Matthew Calacone

Senior Project Manager

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VIA ELECTRONIC MAIL

February 19, 2019

Payson Long New York State Department of Environmental Conservation 625 Broadway, 12th Floor Albany, NY 12233

Subject: Vatrano Road Site NYSDEC Site ID #401036 Albany, NY 12205

Dear Mr. Long:

As requested by the New York State Department of Environmental Conservation (NYSDEC), the General Electric Company (GE) submitted a response letter and Sampling and Analysis Plan (SAP) to the NYSDEC on May 2, 2018 for the collection of samples for 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS) analysis at the Vatrano Road Site (Site). In response to comments from NYSDEC, the SAP was revised and re-submitted to NYSDEC on July 27, 2018, and was subsequently approved by NYSDEC on August 24, 2018.

The commercial Site is serviced by municipal water and sewer and is located at Vatrano Road in Albany, New York. **Figure 1** shows the Site and identifies the four monitoring wells that were selected for sampling. The Site currently provides leased commercial facilities and the general area is zoned for mixed commercial and industrial properties. The public drinking water supply has previously been tested for 1,4-dioxane and PFAS.

O'Brien & Gere Engineers, Inc. (OBG) implemented the SAP on October 3 and 4, 2018. Groundwater samples were collected from monitoring wells MW-1, MW-2, MW-4, and MW-7 for 1,4-dioxane and PFAS analyses. Field quality assurance/quality control (QA/QC) samples were collected per the SAP and consisted of one blind field duplicate sample, one set of matrix spike (MS) and matrix spike duplicate (MSD) samples, and one equipment blank sample, all of which were submitted for 1,4-dioxane and PFAS analyses. Per the SAP, one February 19, 2019 Page 2

field reagent blank (FRB) was also collected and submitted for PFAS analysis. The blind field duplicate sample was collected from monitoring well MW-2, and the MS/MSD sample pair was collected from monitoring well MW-4.

In accordance with the SAP, the monitoring wells were purged at low-flow rates using a bladder pump with dedicated, low density polyethylene (LDPE) tubing. The monitoring wells were purged until field parameters stabilized. Groundwater field parameter data consisting of temperature, pH, specific conductivity, oxidation-reduction potential, dissolved oxygen, and turbidity, were collected and documented on field forms prior to sample collection. The completed field forms are included as **Attachment A**.

TestAmerica's laboratories in Buffalo, New York and Sacramento, California analyzed the groundwater samples for 1,4-dioxane and PFAS, respectively. The 1,4-dioxane analyses were performed using United States Environmental Protection Agency (USEPA) Method 8270 in selective ion monitoring (SIM) mode and achieved a reporting limit of 0.28 parts per billion (ppb) or less. The PFAS analyses were performed using USEPA Method 537, Revision 1.1, modified, and achieved a reporting limit of 2 parts per trillion (ppt) or less for perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA) and several (but not all) of the other PFAS analytes. The 1,4-dioxane and PFAS result forms are included as **Attachment B**.

As requested by NYSDEC, the analytical results were validated and a Data Validation Report was prepared by OBG. The Data Validation Report (DVR) is included as **Attachment C**.

One of the four monitoring wells had a detectable concentration of 1,4-dioxane (0.20 ppb in MW-7, which is less than the NYSDEC-required reporting limit of 0.28 ppb). 1,4-Dioxane was not detected in the equipment blank. There is currently no state groundwater standard for 1,4-dioxane

PFOS and PFOA were detected in three of the four monitoring wells (MW-2, MW-4, and MW-7). As presented in the DVR, PFOS was tentatively identified at an estimated concentration of 100 ppt in the sample from MW-2, and was tentatively identified at 22 and 7.9 ppt in the samples from MW-4 and MW-7, respectively. PFOA was detected in the sample from MW-2 at a concentration of 14 ppt, and was tentatively identified at estimated concentrations of 25 and 14 ppt in the samples from MW-4 and MW-7, respectively. Up to nine other PFAS were detected. Note that perfluorohexanesulfonic acid (PFHxS) was detected at similar, estimated concentrations in the equipment blank, field reagent blank, and laboratory method blank. There is currently no state groundwater standard for PFAS (including PFOS and PFOA). The groundwater is not used at the property and the property will be subject to a groundwater use restriction.

Should you have any questions, please contact me.

February 19, 2019 Page 3

Sincerely,

Mettersen Callacoe

Matthew Calacone Senior Project Manager

attachment

cc: Justin Deming, NYSDOH (via email) Scarlett McLaughlin, NYSDOH (via email) Paul Hare, OBG (via email) Paul D'Annibale, OBG (via email) Mike Noel, TetraTech (via email)





Attachment A – Completed Field Forms

G			Low	Flow Gro	oun	dwater Sa	mpling Lo	Well Dg Northin Eastin	ID: <u>ハレー</u> ng:	
Site Na	me: \	/atrano Rd	Samp	lina Method	:	In f	10.	Field Persor	nnel: JAN	1
Site Locat	tion:	Albany, NY	Equip	oment Used	:	Bludd	erpm		Date: W131	18
Proje	ct #:	69645	Pump/Co	ontroller ID#	:	30281	2674	Wea ⁻	ther: 550 S.	~
Well inform	ation:			W	JI V	niume Multir	liers'	* M	leasurement Poir	nt.
Inst	alled Depth	of Well*:	ft. k	mp. 🗆	1	in. = 0.041 a	al/ft		Well Casing	
Meas	ured Depth	of Well*:	ft. b	mp.	2	in. = 0.163 a	al/ft		Protective Casir	na
	Depth to	Water*: 4, 4	$\frac{0}{10}$ ft.		4	in. = 0.653 g	al/ft	Л	Other:	.9
Length of W	ater Columr	n (LWC):	in.		6	in. = 1.469 g	al/ft	Well Volur	ne:	gal.
-	Well D	liameter:	in.	. 🗆	8	in. = 2.611 g	al/ft P	ump Intake Dept	th*:	ft. bmp.
Start P	urge Time:	+320 13	45							
Initial Ob	servations:	Color Ulac	<u> </u>	dor <u>v</u>		She	en/Free Proc	luct rom		
Elapsed	Depth	ſ		//. Specifi	c c		Dissolved		Flow	
Time	to Water	Temperature	рН	Conducti	vity	ORP	Oxygen	Turbidity	Rate	Other
(minutes)	(ft bmp)	(Celsius)	(SU)	(j	(mV)	(mg/l)	(NTU)	(ml/min)	()
5	\$4.24	21.74	7.31	615.	3	~123.6	0.04	NR	100	
10	4.59	2125	7.25	6708	8	-124.3	1 02	1R	100	
15	487	21.18	7.27	720	u	- 120 4	A 03	NR	100	
20	1.01 MGG	21.05	7	AGIN		- 110.11	0.00		100	
2	1.89	2100		1700	$\frac{1}{2}$	-118,4	0.07	NK	100	
<u> </u>	7.91	20 66	1.08	1124.	<u>(</u>	-117.1	0.05		(00	
50	4.92	20,17	$\frac{1}{2}$	1289	7	-111.0	0,05	687	100	
35	4.92	20,98	7.16	1304.6		-116.2	0.05	651	100	
40	4.92	20,95	7.15	1312.7		-114.6	0.05	642	100	
45	4.91	20.97	7.15	13 22.7		-112.3	0.05	236	10	
50	4.92	20.97	7.17	1328.4	1	- 106.7	0.06	100,9	100	
55	4.92	20,97	717	1333.		-101.2	0.06	108.8	100	
66	4.92	20.46	7.16	1339	q	- 99.1	0.07	107.7	100	
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						i.				
							± 10% if >	± 10% if > 5		
Stabilization	∆ ≤ 0.3'	± 3%	± 0.1	± 3%		_ ± 10 mV	2.0 mg/L	NTU	100 ≤ X ≤ 500	
End F	urge Time:	1445						· · · · · · · · · · · · · · · · · · ·		
Tota	al volume of	groundwater pure	ned 3	nal						
Final Oh		Color Black		9000		Cha	om/Exec Droc	trink () in		
Final Ob	servations:			aor	~~	. Snei	en/Free Prod			
Sample	ID:						Sample Tin	ne: <u>195</u>	0	
Analytical I	Parameters									
Containe	r Size (Clear Blactic	# Collec	τεα	Fie	N	Pr	None	Laborat	ory
250 N 1 I	· <u> </u>	Amber Glass	2			N		None	TestAme	erica
· •			£						1000-1110	
Notes:										

			Low	Flow G	round	dwater Sa	moling L	Well Northi	ID: <u>~</u> ~~	<u>~~</u>
						Awaroi	- S	Easti	ng:	
Site Na	.me:	√atrano Rd	Samp	ling Metho	d:	Low	Flow	Field Persor	nnel: JAN	1
Site Locat	tion:	Albany, NY	_ Equir	pment Use	d:	Bladd	er pmp	C	Date: <u>い(リ</u>)*	8
Projec	ot #:	69645	Pump/Co	ontroller ID	#:	3028	2674	. Wea	ther: <u>600 So</u>	<u>^</u>
Well inform	nation:				Vell Va	olume Multij	pliers:	* N	leasurement Poir	ıt:
Inst	alled Depth	of Well*:	ft. k	omp. [⊐ 1i	in. = 0.041 g	al/ft	Д,	Well Casing	
Meas	ured Depth	of Well*: 21	<u>, 10</u> ft.t	omp. L	2	in. = 0.163 g	al/ft		Protective Casir	ıg
an ath of M	Depth to	Water*: ()	<u>. (70</u> ft. in	L] 4। ⊐ 61	in. = 0.653 g = 1.460 g	al/tt		Other:	
Length of vv	Well C)iameter:	<u>2</u> in. 2	[10 L 18 L	in. = 1.469 y	al/π al/ft Pi	ump Intake Depi	ne: th*:	gai. ft. bmp.
Start P	urge Time:	1320/1								
Initial Ob	servations:	Color (C	low ()dor no	me.	She	en/Free Proc	luct them		
					indicat	te units			<u></u>	-
Elapsed	Depth	Temperature	рН	Specif	fic	ORP	Dissolved	Turbidity	Flow	Other
(minutes)	(ft bmp)	(Celsius)	(SU)		tivity)	(mV)	(ma/l)	(NTU)	mate (ml/min)	
E	10.01	20,50	733	T ~ 22.	1	47.3	5.36	SK.U	100	/
	1/2 01	14.92	1732	526	~	U/ - 7	cr 23	GAI	1000	
	10.01				<u> </u>	16.5	5.00	0, 9	100	
15	10.0 %	(4.57	1.21	528	·8	46.4	5.15	26.7	100	
20	(0.05	19.97	1.31	529.	<u> </u>	46.3	5,09	33.9	100	
25	10,05	19.47	1.31	529.	3	46.2	5.08	\$3.3	100	
30	(0.03	19.48	731	524.4	4	46.0	5,08	22.3	100	
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Stabilization	A < 0.3'	+ 3%		+ 3%	,	± 10 m\/	±10% It>	± 10% it > 5	100 < V < 500	
Stabilizauon	$\Delta \ge 0.3$	± 3%	± 0.1	± 376	<u>،</u>	±IUmv	2.0 mg/L		$100 \ge X \ge 500$	
End P	'urge Time:	1350	. ~1	5						
Tota	al volume of	groundwater purç	jed:	gal.						
Final Ob:	servations:	Color	C	dor		Shee	en/Free Prod	luct		
Sample	ID:	nv-h-	110124	18			Sample Tin	ne: 1355		
Analytical F	Parameters									
Container	r Size (Container Type	# Colle	cted	Fie	d Filtered?	Pr	eservative	Laborat	ory
250 m	۱L	Clear Plastic	2			N		None	TestAme	erica
1 L		Amber Glass	2			N		None	TestAme	ərica
			 							
			 							
Notes:	<u>_</u>		L	<u>_</u>						
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								Well	ID: <u>MV</u> -	- 4
			LOW	Flow G	iround	dwater Sa	mpling Lo	⊃g Nortnir Eastir	ng: na:	
Site Na	me:	Vatrano Rd	Samp	ling Meth	od:	low	Hon	Field Persor	nnel: JAN	1
Site Locat	tion:	Albany, NY	- Equi	pment Us	ed:	Black	v		Date: 10/41	18
Proje	ct #:	69645	Pump/C	ontroller I	D#:	3020	1 76 74	, (Weat	ther: 600 Rcc	1
Well inform	nation:				Well Va	olume Multi	oliers:	* M	leasurement Poin	
Inst	alled Depth	of Well*:	ft. I	omp.		in. = 0.041 a	al/ft	ER.	Well Casing	
Meas	ured Depth	of Well*: 15	Sto ft. I	omp.	Ø~ 2	in. = 0.163 g	al/ft		Protective Casir	ng
	Depth 1	o Water*:	35 ft.		□ 4	in. ≃ 0.653 g	al/ft		Other:	0
Length of W	/ater Colum	n (LWC):	in.		□ 6	in. = 1.469 g	al/ft	Well Volun	ne:	gal.
	Well	Diameter: 🔶	in.		8	in. = 2.611 g	al/ft Pi	ump Intake Dept	:h*:	ft. bmp.
Start P	urge Time	: 0930								
Initial Ob	servations:	Color Bran	$\sim 10^{-10}$	Door N	one	She	en/Free Proc	luct from		
					indicat	te units				
Elapsed	Depth	Tommorroturo		Spec	ific	OPP	Dissolved	Turbidity	Flow	Othor
Time	to Water		рп	Condu	ctivity	UNP	Oxygen	Turblatty	Rate	Ouler
(minutes)	(ft bmp)	(Celsius)	<u>(SU)</u>	()	(mV)	(mg/l)	<u>(NTU)</u>	(ml/min)	
5	836	18,63	1.13	893).C	-24.8	0.72	89.6		
10	839	1872	7.10	898	. 4	-16.4	0.64	44.7		
15	8.38	18.47	7 08	893	. 7	- 8,9	0.48	33.7		
20	8,37	18.33	1.07	892	٦.	-5,8	0.44	32.1		
25	8.38	18,34	7.06	889	.4	-08	0.43	30.8		
30	Q 35	18 32	7.07	487	9	14	0.42	311		
20	x 40	14 22	7 01	arc.	<u>י</u>	-0.5	O JA	304		
	3.10		1.06	705	~	- 0. (0.15	50, 1		
									-	
							± 10% if >	± 10% if > 5		
Stabilization	∆ ≤ 0.3'	± 3%	± 0.1	± 3	%	± 10 mV	2.0 mg/L	NTU	100 ≤ X ≤ 500	
End F	Purge Time	: 1005								
Tota	al volume o	f groundwater pur	ged: ~ 2	- gal.						
Final Oh	oon/ationa:	color clear	/ Vellar	 Ddor I Ar		Sha	on/Eroo Proc	hust men	-	
							enniteeritea			
Sample	ID:	W-4-100	418				Sample Tin	ne: 1015		
Analytical I	Parameter	3:								
Containe	r Size	Container Type	# Colle	cted	Fie	d Filtered?	Pr	reservative	Laborat	lory
250 n	nL	Clear Plastic	2			<u>N</u>		None	TestAme	erica
11		Amper Glass	2			IN		NOUE	I estAme	enca
					-					
										<u>``</u>
Notes:			• <u> </u>						·····	
		MSM	50							

			1		n duratan Ca		Well	ID:	<u>7</u>
U			LOW	Flow Grou	ndwater Sa		og Northir Eastir	ng:	
Site Na	me: V	atrano Rd	Samp	ling Method:	Black	troup	Field Persor	nnel: JAN	1
Site Locat	ion: A	lbany, NY	Equip	oment Used:	Lon F	wn	C	Date: 1073	118
Projec	ct #:	69645	Pump/Co	ontroller ID#:	30981	2674	Weat	ther: <u>550</u>	Sn
Well inform	nation:		<u></u>	Well	Volume Multi	pliers:	* M	leasurement Poin	nt:
Inst	alled Depth o	of Well*:	ft. b	mp. 🗆	1 in. = 0.041 g	al/ft	凶	Well Casing	
Meas	ured Depth	of Well*: <u>(5</u> ,	<u>60</u> ft. b	mp. 🕰	2 in. = 0.163 g	al/ft		Protective Casir	ng
	Depth to	Water*: <u>, , '</u>	<u>3 5 -</u> ft.		4 in. = 0.653 g	al/ft		Other:	
Length of W	ater Column	(LWC):	in.		6 in. = 1.469 g	al/ft	Well Volun	ne:	gal.
	weil D	ameter:	<u> </u>		o III. = 2.011 y				n. bmp.
Start P	urge Time:	1035	1 prom F	la/25		(E. D			
Initial Ob	servations:	Color Clear	<u> </u>	dor <u>win</u>	She	en/Free Prod			
Flansed	Denth	i		India Specific	cate units	Dissolved		Flow	
Time	to Water	Temperature	рН	Conductivit	y ORP	Oxygen	Turbidity	Rate	Other
(minutes)	(ft bmp)	(Celsius)	(SU)	() (mV)	(mg/l)	<u>(NTU)</u>	(ml/min)	()
5	3.52	15 49	7.02	638.7	76.1	7:10,52	11.0	100	
10	3.69	15.43	7.01	651.6	61.3	0.55	1 D, i	100	
15	3.81	15.41	6.27	685.4	53.6	0.57	9.86	100	
20	3,95	15.42	6.95	694.6	53.1	0.57	9. 45	100	
25	4.10	15.42	6.94	699.7	52.4	0.57	9.00	100	
30	4.23	15.41	6.94	702.4	511	0.56	9.06	100	
35	4.39	15.41	6.93	705.4	49.4	0.55	8,98	100	
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Clabilization	4 - 0 2	. 29/	+ 0.1	+ 29/	+ 10 mV	± 10% if >	± 10% if > 5	100 < X < 500	
Stabilization	∆≤0.3	± 3%	± 0.1	±3%	± 10 mv	2.0 mg/L		100 3 X 3 500	
End F	Purge Time:	1110		<u> </u>					
Tota	al volume of	groundwater purg	ged: ~ (.)	s gal.			_		
Final Ob	servations:	Color Cher	<u> </u>	odor in	She	en/Free Prod	luct i	<u>.</u>	
Sample	ID:	MW-7-	\$10/1Z	14		Sample Tim	ne: 1115		
Analytical I	Parameters:			· · · · · · ·					
Containe	r Size C	Container Type	# Colle	cted	Field Filtered?	Pr	eservative	Laborat	tory
250 n	nL	Clear Plastic	2		N		None	TestAme	erica
1L		Amber Glass	2		N		None	TestAme	erica
Notes:								at 1000 11	

Site Name:

(an Weather (temp/precip):

Field Clothing and PPE:

☑ No clothing or boots containing Gore-TexTM

□ Nø clothing or boots treated with water-resistant spray

CLEDI

Safety boots made from polyurethane and PVC

"No-materials containing Tyvek"

☑ Field crew has not used fabric softener on clothing

Field crew has not used cosmetics, moisturizers, hand cream, or other related products this morning

Field crew has not applied unauthorized sunscreen or insect repellant

Field Equipment:

☑ No Teflon® or LDPE containing materials

Z All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene

☑ No waterproof field books, waterproof paper or waterproof bottle labels, waterproof markers/Sharpies®

☑ No plastic clipboards, binders, or spiral hard cover notebooks

☑ No Post-It Notes®

Task: Date:

Coolers filled with regular ice only; no chemical (blue) ice packs in possession

Sample Containers:

Sample containers made of HDPE or polypropylene

Caps are unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

🖞 Wet weather gear made of polyurethane and PVC only

Equipment Decontamination:

"PFAS-free" water on-site for decontamination of sample equipment; no other water sources to be used

□ Alconox® and Liquinox® to be used as decontamination cleaning agents

Food Considerations:

No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade® and Powerade®) that is available for consumption only in the staging area

Vehicle Considerations:

Avoid utilizing a reas inside vehicle as sample staging areas

If any applicable boxes cannot be checked, the field team leader shall describe the deviations below and work with field personnel to address issues prior to commencement of that day's work. If possible, materials identified as potentially containing PFAS (i.e., Tyvek* coveralls, spare equipment) should be relocated to a separate area of the site as far away as possible from the sampling location(s) and containerized if practicable. To assist in the assessment of QC data, the field team leader should document the presence of such items, their location, whether they have been containerized, and, if containerized, what type of container.

Describe any deviation(s) and the action/outcome and document the presence of any potential PFAS-containing materials:

Field Team Leader Name: Field Team Leader Signatur	John neit e: Non 7	Pouce !! May ek	Time:	0930	

OBG | THERE'S A WAY

PAGE 1

				E	C San	npling - G	EV	Vat	ran	οI	Rd	Site	2									Page <u>of</u>
				10 11 1		-	10								-					1.00		Lab Use Only
		Client: Site Name /	Location	Sampling Pr	rogram:		Sampl	er(s):		1	he	Do	ise	U.								Project Number:
TestAmerica		Vatrano Rd Site / Alb	any, NY	EC Sampling	g - GE Vatrano	RdSite			Ş	st-	D		3									
O'Brien & Gere Office: Albany		Laboratory:		Analysis Ho	lding Time fr	om Sample Date:			Chemi	cal Pre	servati	ves: (se	e key	at bot	om)							
Address: O'Brien & Gere		Marie Meidhof							0	0	0	0	0	0	0	0	0	0	0	0		Lab ID:
94 New Karner Rd, Suite 106, Albany, N.Y. 12203		TestAmerica	TestAmerica	14 days to ex	traction, 28 dy	s from extraction to			pot	3270												
Phone: (518) 724-7256		880 Riverside Pkwy	10 Hazelwood Dr	analysis					Meth	por 8						-						
Fax: (518) 869-2945		W. Sacramento, CA	Amherst, NY						ied 1	Met												
Project Contact: Paul D'Annibale/ Maureen Garnde	r	95605-1500	14228-2223				0		lodif	Ad											1	
Email: Paul.D'Annibale@obg.com / Maureen.Gardn	er@obg.com						posite	(N)	AM	USE												Joh Number:
		Contraction of the		Package Re	quirement:		Com	P (Y	SEP	e by												Job Induiber.
				Full NYSDEC	ASP Cat B Level P.	kg wstandard 20 BD TAT	3) or	Itered	by U	xan												
		Phone: 732-593-2554		Project Nur	nber: 69645	11-	ab (C	id Fi	FAS	M M												
Sample Identification		Fax: 732-549-3679		EDD Forma	T EQUIS 4-F		Ü	H	P1 53	1,4 SI										1000		
Unione Field Seconds ID	Sample Logation	Sample Date	Sample Time	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Repo Ur	orting hits	g/L	g/L												Lab Sample ID
M11-7-100318	MUL-7	10/03/18	1115	N	WG	L	G	N	×	×										-		Dati Gampie 10
NW-1-100318	MW-1	V	1450	N	WG	4	G	N	X	X								Y.				
2							G	N														
3							G	N		a de la composition de la comp												
5	e - ne al la composition						G	N							1.1							
6							G	N									and a second					
7							G	N									-					
8		and film					G	N														
9							G	N														
10					1997 200			1												1		
Special Instructions:																		•		The second s		
Relinquished by: J. MCDougall	Date 10/3/18	Received by: 2/a	Lach	-		Date 10-3-1	E	Condi	tion:											Com	ments	or Notes:
of: 00G	1420	of: / CS	t Autri	ca		1020	See.		14.20								1.			Sta	ndo-	d 20 business day TAT
Relinquished by:	Date	Received by:				Date	Custody Seals intact? Y N Standard 20 bu			NVSDEC ASP Cat B												
of:	Time	of:				Time							-							Le	vel P	kg (PDF) and EOuIS 4.
Relinquished by:	Date	Received by:				Date		Coole	r Tempe	erature:				-						file	ED	D.
of:	Time	of:				Time				Carlos -	1.247											
Sample Type: N = Normal environmental sample, F Sample Matrix SE = Sediment, SO = Sol, WG = Gn Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3	D = field duplicate, EB roundwater, WS = Surfa , 3 = H2SO4, 4 = NaO	s = Equipment Blank ce Water, WW = Wa H, 5 = Asorbic Acid,	r, FB = Field Blank, iste Water, WQ = Wa 6 = MeOH, 7 = NaF	TB = Trip Bla ter Quality, T HSO4, 8 = Na	ank, MS = La A = Animal 7 a2S2O3: 9 = H	ab Ma G ipike, Other (Sp Fissue, TP = Plant Tiss I3PO4	pecify): sue, A/	A = An	abient A	ur, Ot	her (Sj	pecify):							-			

