTOW, CA

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Perfluoroheptanoic Acid (PFHpA)	2018/03/01		104	%	73 - 129
			Perfluorohexanoic Acid (PFHxA)	2018/03/01		102	%	74 - 129
			Perfluorohexane Sulfonate (PFHxS)	2018/03/01		94	%	67 - 132
			Perfluorononanoic Acid (PFNA)	2018/03/01		100	%	72 - 131
			Perfluorooctane Sulfonamide (PFOSA)	2018/03/01		103	%	71 - 132
			Perfluoropentanoic Acid (PFPeA)	2018/03/01		99	%	73 - 129
			Perfluorotetradecanoic Acid	2018/03/01		105	%	70 - 134
			Perfluorotridecanoic Acid	2018/03/01		108	%	67 - 143
			Perfluoroundecanoic Acid (PFUnA)	2018/03/01		105	%	71 - 133
			Perfluorodecanoic Acid (PFDA)	2018/03/01		105	%	71 - 133
			Perfluorododecanoic Acid (PFDoA)	2018/03/01		99	%	71 - 131
			Perfluoro-n-Octanoic Acid (PFOA)	2018/03/01		103	%	71 - 130
			Perfluorooctane Sulfonate (PFOS)	2018/03/01		97	%	72 - 131
5419640	KC1	RPD	6:2 Fluorotelomer sulfonate	2018/03/01	4.0		%	30
			8:2 Fluorotelomer sulfonate	2018/03/01	10		%	30
			Perfluorobutanoic acid	2018/03/01	0.59		%	30
			Perfluorobutane Sulfonate (PFBS)	2018/03/01	7.1		%	30
			Perfluorodecane Sulfonate	2018/03/01	9.7		%	30
			Perfluoroheptanoic Acid (PFHpA)	2018/03/01	2.4		%	30
			Perfluorohexanoic Acid (PFHxA)	2018/03/01	1.6		%	30
			Perfluorohexane Sulfonate (PFHxS)	2018/03/01	4.5		%	30
			Perfluorononanoic Acid (PFNA)	2018/03/01	0.62		%	30
			Perfluorooctane Sulfonamide (PFOSA)	2018/03/01	5.8		%	30
			Perfluoropentanoic Acid (PFPeA)	2018/03/01	4.7		%	30
			Perfluorotetradecanoic Acid	2018/03/01	4.1		%	30
			Perfluorotridecanoic Acid	2018/03/01	3.9		%	30
			Perfluoroundecanoic Acid (PFUnA)	2018/03/01	7.0		%	30
			Perfluorodecanoic Acid (PFDA)	2018/03/01	0.39		%	30
			Perfluorododecanoic Acid (PFDoA)	2018/03/01	6.4		%	30
			Perfluoro-n-Octanoic Acid (PFOA)	2018/03/01	6.4		%	30
			Perfluorooctane Sulfonate (PFOS)	2018/03/01	5.6		%	30
5419640	KC1	Method Blank	13C2-6:2 Fluorotelomer sulfonate	2018/03/01		98	%	50 - 150
			13C2-8:2 Fluorotelomer sulfonate	2018/03/01		88	%	50 - 150
			13C2-Perfluorodecanoic acid	2018/03/01		85	%	50 - 150
			13C2-Perfluorododecanoic acid	2018/03/01		77	%	50 - 150
			13C2-Perfluorohexanoic acid	2018/03/01		92	%	50 - 150
