SUMMARY OF SOIL LABORATORY RESULTS - Perfluorinated Compounds in Soil
CAMBRIDGE BAY AIRPORT FTA REMEDIATION

Parameter *Sample ID* *GPS Location (Easting, Northing)* *Collection Date* *Laboratory Job #* *Laboratory Report Date*	**Standard 1** FCSAP (Coarse-Grained)	**Standard 2** Interim Federal Soil Quality Guidelines (commercial, freshwater protection)	**Units**		**Blank for PFOS** 17-Aug-15 B571920 14-Sep-15	**Northeast Wall SA14 @1.7 m** 17-Aug-15 B571920 14-Sep-15	**South Floor SA8 @ 1.7 - 2 m** 19-Aug-15 B572551 15-Sep-15	**South Wall SA24@1.7 m** 18-Aug-15 B572411 4-Sep-15	**South Wall SA23 @ 1 m** 18-Aug-15 B572411 4-Sep-15	**3-09-4M @ 1 m** 14-Aug-15 B570599 4-Sep-15	**FD (3-09-4M @ 1m)** 14-Aug-15 B570599 4-Sep-15	**3-09-4M (floor at 2 m)** 15-Aug-15 B570354 4-Sep-15
Inorganics												
Moisture	nv	nv	%		3	12	11	13	4.7	12	10	8.1
Perfluorinated Compounds												
Perfluorobutane Sulfonate (PFBS)	nv	nv	ug/kg		<0.1	0.6	1.6	<5	<5	20	12	2.9
Perfluorobutanoic acid	nv	nv	ug/kg		<0.1	0.6	0.9	<5	<5	9	4.5	2.7
Perfluorodecane Sulfonate	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	<5	<5	<5
Perfluorodecanoic Acid (PFDA)	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	<0.1	<0.1	<0.1
Perfluorododecanoic Acid (PFDoA)	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	<0.1	<0.1	<0.1
Perfluoroheptanoic Acid (PFHpA)	nv	nv	ug/kg		<0.1	0.2	0.3	<5	<5	10	4.7	0.6
Perfluorohexane Sulfonate (PFHxS)	nv	nv	ug/kg		<0.1	3.8	2.5	53	<5	480	210	1.6
Perfluorohexanoic Acid (PFHxA)	nv	nv	ug/kg		<0.1	2.3	3.8	13	<5	49	35	10
Perfluoro-n-Octanoic Acid (PFOA)	nv	nv	ug/kg		<0.1	0.5	0.3	6	<5	27	11	0.5
Perfluorononanoic Acid (PFNA)	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	<0.1	<0.1	0.2
Perfluorooctane Sulfonamide (PFOSA)	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	1.1	0.4	0.3
Perfluorooctane Sulfonate (PFOS)	1000	130	ug/kg		0.2	14	0.5	**220**	**430**	45	96	29
Perfluoropentanoic Acid (PFPeA)	nv	nv	ug/kg		<0.1	1.6	1.2	10	<5	14	10	3.4
Perfluorotetradecanoic Acid	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	<0.1	<0.1	<0.1
Perfluorotridecanoic Acid	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	<0.1	<0.1	<0.1
Perfluorodecanoic Acid (PFUnA)	nv	nv	ug/kg		<0.1	<0.1	<0.1	<5	<5	<0.1	<0.1	<0.1

Notes:

< denotes less than laboratory reportable detection limitis

ug/kg denotes micrograms per kilogram

GPS denotes Global Positioning System. Northing and Eastings from Universal Transverse Mercator coordinate system, Zone 13W.

n.c. denotes not calculated.

nv denotes no value, no standard exists.

