APPENDIX B

BOREHOLE LOGS FOR WELLS DRILLED IN THE TIER THREE ASSESSMENT FIELD PROGRAM

Appendix B:

Tier Three Drilling Program, Borehole Logs

Monitoring Well: LP-MW-01-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-11
Number: 160900637

Field investigator: A.Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 20-Sep-2010 / 22-Sep-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	218.00			
0	0		TOPSOIL - SANDY SILT LOAM little clay, organics, dark brown, firm, dry	0.00 217.75 0.25			
			SAND fine to medium, brown	217.47 0.53	01	CC	54" 90%
5	2		CLAY to SILTY CLAY with fine sand and silt lenses (<5 mm), trace fine gravel dropstones, brown and reddish brown laminations (<6 mm), firm to very stiff, moist, trace fine gravel dropstones subrounded to angular		02	CC	36" 100%
			oxidation staining from 2.4 m to 3.2 m BGS		03	PQ	30" 100%
10	4		SAND to GRAVEL fine to medium sand grades to coarse gravel with depth, light brown, loose, fining upward sequence, moist to wet, gravel subrounded to angular primarily limestone and shale with some granite	214.12 3.89	04	PQ	30" 50%
15							
20	6				05	PQ	51" 85%
			CLAY and SILTY CLAY trace fine gravel dropstones, light brown-grey with reddish brown laminations, firm to very stiff	211.30 6.71	06	PQ	38" 63%
25	8				07	PQ	27" 45%
30			convoluted bedding from 9.1 m to 10.7 m BGS				
	10				08	PQ	48" 80%
35			INTERBEDDED CLAY to SAND clay to silty clay with 0.1 to 0.3 m layers of silt to very fine grained sand, trace gravel in clay zones, light brown-grey (sand and silt) to reddish brown and grey (clay), firm in sand and silty zones to stiff and very stiff in clayey zones, alternating fining or coarsening down within cohesionless sediments with sharp contacts at clay to silty clay layers	207.33 10.67	09	PQ	60" 100%
40	12				10	PQ	40" 67%
45	14		silt and sand lenses layers more frequent from 13.7 m to 18.2 m BGS		11	PQ	39" 65%
50							
55	16				12	PQ	54" 90%
					13	PQ	48" 80%
60	18						
					14	PQ	48" 80%
65	20				15	PQ	24" 40%
70							
	22				16	PQ	57" 95%
75				194.84			
			CLAY trace fine gravel dropstones, light brown-grey and reddish brown laminations, firm to stiff	23.16 194.08	17	PQ	60" 100%
	24		SILT TILL trace to little gravel (fine to coarse), moist, very stiff to very hard, blocky, gravel subrounded to angular	23.93			
80				192.40	18	PQ	60" 100%
			INTERBEDDED CLAY to SANDY SILT fine sandy silt to clay layers (<0.45 m), light brown-grey and reddish brown, very stiff to hard, laminated (<6 mm) but highly deformed	25.60			
85	26				19	PQ	52" 87%
90				190.29			
	28		SILT TILL (Possibly Catfish Creek Till) little gravel, very stiff to very hard, blocky, gravel subrounded to very angular	27.71 190.24 27.76	20	PQ	60" 100%
95			LIMESTONE (Possibly Dundee Formation) brown and light grey, fossiliferous, trace fractures				

WELL DETAILS

Name:	LP-MW-01-10	Name:	Original Borehole
GS Elev:	218.00 m AMSL	GS Elev:	n/a
TOC Elev:	218.86 m AMSL	TOC Elev:	n/a
Easting:	557649	Easting:	n/a
Northing:	4740832	Northing:	n/a
Stick-up:	0.85 m	Stick-up:	n/a

Above ground casing
Concrete
51 mm Schedule 80 PVC riser
Holeplug
Top of sand (3.0 m BGS)
No.2 Silica Sand
Top of screen (3.7 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (6.7 m BGS)
Bottom of sand (6.7 m BGS)
Groundwater Level: Dry Jan. 26, 2011
Grout

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-01-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-11
Number: 160900637

Field investigator: A.Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 20-Sep-2010 / 22-Sep-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	
			End of Borehole	188.28 29.72	21	PQ	24" 100%	Name: LP-MW-01-10 GS Elev: 218.00 m AMSL TOC Elev: 218.86 m AMSL Easting: 557649 Northing: 4740832 Stick-up: 0.85 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a

100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 ft

30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 m

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-02-10

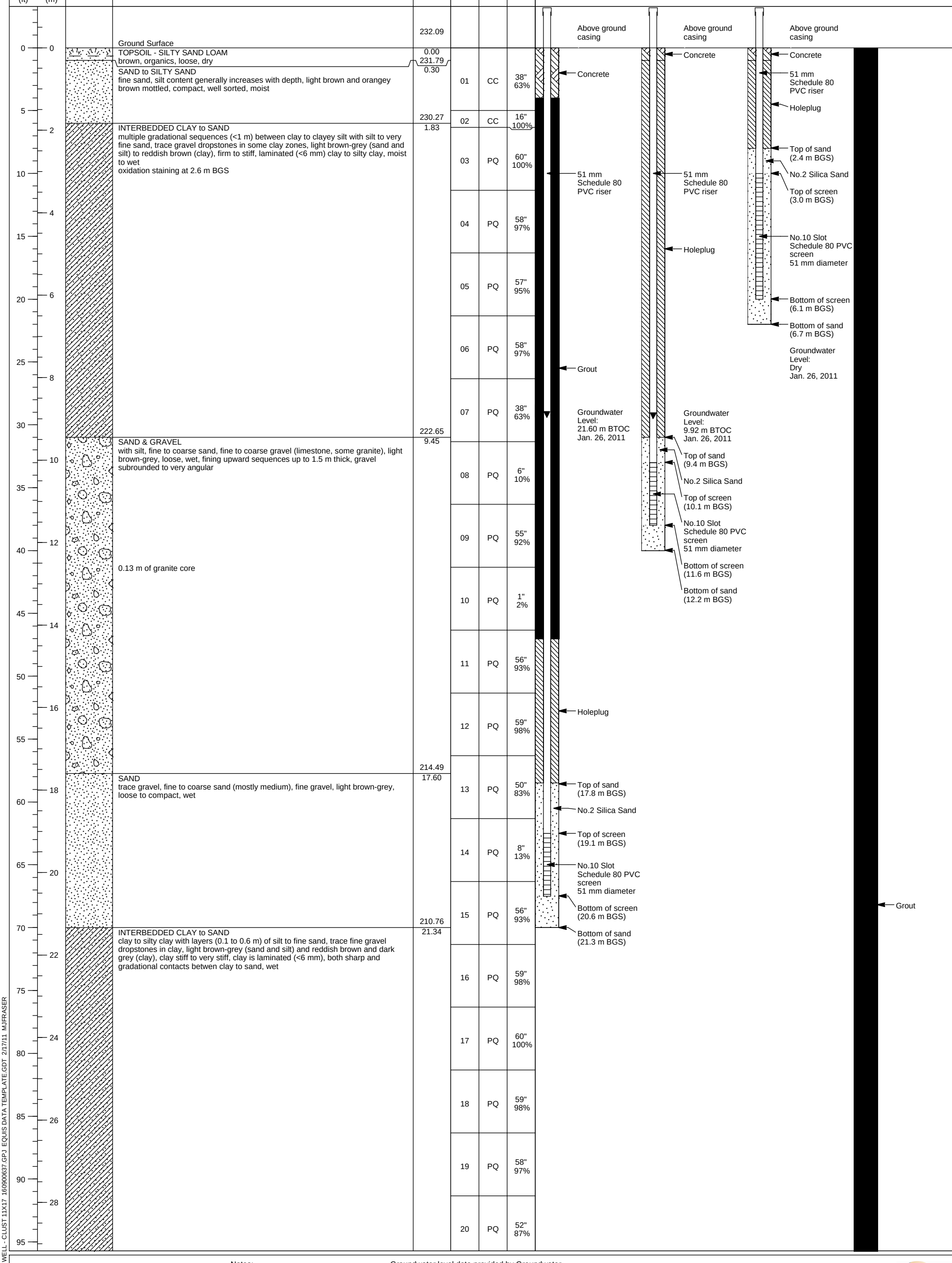
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-12
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 22-Sep-2010 / 28-Sep-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	232.09			
0	0		TOPSOIL - SILTY SAND LOAM brown, organics, loose, dry	0.00 231.79			
			SAND to SILTY SAND fine sand, silt content generally increases with depth, light brown and orangey brown mottled, compact, well sorted, moist	0.30	01	CC	38" 63%
5				230.27	02	CC	16" 100%
	2		INTERBEDDED CLAY to SAND multiple gradational sequences (<1 m) between clay to clayey silt with silt to very fine sand, trace gravel dropstones in some clay zones, light brown-grey (sand and silt) to reddish brown (clay), firm to stiff, laminated (<6 mm) clay to silty clay, moist to wet oxidation staining at 2.6 m BGS	1.83	03	PQ	60" 100%
10					04	PQ	58" 97%
	4				05	PQ	57" 95%
15					06	PQ	58" 97%
	6				07	PQ	38" 63%
20					08	PQ	6" 10%
	8			222.65	09	PQ	55" 92%
25			SAND & GRAVEL with silt, fine to coarse sand, fine to coarse gravel (limestone, some granite), light brown-grey, loose, wet, fining upward sequences up to 1.5 m thick, gravel subrounded to very angular	9.45	10	PQ	1" 2%
30					11	PQ	56" 93%
	10				12	PQ	59" 98%
35					13	PQ	50" 83%
40			0.13 m of granite core		14	PQ	8" 13%
	12				15	PQ	56" 93%
45					16	PQ	59" 98%
	14				17	PQ	60" 100%
50					18	PQ	59" 98%
	16				19	PQ	58" 97%
55					20	PQ	52" 87%
				214.49			
60	18		SAND trace gravel, fine to coarse sand (mostly medium), fine gravel, light brown-grey, loose to compact, wet	17.60			
65	20						
70				210.76			
	22		INTERBEDDED CLAY to SAND clay to silty clay with layers (0.1 to 0.6 m) of silt to fine sand, trace fine gravel dropstones in clay, light brown-grey (sand and silt) and reddish brown and dark grey (clay), clay stiff to very stiff, clay is laminated (<6 mm), both sharp and gradational contacts betwen clay to sand, wet	21.34			
75							
	24						
80							
	26						
85							
90	28						
95							