			13C2-perfluorotetradecanoic acid	2018/03/01		74	%	50 - 150
			13C2-Perfluoroundecanoic acid	2018/03/01		77	%	50 - 150
			13C4-Perfluorobutanoic acid	2018/03/01		88	%	50 - 150
			13C4-Perfluoroheptanoic acid	2018/03/01		85	%	50 - 150
			13C4-Perfluorooctanesulfonate	2018/03/01		76	%	50 - 150
			13C4-Perfluorooctanoic acid	2018/03/01		84	%	50 - 150
			13C5-Perfluorononanoic acid	2018/03/01		91	%	50 - 150
			13C5-Perfluoropentanoic acid	2018/03/01		90	%	50 - 150
			13C8-Perfluorooctane Sulfonamide	2018/03/01		82	%	50 - 150
			18O2-Perfluorohexanesulfonate	2018/03/01		86	%	50 - 150
			6:2 Fluorotelomer sulfonate	2018/03/01	0.015 U, LOD=0.015		ug/L	
			8:2 Fluorotelomer sulfonate	2018/03/01	0.015 U, LOD=0.015		ug/L	
			Perfluorobutanoic acid	2018/03/01	0.015 U, LOD=0.015		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
			Perfluorobutane Sulfonate (PFBS)	2018/03/01	0.015 U, LOD=0.015		ug/L	
			Perfluorodecane Sulfonate	2018/03/01	0.015 U, LOD=0.015		ug/L	
			Perfluoroheptanoic Acid (PFHpA)	2018/03/01	0.015 U, LOD=0.015		ug/L	
			Perfluorohexanoic Acid (PFHxA)	2018/03/01	0.010 U, LOD=0.010		ug/L	
			Perfluorohexane Sulfonate (PFHxS)	2018/03/01	0.015 U, LOD=0.015		ug/L	
			Perfluorononanoic Acid (PFNA)	2018/03/01	0.018 U, LOD=0.018		ug/L	
			Perfluorooctane Sulfonamide (PFOSA)	2018/03/01	0.010 U, LOD=0.010		ug/L	
			Perfluoropentanoic Acid (PFPeA)	2018/03/01	0.018 U, LOD=0.018		ug/L	
			Perfluorotetradecanoic Acid	2018/03/01	0.010 U, LOD=0.010		ug/L	
			Perfluorotridecanoic Acid	2018/03/01	0.010 U, LOD=0.010		ug/L	
			Perfluoroundecanoic Acid (PFUnA)	2018/03/01	0.010 U, LOD=0.010		ug/L	
			Perfluorodecanoic Acid (PFDA)	2018/03/01	0.015 U, LOD=0.015		ug/L	
			Perfluorododecanoic Acid (PFDoA)	2018/03/01	0.010 U, LOD=0.010		ug/L	
			Perfluoro-n-Octanoic Acid (PFOA)	2018/03/01	0.010 U, LOD=0.010		ug/L	
			Perfluorooctane Sulfonate (PFOS)	2018/03/01	0.015 U, LOD=0.015		ug/L	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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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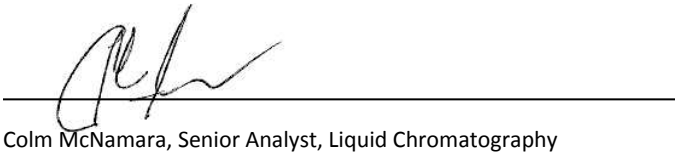
VALIDATION SIGNATURE PAGE

