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**B3J 1T3**

**Bid Fax: (902) 496-5016**

**SOLICITATION AMENDMENT  
MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

**Comments - Commentaires**

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**B3J 1T3**

<b>Title - Sujet</b> Remedial Excavation Shannon Park	
<b>Solicitation No. - N° de l'invitation</b> EB218-191957/A	<b>Amendment No. - N° modif.</b> 003
<b>Client Reference No. - N° de référence du client</b> EB218-19-1957	<b>Date</b> 2018-11-22
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$PWA-110-5814	
<b>File No. - N° de dossier</b> PWA-8-80074 (110)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-11-29</b>	<b>Time Zone</b> Fuseau horaire Atlantic Standard Time AST
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Collier (PWA), Susan	<b>Buyer Id - Id de l'acheteur</b> pwa110
<b>Telephone No. - N° de téléphone</b> (902) 401-3352 ( )	<b>FAX No. - N° de FAX</b> (902) 496-5016
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
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<b>Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

This Solicitation Amendment 003 is being raised to answer the following questions:

**Question 1:**

Is there soil metals leachate analysis/results available for sample MW4-02-2 (Table E-3, Metals in Soil)? The arsenic concentrations exceed some of the soil disposal facility acceptance criteria for arsenic. Leachate analysis required to confirm acceptance of the soil from this area.

**Answer 1:**

In reviewing the historical report which had the original results for MW4-02-2, it was noted that there is an error in the arsenic value that was carried in the Appendix B - table E-3. The arsenic concentration for sample MW4-02-2 (0-0.6m) should be 48 mg/kg (not 485 mg/kg). This concentration is within normally occurring ranges.

**Question 2:**

Is it possible to clarify the locations of samples MW4-02-2 and TH18-01-GS1 from drawing 300-1? Some of the sample locations are not clearly visible on the drawing. Former wharf area vs. former parking lot area.

**Answer 2:**

The location of MW4-02-2, in relation to the other MWs in the area of the Former Parking Lot is provided on the attached drawing 300-1. With respect to TH18-01, this was a sample that was located on the shoreline below the high water mark outside the project boundaries and is not relevant to this remediation project.

**Question 3:**

What is the expected soil sample analysis turn around time? What is the timeline between sample analysis/receipt and being able to backfill areas of excavation? (Sample turn around time)

**Answer 3:**

Please refer to section 31 23 33.01, clause 2.9.1.2 regarding confirmation sampling, analysis and assessment as it pertains to backfilling.

**Question 4:**

Would you be able to provide the complete Stantec report including the bore hole logs?

**Answer 4:**

Available bore hole logs are provided see attached. Complete historical reports will be supplied to the winning bidder.

**Question 5:**

Have samples been analyzed for SAR and EC? If yes, can this information be provided? If not, will this analysis be done and the information provided prior to the tender closing date.

**Answer 5:**

Yes, four samples for SAR and EC have been collected and processed, all results are below SAR and EC guidelines. The chemistry tables and drawing showing locations are included.

**Question 6:**

Can you please supply borehole logs and location diagram for the previous investigations completed at the site?

**Answer 6:**

See answer 4

**Question 7:**

Is there analytical data for Sodium Adsorption Ratio (SAR) and Electrical Conductivity (EC) available? If not, will it be provided prior to the closing date of the tender?

**Answer 7:**

Yes, four samples for SAR and EC have been collected and processed, all results are below SAR and EC guidelines. The chemistry tables and drawing showing locations are included.

**ALL OTHER TERMS AND CONDITIONS WILL REMAIN THE SAME.**

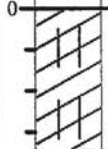
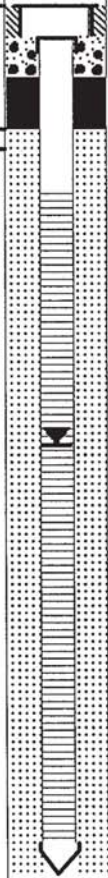


## Monitoring Well: MW1-02-3

Client: DCC

Location: Shannon Park

Project No: 20475B

Logged By: Roger Goyette

Depth (m)	Strata Plot	Description	Depth/Elev.	Sample No.	Sample Type	N value	Recovery (%)	Headspace (ppm)	Well Data	Remarks	Depth (m)
0		Ground Surface	0								0
		Dark brown organic sandy clay soil. No hydrocarbon odour		1	SS	11	20	5		Flushmount Cap, J-Plug Bentonite	
				2	SS	ref	2	5			
1		Cobbles and boulders	-1								1
2			-2								2
3		Quartzite Bedrock	-3								3
4			-4								4
5		End of Borehole	-5								5

Drilling Co.: Boart longyear

Hole Size: 100 mm

Drilling Method: Flight Auger, HQ core

TOC: 3.01 m

Drilling Date: 13 Nov, 2002

Water Level Date: 29 Nov, 2002

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## Monitoring Well: MW4-02-1

**Client:** DCC

**Location:** Shannon Park

**Project No:** 20475B

**Logged By:** Roger Goyette

Depth (m)	Strata Plot	Description	Depth/Elev.	Sample No.	Sample Type	N value	Recovery (%)	Headspace (ppm)	Well Data	Remarks	Depth (m)
0		Ground Surface	0								0
				1	SS	7	30	25		Flushmount Cap, J-Plug Bentonite	
		Brown sandy clay w/ some gravel. Layer of black medium grained well sorted sand. No hydrocarbon odour		2	SS	ref	10	30			
1			-1								1
		cobbles								Screen PVC slot #10	
2			-2								2
		Beige gravelly till with some cobbles.								Silica Sand	
3			-3								3
		Boulders/Bedrock									
4			-4								4
		End of Borehole								Well point	
5			-5								5

Drilling Co.: Boart longyear

Hole Size: 100 mm

Drilling Method: Flight Auger, HQ core

TOC: 3.49 m

Drilling Date: 13 Nov, 2002

Water Level Date: 29 Nov, 2002

**MGI**  
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Dartmouth, NS  
B3B 1X9

## Monitoring Well: MW4-02-2

**Client:** DCC

**Location:** Shannon Park

**Project No:** 20475B

**Logged By:** Roger Goyette

Depth (m)	Strata Plot	Description	Depth/Elev.	Sample No.	Sample Type	N value	Recovery (%)	Headspace (ppm)	Well Data	Remarks	Depth (m)
0		Ground Surface	0								0
		Brown silty clay w/ some gravel. Layer of black medium grained well sorted sandy material (ashes). No Hydrocarbon odour		1	SS	ref	20	15		Flushmount Cap, J-Plug Bentonite	
1			-1								1
2			-2							Screen PVC slot #10	2
3		cobbles/Boulders	-3							Silica Sand	3
4			-4							Well point	4
5		End of Borehole	-5								5