WELL DETAILS

	LP-MW-02-10 D	LP-MW-02-10 I	LP-MW-02-10 S	Original Borehole
Name:	LP-MW-02-10 D	LP-MW-02-10 I	LP-MW-02-10 S	Original Borehole
GS Elev:	232.09 m AMSL	232.10 m AMSL	232.12 m AMSL	n/a
TOC Elev:	232.96 m AMSL	233.03 m AMSL	232.96 m AMSL	n/a
Easting:	556841	556842	556843	n/a
Northing:	4747559	4747557	4747555	n/a
Stick-up:	0.87 m	0.93 m	0.84 m	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-02-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-12
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 22-Sep-2010 / 28-Sep-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type / Recovery	Name: LP-MW-02-10 D GS Elev: 232.09 m AMSL TOC Elev: 232.96 m AMSL Easting: 556841 Northing: 4747559 Stick-up: 0.87 m
100	30		INTERBEDDED CLAY to SAND clay to silty clay with layers (0.1 to 0.6 m) of silt to fine sand, trace fine gravel dropstones in clay, light brown-grey (sand and silt) and reddish brown and dark grey (clay), clay stiff to very stiff, clay is laminated (<6 mm), both sharp and gradational contacts betwen clay to sand, wet		21	PQ 53" 88%	
105	32				22	PQ 57" 95%	
110	34				23	PQ 54" 90%	
115	36				24	PQ 51" 85%	
120	38				25	PQ 60" 100%	
125					26	PQ 58" 97%	
				193.21			
			SAND & SILT TILL (Catfish Creek Till) some gravel, light grey, very stiff, poorly sorted, gravel subrounded to angular	38.89 192.72	27	PQ 60" 100%	
130	40		LIMESTONE (Prossibly Dundee Formation) dark brown to grey, highly fossiliferous (corals, crinoids), trace fractures	39.37			
135					28	PQ 60" 100%	
				190.54			
			End of Borehole	41.55			
140	42						
145	44						
150	46						
155	48						
160							
165	50						
170	52						
175	54						
180							
185	56						
190	58						

WELL DETAILS (continued)

Name: LP-MW-02-10 I	Name: LP-MW-02-10 S	Name: Original Borehole
GS Elev: 232.10 m AMSL	GS Elev: 232.12 m AMSL	GS Elev: n/a
TOC Elev: 233.03 m AMSL	TOC Elev: 232.96 m AMSL	TOC Elev: n/a
Easting: 556842	Easting: 556843	Easting: n/a
Northing: 4747557	Northing: 4747555	Northing: n/a
Stick-up: 0.93 m	Stick-up: 0.84 m	Stick-up: n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-03-10

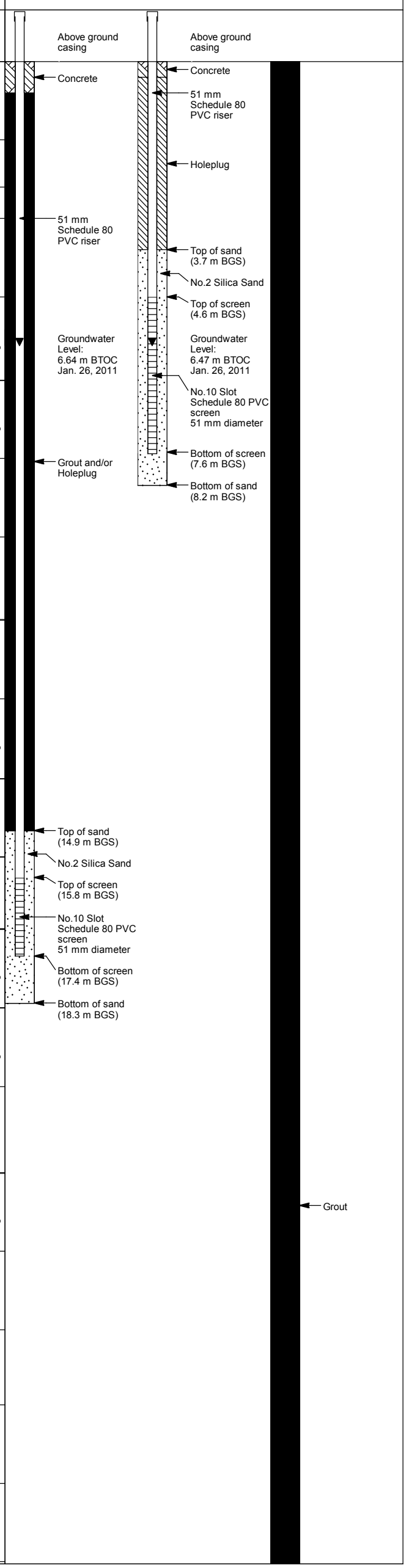
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-10
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 22-Sep-2010 / 28-Sep-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
		Ground Surface	224.41			
0	0	TOPSOIL brown, organics	0.00 224.33			
		SAND fine to medium grained, brown, loose to compact, homogeneous, moist, some sharp contacts with coarse sand and fine gravel, layers (<1.5 m) of coarse sand and fine gravel fining down or coarsening down throughout the unit	0.08	01	CC	49" 82%
5	2			02	CC	35" 97%
10	4			03	PQ	45" 75%
15	6			04	PQ	64" 100%
20				05	PQ	60" 100%
25	8			06	PQ	33" 55%
30	10			07	PQ	60" 95%
35				08	PQ	30" 50%
40	12	0.05 m laminated compact fine sand and silt seam becoming greyish brown 12.5 m BGS		09	PQ	61" 100%
45	14			10	PQ	35" 59%
50				11	PQ	54" 99%
55	16			12	PQ	60" 100%
60	18			13	PQ	60" 100%
65	20	laminated seams and clasts of clay to silty clay which increase with depth from 19.5 m BGS and below		14	PQ	60" 90%
70			202.82			
75	22	CLAY TO CLAYEY SILT trace medium and coarse sand and fine gravel, greyish brown, stiff to very stiff, inclined, horizontal laminations (<6 mm) and convoluted bedding, moist	21.59	15	PQ	60" 100%
		25 mm diameter clast of fine sand				
80	24	soft grey clay clasts (1-2 mm) beginning at 23.6 m BGS		16	PQ	53" 88%
85	26	0.05 m very fine sand seam red and grey silt clasts (1 mm) beginning at 25.9 m BGS		17	PQ	46" 80%
90				18	PQ	55" 92%
95	28	trace coarse gravel beginning at 27.5 m BGS 0.02 m fine sand seam		19	PQ	33" 55%

WELL DETAILS

	LP-MW-03-10 D	LP-MW-03-10 S	Original Borehole
Name:	LP-MW-03-10 D	LP-MW-03-10 S	Original Borehole
GS Elev:	224.41 m AMSL	224.42 m AMSL	n/a
TOC Elev:	225.53 m AMSL	225.38 m AMSL	n/a
Easting:	554367	554368	n/a
Northing:	4743782	4743779	n/a
Stick-up:	1.12 m	0.95 m	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Monitoring Well: LP-MW-03-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-10
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 22-Sep-2010 / 28-Sep-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			CLAY TO CLAYEY SILT trace medium and coarse sand and fine gravel, greyish brown, stiff to very stiff, inclined, horizontal laminations (<6 mm) and convoluted bedding, moist		20	PQ	54" 90%
100	30		0.20 m very fine sand seam 0.20 m seam of sandy silt		21	PQ	15" 25%
105	32		trace to little grey sand and silt clasts (2-20 mm)		22	PQ	45" 75%
110	34				23	PQ	49" 82%
115	36		becoming less laminated		24	PQ	44" 73%
120				187.66			
			CLAY TO CLAYEY SILT TILL trace medium and coarse sand, trace fine gravel, greyish brown, massive, stiff, moist	36.75	25	PQ	56" 90%
125	38			185.35			
			CLAY TO SILT greyish brown, stiff to very stiff, laminated (<6 mm), moist	39.07	26	PQ	57" 95%
130	40		silt and sand clasts 1-3 mm 0.12 m seam of silt		27	PQ	59" 98%
135			red and brown laminations (2-5 mm) to layers (< 0.1 m)				
	42		trace soft grey clay clasts (1 mm)		28	PQ	54" 90%
140				181.49			
			SAND & SILT TILL (Catfish Creek Till) some gravel, light grey, very stiff, poorly sorted, gravel subrounded to angular	42.92 180.75	29	PQ	60" 100%
145	44		LIMESTONE (Possibly Onondaga Formation) light brown to tan, cherty nodules	43.66 179.99			
			End of Borehole	44.42			
150	46						
155							
	48						
160							
	50						
165							
	52						
170							
175	54						
180							
	56						
185							
190	58						