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



Colm McNamara, Senior Analyst, Liquid Chromatography

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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RESULTS OF ANALYSES OF WATER

Maxxam ID		GCK807	GCK808				
Sampling Date		2018/02/14 13:33	2018/02/14 13:32				
	UNITS	**WELL#6**	**FRB**	**DL**	**LOD**	**LOQ**	**QC Batch**
Miscellaneous Parameters							
6:2 Fluorotelomer	ug/L	0.015 U	0.015 U	0.0066	0.015	0.020	5419640
8:2 Fluorotelomer	ug/L	0.015 U	0.015 U	0.0066	0.015	0.020	5419640
Perfluorobutanoic	ug/L	0.014 J	0.015 U	0.0055	0.015	0.020	5419640
Perfluorobutane S	ug/L	0.010 J	0.015 U	0.0054	0.015	0.020	5419640
Perfluorodecane S	ug/L	0.015 U	0.015 U	0.0060	0.015	0.020	5419640
Perfluoroheptano	ug/L	0.015 U	0.015 U	0.0074	0.015	0.020	5419640
Perfluorohexanoic	ug/L	0.010 U	0.010 U	0.0035	0.010	0.020	5419640
Perfluorohexane S	ug/L	0.019 J	0.015 U	0.0056	0.015	0.020	5419640
Perfluorononanoi	ug/L	0.018 U	0.018 U	0.0087	0.018	0.020	5419640
Perfluorooctane S	ug/L	0.010 U	0.010 U	0.0034	0.010	0.020	5419640
Perfluoropentano	ug/L	0.018 U	0.018 U	0.0075	0.018	0.020	5419640
Perfluorotetradec	ug/L	0.010 U	0.010 U	0.0027	0.010	0.020	5419640
Perfluorotridecan	ug/L	0.010 U	0.010 U	0.0038	0.010	0.020	5419640
Perfluoroundecan	ug/L	0.010 U	0.010 U	0.0025	0.010	0.020	5419640
Perfluorodecanoic	ug/L	0.015 U	0.015 U	0.0061	0.015	0.020	5419640
Perfluorododecan	ug/L	0.010 U	0.010 U	0.0050	0.010	0.020	5419640
Perfluoro-n-Octan	ug/L	0.024	0.010 U	0.0033	0.010	0.020	5419640
Perfluorooctane S	ug/L	0.043	0.015 U	0.0060	0.015	0.020	5419640
Surrogate Recovery (%)							
13C2-6:2 Fluorote	%	91	103				5419640
13C2-8:2 Fluorote	%	89	94				5419640
13C2-Perfluorode	%	95	88				5419640
13C2-Perfluorodo	%	82	77				5419640
13C2-Perfluorohe	%	86	93				5419640
13C2-perfluorotet	%	76	73				5419640
13C2-Perfluoroun	%	80	77				5419640
13C4-Perfluorobu	%	80	85				5419640
13C4-Perfluorohe	%	83	96				5419640
13C4-Perfluorooct	%	81	84				5419640
13C4-Perfluorooct	%	82	98				5419640
13C5-Perfluorono	%	83	98				5419640
13C5-Perfluorope	%	87	93				5419640
13C8-Perfluorooct	%	90	81				5419640
18O2-Perfluorohe	%	87	96				5419640

DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
QC Batch = Quality Control Batch
N/A = Not Applicable

Results relate only to the items tested.

Oneida Total Integrated Enterprises

Maxxam Job Number: B836680 **Client Project #: 2017031**

Report Date: 2018/03/05 Site Location: MCLB BARSTOW, CA

TEST SUMMARY

Maxxam ID	GCK807	**Collected**	2/14/2018	
Sample ID	WELL#6	**Shipped**		
Matrix	Water	Received	2018/02/16	

Test Description	Instrumentat	Batch	Extracted	Date Analyze	Analyst
PFOS and PFOA in	LCMS	5419640	2/28/2018	3/1/2018	Kenneth Chu

Maxxam ID	GCK808	**Collected**	2/14/2018	
Sample ID	FRB	**Shipped**		
Matrix	Water	Received	2018/02/16	

Test Description	Instrumentat	Batch	Extracted	Date Analyze	Analyst
PFOS and PFOA in	LCMS	5419640	2/28/2018	3/1/2018	Kenneth Chu

Oneida Total Integrated Enterprises
Attention: Orval Osborne
Report Date: 2018/03/05 Client Project #: 2017031

Site Location: MCLB BARSTOW, CA

Quality Assurance Report
Maxxam Job Number: B836680

QA/QC Batch	Init	QC Type	Parameter	Date Analy	Value	% Recover	UNITS	QC Limits
5419640	KC1	Spiked Blank	13C2-6:2 Fluorotelo	3/1/2018	81	%		50 - 150
			13C2-8:2 Fluorotelo	3/1/2018	87	%		50 - 150
			13C2-Perfluorodeca	3/1/2018	85	%		50 - 150
			13C2-Perfluorododе	3/1/2018	78	%		50 - 150
			13C2-Perfluorohexa	3/1/2018	90	%		50 - 150
			13C2-perfluorotetra	3/1/2018	73	%		50 - 150

