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September 14, 2017

Mr. Jonathan S. Davis, P.E.
AFCEC/CZO
322 East Inner Road
Otis ANG Base, MA 02542

SUBJECT: Final Preliminary PFC Investigation Completion Report
For Site-Wide Groundwater
New Boston AFS, New Boston, NH
Document No. NER0006AJ.05

Dear Mr. Davis:

Environmental Chemical Corporation (ECC) has completed the Preliminary Perfluorinated Compound (PFC) Investigation for Site-Wide Groundwater at New Boston Air Force Station (NBAFS), New Boston, New Hampshire. This completion report presents field documentation and field and laboratory data generated as the result of field activities completed from 01 August 2017 through 03 August 2017. Site figures, field log book pages, field forms, chains of custody, and field and laboratory data results are provided attached herein.

Field activities were conducted in accordance with the Draft Preliminary Perfluorinated Compound (PFC) Investigation for Site Groundwater at New Boston Air Force Station (NBAFS), New Boston, New Hampshire (Versar/ECC, July 2017).

Between 01 August 2017 and 03 August 2017, ECC personnel sampled a total of six (6) groundwater monitoring wells for the purpose of confirming the presence or absence of PFCs in site-wide groundwater, as part of a preliminary site investigation. All samples were collected using low-flow groundwater sampling methods and in accordance with the Draft Final Preliminary PFC Investigation Work Plan dated 31 July 2017, as adapted from the January 2017 PFC Release Response Quality Program Plan for the Former Pease Air Force Base in Portsmouth, NH (currently Pease International Tradeport) and accepted by the New Hampshire Department of Environmental Services (NHDES). All samples were shipped overnight using chain of custody (COC) protocols to Maxxam Analytics, Mississauga, Ontario, Canada. All sample locations are shown on Figure 1 (Attachment 1).

In addition to collecting groundwater samples, on 16 August 2017 ECC personnel conducted a groundwater elevation gauging event. A total of twenty two (22) site-wide groundwater monitoring wells were gauged and groundwater levels were recorded within a 24-hour period. Nine additional monitoring wells located within the investigation area were not gauged due to either being located within a restricted, fenced-in area or could not be located by the field team. Base-wide and site-specific groundwater flow contours were developed based on the results of this gauging. Within the upper, northern portion of the Base (Sites SIS13and SS008), groundwater flow is generally westerly. At Sites SIS15, SIS17, LF003, and SIS18, groundwater flow trends to a more northwesterly direction. Within the lower, southern portion of the Base (Sites SS009, SIS18, and

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LF001), groundwater flows in a more south-southwesterly direction. A Base-wide groundwater flow contour map is presented in Figure 2 (Attachment 1). Concentrations of perfluorooctane sulfonate (PFOS) and perfluoro-n-octanoic acid (PFOA), as reported for each groundwater sample collected under this preliminary investigation, is presented in Figure 3. Site-specific groundwater contour maps for Sites SIS13, Landfill 003 (LF003), SIS18, and SIS08 are presented in Figures 4 through 7 (Attachment 1), respectively.

Monitoring wells to be sampled as part of this preliminary PFC investigation were chosen jointly by the Air Force Civil Engineer Center (AFCEC) and the NHDES as representative of the overall station and within areas of potential concern, based on historical activities. The following wells were initially selected to be sampled during this preliminary investigation: GWQ-4, SIS08-MW1, SIS13-MW1, SIS13-MW2, SIS18-PZ2, and LF003-MW1. Two locations, monitoring well SIS13-MW2 and piezometer (PZ) SIS18-PZ2, could not be sampled. SIS13-MW2 was found to be obstructed at approximately 10 feet (ft) below ground surface (bgs). Historical records indicate the depth of SIS13-MW2 to be 31.5 ft bgs with a 10-ft screen interval spanning 21.5 to 31.5 ft bgs. As a sample collected outside of the screened zone would not be representative of current site conditions, an alternative well, LF002-MW1, was chosen by the on-site AFCEC representative. However, when sampling was attempted at LF002-MW1, it was found to be dry. Therefore, a sample was collected from monitoring well LF002-MW3. Piezometer SIS18-PZ2 was also found to be dry, therefore a sample was collected from SIS18-PZ1. SIS18-PZ1 is located in a wetland area and is downgradient of SIS18-PZ2. A third piezometer, SIS18-PZ3, upgradient of PZ1 and PZ2, was also found to be dry.

All monitoring well and piezometer groundwater samples were analyzed for PFCs by United States Environmental Protection Agency (USEPA) Method 537 Modified. Analytical results were compared to NHDES Ambient Groundwater Quality Standards (AGQS) and USEPA drinking water health advisories for PFCs. An ECC chemist performed validation of the analytical data; validated analytical results are presented in Table 1 (Attachment 2). All groundwater sample data are reported in Table 1 in nanograms per liter (ng/L), also known as parts per trillion. Field forms (groundwater sampling sheets, health and safety sheets, instrument calibration sheets, and groundwater gauging sheets) are presented in Attachment 3. The laboratory COC is presented in Attachment 4. The data validation report is presented in Attachment 5. The laboratory analytical data report is presented in Attachment 6.

Concentrations of PFOS and PFOA were identified in exceedance of NHDES AGQS and USEPA health advisories in three of the six locations sampled. Concentrations of PFOS exceeding the NHDES AGQS and USEPA Health Advisory (70 ng/L for both) were detected in three of the six locations sampled, with concentrations of 200 ng/L, 260 ng/L, and 90 ng/L detected in monitoring wells SIS13-MW1 and LF003-MW1, and piezometer SIS18-PZ1, respectively. PFOS was also reported in the field duplicate sample (DUP1) collected at SIS13-MW1 at a concentration of 220 ng/L. PFOS was detected below the NHDES AGQS and USEPA Health Advisory value of 70 ng/L in the groundwater sample collected from well SIS08-MW1, at a concentration of 49 ng/L. No other PFCs were identified in that sample.

A single concentration of PFOA exceeding the NHDES AGQS and USEPA health advisory (70 ng/L for both) was detected in one of the six locations sampled. The sample collected from monitoring well LF003-MW1 reported a PFOA concentration of 150 ng/L. PFOA was detected below the NHDES AGQS and USEPA Health Advisory value of 70 ng/L in the groundwater samples collected from monitoring well SIS13-MW1 and piezometer SIS18-PZ1, at concentrations of 19 ng/L (20 ng/L field duplicate) and 19 ng/L, respectively.

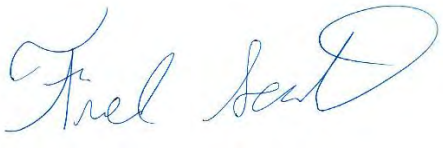
No PFCs were reported above laboratory Limits of Detection in samples collected from wells GWQ-4 or LF002-MW3.

On 16 August 2017, one aqueous Investigation Derived Waste (IDW) sample was collected from a 30-gallon steel drum used to store the sampling purge water and de-contamination fluids. The sample was submitted to an off-site laboratory for waste characterization parameters. Following receipt of the analytical data, the waste will be properly disposed of under manifest.

If you have any questions concerning this fieldwork completion report, please contact me at (508) 229-2270 at extension 22116.