				F	C San	opling - G	E	Vat	ran	o F	P8	Site	2								Page <u>of </u>
					C Can	ipping 0	-	· ai	Lan		.Lu	OIU	-								Lab Use Only
		Client: Site Name /	Location	Sampling P	rogram:		Samp	ler(s):	T	Me	Λ.		11		1						Project Number:
TestAmerica		Vatrano Rd Site / Alb	any, NY	EC Sampling	g - GE Vatrano	RdSite				X	D	52.									
O'Brien & Gere Office: Albany		Laboratory:		Analysis Ho	lding Time fr	om Sample Date:			Chemi	cal Pre	servati	ves: (se	e key	at boton	a)						
Address: O'Brien & Gere		Marie Meidhof							0	0	0	0	0	0 0	0	0	0	0	0		Lab ID:
94 New Karner Rd, Suite 106, Albany, N.Y. 12203		TestAmerica	TestAmerica	14 days to ex	traction, 28 day	s from extraction to			p	0/3			1.300								
Phone: (518) 724-7256		880 Riverside Pkwy	10 Hazelwood Dr	analysis			1.4		letho	od 82											
Fax: (518) 869-2945		W. Sacramento, CA	Amherst, NY						W pa	fetho											
Project Contact: Paul D'Annibale/ Maureen Garnde	r	95605-1500	14228-2223				0		difie	AN				19				1.00		-	
Email: Paul.D'Annibale@obg.com / Maureen.Gardr	ner@obg.com						osite (ź	Mo	ISEI											
				Package Re	quirement:		odwo	12	EPA	by L											Job Number:
				Full NYSDEC	ASP Cat B Level P	kg wstandard 20 BD TAT	oro	ered?	y US	ane								1.1			
Sample Identification		Phone: 732-593-2554 Fax: 732-549-3679		Project Nur EDD Forma	nber: 69645 at: EQuIS 4-F	ile	Grab (G)	Field Filt	PFAS b 537	1,4-diox SIM											
		Samala Data	Sample Time	Sample	Sample		Rep	orting													
Unique Field Sample ID	Sample Location	(mm/dd/yy)	(hh:mm)	(see key)	(see key)	# of Containers			/Jau	(/Bn											Lab Sample ID
1 MW-4-100418	MW-4	10/4/18	1015	N	WG	4	G	N	X	X											
2 MW-4-MSIMSD-100418	MW-4		1015	MS	WG	8	G	N	X	x							18				
3 MU-2-100418	nw-2		131055	N	WG	4	G	N	X	X											
4 EB- 100418			1045	EB	WQ	4	G	N	x	×											
5 FRB-100418			1020	FB	WQ	2	G	N	X												
6 X-1-100418		J.		FD	WG	Ч	G	N	X	X											
7							G	N													
8		and film					G	N													
9							G	N													
10										12											
Special Instructions:																					
Relinquished by: J.M.D.J.gall	Date 1014/18	Received by: Ro	Zech	~		Date 0-4-18	7	Cond	tion:										Con	nments	or Notes:
of: 68561 (P)	Time 1445	of: TA				Time 1445															
Relinquished by:	Date	Received by:			and the second second	Date		Custo	dy Seals	intact?		Y	N						Sta	inda	rd 20 business day TAT
-6	Time	-				Time													for	Full	NYSDEC ASP Cat B
or: Relinquished by:	Date	Received by:		The second		Date		Coole	r Temp	erature:									Le	vel P	kg (PDF) and EQuIS 4
of:	Time	of:				Time													line	ED	<i>D</i> .
Sample Type: N = Normal environmental sample, H	D = field duplicate, EI	3 = Equipment Blank	, FB = Field Blank,	TB = Trip Bl	ank, MS = La	ab Masipike, Other (Sp	pecify):	-		1. A.	1.00			1.20			1.2.5				
Sample Matrix SE = Sediment, SO = Sol, WG = G Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3	roundwater, $WS = Surfa$, 3 = H2SO4, 4 = NaO	ace Water, WW = Wa H, 5 = Asorbic Acid,	ste Water, WQ = Wat 6 = MeOH, 7 = NaH	ter Quality, 7 ISO4, 8 = Na	A = Animal 7 22203: 9 = H	Tissue, TP = Plant Tis I3PO4	sue, A	A = An	nbient 4	Air, Ot	ther (Sp	ecify):									

ATTACHMENTS

Attachment B – Analytical Result Forms



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Buffalo 10 Hazelwood Drive Amherst, NY 14228-2298 Tel: (716)691-2600

TestAmerica Job ID: 480-142905-1 Client Project/Site: GE Vatrano Rd Site

For:

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The

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Expert

O'Brien & Gere Inc of North America 94 New Karner Rd., Suite 106 Albany, New York 12203

Attn: Mr. Paul D'Annibale

marine meit

Authorized for release by: 10/24/2018 2:05:16 PM

Marie Meidhof, Senior Project Manager (732)549-3900 marie.meidhof@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

3

Qualifiers

LUNIS	
Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
В	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

LCMS		
Qualifier	Qualifier Description	
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	5
В	Compound was found in the blank and sample.	5
F1	MS and/or MSD Recovery is outside acceptance limits.	
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	8
%R	Percent Recovery	
CFL	Contains Free Liquid	9
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)	12
LOQ	Limit of Quantitation (DoD/DOE)	13
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
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)	

Job ID: 480-142905-1

Laboratory: TestAmerica Buffalo

Narrative

CASE NARRATIVE

Client: O'Brien & Gere Inc of North America

Project: GE Vatrano Rd Site

Report Number: 480-142905-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

<u>RECEIPT</u>

The samples were received on 10/5/2018 1:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

1,4 DIOXANE BY 8270D SIM, ISOTOPE DILUTION

Samples MW-7-100318 (480-142905-1) and MW-1-100318 (480-142905-2) were analyzed for 1,4 Dioxane by 8270D SIM, Isotope Dilution in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 10/09/2018 and analyzed on 10/11/2018 and 10/13/2018.

No difficulties were encountered during the 1,4 Dioxane analysis.

All quality control parameters were within the acceptance limits.

PERFLUORINATED HYDROCARBONS (PFC)

Samples MW-7-100318 (480-142905-1) and MW-1-100318 (480-142905-2) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with PFC. The samples were prepared on 10/12/2018 and analyzed on 10/16/2018 and 10/21/2018.

The following samples had non-settleable particulate matter which plugged the SPE extraction disk. The amount of sample remaining plus the weight of the bottle are recorded in the "Notes" field of the prep batch. The "Tare Weight" recorded is the weight of the emptied bottle.: MW-1-100318 (480-142905-2). The reporting limits (RLs) have been adjusted proportionately.

Perfluorohexanesulfonic acid (PFHxS) and Perfluorononanoic acid (PFNA) were detected in method blank MB 320-251680/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

The matrix spike (MS) recoveries for Perfluoropentanoic acid (PFPeA) and Perfluorohexanoic acid (PFHxA) in preparation batch

Job ID: 480-142905-1 (Continued)

Laboratory: TestAmerica Buffalo (Continued)

320-251680 and analytical batch 320-252417 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Refer to the QC report for details.

No other difficulties were encountered during the Perfluorinated Hydrocarbons (PFC) analysis.

All other quality control parameters were within the acceptance limits.

Client Sample ID: MW-7-100318

Lab Sample ID: 480-142905-1

5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.20		0.19	0.096	ug/L	1	_	8270D SIM ID	Total/NA
Perfluorobutanoic acid (PFBA)	3.4		1.7	0.30	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.9		1.7	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.0		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.4		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	14		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.3	JB	1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.7		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.8	В	1.7	0.15	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.49	J	1.7	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.9		1.7	0.47	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-1-100318

Lab Sample ID: 480-142905-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	10		1.8	0.31	ng/L	1	_	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.8		1.8	0.44	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.2	J	1.8	0.52	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.92	J	1.8	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4	J	1.8	0.76	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.48	JB	1.8	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.0	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.6		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.9	В	1.8	0.15	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.7	J	1.8	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	0.43	J	1.8	0.31	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-7-100318

Date Collected: 10/03/18 11:15

Date Received: 10/05/18 01:00

Lab Sample ID: 480-142905-1 Matrix: Water

5

6

_ Method: 8270D SIM ID - Semiv	volatile Org	anic Com	ounds (GC/MS	SIM	Isotope	e Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20		0.19	0.096	ug/L		10/09/18 07:33	10/11/18 23:38	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1.4-Dioxane-d8	29		15 - 110				10/09/18 07:33	10/11/18 23:38	1
Method: 537 (modified) - Fluo	rinated Alky	l Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.4		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoropentanoic acid (PFPeA)	2.9		1.7	0.42	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanoic acid (PFHxA)	3.0		1.7	0.50	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanoic acid (PFHpA)	3.4		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanoic acid (PFOA)	14		1.7	0.74	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorononanoic acid (PFNA)	1.3	JB	1.7	0.23	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorobutanesulfonic acid (PFBS)	1.7		1.7	0.17	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanesulfonic acid (PFHxS)	6.8	В	1.7	0.15	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.49	J	1.7	0.16	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonic acid (PFOS)	7.9		1.7	0.47	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 00:28	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	84		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C5 PFPeA	88		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFHxA	89		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C4 PFHpA	97		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C4 PFOA	92		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C5 PFNA	102		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFDA	95		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFUnA	101		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFDoA	93		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFTeDA	103		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C3 PFBS	90		25 - 150				10/12/18 11:11	10/16/18 00:28	1
18O2 PFHxS	95		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C4 PFOS	99		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C8 FOSA	100		25 - 150				10/12/18 11:11	10/16/18 00:28	1
d3-NMeFOSAA	109		25 - 150				10/12/18 11:11	10/16/18 00:28	1
d5-NEtFOSAA	110		25 - 150				10/12/18 11:11	10/16/18 00:28	1

Client Sample ID: MW-7-100318 Date Collected: 10/03/18 11:15 Date Received: 10/05/18 01:00

Method: 537 (modified) - Fluor	rinated Alkyl Su	ubstances (Continued)			
Isotope Dilution	%Recovery Qua	alifier Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	142	25 - 150	10/12/18 11:11	10/16/18 00:28	1
M2-8:2 FTS	106	25 - 150	10/12/18 11:11	10/16/18 00:28	1

Client Sample ID: MW-1-100318 to Collected: 10/02/49 14:50 D

TestAmerica Job ID: 480-142905-1

Lab Sample ID: 480-142905-1 Matrix: Water 6 Lab Sample ID: 480-142905-2

Matrix: Wator

Method: 8270D SIM ID - Semiv	volatile Orga	anic Comp	ounds (GC/N	IS SIM /	Isotope	Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		10/09/18 07:33	10/13/18 03:58	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	20		15_110				10/09/18 07:33	10/13/18 03:58	1
Method: 537 (modified) - Fluo	rinated Alky	/I Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	10		1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoropentanoic acid (PFPeA)	2.8		1.8	0.44	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanoic acid (PFHxA)	1.2	J	1.8	0.52	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanoic acid (PFHpA)	0.92	J	1.8	0.22	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanoic acid (PFOA)	1.4	J	1.8	0.76	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorononanoic acid (PFNA)	0.48	JB	1.8	0.24	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanoic acid (PFDA)	1.0	J	1.8	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorobutanesulfonic acid (PFBS)	5.6		1.8	0.18	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	В	1.8	0.15	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonic acid (PFOS)	1.7	J	1.8	0.48	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonamide (FOSA)	0.43	J	1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/21/18 07:10	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	42		25 - 150				10/12/18 11:11	10/21/18 07:10	1
13C5 PFPeA	45		25 - 150				10/12/18 11:11	10/21/18 07:10	1
13C2 PFHxA	48		25 - 150				10/12/18 11:11	10/21/18 07:10	1
13C4 PFHpA	52		25 - 150				10/12/18 11:11	10/21/18 07:10	1
13C4 PFOA	53		25 - 150				10/12/18 11:11	10/21/18 07:10	1
13C5 PFNA	54		25 - 150				10/12/18 11:11	10/21/18 07:10	1
13C2 PFDA	56		25 - 150				10/12/18 11:11	10/21/18 07:10	1

Lab Sample ID: 480-142905-2 Matrix: Water

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Client Sample ID: MW-1-100318 Date Collected: 10/03/18 14:50 Date Received: 10/05/18 01:00

Isotope Dilution	%Recovery Qua	alifier Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	59	25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFDoA	57	25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFTeDA	49	25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C3 PFBS	47	25 - 150	10/12/18 11:11	10/21/18 07:10	1
1802 PFHxS	56	25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C4 PFOS	58	25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C8 FOSA	53	25 - 150	10/12/18 11:11	10/21/18 07:10	1
d3-NMeFOSAA	76	25 - 150	10/12/18 11:11	10/21/18 07:10	1
d5-NEtFOSAA	75	25 - 150	10/12/18 11:11	10/21/18 07:10	1
M2-6:2 FTS	135	25 - 150	10/12/18 11:11	10/21/18 07:10	1
M2-8:2 FTS	147	25 - 150	10/12/18 11:11	10/21/18 07:10	1

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Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution) Matrix: Water Prep Type: Total/NA

			Percent Isotope Dilution Recovery (Acceptance Limits)
		DXE	
Lab Sample ID	Client Sample ID	(15-110)	
480-142905-1	MW-7-100318	29	
480-142905-2	MW-1-100318	20	
480-142994-C-1-A MS	Matrix Spike	30	
480-142994-C-1-B MSD	Matrix Spike Duplicate	27	
LCS 480-438341/2-A	Lab Control Sample	35	
MB 480-438341/1-A	Method Blank	37	
Surrogate Legend			
DXE = 1,4-Dioxane-d8			

Method: 537 (modified) - Fluorinated Alkyl Substances Matrix: Water

latrix: Water							Pre	ep Type: ˈ	Total/NA
-			Perc	ent Isotope	Dilution Re	ecoverv (Ac	ceptance L	imits)	
		PFBA	PFPeA	PFHxA	PFHpA	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)
480-142905-1	 MW-7-100318		88	89	97	92	102	95	101
480-142905-2	MW-1-100318	42	45	48	52	53	54	56	59
480-142994-A-1-B MS	Matrix Spike	58	61	66	67	70	67	67	66
480-142994-A-1-C MSD	Matrix Spike Duplicate	53	55	63	63	64	67	60	56
LCS 320-251680/2-A	Lab Control Sample	83	86	90	85	93	89	85	93
MB 320-251680/1-A	Method Blank	89	90	93	99	92	95	97	106
			Porc	ent leotone	Dilution Re	covery (Ac	contanco I	imite)	
		PFDoA		3C3-PER	PFHyS	PEOS	PEOSA	.NMeFOS	
Lah Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
480-142905-1	- MW-7-100318		103	90	95	99	100	109	110
480-142905-2	MW-1-100318	57	49	47	56	58	53	76	75
480-142994-A-1-B MS	Matrix Spike	59	56	65	69	71	64	72	72
480-142994-A-1-C MSD	Matrix Spike Duplicate	50	51	58	61	62	57	62	57
LCS 320-251680/2-A	Lab Control Sample	87	83	83	86	93	79	97	111
MB 320-251680/1-A	Method Blank	104	92	92	93	100	90	112	114
				ont leatona	Dilution Br		contanco I	imite)	
		MOGOETS	MOODETE	ent isotope		COVELY (AC	ceptance L		
Lab Osmala ID		WIZ02F13	WIZ02F13						
Lab Sample ID		(25-150)	(25-150)						
460-142905-1	MW 4 100218	142	100						
480-142905-2	MVV-1-100318	135	747						
400-142994-A-1-B IVIS		04	79						
480-142994-A-1-C MSD	Matrix Spike Duplicate	90	62						
LUS 320-251680/2-A	Lab Control Sample	108	104						
MB 320-251680/1-A	Method Blank	121	100						
Surrogate Legend									
PFBA = 13C4 PFBA									
PFPeA = 13C5 PFPeA									
PFHxA = 13C2 PFHxA									
PFHpA = 13C4 PFHpA									
PFOA = 13C4 PFOA									

PFNA = 13C5 PFNA

PFDA = 13C2 PFDA

Isotope Dilution Summary

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

PFUnA = 13C2 PFUnA PFDoA = 13C2 PFDoA PFTDA = 13C2 PFTeDA 13C3-PFBS = 13C3 PFBS PFHxS = 18O2 PFHxS PFOS = 13C4 PFOS PFOSA = 13C8 FOSA d3-NMeFOSAA = d3-NMeFOSAA d5-NEtFOSAA = d5-NEtFOSAA M262FTS = M2-6:2 FTS M282FTS = M2-8:2 FTS

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Method: 8270D SIM ID	- Semivol	atil	e Orga	nic Comp	ounds	6 (G	C/M	S SIM	/	sot	ope Di	lution)		
_ Lab Sample ID: MB 480-43	38341/1-A									Clie	ent Samp	ole ID: Met	thod	Blank
Matrix: Water												Prep Type	e: To	tal/NA
Analysis Batch: 438984												Prep Bat	ch: 4	38341
-		ΜВ	MB											
Analyte	Re	sult	Qualifier	RL		MDL	Unit		D	P	repared	Analyze	d	Dil Fac
1,4-Dioxane		ND		0.20		0.10	ug/L		_	10/0	9/18 07:33	10/11/18 19	9:44	1
		MВ	MB											
Isotope Dilution	%Reco	very	Qualifier	Limits						P	repared	Analyze	d	Dil Fac
1,4-Dioxane-d8		37		15 - 110						10/0	9/18 07:33	10/11/18 1	9:44	1
Lab Sample ID: LCS 480-4	438341/2-A							Clie	ent	Sar	nple ID:	Lab Cont	rol S	ample
Matrix: Water												Prep Type	e: To	tal/NA
Analysis Batch: 438984												Prep Bat	ch: 4	38341
				Spike	LCS	LCS	5					%Rec.		
Analyte				Added	Result	Qua	lifier	Unit		D	%Rec	Limits		
1,4-Dioxane				1.00	1.10			ug/L			110	40 - 140		
	LCS	LCS	5											
Isotope Dilution	%Recovery	Qua	alifier	Limits										
1,4-Dioxane-d8	35			15-110										
Lab Sample ID: 480-14299 Matrix: Water	94-C-1-A MS									CI	ient San	nple ID: M Prep Type	atrix ə: To	Spike tal/NA
Analysis Batch: 438984												Prep Bat	ch: 4	38341
	Sample	San	nple	Spike	MS	MS						%Rec.		
Analyte	Result	Qua	alifier	Added	Result	Qua	lifier	Unit		D	%Rec	Limits		
1,4-Dioxane	ND			0.952	1.09			ug/L			114	40 - 140		
	MS	MS												
Isotope Dilution	%Recovery	Qua	lifier	Limits										
1,4-Dioxane-d8 _	30			15-110										
Lab Sample ID: 480-14299	94-C-1-B MS	D						Client	Sa	mp	le ID: Ma	atrix Spike	e Dup	olicate
Matrix: Water												Prep Type	e: To	tal/NA
Analysis Batch: 438984												Prep Bat	ch: 4	38341
	Sample	San	nple	Spike	MSD	MSE)					%Rec.		RPD
Analyte	Result	Qua	alifier	Added	Result	Qua	lifier	Unit		D	%Rec	Limits	RPD	Limit
1,4-Dioxane	ND		_	1.00	1.13			ug/L			113	40 - 140	4	20
	MSD	MSI	D 											
Isotope Dilution	%Recovery	Qua	alifier	Limits										
1,4-Dioxane-d8	27			15-110										

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-251680/1-A Matrix: Water Analysis Batch: 252417

Analysis Batch: 252417								Prep Batch: 2	251680
-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.49	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorononanoic acid (PFNA)	0.314	J	2.0	0.27	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/12/18 11:11	10/16/18 00:13	1

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Client Sample ID: Method Blank

Prep Type: Total/NA

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

Lab Sample ID: MB 320-25168 Matrix: Water Analysis Batch: 252417	0/1-A						Client Samp	ole ID: Method Prep Type: To Prep Batch:	d Blank otal/NA
Analysis Datch. 232417	МВ	МВ						Fiep Datch.	231000
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.29	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanesulfonic acid (PFHxS)	0.346	J	2.0	0.17	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanesulfonic Acid	ND		2.0	0.19	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.32	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonamide (FOSA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		20	3.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		20	1.9	ng/L		10/12/18 11:11	10/16/18 00:13	1
6:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1
8:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	89		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C5 PFPeA	90		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFHxA	93		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C4 PFHpA	99		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C4 PFOA	92		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C5 PFNA	95		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFDA	97		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFUnA	106		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFDoA	104		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFTeDA	92		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C3 PFBS	92		25 - 150				10/12/18 11:11	10/16/18 00:13	1
18O2 PFHxS	93		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C4 PFOS	100		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C8 FOSA	90		25 - 150				10/12/18 11:11	10/16/18 00:13	1
d3-NMeFOSAA	112		25 - 150				10/12/18 11:11	10/16/18 00:13	1
d5-NEtFOSAA	114		25 - 150				10/12/18 11:11	10/16/18 00:13	1
M2-6:2 FTS	121		25 - 150				10/12/18 11:11	10/16/18 00:13	1
M2-8:2 FTS	100		25 - 150				10/12/18 11:11	10/16/18 00:13	1

Lab Sample ID: LCS 320-251680/2-A Matrix: Water Analysis Batch: 252417

Analysis Batch: 252417							Prep Batch: 251680
	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	39.9		ng/L		100	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	40.2		ng/L		100	66 - 126
Perfluorohexanoic acid (PFHxA)	40.0	39.0		ng/L		98	66 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	41.0		ng/L		102	66 - 126
Perfluorooctanoic acid (PFOA)	40.0	39.0		ng/L		97	64 - 124
Perfluorononanoic acid (PFNA)	40.0	43.5		ng/L		109	68 - 128

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Prep Type: Total/NA

Client Sample ID: Lab Control Sample

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

Lab Sample ID: LCS 320-251680/2 Matrix: Water Analysis Batch: 252417	- A		C	lient Sample	ID: Lab Control Sample Prep Type: Total/NA Prep Batch: 251680
	Spike	LCS	LCS		%Rec.
Analyte	Added	Result	Qualifier Unit	D %Ree	c Limits
Perfluorodecanoic acid (PFDA)	40.0	38.3	ng/L	96	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	39.0	ng/L	98	3 60 - 120
Perfluorododecanoic acid	40.0	37.9	ng/L	95	5 71 ₋ 131
(PFDoA) Perfluorotridecanoic acid (PETriA)	40.0	38.2	ng/L	90	6 72 - 132
Perfluorotetradecanoic acid (PFTeA)	40.0	41.0	ng/L	103	3 68 - 128
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9	ng/L	10 ⁻	1 73 - 133
Perfluorohexanesulfonic acid	36.4	34.2	ng/L	94	4 63 - 123
Perfluoroheptanesulfonic Acid	38.1	37.6	ng/L	99	9 68 - 128
Perfluorooctanesulfonic acid	37.1	33.1	ng/L	89	9 67 - 127
Perfluorodecanesulfonic acid	38.6	37.6	ng/L	98	8 68 - 128
Perfluorooctanesulfonamide	40.0	44.4	ng/L	11	1 70 - 130
N-methylperfluorooctanesulfona	40.0	35.5	ng/L	89	9 67 - 127
N-ethylperfluorooctanesulfonami doacetic acid (NETEOSAA)	40.0	34.9	ng/L	8	7 65 - 125
6:2 FTS	37.9	32.7	ng/L	86	66 - 126
8:2 FTS	38.3	30.7	ng/L	80) 67 - 127
	LCS LCS				

Isotope Dilution %Recov	ery Qualifier	Limits
13C4 PFBA	83	25 - 150
13C5 PFPeA	86	25 - 150
13C2 PFHxA	90	25 - 150
13C4 PFHpA	85	25 - 150
13C4 PFOA	93	25 - 150
13C5 PFNA	89	25 - 150
13C2 PFDA	85	25 - 150
13C2 PFUnA	93	25 - 150
13C2 PFDoA	87	25 - 150
13C2 PFTeDA	83	25 - 150
13C3 PFBS	83	25 - 150
18O2 PFHxS	86	25 - 150
13C4 PFOS	93	25 - 150
13C8 FOSA	79	25 - 150
d3-NMeFOSAA	97	25 - 150
d5-NEtFOSAA	111	25 - 150
M2-6:2 FTS	108	25 - 150
M2-8:2 FTS	104	25 - 150

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

 Lab Sample ID: 480-142994	4-A-1-B MS						CI	ient Sa	mple ID: Matrix Spike
Matrix: Water									Prep Type: Total/NA
Analysis Batch: 252417									Prep Batch: 251680
	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	18	F1 F2	35.4	52.1		ng/L		96	70 - 130
Perfluoropentanoic acid (PFPeA)	65	F1	35.4	87.8	F1	ng/L		63	66 - 126
Perfluorohexanoic acid (PFHxA)	87	F1	35.4	105	F1	ng/L		52	66 - 126
Perfluoroheptanoic acid (PFHpA)	6.9		35.4	41.7		ng/L		98	66 - 126
Perfluorooctanoic acid (PFOA)	25		35.4	54.7		na/L		83	64 - 124
Perfluorononanoic acid (PFNA)	2.0	В	35.4	36.3		na/L		97	68 - 128
Perfluorodecanoic acid (PFDA)	0.35	J	35.4	35.3		na/L		99	69 - 129
Perfluoroundecanoic acid	ND		35.4	34.0		na/L		96	60 - 120
(PFUnA)						5			
Perfluorododecanoic acid	ND		35.4	38.3		ng/L		108	71 - 131
(PFDoA)									
Perfluorotridecanoic acid	ND		35.4	36.6		ng/L		104	72 - 132
(PFIIIA) Perfluorotetradecanoic acid	ND		35.4	36.6		na/l		103	68 - 128
(PFTeA)	ne in e		00.1	00.0		iig/E		100	00 - 120
Perfluorobutanesulfonic acid	5.8		31.3	35.2		ng/L		94	73 - 133
(PFBS)									
Perfluorohexanesulfonic acid	5.9	В	32.2	33.9		ng/L		87	63 - 123
(PFHXS) Berfluerebentenegulfenie Asid	0.66	1	33.7	35.8		na/l		104	68 128
(PFHnS)	0.00	0	00.7	00.0		ng/E		104	00-120
Perfluorooctanesulfonic acid	22		32.8	49.4		ng/L		84	67 - 127
(PFOS)									
Perfluorodecanesulfonic acid	ND		34.1	27.1		ng/L		79	68 - 128
Perfluorooctanesulfonamide	ND		35.4	39.4		ng/L		111	70 - 130
(FOSA)						Ū			
N-methylperfluorooctanesulfona	ND		35.4	32.7		ng/L		92	67 - 127
midoacetic acid (NMeFOSAA)	ND								05 405
N-ethylperfluorooctanesulfonami	ND		35.4	33.3		ng/L		94	65 - 125
6.2 FTS	ND		33.5	31.0		na/l		92	66 126
8.2 FTS			33.0	26.5		ng/L		78	67 127
0.2110	MS	MS	00.0	20.0		ng/E		10	01 - 121
Isotope Dilution	%Recoverv	Qualifier	Limits						
13C4 PFBA	58	quamor	25 - 150						
13C5 PEPeA	61		25 - 150						
13C2 PEHxA	66		25 150						
13C4 PEHnA	67		25 - 150						
13C4 PEOA	70		25 150						
13C5 PENA	67		25 150						
13C2 PEDA	67		25 150						
13C2 PEUnA	66		25 150						
13C2 PEDoA	50		25 150						
13C2 FFD0A	56		25 150						
1302 FF 180A	00 65		20-100						
	05		20-150						
1002 FFRX3	69 		20 - 150						
1304 7703	/1		20-150						
	64		25 - 150						
	/2		25 - 150						
ao-ivetfosaa	72		25 - 150						