RPD Relative Percent Difference = ((x1-x2)/((x1+x2)/2)) * 100%; absolute value

200 **Bold** and yellow fill - value exceeds EC Guideline

200 **Bold** and green fill - value exceeds Interim Federal Soil Guideline for coarse-grained soil

1 - FCSAP, Interim Advice to Federal Departments for the Management of Federal Contaminated Sites Containing PFOS, October 1, 2015. Commercial, direct soil contact

2 - Interim Federal Soil Quality Guidelines for PFOS, October 2015, Commercial, Coarse-Grained Soil, Freshwater Life Pathway

SUMMARY OF SOIL LABORATORY RESULTS - Groundwater
CAMBRIDGE BAY AIRPORT FTA REMEDIATION

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Parameter / *Sample ID* / *Collection Date* / *Laboratory Job #* / *Laboratory Report Date*	[1] Interim Federal GW Quality Guidelines (coarse-grained, freshewater life protection)	Units	**3-09-4M** 28-Jul-15 B567564 18-Aug-15	**3-09-6M** 28-Jul-15 B567564 18-Aug-15	**YCB-01** 28-Jul-15 B567564 18-Aug-15
Perfluorinated Compounds					
Perfluorobutane Sulfonate (PFBS)	nv	ug/L	44	2.6	10
Perfluorobutanoic acid	nv	ug/L	38	4.9	15
Perfluorodecane Sulfonate	nv	ug/L	<0.8	<0.8	<0.8
Perfluorodecanoic Acid (PFDA)	nv	ug/L	<0.8	<0.8	<0.8
Perfluorododecanoic Acid (PFDoA)	nv	ug/L	<0.8	<0.8	<0.8
Perfluoroheptanoic Acid (PFHpA)	nv	ug/L	17	7	14
Perfluorohexane Sulfonate (PFHxS)	nv	ug/L	260	72	250
Perfluorohexanoic Acid (PFHxA)	nv	ug/L	190	23	96
Perfluoro-n-Octanoic Acid (PFOA)	nv	ug/L	19	8	15
Perfluorononanoic Acid (PFNA)	nv	ug/L	<0.8	1.1	<0.8
Perfluorooctane Sulfonamide (PFOSA)	nv	ug/L	<0.8	<0.8	<0.8
Perfluorooctane Sulfonate (PFOS)	60	ug/L	**130**	**400**	18
Perfluoropentanoic Acid (PFPeA)	nv	ug/L	100	20	110
Perfluorotetradecanoic Acid	nv	ug/L	<0.8	<0.8	<0.8
Perfluorotridecanoic Acid	nv	ug/L	<0.8	<0.8	<0.8
Perfluorodecanoic Acid (PFUnA)	nv	ug/L	<0.8	<0.8	<0.8

Notes:

1 Interim Federal Quality Guidelines for PFOS, October 2015, Freshwater Life pathway

< denotes less than laboratory reportable detection limitis

ug/L denotes micrograms per litre

SUMMARY OF SOIL LABORATORY RESULTS
CAMBRIDGE BAY AIRPORT FTA REMEDIATION

Parameter	*Sample ID* *Collection Date* *Laboratory Job #* *Laboratory Report Date*	**Standard** CCME CWS Commercial Ecological Soil Pathway Coarse-Grained	**Units**	**3-09-4M @1.0m** 14-Aug-15 B570599V3 9-Sep-15	**FTA North East Wall SA14 -1.7m** 17-Aug-15 B571920 14-Sep-15	**FTA South Wall SA24 - 1.7m** 18-Aug-15 B572411 4-Sep-15	**FTA South Floor SA8 - 1.7m** 19-Aug-15 B572551V2 15-Sep-15
pH		nv	pH	7.4	7.63	7.57	7.89
Calculated Parameters							
Anion Sum		nv	meq/L	18	110	26	110
Cation Sum		nv	meq/L	20	110	21	110
Cation/EC Ratio		nv	---	11	10	9.8	10
Volatile Organic Compounds							
Benzene		nv	mg/kg	3.7 (2)	<0.0050	<0.0050	<0.005
Toluene		nv	mg/kg	15	<0.020	<0.020	<0.02
Ethylbenzene		nv	mg/kg	11	<0.010	<0.010	<0.01
Xylenes (total)		nv	mg/kg	52	<0.040	<0.040	<0.04
Soluble Parameters							
Soluble Chloride (Cl)		nv	mg/L	340	3000 (1)	410	2300 (1)
Soluble Conductivity		nv	dS/m	1.8	10	2.1	11
Soluble pH		nv	pH	7.40	7.63	7.57	7.89
Sodium Adsorption Ratio		nv	N/A	3.7	23	3.5	19
Soluble Calcium (Ca)		nv	mg/L	86	160	130	240
Soluble Magnesium (Mg)		nv	mg/L	71	180	52	230
Soluble Sodium (Na)		nv	mg/L	190	1800	190	1700
Soluble Potassium (K)		nv	mg/L	67	190	85	180
Saturation %		nv	%	29	30	20	32
Soluble Sulphate (SO4)		nv	mg/L	430	970	700	2000
Petroleum Hydrocarbons F1							
F1 (C6 to C10)		320	mg/kg	**2500**	<12	<12	<12
F1 (C6 to C10 minus BTEX)		nv	mg/kg	2600	<12	<12	<12
F2 (C10-C16 Hydrocarbons)		260	mg/kg	**310**	<10	<10	<10
F3 (C16-C34 Hydrocarbons)		1700	mg/kg	220	<50	<50	<50
F4 (C34-C50 Hydrocarbons)		3300	mg/kg	<50	<50	<50	<50
Parameters							
Soluble Sodium (Na)		nv	mg/L	190	1800	190	1700
Calculated Sodium (Na)		nv	mg/kg	55	540	38	560
Misc. Inorganics							
Fraction of Organic Carbon		nv	g/g	0.013	0.00089	0.0021	0.00058
Total Organic Carbon		nv	%	1.3	0.089	0.21	0.058

Bold - value exceeds CCME Guideline

nv - no standard exists

1 - Canada-Wide Standard for Petroleum Hydrocarbons in Soil, January 2008, Ecological Soil Contact, Commercial, Coarse-grained soils

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

(2) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

SUMMARY OF RPDs - Perfluorinated Compounds in Soil

CAMBRIDGE BAY AIRPORT FTA REMEDIATION

Parameter	*Sample ID* / *Collection Date* / *Laboratory Job #* / *Laboratory Report Date*	Units	3-09-4M @ 1 m 14-Aug-15 B570599 4-Sep-15	FD (3-09-4M @ 1m) 14-Aug-15 B570599 4-Sep-15	RPD (%)
Inorganics					
Moisture		%	12	10	
Perfluorinated Compounds					
Perfluorobutane Sulfonate (PFBS)		ug/kg	20	12	**50.0**
Perfluorobutanoic acid		ug/kg	9	4.5	**66.7**
Perfluorodecane Sulfonate		ug/kg	<5	<5	n.c.
Perfluorodecanoic Acid (PFDA)		ug/kg	<0.1	<0.1	n.c.
Perfluorododecanoic Acid (PFDoA)		ug/kg	<0.1	<0.1	n.c.
Perfluoroheptanoic Acid (PFHpA)		ug/kg	10	4.7	**72.1**
Perfluorohexane Sulfonate (PFHxS)		ug/kg	480	210	**78.3**
Perfluorohexanoic Acid (PFHxA)		ug/kg	49	35	33.3
Perfluoro-n-Octanoic Acid (PFOA)		ug/kg	27	11	**84.2**
Perfluorononanoic Acid (PFNA)		ug/kg	<0.1	<0.1	n.c.
Perfluorooctane Sulfonamide (PFOSA)		ug/kg	1.1	0.4	**93.3**
Perfluorooctane Sulfonate (PFOS)		ug/kg	45	96	**72.3**
Perfluoropentanoic Acid (PFPeA)		ug/kg	14	10	33.3
Perfluorotetradecanoic Acid		ug/kg	<0.1	<0.1	n.c.
Perfluorotridecanoic Acid		ug/kg	<0.1	<0.1	n.c.
Perfluorodecanoic Acid (PFUnA)		ug/kg	<0.1	<0.1	n.c.

n.c. denotes not calculated

*RPDs have only been considered where a concentration is greater than 5 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (5-10 x EQL); 50 (10-30 x EQL); 50 (> 30 x EQL))