Drilling Co.: Boart longyear

Hole Size: 100 mm

Drilling Method: Flight Auger, HQ core

TOC: 3.77 m

Drilling Date: 13 Nov, 2002

Water Level Date: 29 Nov, 2002



MGI Limited  
31 Gloster Court  
Dartmouth, NS  
B3B 1X9

# TEST PIT: TP15-01

**Project:** SHANNON PARK  
**Client:** PUBLIC WORKS & GOVERNMENT SERVICES CANADA  
**Location:** SHANNON PARK, DARTMOUTH, NS  
**Number:** 121413946  
**Field investigator:** D. BUGDEN  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 14-Dec-2015  
**Ground surface elevation:** 97.21 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
(ft) (m)		Ground Surface	97.21 0.00				40 60 120 160
0.5		Dark brown to brown SILTY SAND with gravel and cobbles		1	SA	TPH/BTEX, MET, PAH	5
1.0				2	SA	TPH/BTEX, MET, PAH	0
1.5							
2.0				3	SA		0
2.5							
3.0							
3.5							
4.0							
4.5			95.81 1.40	4	SA		5
5.0		Black PEAT					
5.5							
6.0			95.38 1.83				
6.5		End of TEST PIT					
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
ppm - parts per million by volume  
n/a - not available



Drawn By/Checked By: M. FLINN

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# TEST PIT: TP15-02

**Project:** SHANNON PARK  
**Client:** PUBLIC WORKS & GOVERNMENT SERVICES CANADA  
**Location:** SHANNON PARK, DARTMOUTH, NS  
**Number:** 121413946  
**Field investigator:** D. BUGDEN  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 14-Dec-2015  
**Ground surface elevation:** 96.95 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS				
Depth		Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
(ft)	(m)							
			Ground Surface	96.95				
			Dark brown SILTY SAND with gravel and cobbles - roots and organics	0.00	1	SA		0
0.5	0.2							
1.0					2	SA		10
1.5	0.4		Dark brown SILTY SAND with gravel	96.49				
2.0	0.6			0.46				
2.5								
3.0	0.8				3	SA		5
3.5	1.0							
4.0	1.2		Dark brown SANDY SILT - trace gravel	95.73				
4.5	1.4			1.22				
5.0					4	SA	TPH/BTEX, MET, PAH	10
5.5	1.6							
6.0	1.8		End of TEST PIT	95.12				
				1.83				
6.5	2.0							
7.0	2.2							
7.5								
8.0	2.4							
8.5	2.6							
9.0	2.8							
9.5								

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
ppm - parts per million by volume  
n/a - not available



Drawn By/Checked By: M. FLINN






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# TEST PIT: TP15-03

**Project:** SHANNON PARK  
**Client:** PUBLIC WORKS & GOVERNMENT SERVICES CANADA  
**Location:** SHANNON PARK, DARTMOUTH, NS  
**Number:** 121413946  
**Field investigator:** D. BUGDEN  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 14-Dec-2015  
**Ground surface elevation:** 98.04 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS					
Depth		Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration  (ppm)	
(ft)	(m)								
			Ground Surface	98.04				●	
			Red brown TOPSOIL with organics	0.00	1	SA		●	
0.5	0.2		Brown SANDY SILT - some gravel	97.89 0.15				5	
1.0	0.4				2	SA	TPH/BTEX, MET, PAH	●	
1.5	0.6							0	
2.0	0.8				97.33				
2.5			Black PEAT	0.71 97.23	3	SA	TPH/BTEX, MET, PAH		
3.0	1.0		Grey brown fine SAND - some sandstone - boulders	0.81					●
3.5	1.2								10
4.0			End of TEST PIT	96.82 1.22					
4.5	1.4								
5.0	1.6								
5.5	1.8								
6.0	2.0								
6.5	2.2								
7.0	2.4								
7.5	2.6								
8.0	2.8								
8.5									
9.0									
9.5									

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
ppm - parts per million by volume  
n/a - not available



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# TEST PIT: TP15-04

**Project:** SHANNON PARK  
**Client:** PUBLIC WORKS & GOVERNMENT SERVICES CANADA  
**Location:** SHANNON PARK, DARTMOUTH, NS  
**Number:** 121413946  
**Field investigator:** D. BUGDEN  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 14-Dec-2015  
**Ground surface elevation:** 98.50 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
(ft) (m)		Ground Surface	98.50 0.00				40 80 120 160
0.5 0.2		Black SAND with ash and fine gravel		1	SA	TPH/BTEX, MET, PAH	0
1.0 0.4		Brown grey SILTY SAND with gravel - some cobbles	98.20 0.30	2	SA		0
1.5 0.6							
2.0 0.8							
2.5 1.0				3	SA		0
3.0 1.2							
3.5 1.4							
4.0 1.6				4	SA		0
4.5 1.8							
5.0 2.0							
5.5 2.2							
6.0 2.4							
6.5 2.6							
7.0 2.8							
7.5 3.0							
8.0 3.2							
8.5 3.4							
9.0 3.6							
9.5 3.8							
		End of TEST PIT	96.67 1.83				

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
ppm - parts per million by volume  
n/a - not available



Drawn By/Checked By: M. FLINN

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# TEST PIT: TP15-05

**Project:** SHANNON PARK  
**Client:** PUBLIC WORKS & GOVERNMENT SERVICES CANADA  
**Location:** SHANNON PARK, DARTMOUTH, NS  
**Number:** 121413946  
**Field investigator:** D. BUGDEN  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 14-Dec-2015  
**Ground surface elevation:** 97.91 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
		Ground Surface	97.91				40 80 120 160
		Dark brown gravel - some silty sand	0.00	1	SA		5
0.5	0.2						
		Brown grey SILTY SAND with gravel - some cobbles	97.71 0.20	2	SA	TPH/BTEX, MET, PAH	10
1.0							
1.5							
2.0							
2.5							
3.0				3	SA		0
3.5							
4.0							
4.5							
5.0				4	SA		0
5.5							
6.0	1.8		96.08				
		End of TEST PIT	1.83				
6.5	2.0						
7.0	2.2						
7.5	2.4						
8.0	2.6						
8.5	2.8						
9.0							
9.5							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
ppm - parts per million by volume  
n/a - not available



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STANTEC BOREHOLE AND WELL V2 121413946\_SHANNON\_PARK.GPJ STANTEC - DATA TEMPLATE.GDT 1/22/16 GWHALEN

# TEST PIT: TP15-06

**Project:** SHANNON PARK  
**Client:** PUBLIC WORKS & GOVERNMENT SERVICES CANADA  
**Location:** SHANNON PARK, DARTMOUTH, NS  
**Number:** 121413946  
**Field investigator:** D. BUGDEN  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 14-Dec-2015  
**Ground surface elevation:** 97.73 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS				
Depth		Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration  (ppm)
(ft)	(m)							
			Ground Surface	97.73				●
			Brown SILTY SAND - some organics - trace gravel	0.00	1	SA	TPH/BTEX, MET, PAH	5
0.5	0.2		Brown grey SILTY SAND with gravel and cobbles	0.15	2	SA		5
1.0	0.4				3	SA		0
1.5	0.6				4	SA	TPH/BTEX, MET, PAH	5
2.0	0.8							
2.5	1.0							
3.0	1.2							
3.5	1.4							
4.0	1.6							
4.5	1.8							
5.0								
5.5								
6.0			End of TEST PIT	1.83				
6.5	2.0							
7.0	2.2							
7.5	2.4							
8.0	2.6							
8.5	2.8							
9.0								
9.5								

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
ppm - parts per million by volume  
n/a - not available