Lab Sample ID: 480-142994-A-1-B MS

Client Sample ID: Matrix Spike Duplicate

Client Sample ID: Matrix Spike Prep Type: Total/NA Prep Batch: 251680

Prep Type: Total/NA

Matrix: Water Analysis Batch: 252417			
	MS	MS	
Isotope Dilution	%Recovery	Qualifier	Limits
M2-6:2 FTS	84		25 - 150
M2-8:2 FTS	79		25 - 150

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

Lab Sample ID: 480-142994-A-1-C MSD Matrix: Water Analysis Batch: 252417

Analysis Batch: 252417	Sample	Sample	Spike	MSD	MSD				Prep Ba %Rec.	atch: 2	51680 RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorobutanoic acid (PFBA)	18	F1 F2	36.5	55.9		ng/L		103	70 - 130	7	30
Perfluoropentanoic acid (PFPeA)	65	F1	36.5	98.8		na/L		91	66 - 126	12	30
Perfluorohexanoic acid (PFHxA)	87	F1	36.5	118		ng/L		84	66 - 126	11	30
Perfluorohentanoic acid (PEHnA)	6.9		36.5	42.7		ng/l		98	66 - 126	2	30
Perfluorooctanoic acid (PEOA)	25		36.5	53.2		ng/L		77	64 - 124	- 3	30
Perfluorononanoic acid (PENA)	2.0	в	36.5	37.1		ng/L		96	68 128	2	30
Perfluorodecanoic acid (PEDA)	0.35		36.5	38.7		ng/L		105	60 120		30
Perfluoroundecanoic acid (PELInA)	ND	0	36.5	37.1		ng/L		102	60 - 120	9	30
Perfluorododecanoic acid (PFDoA)	ND		36.5	36.5		ng/L		100	71_131	5	30
Perfluorotridecanoic acid (PFTriA)	ND		36.5	36.6		ng/L		100	72 - 132	0	30
Perfluorotetradecanoic acid (PFTeA)	ND		36.5	37.2		ng/L		102	68 - 128	2	30
Perfluorobutanesulfonic acid (PFBS)	5.8		32.3	38.8		ng/L		102	73 - 133	10	30
Perfluorohexanesulfonic acid (PFHxS)	5.9	В	33.2	38.9		ng/L		99	63 - 123	14	30
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	34.7	37.6		ng/L		106	68 - 128	5	30
Perfluorooctanesulfonic acid (PFOS)	22		33.9	56.5		ng/L		102	67 - 127	13	30
Perfluorodecanesulfonic acid (PFDS)	ND		35.2	28.2		ng/L		80	68 - 128	4	30
Perfluorooctanesulfonamide (FOSA)	ND		36.5	38.9		ng/L		107	70 - 130	1	30
N-methylperfluorooctanesulfona midoacetic acid (NMeFOSAA)	ND		36.5	32.7		ng/L		90	67 _ 127	0	30
N-ethylperfluorooctanesulfonami doacetic acid (NEtFOSAA)	ND		36.5	34.2		ng/L		94	65 - 125	3	30
6:2 FTS	ND		34.6	31.8		ng/L		92	66 - 126	3	30
8:2 FTS	ND		35.0	35.9		ng/L		103	67 - 127	30	30
	MSD	MSD									
Isotope Dilution	%Recovery	Qualifier	Limits								
13C4 PFBA	53		25 - 150								
13C5 PFPeA	55		25 - 150								
13C2 PFHxA	63		25 - 150								
13C4 PFHpA	63		25 - 150								
13C4 PFOA	64		25 - 150								
13C5 PFNA	67		25 - 150								
13C2 PFDA	60		25 - 150								
13C2 PFUnA	56		25 - 150								

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

Lab Sample ID: 480-14299 Matrix: Water Analysis Batch: 252417	94-A-1-C MS	D		Client Sample ID: Matrix Spike Duplicate Prep Type: Total/NA Prep Batch: 251680
	MSD	MSD		
Isotope Dilution	%Recovery	Qualifier	Limits	
13C2 PFDoA	50		25 - 150	
13C2 PFTeDA	51		25 - 150	
13C3 PFBS	58		25 - 150	
18O2 PFHxS	61		25 - 150	
13C4 PFOS	62		25 - 150	
13C8 FOSA	57		25 - 150	
d3-NMeFOSAA	62		25 - 150	
d5-NEtFOSAA	57		25 - 150	
M2-6:2 FTS	90		25 - 150	
M2-8:2 FTS	62		25 - 150	
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GC/MS Semi VOA

Prep Batch: 438341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	3510C	
480-142905-2	MW-1-100318	Total/NA	Water	3510C	
MB 480-438341/1-A	Method Blank	Total/NA	Water	3510C	
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	3510C	
480-142994-C-1-A MS	Matrix Spike	Total/NA	Water	3510C	
480-142994-C-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	3510C	
Analysis Batch: 4389	84				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	8270D SIM ID	438341
MB 480-438341/1-A	Method Blank	Total/NA	Water	8270D SIM ID	438341
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	8270D SIM ID	438341
480-142994-C-1-A MS	Matrix Spike	Total/NA	Water	8270D SIM ID	438341
480-142994-C-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	8270D SIM ID	438341
Analysis Batch: 4391	96				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-2	MW-1-100318	Total/NA	Water	8270D SIM ID	438341
LCMS					
Prep Batch: 251680					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	3535	
480-142905-2	MW-1-100318	Total/NA	Water	3535	
MB 320-251680/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	3535	
480-142994-A-1-B MS	Matrix Spike	Total/NA	Water	3535	
480-142994-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	3535	
Analysis Batch: 2524	17				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	537 (modified)	251680
MB 320-251680/1-A	Method Blank	Total/NA	Water	537 (modified)	251680
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	251680
480-142994-A-1-B MS	Matrix Spike	Total/NA	Water	537 (modified)	251680
480-142994-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	537 (modified)	251680
Analysis Batch: 2537	65				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-2	MW-1-100318	Total/NA	Water	537 (modified)	251680

Client Sam Date Collecte Date Receive	ple ID: MW ed: 10/03/18 1 d: 10/05/18 0	/-7-100318 1:15 1:00					Lab Sa	ample ID: 4	480-142905-1 Matrix: Water
_	Batch	Batch		Dilution	Batch	Prepared			
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF	
Total/NA	Analysis	8270D SIM ID		1	438984	10/11/18 23:38	DMR	TAL BUF	
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC	
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 00:28	CBW	TAL SAC	
Client Sam	ple ID: MW	-1-100318					Lab Sa	ample ID: 4	480-142905-2

Client Sample ID: MW-1-100318 Date Collected: 10/03/18 14:50 Date Received: 10/05/18 01:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	439196	10/13/18 03:58	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	253765	10/21/18 07:10	S1M	TAL SAC

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

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

Matrix: Water

Accreditation/Certification Summary

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

5

Laboratory: TestAmerica Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10026	03-31-19

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18 *
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

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

Method Summary

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

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Method	Method Description	Protocol	Laboratory
8270D SIM ID	Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)	SW846	TAL BUF
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL BUF
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

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 BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600 TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

Lab Sample ID	Client Sample ID	Matrix	Collected Received
480-142905-1	MW-7-100318	Water	10/03/18 11:15 10/05/18 01:00
480-142905-2	MW-1-100318	Water	10/03/18 14:50 10/05/18 01:00

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Difference (State) Differe	Address: O'Brien & Gere		Marie Meichof						0 0	0 0	0 0	0 0 0	0 0	0 Lab ID:	
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Preventives Code: 0 = none, 1 = HCL, 2 = HNU3, 3 = HIZUA, 4 = NAUH, 5 = ANGNECACIO, 6 = MEUH, 7 = NALYOUS, 9 = NAZAZOJS 9 = INJECH	Sample Type: N = Normal environmental sample, I Sample Matrix SE = Sediment, SO = Søl, WG = G. Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3.	FD = field duplicate, EB roundwater, WS = Surfa , 3 = H2SO4, 4 = NaOI	= Equipment Blank, 1 ce Water, WW = Waste H, 5 = Asobic Acid, 6:	FB = Field Blank, T : Water, WQ = Wate = MeOH, 7 = NaHS	B = Trip Blan r Quality, TA 04, 8 = Na29	k, MS = Lab = Animal Tis \$203: 9 = H3F	Matipike, Other (Specsue, TP = Plant Tissu 204	cify): e, AA = Am	bient Air, O	ther (Specify)					

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		stervatives Code: 0 = none, 1 = HCL, 2 = HNO3,	3 = H2SO4, 4 = NaO	H, 5 = Asabic Acid, 6	= MeOH, 7 = NaH	SO4, 8 = Na2S	203: 9 = H3P	04	C	200			

480501-Albany

USI/	VIEI	ICO	Sample Receiving Notes		
HE LEADER IN	ENVIRONMENTA	L TESTING	Job: 480-142905 Field Sheet		
Tracking #	4635	9988 8726	SO / PO / FO / 2-Day / SAT / Ground / U	s/c	ourier /
se this form to rec le in the job folder	ord Sample Custo	Drop O dy Seal, Cooler Cust	ff / GSO / OnTrac / Goldstreak / USPS / Other ody Seal, Temperature & corrected Temperature & othe	obser	vations.
Notes:			Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACO	P/O	ther
_			Cooler Custody Seal: 743/59		-
			Sample Custody Seal:		
			Temp: Observed 0.8 Corrected 0	5	
	48018	237			
	480	-142905	Yes Perchlorate has headspace? Alkalinity has no headspace?	No D D	NA PO po
			Samples received within holding time?		
			Samples compromised/tampered with?	東戸口	
_			Sample containers have legible labels? Containers are not broken or leaking? Sample date/times are provided.		
	-		Appropriate containers are used?		
			Multiphasic samples are not present? Sample temp OK? Sample out of temp?	¥ D D	
			Initials: DIA Date: 10/5/18	عر	

Login Sample Receipt Checklist

Client: O'Brien & Gere Inc of North America

Login Number: 142905 List Number: 1 Creator: Hulbert, Michael J

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
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	
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?	True	
There are no discrepancies between the sample IDs on the containers 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	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Job Number: 480-142905-1 List Source: TestAmerica Buffalo 5 6 7 9 10 11 12 13 14 15 16

Login Sample Receipt Checklist

Client: O'Brien & Gere Inc of North America

Job Number: 480-142905-1

Login Number: 142905	List Source: TestAmerica Sacramento
List Number: 2	List Creation: 10/06/18 01:36 PM
Creator: Nelson, Kym D	

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	743159
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	0.5C
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?	True	
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	



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Buffalo 10 Hazelwood Drive Amherst, NY 14228-2298 Tel: (716)691-2600

TestAmerica Job ID: 480-142994-1 Client Project/Site: GE Vatrano Rd Site

For:

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Expert

O'Brien & Gere Inc of North America 94 New Karner Rd., Suite 106 Albany, New York 12203

Attn: Mr. Paul D'Annibale

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Authorized for release by: 10/24/2018 2:24:28 PM

Marie Meidhof, Senior Project Manager (732)549-3900 marie.meidhof@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

3

Qualifiers

LUNS	
Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
В	Compound was found in the blank and sample.

Glossary

F1	MS and/or MSD Recovery is outside acceptance limits.	 5
F2	MS/MSD RPD exceeds control limits	
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	
В	Compound was found in the blank and sample.	
Glossary		
Abbreviation	These commonly used abbreviations may or may not be present in this report.	 8
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	9
CFL	Contains Free Liquid	
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)	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	10
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
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)

Job ID: 480-142994-1

Laboratory: TestAmerica Buffalo

Narrative

CASE NARRATIVE

Client: O'Brien & Gere Inc of North America

Project: GE Vatrano Rd Site

Report Number: 480-142994-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

<u>RECEIPT</u>

The samples were received on 10/5/2018 1:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

1,4 DIOXANE BY 8270D SIM, ISOTOPE DILUTION

Samples MW-4-100418 (480-142994-1), MW-2-100418 (480-142994-2), EB-100418 (480-142994-3) and X-1-100418 (480-142994-5) were analyzed for 1,4 Dioxane by 8270D SIM, Isotope Dilution in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 10/09/2018 and analyzed on 10/11/2018 and 10/12/2018.

No difficulties were encountered during the 1,4 Dioxane analysis.

All quality control parameters were within the acceptance limits.

PERFLUORINATED HYDROCARBONS (PFC)

Samples MW-4-100418 (480-142994-1), MW-2-100418 (480-142994-2), EB-100418 (480-142994-3), FRB-100418 (480-142994-4) and X-1-100418 (480-142994-5) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with PFC. The samples were prepared on 10/12/2018 and analyzed on 10/16/2018.

The following samples had non-settleable particulate matter which plugged the SPE extraction disk. The amount of sample remaining plus the weight of the bottle are recorded in the "Notes" field of the prep batch. The "Tare Weight" recorded is the weight of the emptied bottle: MW-4-100418 (480-142994-1), MW-4-100418 (480-142994-1[MS]) and MW-4-100418 (480-142994-1[MSD]). The reporting limits (RLs) have been adjusted proportionately.

Perfluorohexanesulfonic acid (PFHxS) and Perfluorononanoic acid (PFNA) were detected in method blank MB 320-251680/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Job ID: 480-142994-1 (Continued)

Laboratory: TestAmerica Buffalo (Continued)

The matrix spike (MS) recoveries for Perfluoropentanoic acid (PFPeA) and Perfluorohexanoic acid (PFHxA) forpreparation batch 320-251680 and analytical batch 320-252417 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Refer to the QC report for details.

No other difficulties were encountered during the Perfluorinated Hydrocarbons (PFC) analysis.All other quality control parameters were within the acceptance limits.

Client Sample ID: MW-4-100418

Lab Sample ID: 480-142994-1

Lab Sample ID: 480-142994-3

Lab Sample ID: 480-142994-4

Lab Sample ID: 480-142994-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	18	F1 F2	1.8	0.32	ng/L	1	_	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	65	F1	1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	87	F1	1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.9		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	25		1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.0	В	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.35	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.8		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	5.9	В	1.8	0.15	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	1.8	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	22		1.8	0.49	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-2-100418

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.9		1.8	0.32	ng/L	1	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.7		1.8	0.45	ng/L	1	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.53	ng/L	1	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.0		1.8	0.23	ng/L	1	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	14		1.8	0.78	ng/L	1	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	5.6	В	1.8	0.25	ng/L	1	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.3	J	1.8	0.18	ng/L	1	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.0	В	1.8	0.16	ng/L	1	537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.93	J	1.8	0.17	ng/L	1	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	100		1.8	0.49	ng/L	1	537 (modified)	Total/NA

Client Sample ID: EB-100418

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.23	JB	1.7	0.14	ng/L	1	_	537 (modified)	Total/NA

Client Sample ID: FRB-100418

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.23 J B	1.8	0.16 ng/L	1 537 (modified)	Total/NA

Client Sample ID: X-1-100418

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.3		1.7	0.31	ng/L	1	-	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.2		1.7	0.43	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.2		1.7	0.51	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.9		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	15		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	5.4	В	1.7	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.37	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.63	J	1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.2	J	1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.9	В	1.7	0.15	na/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Lab Sample ID: 480-142994-5

5

Client Sample ID: X-1-100418 (Continued)

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Perfluoroheptanesulfonic Acid	1.0 J	1.7	0.17 ng/L	1 537 (modified)) Total/NA
(PFHpS)					
Perfluorooctanesulfonic acid (PFOS)	110	1.7	0.47 ng/L	1 537 (modified)) Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-4-100418

Lab Sample ID: 480-142994-1 Matrix: Water

5

6

Date Collected: 10/04/18 10:15 Date Received: 10/05/18 01:15

Method: 8270D SIM ID - Semiv	olatile Orga	anic Comp	ounds (GC/M	IS SIM /	Isotope Dil	ution)		
Analyte	Result	Qualifier	RL	MDL	Unit	D Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L	10/09/18 07:33	10/11/18 21:17	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	31		15 - 110			10/09/18 07:33	10/11/18 21:17	1
Method: 537 (modified) - Fluor	inated Alky	/I Substan	Ces	MDI	11	D. D	•	D'I 5
Analyte	Result	Qualifier	RL		Unit	D Prepared	Analyzed	
Perfluorobutanoic acid (PFBA)	18	F1 F2	1.8	0.32	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluoropentanoic acid (PFPeA)	65	F1	1.8	0.45	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorohexanoic acid (PFHxA)	87	F1	1.8	0.53	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluoroheptanoic acid (PFHpA)	6.9		1.8	0.23	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanoic acid (PFOA)	25		1.8	0.77	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorononanoic acid (PFNA)	2.0	В	1.8	0.25	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorodecanoic acid (PFDA)	0.35	J	1.8	0.28	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorobutanesulfonic acid (PFBS)	5.8		1.8	0.18	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorohexanesulfonic acid	5.9	В	1.8	0.15	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluoroheptanesulfonic Acid	0.66	J	1.8	0.17	ng/L	10/12/18 11:11	10/16/18 00:43	1
(PFHpS) Perfluorooctanesulfonic acid	22		1.8	0.49	ng/L	10/12/18 11:11	10/16/18 00:43	1
(PFOS)								
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L	10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L	10/12/18 11:11	10/16/18 00:43	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		18	2.8	ng/L	10/12/18 11:11	10/16/18 00:43	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		18	1.7	ng/L	10/12/18 11:11	10/16/18 00:43	1
6:2 FTS	ND		18	1.8	ng/L	10/12/18 11:11	10/16/18 00:43	1
8:2 FTS	ND		18	1.8	ng/L	10/12/18 11:11	10/16/18 00:43	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C4 PFBA	70		25 - 150			10/12/18 11:11	10/16/18 00:43	1
13C5 PFPeA	75		25 - 150			10/12/18 11:11	10/16/18 00:43	1
13C2 PFHxA	79		25 - 150			10/12/18 11:11	10/16/18 00:43	1
13C4 PFHpA	87		25 - 150			10/12/18 11:11	10/16/18 00:43	1
13C4 PFOA	81		25 - 150			10/12/18 11:11	10/16/18 00:43	1
13C5 PENA	90		25 - 150			10/12/18 11.11	10/16/18 00.43	1
13C2 PEDA	85		25 150			10/12/18 11:11	10/16/18 00:43	
13C2 PEUnA	78		25 150			10/12/18 11:11	10/16/18 00:43	1
13C2 PEDA	70		25 150			10/12/18 11:11	10/16/18 00:43	1
1302 I I DOA 1302 PETADA	70 67		25 150			10/12/10 11.11	10/16/19 00.43	
1302 FF 160A	07		20-100			10/12/10 11.11	10/16/19 00:43	1
	84		20 - 150			10/12/18 11:11	10/10/18 00:43	1
10U2 PFMXS	89		25 - 150			10/12/18 11:11	10/16/18 00:43	1
1304 PFOS	94		25 - 150			10/12/18 11:11	10/16/18 00:43	1
	82		25 - 150			10/12/18 11:11	10/16/18 00:43	1
as-NMEFOSAA	96		25 - 150			10/12/18 11:11	10/16/18 00:43	1
d5-NĒtFOSAA	87		25 - 150			10/12/18 11:11	10/16/18 00:43	1

Client Sample ID: MW-4-1 Date Collected: 10/04/18 10:15 Date Received: 10/05/18 01:15	00418					Lab Sample ID: 480-14299 Matrix: W					
Method: 537 (modified) - Fluo	rinated Alky	vl Substan	ces (Continu	ed)			/				
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	DIIFac		
M2-6:2 F1S	118		25 - 150				10/12/18 11:11	10/16/18 00:43	1		
M2-8:2 FTS	93		25 - 150				10/12/18 11:11	10/16/18 00:43	1		
Client Sample ID: MW-2-1 Date Collected: 10/04/18 13:55 Date Received: 10/05/18 01:15	00418					La	ıb Sample	ID: 480-142 Matrix:	2 994-2 Water		
Method: 8270D SIM ID - Semix Analyte	volatile Orga Result	anic Comp Qualifier	oounds (GC/M RL	/ <mark>IS SIM</mark> / MDL	<mark>Isotope</mark> Unit	Diluti D	on) Prepared	Analyzed	Dil Fac		
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:25	1		
Isotope Dilution	%Recoverv	Qualifier	Limits				Prepared	Analyzed	Dil Fac		
1,4-Dioxane-d8	30		15 - 110				10/09/18 07:33	10/12/18 00:25	1		
Method: 537 (modified) - Fluo Analyte	rinated Alky Result	v <mark>l Substan</mark> Qualifier	ces RL	MDL	Unit	D	Prepared	Analvzed	Dil Fac		
Perfluorobutanoic acid (PFBA)	2.9		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluoropentanoic acid (PFPeA)	2.7		1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluoroheptanoic acid (PFHpA)	3.0		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorooctanoic acid (PFOA)	14		1.8	0.78	na/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorononanoic acid (PFNA)	5.6	в	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorobutanesulfonic acid (PFBS)	1.3	J	1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorohexanesulfonic acid (PFHxS)	4.0	В	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluoroheptanesulfonic Acid (PFHpS)	0.93	J	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorooctanesulfonic acid (PFOS)	100		1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		10/12/18 11:11	10/16/18 01:05	1		
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1		
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 01:05	1		
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 01:05	1		
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:05	1		

Client Sample ID Date Collected: 10/0 Date Received: 10/0

Isotope Dilution

13C4 PFBA

13C5 PFPeA

13C2 PFHxA

13C4 PFHpA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

8:2 FTS

M2-8:2 F1S	93		25 - 150				10/12/18 11:11	10/16/18 00:43	1
Client Sample ID: MW-2-1	00418					La	b Sample	ID: 480-142	2994-2
Date Collected: 10/04/18 13:55 Date Received: 10/05/18 01:15							-	Matrix	: Water
Method: 8270D SIM ID - Semi	volatile Org	anic Comp	oounds (GC/I	MS SIM /	Isotope	e Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:25	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	30		15 - 110				10/09/18 07:33	10/12/18 00:25	1
Method: 537 (modified) - Fluo	rinated Alky	vl Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.9		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoropentanoic acid (PFPeA)	2.7		1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroheptanoic acid (PFHpA)	3.0		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanoic acid (PFOA)	14		1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorononanoic acid (PFNA)	5.6	В	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:05	1

5

6

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

10/12/18 11:11 10/16/18 01:05

Analyzed

Prepared

18

Limits

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

1.8 ng/L

ND

%Recovery Qualifier

73

80

85

93

95

91

90

87

1

1

1

1

1

1

1

1

1

Dil Fac

Lab Sample ID: 480-142994-2 Matrix: Water

Client Sample ID: MW-2-100418 Date Collected: 10/04/18 13:55 Date Received: 10/05/18 01:15

Method: 537 (modified)) - Fluorinated Alkyl Substan	ces (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	83	25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C2 PFTeDA	81	25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C3 PFBS	88	25 - 150	10/12/18 11:11	10/16/18 01:05	1
18O2 PFHxS	91	25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C4 PFOS	95	25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C8 FOSA	91	25 - 150	10/12/18 11:11	10/16/18 01:05	1
d3-NMeFOSAA	102	25 - 150	10/12/18 11:11	10/16/18 01:05	1
d5-NEtFOSAA	104	25 - 150	10/12/18 11:11	10/16/18 01:05	1
M2-6:2 FTS	131	25 - 150	10/12/18 11:11	10/16/18 01:05	1
M2-8:2 FTS	93	25 - 150	10/12/18 11:11	10/16/18 01:05	1

Client Sample ID: EB-100418 Date Collected: 10/04/18 10:45 Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-3