Warmest regards,

ECC



Fred Santos, PG, PMP
Project Manager

Copy: Ms. Nan Glenn, Versar (w/attachments)
Mr. Jeffery Oja, NBAFS (w/attachments)
Mr. Melvin Alli, AFCEC (w/attachments)

Attachments:

Attachment 1 – Figure 1, Groundwater Sample Locations
– Figure 2, Basewide Groundwater Contour Map
– Figure 3, PFOS/PFOA Sample Results
– Figure 4, Site SS13 Groundwater Contour Map
– Figure 5, Site LF003 Groundwater Contour Map
– Figure 6, Site SS18 Groundwater Contour Map
– Figure 7, Site SS08 Groundwater Contour Map

Attachment 2 – Table 1 - Summary of Polyfluorinated Compounds Detected in Groundwater

Attachment 3 – Field Forms

Attachment 4 – Laboratory Chains of Custody

Attachment 5 – Data Validation Report

Attachment 6 – Laboratory Analytical Data Package

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ATTACHMENT 1

Figures

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PIEZOMETER SAMPLE LOCATIONS
MONITORING WELL SAMPLE LOCATIONS
MONITORING WELLS
INSTALLATION BOUNDARY
WATER BODIES
ROADS
STREAM NETWORK

0 500 1,000 Feet

Notes:
1. Map Coordinates: NAD83 State Plane New Hampshire in feet

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FIGURE 1

Groundwater Sample Locations

Preliminary PFC Investigation Report for Site-Wide Groundwater

ENVIRONMENTAL CHEMICAL CORPORATION

ECC GIS Server F:\Projects\NewBoston\MapDocuments\Site18\RAWP\Site18_PFC_SampMap.mxd

Notes:
1. Map Coordinates: NAD83 State Plane New Hampshire in feet

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FIGURE 2

Basewide Groundwater Contours

Preliminary PFC Investigation Report for Site-Wide Groundwater

ENVIRONMENTAL CHEMICAL CORPORATION

ECC GIS Server F:\Projects\NewBoston\MapDocuments\Site18RAWP\Site18_GW_ContourMap.mxd

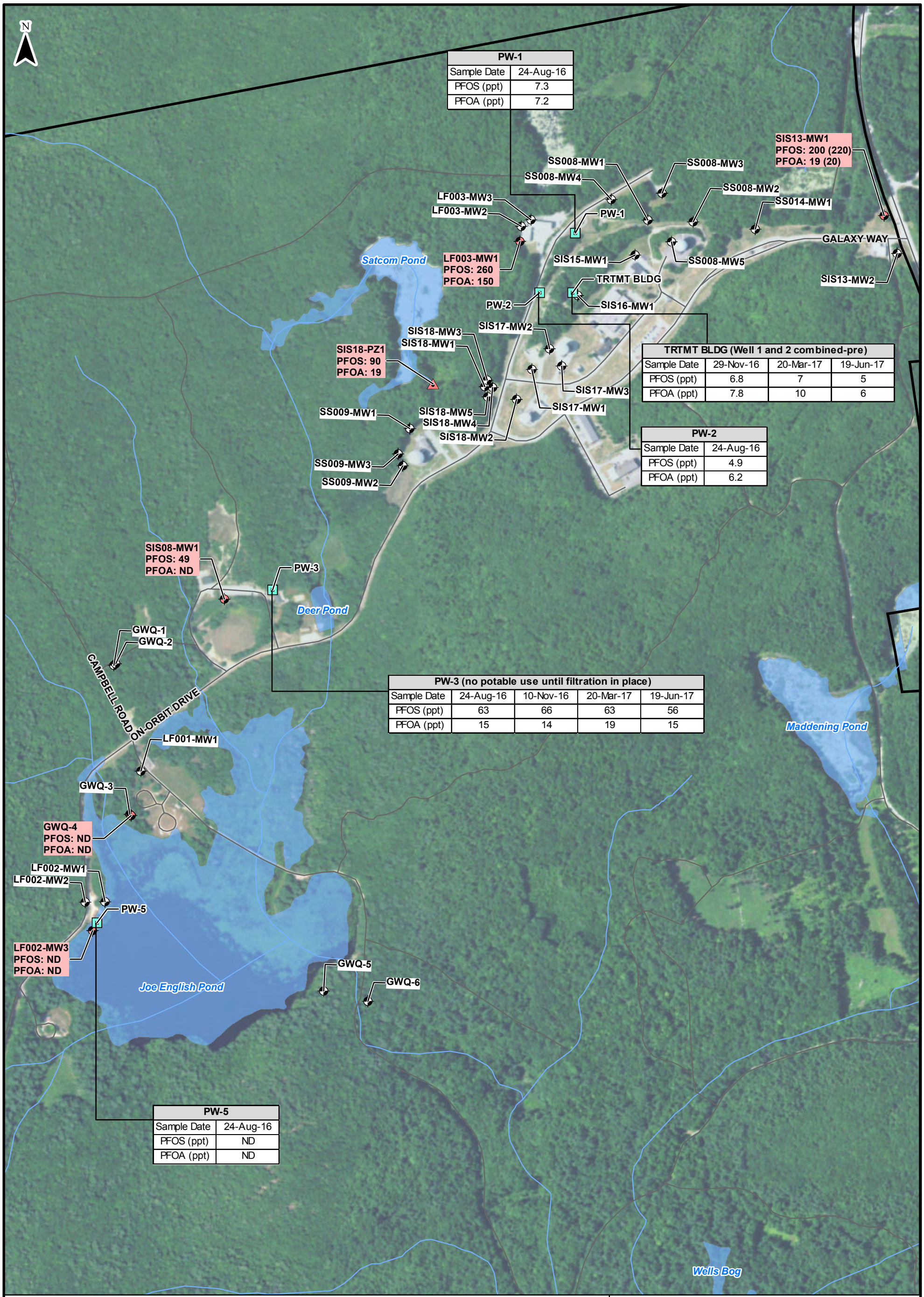
N
PW-1
Sample Date 24-Aug-16
PFOS (ppt) 7.3
PFOA (ppt) 7.2
SIS13-MW1
PFOS: 200 (220)
PFOA: 19 (20)
SS008-MW1
SS008-MW3
SS008-MW4
SS008-MW2
SS014-MW1
LF003-MW3
LF003-MW2
PW-1
GALAXY WAY
Satcom Pond
LF003-MW1
PFOS: 260
PFOA: 150
SIS15-MW1
SS008-MW5
TRTMT BLDG
SIS13-MW2
PW-2
SIS16-MW1
SIS18-MW3
SIS17-MW2
SIS18-MW1
SIS18-PZ1
PFOS: 90
PFOA: 19
TRTMT BLDG (Well 1 and 2 combined-pre)
Sample Date 29-Nov-16 20-Mar-17 19-Jun-17
PFOS (ppt) 6.8 7 5
PFOA (ppt) 7.8 10 6
SIS17-MW3
SIS17-MW1
SS009-MW1
SIS18-MW5
SIS18-MW4
SIS18-MW2
PW-2
Sample Date 24-Aug-16
PFOS (ppt) 4.9
PFOA (ppt) 6.2
SS009-MW3
SS009-MW2
SIS08-MW1
PFOS: 49
PFOA: ND
PW-3
Deer Pond
GWQ-1
GWQ-2
CAMPBELL ROAD
ON-ORBIT DRIVE
PW-3 (no potable use until filtration in place)
Sample Date 24-Aug-16 10-Nov-16 20-Mar-17 19-Jun-17
PFOS (ppt) 63 66 63 56
PFOA (ppt) 15 14 19 15
Maddening Pond
LF001-MW1
GWQ-3
GWQ-4
PFOS: ND
PFOA: ND
LF002-MW1
LF002-MW2
PW-5
LF002-MW3
PFOS: ND
PFOA: ND
GWQ-5
GWQ-6
Joe English Pond
PW-5
Sample Date 24-Aug-16
PFOS (ppt) ND
PFOA (ppt) ND
Wells Bog
DRINKING WATER SAMPLES BY AIR FORCE
PIEZOMETER SAMPLE LOCATIONS
MONITORING WELL SAMPLE LOCATIONS
MONITORING WELLS
INSTALLATION BOUNDARY
WATER BODIES
ROADS
STREAM NETWORK
0 500 1,000
Feet
Notes:
1. Map Coordinates: NAD83 State Plane New Hampshire in feet
2. PFOS = Perfluorooctane Sulfonate
3. PFOA = Perfluorooctanoic Acid
4. Concentrations in parts per trillion (ppt)
5. ND = below detection limits
6. (###) = reported concentration is from duplicate sample
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FIGURE 3
PFOS/PFOA Sample Results
Preliminary PFC Investigation Report for Site-Wide Groundwater
ENVIRONMENTAL CHEMICAL CORPORATION
ECC GIS Server F:\Projects\NewBoston\MapDocuments\Site18RAWP\Site18_PFC_ResultMap.mxd

N

660'
670'
680'
690'
700'

SS008-MW2

SS014-MW1
(688.87')

SIS13-MW1
(696.43')

GALAXY WAY

SIS13-MW2
(708.07')

MONITORING WELLS GAUGED AND SAMPLED
MONITORING WELLS GAUGED
MONITORING WELLS NOT GAUGED
GROUNDWATER FLOW DIRECTION
GROUNDWATER CONTOURS
ROADS
STREAM NETWORK
INSTALLATION BOUNDARY
WATER BODIES