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# TEST PIT: TP15-07

**Project:** SHANNON PARK  
**Client:** PUBLIC WORKS & GOVERNMENT SERVICES CANADA  
**Location:** SHANNON PARK, DARTMOUTH, NS  
**Number:** 121413946  
**Field investigator:** D. BUGDEN  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 14-Dec-2015  
**Ground surface elevation:** 97.30 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS				
Depth		Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
(ft)	(m)							
			Ground Surface	97.30				●
			Brown SILTY SAND - trace gravel	0.00	1	SA		0
0.5	0.2		Brown grey SILTY SAND with gravel and cobbles	0.15	2	SA	TPH/BTEX, MET, PAH	0
1.0	0.4							
1.5	0.6							
2.0	0.8							
2.5	1.0				3	SA		0
3.0	1.2							
3.5	1.4							
4.0	1.6				4	SA		0
4.5	1.8							
5.0								
5.5								
6.0			End of TEST PIT	95.47				
				1.83				
6.5	2.0							
7.0	2.2							
7.5	2.4							
8.0	2.6							
8.5	2.8							
9.0								
9.5								

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
ppm - parts per million by volume  
n/a - not available



Drawn By/Checked By: M. FLINN

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## TEST PIT: TP6

**Project:** TUFTS COVE  
**Client:** MILLBROOK FIRST NATION  
**Location:** TUFTS COVE, DARTMOUTH, NOVA SCOTIA  
**Number:** 121620293  
**Field investigator:** D. GRAHAM  
**Contractor:** DEXTER

**Drilling method:** 200 KOMATSU EXCAVATOR  
**Date started/completed:** 14-Dec-2016  
**Ground surface elevation:** 8.33 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS		
Depth		Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type
(ft)	(m)		Ground Surface	8.33		
			ROOTMAT/TOPSOIL	0.00		
0.5	0.2					
1.0	0.4		Compact reddish brown silty sand TILL - trace to some gravel - some cobbles and boulders	8.03		
1.5	0.6			0.30	1	SA
2.0	0.8					
2.5	1.0				2	SA
3.0	1.2		- bedrock inferred at 1.2 metres at west end of test pit			
3.5	1.4					
4.0	1.6					
4.5	1.8		- refusal on inferred bedrock	6.50		
5.0			End of TEST PIT	1.83		
5.5						
6.0						
6.5						

**Notes:**  
 m AMSL - metres above mean sea level  
 m BGS - metres below ground surface  
 n/a - not available



Drawn By/Checked By: M. FLINN




Sheet 1 of 1

STANTEC BOREHOLE AND WELL V2 121420293\_TUFTS\_COVE.GPJ STANTEC - DATA TEMPLATE.GDT 2/1/17 GWHALEN

## TEST PIT: TP7

**Project:** TUFTS COVE  
**Client:** MILLBROOK FIRST NATION  
**Location:** TUFTS COVE, DARTMOUTH, NOVA SCOTIA  
**Number:** 121620293  
**Field investigator:** D. GRAHAM  
**Contractor:** DEXTER

**Drilling method:** 200 KOMATSU EXCAVATOR  
**Date started/completed:** 14-Dec-2016  
**Ground surface elevation:** 5.00 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth		Graphic Log	Lithologic Description	Elevation (m AMSL)	Sample Number	Sample Type
(ft)	(m)		Ground Surface	Depth (m BGS)		
			ROOTMAT/TOPSOIL	0.00		
1			Orange-brown SAND with silt - some roothairs	4.70		
	0.5		Compact to dense brown silty sand with gravel TILL - occasional cobbles and boulders - frequency of cobbles and boulders increasing with depth	0.30 4.54 0.46	1	SA
2						
3	1.0					
4					2	SA
5	1.5					
6						
7	2.0					
8	2.5					
9						
10	3.0					
11	3.5				3	SA
12						
13	4.0					
14			End of TEST PIT	0.73 4.27		
15	4.5					
16						
17	5.0					

Notes:  
 m AMSL - metres above mean sea level  
 m BGS - metres below ground surface  
 n/a - not available





Drawn By/Checked By: M. FLINN

Sheet 1 of 1

# TEST PIT: TP8

**Project:** TUFTS COVE  
**Client:** MILLBROOK FIRST NATION  
**Location:** TUFTS COVE, DARTMOUTH, NOVA SCOTIA  
**Number:** 121620293  
**Field investigator:** D. GRAHAM  
**Contractor:** DEXTER

**Drilling method:** 200 KOMATSU EXCAVATOR  
**Date started/completed:** 14-Dec-2016  
**Ground surface elevation:** 7.68 m AMSL  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth		Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type
(ft)	(m)					
			Ground Surface	7.68		
			ROOTMAT/TOPSOIL	0.00		
1			FILL: Brown silty sand - frequent roots - occasional cobbles and boulders	7.53	1	SA
	0.5			0.15	2	SA
2						
3			Dense brown silty sand with gravel TILL - occasional to some cobbles and boulders - bedrock inferred at 1.2 metres at north end of test pit	6.77		
	1.0			0.91		
4						
5					3	SA
	1.5					
6						
	2.0					
7						
	2.5					
8						
	3.0					
9						
	3.5					
10			- refusal on inferred bedrock	4.63		
	4.0		End of TEST PIT	3.05		
11						
	4.5					
12						
	5.0					
13						
	5.5					
14						
	6.0					
15						
	6.5					
16						
	7.0					
17						
	7.5					
18						
	8.0					
19						
	8.5					
20						
	9.0					
21						
	9.5					
22						
	10.0					
23						
	10.5					
24						
	11.0					
25						
	11.5					
26						

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



Drawn By/Checked By: M. FLINN

Sheet 1 of 1



# TEST PIT: TP16-01

**Project:** SUPPLEMENTAL ESA  
**Client:** MILBROOK FIRST NATION  
**Location:** TUFTS COVE  
**Number:** 121414424  
**Field investigator:** H. NEWELL  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 15-Sep-2016  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth		Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
(ft)	(m)					
			Ground Surface			
0.5	0.2		Brown to orange silty SAND with cobbles and boulders	0.00	1	SA
1.0	0.4					
1.5	0.6					
2.0	0.6					
2.5	0.8					
3.0	1.0					
3.5	1.2					
4.0	1.2					
4.5	1.4					
5.0	1.6					
5.5	1.8	End of TEST PIT		0.60		
6.0	1.8					
6.5	2.0					
7.0	2.2					
7.5	2.2					
8.0	2.4					
8.5	2.6					
9.0	2.8					
9.5						

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



Drawn By/Checked By: M. DUGUAY

Sheet 1 of 1

# TEST PIT: TP16-02

**Project:** SUPPLEMENTAL ESA  
**Client:** MILBROOK FIRST NATION  
**Location:** TUFTS COVE  
**Number:** 121414424  
**Field investigator:** H. NEWELL  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 15-Sep-2016  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
		Ground Surface	0.00		
		ORGANIC MATERIAL			
0.5 0.2		Dark brown to brown silty SAND with gravel and cobbles	0.15	1	SA
1.0 0.4					
1.5 0.6					
2.0 0.8					
2.5 1.0					
3.0 1.2					
3.5 1.4					
4.0 1.6					
4.5 1.8					
5.0 2.0					
5.5 2.2					
6.0 2.4					
6.5 2.6					
7.0 2.8					
7.5 3.0					
8.0 3.2					
8.5 3.4					
9.0 3.6					
9.5 3.8					
		End of TEST PIT	1.60		