WELL DETAILS

Name:	LP-MW-03-10 D	Name:	LP-MW-03-10 S	Name:	Original Borehole
GS Elev:	224.41 m AMSL	GS Elev:	224.42 m AMSL	GS Elev:	n/a
TOC Elev:	225.53 m AMSL	TOC Elev:	225.38 m AMSL	TOC Elev:	n/a
Easting:	554367	Easting:	554368	Easting:	n/a
Northing:	4743782	Northing:	4743779	Northing:	n/a
Stick-up:	1.12 m	Stick-up:	0.95 m	Stick-up:	n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Monitoring Well: LP-MW-04-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-08
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 28-Sep-2010 / 05-Oct-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	223.82			
0	0		TOPSOIL dark brown, organics	0.00 223.66	01	CC	45" 75%
			SAND fine grained, trace gravel, dark brown, loose, homogeneous, moist	0.15 223.51			
			SAND FILL trace gravel, loose, poorly graded, moist	0.30 223.21			
5	2		SAND fine to medium grained, light to dark brown, coarse sand and/or gravel content grades in and out with depth, some sections have poorly graded sand seams, loose to compact, homogeneous to stratified, moist	0.61	02	CC	38" 90%
10			becoming wet at 3.3 m BGS		03	PQ	38" 100%
	4				04	PQ	60" 100%
15							
20	6		10 mm seam of silty sand seam at 5.5 m, 6.1 m, and 6.3 m BGS 123 mm seam of silty sand		05	PQ	61" 100%
25	8				06	PQ	41" 68%
30			51 mm seam of coarse gravel		07	PQ	60" 98%
35	10				08	PQ	41" 68%
40	12				09	PQ	36" 100%
					10	PQ	24" 100%
45	14		812 mm seam of coarse sand and fine gravel		11	PQ	15" 25%
50					12	PQ	42" 72%
55	16				13	PQ	32" 53%
					14	PQ	60" 100%
60	18				15	PQ	60" 100%
65	20				16	PQ	60" 100%
70							
75	22		2 mm seam of soft grey clay soft grey clay laminations (1 mm)		17	PQ	60" 100%
80	24			199.41	18	PQ	53" 88%
			CLAYEY SILT TILL trace sand, trace angular gravel, very stiff, massive, moist	24.41 199.03			
85	26		INTERBEDDED CLAY to SAND clay to clayey silt with layers (0.1 to 0.6 m) of fine sand to silt, trace fine gravel dropstones in clay, light brown-grey (sand and silt) and reddish brown and dark grey (clay), clay stiff to very stiff, clay can be laminated (<6 mm), both sharp and gradational contacts between clay to silt and sand, wet deformation laminations from 24.8 m to 25.1 m BGS	24.79	19	PQ	54" 90%
90				196.31	20	PQ	56" 93%
	28		CLAY DIAMICTON trace sand, trace gravel, greyish brown, stiff, massive, moist	27.51			
95				194.91 28.91	21	PQ	58" 97%

WELL DETAILS

	LP-MW-04-10 D	LP-MW-04-10 I	LP-MW-04-10 S	Original Borehole
GS Elev:	223.82 m AMSL	223.80 m AMSL	223.80 m AMSL	n/a
TOC Elev:	224.82 m AMSL	224.79 m AMSL	224.74 m AMSL	n/a
Easting:	553695	553694	553693	n/a
Northing:	4743091	4743093	4743094	n/a
Stick-up:	1.00 m	1.00 m	0.95 m	n/a

- Above ground casing
- Concrete
- 51 mm Schedule 80 PVC riser
- Groundwater Level: 4.71 m BTOC Jan. 26, 2011
- Grout and/or Holeplug
- Top of sand (18.0 m BGS)
- No.2 Silica Sand
- Top of screen (18.9 m BGS)
- No.10 Slot Schedule 80 PVC screen 51 mm diameter
- Bottom of screen (22.0 m BGS)
- Bottom of sand (22.9 m BGS)

- Above ground casing
- Concrete
- 51 mm Schedule 80 PVC riser
- Groundwater Level: 4.68 m BTOC Jan. 26, 2011
- Holeplug
- Top of sand (11.0 m BGS)
- No.2 Silica Sand
- Top of screen (11.6 m BGS)
- No.10 Slot Schedule 80 PVC screen 51 mm diameter
- Bottom of screen (13.1 m BGS)
- Bottom of sand (13.7 m BGS)

- Above ground casing
- Concrete
- 51 mm Schedule 80 PVC riser
- Holeplug
- Top of sand (2.4 m BGS)
- No.2 Silica Sand
- Top of screen (3.0 m BGS)
- Groundwater Level: 4.62 m BTOC Jan. 26, 2011
- No.10 Slot Schedule 80 PVC screen 51 mm diameter
- Bottom of screen (6.1 m BGS)
- Bottom of sand (6.7 m BGS)
- Grout

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-04-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-08
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 28-Sep-2010 / 05-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-04-10 D GS Elev: 223.82 m AMSL TOC Elev: 224.82 m AMSL Easting: 553695 Northing: 4743091 Stick-up: 1.00 m Name: LP-MW-04-10 I GS Elev: 223.80 m AMSL TOC Elev: 224.79 m AMSL Easting: 553694 Northing: 4743093 Stick-up: 1.00 m Name: LP-MW-04-10 S GS Elev: 223.80 m AMSL TOC Elev: 224.74 m AMSL Easting: 553693 Northing: 4743094 Stick-up: 0.95 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
			SANDY SILT trace sand, trace gravel, trace to little soft grey clasts (1 mm), firm, homogeneous, moist	194.02				
	30		CLAY DIAMICTON trace sand, trace gravel, greyish brown, stiff, massive, moist	29.79 193.67	22	PQ	56" 93%	
100			SANDY SILT trace sand, trace gravel, trace to little soft grey clasts (1 mm), firm, homogeneous, moist	30.15 193.49				
			CLAY DIAMICTON trace sand, trace gravel, greyish brown, stiff, massive, moist	30.33 192.63				
			CLAY TO CLAYEY SILT trace sand, trace gravel, greyish brown, soft to very stiff, massive, moist deformation features in upper 0.3 m,	31.19	23	PQ	57" 95%	
105	32		trace to little soft grey clasts (1 mm) from 32.5 m to 33.2 m BGS		24	PQ	51" 85%	
110								
	34				25	PQ	19" 32%	
115			1 mm clay laminations from 35.5 m to 35.6 m BGS					
	36				26	PQ	22" 37%	
120								
					27	PQ	16" 27%	
125	38		becoming grey trace cobble					
					28	PQ	30" 50%	
130			convoluted bedding					
	40		1 mm clay laminations	183.69				
			CLAY TO SANDY SILT grey, stiff, non cohesive to high plasticity, stratified (up to 40 mm) and laminated (1 mm), moist to wet	40.13	29	PQ	54" 90%	
135			convoluted bedding					
	42				30	PQ	48" 80%	
140			LIMESTONE grey to light grey, fossiliferous, calcite mineralization on fractures	181.30 42.52				
					31	PQ	45" 100%	
145	44		End of Borehole	179.50 44.32				
150	46							
155								
	48							
160								
	50							
165								
170	52							
175								
	54							
180								
	56							
185								
190	58							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-05-10