0 100 200
Feet

Notes:
Map Coordinates: NAD83 State Plane New Hampshire in feet

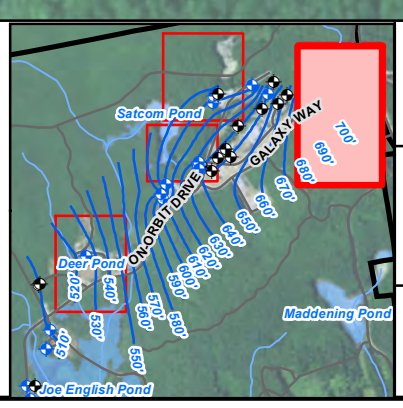

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FIGURE 4

Site SIS13
Groundwater Contour Map
Preliminary PFC Investigation Report for Site-Wide Groundwater

ENVIRONMENTAL CHEMICAL CORPORATION

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N

SS008-MW4
(594.00')

LF003-MW3

LF003-MW2
(593.84')

LF003-MW1
(604.26')

SIS16-MW1

SIS17-MW2

590'
600'
610'
620'
630'
640'
650'
580'

Satcom Pond

ON-ORBIT-DRIVE

MONITORING WELLS GAUGED AND SAMPLED
MONITORING WELLS GAUGED
MONITORING WELLS NOT GAUGED
GROUNDWATER FLOW DIRECTION
GROUNDWATER CONTOURS
ROADS
STREAM NETWORK
INSTALLATION BOUNDARY
WATER BODIES

0 100 200
Feet

Notes:
Map Coordinates: NAD83 State Plane New Hampshire in feet

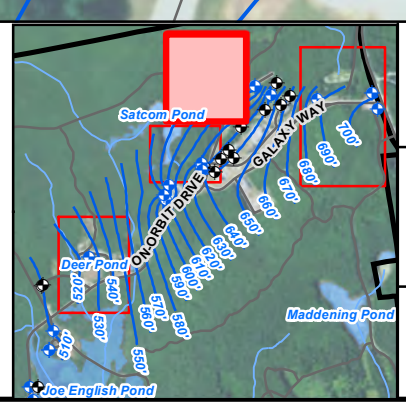

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FIGURE 5

Site LF003
Groundwater Contour Map
Preliminary PFC Investigation Report for Site-Wide Groundwater

ENVIRONMENTAL CHEMICAL CORPORATION

ECC GIS Server F:\Projects\NewBoston\MapDocuments\Site18RAWP\Site18_GW_ContourMap_ZoomIn.mxd

N

590'
600'
610'
620'
630'
640'
650'
580'
570'

LF003-MW3
LF003-MW2 (593.84')
LF003-MW1 (604.26')
SIS16-MW1
SIS17-MW2
SIS17-MW1
SIS17-MW3
SIS18-MW3 (622.74')
SIS18-MW1 (622.84')
SIS18-PZ1
SIS18-MW4
SIS18-MW5 (639.97')
SIS18-MW2
SS009-MW1 (603.20')
SS009-MW3 (575.72')
SS009-MW2 (606.90')

Satcom Pond
Deer Pond
Maddening Pond
Joe English Pond
ON-ORBIT-DRIVE
GALAXY-WAY

PIEZOMETER SAMPLE LOCATIONS
MONITORING WELLS GAUGED AND SAMPLED
MONITORING WELLS GAUGED
MONITORING WELLS NOT GAUGED
GROUNDWATER FLOW DIRECTION
GROUNDWATER CONTOURS
ROADS
STREAM NETWORK
INSTALLATION BOUNDARY
WATER BODIES

0 100 200 Feet

Notes:
Map Coordinates: NAD83 State Plane New Hampshire in feet

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FIGURE 6

Site SIS18 Groundwater Contour Map

Preliminary PFC Investigation Report for Site-Wide Groundwater

ENVIRONMENTAL CHEMICAL CORPORATION

ECC GIS Server F:\Projects\NewBoston\MapDocuments\Site18RAWP\Site18_GW_ContourMap_ZoomIn.mxd

N

520'
530'
540'
550'
560'
570'
580'
510'

SIS08-MW1
(522.75')

GWQ-2
GWQ-1

LF001-MW1
(511.00')

Deer Pond
Joe English Pond

ON-ORBIT DRIVE
CAMPBELL ROAD

MONITORING WELLS GAUGED AND SAMPLED
MONITORING WELLS GAUGED
MONITORING WELLS NOT GAUGED
GROUNDWATER FLOW DIRECTION
GROUNDWATER CONTOURS
ROADS
STREAM NETWORK
INSTALLATION BOUNDARY
WATER BODIES

0 100 200
Feet

Notes:
Map Coordinates: NAD83 State Plane New Hampshire in feet

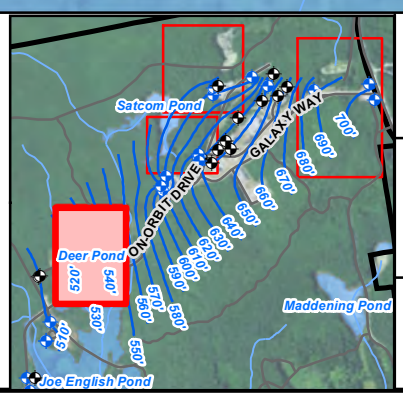

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FIGURE 7

Site SIS08
Groundwater Contour Map
Preliminary PFC Investigation Report for Site-Wide Groundwater

ENVIRONMENTAL CHEMICAL CORPORATION

ECC GIS Server F:\Projects\NewBoston\MapDocuments\Site18RAWP\Site18_GW_ContourMap_ZoomIn.mxd

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ATTACHMENT 2

Table 1
Summary of Polyfluorinated Compounds Detected in Groundwater

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Table 1
Groundwater Sampling Analytical Results

	NHDES AGQS[a]	USEPA Health Advisory[b]	Groundwater Sampling Analytical Results (ng/L)											
	Groundwater (ng/L)	Drinking Water (ng/L)	NBAFS-SIS13-MW1-080117		NBAFS-LF003-MW1-080117		NBAFS-DUP1-080117[c]		NBAFS-S1S08-MW1-080217		NBAFS-LF002-MW3-080217		NBAFS-SIS18-PZ-1-080217		NBAFS-GWQ4-080317	
Parameters																
Perfluorooctane Sulfonate (PFOS)	70	70	**200**	**J**	**260**		**220**	**J**	**49**		10	UJ	**90**		10	U
Perfluoro-n-Octanoic Acid (PFOA)	70	70	**19**	**J**	**150**		**20**	**J**	10	U	10	UJ	**19**	**J**	10	U
6:2 Fluorotelomer sulfonate	NL	NL	**31**	**J**	**260**		**40**	**J**	10	U	10	UJ	10	U	10	U
8:2 Fluorotelomer sulfonate	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
N-ethylperfluorooctane sulfonamide	NL	NL	13	UJ	13	U	13	UJ	13	U	13	UJ	13	U	10	U
N-ethylperfluorooctane sulfonamidoe	NL	NL	13	UJ	13	U	13	UJ	13	U	13	UJ	13	U	10	U
N-methylperfluorooctane sulfonamide	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
N-methylperfluorooctanesulfonamidol	NL	NL	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U
Perfluorobutane Sulfonate (PFBS)	NL	380,000	**12**	**J**	10	U	**14**	**J**	10	U	10	UJ	10	U	10	U
Perfluorobutanoic acid	NL	NL	10	UJ	**210**		10	UJ	10	U	10	UJ	10	U	10	U
Perfluorodecane Sulfonate	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
Perfluorodecanoic Acid (PFDA)	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
Perfluorododecanoic Acid (PFDoA)	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
Perfluoroheptane sulfonate	NL	NL	10	UJ	**9.2**	**J**	10	UJ	10	U	10	UJ	10	U	10	U
Perfluoroheptanoic Acid (PFHpA)	NL	NL	**22**	**J**	**320**		**20**	**J**	10	U	10	UJ	10	U	10	U
Perfluorohexane Sulfonate (PFHxS)	NL	NL	**89**	**J**	**71**		**110**	**J**	10	U	10	UJ	**12**	**J**	10	U
Perfluorohexanoic Acid (PFHxA)	NL	NL	**50**	**J**	**670**		**53**	**J**	10	U	10	UJ	10	U	10	U
Perfluorononanoic Acid (PFNA)	NL	NL	10	UJ	**17**	**J**	10	UJ	10	U	10	UJ	10	U	10	U
Perfluorooctane Sulfonamide (PFOSA)	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
Perfluoropentanoic Acid (PFPeA)	NL	NL	**65**	**J**	**800**		**64**	**J**	10	U	10	UJ	10	U	10	U
Perfluorotetradecanoic Acid	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
Perfluorotridecanoic Acid	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U
Perfluoroundecanoic Acid (PFUnA)	NL	NL	10	UJ	10	U	10	UJ	10	U	10	UJ	10	U	10	U