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



Drawn By/Checked By: M. DUGUAY

Sheet 1 of 1

# TEST PIT: TP16-03

**Project:** SUPPLEMENTAL ESA  
**Client:** MILBROOK FIRST NATION  
**Location:** TUFTS COVE  
**Number:** 121414424  
**Field investigator:** H. NEWELL  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 15-Sep-2016  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
		Ground Surface	0.00		
		ORGANIC material			
0.5 0.2		Dark brown to brown silty SAND with gravel and cobbles	0.15	1	SA
1.0 0.4					
1.5 0.6					
2.0 0.8					
2.5 1.0				2	SA
3.0 1.2					
3.5 1.4					
4.0 1.6				3	SA
4.5 1.8					
5.0 2.0					
5.5 2.2					
6.0 2.4					
6.5 2.6					
7.0 2.8					
7.5 3.0					
8.0 3.2					
8.5 3.4					
9.0 3.6					
9.5 3.8					
		Black PEAT	1.80		
		Grey silty CLAY with gravel - wet	2.00	4	SA
				5	SA
		End of TEST PIT	2.80		

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



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Sheet 1 of 1

STANTEC BOREHOLE AND WELL V2 121414424\_TUFTSCOVE\_SEPT2016.GPJ STANTEC - DATA TEMPLATE.GDT 10/25/16 GWHALEN

# TEST PIT: TP16-04

**Project:** SUPPLEMENTAL ESA  
**Client:** MILBROOK FIRST NATION  
**Location:** TUFTS COVE  
**Number:** 121414424  
**Field investigator:** H. NEWELL  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 15-Sep-2016  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth		Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
(ft)	(m)					
			Ground Surface			
			Black organic material - roots	0.00		
0.5	0.2					
1.0	0.4		Brown grey silty SAND with gravel and boulders	0.30	1	SA
1.5	0.6					
2.0	0.8					
2.5	1.0					
3.0	1.2					
3.5	1.4					
4.0	1.6					
4.5	1.8					
5.0	2.0					
5.5	2.2					
6.0	2.4					
6.5	2.6					
7.0	2.8					
7.5						
8.0						
8.5						
9.0						
9.5						
			End of TEST PIT	1.80		

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



Drawn By/Checked By: M. DUGUAY

Sheet 1 of 1

# TEST PIT: TP16-05

**Project:** SUPPLEMENTAL ESA  
**Client:** MILBROOK FIRST NATION  
**Location:** TUFTS COVE  
**Number:** 121414424  
**Field investigator:** H. NEWELL  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 15-Sep-2016  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE					SAMPLE DETAILS	
Depth		Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
(ft)	(m)					
			Ground Surface			
			Grey to brown silty SAND and gravel	0.00	1	SA
0.5	0.2		Brown to grey silty SAND with cobbles and gravel - boulders present	0.20		
1.0	0.4				2	SA
1.5	0.6					
2.0	0.8				3	SA
2.5	1.0					
3.0	1.2				4	SA
3.5	1.4					
4.0	1.6					
4.5	1.8					
5.0	2.0					
5.5	2.2					
6.0	2.4					
6.5						
7.0						
7.5						
8.0			Grey silty CLAY	2.30		
8.5			End of TEST PIT	2.40		
9.0						
9.5						

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



Drawn By/Checked By: M. DUGUAY

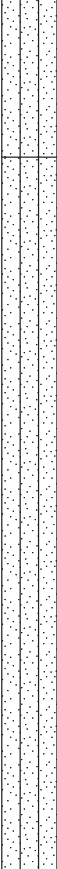
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STANTEC BOREHOLE AND WELL V2 121414424\_TUFTSCOVE\_SEPT2016.GPJ STANTEC - DATA TEMPLATE.GDT 10/25/16 GWHALEN

# TEST PIT: TP16-06

**Project:** SUPPLEMENTAL ESA  
**Client:** MILBROOK FIRST NATION  
**Location:** TUFTS COVE  
**Number:** 121414424  
**Field investigator:** H. NEWELL  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 15-Sep-2016  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE						SAMPLE DETAILS	
Depth		Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	
(ft)	(m)						
			Ground Surface				
0.5	0.2		Dark brown silty SAND with gravel and cobbles - roots and organic material	0.00	1	SA	
1.0	0.4		Brown to dark brown silty SAND with gravel and cobbles	0.40			
1.5	0.6				2	SA	
2.0	0.8						
2.5	1.0						
3.0	1.2				3	SA	
3.5	1.4						
4.0	1.6						
4.5	1.8		- boulders present		4	SA	
5.0	2.0						
5.5	2.2						
6.0	2.4						
6.5	2.6						
7.0	2.8						
7.5			End of TEST PIT	2.20			
8.0							
8.5							
9.0							
9.5							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



Drawn By/Checked By: M. DUGUAY

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STANTEC BOREHOLE AND WELL V2 121414424\_TUFTSCOVE\_SEPT2016.GPJ STANTEC - DATA TEMPLATE.GDT 10/25/16 GWHALEN

# TEST PIT: TP16-07

**Project:** SUPPLEMENTAL ESA  
**Client:** MILBROOK FIRST NATION  
**Location:** TUFTS COVE  
**Number:** 121414424  
**Field investigator:** H. NEWELL  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** EXCAVATOR  
**Date started/completed:** 15-Sep-2016  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS	
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type
0.0		Ground Surface	0.00		
0.5		Dark brown GRAVEL - some silty sand			
1.0		Brown grey silty SAND with gravel - some cobbles	0.20		
1.5					
2.0					
2.5					
3.0					
3.5					
4.0					
4.5					
5.0					
5.5					
6.0		- boulders present			
6.5				1	SA
7.0		End of TEST PIT	2.00		
7.5					
8.0					
8.5					
9.0					
9.5					

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
n/a - not available



Drawn By/Checked By: M. DUGUAY

Sheet 1 of 1

# BOREHOLE: BH17-01

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 24-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 45228.334805  
**Northing:** 4947733.76698

SUBSURFACE PROFILE					SAMPLE DETAILS				
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Recovery	N Value	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00						
0.5		Silty BOULDERS and COBBLES - dry to moist - refusal at 1.52 m BGS							
1.0									
1.5									
2.0				1	SS	300	77/229	CCME/PHCs, FOCs	10
2.5									
3.0									
3.5									
4.0				2	AS	n/a	n/a		5
4.5									
5.0		End of Borehole	1.52						
5.5									
6.0									
6.5									
7.0									
7.5									
8.0									
8.5									
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
SS - split-spoon sample  
AS - auger sample  
ppm - parts per million by volume  
n/a - not available



Drawn By/Checked By: K. CAMERON

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# BOREHOLE: BH17-02

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 24-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 451238.801437  
**Northing:** 4947411.58937

SUBSURFACE PROFILE					SAMPLE DETAILS				
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Recovery	N Value	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00						
0.5		Sandy GRAVEL - dry							
1.0									
1.5									
2.0				1	SS	450	19	PAHs, PCBs, METALS	10
2.5									
3.0									
3.5		Brown SILT	0.91						
4.0				2	SS	180	17		5
4.5									
5.0									
5.5									
6.0				3	SS	180	58		10
6.5									
7.0									
7.5		End of Borehole	2.13						
8.0									
8.5									
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
SS - split-spoon sample  
ppm - parts per million by volume  
n/a - not available