			13C2-Perfluorounde	3/1/2018	91	%	50 - 150
			13C4-Perfluorobuta	3/1/2018	91	%	50 - 150
			13C4-Perfluorohept	3/1/2018	89	%	50 - 150
			13C4-Perfluorooctar	3/1/2018	86	%	50 - 150
			13C4-Perfluorooctar	3/1/2018	84	%	50 - 150
			13C5-Perfluorononа	3/1/2018	95	%	50 - 150
			13C5-Perfluoropent	3/1/2018	91	%	50 - 150
			13C8-Perfluorooctar	3/1/2018	74	%	50 - 150
			18O2-Perfluorohexa	3/1/2018	93	%	50 - 150
			6:2 Fluorotelomer s	3/1/2018	115	%	68 - 133
			8:2 Fluorotelomer s	3/1/2018	109	%	70 - 130
			Perfluorobutanoic a	3/1/2018	108	%	72 - 129
			Perfluorobutane Sul	3/1/2018	101	%	65 - 135
			Perfluorodecane Sul	3/1/2018	101	%	62 - 127
			Perfluoroheptanoic	3/1/2018	107	%	73 - 129
			Perfluorohexanoic A	3/1/2018	104	%	74 - 129
			Perfluorohexane Sul	3/1/2018	99	%	67 - 132
			Perfluorononanoic A	3/1/2018	100	%	72 - 131
			Perfluorooctane Sul	3/1/2018	109	%	71 - 132
			Perfluoropentanoic	3/1/2018	104	%	73 - 129
			Perfluorotetradecar	3/1/2018	100	%	70 - 134
			Perfluorotridecanoic	3/1/2018	113	%	67 - 143
			Perfluoroundecanoi	3/1/2018	98	%	71 - 133
			Perfluorodecanoic A	3/1/2018	106	%	71 - 133
			Perfluorododecanoi	3/1/2018	105	%	71 - 131
			Perfluoro-n-Octanoi	3/1/2018	110	%	71 - 130
			Perfluorooctane Sul	3/1/2018	103	%	72 - 131
5419640	KC1	Spiked Blank DUP	13C2-6:2 Fluorotelo	3/1/2018	84	%	50 - 150
			13C2-8:2 Fluorotelo	3/1/2018	90	%	50 - 150
			13C2-Perfluorodeca	3/1/2018	84	%	50 - 150
			13C2-Perfluorododе	3/1/2018	78	%	50 - 150
			13C2-Perfluorohexa	3/1/2018	87	%	50 - 150
			13C2-perfluorotetra	3/1/2018	77	%	50 - 150
			13C2-Perfluorounde	3/1/2018	82	%	50 - 150
			13C4-Perfluorobuta	3/1/2018	87	%	50 - 150
			13C4-Perfluorohept	3/1/2018	89	%	50 - 150
			13C4-Perfluorooctar	3/1/2018	87	%	50 - 150
			13C4-Perfluorooctar	3/1/2018	90	%	50 - 150
			13C5-Perfluorononа	3/1/2018	92	%	50 - 150
			13C5-Perfluoropent	3/1/2018	93	%	50 - 150
			13C8-Perfluorooctar	3/1/2018	79	%	50 - 150
			18O2-Perfluorohexa	3/1/2018	95	%	50 - 150
			6:2 Fluorotelomer s	3/1/2018	110	%	68 - 133
			8:2 Fluorotelomer s	3/1/2018	98	%	70 - 130
			Perfluorobutanoic a	3/1/2018	108	%	72 - 129
			Perfluorobutane Sul	3/1/2018	94	%	65 - 135