Matrix: Water

5

6

Method: 8270D SIM ID - Semiv	olatile Orga	anic Comp	ounds (GC/M	IS SIM /	Isotope	Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:48	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	31		15 - 110				10/09/18 07:33	10/12/18 00:48	1
_ Method: 537 (modified) - Eluor	inated Alky	/I Substan	C85						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoropentanoic acid (PFPeA)	ND		1.7	0.41	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanoic acid (PFHxA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.21	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanoic acid (PFOA)	ND		1.7	0.71	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.26	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.91	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.46	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanesulfonic acid (PFHxS)	0.23	JB	1.7	0.14	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.7	0.16	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.45	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		17	2.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:13	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:13	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	85		25 - 150				10/12/18 11:11	10/16/18 01:13	1

Lab Sample ID: 480-142994-3 Matrix: Water

Client Sample ID: EB-100418 Date Collected: 10/04/18 10:45 Date Received: 10/05/18 01:15

Method: 537 (modified) -	Fluorinated Alkyl Substan	ces (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFPeA	86	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFHxA	87	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFHpA	92	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFOA	90	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C5 PFNA	91	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFDA	87	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFUnA	95	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFDoA	86	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFTeDA	86	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C3 PFBS	85	25 - 150	10/12/18 11:11	10/16/18 01:13	1
18O2 PFHxS	91	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFOS	95	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C8 FOSA	84	25 - 150	10/12/18 11:11	10/16/18 01:13	1
d3-NMeFOSAA	102	25 - 150	10/12/18 11:11	10/16/18 01:13	1
d5-NEtFOSAA	106	25 - 150	10/12/18 11:11	10/16/18 01:13	1
M2-6:2 FTS	103	25 - 150	10/12/18 11:11	10/16/18 01:13	1
M2-8:2 FTS	95	25 - 150	10/12/18 11:11	10/16/18 01:13	1

Client Sample ID: FRB-100418 Date Collected: 10/04/18 10:20 Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-4 Matrix: Water

15

5

Method: 537 (modified) - Fluorin	ated Alkyl Substance	S						
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND	1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoropentanoic acid (PFPeA)	ND	1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorohexanoic acid (PFHxA)	ND	1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroheptanoic acid (PFHpA)	ND	1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanoic acid (PFOA)	ND	1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorononanoic acid (PFNA)	ND	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorodecanoic acid (PFDA)	ND	1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroundecanoic acid (PFUnA)	ND	1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorododecanoic acid (PFDoA)	ND	1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorotridecanoic acid (PFTriA)	ND	1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorotetradecanoic acid (PFTeA)	ND	1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorohexanesulfonic acid (PFHxS)	0.23 JB	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	0.29	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanesulfonamide (FOSA)	ND	1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND	18	2.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND	18	1.7	ng/L		10/12/18 11:11	10/16/18 01:20	1
6:2 FTS `	ND	18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
8:2 FTS	ND	18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1

Limits

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

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25 - 150

Isotope Dilution

13C4 PFBA

13C5 PFPeA

13C2 PFHxA

13C4 PFHpA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

13C2 PFTeDA

13C3 PFBS

1802 PFHxS

13C4 PFOS

13C8 FOSA

M2-6:2 FTS

M2-8:2 FTS

Client Sample ID: X-1-100418

Date Collected: 10/04/18 00:00

Date Received: 10/05/18 01:15

d3-NMeFOSAA

d5-NEtFOSAA

%Recovery Qualifier

86

86

90

88

88

90

90

93

80

78

92

88

99

85

91

99

118

108

Lab Sample ID: 480-142994-4 Matrix: Water

10/12/18 11:11 10/16/18 01:20

10/12/18 11:11 10/16/18 01:20

10/12/18 11:11 10/16/18 01:20

10/12/18 11:11 10/16/18 01:20

10/12/18 11:11 10/16/18 01:20

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10/12/18 11:11 10/16/18 01:20

10/12/18 11:11 10/16/18 01:20

10/12/18 11:11 10/16/18 01:20

Analyzed

Prepared

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.097	ug/L		10/09/18 07:33	10/12/18 01:12	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
1,4-Dioxane-d8	28		15 - 110				10/09/18 07:33	10/12/18 01:12	
_ Method: 537 (modified) - Fluo	rinated Alky	/I Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluorobutanoic acid (PFBA)	2.3		1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluoropentanoic acid (PFPeA)	2.2		1.7	0.43	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorohexanoic acid (PFHxA)	2.2		1.7	0.51	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluoroheptanoic acid (PFHpA)	2.9		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorooctanoic acid (PFOA)	15		1.7	0.74	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorononanoic acid (PFNA)	5.4	В	1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorodecanoic acid (PFDA)	0.37	J	1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorododecanoic acid (PFDoA)	0.63	J	1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:35	••••••
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorobutanesulfonic acid (PFBS)	1.2	J	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorohexanesulfonic acid (PFHxS)	3.9	В	1.7	0.15	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	J	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorooctanesulfonic acid (PFOS)	110		1.7	0.47	ng/L		10/12/18 11:11	10/16/18 01:35	
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 01:35	

Lab Sample ID: 480-142994-5 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	71		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C5 PFPeA	81		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C2 PFHxA	87		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C4 PFHpA	94		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C4 PFOA	87		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C5 PFNA	99		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C2 PFDA	93		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C2 PFUnA	93		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C2 PFDoA	91		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C2 PFTeDA	82		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C3 PFBS	87		25 - 150				10/12/18 11:11	10/16/18 01:35	1
18O2 PFHxS	93		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C4 PFOS	93		25 - 150				10/12/18 11:11	10/16/18 01:35	1
13C8 FOSA	92		25 - 150				10/12/18 11:11	10/16/18 01:35	1
d3-NMeFOSAA	103		25 - 150				10/12/18 11:11	10/16/18 01:35	1
d5-NEtFOSAA	110		25 - 150				10/12/18 11:11	10/16/18 01:35	1
M2-6:2 FTS	148		25 - 150				10/12/18 11:11	10/16/18 01:35	1
M2-8:2 FTS	110		25 - 150				10/12/18 11:11	10/16/18 01:35	1

Prep Type: Total/NA

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution) Matrix: Water Prep Type: Total/NA

			Percent Isotope Dilution Recovery (Acceptance Limits)
		DXE	
Lab Sample ID	Client Sample ID	(15-110)	
480-142994-1	MW-4-100418	31	
480-142994-1 MS	MW-4-100418	30	
480-142994-1 MSD	MW-4-100418	27	
480-142994-2	MW-2-100418	30	
480-142994-3	EB-100418	31	
480-142994-5	X-1-100418	28	
LCS 480-438341/2-A	Lab Control Sample	35	
MB 480-438341/1-A	Method Blank	37	
Surrogate Legend			

DXE = 1,4-Dioxane-d8

Method: 537 (modified) - Fluorinated Alkyl Substances

Μ	atr	ix:	W	ate	r

			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	.imits)	
		PFBA	PFPeA	PFHxA	PFHpA	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)
480-142994-1	MW-4-100418	70	75	79	87	81	90	85	78
480-142994-1 MS	MW-4-100418	58	61	66	67	70	67	67	66
480-142994-1 MSD	MW-4-100418	53	55	63	63	64	67	60	56
480-142994-2	MW-2-100418	73	80	85	93	95	91	90	87
480-142994-3	EB-100418	85	86	87	92	90	91	87	95
480-142994-4	FRB-100418	86	86	90	88	88	90	90	93
480-142994-5	X-1-100418	71	81	87	94	87	99	93	93
LCS 320-251680/2-A	Lab Control Sample	83	86	90	85	93	89	85	93
MB 320-251680/1-A	Method Blank	89	90	93	99	92	95	97	106
			Perce	ent Isotope	Dilution Re	coverv (Ac	ceptance L	imits)	
		PFDoA	PFTDA	3C3-PFB	PFHxS	PFOS	PFOSA	-NMeFOS	-NEtFOS/
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
480-142994-1	MW-4-100418		67	84	89	94	82	96	87
480-142994-1 MS	MW-4-100418	59	56	65	69	71	64	72	72
480-142994-1 MSD	MW-4-100418	50	51	58	61	62	57	62	57
480-142994-2	MW-2-100418	83	81	88	91	95	91	102	104
480-142994-3	EB-100418	86	86	85	91	95	84	102	106
480-142994-4	FRB-100418	80	78	92	88	99	85	91	99
480-142994-5	X-1-100418	91	82	87	93	93	92	103	110
LCS 320-251680/2-A	Lab Control Sample	87	83	83	86	93	79	97	111
MB 320-251680/1-A	Method Blank	104	92	92	93	100	90	112	114
			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	.imits)	
		M262FTS	M282FTS	-		• •	-		
Lab Sample ID	Client Sample ID	(25-150)	(25-150)						
480-142994-1	 MW-4-100418	118	93						
480-142994-1 MS	MW-4-100418	84	79						
480-142994-1 MSD	MW-4-100418	90	62						
480-142994-2	MW-2-100418	131	93						
480-142994-3	EB-100418	103	95						
480-142994-4	FRB-100418	118	108						
480-142994-5	X-1-100418	148	110						

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued) Matrix: Water Prep Type: Total/NA Percent Isotope Dilution Recovery (Acceptance Limits) M262FTS M282FTS Lab Sample ID **Client Sample ID** (25-150) (25-150) LCS 320-251680/2-A Lab Control Sample 108 104 MB 320-251680/1-A Method Blank 121 100 Surrogate Legend PFBA = 13C4 PFBA PFPeA = 13C5 PFPeA PFHxA = 13C2 PFHxA PFHpA = 13C4 PFHpA PFOA = 13C4 PFOA PFNA = 13C5 PFNA PFDA = 13C2 PFDA PFUnA = 13C2 PFUnA PFDoA = 13C2 PFDoA PFTDA = 13C2 PFTeDA 13C3-PFBS = 13C3 PFBS PFHxS = 18O2 PFHxS PFOS = 13C4 PFOS PFOSA = 13C8 FOSA d3-NMeFOSAA = d3-NMeFOSAA d5-NEtFOSAA = d5-NEtFOSAA M262FTS = M2-6:2 FTS

M282FTS = M2-8:2 FTS

Method: 8270D SIM ID	- Semivol	atile	Orga	nic Comp	ounds	s (GC	//	S SIN	/	sot	ope Di	lution)		
Lab Sample ID: MB 480-4 Matrix: Water Analysis Batch: 438984	38341/1-A	MD 1	ND							Clie	nt Samp	ole ID: Mo Prep Typ Prep Ba	ethod be: To itch: 4	Blank tal/NA 38341
Awalista	Π.			ы			1		-			A a h		
Analyte	Re		Jualitier		-				<u> </u>	10/0	repared	Analyz	.ea	DIIFac
1,4-Dioxane				0.20)	0.10 0	ig/L			10/0	9/18 07:33	10/11/18	19:44	1
Isotopo Dilution	% Poco	IVIB IN	WB Qualifiar	Limite						D	roporod	Analyz	od	Dil Eac
1 4 Dioyana de	//////////////////////////////////////	$\frac{very}{27}$	zuanner	$-\frac{15}{15}$	-					10/0	0/10 07.22	Alidiy2	10·11	DII Fac
1,4-Dioxane-08		37		15-110						10/0	9/10 07.33	10/11/10	19.44	1
Lab Sample ID: LCS 480-	438341/2-A							Cli	ent	Sar	nple ID:	Lab Con	trol S	ample
Matrix: Water										-		Prep Tv	e: To	tal/NA
Analysis Batch: 438984												Prep Ba	tch: 4	38341
				Spike	LCS	LCS						%Rec.		
Analyte				Added	Result	Qualit	fier	Unit		D	%Rec	Limits		
1,4-Dioxane	- <u> </u>			1.00	1.10			ug/L			110	40 - 140		
	LCS	LCS												
Isotope Dilution	%Recovery	Qualit	fier	Limits										
1,4-Dioxane-d8	35			15_110										
Lab Sample ID: 480-1429	94-1 MS									Clie	ent Sam		VV-4-1	00418
Matrix: Water												Prep Typ	be: To	tal/NA
Analysis Batch: 438984	0	0		Omilia	мо							Prep Ba	itch: 4	38341
A secolaria	Sample	Samp	ole C	Бріке	11/15	W5		11		-	0/ D	%Rec.		
Analyte	Result	Quain	tier	Added	Result	Quain	rier			. <u> </u>	%Rec			
1,4-Dioxane	ND	MC		0.952	1.09			ug/L			114	40 - 140		
leaters Dilution	W Decessory	NIS Oudi	fier	Limita										
1 4 Diavana de	%Recovery	Quain	ner											
1,4-Di0Xane-08	50			15-110										
 I ab Sample ID: 480-1429	94-1 MSD									Clie	ent Sam	nle ID [.] M	W-4-1	00418
Matrix: Water												Pren Tvr	e: To	tal/NA
Analysis Batch: 438984												Pren Ba	tch: 4	38341
	Sample	Samp	le	Spike	MSD	MSD						%Rec.		RPD
Analyte	Result	Quali	fier	Added	Result	Qualit	fier	Unit		D	%Rec	Limits	RPD	Limit
1,4-Dioxane	ND			1.00	1.13			ug/L			113	40 - 140	4	20
	MSD	MSD						-						
Isotope Dilution	%Recovery	Qualit	fier	Limits										

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-251680/1-A Matrix: Water Analysis Batch: 252417

Analysis Batch: 252417								Prep Batch:	251680
-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.49	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorononanoic acid (PFNA)	0.314	J	2.0	0.27	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/12/18 11:11	10/16/18 00:13	1

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Client Sample ID: Method Blank

Prep Type: Total/NA

Lab Sample ID: MB 320-251680/1-A

Matrix: Water

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

Client Sample ID: Method Blank Prep Type: Total/NA 5

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Analysis Batch: 252417	MB	MB						Prep Batch:	251680
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.29	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanesulfonic acid (PFHxS)	0.346	J	2.0	0.17	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.19	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.32	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonamide (FOSA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		20	3.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		20	1.9	ng/L		10/12/18 11:11	10/16/18 00:13	1
6:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1
8:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	89		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C5 PFPeA	90		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFHxA	93		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C4 PFHpA	99		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C4 PFOA	92		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C5 PFNA	95		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFDA	97		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFUnA	106		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFDoA	104		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C2 PFTeDA	92		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C3 PFBS	92		25 - 150				10/12/18 11:11	10/16/18 00:13	1
18O2 PFHxS	93		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C4 PFOS	100		25 - 150				10/12/18 11:11	10/16/18 00:13	1
13C8 FOSA	90		25 - 150				10/12/18 11:11	10/16/18 00:13	1
d3-NMeFOSAA	112		25 - 150				10/12/18 11:11	10/16/18 00:13	1
d5-NEtFOSAA	114		25 - 150				10/12/18 11:11	10/16/18 00:13	1
M2-6:2 FTS	121		25 - 150				10/12/18 11:11	10/16/18 00:13	1
M2-8:2 FTS	100		25 - 150				10/12/18 11:11	10/16/18 00:13	1

Lab Sample ID: LCS 320-251680/2-A Matrix: Water Analysis Batch: 252417

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Perfluorobutanoic acid (PFBA)	40.0	39.9		ng/L		100	70 - 130	
Perfluoropentanoic acid (PFPeA)	40.0	40.2		ng/L		100	66 - 126	
Perfluorohexanoic acid (PFHxA)	40.0	39.0		ng/L		98	66 - 126	
Perfluoroheptanoic acid (PFHpA)	40.0	41.0		ng/L		102	66 - 126	
Perfluorooctanoic acid (PFOA)	40.0	39.0		ng/L		97	64 - 124	
Perfluorononanoic acid (PFNA)	40.0	43.5		ng/L		109	68 - 128	

TestAmerica Buffalo

Prep Type: Total/NA

Prep Batch: 251680

Client Sample ID: Lab Control Sample

4 5

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

Lab Sample ID: LCS 320-251680/2-A Matrix: Water Analysis Batch: 252417			Client	t Sample ID	: Lab Control Sample Prep Type: Total/NA Prep Batch: 251680
	Spike	LCS LCS			%Rec.
Analyte	Added	Result Quali	fier Unit	D %Rec	Limits
Perfluorodecanoic acid (PFDA)	40.0	38.3	ng/L	96	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	39.0	ng/L	98	60 - 120
Perfluorododecanoic acid	40.0	37.9	ng/L	95	71 - 131
(PFDoA)					
Perfluorotridecanoic acid	40.0	38.2	ng/L	96	72 - 132
(PFTriA)					
Perfluorotetradecanoic acid	40.0	41.0	ng/L	103	68 - 128
(PFTeA)					
Perfluorobutanesulfonic acid	35.4	35.9	ng/L	101	73 - 133
(PFBS)			· · · · · · · · · · · · · · · · · · ·		
Perfluorohexanesulfonic acid	36.4	34.2	ng/L	94	63 - 123
(PFHxS)	00.4	07.0			00, 100
Perfluoroheptanesulfonic Acid	38.1	37.6	ng/L	99	68 - 128
(PFHpS)	07.4	00.4			07.407
Perfluorooctanesulfonic acid	37.1	33.1	ng/L	89	67 - 127
(PFOS)	20.6	27.6	ng/l	00	60 100
Perfluorodecanesulfonic acid	30.0	37.0	ng/L	90	00 - 120
(PFDS)	40.0	11 1	ng/l	111	70 130
Periluorooctanesultonamide	40.0	44.4	IIG/L		70 - 150
(FUSA)	40.0	35 5	ng/l	80	67 127
mideacetic acid (NMoEOSAA)	40.0	55.5	ng/L	03	07 - 127
N othylporfluorooctoposulfonami	40.0	34.9	na/l	87	65 125
	40.0	04.0	iig/L	01	00-120
6.2 FTS	37.9	327	ng/l	86	66 - 126
8-2 FTS	38.3	30.7	ng/L	80	67 127
0.2110	50.5	50.7	iig/L	00	07 - 127

Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFBA	83		25 - 150
13C5 PFPeA	86		25 - 150
13C2 PFHxA	90		25 - 150
13C4 PFHpA	85		25 - 150
13C4 PFOA	93		25 - 150
13C5 PFNA	89		25 - 150
13C2 PFDA	85		25 - 150
13C2 PFUnA	93		25 - 150
13C2 PFDoA	87		25 - 150
13C2 PFTeDA	83		25 - 150
13C3 PFBS	83		25 - 150
18O2 PFHxS	86		25 - 150
13C4 PFOS	93		25 - 150
13C8 FOSA	79		25 - 150
d3-NMeFOSAA	97		25 - 150
d5-NEtFOSAA	111		25 - 150
M2-6:2 FTS	108		25 - 150
M2-8:2 FTS	104		25 - 150

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

	4-1 MS						Cli	ent San	nple ID: MW-4-100418
Matrix: Water									Prep Type: Total/NA
Analysis Batch: 252417									Prep Batch: 251680
	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	18	F1 F2	35.4	52.1		ng/L		96	70 - 130
Perfluoropentanoic acid (PFPeA)	65	F1	35.4	87.8	F1	ng/L		63	66 - 126
Perfluorohexanoic acid (PFHxA)	87	F1	35.4	105	F1	ng/L		52	66 - 126
Perfluoroheptanoic acid (PFHpA)	6.9		35.4	41.7		ng/L		98	66 - 126
Perfluorooctanoic acid (PFOA)	25		35.4	54.7		ng/L		83	64 - 124
Perfluorononanoic acid (PFNA)	2.0	В	35.4	36.3		ng/L		97	68 - 128
Perfluorodecanoic acid (PFDA)	0.35	J	35.4	35.3		ng/L		99	69 - 129
Perfluoroundecanoic acid (PFUnA)	ND		35.4	34.0		ng/L		96	60 - 120
Perfluorododecanoic acid (PFDoA)	ND		35.4	38.3		ng/L		108	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		35.4	36.6		ng/L		104	72 - 132
Perfluorotetradecanoic acid (PFTeA)	ND		35.4	36.6		ng/L		103	68 - 128
Perfluorobutanesulfonic acid (PFBS)	5.8		31.3	35.2		ng/L		94	73 - 133
Perfluorohexanesulfonic acid (PFHxS)	5.9	В	32.2	33.9		ng/L		87	63 - 123
Perfluoroheptanesulfonic Acid	0.66	J	33.7	35.8		ng/L		104	68 - 128
Perfluorooctanesulfonic acid	22		32.8	49.4		ng/L		84	67 - 127
Perfluorodecanesulfonic acid (PEDS)	ND		34.1	27.1		ng/L		79	68 - 128
Perfluorooctanesulfonamide (FOSA)	ND		35.4	39.4		ng/L		111	70 - 130
N-methylperfluorooctanesulfona midoacetic acid (NMeFOSAA)	ND		35.4	32.7		ng/L		92	67 - 127
N-ethylperfluorooctanesulfonami doacetic acid (NEtFOSAA)	ND		35.4	33.3		ng/L		94	65 - 125
6:2 FTS	ND		33.5	31.0		ng/L		92	66 - 126
8:2 FTS	ND MS	MS	33.9	26.5		ng/L		78	67 - 127
Isotono Dilution	W Bocovory	Qualifier	Limite						
	58	Quaimer	25 150						
1305 DEDoA	61		25 150						
13C3 FFFEA	66		25 - 150						
1302 FF11XA 1204 DEHnA	67		25 - 150						
13C4 PEOA	70		25 - 150						
13C4 PFOA	70		25 - 150						
1303 FFNA	67		25 - 150						
	07		25 - 150						
	50		25 - 150						
1302 FFDUA 1202 DET-DA	59		20 - 100 25 150						
1302 FF 180A	50 65		20 - 100 25 - 150						
	05		20-100						
1002 FFRX3	09 74		20 - 100 25 450						
1304 PFUS	/1		25-150						
1300 FUSA	64		20 - 150 25 - 150						
	/2		25 - 150						
UD-INETFUSAA	72		25 - 150						

Client Sample ID: MW-4-100418

Client Sample ID: MW-4-100418 Prep Type: Total/NA Prep Batch: 251680

Prep Type: Total/NA

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Matrix: Water Analysis Batch: 252417			
· ····· , ··· · ··· ··· ··· ···	MS	MS	
Isotope Dilution	%Recovery	Qualifier	Limits
M2-6:2 FTS	84		25 - 150
M2-8:2 FTS	79		25 - 150

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

Lab Sample ID: 480-142994-1 MSD Matrix: Water

Lab Sample ID: 480-142994-1 MS

Analysis Batch: 252417	Comula	Comple	Cuilco	Med	MOD				Prep Ba	itch: 28	51680
Analyta	Sample	Sample	Spike	Booult	NISD	Unit	_	% Baa	%Rec.	חחם	RPD Limit
Perfluorobutanoic acid (PEBA)	18		36.5	55.0	Quaimer			103	70 130		<u></u>
Porfluoroportanoic acid (PEPoA)	10	E1	36.5	09.9		ng/L		01	66 126	12	30
	03		30.5	90.0		ng/L		91	00 - 120	12	30
	0/		30.5	110		ng/∟		04	00 - 120		30
Perfluoroheptanoic acid (PFHpA)	6.9		36.5	42.7		ng/L		98	66 - 126	2	30
Perfluorooctanoic acid (PFOA)	25		36.5	53.2		ng/L		77	64 - 124	3	30
Perfluorononanoic acid (PFNA)	2.0	В	36.5	37.1		ng/L		96	68 - 128	2	30
Perfluorodecanoic acid (PFDA)	0.35	J	36.5	38.7		ng/L		105	69 - 129	9	30
Perfluoroundecanoic acid (PFUnA)	ND		36.5	37.1		ng/L		102	60 - 120	9	30
Perfluorododecanoic acid (PFDoA)	ND		36.5	36.5		ng/L		100	71 - 131	5	30
Perfluorotridecanoic acid	ND		36.5	36.6		ng/L		100	72 - 132	0	30
(FFILIA) Perfluorotetradecanoic acid	ND		36.5	37.2		na/l		102	68 . 128	2	30
(PFTeA)	HB		00.0	07.2		iig/L		102	00-120	-	00
Perfluorobutanesulfonic acid (PEBS)	5.8		32.3	38.8		ng/L		102	73 - 133	10	30
Perfluorohexanesulfonic acid (PEHxS)	5.9	В	33.2	38.9		ng/L		99	63 - 123	14	30
Perfluoroheptanesulfonic Acid	0.66	J	34.7	37.6		ng/L		106	68 - 128	5	30
(PFHpS)	00		22.0					400	07 407	10	20
(PEOS)	22		33.9	00.0		ng/L		102	07 - 127	15	30
Perfluorodecanesulfonic acid	ND		35.2	28.2		ng/L		80	68 - 128	4	30
(PFDS)											
Perfluorooctanesulfonamide (FOSA)	ND		36.5	38.9		ng/L		107	70 - 130	1	30
N-methylperfluorooctanesulfona	ND		36.5	32.7		ng/L		90	67 _ 127	0	30
midoacetic acid (NMeFOSAA)											
N-ethylperfluorooctanesulfonami	ND		36.5	34.2		ng/L		94	65 - 125	3	30
doacetic acid (NEtFOSAA)			24.0	04.0				00	00 400	2	20
6.2 FTS	ND		34.6	31.8		ng/L		92	00 - 120	3	30
8:2 F I S	ND		35.0	35.9		ng/L		103	67 - 127	30	30
	MSD	MSD									
Isotope Dilution	%Recovery	Qualifier	Limits								
13C4 PFBA	53		25 - 150								
13C5 PFPeA	55		25 - 150								
13C2 PFHxA	63		25 - 150								
13C4 PFHpA	63		25 - 150								
13C4 PFOA	64		25 - 150								
13C5 PFNA	67		25 - 150								
13C2 PFDA	60		25 - 150								
13C2 PFUnA	56		25 - 150								