Notes:

Bold = Compound detected above laboratory detection limit

Bold/Shaded = Compound detected above regulatory criteria

a = NHDES AGQS = New Hampshire Department of Environmental Services Ambient Groundwater Quality Standards

b = USEPA, May 2016a. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) and USEPA, May 2016b. Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).

c = NBAFS-DUP1-080217 is a duplicate sample of NBAFS-SIS13-080217

NL = Not listed

ng/L = nanograms per liter (parts per trillion)

J = Estimated value

U = Compound not detected

UJ = Compound not detected with estimated limits

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ATTACHMENT 3

Field Forms

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Environmental Chemical Corporation

Low Flow/Low Stress Groundwater Sampling Log

Project: New Boston AFS **Date:** 8-1-17

Location: _____ **Sampler:** J. Donovan

Well ID: SISI3-MW1 **PID Reading:** NM

Start Time: 1345 **End Time:** 1425

Well Construction: 2" PVC STICK UP

Depth to water: 9.01 TOC

Well Depth: 26 (FROM TABLE)

Water Column: 16.99

Total Volume Removed (L) 6.0 + 3 GALS PURGED

Field Testing Equipment

Make	Model	Serial #
YSI	650 MDS	09J101599
YSI	600 XL	600336-4m
Lamotte	2020WE	5660-2315
Solinist Water Lev.	101	250978

Time	Volume Removed (liters)	Flow Rate (ml/min)	Depth To Water (ft)	Temp (celsius)	pH (STD)	SPC uS/cm^c	DO (mg/L)	ORP (mV)	Turbidity (NTU)	color
1345	0	150	~~10.22~~	16.27	6.71	.539	1.76	120.2	2.28	CLOUDY
1350	.75	150	10.22	16.25	5.7	.535	1.02	119.7	1.98	"
1355	1.5	150	10.11	16.24	5.1	.536	0.98	122.7	1.72	"
1400	2.25	150	10.11	16.28	4.96	.536	0.58	116.2	1.86	"
1405	3.0	150	10.11	16.21	4.87	.540	0.47	107.1	1.91	"
1410	3.75	150	10.11	16.21	4.97	.539	0.42	106.9	1.82	"
1415	4.50	150	10.11	16.21	4.98	.537	0.38	110.6	1.8	"
1420	5.25	150	10.11	16.20	4.98	.538	0.32	108.1	1.79	"
1425	6.0	150	10.11	16.20	4.97	.538	0.31	106.4	1.8	"
Acceptance Criteria:					10%	10%	10%	10%	<10	

2" screen volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# of Bottles	Preservative	Analyses
	~~NBAFS-A~~	125 ML POLY	2	NONE	PFCS
1430	NBAFS-SISI3-MW1-080117				
↓	NBAFS-SISI3-MW1-MS/MSD-↓				
0600	NBAFS-DUP1-MW1-080117				

Comments COLL DUP + MS/MSD @

2.7 GALS = 1 WELL VOL - 1 WELL VOL. PURGED PRIOR TO TAKING READINGS. PUMPING AT 500 ML'S/MIN (APPROX) DURING WELL VOL REMOVAL.

Signature _____ Date 8/1/17

Environmental Chemical Corporation

Low Flow/Low Stress Groundwater Sampling Log

Project: New Boston AFS
Location: SS13-MW2
Well ID: ~~SS13-MW2~~

Date: 8-1-17
Sampler: J. Donovan
PID Reading: NM

Start Time: _____ **End Time:** _____
Well Construction: 2" PVC
Depth to water: 5.5
Well Depth: ~~BLOCKED~~
Water Column: —
Total Volume Removed (L) _____

Field Testing Equipment

Make	Model	Serial #
YSI	650 MDS	
YSI	600 XL	
Lamotte	2020WE	
Solinist Water Lev.	101	

Time	Volume Removed (liters)	Flow Rate (ml/min)	Depth To Water (ft)	Temp (celsius)	pH (STD)	SPC uS/cm^{c}	DO (mg/L)	ORP (mV)	Turbidity (NTU)	color
		NOT SAMPLED / BLOCKED AT								
				APPROX		10.7 FT from TOC				
			GW AT	5.5	TOC					
Acceptance Criteria:					10%	10%	10%	10%	<10	

2" screen volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# of Bottles	Preservative	Analyses

Comments

_____

_____

_____

Signature _____ Date 8-1-17

Environmental Chemical Corporation

Low Flow/Low Stress Groundwater Sampling Log

Project: New Boston AFS
Location:
Well ID: SISO8-MW1

Date: 8-2-17
Sampler: J. Donovan
PID Reading: NM

Start Time: 1150 **End Time:** 1220
Well Construction: 2" PVC STICK UP
Depth to water: 22.1 TOC
Well Depth: 101.0
Water Column: 78.9
Total Volume Removed (L) 6 & 12.8 GALS PURGED

Field Testing Equipment

Make	Model	Serial #
YSI	650 MDS	09510159
YSI	600 XL	600336-4m
Lamotte	2020WE	5660-2315
Solinist Water Lev.	101	250978

Time	Volume Removed (liters)	Flow Rate (ml/min)	Depth To Water (ft)	Temp (celsius)	pH (STD)	SPC uS/cm^C	DO (mg/L)	ORP (mV)	Turbidity (NTU)	color
1150	0	200	24.03	18.11	7.15	.095	9.09	68.4	1.34	CLEAR
1155	1		23.89	16.43	6.88	.090	5.14	209.4	1.29	
1200	2		23.9	15.88	4.21	.088	4.97	185.6	1.26	
1205	3		22.8	15.02	4.61	.088	4.7	199.4	1.23	
1210	4		22.9	15.04	4.59	.088	4.69	201.6	1.2	
1215	5		22.3	15.04	4.59	.088	4.68	199.8	1.22	
1220	6	↓	22.2	15.05	4.6	.089	4.66	200.2	1.2	↓
Acceptance Criteria:					10%	10%	10%	10%	<10	

2" screen volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# of Bottles	Preservative	Analyses
1225	NBAFS-SISO8-MW1-080217	125 mL POLY	2	NONE	PFC's

Comments

1 WELL VOL = 12.8 GALS

Signature

8-2-17
Date

Environmental Chemical Corporation

Low Flow/Low Stress Groundwater Sampling Log

Project: New Boston AFS
Date: 8-2-17
Location:
Sampler: J. Donovan
Well ID: SS18 ~~P2-92~~ P2-1
PID Reading: NM
Start Time: 1700 **End Time:** 1740
Well Construction: 2" PVC STICK UP RISER
Depth to water: 4.4 TOC
Well Depth: 5.5 APPROX
Water Column: ~~1.4~~ 1.1
Total Volume Removed (L) 6+ 1.8 GALS

Field Testing Equipment

Make	Model	Serial #
YSI	650 MDS	09J101594
YSI	600 XL	600336-4m
Lamotte	2020WE	5660-2315
Solinist Water Lev.	101	250970

Time	Volume Removed (liters)	Flow Rate (ml/min)	Depth To Water (ft)	Temp (celsius)	pH (STD)	SPC uS/cm^C	DO (mg/L)	ORP (mV)	Turbidity (NTU)	color
1700	0	150	4.6	18.41	5.46	.545	0.98	205.3	2.76	CLEAR
1705	.75	150	4.8	18.31	5.29	.547	0.56	221.8	2.44	
1710	1.5	150	4.8	18.27	5.27	.549	0.57	226.4	2.11	
1715	2.25	150	4.9	18.24	5.19	.547	0.51	219.7	1.86	
1720	3.0	150	4.9	17.76	5.15	.546	0.48	208.4	1.87	
1725	3.75	150	4.9	17.68	5.16	.546	0.42	198.4	1.84	
1730	4.5	150	4.8	17.41	5.16	.544	0.44	196.4	1.79	
1735	5.25	150	4.8	17.42	5.17	.545	0.46	193.2	1.72	
1740	6.0	150	4.8	17.39	5.17	.545	0.45	189.4	1.75	↓
Acceptance Criteria:					10%	10%	10%	10%	<10	

2" screen volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# of Bottles	Preservative	Analyses
1745	NBAFS-SS18-P2-080217	125 POLY	2	NONE	PFOS