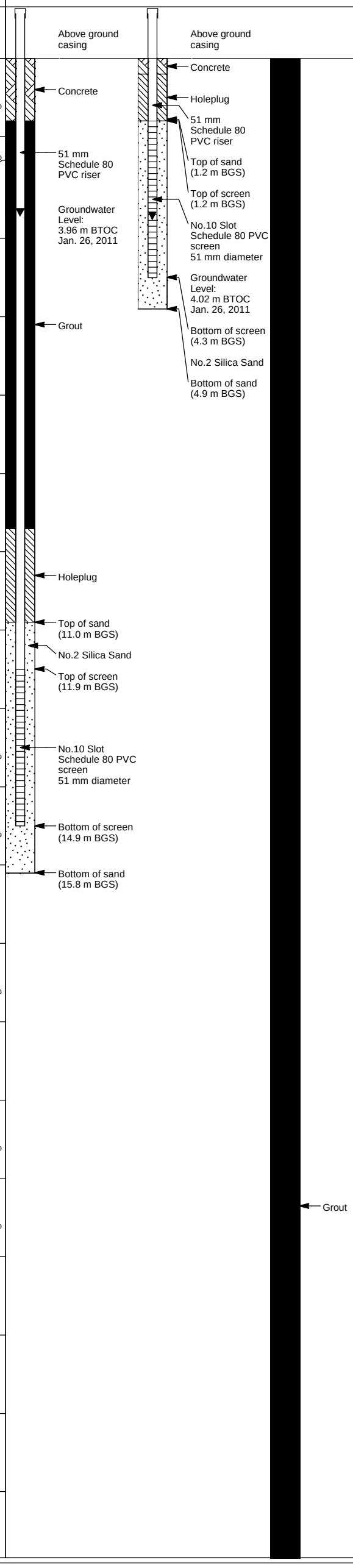
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-14
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 29-Sep-2010 / 05-Oct-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	225.25			
0	0		TOPSOIL fine grained sand with silt, trace gravel, organics, dark brown, compact	0.00 225.09			
			SAND AND SILT fining downwards from medium grained to fine grained sand, orangey brown	0.15 224.44	01	CC	60" 100%
5	2		INTERBEDDED CLAY TO SILTY SAND fine grained silty sand grades to clay and back, light brown to reddish brown, laminated clay (<6 mm), moist	0.81	02	CC	18" 100%
			wet		03	PQ	48" 80%
10	4		SAND primarily medium grained sand, some sections of finer or coarser grained sand, some sections with trace to little gravel and/or silt, light brown to light grey-brown, loose to compact	222.25 3.00	04	PQ	37" 62%
15					05	PQ	37" 62%
20	6				06	PQ	26" 43%
25	8		762 mm layer of sand & gravel oxidation staining		07	PQ	57" 95%
			clay block clast (20 mm)		08	PQ	44" 73%
30	10				09	PQ	51" 85%
35					10	PQ	60" 100%
40	12		101 mm layer of laminated silty clay		11	PQ	60" 100%
45	14		SAND fine grained sand, trace to with silt, trace grey clasts (3 mm) of silty clay to clay, compact to dense, wet	211.83 13.41	12	PQ	50" 83%
50					13	PQ	60" 100%
55	16				14	PQ	57" 95%
60	18		INTERBEDDED CLAY to SAND clay to silty clay with 0.1 to 0.3 m layers of silt to very fine grained sand, trace gravel in clay zones, light brown-grey (sand and silt) to reddish brown and grey (clay), firm in sand and silty zones to stiff and very stiff in clayey zones, alternating fining or coarsening down within cohesionless sediments with sharp contacts at clay to silty clay layers	208.71 16.54	15	PQ	60" 100%
			trace clay clasts (<1 mm) from 18.7 m to 20.1 m BGS		16	PQ	60" 100%
65	20			204.98			
70			SANDY CLAYEY SILT TILL trace gravel, grey, blocky, very stiff to very hard	20.27 204.82	17	PQ	44" 73%
	22		INTERBEDDED CLAY to SAND clay to silty clay with 0.1 to 0.3 m layers of silt to very fine grained sand, trace gravel in clay zones, light brown-grey (sand and silt) to reddish brown and grey (clay), firm in sand and silty zones to stiff and very stiff in clayey zones, alternating fining or coarsening down within cohesionless sediments with sharp contacts at clay to silty clay layers deformed laminations within upper 0.4 m of unit	20.42 201.93	18	PQ	48" 80%
75					19	PQ	59" 98%
80	24		CLAY TO SILTY CLAY trace sand and gravel, grey, very stiff to very hard, homogeneous to laminated (<1 mm)	23.32	20	PQ	56" 93%
85	26						
90			10 mm sand seams from 26.9 m to 27.9 m BGS				
95	28		convoluted bedding SILT TO SAND fine grained, trace grey clay clasts, light grey brown, wet	197.13 28.12 196.14			

WELL DETAILS

Name:	LP-MW-05-10 D	Name:	LP-MW-05-10 S	Name:	Original Borehole
GS Elev:	225.25 m AMSL	GS Elev:	225.31 m AMSL	GS Elev:	n/a
TOC Elev:	226.14 m AMSL	TOC Elev:	226.20 m AMSL	TOC Elev:	n/a
Easting:	553657	Easting:	553655	Easting:	n/a
Northing:	4745937	Northing:	4745936	Northing:	n/a
Stick-up:	0.89 m	Stick-up:	0.89 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-05-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-14
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 29-Sep-2010 / 05-Oct-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			SILTY CLAY convoluted bedding, grey, moist	29.11 195.83			
			CLAYEY SILT DIAMICTON trace sand, trace gravel, blockey, very stiff to very hard	29.41			
100	30				21	PQ	56" 93%
105	32				22	PQ	60" 100%
				192.48			
			CLAYEY SILT homogeneous to convoluted bedding with fine sandy silt, grey to reddish brown mottling, stiff 10 mm silty fine sand seam trace gravel from 35.8 m BGS to bottom of unit	32.77	23	PQ	54" 90%
110	34			191.11			
			SANDY SILT fine grained, light grey brown, dense to very dense, homogeneous to blocky	34.14	24	PQ	60" 100%
115				189.74			
			CLAYEY SILT trace gravel and coarse sand, brown and reddish brown mottling	35.51			
120	36		380 mm layer of silty fine sand	188.21	25	PQ	59" 98%
125	38		INTERBEDDED CLAY to SAND clay to silty clay (150 mm to 200 mm thick) interbedded with silt to very fine grained sand (80 mm to 200 mm thick), trace gravel in clay zones, light brown-grey (sand and silt) to reddish brown and grey (clay), firm in sand and silty zones to stiff and very stiff in clayey zones, laminated and convoluted bedding clay and silt sections, alternating fining or coarsening down within cohesionless sediments with sharp contacts at clay to silty clay layers	37.03	26	PQ	58" 97%
130	40				27	PQ	32" 53%
135					28	PQ	60" 100%
				183.49			
	42		SAND & SILT TILL (Catfish Creek Till) some gravel, light grey, very stiff, poorly sorted, gravel subrounded to angular	41.76 182.73	29	PQ	40" 67%
140			LIMESTONE (Prossibly Dundee Formation) dark brown to grey, highly fossiliferous (corals, crinoids), trace fractures	42.52			
145	44				30	PQ	65" 108%
				180.59			
			End of Borehole	44.65			
150	46						
155							
160	48						
165	50						
170	52						
175	54						
180							
185	56						
190	58						

WELL DETAILS

Name:	LP-MW-05-10 D	Name:	LP-MW-05-10 S	Name:	Original Borehole
GS Elev:	225.25 m AMSL	GS Elev:	225.31 m AMSL	GS Elev:	n/a
TOC Elev:	226.14 m AMSL	TOC Elev:	226.20 m AMSL	TOC Elev:	n/a
Easting:	553657	Easting:	553655	Easting:	n/a
Northing:	4745937	Northing:	4745936	Northing:	n/a
Stick-up:	0.89 m	Stick-up:	0.89 m	Stick-up:	n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-06-10

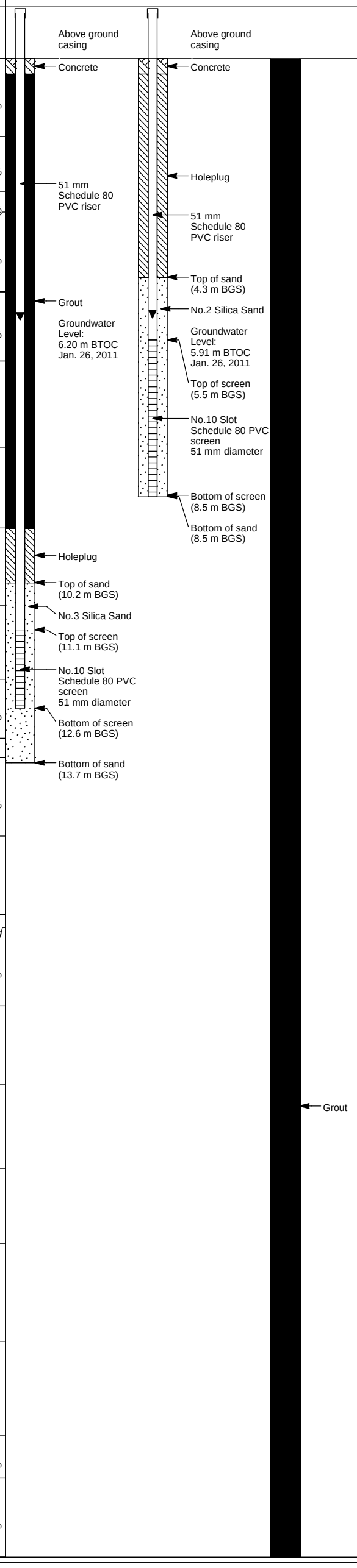
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-13
Number: 160900637

Field investigator: M. Fraser / J. Koch / A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 01-Oct-2010 / 07-Oct-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
		Ground Surface	231.11			
0	0	TOPSOIL silty loam, trace gravel, dark brown, moist	0.00 230.89			
		SANDY SILT very fine grained, trace coarse sand, light brown with some oxidation staining, homogeneous to laminated (<6 mm), moist	0.23 229.87	01	CC	60" 100%
5		oxidation staining from 1.2 m to 2.1 m BGS	1.24			
	2	SILT little clay, light brown, homogeneous		02	CC	42" 100%
		10 mm soft grey clay, trace gravel, layer	228.12	03	PQ	16" 100%
10		SILTY CLAY TO SILT gradational and sharp transitions between silt and clayey silt, light brown, homogeneous to laminated (<6 mm)	3.00	04	PQ	61" 100%
15	4					
			225.86	05	PQ	53" 100%
20	6	SAND medium grained, little fine grained, brown, homogeneous, wet	5.26	06	PQ	60" 91%
25		trace gravel from 7.3 m BGS and below		07	PQ	25" 40%
30	8			08	PQ	n/a
35	10			09	PQ	37" 65%
40	12			10	PQ	45" 100%
			217.50			
45	14	SAND & GRAVEL medium to coarse sand, fine to coarse grained rounded gravel, little cobbles, homogeneous, wet	13.61	11	PQ	60" 100%
50		coarsening to base of unit		12	PQ	50" 83%
55	16		214.30	13	PQ	10" 100%
		SILT little fine sand, little fine gravel, little clay	16.81	14	PQ	60" 100%
60	18	grey				
		grading to silty sand towards base of unit		15	PQ	28" 47%
65	20		211.30			
		SAND trace silt, fine grained, grey, wet	19.81	16	PQ	58" 89%
70			210.16			
	22	CLAYEY SILT TO SILT clay content varies, trace to some sand, trace gravel, grey, convoluted bedding to homogeneous, some sections with laminations (<6 mm), wet	20.96	17	PQ	55" 96%
75						
80	24			18	PQ	60" 80%
		457 mm sand layer		19	PQ	60" 83%
85	26	457 mm sand layer	204.57			
		SILT TO SAND layers of silt to sand, both gradational and sharp contacts, 5 mm seams of clay throughout, light grey brown, compact to dense, wet	26.54	20	PQ	33" 100%
90		inclined laminations and cross bedding from 27.4 m to 28.9 m BGS				
	28	reddish brown clay clasts (3 mm) from 28.0 m to 29.2 m BGS		21	PQ	60" 100%
95						