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

Lab Sample ID: 480-14299 Matrix: Water Analysis Batch: 252417	94-1 MSD			Client Sample ID: MW-4-100418 Prep Type: Total/NA Prep Batch: 251680
	MSD	MSD		
Isotope Dilution	%Recovery	Qualifier	Limits	
13C2 PFDoA	50	. <u></u> .	25 - 150	
13C2 PFTeDA	51		25 - 150	
13C3 PFBS	58		25 - 150	
18O2 PFHxS	61		25 - 150	
13C4 PFOS	62		25 - 150	
13C8 FOSA	57		25 - 150	
d3-NMeFOSAA	62		25 - 150	
d5-NEtFOSAA	57		25 - 150	
M2-6:2 FTS	90		25 - 150	
M2-8:2 FTS	62		25 - 150	
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QC Association Summary

GC/MS Semi VOA

Prep Batch: 438341

Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	3510C	
480-142994-2	MW-2-100418	Total/NA	Water	3510C	
480-142994-3	EB-100418	Total/NA	Water	3510C	
480-142994-5	X-1-100418	Total/NA	Water	3510C	
MB 480-438341/1-A	Method Blank	Total/NA	Water	3510C	
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	3510C	
480-142994-1 MS	MW-4-100418	Total/NA	Water	3510C	
480-142994-1 MSD	MW-4-100418	Total/NA	Water	3510C	

Analysis Batch: 438984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-2	MW-2-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-3	EB-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-5	X-1-100418	Total/NA	Water	8270D SIM ID	438341
MB 480-438341/1-A	Method Blank	Total/NA	Water	8270D SIM ID	438341
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	8270D SIM ID	438341
480-142994-1 MS	MW-4-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-1 MSD	MW-4-100418	Total/NA	Water	8270D SIM ID	438341

LCMS

Prep Batch: 251680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	3535	
480-142994-2	MW-2-100418	Total/NA	Water	3535	
480-142994-3	EB-100418	Total/NA	Water	3535	
480-142994-4	FRB-100418	Total/NA	Water	3535	
480-142994-5	X-1-100418	Total/NA	Water	3535	
MB 320-251680/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	3535	
480-142994-1 MS	MW-4-100418	Total/NA	Water	3535	
480-142994-1 MSD	MW-4-100418	Total/NA	Water	3535	

Analysis Batch: 252417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	537 (modified)	251680
480-142994-2	MW-2-100418	Total/NA	Water	537 (modified)	251680
480-142994-3	EB-100418	Total/NA	Water	537 (modified)	251680
480-142994-4	FRB-100418	Total/NA	Water	537 (modified)	251680
480-142994-5	X-1-100418	Total/NA	Water	537 (modified)	251680
MB 320-251680/1-A	Method Blank	Total/NA	Water	537 (modified)	251680
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	251680
480-142994-1 MS	MW-4-100418	Total/NA	Water	537 (modified)	251680
480-142994-1 MSD	MW-4-100418	Total/NA	Water	537 (modified)	251680

Client Sample ID: MW-4-100418

Date Collected: 10/04/18 10:15

Analyst

Lab

TAL BUF

TAL BUF

TAL SAC

TAL SAC

Lab Sample ID: 480-142994-2

Lab Sample ID: 480-142994-3

Lab Sample ID: 480-142994-4

Lab Sample ID: 480-142994-5

Lab Sample ID: 480-142994-1 Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

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Date Received: 10/05/18 01:15 Batch Batch Dilution Batch Prepared Prep Type Method Run Factor Number or Analyzed Туре Total/NA Prep 3510C 438341 10/09/18 07:33 JMP Total/NA Analysis 8270D SIM ID 438984 10/11/18 21:17 DMR 1 3535 Total/NA Prep 251680 10/12/18 11:11 TWL Total/NA 537 (modified) Analysis 1 252417 10/16/18 00:43 CBW

Client Sample ID: MW-2-100418 Date Collected: 10/04/18 13:55 Date Received: 10/05/18 01:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/12/18 00:25	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:05	CBW	TAL SAC

Client Sample ID: EB-100418 Date Collected: 10/04/18 10:45 Date Received: 10/05/18 01:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/12/18 00:48	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:13	CBW	TAL SAC

Client Sample ID: FRB-100418 Date Collected: 10/04/18 10:20 Date Received: 10/05/18 01:15

Bron Type	Batch	Batch Method	Pun	Dilution	Batch	Prepared	Analyst	Lab
Total/NA	Prep	3535	Kun		251680	10/12/18 11:11		TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:20	CBW	TAL SAC

Client Sample ID: X-1-100418 Date Collected: 10/04/18 00:00 Date Received: 10/05/18 01:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/12/18 01:12	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:35	CBW	TAL SAC

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600 TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

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Laboratory: TestAmerica Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10026	03-31-19

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18 *
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

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

Method Summary

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

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Method	Method Description	Protocol	Laboratory
8270D SIM ID	Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)	SW846	TAL BUF
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL BUF
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
Protocol Ref	erences:		
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 BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600 TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: O'Brien & Gere Inc of North America Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received	- 3
480-142994-1	MW-4-100418	Water	<u>10/04/18 10:15</u> <u>10/05/18 01:</u>	15
480-142994-2	MW-2-100418	Water	10/04/18 13:55 10/05/18 01:	15
480-142994-3	EB-100418	Water	10/04/18 10:45 10/05/18 01:	15 5
480-142994-4	FRB-100418	Water	10/04/18 10:20 10/05/18 01:	15
480-142994-5	X-1-100418	Water	10/04/18 00:00 10/05/18 01:	6
				8
				9

Textball Construction Construction <th>Ь</th> <th></th> <th></th> <th></th> <th>E</th> <th>C SamJ</th> <th>pling - G</th> <th>ΕVa</th> <th>utrat</th> <th>o Rd</th> <th>lite</th> <th></th> <th></th> <th>I age _ vi _</th>	Ь				E	C SamJ	pling - G	ΕVa	utrat	o Rd	lite			I age _ vi _
Technicity Techni			Client: Site Name / 1	cation	Sampling Pro	gram:		Sampler(s		- Ach	1 -			Project Number:
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	TestAmerica		Vatrano RdSite / Alba	ny, NY	EC Sampling -	- GE Vatrano Rd	Site			and a				
Material Characterization (International Characterization) Constant <	O'Brien & Gere Office: Albany		Laboratory:		Analysis Hold	ding Time from	Sample Date:		Chem	ical Preservativ	es: (see key at l	tetom)		0.063
The control matrix from the con	Address: O'Brien & Gere		Marie Meichof						0	0 0	0 0 0	0 0 0	0 0 0	
Energi (19) (12)(25) Energy (14) (12)(25) Energy (14)(25)(25) Energy (14)(25)(25)(25) Energy (14)(25)(25)(25) Energy (14)(25)(25)(25)(25) Energy (14)(25)(25)(25)(25) Energy (14)(25)(25)(25)(25) Energy (14)(25)(25)(25)(25)(25) Energy (14)(25)(25)(25)(25)(25) Energy (14)(25)(25)(25)(25)(25)(25)(25)(25)(25)(25	94 New Karner Rd, Suite 106, Albany, N.Y. 12203		TestAmerica	TestAmerica	14 days to extr	raction, 28 days fr	om extraction to		po	0425				5
	Phone: (518) 724-7256		880 Riverside Pkwy	10 Hazelwood Dr	analysis				фэМ	8 poq				
Protect Concerts The UP Channel Content Total State	Fax: (518) 869-2945		W. Sacramento, CA	Amherst, NY					pə	Med				
	Project Contact: Paul D'Annibale/ Maureen Garnde Email: Paul.D'Annibale@obg.com / Maureen.Gardn	r er@obg.com	95605-1500	14228-2223				(C) esite (C)	diboM A	A AGERA				400-147004
Image: frame frame frame frame frame frame The manual frame					Package Req	uirement: SP Cat B Level Pkg w	standard 20 BD TAT	ot Compo	DREF	1 ya by L				Job Number:
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			Phone: 732-593-2554		Project Numl EDD Format	ber: 69645 t: EOuIS 4-File		o (Đ) dat	EAS by	exoib-Þ,				
$\frac{1}{1 \times U^{-1} + C_{1} \otimes U_{1} (Y_{1} - Y_{2} + C_{1} \otimes U_{1} (Y_{1} - Y_{2} + C_{1} \otimes U_{2} + C_{1} \otimes U_{2$	Sample Identification		Fax: /32-549-36/9					Ð	đ	is T	-			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Reportin Units	M J\ga	J/Su				Lab Sample ID
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	1 MW-4- 100418	ちょうて	11/1/21	1015	2	w G	Ц	U	X	×				
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480501-Albany

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Page 29 of 36

480501-Albany

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	- Samples compromised/tampered with?		jà:	
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	Sample containers have legible labels?	P		
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	Appropriate containers are provided.			
	Sample bottles are completely filled?	P		
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	- 91 Vole	1.1		
	Initials: Date:/b	1 - 0		
	*Containers requiring zero headspace have no headspace,	or bubbl	e < 6 m	m (1/4")

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- 1QA-812 SAMPLE RECEIVING NOTES.DOC QA-812 TGT 08/29/2018

10 P	
	Sacramento
estAmerico	Sample Receiving Notes
E LEADER IN ENVIRONMENTAL TESTIN	G
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len en e	NCM Filed: Yes D No D
	Yes No NA
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•	Samples received within holding time?
	Sample preservatives verified?
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•	Samples w/o discrepancies?
	Sample containers have legible labels?
	Containers are not broken or leaking?
	Sample date/times are provided.
	Appropriate containers are used?
	Sample bottles are completely filled?
	Zero headspace?*
	Multiphasic samples are not present?
	Sample temp OK?
	Sample out of temp?
	Initials: 6(Date: 0/6/09

AA-812 SAMPLE RECEIVING NOTES.DOC QA-812 TGT 08/29/2018

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CULAINEIICU	Sample Receiving Note	S		
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	*Containers requiring zero headspace have no headspace	or bubb	e < 6 m	m (1/4")

PARA-812 SAMPLE RECEIVING NOTES.DOC QA-812 TGT 08/29/2018






Login Sample Receipt Checklist

Client: O'Brien & Gere Inc of North America

The cooler's custody seal, if present, is intact.

Sample custody seals, if present, are intact.

Radioactivity wasn't checked or is </= background as measured by a survey

Question

meter.

Job Number: 480-142994-1

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РМ	5
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	16

Login Number: 142994	List Source: TestAmerica Sacramento
List Number: 2	List Creation: 10/06/18 03:57 PM
Creator: Nelson, Kym D	

Answer

True

True

N/A

Comment

511835, 511836, 511838

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	0.6C, 0.8C, 0.8C
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?	True	
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	

Attachment C – Data Validation Report

cc:

TO:Paul D'AnnibaleFROM:KA StorneRE:Vatrano Road Site Data Validation ReportFILE:69645.001.016DATE:January 3, 2019

This report presents the results of data validation performed for samples collected as the part of the Vatrano Road Site sampling in Albany, New York. Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (OBG) in October 2018.

TestAmerica Laboratories, Inc. of Sacramento, California (TA Sacramento) and TestAmerica Laboratories, Inc. of Amherst, New York (TA Buffalo) performed the laboratory analyses for the sampling event. The laboratory packages contain summary forms for quality control analysis and supportive raw data.

Table 1 below summarizes the sample analysis submitted for data validation.

Table 1. Analytical Methods and References

Analysis and Laboratory	Method	Reference
Pre- and Polyfluorinated Substances (PFAS) performed by TA Sacramento	Laboratory SOP based on Modified USEPA Method 537, Version 1.1 (TestAmerica Sacramento. 2017. Per- and Polyfluorinated Substances (PFAS) in Water, Soils, Sediments and Tissue (Method 537 Modified), SOP No. WS-LC-0025, Rev 2.2, 02/02/2017)	1
1,4-Dioxane performed by TA Buffalo	USEPA Methods 3510C/8000C/8270D/SIM	2
Notes: 1. USEPA. 2009. Modified - Deter (SPE) and Liquid Chromatogra	ermination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Pha phy/Tandem Mass Spectrometry (LC/MS/MS), Version 1.1, Cincinnati, Ohio.	se Extraction

2. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.

The samples submitted for data validation are summarized in the attached Table 2. Table 3, attached, presents the specific data validation approach applied to data generated for this investigation. Table 4, also attached, presents the laboratory quality assurance/quality control (QA/QC) analyses definitions.

Full validation was performed on the samples collected for this investigation. The analytical data generated for this investigation were evaluated by OBG using the QA/QC criteria established in the laboratory standard operating procedures (SOPs), the methods and professional judgement.

Since data validation guidelines for USEPA Method 537 are not available, application of qualifiers for excursions from the laboratory SOP and the method was based on the general approach used to qualify samples described in the following document:

USEPA. 2016. National Functional Guidelines for High Resolution Superfund Methods Data Review. EPA-542-B-16-001. Washington, D.C.

Application of qualifiers to the 1,4-dioxane data affected by excursions from the method criteria was based on guidance provided in the following document and professional judgment:

 USEPA. 2008. USEPA Region II Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8270D, SOP HW-22 Revision 4.



The following qualifiers are used in this type of data validation:

- "R" Indicates that the reporting limit (RL) or sample result has been identified as unusable due to a major deficiency in the data generation process. The data were rejected and should not be used for any qualitative or quantitative purposes.
- "U" Indicates that the analyte was not detected and the sample RL is presented. This qualifier is also used to signify blank excursions.
- "J" Indicates that the concentration should be considered approximate. The target analyte was
 positively identified and the associated numerical value is the approximate concentration; either the
 data quality criteria were not met or the concentration of the target analyte was greater than the
 method detection limit (MDL) and below the RL.
- "UJ" Indicates that the analyte was analyzed for and was not detected; however, the RL is presented and should be considered approximate. This qualifier is used when data quality criteria were not met.
- "JN" Indicates that the target analyte has been "tentatively identified" as present and the associated numerical value is the estimated concentration in the sample. This qualifier may be applied due to data interpretation issues.

The data quality evaluation results in only one type of qualifier for each analyte; in a case when several qualifiers are applicable to the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers. For example, if a sample result is affected by low LCS recovery, for which the "UJ" qualifier is applied, but low MS/MSD recoveries result in the rejection of the sample result (application of the "R" qualifier), the final data qualifier is the "R" qualifier. QA/QC excursions that do not result in the qualification of an analyte are not discussed, with the exception of those excursions that provide useful information to the data user.

The data validation included an evaluation of the following parameters, where applicable:

- Chain-of-custody records
- Sample collection and sample preservation
- Holding times
- Instrument performance
- Calibration
- Blank analysis
- Surrogate recovery
- Matrix spike (MS)/matrix spike duplicate (MSD) analysis
- Laboratory control sample (LCS) /Laboratory control sample duplicate (LCSD) analysis
- Field duplicate samples analysis
- Isotopic Dilution Analyte (IDA) performance
- Internal standards performance
- Target compound identification, quantitation, and reporting limits (RLs)
- Documentation completeness

The following sections of this memorandum present the results of the comparison of the analytical data to the QA/QC criteria specified above.



CHAIN OF CUSTODY RECORD AND SAMPLE COLLECTION

Samples submitted for PFAS and 1,4-dioxane analyses were collected by the OBG field representative at the sampling location using containers that were provided by TA. After receiving the samples from the OBG field representative, TA then shipped the samples to TA Sacramento and TA Buffalo for sample analysis.

For the samples collected for this sampling event, the sample transfers from TA to the courier and from the courier to TA Sacramento and to TA Buffalo were incomplete on the chain-of-custody records; the courier name and tracking numbers were not listed on the records.

For samples submitted for PFAS analysis, the laboratory indicated that samples contained non-settleable particulate matter, which plugged the Solid Phase Extraction (SPE) disk. The aqueous portion of the sample that passed through the SPE disk was analyzed. The following samples were impacted:

MW-1-100318 and MW-4-100418

Although TA's laboratory policy includes contacting the client to discuss the actions to be taken when particulates are found in samples, the laboratory did not contact OBG for these samples.

PFAS DATA EVALUATION SUMMARY

The following QA/QC parameters were found to meet validation criteria or did not result in additional qualification of sample results:

- Sample preservation
- Holding times
- Instrument performance
- Calibration
- MS/MSD analysis
- LCS /LCSD analysis
- IDA performance
- Internal standards performance

Deviations from QA/QC criteria that resulted in qualified data and additional observations are summarized below.

I. Blank Analysis

Target analytes were detected in the field blank (FRB-100418), equipment blank (EB-100418) and method blanks for PFAS. The following samples were qualified as non-detected (U) for the minor representativeness blank excursions:

Perfluorononanoic acid (PFNA) in samples MW-1-100318 and MW-7-100318.

II. Field Duplicate Analysis

The following samples were qualified as approximate (UJ, J) for minor field duplicate precision excursions:

Perfluorodecanoic acid (PFDA) and perfluorododecanoic acid (PFDoA) in samples X-1-100418[MW-2-100418] and MW-2-100418.

III. Target Analyte Quantitation, Identification and RLs

The validation approach utilized for this data set is presented in Table 3.



The following observations pertain to the laboratory target analyte quantitation and identification process applied to data:

- The laboratory analyst's experience and judgement are used to evaluate and report target analyte identification and concentrations, based on interpretation of target analyte peak shape, the chromatography baseline, target analyte retention time and signal strength.
- During data validation, peak integration and identification interpretation performed by the laboratory analysts was reviewed. Validation qualifiers were applied to sample results when chromatography, retention times or peak shapes may have impacted sample identifications and/or concentrations.
- For this analysis, the isotope dilution technique is applied, which includes the utilization of IDAs, which are added to samples in the sample extraction process. Since IDAs respond in the same manner as target analytes, the IDA is used for target analyte identification and for calculating sample concentrations for the volume of sample analyzed.
- Although generated and reported by the laboratory for some target analytes, the laboratory did not utilize the results for ion ratios in identifying detected target analytes. Ion ratio results were evaluated during data validation for target analyte identification and confirmation.
- For this method, branched-chain isomers may be identified for perfluorooctanoic acid (PFOA), perfluorohexanesulfonic acid (PFHxS) perfluorooctanesulfonic acid (PFOS), perfluorobutanesulfonic acid (PFBS), n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA) and nethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA).
- The laboratory indicated that reference data is inconsistent as to whether PFBS will have both branched and linear isomers present in the environment.
- The laboratory only processes and evaluates PFOS, PFHxS, NMeFOSAA and NEtFOSAA for both linear and branched isomers based on the linear and branched isomers in the calibration standards.
- The laboratory does not have established retention times for branched isomers. Areas for target analytes in samples with linear and branched isomers are integrated as the total response and quantitated against the associated labeled linear isomer. The calibration standard retention time is evaluated for the beginning of the branched through the linear isomer as a visual tool to use in target analyte identification.
- The results for PFBS are quantitated based on a single linear isomer peak, defined by the calibration solutions.
- The laboratory utilized a qualitative/technical mixture for the PFOA standard to determine retention times only for the PFOA branch-chain isomers. A separate, certified quantitation/calibration-quality standard source, which only includes the linear isomer, was used for calibration.
- Samples results are qualified as approximate (JN) but bias is not assigned to sample results with branchchain isomers when quantitated using linear calibration standards or standards with chromatography that may differ from the branch chromatography present in the samples.
- Although peak fronting was observed for PFBA chromatography in several samples, sample results were not qualified for this peak shape excursion. The laboratory indicated that the peak shape in the samples is consistent with the peak shape in the associated calibration standards.

Revised laboratory data:

During validation, excursions from the signal-to-noise ratio criterion of 3:1 were identified for target analytes reported as detected by TA Sacramento. As a result of re-evaluation of these signal-to-noise excursions, the following sample results for MW-1 100318 were revised by TA Sacramento:



- Perfluorobutanoic acid (PFBA) was revised from 10 ng/L to non-detected (U#) at 10 ng/L.
- Perfluoropentanoic acid (PFPeA) was revised from 2.8 ng/L to non-detected (U#) at 3 ng/L.
- Perfluorohexanoic acid (PFHxA) was revised from 1.2 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluoroheptanoic acid (PFHpA) was revised from 0.92 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluorooctanoic acid (PFOA) was revised from 1.4 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluorononanoic acid (PFNA) was revised from 0.48 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluorodecanoic acid (PFDA) was revised from 1.6 ng/L J to non-detected (U#) at 1.8 ng/L
- Perfluorohexanesulfonic acid (PFHxS) was revised from 1.9 ng/L to non-detected (U#) at 1.8 ng/L.
- Perfluorooctanesulfonic acid (PFOS) was revised from 1.7 ng/L J to non-detected (U#) at 1.8 ng/L.

Data validation qualifiers were applied to the following sample results:

Linear and Branched Isomers

- The laboratory utilized a qualitative/technical mixture for the PFOA standard to determine retention times only for the PFOA branch-chain isomers. A separate, certified quantitation/calibration-quality standard source, which only includes the linear isomer, was used for calibration. The results for perfluorooctanoic acid (PFOA) in the following samples were qualified as approximate (JN) since a PFOA branched-chain isomer was identified in the samples and the associated PFOA calibration standard did not include the branched isomer or interferences may be present: MW-7-100318 and MW-4-100418.
- The results for perfluorooctanesulfonic acid (PFOS) in the following samples were qualified as approximate (JN) since a PFOS branched-chain isomer was identified in the samples and the chromatography in the associated calibration standard differs from the branch chromatography present in the samples or interferences may be present: MW-7-100318, MW-1-100318, MW-4-100418, MW-2-100418 and X-1-100418[MW-2-100418].

Ion Ratio Excursion

- The result for perfluorononanoic acid (PFNA) in the following samples were qualified as approximate (JN) since the reported ion ratios were outside of the laboratory control limits: MW-7-100318 and MW-1-100318.
- The result for perfluorononanoic acid (PFNA) in the following samples were qualified as approximate (JN) since the reported ion ratio was outside of the laboratory control limits: MW-7-100318 and MW-1-100318.
- The result for perfluorobutanesulfonic acid (PFBS) in the following sample was qualified as approximate (JN) since the reported ion ratio was outside of the laboratory control limits: MW-1-100318.

Peak Integration and Matrix Interference

The result for perfluorobutanoic acid (PFBA) in the following sample was qualified as approximate (JN) based on peak integration evaluation or possible matrix interferences: MW-1-100318,

Document Completeness

Supplemental laboratory information and clarifications addressing the laboratory analysis and data interpretation were requested during the validation process. The supplemental laboratory information was necessary to complete the validation process. Data were revised by TA Sacramento as a result of requests during data validation.



1, 4-DIOXANE DATA EVALUATION SUMMARY

The following QA/QC parameters were found to meet validation criteria or did not require additional comments:

- Sample preservation
- Holding times
- Instrument performance
- Calibration
- Blank analysis
- Surrogate recovery
- MS/MSD analysis
- LCS /LCSD analysis
- Field duplicate samples analysis
- Internal standards performance
- Target compound identification, quantitation and RLs
- Documentation completeness

Deviations from QA/QC criteria were not identified during data validation.

DATA USABILITY

The data from the samples presented in Table 2 were evaluated based on QA/QC criteria established by the laboratory SOP and methods. Data validation qualifiers were applied to data based on the general approach presented in Table 3.

Major deficiencies that would have resulted in rejected data were not identified for data from this sampling event. Minor deficiencies in the data generation process resulted in approximation of some sample data and data qualified as non-detected.

This section summarizes the adherence of the analytical data to precision, accuracy, representativeness, comparability, completeness, and sensitivity data quality objectives. Data quality was evaluated using percent usability, defined as the percentage of sample results that are usable for qualitative and quantitative purposes.

Precision: Data usability with respect to precision is 100 percent.

Sensitivity: Sensitivity is established by RLs, which represent measurable concentrations of analytes that can be quantified with a designated level of confidence and are less than the project action limits established for the project. Dilutions were not performed for sample analyses. Data usability with respect to sensitivity is 100 percent.

Accuracy: Data usability with respect to accuracy is 100 percent.

Representativeness: Data usability with respect to representativeness is 100 percent.



Comparability: Comparability is not compromised provided that the analytical method approach did not change over time. A major component of comparability is the use of standard reference materials for calibration and QC. Since the modified analytical method approach and reporting procedures were consistently used by the laboratory, the comparability criteria for the analytical data were met.

Completeness: Overall, considering the complete data set, 100 percent of the data were usable for quantitative and quantitative purposes based on the data validation performed.



Table 2. Sample Cross Reference Table						
Samples collected and submitted for data validation						
Laboratory Name	Sample Delivery Group	Date Collected	Laboratory Identification	Client Identification	Matrix	Analysis Requested
TA	480-142905	10/3/2018	480-142905-1	MW-7-100318	Groundwater	1,4-Dioxane and PFAS
TA	480-142905	10/3/2018	480-142905-2	MW-1-100318	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-1	MW-4-100418, MS/MSD	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-2	MW-2-100418	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-3	EB-100418	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-4	FRB-100418	Groundwater	PFAS
TA	480-142994	10/4/2018	480-142994-5	X-1-100418[MW-2-100418]	Groundwater	1,4-Dioxane and PFAS

Notes:

TA indicates TestAmerica Buffalo located in Amherst, New York (performing 1,4-dioxane analysis) and TA Sacramento located in West Sacramento California (performing PFAS analysis).