Drawn By/Checked By: K. CAMERON

Sheet 1 of 1

# BOREHOLE: BH17-03

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 25-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** n/a  
**Northing:** n/a

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm) ●
		Ground Surface	0.00				40 80 120 160
0.5		FILL: Black to dark grey gravel - refusal on inferred bedrock					
1.0							
1.5							
2.0				1	AS	CCME/PHCs	5
2.5							
3.0							
3.5				2	AS	CCME/PHCs	5
4.0							
4.5							
5.0		End of Borehole	1.40				
5.5							
6.0							
6.5							
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
AS - auger sample  
ppm - parts per million by volume  
n/a - not available



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# BOREHOLE: BH17-04

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 25-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452289.920767  
**Northing:** 4947725.87184

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00				
0.5		GRAVEL - with rootmat					
1.0							
1.5							
2.0		Dark brown SILTY SAND	0.60	1	AS	FOCs, METALS, PAHs	5
2.5							
3.0							
3.5							
4.0							
4.5							
5.0							
5.5				2	AS		60
6.0		SILTY SAND and GRAVEL - wet below 2.8 m BGS	1.80				
6.5				3	GS	CCME/PHCs, PAHs, METALS	10
7.0							
7.5							
8.0							
8.5							
9.0				4	GS		5
9.5							
10.0		End of Borehole	3.00				
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
GS - grab sample  
AS - auger sample  
ppm - parts per million by volume  
n/a - not available




Drawn By/Checked By: K. CAMERON

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# BOREHOLE: BH17-05

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 25-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452293.195594  
**Northing:** 4947720.54323

SUBSURFACE PROFILE					SAMPLE DETAILS				
Depth		Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration	
(ft)	(m)							(ppm)	
			Ground Surface	0.00				●	
0.5	0.2		Fine brown SILTY SAND - refusal on inferred bedrock						
1.0	0.4								
1.5	0.6								
2.0	0.8								
2.5	1.0					1	AS	CCME/PHCs	●
3.0	1.2								
3.5	1.4					2	SA		●
4.0	1.6								
4.5	1.8								
5.0	2.0								
5.5	2.2								
6.0	2.4								
6.5	2.6								
7.0	2.8								
7.5	3.0								
8.0	3.2								
8.5	3.4								
9.0	3.6								
9.5	3.8								
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
			End of Borehole	1.80					

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
AS - auger sample  
ppm - parts per million by volume  
n/a - not available



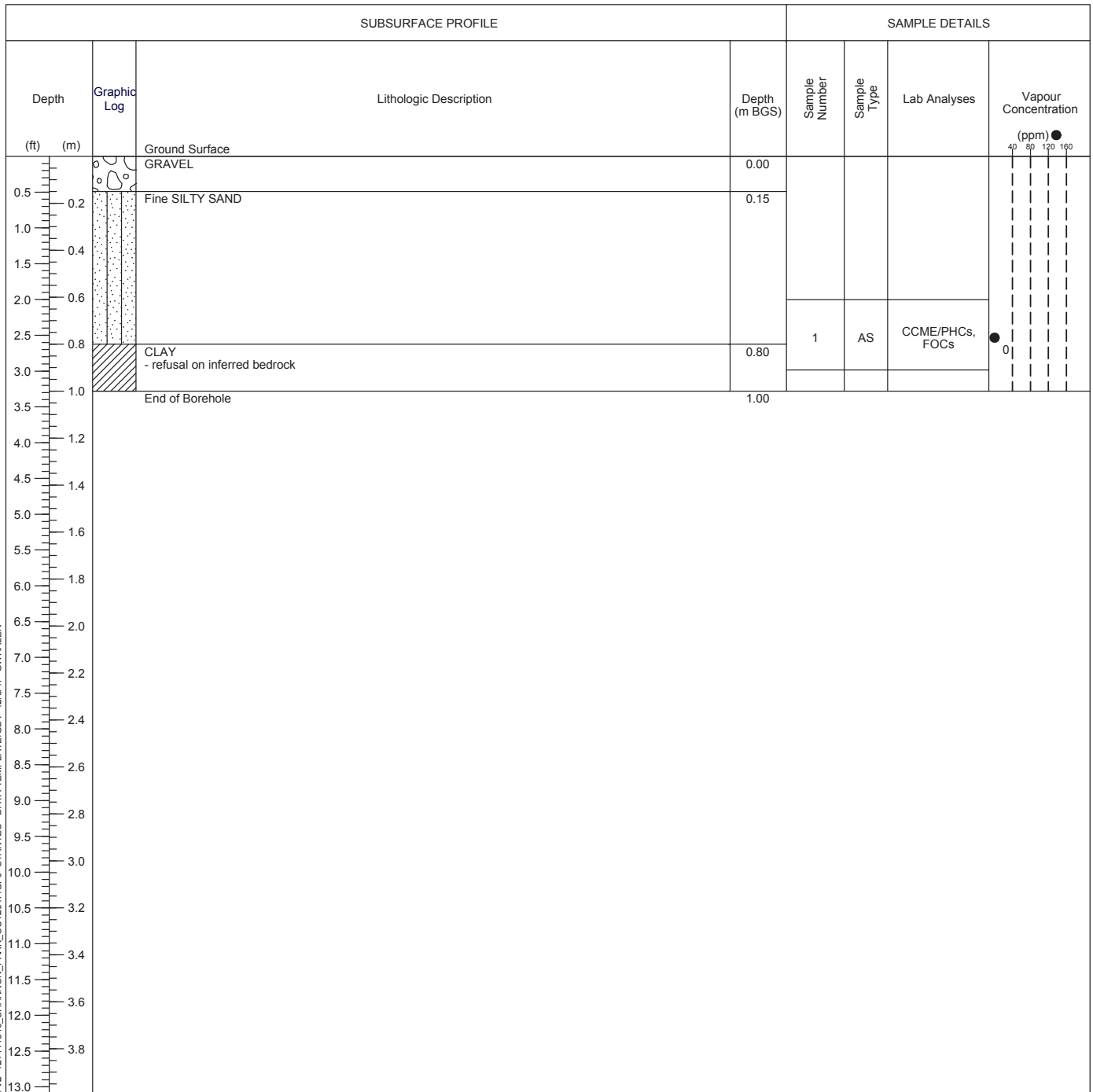
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Sheet 1 of 1

# BOREHOLE: BH17-06

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 25-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452304.047565  
**Northing:** 4947732.42531



Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
AS - auger sample  
ppm - parts per million by volume  
n/a - not available



Drawn By/Checked By: K. CAMERON

Sheet 1 of 1

# BOREHOLE: BH17-07

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 25-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452332.210526  
**Northing:** 494779.61087

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
(ft) (m)		Ground Surface	0.00				40 80 120 160
0.5		Brown SAND - refusal at 1.3 m BGS		1	AS		10
1.0							
1.5							
2.0							
2.5							
3.0				2	AS	METALS	5
3.5							
4.0				3	AS	CCME/PHCs	15
4.5		End of Borehole	1.30				
5.0							
5.5							
6.0							
6.5							
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
AS - auger sample  
ppm - parts per million by volume  
n/a - not available