WELL DETAILS

LP-MW-06-10 D	LP-MW-06-10 S	Original Borehole
GS Elev: 231.11 m AMSL	GS Elev: 231.12 m AMSL	GS Elev: n/a
TOC Elev: 232.22 m AMSL	TOC Elev: 231.98 m AMSL	TOC Elev: n/a
Easting: 552271	Easting: 552273	Easting: n/a
Northing: 4747001	Northing: 4747001	Northing: n/a
Stick-up: 1.11 m	Stick-up: 0.85 m	Stick-up: n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-06-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-13
Number: 160900637

Field investigator: M. Fraser / J. Koch / A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 01-Oct-2010 / 07-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-06-10 D GS Elev: 231.11 m AMSL TOC Elev: 232.22 m AMSL Easting: 552271 Northing: 4747001 Stick-up: 1.11 m Name: LP-MW-06-10 S GS Elev: 231.12 m AMSL TOC Elev: 231.98 m AMSL Easting: 552273 Northing: 4747001 Stick-up: 0.85 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		SILT TO SAND layers of silt to sand, both gradational and sharp contacts, 5 mm seams of clay throughout, light grey brown, compact to dense, wet possible organics in sand		22	PQ	60" 100%	
			possible organics in sand		23	PQ	61" 97%	
105	32			198.83				
			INTERBEDDED CLAY to SAND clay to silty clay with layers (0.1 to 0.6 m) of silt to fine sand, trace fine gravel dropstones in clay, light brown-grey (sand and silt) and reddish brown and dark grey (clay), clay stiff to very stiff, laminated (<6 mm) to convoluted bedding, both sharp and gradational contacts betwen clay to sand, wet	32.28	24	PQ	60" 100%	
110	34				25	PQ	60" 100%	
115	36				26	PQ	60" 100%	
120					27	PQ	60" 100%	
125	38			192.91				
			SAND & SILT TILL (Catfish Creek Till) some gravel, light grey, very stiff, poorly sorted, gravel subrounded to angular	38.20	28	PQ	59" 98%	
				191.92				
130	40		LIMESTONE (Prossibly Dundee Formation) dark brown to grey, highly fossiliferous (corals, crinoids), trace fractures	39.19	29	PQ	35" 100%	
135	42			190.32				
			End of Borehole	40.79				
140								
145	44							
150	46							
155								
160	48							
165	50							
170	52							
175	54							
180								
185	56							
190	58							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-07-10

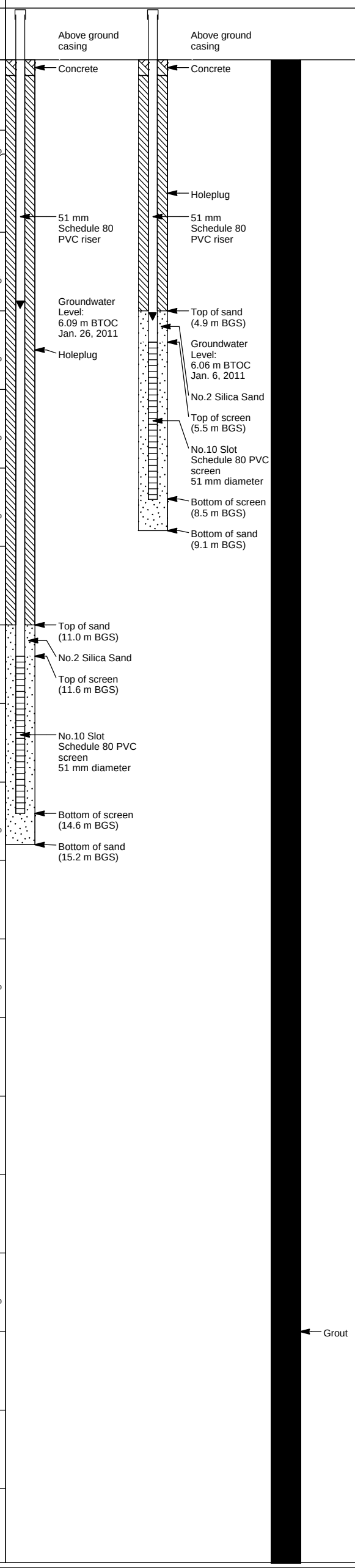
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-09
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 06-Oct-2010 / 19-Oct-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
		Ground Surface	228.54			
0	0	TOPSOIL medium sand with organics, dark brown	0.00 228.39			
		SAND fine to medium grained, some sections with little silt, brown, loose, homogeneous, moist to wet	0.15	01	CC	49" 91%
5	2			02	CC	18" 100%
			226.05			
		SILT AND CLAY LAYERS reddish brown to light grey, stiff to very stiff, laminated (<6 mm), moist	2.49 225.39	03	PQ	56" 93%
10		SAND fine to medium grained, yellowish brown to grey brown, loose to compact, grading between fine to medium sand, moist	3.15			
	4			04	PQ	60" 100%
15						
				05	PQ	60" 100%
20	6	oxidation staining				
				06	PQ	60" 100%
25	8					
		76 mm seam of gravel trace gravel from 8.3 m BGS and below		07	PQ	60" 100%
30	10					
				08	PQ	54" 90%
35						
				09	PQ	30" 50%
40	12					
				10	PQ	48" 80%
45						
	14					
			213.86			
		CLAYEY SILT TILL trace coarse sand and fine gravel, grey, stiff to very stiff, blocky	14.68	11	PQ	60" 100%
50						
	16			12	PQ	52" 87%
55						
			210.97			
		INTERBEDDED CLAY to SAND clay to silty clay with layers (0.1 to 0.6 m) of silt to fine sand, trace fine gravel dropstones in clay, light brown-grey (sand and silt) and reddish brown and dark grey (clay), clay stiff to very stiff, structure ranges from laminated (<6 mm), convoluted bedding to homogeneous, both sharp and gradational contacts betwen clay to sand, wet	17.57	13	PQ	60" 100%
60	18					
		deformed laminations within upper 0.3 m of unit		14	PQ	20" 33%
65	20					
				15	PQ	57" 95%
70						
	22			16	PQ	54" 90%
75						
				17	PQ	60" 100%
80	24					
				18	PQ	56" 93%
85	26					
				19	PQ	36" 60%
90						
		230 mm fossiliferous limestone cobble	200.57			
	28	CLAYEY SILT TILL trace coarse sand, grey, stiff to very stiff, blockey	27.97	20	PQ	26" 43%
95						

WELL DETAILS

Name:	LP-MW-07-10 D	Name:	LP-MW-07-10 S	Name:	Original Borehole
GS Elev:	228.54 m AMSL	GS Elev:	228.81 m AMSL	GS Elev:	n/a
TOC Elev:	229.80 m AMSL	TOC Elev:	229.82 m AMSL	TOC Elev:	n/a
Easting:	552484	Easting:	552479	Easting:	n/a
Northing:	4744349	Northing:	4744348	Northing:	n/a
Stick-up:	1.26 m	Stick-up:	1.01 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-07-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-09
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 06-Oct-2010 / 19-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-07-10 D GS Elev: 228.54 m AMSL TOC Elev: 229.80 m AMSL Easting: 552484 Northing: 4744349 Stick-up: 1.26 m Name: LP-MW-07-10 S GS Elev: 228.81 m AMSL TOC Elev: 229.82 m AMSL Easting: 552479 Northing: 4744348 Stick-up: 1.01 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		dark grey fossiliferous limestone cobble	199.20 29.34				
			SILT TO CLAY grading between silt and clay with depth, trace fine sand, trace gravel dropstones, light brown grey, very stiff, laminated (<6 mm) to homogeneous		21	PQ	31" 52%
105	32				22	PQ	48" 80%
110					23	PQ	57" 95%
	34		100 mm seam of medium to coarse sand	194.61 33.93			
			INTERBEDDED CLAY to SAND clay to silty clay with layers (0.1 to 0.6 m) of silt to fine sand, trace fine gravel dropstones in clay, light brown-grey (sand and silt) and reddish brown and dark grey (clay), clay soft to very stiff, structure ranges from laminated (<6 mm), convoluted bedding to homogeneous, both sharp and gradational contacts betwen clay to sand, wet		24	PQ	30" 50%
115	36				25	PQ	25" 42%
120					26	PQ	13" 22%
125	38				27	PQ	4" 7%
130	40		convoluted bedding		28	PQ	36" 60%
135					29	PQ	30" 50%
	42				30	PQ	6" 10%
140					31	PQ	50" 83%
145	44				32	PQ	28" 47%
150				180.86 47.68			
	46		LIMESTONE grey brown, few fractures, visible bedding/layers		33	PQ	54" 90%
155							
	48						
160							
				179.16 49.38	34	PQ	12" 100%
			End of Borehole				
165	50						
170	52						
175							
	54						
180							
	56						
185							
190	58						