PFAS indicates perfluoroalkyl and polyfluoroalkyl substances.

FRB indicates field reagant blank.

EB indicates equipment blank.

MS/MSD indicates matrix spike/matrix spike duplicate.

FD indicates field duplicate.

The sample identification utilized for field duplicate is shown in brackets.

Modified USEPA I (8081B), PCBs (80 validation report	Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides 82A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
General Validation Approach	The validation approach taken by O'Brien & Gere is a conservative one; qualifiers are applied to sample data to indicate both major and minor excursions so that data associated with any type of excursion are identified to the data user. Major excursions result in data being rejected (R), indicating that the data are considered unusable for either quantitative or qualitative purposes. Minor excursions result in sample data being qualified as approximate (J, UJ, JN) or non-detected (U) that is otherwise usable for quantitative or qualitative purposes.
	Excursions are subdivided into excursions that are within the laboratory's control and those that are out of the laboratory's control. Excursions involving laboratory control sample recovery, calibration response, method blank excursions, low or high spike recovery due to inaccurate spiking solutions or poor instrument response, holding times, interpretation errors, and quantitation errors are within the control of the laboratory. Excursions resulting from poor spike recovery due to interference from the sample matrix is an example of an excursion that is not within the laboratory's control if the laboratory has followed proper method procedures, including applying appropriate sample preparation techniques.
Applying professional judgment	USEPA data validation directs professional judgment to be used when applying qualifiers in some cases, considering the laboratory analysis approach and method requirements.
Validation Guidelines- PFAS	TestAmerica Sacramento's Laboratory standard operating procedure (SOP) reflects a modified version of USEPA Method 537, since Method 537 applies to only drinking water sample matrices. Therefore, evaluation of other aqueous and solid data is based on the laboratory SOP's requirements. Since data validation guidelines for Method 537 are not available at this time, application of qualifiers for excursions from the laboratory SOP is based on the general approach used to qualify data described in the National Functional Guidelines for High Resolution Superfund Methods Data Review, April 2016.
Validation Guidelines- Remaining Analyses	O'Brien & Gere data validation approach for the remaining analyses is based on current Region II guidelines for SW-846 methods. Since Region II guidelines available for metals apply only to the CLP method, only the general approach to applying qualifiers is utilized for metals and inorganics.
Validation Qualifiers	 "R" Indicates that the reporting limit (RL) or sample result has been identified as unusable due to a major deficiency in the data generation process. The data were rejected and should not be used for any qualitative or quantitative purposes. "U" Indicates that the analyte was not detected and the sample RL is presented. This qualifier is also used to signify blank excursions. "J" Indicates that the concentration should be considered approximate. The target analyte was positively identified and the associated numerical value is the approximate concentration; either the data quality criteria were not met or the concentration of the target analyte was greater than the method detection limit (MDL) and below the RL. "J+" Indicates that the concentration should be considered approximate and biased high. This qualifier identifies a deficiency in the data generation process.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory -

O'Brien & Gere L Modified USEPA I (8081B), PCBs (80	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides 182A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
validation report	
	"UJ" Indicates that the analyte was analyzed for and was not detected; however, the RL is presented and should be considered approximate. This qualifier is used when data quality criteria were not met. "JN" – Indicates that the target analyte has been "tentatively identified" as present and the associated numerical value is the estimated concentration in the sample. This qualifier may be applied due to data interpretation issues.
Overall PFAS Method Summary	The TA Sacramento SOP, based on a modified Method 537, utilizes liquid chromatography/ tandem mass spectrometry (LC/MS/MS) and isotope dilution technique to analyze environmental samples for per- and polyfluorinated substances (PFAS). This includes the utilization of Isotope Dilution Analytes (IDAs) which are added to samples in the sample extraction process. Since IDAs respond in the same manner as target analytes, the IDA is used for target analyte identification and for calculating sample concentrations.
Cooler Temperature	Results for samples submitted analyses that are impacted by coolers that did not contain ice, or if the ice melted upon receipt and the cooler temperatures are greater than 10°C, are qualified as approximate (UJ, J). If samples are delivered to the laboratory the same day as sample collection and samples did not have sufficient time to reach 10°C, samples are not qualified, unless proper preservation was not provided for samples between sample collection and sample receipt at the laboratory. Results for samples received at ambient temperature involved in extended shipment-day issues may be rejected, applying professional judgment.
Percent Solids	Results for samples submitted for organic analyses that are impacted by percent solids of 50 percent or less are qualified as approximate (UJ, J).
Soil sample collection for VOCs	Soil samples for VOCs submitted for low level analyses must be collected in accordance with EPA Method 5035A. If samples are not collected in encores or weighed/preserved containers in the field, the VOC data are qualified as approximate (UJ, J).
Holding Time for PFAS	Samples are stored at 4±2°C. Aqueous samples must be extracted within 14 days of collection and extracts analyzed within 40 days of extraction. Results for samples properly preserved and analyzed outside of but less than two times the holding time window for preparation and/or analysis are qualified as approximate (UJ, J). Non-detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are rejected (R). Detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are rejected (R).
Holding Time for Organics	Results for samples properly preserved and analyzed outside of but less than two times the holding time window established in the QAPP for preparation and/or analysis are qualified as approximate (UJ, J). Non-detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are <u>rejected</u> (R). Detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are <u>rejected</u> (R). Detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are qualified as approximate (J). The entire sample target list for a VOC sample impacted by a holding time excursion is qualified.

O'Brien & Gere L Modified USEPA I (8081B), PCBs (80	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides 182A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
validation report	
Holding Time for Inorganics	Results for samples properly preserved and analyzed outside of but less than two times the holding time window established in the method or the QAPP for preparation and/or analysis are qualified as approximate (UJ, J-). Non-detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are <u>rejected</u> (R). Detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are <u>ualified</u> as approximate (I-)
Calibration Evaluation for PFAS	A minimum of five to six calibration standards are analyzed to generate average response factors, linear or quadratic fit calibration curves. The calibrations are evaluated using the criteria of less than 35 percent relative standard deviation (%RSD) for target analytes quantitated by isotope dilution analytes (IDAs), less than 50 %RSD for target analytes quantitated by internal standards (without IDAs) or a correlation coefficient (r) greater than 0.995 for a linear fit. Initial calibration verification (ICV) mid-range standard (from a separate source) must be within 60 to 140 percent recovery (%R) for target analytes associated with IDAs and within 50 to 150%R for target analytes without IDAs. IDAs in the ICV must be greater than or equal to 50%R and less than or equal to 150%R. Mid-level continuing calibration verifications (CCVs) are analyzed at the beginning of the analysis sequence, at the end, and after every 10 samples. The CCV recovery must be within 60 to 140 percent recovery (%R) for target analytes associated with IDAs and within 50 to 150%R for target analytes without IDAs. IDAs must be greater than or equal to 50%R and less than or equal to 150%R.
Calibration Actions for PFAS	Due to relative standard deviation (RSD) calibration excursions, detected results for analytes in samples associated with the calibration are qualified as approximate (J). Non-detected results associated with RSD excursions may be qualified as approximate (UJ) based on professional judgment. If the RSD calibration excursion is greater than 90, detected results for analytes in samples associated with the calibration are qualified as approximate (J) and non-detected results may be rejected (R), applying professional judgment. For ICV excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ). Due to %D CCV excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ).
Calibration Evaluation for VOCs	VOC target analytes are evaluated using the criteria of <20% percent relative standard deviation (%RSD) or correlation coefficient of 0.990 for initial calibration curves. Calibration verifications are evaluated using a criterion of 20 percent difference (%D) for target analytes. Initial calibrations and calibration verifications are also evaluated using the response factor (RF) criteria described in Table 4, Method 8260C. The following exceptions may be allowed: RFs \geq 0.010 for poor purging target analytes such as ketones, acetonitrile, acrolein, propionitrile, vinyl acetate, 1,4-dioxane, alcohols, tetrahydrofuran, and cyclohexanone. Other target analytes not listed on Table 4 the RFs must be \geq 0.050. For Ketones or other poor purging target analytes listed in Table 4 with RFs \geq 0.010 and less than 0.100 results, data will be qualified as approximate (UJ, J). ICV recoveries are evaluated using laboratory control limits if available or 70 to 130%.

O'Brien & Gere L Modified USEPA ((8081B), PCBs (80 validation report	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides D82A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
Calibration Evaluation for SVOCs	 SVOC target analytes are evaluated using the criteria of <20% RSD or correlation coefficient of 0.990 for initial calibration curves. Calibration verifications are evaluated using a criterion of 20 %D for the target analytes. Initial calibrations and calibration verifications are also evaluated using the criterion for RFs listed in the method. ICV recoveries are evaluated using laboratory control limits if available or 70 to 130%.
Calibration Evaluation for Pesticides, PCBs and Herbicides	Pesticide and herbicide target analytes are evaluated using the criteria of 20 %RSD or correlation coefficient of 0.990 for initial calibration curves. Calibration verifications are evaluated using a criterion of 20%D for target analytes. ICV recoveries are evaluated using laboratory control limits if available or 70 to 130%.
Calibration Actions for Organics	Due to relative standard deviation (RSD) calibration excursions, detected results for analytes in samples associated with the calibration are qualified as approximate (J). Non-detected results associated with RSD excursions may be qualified as approximate (UJ) based on professional judgment. If the RSD calibration excursion is greater than 90, detected results for analytes in samples associated with the calibration are qualified as approximate (J) and non-detected results may be <u>rejected (R)</u> , applying professional judgment. Due to %D calibration verification excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ). The response direction and detection of target analytes in associated sample may be considered in applying qualifiers. For response factor excursions, detected results are qualified as approximate (J) and non- detected results are <u>rejected (R)</u> . For initial calibration verifications (ICV) excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J) and non- detected results are <u>rejected (R)</u> . For initial calibration verifications (ICV) excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ). The response direction and detection of target analytes in associated sample may be considered in applying qualifiers.
Associating samples with Field and Laboratory QC Samples	Equipment blanks (Rinsate blanks) are associated with samples collected in the same day (or sampling event) using the same sample collection equipment and decontamination solutions. When sampling equipment or decontamination solutions are changed, a new equipment blank should be collected. Each sample should be associated with one equipment blank, which is collected as close to the sample collection date/time as possible. Field blanks are associated with the sample containers used to collect samples. When sampling container lots are changed, a new field blank should be collected. Method blanks are associated with samples prepared at the same time as the samples. Method blanks should reflect the sample matrix type. Laboratory Control Samples (LCSs) are solutions containing known amounts of target analytes, analyzed within the laboratory to evaluate recovery of target analytes without sample matrix impacts. The LCSs are associated with samples prepared at the same time as the same time as the samples. MS/MSD samples are collected in the field and spiked with known amounts of target analytes, analyzed in the laboratory to evaluate recovery and precision of target analytes. MS/MSDs measure the impact of matrix interference on target analytes. The MS/MSDs must be prepared using project samples and are associated with samples prepared at the same time as the same time with the same matrix type.

O'Brien & Gere L Modified USEPA I (8081B), PCBs (80	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides 182A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
validation report	
	Field duplicates and collocated samples are duplicate samples collected in the field to measure field precision and are associated with samples of the same matrix type.
	In the case that insufficient QC samples are provided due to field or laboratory problems,
	professional judgment is used to associate each sample with a QC sample that reflects the
	sample matrix and analysis conditions.
	The laboratory control limit (CL) provided in the laboratory SOP is used to assess MS/MSD,
	In the case that excursions are identified in more than one quality control sample of the
	same matrix within one sample delivery group, samples are batched according to sample
	preparation or analysis date and qualified accordingly.
	In general, if percent recoveries are less than laboratory CLs but greater than 10%, non-
	detected and detected results are qualified as approximate (UJ, J).
	If percent recoveries are greater than laboratory CLs, detected results are qualified as approximate (J).
	If percent recoveries are less than 10%, detected results are qualified as approximate (J) and
	non-detected results may be rejected (R), applying professional judgement.
Evoluction and	If RPDs for MSDs are outside of laboratory CLs, detected results are qualified as approximate
Evaluation and	(J). Non-detected results may not be qualified, applying professional judgment.
MS/MSD, LCS,	Qualification is performed only when both MS and MSD recoveries are outside of laboratory CLs.
Surrogate and	Qualification is not performed for MS/MSD results if the sample concentration is greater
Organic Data	than 4 times the MS or MSD spike concentration.
Organic Data	Non-detected data are rejected (R) in the case that both MS/MSD recoveries are less than 10%.
	Qualification is not performed if MS/MSD are outside of laboratory CLs if the analysis was
	performed using a dilution factor of 10 times or more, applying professional judgment.
	Qualification of data associated with MS/MSD or field duplicate excursions is limited to the
	un-spiked sample or the field duplicate pair, respectively.
	Field duplicate data are evaluated against relative percent difference (RPD) criteria of less
	than 50 percent for aqueous samples and less than 100 percent for soils when results are
	greater than or equal to five times the RL. When a field duplicate result is less than five times
	the RL, a control limit of plus or minus two times the RL (difference criterion) is applied. If
	RPDs or differences are outside of criterion, detected and non-detected results are qualified as approximate (UL, I).
	Field duplicate data are evaluated against relative percent difference (RPD) criteria of less
Evaluation Field	than 30 percent when results are greater than or equal to five times the RL. When a field
Duplicate Data for	duplicate result is less than two times the RL, a control limit of 50 RPD is applied. If RPDs are
PFAS	outside of criterion, detected and non-detected results are qualified as approximate (UJ, J).
Evaluation and	If a PEAS target analyte is detected in a blank at a concentration greater than the MDL for
Actions for Blank	samples with concentrations less than five times the blank concentration, the sample is
Results (Method,	qualified as non-detected (U) and reported or reported at the RL.
Field, Equipment)	
tor PFAS	

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B) PCBs (8082A) Metals (200 7/200 8) Marcury (245 1) Cyanida (335 4) and other methods listed in the				
validation report				
Evaluation and Actions for Blank Results (Trip, Method, Field, Equipment)	Blanks are analyzed to evaluate laboratory and/or field contamination of project samples. Method blanks evaluate potential laboratory contamination and field and equipment blanks evaluate potential field contamination. Blanks are not qualified due to contamination of another blank. Sample results qualified as non-detected (U) are treated as detected results when qualifying for other excursions. 1. For blank results less than the RL, samples with concentrations less than the RL are reported at the RL and qualified as non-detected (U). Samples with concentrations greater than or equal to the RL are not qualified or the Blank Rule Option may be applied. 2. For blank results greater than the RL, samples with concentrations less than the RL are reported at the RL and qualified as non-detected (U). Samples with concentrations greater than or equal to the RL and less than the blank contamination level are reported and qualified as non-detected (U). Samples with concentrations greater than or equal to the RL and less than the blank contamination level are reported and qualified as non-detected (U). Samples with concentrations greater than or equal to the BL and less than the blank contamination level are not qualified or the Blank Rule Option may be applied. 3. For blank results equal to the RL, sample concentrations less than the RL are reported at the RL value and qualified as non-detected (U). Samples greater than or equal to the RL are not qualified or the Blank Rule Option may be applied. 4. For gross contamination in blanks (interference peaks, poor baselines), all associated sample detected results may be rejected (R) or qualified as non-detected (U), applying professional judgment. Blank Rule Option- If a target analyte is detected in a blank at a concentration greater than the MDL, for samples with concentrations less than five times the blank contentration, the sample is qualified as non-detected (U) and reported at the RL. If methylene chloride, acetone, 2-butanone, or phthalates are detected in the sample a			
Evaluation and Actions for Surrogate Data for PCB, Pesticides and Herbicides	The following approach is utilized for applying qualifiers when both surrogate recoveries from the primary column are outside of laboratory CLs (also considering confirmation column results): Detected result associated with recovery of greater than upper laboratory CLs is qualified as approximate (J). Non-detected result is not qualified. Detected result associated with recovery of greater than or equal to 10% but less than the lower laboratory CL is qualified as approximate (J). Non-detected result is qualified as approximate (UJ). Detected result associated with recoveries of less than 10% is qualified as approximate (J). Non-detected result is <u>rejected (R)</u> . If the sample was diluted using a dilution factor of 10 times or more, detected and non- detected results are not qualified since the surrogate concentration is diluted, using professional judgment. If the retention times of the surrogates are outside of the laboratory retention time window, associated sample results are qualified as approximate (UJ, J) or rejected (R), using professional judgment.			

O'Brien & Gere D Modified LISEPA I	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Method 537 and SW-846 analytical methods including VOCs (8260C) SVOCs (8270D) Pesticides
(8081B), PCBs (80	182A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
validation report	
	The following approach is utilized for applying qualifiers when one LCS result (including all
Evaluation of LCS	primary and confirmation column results) is outside of laboratory CLs for recovery:
Data for PCB,	1. Detected result associated with recovery of greater than upper laboratory CL is qualified
Pesticides and	as approximate (J). Non-detected result is not qualified.
Herbicides	2. Detected result associated with recovery of less than lower laboratory CL is qualified as
	approximate (J).
	3. Non-detected result associated with a recovery of less than 10% is rejected (R).
	The following approach is utilized for applying qualifiers when both MS and MSD results are
	outside of laboratory CLs for recovery or RPD criteria:
Evaluation of	1. Detected result associated with recoveries of greater than or equal to 10% is qualified as
MS/MSD Data for	approximate (J). Non-detected result is qualified as approximate (UJ).
PCB, Pesticides	2. Detected result associated with recoveries of greater than the upper laboratory CL and
and Herbicides	outside of RPD criterion is qualified as approximate (J). Non-detected result is not qualified.
	3. Detected result associated with recoveries of less than 10% is qualified as approximate (J).
	Non-detected result is <u>rejected</u> (R).
	The isotope dilution technique includes the utilization of IDAs, which are carbon-13 labeled
	analogs, oxygen-18 labeled analogs or deuterated analogs of target analytes which are
	added to samples in the sample extraction process. Since IDAs respond in the same manner
	as target analytes, the IDA is used for target analyte identification and for calculating sample
Evaluation of	concentrations.
Isotope Dilution	The IDAs are evaluated in sample results using control limits of 25% to 150%. Based on the
Analytes (IDAs)	laboratory SOP, low recoveries of IDAs are acceptable as long as the signal-to-noise (S/N)
and Internal	ratio is greater than 10:1.
Standards for PFAS	The Internal Standard (IS) used is 13C2 PFOA.
	Results for target analytes associated with IDAs/IS with recoveries greater than or less than
	10% with a S/N of greater than 10:1 are qualified as approximate (J, UJ).
	Results for target analytes associated with IDA/IS with recoveries less than 10% with a S/N of
	less than 10:1 are rejected (R), using professional judgment.
	Internal standard recoveries are evaluated using control limits of from 50% of the lower
	standard area to 100% of the upper standard area of the associated calibration verification
Evaluation of	standard.
Internal Standards	The results associated with internal standard area recoveries 25% or greater but less than
for Organics	50% are qualified as approximate (J, UJ).
	Non-detected results associated with internal standard area recoveries less than 25% are
	rejected (R), using professional judgment.
	RPD value, calculated for the positive results from the primary and confirmation
	chromatographic columns, is defined as the difference between the columns divided by the
Evaluation of Dual	average of the two columns, times 100.
Column Results for	The following approach is utilized for applying qualifiers:
Pesticide,	1. For detected result greater than the method detection limit (MDL) and less than the QL, with a RDD substant them 50 membres are the it is 10^{-1}
Herbicides and	with a KPD greater than 50, replace result with the QL and qualify as non-detected (U).
PCB Data	2. For detected result greater than the QL with a RPD >40%%:
	a. With a RPD of 41 to 70, result is qualified as approximate (J).
T	D. with a KPD > /1, result is qualified as approximate and tentative (JN).
larget Analyte	if incorrect target analyte identifications were made due to laboratory errors, the associated
Inclutions	result will be corrected of rejected (n), applying professional judgment.

O'Brien & Gere L	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory -
Modified USEPA	Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides
(8081B), PCBs (80	182A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
vanuation report	1 The laboratory is performing identification and quantitation for sample data using the
	guidance presented in the USEPA Technical Advisory – Laboratory Analysis of Drinking
	Water Samples for PFOA using EPA Method 537 Rev. 1.1.
	2. The laboratory analyst's experience and judgement are used to report both target
	analyte identification and concentrations, which are based on interpretation of peak
	shape, chromatography baseline, retention time and signal strength. The laboratory did
	not utilize ion ratios for target analyte identification for this method.
	3. During data validation, peak integration and identification interpretation performed by
	the laboratory analysts is reviewed. Validation qualifiers are applied to sample results
	when overall chromatography, retention times or peak shapes may have impacted
	sample identifications and/or concentrations.
	4. IDAs are utilized to identify target analytes (TAs), where certified
	quantitation/calibration- quality IDA standards are available for inclusion in the
	calibration. For target analytes without IDAS, an IDA is assigned for retention time
	5 Branched-chain isomers for perfluorooctanoic acid (PEOA) perfluorobevanesulfonic acid
	(PEHxS) perfluorooctane sulfonic acid (PEOS) perfluorobutanesulfonic acid (PEBS) n-
	methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) and n-ethyl
Target Analyte	perfluorooctane sulfonamidoacetic acid (NEtFOSAA) may be identified in samples. The
Identification and	calibration standards used by the laboratory includes linear and branched isomers for
Quantitation for	only these target analytes based on current literature. Other target analytes are
PFAS (TA	quantitated based on a single linear isomer peak, defined by the calibration solutions in
Sacramento SOP)	the initial calibration.
	6. The laboratory may utilize a qualitative/technical mixture for the PFOA standard to
	determine retention times only for the PFOA branch-chain isomers. A separate, certified
	quantitation/calibration-quality standard source, which only includes the linear isomer,
	7 Samples results are gualified as approximate (1) but bias is not assigned to sample results
	with branch-chain isomers when quantitated using linear calibration standards or
	standards that do not include the branches present in the samples.
	8. Target analytes are identified using TA and IDA comparisons of retention time (RT) and
	relative retention time (RRT - defined as the RT of the target analyte/RT of the IDA), as
	applicable based on laboratory experience.
	9. Target analytes are identified as detected using the signal-to-noise ratio criterion of 3:1.
	10. According to the laboratory, the data system's integration parameters are optimized for
	minimal manual intervention. Laboratory analyst's experience and judgement are used
	to evaluate IA peaks. Should there be any issue with the data system's integration the
	analyst will overwrite the data report with a manual integration. This manual integration will take into account TA signal strength, overall shrematography and
	haseline determinations, which can vary from sample to sample, especially for low level
	detections.
Target Analyte	If incorrect target analyte identifications were made due to data interpretation or laboratory
Identifications for	transcription errors, the associated result will be corrected or rejected (R), applying
Organics	professional judgment.
Evaluation of	Metals are evaluated using the criteria for ICV and CCV of 90% to 110% of the expected
Initial (ICV) and	value.