Comments 0.15 = 1 WELL VOL

Signature

8-2-17
Date

Environmental Chemical Corporation

Low Flow/Low Stress Groundwater Sampling Log

Project: New Boston AFS
Date: 8-2-17
Location:
Sampler: J. Donovan
Well ID: LF002 MW 3
PID Reading: NM

Start Time: 1500 **End Time:** 1530
Well Construction: 2" PVC STICK UP
Depth to water: 6.1 TOC
Well Depth: 10 FT (TABLE 2-5)
Water Column: 3.9
Total Volume Removed (L) 6+ 1 GAL PURGED

Field Testing Equipment

Make	Model	Serial #
YSI	650 MDS	09510159
YSI	600 XL	600 336-4m
Lamotte	2020WE	5660-2315
Solinist Water Lev.	101	250978

Time	Volume Removed (liters)	Flow Rate (ml/min)	Depth To Water (ft)	Temp (celsius)	pH (STD)	SPC uS/cm^c	DO (mg/L)	ORP (mV)	Turbidity (NTU)	color
1500	0	200	6.3	18.6	7.0	0.30	5.75	115.6	3.24	CLEAR
1505	1		6.27	17.83	3.41	0.29	0.33	227.6	1.98	
1510	2		6.25	17.48	2.14	0.29	6.30	301.1	1.86	
1515	3		6.23	17.74	3.12	6.29	0.26	258.1	1.21	
1520	4		6.23	17.72	3.3	6.29	0.26	252.4	1.03	
1525	5		6.2	17.72	3.35	0.30	0.25	249.6	1.04	
1530	6		6.2	17.73	3.36	0.29	0.25	257.7	0.98	
Acceptance Criteria:					10%	10%	10%	10%	<10	

2" screen volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# of Bottles	Preservative	Analyses
1535	NBAFS-LF002-MW3-080217	125 ML POLY	2	NONE	PFCs

Comments 1 WELL VOL = 0.7 GALS

Signature

8-2-17
Date

1

Environmental Chemical Corporation

Low Flow/Low Stress Groundwater Sampling Log

Project: New Boston AFS
Location:
Well ID: LF003-MW1

Date: 8-1-17
Sampler: J. Donovan
PID Reading: NM

Start Time: 1620 **End Time:** 1700
Well Construction: 2" flush mt
Depth to water: 29.21 TOC
Well Depth: 37.65
Water Column: 8.44
Total Volume Removed (L) 5.25 x 2 gals purged

Field Testing Equipment

Make	Model	Serial #
YSI	650 MDS	09J101594
YSI	600 XL	600336-YM
Lamotte	2020WE	5660-2315
Solinist Water Lev.	101	250978

Time	Volume Removed (liters)	Flow Rate (ml/min)	Depth To Water (ft)	Temp (celsius)	pH (STD)	SPC uS/cm^C	DO (mg/L)	ORP (mV)	Turbidity (NTU)	color
1620	0	150	29.31	14.37	6.03	.169	5.03	90.7	1.86	clear
1625	.75		29.31	13.55	5.25	.160	1.95	116.7	1.85	
1630	1.5		29.31	13.77	3.75	.158	0.52	176.4	1.85	
1635	2.25		29.31	13.57	4.08	.159	0.39	157.0	1.62	
1640	3.0		29.31	13.28	4.10	.158	0.36	142.1	1.42	
1645	3.75		29.31	13.29	4.13	.159	0.35	148.7	1.31	
1650	4.50		29.31	13.30	4.13	.159	0.36	152.4	1.28	
1655	5.25	↓	29.31	13.31	4.14	.159	0.36	151.6	1.22	↓
Acceptance Criteria:					10%	10%	10%	10%	<10	

2" screen volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# of Bottles	Preservative	Analyses
1700	NBAFS-LF003-MW1	125 mL poly	2	NONE	PFC's

Comments 1 well vol = 1.37 gals

Signature

8-1-17
Date

Environmental Chemical Corporation

Low Flow/Low Stress Groundwater Sampling Log

Project: New Boston AFS **Date:** 8-3-17

Location: _____ **Sampler:** J. Donovan

Well ID: GWQ 4 **PID Reading:** NM

Start Time: 1015 **End Time:** 1050

Well Construction: 4" STEEL RISER

Depth to water: 5.77

Well Depth: 21.5 (TABLE 2-5)

Water Column: 15.73

Total Volume Removed (L) 7 + 2.6 TALS PURGED

Field Testing Equipment

Make	Model	Serial #
YSI	650 MDS	09510195Y
YSI	600 XL	600336-YM
Lamotte	2020WE	5660-2315
Solinist Water Lev.	101	250978
GROPUMP	GROTECH	436

Time	Volume Removed (liters)	Flow Rate (ml/min)	Depth To Water (ft)	Temp (celsius)	pH (STD)	SPC uS/cm^c	DO (mg/L)	ORP (mV)	Turbidity (NTU)	color
1015	0	200	5.87	16.1	6.85	0.63	18.37	139.2	3.2	CLEAR
1020	1		5.80	12.58	5.62	0.57	10.14	191.6	2.76	
1025	2		5.82	12.32	3.67	0.56	9.16	241.6	2.21	
1030	3		5.82	11.91	2.88	0.55	8.18	323.4	1.44	
1035	4		5.82	12.1	4.15	0.54	7.96	267.1	1.28	
1040	5		5.82	12.06	5.21	0.54	8.01	240.1	1.21	
1045	6		5.82	12.06	5.01	0.54	8.03	278.1	1.18	
1050	7	↓	5.82	12.07	5.10	0.54	8.01	284.7	1.16	↓
Acceptance Criteria:					10%	10%	10%	10%	<10	

2" screen volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# of Bottles	Preservative	Analyses
1055	NBAFS-GWQ4-080317	125 ML POLY	2	NONE	PFC's

Comments

1 WELL VOL = 2.6 GALS

Jeff Donovan
Signature

8-3-17
Date

Vision Integrity Results	ECC	DAILY SAFETY MEETING SIGN-IN SHEET

Date: 8-1-12 Project Name/Location: New Boston AFB
Company: ECC Person Conducting Briefing: J. Donovan

1. AWARENESS (e.g., special EHS concerns, pollution prevention, recent incidents, etc.):
Vehicle awareness
Obey Base speed limit, no handheld devices to be used while driving
Check for ticks – use insect repellant before walking through grassy areas
Stay hydrated
Trips and falls

2. OTHER ISSUES (HASP changes, new AHAs, attendee comments, etc.):
No new AHA's or HASP changes

Follow PFC sampling protocols

3. DISCUSSION OF DAILY ACTIVITIES/TASKS AND SAFETY MEASURES TO BE USED:

GW low flow sampling for PFCs

4. ATTENDEES (Print Name):

1. Jeff Donovan	2. Fred Santa
3.	4.
5.	6.
7.	8.
9.	10.
11.	12.
13.	14.
15.	16.
17.	18.
19.	20.
21.	22.
23.	24.
25.	26.
27.	28.
29.	30.

ECC Vision Integrity Results	ECC	DAILY SAFETY MEETING SIGN-IN SHEET

Date: 8-2-17 Project Name/Location: New Boston AFB
Company: ECC Person Conducting Briefing: J. Donovan

1. AWARENESS (e.g., special EHS concerns, pollution prevention, recent incidents, etc.):
Vehicle awareness
Obey Base speed limit, no handheld devices to be used while driving
Check for ticks – use insect repellant before walking through grassy areas
Stay hydrated
Trips and falls

2. OTHER ISSUES (HASP changes, new AHAs, attendee comments, etc.):
No new AHA's or HASP changes

3. DISCUSSION OF DAILY ACTIVITIES/TASKS AND SAFETY MEASURES TO BE USED:
CONTINUE
GW low flow sampling for PFCs

FOLLOW PFC SAMPLING PROTOCOL

4. ATTENDEES (Print Name):

1. Jeff Donovan	2.
3.	4.
5.	6.
7.	8.
9.	10.
11.	12.
13.	14.
15.	16.
17.	18.
19.	20.
21.	22.
23.	24.
25.	26.
27.	28.
29.	30.