			Perfluorodecane Sul	3/1/2018		92	%	62 - 127
			Perfluoroheptanoic	3/1/2018		104	%	73 - 129
			Perfluorohexanoic A	3/1/2018		102	%	74 - 129
			Perfluorohexane Sul	3/1/2018		94	%	67 - 132
			Perfluorononanoic /	3/1/2018		100	%	72 - 131
			Perfluorooctane Sul	3/1/2018		103	%	71 - 132
			Perfluoropentanoic	3/1/2018		99	%	73 - 129
			Perfluorotetradecar	3/1/2018		105	%	70 - 134
			Perfluorotridecanoic	3/1/2018		108	%	67 - 143
			Perfluoroundecanoi	3/1/2018		105	%	71 - 133
			Perfluorodecanoic A	3/1/2018		105	%	71 - 133
			Perfluorododecanoi	3/1/2018		99	%	71 - 131
			Perfluoro-n-Octanoi	3/1/2018		103	%	71 - 130
			Perfluorooctane Sul	3/1/2018		97	%	72 - 131
5419640	KC1	RPD	6:2 Fluorotelomer su	3/1/2018	4.0		%	30
			8:2 Fluorotelomer su	3/1/2018	10		%	30
			Perfluorobutanoic a	3/1/2018	0.59		%	30
			Perfluorobutane Sul	3/1/2018	7.1		%	30
			Perfluorodecane Sul	3/1/2018	9.7		%	30
			Perfluoroheptanoic	3/1/2018	2.4		%	30
			Perfluorohexanoic A	3/1/2018	1.6		%	30
			Perfluorohexane Sul	3/1/2018	4.5		%	30
			Perfluorononanoic /	3/1/2018	0.62		%	30
			Perfluorooctane Sul	3/1/2018	5.8		%	30
			Perfluoropentanoic	3/1/2018	4.7		%	30
			Perfluorotetradecar	3/1/2018	4.1		%	30
			Perfluorotridecanoic	3/1/2018	3.9		%	30
			Perfluoroundecanoi	3/1/2018	7.0		%	30
			Perfluorodecanoic A	3/1/2018	0.39		%	30
			Perfluorododecanoi	3/1/2018	6.4		%	30
			Perfluoro-n-Octanoi	3/1/2018	6.4		%	30
			Perfluorooctane Sul	3/1/2018	5.6		%	30
5419640	KC1	Method Blank	13C2-6:2 Fluorotelo	3/1/2018		98	%	50 - 150
			13C2-8:2 Fluorotelo	3/1/2018		88	%	50 - 150
			13C2-Perfluorodeca	3/1/2018		85	%	50 - 150
			13C2-Perfluorododec	3/1/2018		77	%	50 - 150
			13C2-Perfluorohexa	3/1/2018		92	%	50 - 150
			13C2-perfluorotetra	3/1/2018		74	%	50 - 150
			13C2-Perfluorounde	3/1/2018		77	%	50 - 150
			13C4-Perfluorobutar	3/1/2018		88	%	50 - 150
			13C4-Perfluorohepta	3/1/2018		85	%	50 - 150
			13C4-Perfluorooctar	3/1/2018		76	%	50 - 150
			13C4-Perfluorooctar	3/1/2018		84	%	50 - 150
			13C5-Perfluoronona	3/1/2018		91	%	50 - 150
			13C5-Perfluoropenta	3/1/2018		90	%	50 - 150
			13C8-Perfluorooctar	3/1/2018		82	%	50 - 150

18O2-Perfluorohexa	3/1/2018		86	%	50 - 150
6:2 Fluorotelomer s	3/1/2018	0.015 U, LOD=0.015		ug/L	
8:2 Fluorotelomer s	3/1/2018	0.015 U, LOD=0.015		ug/L	
Perfluorobutanoic a	3/1/2018	0.015 U, LOD=0.015		ug/L	
Perfluorobutane Sul	3/1/2018	0.015 U, LOD=0.015		ug/L	
Perfluorodecane Sul	3/1/2018	0.015 U, LOD=0.015		ug/L	
Perfluoroheptanoic	3/1/2018	0.015 U, LOD=0.015		ug/L	
Perfluorohexanoic A	3/1/2018	0.010 U, LOD=0.010		ug/L	
Perfluorohexane Sul	3/1/2018	0.015 U, LOD=0.015		ug/L	
Perfluorononanoic A	3/1/2018	0.018 U, LOD=0.018		ug/L	
Perfluorooctane Sul	3/1/2018	0.010 U, LOD=0.010		ug/L	
Perfluoropentanoic	3/1/2018	0.018 U, LOD=0.018		ug/L	
Perfluorotetradecan	3/1/2018	0.010 U, LOD=0.010		ug/L	
Perfluorotridecanoic	3/1/2018	0.010 U, LOD=0.010		ug/L	
Perfluoroundecanoi	3/1/2018	0.010 U, LOD=0.010		ug/L	
Perfluorodecanoic A	3/1/2018	0.015 U, LOD=0.015		ug/L	
Perfluorododecanoi	3/1/2018	0.010 U, LOD=0.010		ug/L	
Perfluoro-n-Octanoi	3/1/2018	0.010 U, LOD=0.010		ug/L	
Perfluorooctane Sul	3/1/2018	0.015 U, LOD=0.015		ug/L	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
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.