O'Brien & Gere D	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory -
(2021R) DCRc (20	vietnou 537 and Svv-846 analytical methods including VOCs (8200C), SVOCs (8270D), Pesitides
validation report	62A), Metals (200.7/200.0), Metally, (245.1), Cyaniae (555.4) and other methods instea in the
Calibration	Mercury is evaluated using the criteria for ICV of 90% to 110% of the expected value and 80%
Verification (CCV)	to 120% of the expected value for the CCV.
for Metals.	Cvanide are evaluated using the criteria for ICV of 90% to 110% of the expected value and
Mercury and	85%-115% of the expected value for the CCV.
Inorganics	For analyses utilizing a calibration curve, the correlation coefficient for the first or second
	order curve must be ≥ 0.995 .
ICV and CCV	For ICV and CCV recoveries outside of laboratory CLs:
Actions for Metals.	1. Detected result associated with recovery of greater than upper CLs is gualified as
Mercury and	approximate, biased high (J ⁺). Non-detected result is not qualified.
Inorganics	2. Detected result associated with recovery of greater than or equal to 75% but less than the
	lower laboratory CL is gualified as approximate, biased low (1). Non-detected result is
	qualified as approximate (UJ).
	3. Detected result associated with recovery of less than 75% is qualified as approximate.
	biased low (J ⁻). Non-detected result is rejected (R).
Metals. Mercurv.	
and Inorganic	Oualification of sample results associated with MS/MSD. laboratory duplicate and field
MS/MSD.	duplicate excursions is performed on samples for the same matrix, within the same
Laboratory/Field	preparation batch, within the same SDG group. [Region II only qualifies the Field Duplicate
Duplicate, Serial	and associated sample.]
Dilution	
	To apply gualifiers if LCS result is outside of laboratory CLs or 80 to 120%:
	Aqueous sample:
	1. Detected and non-detected result associated with a recovery of less than 50% is rejected
	(R).
	2. Detected result associated with recovery between 50 and 79%, is qualified as approximate
	(J-). Non-detected result is qualified as approximate (UJ).
Evaluation of LCC	3. Detected result associated with recoveries of between 121 and 150% is qualified as
Evaluation of LCS	approximate (J+).
Data for ivietais	4. Detected result associated with recoveries of greater than 150% is rejected (R), applying
and morganics	professional judgment.
	Soil sample:
	1. Detected result associated with recovery greater than the upper CL is qualified as
	approximate (J+).
	2. Detected result associated with recovery less than the lower CL is qualified as approximate
	(J-) and non-detected result is qualified as approximate (UJ).
	3. Detected and non-detected result associated with a recovery of less than 10% is <u>rejected</u>
	(R).
	To apply qualifiers if either MS or MSD result is outside of laboratory CL or 75 to 125%:
Evaluation of	Aqueous sample:
MS/MSD Data for	1. Detected and non-detected result associated with a recovery of less than 30% is <u>rejected</u>
Metals and	(R).
Inorganics	2. Detected result associated with recoveries between 30 and 74%, is qualified as
	approximate (J, or J-). Non-detected result is qualified as approximate (UJ).
	3. Detected result associated with recoveries >126% are qualified as approximate (J, or J+).
	Soil sample:

O'Brien & Gere E Modified USEPA I (8081B), PCBs (80 validation report	Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides 182A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the
vanaation report	1. Detected and non-detected result associated with a recovery of less than 10% is rejected
	(R).
	2. Detected result associated with recovery of between 10 and 74%, is qualified as
	approximate (J, or J-). Non-detected result is qualified as approximate (UJ).
	3. Detected result associated with recoveries > 126 are qualified as approximate (J, or J+).
	To apply qualifiers if laboratory duplicate results are outside of laboratory RPD control limits
	(or 20%) or difference criteria:
	Aqueous sample with sample and duplicate values <u>both</u> greater than or equal to 5 times the
Fuelwetten of	QL:
Evaluation of	1. Detected result greater than or equal to the QL, associated with an RPD of greater than 20
Laboratory	is qualified as approximate (J).
Metals and	1 Detected results with absolute difference greater than the OL are qualified as approximate
Inorganics	(1). Non-detected results are qualified as approximate (UI).
	Soil sample for sample and duplicate values both greater than or equal to 5 times the QL:
	1. Detected result greater than or equal to the QL, associated with an RPD of greater than or
	equal to 20 is qualified as approximate (J).
	Soil sample when either detected sample or duplicate value is less than 5 times the QL:
	1. Sample results with absolute difference greater than 2 times the QL are qualified as
	approximate (J). Non-detected results are qualified as approximate (UJ).
Evaluation of	For calibration blanks and preparation blanks at concentrations greater than laboratory
Blank Data for	MDLs but less than or equal to QLs:
Inorganics	1. Concentration in the associated samples of greater than or equal to the MDLs but less
morganics	than or equal to QLs are revised to the QL level and qualified as non-detected (U).
	For calibration blanks, preparation blanks and field blanks at concentrations greater than
	1 Concentration in the associated samples of greater than the blank concentration and less
	than ten times the blank concentration are qualified as approximate (J or $J+$).2.
	Concentrations in the associated samples of greater than or equal to the MDLs but less than
Evaluation of	or equal to QLs are revised to the QL level and are qualified as non-detected (U). 3. Data
Blank Data for Motals and	may be rejected based on 2006 guidelines for sample results with concentrations greater
Inorganics	than the QL but less than the blank value.
morganies	For calibration blanks and preparation blanks at concentrations less than the negative value
	of the QLs:
	1. Concentration in the associated samples of less than ten times the QLs are qualified as
	approximate (J).
	2. Non-detected concentrations in the associated samples are qualified as approximate (0).
	greater than 50 times the MDL.
	If the percent difference is greater than 10%, associated sample results greater than or equal
Evaluation of	to the MDL are qualified as approximate (J).
Serial Dilution	If the percent difference is greater than or equal to 100%, associated sample results greater
Data for ivietals	than or equal to the MDL are rejected (R), applying professional judgment. The response
	direction and concentration of target analytes in associated sample may be considered in
	applying qualifiers.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory -Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report

Source O'Brien & Gere

Laboratory QA/QC analyses definitions								
QA/QC Term	Definition							
Reporting limit (RL) or Quantitation limit (QL)	The level above which numerical results may be obtained with a specified degree of confidence; the minimum concentration of an analyte in a specific matrix that can be identified and quantified above the method detection limit and within specified limits of precision and bias during routine analytical operating conditions.							
Method detection limit (MDL)	The minimum concentration of an analyte that undergoes preparation similar to the environmental samples and can be reported with a stated level of confidence that the analyte concentration is greater than zero.							
Calibration	Compliance requirements for satisfactory instrument calibration are established to verify that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of analysis and calibration verifications document satisfactory maintenance and adjustment of the instrument on a day-to-day basis.							
Relative standard deviation (RSD)	The standard deviation divided by the mean; a unit-free measure of variability.							
Correlation coefficient	A measure of the strength of the relationship between two variables.							
Relative Percent Difference (RPD)	Used to compare two values; the relative percent difference is based on the mean of the two values, and is reported as an absolute value, i.e., always expressed as a positive number or zero.							
Percent Difference (%D)	Used to compare two values; the percent difference indicates both the direction and the magnitude of the comparison, i.e., the percent difference may be either negative, positive, or zero.							
Percent Recovery (%R)	The act of determining whether or not the methodology measures all of the target analytes contained in a sample.							
Calibration blank	Consists of acids and reagent water used to prepare samples for analysis. This type of blank is analyzed to evaluate whether contamination is occurring during the preparation and analysis of the sample.							
Method blank	A water or soil blank that undergoes the preparation procedures applied to a sample (i.e., extraction, digestion, clean-up). These samples are analyzed to examine whether sample preparation, clean-up, and analysis techniques result in sample contamination.							
Field/equipment blank	Collected and submitted for laboratory analysis, where appropriate. Field/equipment blanks are handled in the same manner as environmental samples. Equipment/field blanks are analyzed to assess contamination introduced during field sampling procedures.							
Calibrationverify calibration (calibration (calibration (RSD) Correlation coefficientverify (calibration (RSD) The Used the find position 	Compounds not found in environmental samples which are spiked into samples and quality control samples at the time of sample preparation for organic analyses. Internal standards must meet retention time and recovery criteria specified in the analytical method. Internal standards are used as the basis for quantitation of the target analytes.							
Surrogate recovery	Compounds similar in nature to the target analytes but not expected to be detected in the environmental media which are spiked into environmental samples, blanks, and quality control samples prior to sample preparation for organic analyses. Surrogates are used to evaluate analytical efficiency by measuring recovery.							
Laboratory control sample (LCS)	Standard solutions that consist of known concentrations of the target analytes spiked into laboratory analyte-free water or sand. They are prepared or purchased from a certified manufacturer from a source independent from the calibration standards to provide an independent verification of the calibration procedure. They are prepared							

	Laboratory QA/QC analyses definitions
QA/QC Term	Definition
	and analyzed following the same procedures employed for environmental sample analysis to assess method accuracy independently of sample matrix effects.
Matrix	The material of which the sample is composed or the substrate containing the analyte of interest, such as drinking water, waste water, air, soil/sediment, biological material.
Retention time (RT)	The time a target analyte is retained on a chromatography column before elution. The identification of a target analyte is dependent on a target compound's retention time falling within the specified retention time window established for that compound.
Relative retention time (RRT)	The ratio of the retention time of a compound to that of a standard.
Source O'Brien & Gere	

Lab Sample ID: 480-142905-1 Matrix: Water

Client Sample ID: MW-7-100318 Date Collected: 10/03/18 11:15 Date Received: 10/05/18 01:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1.4-Dioxane	0.20		0.19	0.096	ug/L		10/09/18 07:33	10/11/18 23:38	1
Isotope Dilution	%Recovery	Qualifie	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	29		15-110				10/09/18 07:33	10/11/18 23:38	1
Method: 537 (modified) - Fluo	rinated Alky	I Substanc	es f			-			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.4		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoropentanoic acid (PFPeA)	2.9		1.7	0.42	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanoic acid (PFHxA)	3.0		1.7	0.50	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanoic acid (PFHpA)	3.4		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanoic acid (PFOA)	14	JN	17	0.74	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorononanoic acid (PFNA)	1.3			0.23	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorobutanesulfonic acid (PFBS)	17		1.7	0.17	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanesulfonic acid (PFHxS)	6.8		1.7	0.15	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	0,49		1.7	0.16	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonic acid (PFOS)	7.9	JN	1.7	0.47	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 00:28	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	84		25-150				10/12/18 11:11	10/16/18 00:28	- 7
13C5 PFPeA	88		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFHxA	89	/	25_150				10/12/18 11:11	10/16/18 00:28	1
13C4 PFHpA	97	1	25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C4 PFOA	92	í	25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C5 PFNA	102	Į –	25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFDA	95	1	25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFUnA	101	\	25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFDoA	93		25-150				10/12/18 11:11	10/16/18 00:28	1
13C2 PFTeDA	103		25-150				10/12/18 11:11	10/16/18 00:28	1
13C3 PFBS	90	\	25 - 150				10/12/18 11:11	10/16/18 00:28	1
18O2 PFHxS	95		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C4 PFOS	99		25 - 150				10/12/18 11:11	10/16/18 00:28	1
13C8 FOSA	100	l l	25 - 150				10/12/18 11:11	10/16/18 00:28	1
d3-NMeFOSAA	109		25 - 150				10/12/18 11:11	10/16/18 00:28	1
d5-NEtFOSAA	110		25 - 150				10/12/18 11:11	10/16/18 00:28	1
	,,,,								

Lab Sample ID: 480-142905-1 Matrix: Water

Client Sample ID: MW-7-100318 Date Collected: 10/03/18 11:15 Date Received: 10/05/18 01:00

Method: 537 (modified) - + luor	mated Alkyl Substan	ces (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	142	25-150	10/12/18 11:11	10/16/18 00:28	1
M2-8:2 FTS	106	25 - 150	10/12/18 11:11	10/16/18 00:28	1

Client Sample ID: MW-1-100318 Date Collected: 10/03/18 14:50 Date Received: 10/05/18 01:00

Lab Sample ID: 480-142905-2 Matrix: Water

Method: 8270D SIM ID - Semiv	olatile Orga	nic Compe Qualifier	ounds (BC/MS	SIM /	Isotop	e Diluti	on)	Analyzad	Dil Fac
1 4-Dioxane			0 20	0 10		<u> </u>	10/09/18 07:33	10/13/18 03:58	1
Instano Dilution	*/ Basel/OF/	Qualifia	l imite	••••	-3		Proported	Analyzed	
14 Diayonn da	20		15 110				10/00/18 07:33	10/12/18 03-58	
1,4-DIOXANE-U	20	DA	15-110				10/03/10 01:55	10/13/10 03.00	,
Method: 537 (modified) / Fluor	rinated Alky	I Substand	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	Ð	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1 1 (10)	30	1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoropentanoic acid (PFPeA)	U# 30	3.0	1.8	0.44	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanoic acid (PFHxA)	U 🕈 -4.2	J FD	1.8	0.52	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanoic acid (PFHpA)	U.T. a.e.	J	(1.8)	0.22	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanoic acid (PFOA)	L # -14		(1.8)	0.76	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorononanoic acid (PFNA)	天 🖡 0.48-	ⅎⅎՅℋ		0.24	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanoic acid (PFDA) 🖍 🕻	J 🕈 4.0-	ᢖ	(1.8)	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorobutanesulfonic acid	5.6 (JU	1.8	0.18	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanesulfonic acid	(# . <u></u>	8	1.8	0.15	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanesulfonic Acid	ND		1.8	0.17	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonic acid	سور 🔻 ا	+ TH	1.8	0.48	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanesulfonic acid (PFDS)	ND	1-	1.8	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonamide	0 43	J)	1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
(FOSA)									
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
N-ethylperfluorooctanesulfonamidoac	ND		18	1.7	ng/L		10/12/18 11:11	10/21/18 07:10	1
etic acid (NETFOSAA) 6:2 FTS	ND		18	1.8	na/L		10/12/18 11:11	10/21/18 07:10	1
8:2 FTS	ND		18	1.8	na/L		10/12/18 11:11	10/21/18 07:10	1
isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	42		25.150				10/12/18 11:11	10/21/18 07:10	1
13C5 PEPeA	45		25.150				10/12/18 11:11	10/21/18 07:10	1
13C2 PEHXA	48	/	25.150				10/12/18 11:11	10/21/18 07:10	1
13C4 PEHnA	52	1	25, 150				10/12/18 11:11	10/21/18 07:10	1
13C4 PEOA	53	\	25_150				10/12/18 11:11	10/21/18 07:10	1
13C5 PENA	54	\backslash	25.150				10/12/18 11:11	10/21/18 07:10	1
13C2 PFDA	56		25 - 150				10/12/18 11:11	10/21/18 07:10	1
								TestAmerica	Buffalo
U# Jak	, AUT	sian	Page 9 of 557					10/24/2	018

Lab Sample ID: 480-142905-2 Matrix: Water

Client Sample ID: MW-1-100318 Date Collected: 10/03/18 14:50 Date Received: 10/05/18 01:00

1	Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
	13C2 PFUnA	59	25 - 150	10/12/18 11:11	10/21/18 07:10	1
	13C2 PFDoA	57 /	25-150	10/12/18 11:11	10/21/18 07:10	1
1	13C2 PFTeDA	49 /	25 - 150	10/12/18 11:11	10/21/18 07:10	1
1	13C3 PFBS	47	25 - 150	10/12/18 11:11	10/21/18 07:10	1
1	1802 PFHxS	56	25 - 150	10/12/18 11:11	10/21/18 07:10	1
	13C4 PFOS	58	25 - 150	10/12/18 11:11	10/21/18 07:10	1
'	13C8 FOSA	53	25 - 150	10/12/18 11:11	10/21/18 07:10	1
	d3-NMeFOSAA	76	25 - 150	10/12/18 11:11	10/21/18 07:10	1
	d5-NEtFOSAA	75	25 - 150	10/12/18 11:11	10/21/18 07:10	1
A	M2-6:2 FTS	135	25 - 150	10/12/18 11:11	10/21/18 07:10	1
1	M2-8:2 FTS	147	25-150	10/12/18 11:11	10/21/18 07:10	1
		/	1			

Client Sample ID: MW-4-100418

Date Collected: 10/04/18 10:15

Lab Sample ID: 480-142994-1 Matrix: Water

Dil Fac

Dil Fac

Dil Fac

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Dil Fac

Date Received: 10/05/18 01:15 Method: 8270D SIM ID - Semivoratile Organic Compounds (GC/MS SIM / Isotope Dilution) Analyte **Result Qualifier** MDL Unit RL D Prepared Analyzed 1.4-Dioxane ND 0.20 0.10 ug/L 10/09/18 07:33 10/11/18 21:17 Isotope Dilution %Recovery Qualified Limits Prepared Analyzed 1.4-Dioxane-d8 31 15-110 10/09/18 07:33 10/11/18 21:17 Method: 537 (modified) - Fluorinated Alkyl Substances **Result Qualifier** RL MDL Unit D Prepared Analyzed Analyte 18 7.52 1.8 10/12/18 11:11 10/16/18 00:43 Perfluorobutanoic acid (PFBA) 0.32 ng/L 65 F 1.8 0.45 ng/L 10/12/18 11:11 10/16/18 00:43 Perfluoropentanoic acid (PFPeA) 87 1.8 10/16/18 00:43 0.53 ng/L 10/12/18 11:11 Perfluorohexanoic acid (PEHxA) 1.8 0.23 ng/L 10/12/18 11:11 10/16/18 00:43 Perfluoroheptanoic acid (PFHpA) 6.9 10/16/18 00:43 Perfluorooctanoic acid (PFOA) 25 ١N 1.8 0.77 ng/L 10/12/18 11:11 2.0._8 1.8 0.25 ng/L 10/12/18 11:11 10/16/18 00:43 Perfluorononanoic acid (PFNA) 1.8 10/12/18 11:11 10/16/18 00:43 Perfluorodecanoic acid (PFDA) 0.350.28 ng/L j. Perfluoroundecanoic acid (PFUnA) ND 1.8 1.0 ng/L 10/12/18 11:11 10/16/18 00:43 ND ng/L 10/12/18 11:11 10/16/18 00:43 Perfluorododecanoic acid (PFDoA) 18 0.50 ND Perfluorotridecanoic acid (PFTriA) 1.8 1.2 ng/L 10/12/18 11:11 10/16/18 00:43 Perfluorotetradecanoic acid (PFTeA) ND 0.26 ng/L 10/12/18 11:11 10/16/18 00:43 1.8 Perfluorobutanesulfonic acid 5.8 1.8 0.18 ng/L 10/12/18 11:11 10/16/18 00:43 (PFBS) 10/12/18 11:11 10/16/18 00:43 0.15 ng/L Perfluorohexanesulfonic acid 5.9-B 1.8 (PFHxS) 0 66 (5 1.8 0.17 ng/L 10/12/18 11:11 10/16/18 00:43 Perfluoroheptanesulfonic Acid (PFHpS) Perfluorooctanesulfonic acid 1.8 0.49 ng/L 10/12/18 11:11 10/16/18 00:43 (PFOS) Perfluorodecanesulfonic acid (PFDS) ND 1.8 0.29 ng/L 10/12/18 11:11 10/16/18 00:43 Perfluorooctanesulfonamide (FOSA) ND 1.8 0.32 ng/L 10/12/18 11:11 10/16/18 00:43 N-methylperfluorooctanesulfonamidoa ND 18 2.8 ng/L 10/12/18 11:11 10/16/18 00:43 cetic acid (NMeFOSAA) ND 18 1.7 ng/L 10/12/18 11:11 10/16/18 00:43 N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA) ND 18 1.8 ng/L 10/12/18 11:11 10/16/18 00:43 6:2 FTS 8:2 FTS ND 18 1.8 ng/L 10/12/18 11:11 10/16/18 00:43 **isotope** Dilution %Recovery Qualifier Limits Prepared Analyzed 13C4 PFBA 70 25-150 10/12/18 11:11 10/16/18 00:43 13C5 PFPeA 75 25 - 150 10/12/18 11:11 10/16/18 00:43 13C2 PFHxA 79 25-150 10/12/18 11:11 10/16/18 00:43 13C4 PFHpA 87 25 - 150 10/12/18 11:11 10/16/18 00:43 13C4 PFOA 81 25 - 150 10/12/18 11:11 10/16/18 00:43 13C5 PFNA 90 25 - 150 10/12/18 11:11 10/16/18 00:43 85 10/12/18 11:11 10/16/18 00:43 13C2 PEDA 25 - 150 13C2 PFUnA 78 25.150 10/12/18 11:11 10/16/18 00:43 70 10/12/18 11:11 10/16/18 00:43 25 - 150 13C2 PFDoA 13C2 PFTeDA 67 25-150 10/12/18 11:11 10/16/18 00:43 10/12/18 11:11 10/16/18 00:43 84 25 . 150 13C3 PFBS 10/12/18 11:11 10/16/18 00:43 1802 PFHxS 89 25 - 150 10/12/18 11:11 10/16/18 00:43 **13C4 PEOS** 94 25-150 10/16/18 00:43 13C8 FOSA 82 25-150 10/12/18 11.11 10/12/18 11:11 10/16/18 00:43 d3-NMeFOSAA 96 25-150 d5-NEtFOSAA 87 25-150 10/12/18 11:11 10/16/18 00:43

Client Sample Results

Client Sample ID: MW-4-1	Lab Sample ID: 480-142994-1								
Date Collected: 10/04/18 10:15							-	Matrix	Water
Date Received: 10/05/18 01:15									
		\int							
Method: 537 (modified) Fileo	rinated Alky	/I Substan	ces (Continu	led)					
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
M2-6:2 FTS	118		25 - 150				10/12/18 11:11	10/16/18 00:43	1
M2-8:2 FTS	93	J	25-150				10/12/18 11:11	10/16/18 00:43	1
Client Sample ID: MW-2-1	00418	<u> </u>				La	b Sample	ID: 480-142	994-2
Date Collected: 10/04/18 13:55	00410							Matrix	Water
Date Received: 10/05/18 01:15								NIGLA IA.	water
		·							
Method: 8270D SIM ID - Semiv	oiatile Orga	anic Comp	ounds (GC/I	ns sim /	Isotope	Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:25	1
isotope Dilution	%Recovery	Qualitier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxang 08	30	1	15-110	_			10/09/18 07:33	10/12/18 00:25	1
		PO							
Method: 537 (modified) - Fluo	rinated Alky	/l'Substan	ces			-		.	
Analyte	Result	Qualifier	RL	MDL	Unit		Prepared	Analyzed	
Perfluorobutanoic acid (PFBA)	2.9		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoropentanoic acid (PEPeA)	2.7		1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorohexanoic acid (PEHxA)	23		1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroheptanoic acid (PEHpA)	30		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanoic acid (PFOA)	14	/	1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorononanoic acid (PFNA)	5.6		1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorodecanoic acid (PFDA)	ND(<i>us</i>	1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroundecanoic acid (PFUnA)	ND	-	1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorododecanoic acid (PFDoA)	ND	us .	1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorotetradecanoic acid (PFTeA)	ND	(\cdot)	1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorobutanesulfonic acid (PFBS)	1.3(<u> </u>	1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorohexanesulfonic acid	40.	-5	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:05	1
(PFHXS) Perfluoroheptanesullonic Acia	0.93	(J)	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:05	1
(PFHpS)		TIL							
Perfluorooctanesulfonic acid	100	10	1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:05	1
(PFOS) Berfluerodecanesulfonic acid (BEDS)	ND		1.8	0.29	na/l		10/12/18 11-11	10/16/18 01:05	1
Perfluorooctanesulfonemide (FOSA)	ND		1.0	0.20	ng/L		10/12/18 11:11	10/16/18 01:05	. 1
N methylperfluercentapesulfenamidea	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 01:05	1
cetic acid (NMeEOSAA)	115			2.0	g. =				
N-ethylperfluorooctanesulfonamidoac	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 01:05	1
etic acid (NEtFOSAA)									
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:05	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:05	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	73	7	25-150				10/12/18 11:11	10/16/18 01:05	1
13C5 PFP#A	80	1	25 _ 150				10/12/18 11:11	10/16/18 01:05	1
13C2 PFHxA	85	(25-150				10/12/18 11:11	10/16/18 01:05	1
13C4 PFHpA	93		25 - 150				10/12/18 11:11	10/16/18 01:05	1
13C4 PFOA	95		25 - 150				10/12/18 11:11	10/16/18 01:05	1
13C5 PFNA	91		25 - 150				10/12/18 11:11	10/16/18 01:05	1
13C2 PFDA	90	}	25 - 150				10/12/18 11:11	10/16/18 01.05	1
13C2 PFUnA	87)	25-150				10/12/18 11:11	10/16/18 01:05	1
		•							

TestAmerica Buffalo

Limits

25-150

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25 - 150

25.150

25 - 150

25-150

25-150

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

%Recovery Qualifier

83

81

88

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95

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102

104

131

93

Client Sample ID: MW-2-100418 Date Collected: 10/04/18 13:55 Date Received: 10/05/18 01:15

Isotope Dilution

13C2 PFTeDA

13C3 PFBS

1802 PFHxS

13C4 PFOS 13C8 FOSA

d3-NMeFOSAA

d5-NEtFOSAA

M2-6:2 FTS

M2-8:2 FTS

Lab Sample ID: 480-142994-2 Matrix: Water

d	D)il Fac
1.1	5	1
1:1	5	1
1:1	5	1
1:1	5	1
1:1	5	1
1:1	5	1
1:1	5	1
1:1:	5	1
1:1	5	1
1:1:	5	1

Client Sample ID: EB-100418 Date Collected: 10/04/18 10:45 Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:48	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-da	31		15-110				10/09/18 07:33	10/12/18 00:48	1
Method: 537 (modified) - Fluo	rinated Alky	/I Substap	a s						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoropentanoic acid (PFPeA)	ND		1.7	0.41	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanoic acid (PFHxA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.21	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanoic acid (PFOA)	ND		1.7	0.71	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.26	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.91	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.46	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorobutanesulfonic acid (PFBS)	ND	>	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanesulfonic acid	0.23	(J)B	1.7	0.14	ng/L		10/12/18 11:11	10/16/18 01:13	1
(PFHxS)		0							
Perfluoroheptanesulfonic Acid (PEHpS)	ND		1.7	0.16	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.45	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-methylperfluorooctanesulfonamidoa	ND		17	2.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-ethylperfluorooctanesulfonamidoac	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
6.2 FTS	ND		17	1.7	na/L		10/12/18 11:11	10/16/18 01:13	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:13	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	85	1	25 - 150				10/12/18 11:11	10/16/18 01:13	1

Client Sample ID: EB-100418 Date Collected: 10/04/18 10:45 Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-3 Matrix: Water

Lab Sample ID: 480-142994-4

Matrix: Water

Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFPeA	86	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFHxA	87	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFHpA	92	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFOA	90	25 ₋ 150	10/12/18 11:11	10/16/18 01:13	1
13C5 PFNA	91	25 ₋ 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFDA	87	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFUnA	95	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFDoA	86	25 <u>- 150</u>	10/12/18 11:11	10/16/18 01:13	1
13C2 PFTeDA	86	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C3 PFBS	85	25 - 150	10/12/18 11:11	10/16/18 01:13	1
1802 PFHxS	91	25 - 150	10/12/18 11:11	10/16/18 01:13	1
, 13C4 PFOS	95	25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C8 FOSA	84	25 - 150	10/12/18 11:11	10/16/18 01:13	1
d3-NMeFOSAA	102	25 - 150	10/12/18 11:11	10/16/18 01:13	1
d5-NEIFOSAA	106	25 - 150	10/12/18 11:11	10/16/18 01:13	1
M2-6:2 FTS	103	25 - 150	10/12/18 11:11	10/16/18 01:13	1
M2-8:2 FTS	95 l	25 - 150	10/12/18 11:11	10/16/18 01:13	1