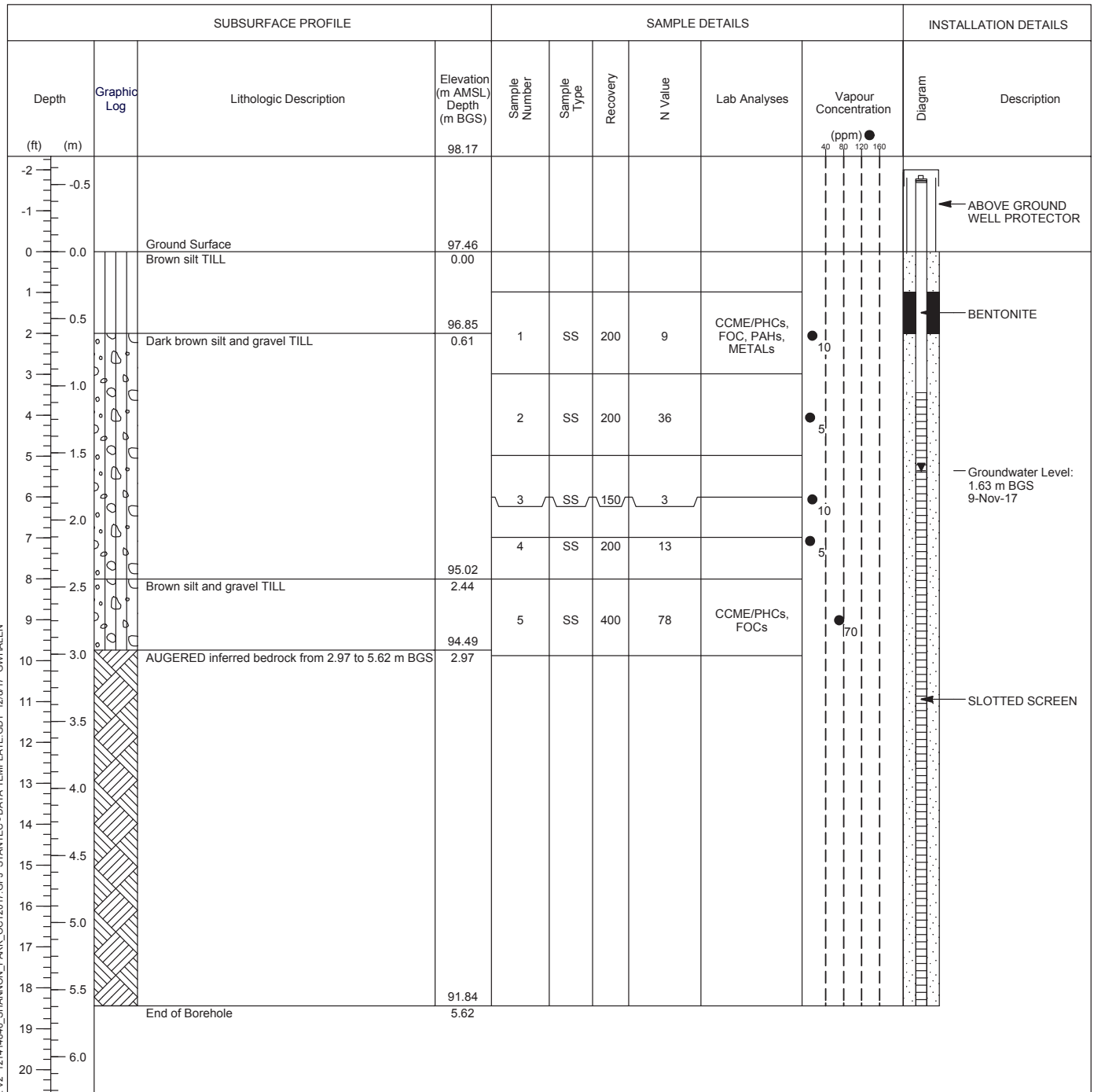
Drawn By/Checked By: K. CAMERON

Sheet 1 of 1

# MONITOR WELL: MW17-01

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 24-Oct-2017  
**Ground surface elevation:** 97.46 m AMSL  
**Top of casing elevation:** 98.23 m AMSL  
**Easting:** 452177.221824  
**Northing:** 4947488.57887



Screen Interval: 1.05 - 5.62 m BGS  
 Sand Pack Interval: 0.61 - 5.62 m BGS  
 Well Seal Interval: 0.30 - 0.61 m BGS

Notes:  
 m AMSL - metres above mean sea level  
 m BGS - metres below ground surface  
 SS - split-spoon sample  
 ppm - parts per million by volume  
 n/a - not available