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-08-10

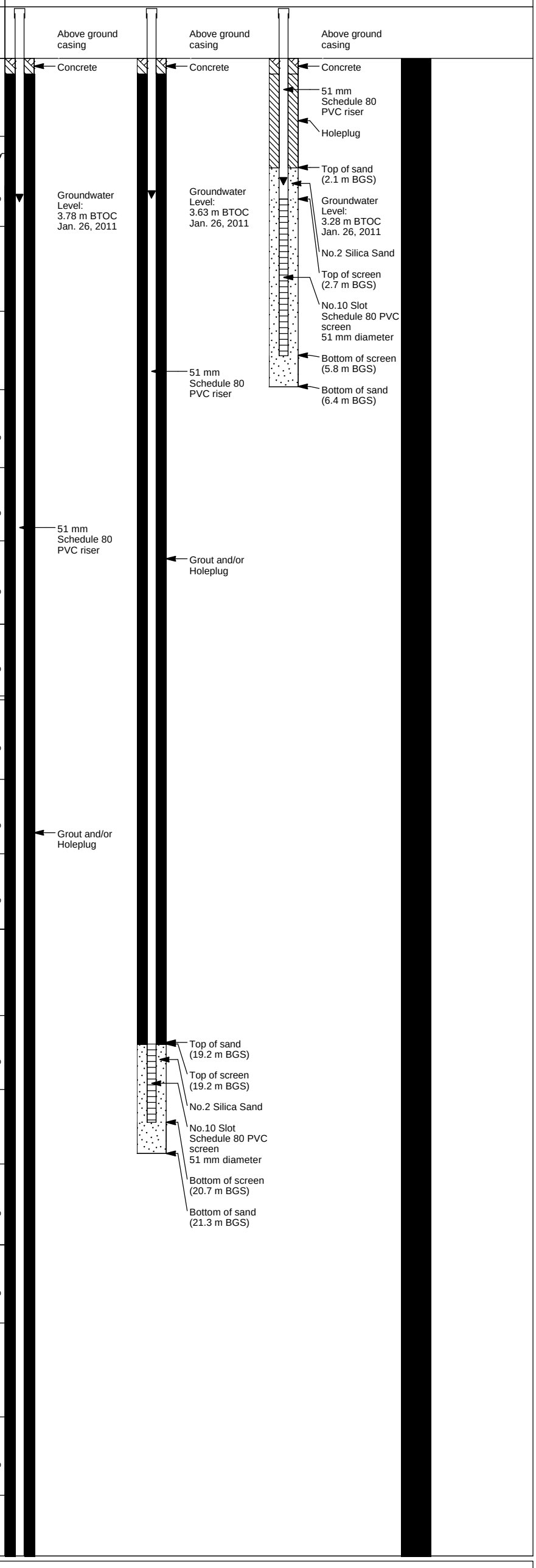
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-06
Number: 160900637

Field investigator: R. Dong / J. Koch / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 08-Oct-2010 / 21-Oct-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	234.70			
0	0		TOPSOIL fine sand, little silt, dark brown, homogeneous, moist	0.00 234.24			
			SAND fine grained, yellowish brown, loose to compact, homogeneous, moist	0.46	01	CC	48" 80%
5					02	CC	13" 100%
	2		wet convoluted bedding brown		03	PQ	56" 100%
10					04	PQ	60" 92%
15	4		black and grey brown laminations (<3 mm)		05	PQ	43" 72%
20	6		black laminations (2-10 mm)		06	PQ	60" 100%
25				226.72			
	8		50 mm seam of convoluted bedding of silt and clay	7.98	07	PQ	56" 100%
30			SILT grey, very soft, homogeneous, wet	225.12			
			CLAYEY SILT grey, convoluted bedding and laminations, moist	9.57	08	PQ	64" 100%
35	10			223.67			
			SAND fine grained, brown, laminated, wet	11.02 223.32			
			SILT laminations (5 mm to 10 mm) of silty clay to clay, grey, firm, wet	11.38	09	PQ	55" 100%
40	12			222.20			
			INTERBEDDED SILT AND SAND primarily silt with sand layers (up to 201 mm), fine grained, grey, wet	12.50	10	PQ	61" 100%
45							
	14		laminations (<6 mm) in sand layers		11	PQ	57" 100%
50			160 mm lense of convoluted clayey silt 160 mm lense of convoluted clayey silt 160 mm lense of convoluted clayey silt				
	16		400 mm layer of fine grained sand		12	PQ	58" 100%
55				217.73			
			SANDY SILT fine to very fine grained, grey, firm, wet, 24 mm lense of convoluted silty clay 24 mm lense of convoluted silty clay	16.97	13	PQ	54" 82%
60	18		24 mm lense of convoluted silty clay				
					14	PQ	57" 100%
65	20				15	PQ	19" 33%
70				213.16			
			SAND fine grained, trace silt, brownish grey to grey, loose to compact, homogeneous, wet	21.54	16	PQ	62" 100%
75	22						
					17	PQ	60" 100%
80	24						
					18	PQ	51" 71%
85	26		76 mm lense of silty clay				
			250 mm layer of silt		19	PQ	60" 100%
90	28						
95			126 mm layer of silty clay		20	PQ	35" 58%

WELL DETAILS

LP-MW-08-10 D	LP-MW-08-10 I	LP-MW-08-10 S	Original Borehole
Name:	Name:	Name:	Name:
GS Elev: 234.70 m AMSL	GS Elev: 234.74 m AMSL	GS Elev: 234.78 m AMSL	GS Elev: n/a
TOC Elev: 235.68 m AMSL	TOC Elev: 235.65 m AMSL	TOC Elev: 235.60 m AMSL	TOC Elev: n/a
Easting: 549453	Easting: 549454	Easting: 549455	Easting: n/a
Northing: 4742765	Northing: 4742763	Northing: 4742761	Northing: n/a
Stick-up: 0.99 m	Stick-up: 0.91 m	Stick-up: 0.82 m	Stick-up: n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-08-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-06
Number: 160900637

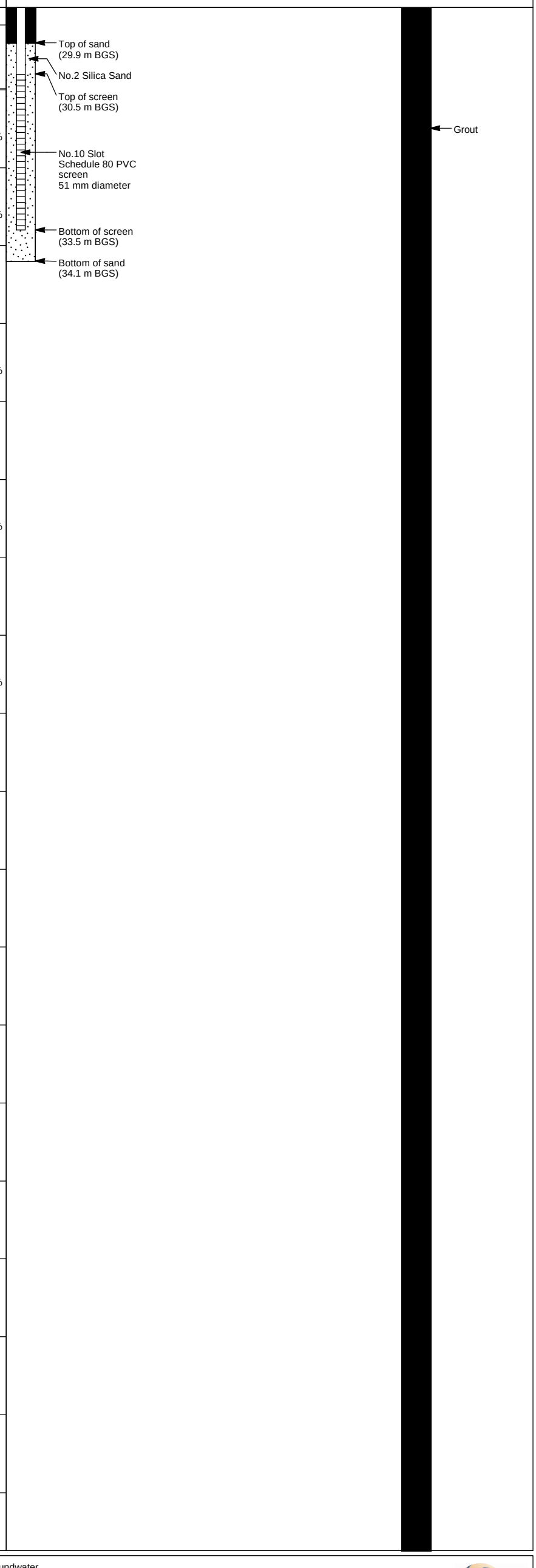
Field investigator: R. Dong / J. Koch / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 08-Oct-2010 / 21-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	