J Z M

Client Sample ID: FRB-100418 Date Collected: 10/04/18 10:20 Date Received: 10/05/18 01:15

	Method: 537 (modified) - Fluorin Analyte	ated Alkyl Substance	S RI	MDL	Unit	ם	Prepared	Analyzed	Dil Fac
	Perfluorobutanoic acid (PFBA)	ND	1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
:	Perfluoropentanoic acid (PFPeA)	ND	1,8	0.45	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluorohexanoic acid (PFHxA)	ND	1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluoroheptanoic acid (PFHpA)	ND	1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluorooctanoic acid (PFOA)	ND	1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:20	1
,	Perfluorononanoic acid (PFNA)	ND	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluorodecanoic acid (PFDA)	ND	1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluoroundecanoic acid (PFUnA)	ND	1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluorododecanoic acid (PFDoA)	ND	1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:20	1
1	Perfluorotridecanoic acid (PFTriA)	ND	1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:20	1
'	Perfluorotetradecanoic acid (PFTeA)	ND	1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluorobutanesulfonic acid (PFBS)	ND	1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:20	1
i	Perfluorohexanesulfonic acid	0.23 J	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:20	1
i	Perfluoroheptanesulfonic Acid (PFHpS)	ND	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:20	1
	Perfluorooctanesulfonic acid (PFOS)	ND	1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:20	1
İ	Perfluorodecanesulfonic acid (PFDS)	ND	1.8	0.29	ng/L		10/12/18 11:11	10/16/18 01:20	1
)	Perfluorooctanesulfonamide (FOSA)	ND	1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
1	N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND	18	2.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
; ;	N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND	18	1.7	ng/L		10/12/18 11:11	10/16/18 01:20	1
;	6:2 FTS	ND	18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
	8:2 FTS	ND	18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1

Client Sample ID: FRB-100418 Date Collected: 10/04/18 10:20 Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-4 Matrix: Water

Isotope Dilution %	Recovery Qualitie	or Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	86	25 - 150	10/12/18 11:11	10/16/18 01:20	
13C5 PFPeA	86 /	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFHxA	90 /	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFHpA	88	25 - 150	10/12/18 11 11	10/16/18 01:20	1
13C4 PFOA	88	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C5 PFNA	90	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFDA	90	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFUnA	93	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFDoA	80	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFTeDA	78	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C3 PFBS	92	25 - 150	10/12/18 11:11	10/16/18 01:20	1
1802 PFHxS	88 \	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFOS	99	25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C8 FOSA	85	25 - 150	10/12/18 11:11	10/16/18 01:20	1
d3-NMeFOSAA	91	25 - 150	10/12/18 11:11	10/16/18 01:20	1
d5-NEtFOSAA	99	25 - 150	10/12/18 11:11	10/16/18 01:20	1
M2-6:2 FTS	118	25 - 150	10/12/18 11:11	10/16/18 01:20	1
M2-8:2 FTS	108	25 - 150	10/12/18 11:11	10/16/18 01:20	1
Client Sample ID: X-1-100418	B (MWZ)		Lab Sample	ID: 480-142	994-5

Client Sample ID: X-1-100418 (MWス) Date Collected: 10/04/18 00:00 Date Received: 10/05/18 01:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.097	ug/L		10/09/18 07:33	10/12/18 01:12	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Ana/yzed	Dil Fac
1,4-Dioxane-d8	28		15-110				10/09/18 07:33	10/12/18 01:12	1
Method: 537 (modified) - Fluor	rinated Alky		es)						
Analyte	Result	Qualifier	₹ RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.3		1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoropentanoic acid (PFPeA-	2.2		1.7	0.43	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorohexanoic acid (PEHxA:	2.2		1.7	0.51	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroheptanoic acid (PEHpA)	2.9		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorooctanoic acid (PFOA)	15		1.7	0.74	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorononanoic acid (PENA)	5.4	B	1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorodecanoic acid (PFDA)	0.37	L (1)	1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorododecanoic acid (PFDoA)	0.63	ØS	1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	1 0/16/18 01:35	1
 Perfluorobutanesulfonic acid (PFBS) 	1.2	D	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorohexanesulfomic acid (PFHxS)	39,	×	1.7	0.15	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroheptanesulfonic Acid (PEHpS)	1.0	(J)	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorooctanesulfonic acid (PFOS)	110	JN	1.7	0.47	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 01:35	1

TestAmerica Buffalo

Matrix: Water

Client Sample ID: X-1-100418 Date Collected: 10/04/18 00:00 Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-5 Matrix: Water

ļ	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Í	Perfluorooctanesulfonamide (FOSA)	ND	-	1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	1
	N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
!	N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
	6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
	8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
;	Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
	13C4 PFBA	71	7	25 - 150				10/12/18 11:11	10/16/18 01:35	1
	13C5 PFPeA	81		25 <i>-</i> 1 5 0				10/12/18 11:11	10/16/18 01:35	1
	13C2 PFHxA	87		25 - 150				10/12/18 11:11	10/16/18 01:35	1
-	13C4 PFHpA	94	/	25-150				10/12/18 11:11	10/16/18 01:35	1
i	13C4 PFOA	87	1	25 - 150				10/12/18 11:11	10/16/18 01:35	1
	13C5 PFNA	99		25 <u>- 15</u> 0				10/12/18 11:11	10/16/18 01:35	1
l	13C2 PFDA	93	\	25 - 150				10/12/18 11:11	10/16/18 01:35	1
1	13C2 PFUnA	93	\backslash	25-150				10/12/18 11:11	10/16/18 01:35	1
!	13C2 PFDoA	91	\mathbf{X}	25 - 150				10/12/18 11:11	10/16/18 01:35	1
	13C2 PFTeDA	82		25 - 150				10/12/18 11:11	10/16/18 01:35	1
:	13C3 PFBS	87		25 - 150				10/12/18 11:11	10/16/18 01:35	1
	1802 PFHxS	93		25-150				10/12/18 11:11	10/16/18 01:35	1
•	13C4 PFOS	93	\	25 - 150				10/12/18 11:11	10/16/18 01:35	1
	13C8 FOSA	92		25-150				10/12/18 11:11	10/16/18 01:35	1
	d3-NMeFOSAA	103		25 - 150				10/12/18 11:11	10/16/18 01:35	1
	d5-NEtFOSAA	110		25-150				10/12/18 11:11	10/16/18 01:35	1
	M2-6:2 FTS	148		25_150				10/12/18 11:11	10/16/18 01:35	1
		440		L 25 450				10/10/10 11.11	10/16/10 01:05	4

TestAmerica TestAmerica TestAmerica Total Control (Rec. Albany) Dowe Korren R. Same (Re, Albany, N.Y. 1220) New Korren R. Same (Re, Albany, N.Y. 1220) Dome: (Stig. (24-175) Contact: Pail (D'Anothele@obg.com / Ishareen (Stande: multi: (Faul (D'Anothele@obg.com / Ishareen (Stande: Contact: Pail (D'Anothele@obg.com / Ishareen (Stande: Multi-(Stange) Sample (D) Sample (D) Sample (D)	Cileau Site Naroe / Lataton Varano Rid Site / Altaroy, NY Lahousuors: Maie Nenchof Fetchmenia 860 Uversule Pleary 10 Harnbacod In W. Sarramenn, CA. An Incur, NY 95605-1500 142:8 253 95605-1500 142:8 223 95605-1500 142:8 223 95605-1500 142:8 223 95605-1500 142:8 223 95605-1500 142:8 234 95605-1500 142:8 234 95605-1500 142:8 243 95605-1500 1425 95605-15005 1425 95605-15005 1425 95605-15005 1425 95605-1505 95605-1505 956	Stanpling Program. EC Sompleg GU Varence Raber Audysis Holding Time from Sample Date. Hase to estaction, 28 dys from extraction to	Surperior The Consist t	Lab Use Oaly Project Nonsber
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ddreser O'Bren & Grte New Konse Pol Sure F6, Albany, N.Y. 12203 one (S18, 124-7255 one (S18, 669-2945 os: (S18, 669-2945 mail: Paul D'Anubale@ebg.com / Jhareen Gandnet oject Constact: Prai D'Anubale@ebg.com / Januer Candnet@obg.com mail: Paul D'Anubale@ebg.com / Jhareen Gandnet Sample Identification Unique Field Sample ID Sample ID	Mare Nerdrof TerrAnenta TerrAnenta FertAmenta TerrAnenta TerrAnenta 880 Birennik, Fray 10 Harnweed In W Sarranennik, CA Antean, NY 95605-1500 1028.225 95605-1500 1028.225 95605-1500 1028.225 95605-1500 1028.225 850.3150 1028.225 850.315 1028.225 950.315 111.5	ន់ដំ ជំងំលោក ហេ សំពេសដែលកេ, 28 សំពុង ភ័យកា លោកមួយកែអូក ស្រ 	Chemical Preservatives: (see key at hdown)	
New Kareer Bd. Sune 166, Allamy, N.Y. 12203 one (S18, 724-7255 mail: Cantact: Pad D'Anubale/ Mauren Gande: eject Contact: Pad D'Anubale/ Mauren Gande: mail: Pad D'Anubale@oby.com / Dhuren Gande: Mail: Pad D'Anubale@oby.com / Sample Lanaine Unique Field Sample D	TestAmenta TestAmenta 860 Usernuk, Flezy 10 Harnweed Ur W. Saraments, CA Antanweed Ur W. Saraments, Sarameta 14258, 2253 Phone: 115, 594, 2534 14258, 2223 Sample: Date Sample: Tante Cample: Date Sample: Tante Lo: Co: Si: 15 11	le dave to entrection, 25 dys from extression to		1 [14b (D):
oure (518, 724-7255 E. (518, 869, 2945 eject Contact: Pai D'Aenbale/ Mauren Gande: mail: Pai D'Ansibale@obg.com / Dhareen Gandle: mail: Pai D'Ansibale@obg.com / Dhareen Gandle: mail: Pai D'Ansibale@obg.com / Dhareen Gandle: Mail: Pai D'Ansibale@obg.com / Diagon / Dia	880 Birende Fleag 70 Hambued In W. Sarameni, CA. Archene, NY 05605-1500 142:52 2253 05605-1500 142:52 2253 05605-1500 142:52 2253 142:52 5253-1570 Fac. 722,549,4570 5ample Date 5ample Time (cont.dd/yy) 10.0 03/15 11.15		0/2 p<	1
ix: (5)8: 869.2645 bjeet Contaet: Pai D'Anubale/ Mureen Gandee mail: Pau D'Anubale@obg.com / J.Mureen Gandee mail: Pau D'Anubale@obg.com / J.Mureen Gandee Sample Landee Unique Field Sample ID Sample Landee	W. Surfarente, CA. Archente, NY. 95605-1500 10238-2225 Phone: 135-954-2254 Fac: 722,549-3254 Fac: 722,549-3276 Fac: 722,54	2.5 %X/X	54191 25 bar	
oject Contact: Paul D'Anubale/ Maureen Candle: nail: Paul D'Anubale@obig.com / Johnreen Cardine@globg.com and: Paul D'Anubale@obig.com / Johnreen Cardine@globg.com Sample Landon - Sample Landon - Sample Landon - Linique Fredd Sample ID	95605-1500 [1428-225 Phone: 135-593-2534 Fax: 712-549-3679 Sample Date Sample Trate (cont.del/yr) [1] [5]		6 to 2	
Sample Lärmühanim Linique Field Sample ID Sample ID Sample Laraiue	Phone: 135-593-2534 Pac: 722.543-7679 Sampk Date Sample Tunk (man/dd/yy) (hkmm) (O [0 7] 1 5 11 [5		(); 2% (4) (4) (4) (4) (4) (4) (4) (4) (4) (4)	
Sample Lacurification Linique Field Sample ID Sample ID Sample Lacation	Phone: 132-59A 2234 Fax: 732-549-707 Sampk Date Sample Time (man/dd/yy) (hkmm) (O [0 7] 1 5 11 [5	Pachage Requirement: Sa SYSSEC ARE Gard Lovel Provider And 30 B.S. 7.87	۲۰۰۰ ۲۰۰۰ ۲۰۰۰ ۲۰۰۰ ۲۰۰۰ ۲۰۰۰ ۲۰۰۰ ۲۰۰	Job Number
Unique Field Sample ID Sample Location	Sample Date Sample Tune (nam/dd/y) (bh/ann) (O [0 7] 5 5	Project Number 59335 BDD Pamar ROUS 4 File	K15 colp +1 245 cq sV4a 240 (P2) 250 qp (2)	
	10/03/18 11/5	Sample Sample Type Mattha (ece kev) fste kev) fi of Coursinerts	۲/۲ ۲/۲ ۳/۲ ۳/۲ ۳/۲	
T-UN 810001-1-UN		v 1061 4	XXZ	Lab Sample II.
NU-1-100318 MU-1	V 1950	<u>د ادم</u>	× × × 2 0	
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manually T, M. Wegur (2) Day 10/3/18 R	acounty fat for the	Due 10-3-16	Control Control	encerts are Nortese
aquestical age Real Level 1 Trave 1800 34	accreting And The	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Carriedy Sodit (react) Co N Starth	ndard 20 business day T Full NYSDEC ASP Cat
upus liech by D2.1% D4.1% D5.1% D6.1% D5.1% D6.1% D6.1\% D6.1	teartreed by: É	Dare Ture	actes responses 22 A 2 life F	et Fkg (FUF) and EQuI EDD.
upic Types N = Normal covintencental sample, FD = field duplicate, EB = 1 uple Matrix SE = Sectionent, 5O = Sol, WG = Granndwater, WS = Sorface V	Equipment Blank, FB = Field Blank, TB Water, WW = Water Water, WO = Water (: Trip Blank, MS of Lab Machinke, Other (Spec native, TA of Amend Treeve - TH - miner Theorem		
Lab Name: Tes	stAmerica Buffalo	Job No.: 480-142905-1		
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SDG No.:				
Client Sample	DID: MW-7-100318	Lab Sample ID: 480-142905-1		
Matrix: Water	· · · · · · · · · · · · · · · · · · ·	Lab File ID: U3312331.D		
Analysis Meth	od: 8270D SIM ID	Date Collected: 10/03/2018 11.15		
Extract. Meth	od: 3510C	Date Extracted: 10/09/2018 07:33		
Sample wt/vol	: 1040(mL)	Date Analyzed: 10/11/2018 23:38		
Con. Extract	Vol.: <u>1(mL)</u>	Dilution Factor: 1		
Injection Vol	ume: 1(uL)	Level: (low/med) Low		
% Moisture:		GPC Cleanup:(Y/N) N		
Analysis Batc	h No.: 438984	Units: ug/L		
CAS NO.	COMPOUND NAME			

	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	0.20		0.19	0.096

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	29		15-110

Lab Name: Te	TestAmerica Buffalo Job No.: 480-142905-1						
SDG No.:							
Client Sampl	e ID: <u>MW-1-100318</u>	Lab	Sample ID:	480-14	12905-2		
Matrix: Wate	er	Lab	File ID: U	3312394	4.D		
Analysis Met	thod: 8270D SIM ID	Dat	e Collected	: 10/03	3/2018 14:50)	
Extract. Met	hod: 3510C	Dat	e Extracted	: 10/09	9/2018 07:33	}	
Sample wt/vc	ol: 1000(mL)	Dat	e Analyzed:	10/13/	2018 03:58	· · · · · · · · · · · · · · · · · · ·	
Con. Extract	ract Vol.: 1(mL) Dilution Factor: 1						
Injection Vo	plume: 1(uL)	Lev	el: (low/me	d) Low			
% Moisture:		GPC	Cleanup:(Y	/N) N		······	
Analysis Bat	ch No.: 439196	Units: ug/L					
CAS NO.	COMPOUND NAME		RESULT	Q	RL	MDL	
123-91-1	1,4-Dioxane		ND		0.20	0.10	
					······································		

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	20		15-110

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U				E	C Sam	pling - Gl	E Va	tranc	Rd	Site					age 1 ul 1	
)		Client: Site Name / L	.ccatiton	Sampling Pro	graan:		Sampler(s):	ł	4						ab Use Ooly	
TestAmerica		Vatrano RdSite / Alba	ey, NY	EC Sampling -	GE Vatorio Rd	Site		~	20	= 5				1 07	Joject Number:	
O'Brien & Gere Office. Albany Address: O'Brien & Gere 94 New Karner Rd, Suite 196, Albany, N.Y. 12203 194 New (Silis) 724-7256 Fax: (Silis) 869-2045 Fax: (Silis) 869-2045 Froniert Daul D'Annbale/ Manteen Garadore@ol Email: Paul D'Annbale@obg.com / Manteen Garadore@ol	bg.com	Laboratory: Mare Methof TestAmetica 880 Riverside Pkvy 1 880 Riverside Pkvy 1 95005-1500	FertAmenca 10 Hazelwood Dr Anisorst, NV 4228-223	Analysis Hok A days to each maigsis	ting Time from acteur, 28 dys fr	Sample Date: sun extracrien to) م (ز)	C bothelf bethow		0 0	ey at bacon	a a	0		480-142994 CC	<u>т</u> т
Sample Identification	3	Phone: 732-593-2554 Fax: 732-543:3679		Package Req Fai NVSDEC AS Project Numi EDD Formate	uirement: P Cat B Level Phy w Pert 69645 EQuIS 44 File	Anished 20 BD TAT	troqual to (0) dut((1 / 1) (2 maint blait	193 55 PÅ OSE5 V 55 VAESO Å	WR						ob Numbec	
Unique Field Sample [D	ample Location	Sample Date (mm/dd/yy)	Sample Time (thtmm)	Sample Type (see key)	Sample Matrix (see key)	# of Centainers	Reporting	J\80	·1/84						CI Manual II	Τ
1 Short-QSHSV-1-MW Page	MW-9	S//H/0]	5101	Z X SW	5 Q 6 Q	л ф	z z o o								ALL MIL HERE'S WASA	
1 1 1 1 1 1 1 1 1 1 1 1 1 1	カレース		13055	2	<i>U</i> 6	5	z v	\mathbf{k}								
10 EB - 100418			10 15	ê9	ωQ	-2-	z o	X								
216001-981 FKB- 147	Name and American		1070	6.0	8	6	z v	×								
· X-1-100018)	-	6	€ C	T	z v	X	×							
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9 10 10 10 10 10 10 10 10 10 10 10 10 10							z v									T
Special Instructions:							-	-1	-	-				***		Τ
Reinquished by J. M.C.D. 214 cu VI Date act. C.Q.J.C.J. (D) Time	1445	Received by: Ro- of: 779	(Zente)		1442		ätion:	8					Connects of	Notes:	Τ
Reinquestred by Reel Level Date 26 77 Refinquestred by Reinquestered by Date	10-4-01	Received by of Received by	R	INS.	<u>a lë ë</u>	ne 1/5/18	Cuart Conde	ody Seals int	act?	x A				Standard for Full N Level Pkg	20 business day T YSDEC ASP Cat t (PDF) and EQu	AT B S 4
of Time		УÇ			<u>e</u>	res. He		undus r	$\mathcal{O}_{\mathbf{R}}$	5.	¢ i	× ×	~~	ale EDD,		
Rempte 1 ype: N = Normal environmental studye, H D = fi) Woople Mattick SE = Sediment, SO = Sdi, WG = Groundw Generwarves Code: 0 = none, 1 = HCL, 2 = HNO <u>3, 5 = F</u> B	eld duplicate, EB : vater, WS = Surfac H2SO4, 4 = NaOH	= Equipment Blank, e Water, WW = Wast, i, 5 = Asobie Acid, 6	FB = Field Black, T e Water, WQ = Wate = McOH, T = NaHS =	B = Trip Blan r Quality, TA (04, 8= Na25	k, MS = Lab N = Animal Tiss. 203: 9 = 113PC	latipike, Other (Spec Le, TP = Plant Tissu)4	cify); ic, AA = An	abient Åir,	Other (Sp	cafy):						

Lab Name: TestAmerica Buffalo	Name: <u>TestAmerica Buffalo</u> Job No.: 480-3			
SDG No.:		·····		
Client Sample ID: MW-4-100418	Lab Sample ID:	480-142	994-1	
Matrix: Water	Lab File ID: U	3312325.1)	
Analysis Method: 8270D SIM ID	Date Collected	: 10/04/2	2018 10:1	.5
Extract. Method: 3510C	Date Extracted	: 10/09/2	2018 07:3	33
Sample wt/vol: 1000(mL)	Date Analyzed:	10/11/20)18 21:17	,
Con. Extract Vol.: 1(mL)	Dilution Facto:	r: 1		
Injection Volume: <u>1(uL)</u>	Level: (low/med	d) Low		
% Moisture:	GPC Cleanup:(Y/N) N			
Analysis Batch No.: 438984	Units: ug/L			
			······	V
CAS NO. COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1 1,4-Dioxane	ND		0.20	0.10
CAS NO. ISOTOPE DILU	TION	%REC	Q	LIMITS
17647-74-4 1,4-Dioxane-d8		33		15-110

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Lab Name: T	estAmerica Buffalo	Job No.: 480-1	Job No.: <u>480-142994-1</u>					
SDG No.:								
Client Samp	le ID: <u>MW-2-100418</u>	Lab Sample ID:	480-142	994-2				
Matrix: Wate	er	Lab File ID: U	3312333.					
Analysis Met	thod: 8270D SIM ID	 Date Collected	: 10/04/2	2018 13:5	.5			
Extract. Met	thod: 3510C	Date Extracted	: 10/09/2	2018 07:3	3			
Sample wt/vo	ol: 1040(mL)	Date Analyzed:	10/12/20	00:25				
Con. Extract	- Vol.: 1(mL)	Dilution Factor: 1						
Injection Vo	plume: 1(uL)	Level: (low/me	Level: (low/med) Low					
<pre>% Moisture:</pre>		GPC Cleanup:(Y/N) N						
Analysis Bat	cch No.: <u>438984</u>	Units: ug/L		· · · · · · · · · · · · · · · · · · ·				
CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDI.			
123-91-1	1,4-Dioxane	ND		0 19	0.006			
					0.098			
CAS NO.	ISOTOPE DILU:	FION	%REC	Q	LIMITS			
17647-74-4	1,4-Dioxane-d8	· · · · · · · · · · · · · · · · · · ·	3(15-110			

Lab Name: TestAmerica Buffalo Job No.: 480-14			42994-1			
SDG No.:			<i></i>			
Client Sampl	e ID: <u>EB-100418</u>	Lat	Sample ID:	480-1429	94-3	
Matrix: Wate	r	Lab	File ID: U	3312334.D)	
Analysis Meth	hod: 8270D SIM ID	Dat	e Collected	: 10/04/2	018 10:	45
Extract. Meth	nod: <u>3510C</u>	 Dat	e Extracted	: 10/09/2	018 07:	33
Sample wt/vol	l: 1040(mL)	 Dat	e Analyzed:	10/12/20	18 00.4	8
Con. Extract	Vol.: 1(mL)	 Dil	ution Factor	r: 1	20 00.4	
Injection Volume: 1(uL) Level: (low/me			 d) Low	· · · · ·		
<pre>% Moisture:</pre>		GPC Cleanup: (Y/N) N			······································	
Analysis Batch No.: 438984 Units: ug/L		ts: <u>ug/L</u>		/		
CAS NO.	COMPOUND NAME		RESULT	2	RL	MDL
123-91-1	1,4-Dioxane		ND		0.19	0.096
CAS NO.	ISOTOPE DILUT	TON		& RFC		LIMITO
17647-74-4	1,4-Dioxane-d8			31		LIMITS
	denter and the second					10-110

Lab Name: Te	ab Name: TestAmerica Buffalo Job No.: 480-142994-1					
SDG No.:		_				
Client Sampl	e ID: X-1-100418 MW-2	Lal	o Sample ID:	480-14299	94-5	· · · · · · · · · · · · · · · · · · ·
Matrix: Wate	r	$-\mathcal{J}_{\text{Lak}}$	o File ID: U3	3312335.D		
Analysis Met	hod: 8270D SIM ID	 Dat		: 10/04/20	18 00:0)0
Extract. Met	hod: <u>3510C</u>	 Dat	e Extracted:	10/09/20	18 07:1	33
Sample wt/vol	l: 1030(mL)	 Dat	e Analyzed:	10/12/201	8 01:12	2
Con. Extract	Vol.: <u>1(mL)</u>	_ Dil	ution Factor	: 1		
Injection Vol	lume: 1(uL)	Level: (low/med) Low				
% Moisture:		GPC Cleanup:(Y/N) N				
Analysis Batch No.: <u>438984</u> Units			ts: ug/L			
[T					· · · · · · · · · · · · · · · · · · ·
CAS NO.	COMPOUND NAME		RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane		ND		0.19	0.097
(· · · · ·				
CAS NO.	ISOTOPE DILUTI	ON		%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8			28		15-110