Drawn By/Checked By: K. CAMERON

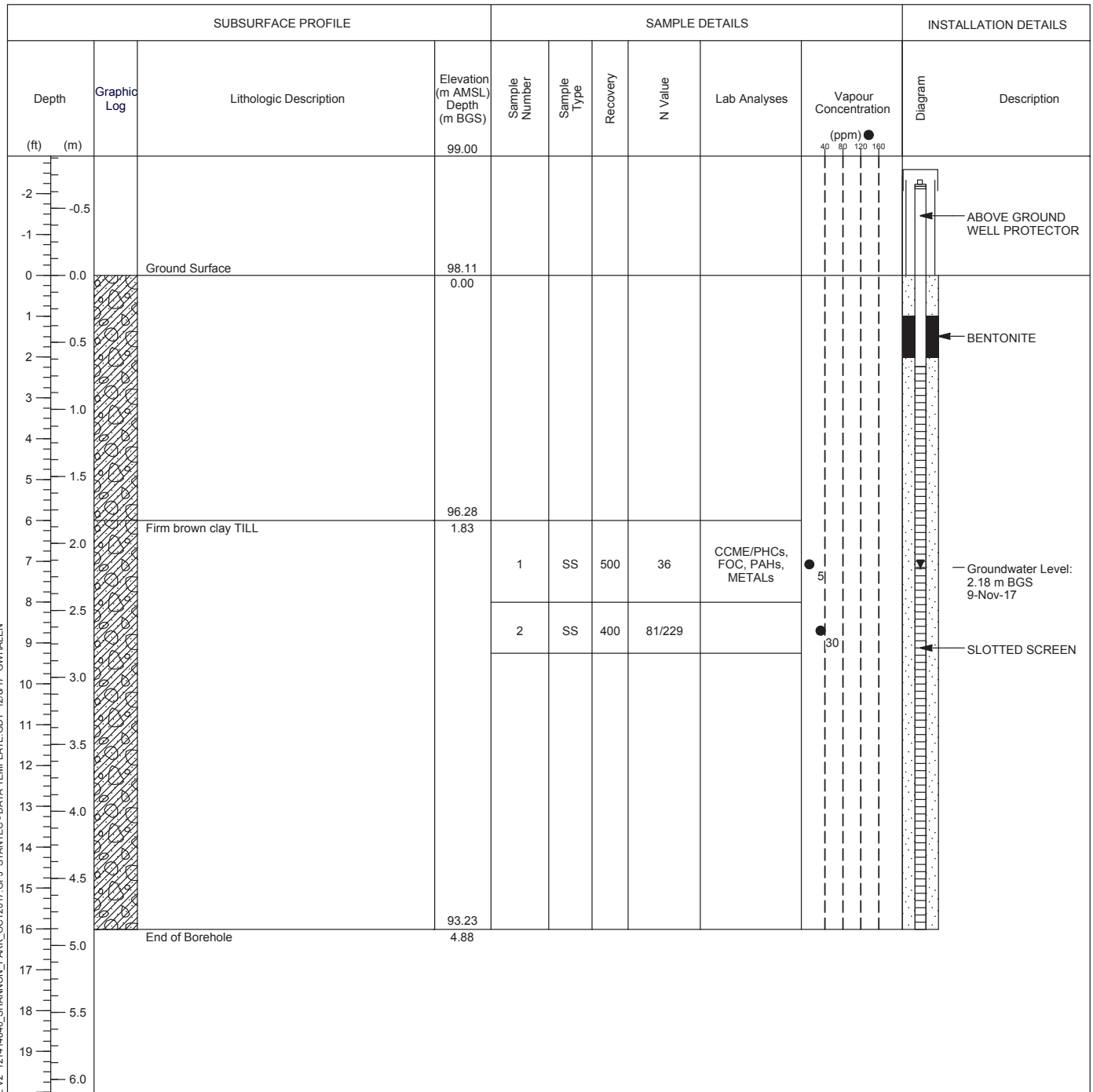
Sheet 1 of 1

STANTEC BOREHOLE AND WELL V2 121414846\_SHANNON\_PARK\_OCT2017.GPJ STANTEC - DATA TEMPLATE.GDT 12/8/17 GWHALEN

# MONITOR WELL: MW17-02

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 24-Oct-2017  
**Ground surface elevation:** 98.11 m AMSL  
**Top of casing elevation:** 98.97 m AMSL  
**Easting:** 452223.446185  
**Northing:** 4947540.30516



Screen Interval: 0.68 - 4.88 m BGS  
 Sand Pack Interval: 0.61 - 4.88 m BGS  
 Well Seal Interval: 0.30 - 0.61 m BGS

Notes:  
 m AMSL - metres above mean sea level  
 m BGS - metres below ground surface  
 SS - split-spoon sample  
 ppm - parts per million by volume  
 n/a - not available



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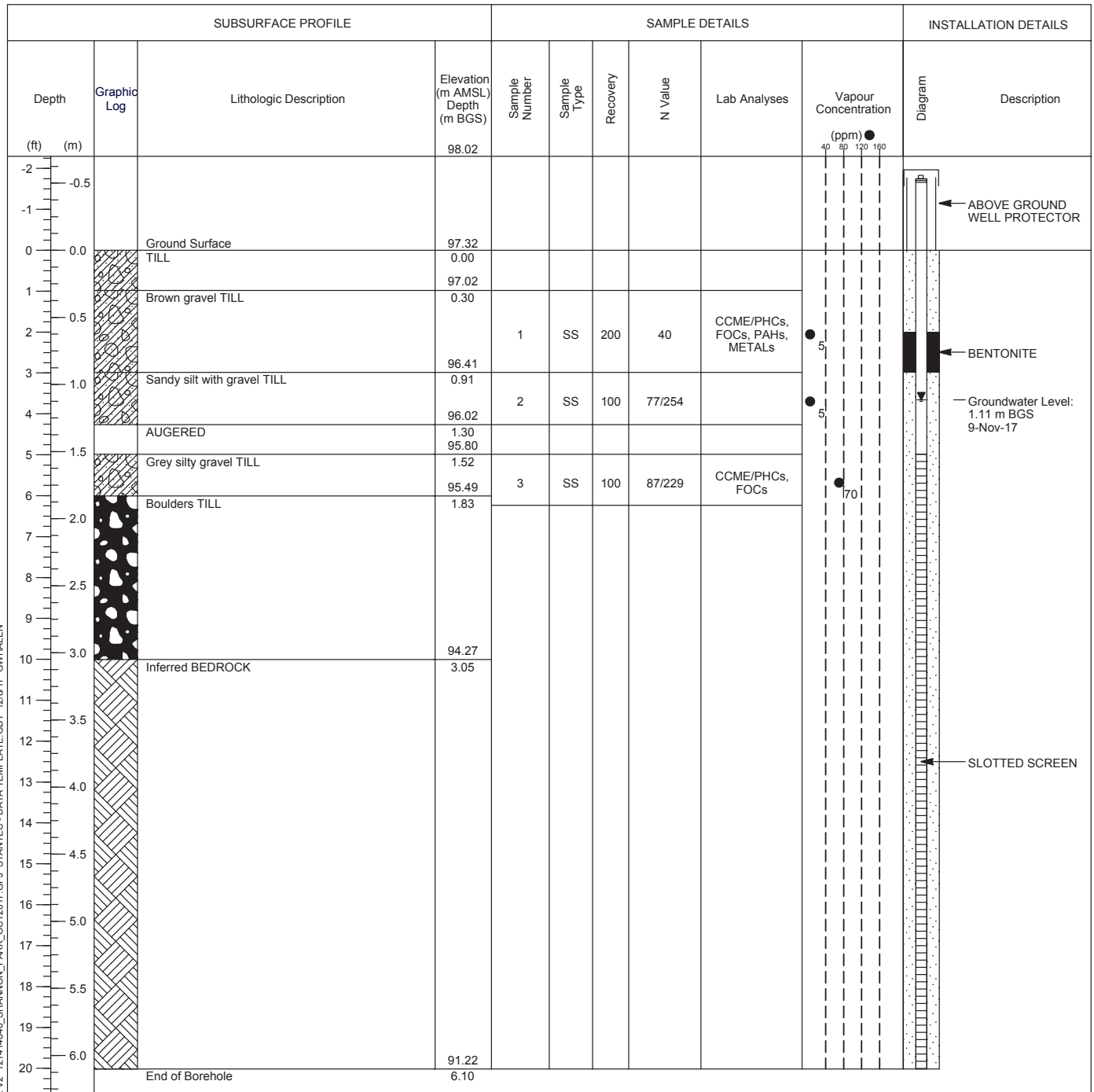
STANTEC BOREHOLE AND WELL V2 121414846\_SHANNON\_PARK\_OCT2017 GPJ STANTEC - DATA TEMPLATE.GDT 12/8/17 GWHALEN



# MONITOR WELL: MW17-03

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** NOVA DRILLING

**Drilling method:** SPLIT SPOON  
**Date started/completed:** 25-Oct-2017  
**Ground surface elevation:** 97.32 m AMSL  
**Top of casing elevation:** 98.00 m AMSL  
**Easting:** 452239.607183  
**Northing:** 4947588.75665



Screen Interval: 1.52 - 6.10 m BGS  
 Sand Pack Interval: 0.91 - 6.10 m BGS  
 Well Seal Interval: 0.61 - 0.91 m BGS

Notes:  
 m AMSL - metres above mean sea level  
 m BGS - metres below ground surface  
 SS - split-spoon sample  
 ppm - parts per million by volume  
 n/a - not available



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STANTEC BOREHOLE AND WELL V2 121414846\_SHANNON\_PARK\_OCT2017.GPJ STANTEC - DATA TEMPLATE.GDT 12/8/17 GWHALEN