Vision Integrity Results	ECC	DAILY SAFETY MEETING SIGN-IN SHEET

Date: 8-3-17 Project Name/Location: New Boston AFB
Company: ECC Person Conducting Briefing: J. Donovan

1. AWARENESS (e.g., special EHS concerns, pollution prevention, recent incidents, etc.):
Vehicle awareness
Obey Base speed limit, no handheld devices to be used while driving
Check for ticks – use insect repellant before walking through grassy areas
Stay hydrated
Trips and falls

2. OTHER ISSUES (HASP changes, new AHAs, attendee comments, etc.):
No new AHA's or HASP changes
FOLLOW PFC SAMPLING PROTOCOLS

3. DISCUSSION OF DAILY ACTIVITIES/TASKS AND SAFETY MEASURES TO BE USED:
CONTINUE
GW low flow sampling for PFCs

4. ATTENDEES (Print Name):

1. Jeff Donovan	2.
3.	4.
5.	6.
7.	8.
9.	10.
11.	12.
13.	14.
15.	16.
17.	18.
19.	20.
21.	22.
23.	24.
25.	26.
27.	28.
29.	30.

INSTRUMENT CALIBRATION LOG

Project/Site Name New Boston AFB **Date** 8-1-17 **Weather** SUNNY - 80'S

Calibrated By J. Donovan **Instrument** YSI 556 MPS / YSI SONDE **Serial Number** 09J101594 / 600336-EM

Parameters	Morning Calibration	Calibration Temp	Afternoon Cal Check	Comments
Conductivity (mS/cm^c)	1.0	27.6	1.028	
pH (7)	7.0	27.57	6.98	
pH (4)	4.0	27.61	4.3	
pH (10)	10.0	27.42	10.2	
ORP (mV)	240.0	26.71	237.6	
Barometric Pressure (mmHg)	750.6		750.8	
Dissolved Oxygen (%)	98.6	26.82	97.8	

Lamotte Turbidity Meter	Serial Number	0 NTUs Pre / Post Cal	10 NTUs Pre / Post Cal.	Date
2020 WE	5660-2315	0.0 / 0.6	9.8 / 10.1	8-1-17

INSTRUMENT CALIBRATION LOG

Project/Site Name New Boston AFB **Date** 8-2-17 **Weather** sunny 80's

Calibrated By J. Donovan **Instrument** YSI 556 MDS / YSI Sonde **Serial Number** 09J101594 / 600336-421

Parameters	Morning Calibration	Calibration Temp	Afternoon Cal Check	Comments
Conductivity (mS/cm^c)	1.0	26.4	.996	
pH (7)	7.0	27.3	7.2	
pH (4)	4.0	27.51	3.8	
pH (10)	10.0	27.63	9.7	
ORP (mV)	246.1	26.91	242.7	
Barometric Pressure (mmHg)	751.3		752.1	
Dissolved Oxygen (%)	99.2	26.87	98.7	

Lamotte Turbidity Meter	Serial Number	0 NTUs Pre / Post Cal	10 NTUs Pre / Post Cal.	Date
2020 WE	5860-2315	0.0 / 0.9	10.1 / 9.7	8-2-17

INSTRUMENT CALIBRATION LOG

Project/Site Name New Boston AFB **Date** 8-3-17 **Weather** PTLY SUNNY - 80's

Calibrated By J. DONOVAN **Instrument** YSI 556 MPS / YSI SONDE **Serial Number** 09J 101394 / 600 336-4M

Parameters	Morning Calibration	Calibration Temp	Afternoon Cal Check	Comments
Conductivity (mS/cm^c)	1.0	25.6	1.031	
pH (7)	7.0	24.8	6.96	
pH (4)	4.0	26.1	3.95	
pH (10)	10.1	23.2	10.4	
ORP (mV)	246.1	24.7	250.1	
Barometric Pressure (mmHg)	752.1		752.3	
Dissolved Oxygen (%)	99.6	23.8	97.6	

Lamotte Turbidity Meter	Serial Number	0 NTUs Pre / Post Cal	10 NTUs Pre / Post Cal.	Date
2020 WE	5660-2315	0.0 / 0.8	9.9 / 10.1	8-3-16

New Boston AFS
New Boston, NH
Groundwater Level Measurement Sheet

Pg 1 of 2

Project Site: New Boston AFS
Location: SIS8, 13, 18, GWQ-3
Date: 8-16-17

ALL WELLS MEAS. FROM TOP PVC RISER

Water Level Meter: Solinist 101
Weather: SUNNY - 70's
Field Crew: J. Donovan

Well ID	Construction	Depth to Water (FT)	Depth of Well (FT)	Comments
SIS13-MW1	2" STICK UP	9.13	NM	TUBING IN WELL
SIS13-MW2	2" PVC STICK UP	5.67	NM	THIS WELL BLOCKED AT AS MEAS. ON
SIS14-MW1	—	—	—	—
SS014-MW1	2" STICK UP	23.19	NM	
LF003-MW3	2" FLUSH MT	39.57	NM	
LF003-MW2	2" FLUSH MT	38.26	NM	TUBING IN WELL
LF003-MW1	↓	29.75	NM	↓
SS008-MW4	2" STICK UP	42.60	NM	"
SS008-MW3	2" FLSH. MT	DRY	NM	
SIS18-MW1	2" STICK UP	30.45	NM	
SIS18-MW3	2" STICK UP	28.95	NM	TUBING IN WELL
SIS18-MW5	2" FLUSH MT	10.62	NM	
SIS18-PZ1	2" PVC STICK UP	4.31	NM	
SIS18-PZ2	↓	DRY	—	
SIS18-PZ3	↓	DRY	—	
SIS18-MW4	—	NOT FOUND	—	NOT FOUND
SIS8-MW1	2" STICK UP	22.34	NM	TUBING IN WELL
LF001-MW1	2" FLUSH MT	4.81	NM	
GWQ-4	4" STEEL STICK UP	5.73	NM	STICK UP
GWQ-3	6" STEEL	6.93	NM	STICK UP
LF002-MW3	2" STICK UP	6.09	NM	TUBING IN WELL
LF002-MW1	2" FLUSH MT	DRY	NM	DRY
LF002-MW2	2" STICK UP	7.43	NM	
GWQ-1	6" STEEL	11.94	NM	STICK UP

Pg 2 of 2

New Boston AFS
New Boston, NH
Groundwater Level Measurement Sheet

Project Site: New Boston AFS

Location: SIS8, 13, 18, GWQ-3

Date: 8-16-17

Water Level Meter: Solinist 101

Weather: SUNNY 70's

Field Crew: J. Donovan

Well ID	Construction	Depth to Water (FT)	Depth of Well (FT)	Comments
GWQ-2	4" STEEL	NM	NM	COULD NOT GET STEEL CAP OFF
MW3 SS009-MW3	2" STICK UP	39.84	NM	
SS009-MW2	2" FLUSH MT	8.43	NM	
SS009-MW1	2" FLUSH MT	5.40	NM	
SS008-MW1	2" FLUSH MT	10.17	NM	

CONTENTS

PAGE	REFERENCE	DATE

8-1-17 NBAFS SUNNY - 80's

1000 J. DONOVAN (ECC) AT NB.
TO CONDUCT LOW FLOW GW
SAMPLING FOR PFC'S.
1015 CAL. SAMPLING EQUIP
1030 F. SANTOS ON SITE
1035 HTS MEETING
REVIEW PFC QAPP PROTOCOLS
WILL LOW FLOW 6 LOCATIONS:
GW QF
LF003-MW1
SI508-MW1
SI513-MW1
↓ -MW2
SI518-P2-2,

NOTE:
NO SUN
SCREEN WILL BE
USED DURING
SAMPLING EVENT

1050 LOCATE SI508-MW1
1110 " LF003-MW1
1130 " GW QF-4
1145 AT SI513-MW2 W/ JON DAVIS
(AECOM RP), WILL START SAMPLING
HERE, WELL IS BROKEN JUST
BELOW GRND, SURFACE, CAN BE
SAMPLED. CANNOT GO DOWN
RISER,
1200 PUTTING 2 STAKES ON

Rite in the Rain.

29 (2) 8-1-17

EACH SIDE OF SIS13MW2 TO
STABILIZE RISER PRIOR TO
SAMPLING.