WELL DETAILS

Name:	LP-MW-08-10 D	Name:	LP-MW-08-10 I	Name:	LP-MW-08-10 S	Name:	Original Borehole
GS Elev:	234.70 m AMSL	GS Elev:	234.74 m AMSL	GS Elev:	234.78 m AMSL	GS Elev:	n/a
TOC Elev:	235.68 m AMSL	TOC Elev:	235.65 m AMSL	TOC Elev:	235.60 m AMSL	TOC Elev:	n/a
Easting:	549453	Easting:	549454	Easting:	549455	Easting:	n/a
Northing:	4742765	Northing:	4742763	Northing:	4742761	Northing:	n/a
Stick-up:	0.99 m	Stick-up:	0.91 m	Stick-up:	0.82 m	Stick-up:	n/a

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
100	30	SAND fine grained, trace silt, brownish grey to grey, loose to compact, homogeneous, wet 25 mm lense of convoluted clayey silt 25 mm lense of convoluted clayey silt 25 mm lense of convoluted clayey silt		21	PQ	35" 71%
105	32	50 mm lense of clay increased silt content from 31.1 m to 31.7 m BGS		22	PQ	60" 100%
110			200.86	23	PQ	60" 100%
	34	INTERBEDDED CLAY TO SILT primarily clay to clayey silt with layers of silt to sand, fine to very fine grained, greyish brown to grey, homogeneous to laminated, wet	33.83	24	PQ	49" 82%
115						
	36			25	PQ	60" 100%
120		convoluted bedding		26	PQ	38" 63%
125	38			27	PQ	60" 100%
130	40			28	PQ	29" 48%
135		convoluted bedding		29	PQ	60" 100%
	42			30	PQ	28" 47%
140				31	PQ	30" 50%
145	44			32	PQ	35" 58%
150				33	PQ	16" 27%
	46			34	PQ	24" 40%
155				35	PQ	51" 85%
	48			36	PQ	56" 93%
160				37	PQ	22" 37%
	50	trace fine gravel in clay layers from 50.6 m to 52.1 m BGS loading structure		38	PQ	2" 3%
165				39	PQ	39" 65%
170	52			40	PQ	38" 63%
175		loading structure (clay injected into sand layer)				
	54					
180						
	56					
185						
190	58					



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-08-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-06
Number: 160900637

Field investigator: R. Dong / J. Koch / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 08-Oct-2010 / 21-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	
195			INTERBEDDED CLAY TO SILT primarily clay to clayey silt with layers of silt to sand, fine to very fine grained, greyish brown to grey, homogeneous to laminated, wet	174.35				
	60		SILTY SAND TILL (Possibly Catfish Creek) some clay, trace gravel, well graded, wet	60.35 173.99 60.70	41	PQ	51" 85%	
200			LIMESTONE grey brown, trace fossils, highly fractured, visible bedding/layers					
	62				42	PQ	58" 97%	
205				171.63				
			End of Borehole	63.07				
210	64							
215	66							
220	68							
225	70							
230	72							
235	74							
240	76							
245	78							
250	80							
255	82							
260	84							
265	86							
270	88							
275								
280								
285								
290								

WELL DETAILS

Name:	LP-MW-08-10 D	Name:	LP-MW-08-10 I	Name:	LP-MW-08-10 S	Name:	Original Borehole
GS Elev:	234.70 m AMSL	GS Elev:	234.74 m AMSL	GS Elev:	234.78 m AMSL	GS Elev:	n/a
TOC Elev:	235.68 m AMSL	TOC Elev:	235.65 m AMSL	TOC Elev:	235.60 m AMSL	TOC Elev:	n/a
Easting:	549453	Easting:	549454	Easting:	549455	Easting:	n/a
Northing:	4742765	Northing:	4742763	Northing:	4742761	Northing:	n/a
Stick-up:	0.99 m	Stick-up:	0.91 m	Stick-up:	0.82 m	Stick-up:	n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-09-10

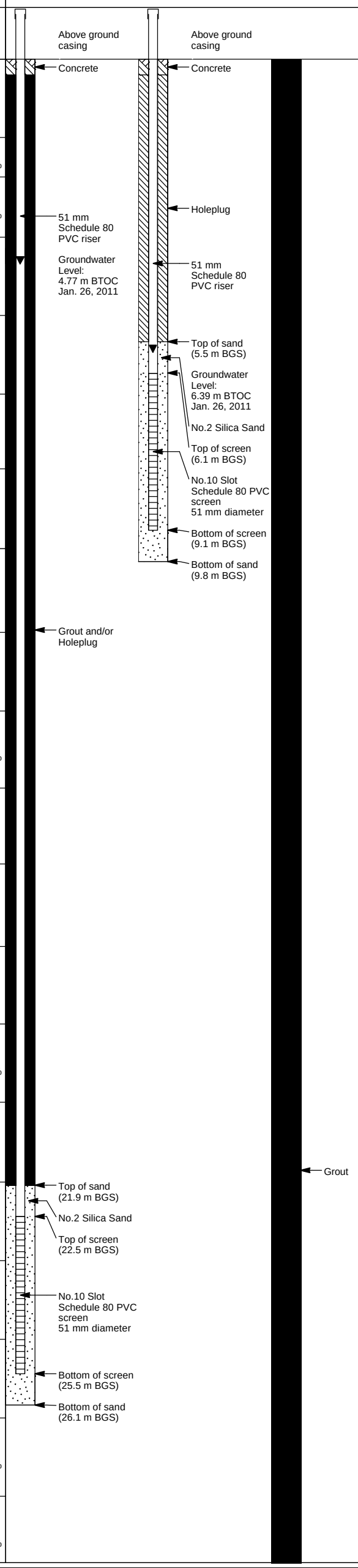
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-07
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 14-Oct-2010 / 20-Oct-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	222.42			
0	0		TOPSOIL sand, trace silt, organics, dark brown, loose, moist	0.00 222.24			
			SAND medium grained, trace silt, yellowish brown to grey brown, loose, homogeneous, some coarse and/or fine sand grades in and out with depth	0.18	01	CC	19" 32%
5	2				02	CC	30" 100%
10					03	PQ	46" 100%
	4				04	PQ	21" 35%
15					05	PQ	44" 73%
20	6				06	PQ	46" 81%
25	8		trace fine gravel		07	PQ	30" 49%
30			48 mm seam of clay	212.72			
	10		INTERBEDDED CLAY TO SILTY SAND layers of clay (<200 mm)and silty sand (<200 mm) with both gradational and sharp contacts, light brown to reddish brown, clay soft to very stiff, sand loose to compact, clay laminated to homogeneous,	9.70	08	PQ	40" 63%
35							
40	12				09	PQ	58" 97%
45					10	PQ	59" 100%
	14						
50					11	PQ	53" 91%
	16		convoluted bedding convoluted bedding		12	PQ	53" 84%
55							
60	18				13	PQ	57" 97%
			inclined 25 mm seam of grey clay		14	PQ	60" 100%
65	20			202.18			
			SAND fine grained, trace to some medium grained sand, trace to some silt, light grey to brown, loose to dense, some sections laminated	20.24	15	PQ	51" 84%
70							
	22				16	PQ	54" 90%
75							
	24		cross-bedding		17	PQ	24" 40%
80							
85	26		48 mm seam of clay 48 mm seam of clay cross-bedding		18	PQ	54" 90%
90					19	PQ	60" 100%
	28		48 mm seam of silty clay				
95					20	PQ	60" 100%

WELL DETAILS

Name:	LP-MW-09-10 D	Name:	LP-MW-09-10 S	Name:	Original Borehole
GS Elev:	222.42 m AMSL	GS Elev:	222.67 m AMSL	GS Elev:	n/a
TOC Elev:	223.21 m AMSL	TOC Elev:	223.37 m AMSL	TOC Elev:	n/a
Easting:	554675	Easting:	554676	Easting:	n/a
Northing:	4742247	Northing:	4742248	Northing:	n/a
Stick-up:	0.79 m	Stick-up:	0.70 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-09-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-07
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 14-Oct-2010 / 20-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-09-10 D GS Elev: 222.42 m AMSL TOC Elev: 223.21 m AMSL Easting: 554675 Northing: 4742247 Stick-up: 0.79 m Name: LP-MW-09-10 S GS Elev: 222.67 m AMSL TOC Elev: 223.37 m AMSL Easting: 554676 Northing: 4742248 Stick-up: 0.70 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		48 mm seam of silty clay SAND fine grained, trace to some medium grained sand, trace to some silt, light grey to brown, loose to dense, some sections laminated		21	PQ	60" 100%	
105	32				22	PQ	60" 100%	
110	34		80 mm seam of silty clay		23	PQ	60" 100%	
115	36			186.35	24	PQ	60" 100%	
120	36		CLAY TO SILT gradations between clay to silt, trace fine gravel, trace to little sand, light grey to brown, firm to stiff, laminated	36.07	25	PQ	54" 90%	
125	38				26	PQ	44" 73%	
130	40				27	PQ	48" 80%	
135	40		SILT TILL little fine sand, little gravel, grey, very stiff to very hard, blocky	182.16 40.26 181.73	28	PQ	59" 100%	
			SILTY CLAY TO CLAYEY SILT trace coarse sand, trace gravel dropstones, grey, laminated	40.69 181.38				
			LIMESTONE grey brown, trace fossils, few fractures, visible bedding/layers	41.04				
140	42				29	PQ	56" 92%	
			End of Borehole	179.29 43.13				
145	44							
150	46							
155	48							
160	50							
165								
170	52							
175	54							
180								
185	56							
190	58							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-10-10