# TEST PIT: TP17-02

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** CAT 305 EXCAVATOR  
**Date started/completed:** 27-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452243.812925  
**Northing:** 4947649.82168

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00				
0.5		Brown SILTY SAND and gravel					
1.0							
1.5							
2.0				1	GS	CCME/PHCs, PAHs, METALS	10
2.5							
3.0							
3.5							
4.0							
4.5							
5.0				2	GS		5
5.5							
6.0		Grey CLAY - moist - refusal on inferred bedrock at 2.4 m BGS	1.80				
6.5							
7.0				3	GS		5
7.5							
8.0		End of TEST PIT	2.40				
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
GS - grab sample  
ppm - parts per million by volume  
n/a - not available



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# TEST PIT: TP17-03

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** CAT 305 EXCAVATOR  
**Date started/completed:** 27-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452281.776306  
**Northing:** 4947524.09949

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00				
0.5		Dark brown sand TILL - gravel and cobbles					
1.0							
1.5				1	GS	CCME/PHCs, PAHs, FOC	10
2.0							
2.5							
3.0							
3.5				2	GS		5
4.0		Fine silty sand TILL - cobbles and boulders	1.20				
4.5							
5.0							
5.5							
6.0				3	GS		5
6.5							
7.0		End of TEST PIT	2.00				
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
GS - grab sample  
ppm - parts per million by volume  
n/a - not available



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# TEST PIT: TP17-04

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** CAT 305 EXCAVATOR  
**Date started/completed:** 27-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452241.62161  
**Northing:** 4947508.19796

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00				
0.5		Dark brown SILTY SAND and gravel - refusal on inferred bedrock					
1.0							
1.5				1	GS	CCME/PHCs, PAHs, METALS	15
2.0							
2.5							
3.0				2	GS	METALS	5
3.5							
4.0		End of TEST PIT	1.10				
4.5							
5.0							
5.5							
6.0							
6.5							
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
GS - grab sample  
ppm - parts per million by volume  
n/a - not available



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## TEST PIT: TP17-05

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** CAT 305 EXCAVATOR  
**Date started/completed:** 27-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452193.20662  
**Northing:** 4947478.90516

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00				
0.5		FILL: Boulders					
1.0							
1.5		Dark brown organics and BOULDERS - refusal on inferred bedrock	0.30	1	GS	CCME/PHCs, PAHs, METALS	10
2.0		End of TEST PIT	0.60				
2.5							
3.0							
3.5							
4.0							
4.5							
5.0							
5.5							
6.0							
6.5							
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
 m AMSL - metres above mean sea level  
 m BGS - metres below ground surface  
 GS - grab sample  
 ppm - parts per million by volume  
 n/a - not available



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# TEST PIT: TP17-06

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** CAT 305 EXCAVATOR  
**Date started/completed:** 27-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452192.993529  
**Northing:** 4947385.52312

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00				
0.5		Black rootmat TILL					
1.0							
1.5				1	GS	CCME/PHCs, PAHs, METALS	10
2.0							
2.5				2	GS		5
3.0							
3.5							
4.0							
4.5				3	GS		5
5.0		Gray clay TILL	1.40				
5.5		End of TEST PIT	1.50				
6.0							
6.5							
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
GS - grab sample  
ppm - parts per million by volume  
n/a - not available




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# TEST PIT: TP17-07

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** CAT 305 EXCAVATOR  
**Date started/completed:** 27-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452188.678464  
**Northing:** 4947419.15154

SUBSURFACE PROFILE					SAMPLE DETAILS			
Depth		Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
(ft)	(m)							
			Ground Surface	0.00				
0.5	0.2		Boulder TILL					
1.0	0.4		Medium brown organic TILL - with gravel	0.30	1	GS	CCME/PHC, PAHs, METALS	10
2.0	0.6		Gravel with fine grey silty clay TILL	0.60				
2.5	0.8				2	GS		5
3.0	1.0							
3.5	1.2							
4.0	1.4		Fine brown sand and gravel TILL	1.20	3	GS		5
4.5								
5.0	1.6		End of TEST PIT	1.50				
5.5	1.8							
6.0	2.0							
6.5	2.2							
7.0	2.4							
7.5	2.6							
8.0	2.8							
8.5	3.0							
9.0	3.2							
9.5	3.4							
10.0	3.6							
10.5	3.8							
11.0								
11.5								
12.0								
12.5								
13.0								

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
GS - grab sample  
ppm - parts per million by volume  
n/a - not available



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# TEST PIT: TP17-08

**Project:** SHANNON PARK  
**Client:** PSPC  
**Location:** SHANNON PARK, DARTMOUTH, NOVA SCOTIA  
**Number:** 121414846  
**Field investigator:** D. COX  
**Contractor:** EAVIS CONSTRUCTION

**Drilling method:** CAT 305 EXCAVATOR  
**Date started/completed:** 27-Oct-2017  
**Ground surface elevation:** n/a  
**Top of casing elevation:** n/a  
**Easting:** 452226.513308  
**Northing:** 4947416.36098

SUBSURFACE PROFILE				SAMPLE DETAILS			
Depth (ft) (m)	Graphic Log	Lithologic Description	Depth (m BGS)	Sample Number	Sample Type	Lab Analyses	Vapour Concentration (ppm)
0.0		Ground Surface	0.00				
0.5		Brown organic rootmat and gravel TILL					
1.0							
1.5				1	GS	CCME/PHC, PAHS, METALS	5
2.0		Silty sand and gravel TILL	0.60				
2.5				2	GS		5
3.0							
3.5							
4.0		End of TEST PIT	1.10				
4.5							
5.0							
5.5							
6.0							
6.5							
7.0							
7.5							
8.0							
8.5							
9.0							
9.5							
10.0							
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							

Notes:  
m AMSL - metres above mean sea level  
m BGS - metres below ground surface  
GS - grab sample  
ppm - parts per million by volume  
n/a - not available



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TABLE 1

**SODIUM ADSORPTION RATIO - ELECTRICAL CONDUCTIVITY**  
Public Service and Procurement Canada  
Shannon Park Remedial Excavation, Dartmouth, Nova Scotia  
Stantec Consulting Ltd. Project No. 121415668

Parameter	Units	CCME SQG Commercial non-potable	Sample ID					
			SA-A1	SA-A2	SA-A3	SA-A4	SA-B1	SA-C1
Date Sampled			19-Nov-18	19-Nov-18	19-Nov-18	19-Nov-18	19-Nov-18	19-Nov-18
Sample Depth (mbg)			0.15-1.0	1.0-1.6	0.15-1.0	1.0-1.6	0.15-0.3	0.15-0.6
Sodium Adsorption Ratio	N/A	12	0.66	1.0	0.28	0.2	0.13	0.21
Metals								
Dissolved Calcium	µg/L	-	2300	4300	4000	1600	22000	1400
Dissolved Magnesium	µg/L	-	1300	1000	450	230	1000	470
Dissolved Sodium	µg/L	-	5100	9300	2200	1000	2300	1100
Conductivity	µS/cm	4000	35	42	23	9.4	97	16

**Notes:**

1. "-" = no standard available; mbg = meters below grade
2. Lab Dup = laboratory QA/QC duplicate
3. Canadian Council of Ministers of the Environment, Soil Quality Guidelines for Protection of Environmental and Human Health (CCME Online, 2018)