1245 DEPTH TO GW 5.58 TOC
BLOCKED AT 10.72 TOC
MUST BE CLOGGED DUE TO
BROKEN RISER.

1220 JON DAVIS SAYS DON'T
BOTHER WITH SIS13MW2
SAMPLE ALTERNATIVES (PER
JON DAVIS):

1ST LF002 MW-01
2ND ↓ -03
3RD -02

1235 AT SIS13-MW1 - WELL LOCKED
KEY FROM JEFF OJA DOES
NOT WORK, OK TO CUT
LOCK (J. DAVIS)

1255 BEGIN PURGING 1 WELL VOL.
(2.7 GALS) FROM SIS13MW1
GW = 9.07 TOC WELL = 26'

1300 J. DAVIS OFF SITE.

1345 BEGIN RECORDING PARAMETERS
WILL COLL DUP + MS/MSD AT

8-1-17 (3) 27

SIS13-MW1

1430 COLL NBAFS-SIS13-MW1-080117
MS/MSD + DUP 1

1500 AT LF003MW1 - TUBING
ALREADY IN WELL - 1/2" ID
WILL PULL TUBING & USE
NEW HDPE TUBING.

NOTE: GW ELEV PROBE DE-CON'ED
BETWEEN EACH WELL WITH
ALCONOX & PFC FREE WATER
(FROM LAB) & PFC FREE
WATER RINSE. ONLY USING
WATER ELEV. METER TO GET
DEPTH TO WATER, NOT
TOTAL WELL DEPTH, USING
DEPTHS FROM TABLE 2-5 FOR
WELL DEPTHS TO GAUGE WELL
VOLUMES.

1518 BEGIN REMOVING 1 WELL
VOL. FROM L003-MW1
1 WELL VOL = 1.37 GALS

1615 1 1/2 GALS OUT OF L003MW1
WILL START PARAMETER READINGS

1700 COLL NBAFS-LF003-MW1-080117

Rite in the Rain.

28

8-1-17

1715 ALL PURGE WATER PUT IN DRUM. ALL SAMPLES ON ICE.

1730 OFF SITE.

1900 POST CAL/CAL SAMPLING EQUIP. AT HOME

[signature]

1

8-2-17 NBAFS SUNNY ~80's

0840 J. DONOVAN (ECC) ONSITE AT SS508-MW1. WILL CONT. W/ PFC LOW FLOW GW SAMPLING

0930 DEPTH TO WATER AT SS508-MW1 ≃ 22.1 TOC - WELL DEPTH REPORTED TO BE 101 FT (FROM TABLE 2-5), 1 WELL VOL = 12.8 GALS. WILL PURGE 1 WELL VOL BEFORE RECORDING PARAMETERS. BEGIN PURGING AT 0930

0905 APPROX. 2 GALS PURGED. GW LEV. STEADY AT 23.1 TOC

0945 STILL PURGING - WAT LEV. = 23.4

1150 13 GALS (APPROX) REMOVED - WILL START RECORDING PARAMETERS.

1225 COLL NBAFS-SS508-MW1-080217

1245 AT ALTERNATE LOCATION TO SS513-MW2 - AT LF002-MW1 PER J. DAVIS INSTRUCTIONS MW1 IS A FLUSH MT, MW 2+3 ARE STICKUPS.

1255 AT LF002 MW1 - WENT TO GAUGE GW LEV - WELL IS DRY TOTAL WELL DEPTH = 14.4 TABLE 2-5 SAYS WELL SHOULD BE 25.7

8-2-17

SURFACE ELEV. + TOC ELEV MATCH ACCORDING TO TABLE 2-5 INDICATING MW1 IS A FLUSH MT. BUT DEPTH'S OF WELLS DOESN'T MATCH. WELL BLOCKED OF 14 FT.

1420 CALL FROM FASTSAMPS PER T. DAVIS - DUE TO MT BEING UNABLE TO SAMPLE SISØ3 MW2 (OBSTRUCTED) AND LF002 MW1 (DRY AT 14 FT) COLL ALTERNATIVE SAMPLE AT LF002 MW3

1425 DEPTH TO WAT. LF002 MW3 = 6.1 TOC TABLE 2-5 SCRS WELL DEPTH = 10.7 1 WELL VOL = 0.6 GAL WILL PURGE 1 GAL BEFORE TAKING READINGS

1430 BEGIN PURGING 1 WELL VOL OUT OF LF002 MW3

1500 BEGIN RECORDING GW PARAMETERS

1535 COLL NBAFS-LF002-MW3-080217

8-2-17

AT SISI8 PZ2 - PZ2 DRY

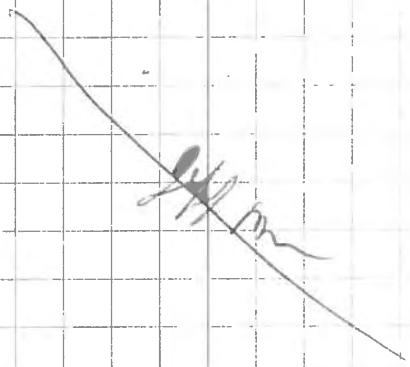
1610 BEGIN PURGING PZ-1 DEPTH TO WAT = 4.4 H OF WELL = 5.5 (APPROX) 1 WELL VOL = 0.18 GALS

1700 APPROX 2 GALS PURGED (LEFT SITE) BEGIN READINGS AT PZ-1

1745 COLL NBAFS-SISI8-PZ-1-080217

1800 ALL SAMPLES ON ICE LEAVE SITE

1930 POST CAL SEAL SAMPLING EQUIP AT home



22(1)

8-3-17 NBAFS PTLY SUNNY - 80's

0815 J. DONOVAN (ECC) ON SITE AT GWQ4 LOCATION. OPENED GWQ4 W/TOOLS. DEPTH TO GW = 3.77
" OF WELL = 21.5 (TABLE 2-5)
1 WELL VOL = 2.6 GALS

0900 BEGIN PURGING 1 WELL VOL. FROM GWQ4.

1015 APPROX 3 GALS PURGED FROM GWQ4, WILL START TAKING PARAMETER READINGS

1055 COLL. NBAFS-GWQ4-080317

1130 COLL. NBAFS-RB-080317 (RINSATE BLK)

PFC FREE WATER FROM LAB USED FOR RINSATE BLK, POURED OVER TIP OF GW LEV. METER

1200 SAMPLES ON ICE - POST CAL EQUIP.

1230 OFF SITE - GOING TO FRANK TO SHIP SAMPLES OVERNITE TO MAXXAM LABS
POST CAL EQUIP.

Jeff Don...

8-16-17 SUNNY - 70's ① 85

0915 J. DONOVAN (ECC) ON SITE TO TAKE GW LEVEL READINGS IN MW'S, WILL NOT MEAS. TOTAL DEPTHS TO ~~AVOID ANY~~ TO MINIMIZE GW CONTACT WITH WAT. LEV. PROBE. WILL ALSO COLL. IDW SAMPLE FOR DISPOSAL PURPOSES.

1215 COLL IDW GW SAMPLE NBAFS-IDW-081617 FOR WASTE CHARACTERIZATION BTEX, METALS + PH PER TOM CLAIRE - TRADEBE REP.

1230 DRUM SEALED, LABEL (NON HAZ) IN PLACE, PLASTIC PUT OVER TOP OF DRUM.

1440 GAUGED 27 MW'S - 9 MW'S INSIDE FENCELINE NOT GAUGED
SISI8 MW 2 + 4 NOT FOUND

1445 RETURN KEYS TO J. OJA'S OFFICE (LEFT ON DESK)

1455 OFF SITE - SAMPLES ON ICE

*NOTE: GW LEVEL DE-CONED BETWEEN EACH MW W/ PFC FREE WATER + ALCONOX

Jeff Don...

Rite in the Rain

ATTACHMENT 4

Laboratory Chains of Custody

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Maxxam
A Bureau Veritas Group Company

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

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#31868 ECC	Company Name:	SAME	Quotation #:		Maxxam Job #:	Bottle Order #:
Attention:	~~Jeff Donovan~~ FRED SANTOS	Attention:	JACKSON "KIKER"	P.O. #:			622216
Address:	43 Broad St. Suite A301	Address:		Project:	NEW BOSTON AFS		
	Hudson MA 01749			Project Name:		COC #:	Project Manager:
Tel:	(508) 229-2270 x Fax:	Tel:	Fax:	Site #:		C#622216-02-01	Stephanie Pollen
Email:	~~JDonovan@ecc.net~~ FSANTOS@ECC.NET	Email:	JKIKER@ECC.NET	Sampled By:	J. DONOVAN		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
☐ Table 1 ☐ Res/Park ☐ Medium/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ For RSC
☐ Table ___

Other Regulations
☐ CCME ☐ Sanitary Sewer Bylaw
☐ Reg 558 ☐ Storm Sewer Bylaw
☐ MISA Municipality ___
☐ PWQO
☐ Other ___

Special Instructions
*23 PFCS PER QAPP WORKSHEET #15A

ERPIMS EDD

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered	Metals / Hg / Cr VI	# of Bottles	Comments
1		NBAFS-SS13-MW1-080117	8-1-17	1430	GW		X	2	
2		-SS13-MW1-080117		1430					MS/MSD
3		-LF003-MW1-080117		1700					
4		-DUP1-080117		0000					
5		-SS08-MW1-080217	8-2-17	1225					
6		-LF002-MW3-080217		1535					
7		-SS18-P2-1-080217		1745					
8		-GWQ4-080317	8-3-17	1055					
9		-RB-080317		1130	PFC FREE WATER FROM LAB			*	RINSATE BLK.
10	JD								

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
[illegible] / JEFF DONOVAN	8-3-17	1400	FEDEX	8-3-17	1400	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
		Present		
		Intact		

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

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ATTACHMENT 5

Data Validation Report

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ECC Data Review Worksheet
Project: New Boston AFS

Perfluorinated Compounds
Review Criteria: Draft Final Preliminary PFC Investigation Work Plan for Site-Wide Groundwater (Based on Pease AFB UFP-QAPP)

Validation Level	Matrix	Chemical Preservation	Temperature Sample Receipt	Laboratory	SDG Number
Tier II	Groundwater	Not Applicable	1 Cooler 5.4 °C	Maxxam Analytics Laboratory, Mississauga, Ontario, Canada	B7G7896

Field Identification and Laboratory Number of Samples Evaluated:

Field ID	Lab Sample Number	Sample Status
NBAFS-SIS13-MW1-080117	EWS022	Duplicated Field Sample
NBAFS-LF003-MW1-080117	EWS023	
NBAFS-DUP1-080117	EWS024	Field Duplicate
NBAFS-S1S08-MW1-080217	EWS025	
NBAFS-LF002-MW3-080217	EWS026	
NBAFS-SIS18-PZ-1-080217	EWS027	
NBAFS-GWQ4-080317	EWS028	
NBAFS-RB-080317	EWS029	Rinsate Blank

Note: Samples are described below in the data worksheets by reference to the last two digits of the Lab Sample Number

Data Qualifiers from the Pease QAPP
U-The analyte was analyzed for, but was not detected above the reported detection limit.
J-The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ-The analyte was not detected above the reported detection limit and the sample detection limit is estimated.
R-Rejected.
B-The analyte was detected in an associated blank at a concentration greater than 1/10 the concentration detected in the sample.
Q-The result should be both **B** and **J** qualified.

REVIEW ITEMS	ACCEPTANCE CRITERIA	SAMPLES AFFECTED/Rationale	Inven-tory	QUAL	BIAS
COC	Unbroken custody (accept or if broken R) Temp- 6°C ≤ X ≤ 2°C (J detects, R – ND) No chemical preservation per method (HDPE container, temperature), J, UJ, or R (function of HT and compound)	1. Cooler temperatures between 2 - 6 °C, therefore no sample qualifications. Sample custody transferred from Field Team Leader to lab sample custodian. 2. Unbroken Chain of Custody. No samples qualified.	X	-	
Holding Time	14 days to extraction and 28 days to analysis, if preserved J –detects, UJ or R –non-detects (function of time) *transcription errors	All samples were extracted and analyzed within holding times. No qualifications were required.	X	-	
Results > Cal Range or <Cal Range	1) >Upper Cal Range J-detects - ensure instrument blank performed 2) <LOQL but >DL – J –detects (estimated) listed on data summary sheet.	All compounds were within the upper calibration range. Samples <LOQ but >DL were qualified J (estimated)	X	J	
Lab Blanks (method blanks)	No target compounds > RL	Method Blank was non-detect for native PFCs. No samples qualified.	X	-	

ECC Data Review Worksheet
Project: New Boston AFS

Perfluorinated Compounds
Review Criteria: Draft Final Preliminary PFC Investigation Work Plan for Site-Wide Groundwater (Based on Pease AFB UFP-QAPP)

REVIEW ITEMS	ACCEPTANCE CRITERIA	SAMPLES AFFECTED/Rationale	Inven-tory	QUAL	BIAS
Equip Blank	No analytes > RL	Equipment Blank was sample #29. Equipment blank/rinsate blank was non-detect for PFCs	X	-	
Isotope Dilution/ Internal Standards (listed in SDG as surrogate recovery)	C-13 and O-18 Internal standards 50-150% >UCL (J detected.) <LCL (J detected., UJ non-detect) <10% (R)	All internal standards within MPC limits. No samples qualified	X	-	
Surrogate	Lab limits -SOP 70-130%	All surrogates within MPC limits, except for N-ethy-d5-perfluoroctane-Sufonam in samples #22/#24 (FD pair)and #26. Surrogate was below the lower control limit. Sample re-injected to confirm low %R.	X	#22/#24 /#26 J Detects, UJ Non-detects	
LCS %R	Laboratory %R 70-130%	All LCS %Rs within laboratory control limits. No samples qualified	X	-	
MS/MSD Recovery	MS/MSD %R 60-140%; 50-150% RPD Control Limits	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were planned to be performed on extra water volume collected for sample #22. However, sample #22 matrix spike sample was lost during extraction. All samples were re-extracted into another batch, but insufficient sample remained for a site specific MS/MSD sample to be performed. Potential matrix issues will be determined by the internal standard recoveries and chromatograms.	-	-	
LCS/LCSD RPD	30% RPD	LCS/LCSD RPDs in limits.	X	-	
Field Dup RPD	30% FD RPD	Field duplicate pair #22/#24. See table below. All FD RPDs in limits.	X	-	
Tune check	Method SOP	MS/MS tuning report provided for parent ions	X	-	
Initial Cal Multipoint (instrument evaluation)	%RSD 35 or 50 % (depends on analyte) R^2 <0.99 S/N >5	Instrument ID: LCMSO40 8/19/2017 Calibration in limits.	X	-	
Analyte Detection	Relative Retention Time 0.75 to 1.25, Transition Ratios -SOP m/z Chromatographic peak shape	Acceptable	X	-	
2nd Source ICV	± 25% of the true value J –detects UJ-non detects	ICV in limits.	X	-	
CCV	± 25% of the true value J –detects UJ-non detects	CCV in limits.	X		

REVIEW ITEMS	ACCEPTANCE CRITERIA	SAMPLES AFFECTED/Rationale	Inven-tory	QUAL	BIAS
Overall Evaluation of Data	Appropriate method Evaluate any analytical problems Evaluate sampling errors – field contamination, sample hold times	Analytical Error Evaluation: Acceptable laboratory precision and accuracy. Results usable for making project decisions, as qualified. 1. All surrogate recoveries were within the control limits, except for one surrogate in 3 samples came in less than the lower control limit. 2. LCS: All %Rs within control limits. 3. MS/MSD: -submitted but not able to be analyzed by laboratory 4. Method Blank: all ND 5. ICAL; Acceptable linearity. 6. ICV: %R acceptable 7. CCV: %R acceptable. Sampling Error Evaluation: 1. Equipment Blank non-detect for PFCs. 2. FD table shown below. FD RPDs in limits. Overall sampling and analysis precision is acceptable.	X	-	

Field Duplicate Table:

Maxxam ID	EWS022	EWS024	
Sampling Date	2017/08/01 14:30	8/1/2017	
COC Number	622216-02-01	622216-02-01	
	NBAFS-SIS13-MW1-080117	**NBAFS-DUP1-080117**	
Miscellaneous Parameters			**FD RPD**
6:2 Fluorotelomer sulfonate	0.031	0.040	25.4
Perfluorobutane Sulfonate (PFBS)	0.012	0.014	15.4
Perfluoroheptanoic Acid (PFHpA)	0.022	0.02	9.5
Perfluorohexane Sulfonate (PFHxS)	0.089	0.11	21.1
Perfluorohexanoic Acid (PFHxA)	0.050	0.053	5.8
Perfluoro-n-Octanoic Acid (PFOA)	0.019	0.02	5.1
Perfluorooctane Sulfonate (PFOS)	0.20	0.22	9.5
Perfluoropentanoic Acid (PFPeA)	0.065	0.064	1.6

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ATTACHMENT 6

Laboratory Analytical Data Package

The Laboratory Data Package included on Compact Disk only due to file size

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