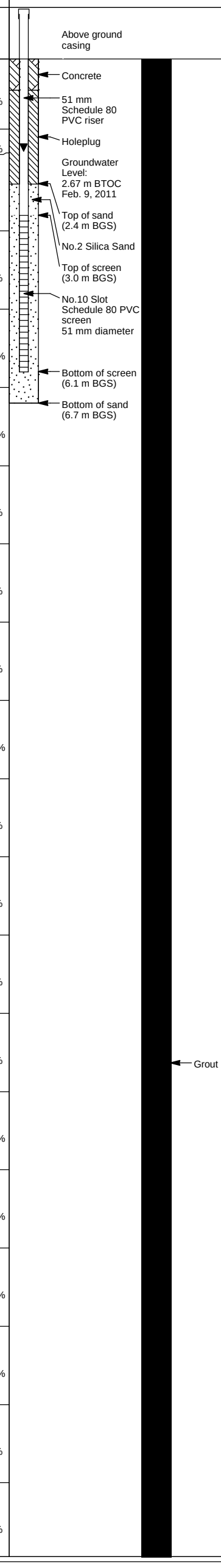
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-23
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 20-Oct-2010 / 26-Oct-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	237.26			
0	0		TOPSOIL fine grained sand with organics, very dark brown, loose, homogeneous, poorly graded, moist	0.00 236.93			
			SAND fine grained, pale brown to grey brown, homogeneous, loose, moist dark brown and dark yellowish brown mottling	0.33	01	CC	43" 80%
5			laminations (<6 mm) from 1.2 m to 1.5 m BGS		02	CC	12" 67%
	2				03	PQ	0" 0%
10							
	4				04	PQ	47" 78%
15							
					05	PQ	60" 100%
20	6		wet at 6.4 m BGS				
			trace to little silt from 7.1 m to 7.9 m BGS 25 mm seam of dark grey clay 80 mm seam of firm brown silt		06	PQ	60" 100%
25				229.33			
	8		INTERBEDDED CLAY TO SILT layers of clay (<150 mm) and silt (<300 mm) with both gradational and sharp contacts, greyish brown to reddish brown, soft clay and firm silt, laminated to homogeneous, wet	7.92	07	PQ	53" 88%
30			silt includes little fine sand from 9.4 m to 11.0 m BGS				
	10				08	PQ	44" 73%
35			highly convoluted silty clay to clay beds trace soft grey and reddish brown clay clasts in all layers from 11.0 m to 14.0 m BGS trace fine gravel				
					09	PQ	59" 98%
40	12						
					10	PQ	60" 100%
45				223.23			
	14		CLAY trace coarse gravel, greyish brown, moist	14.02	11	PQ	22" 37%
50			50 mm seam of silt	221.71			
	16		SILT AND SAND trace to little fine gravel, fine grained, grey, homogeneous, moist	15.54	12	PQ	26" 43%
55							
					13	PQ	28" 47%
60	18			218.97			
			INTERBEDDED CLAY TO SAND layers (50 to 100 mm) of clay and silt and sand, sharp contacts with clay layers, light brown to reddish brown, clay soft to very stiff, silt and sand loose to compact, clay laminated	18.29	14	PQ	14" 23%
65							
	20			217.14			
			SAND fine grained, grey, loose to compact, homogeneous, wet	20.12	15	PQ	60" 100%
70				216.00			
			CLAY TO SILT greyish brown and grey, highly convoluted laminations from 1 to 2 mm thick	21.26 215.61			
	22		SAND fine grained, grey, loose to compact, homogeneous, wet	21.64	16	PQ	60" 100%
75				214.60			
			INTERBEDDED CLAY TO SILT layers (50 to 100 mm) of clay and silt, varying degree of trace to little sand within silt layers, both gradational and sharp contacts, light brown, grey, and reddish brown, clay soft to very stiff, silt loose to compact, horizontal and convoluted laminations	22.66			
			trace cobble		17	PQ	60" 100%
80	24						
			300 mm layer of fine grained sand		18	PQ	60" 100%
			250 mm layer of fine grained sand				
85	26			211.04			
			SILTY CLAY TILL little medium and coarse sand, trace to little fine and coarse gravel, greyish brown, hard 100 mm cobble	26.21			
			100 mm cobble		19	PQ	38" 63%
90	28						
			100 mm cobble		20	PQ	35" 58%
95			100 mm cobble				

WELL DETAILS

Name:	LP-MW-10-10 S	Name:	Original Borehole
GS Elev:	237.26 m AMSL	GS Elev:	n/a
TOC Elev:	238.13 m AMSL	TOC Elev:	n/a
Easting:	549878	Easting:	n/a
Northing:	4750746	Northing:	n/a
Stick-up:	0.87 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-10-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-23
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 20-Oct-2010 / 26-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-10-10 S GS Elev: 237.26 m AMSL TOC Elev: 238.13 m AMSL Easting: 549878 Northing: 4750746 Stick-up: 0.87 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		SILTY CLAY TILL little medium and coarse sand, trace to little fine and coarse gravel, greyish brown, hard	207.51				
			DEFORMED SILTY CLAY little medium and coarse sand, trace to little fine and coarse gravel, grey and reddish brown, hard, convoluted mixing or deformed layers of grey and reddish brown sediment	29.74 206.75	21	PQ	60" 100%	
			SILTY CLAY TILL little medium and coarse sand, trace to little fine and coarse gravel, greyish brown, hard 80 mm seam of fine sand	30.50 205.56	22	PQ	60" 100%	
105	32		INTERBEDDED CLAY TO SAND layers (50 to 100 mm) of clay and silt and sand, sharp contacts with clay layers, light brown to reddish brown, clay firm to very stiff, silt and sand loose to compact, convoluted laminations (<6 mm) and layers	31.70				
					23	PQ	60" 100%	
110	34		CLAY DIAMICTON trace medium and coarse sand, trace fine and coarse gravel, dark greyish brown, massive, moist	203.42 33.83				
					24	PQ	60" 100%	
115	36		SAND & SILT TILL (Catfish Creek Till) some gravel, some cobbles, light grey, very stiff, poorly sorted, gravel subrounded to angular	201.90 35.36				
					25	PQ	49" 82%	
120				199.74				
125	38		LIMESTONE (Possibly Dundee Formation) dark brown to grey, highly fossiliferous (corals, crinoids), trace fractures	37.51	26	PQ	60" 100%	
					27	PQ	28" 100%	
				198.14				
			End of Borehole	39.11				
130	40							
135								
	42							
140								
	44							
145								
150	46							
155								
	48							
160								
	50							
165								
170	52							
175								
	54							
180								
	56							
185								
190	58							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-11-10

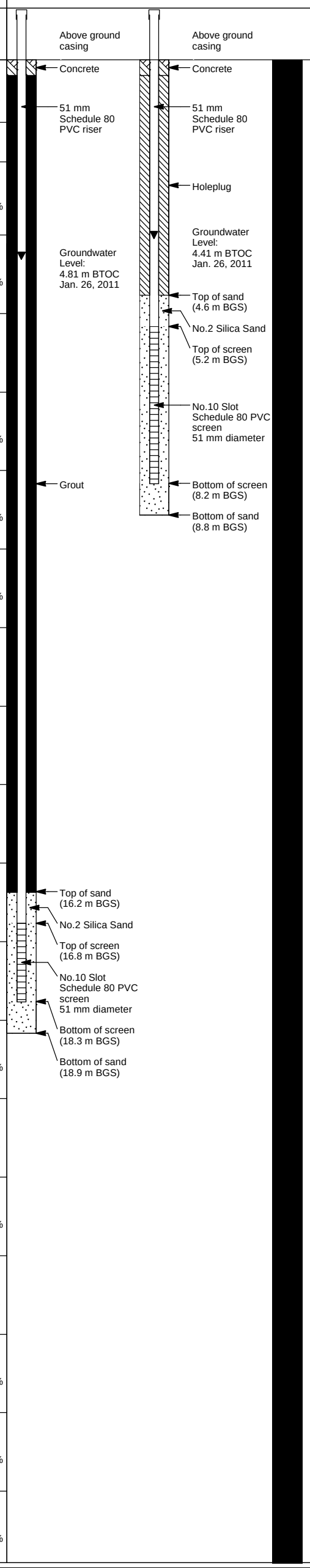
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-17
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 25-Oct-2010 / 08-Nov-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
0	0	Ground Surface	236.86			
		SAND medium to fine grained, yellowish brown to light brown, loose to compact, homogeneous to laminated, some sections have gradational sequences between fine and medium grained sand	0.00	01	CC	39" 81%
5	2	oxidation staining from 1.2 m to 2.7 m BGS		02	CC	27" 90%
				03	PQ	56" 100%
10		grading between fine and medium grained sand with trace silt				
	4	laminated		04	PQ	60" 100%
15				05	PQ	58" 97%
20	6			06	PQ	60" 100%
25	8	wet at 7.9 m BGS		07	PQ	60" 100%
30				08	PQ	60" 100%
	10					
35		4 mm diameter red and light grey clay clasts		09	PQ	50" 83%
40	12					
				10	PQ	24" 40%
45	14			11	PQ	24" 40%
50						
	16			12	PQ	15" 25%
55				13	PQ	40" 67%
60	18		218.22			
		INTERBEDDED CLAY TO SILTY SAND predominantly silt to sand layers (150 mm to 450 mm) with thinner clay layers interbedded (10 mm to 75 mm), gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay firm to stiff, silt and sand loose to compact, horizontal and convoluted laminations in clay	18.64	14	PQ	60" 100%
65	20					
		deformed laminations in clay		15	PQ	46" 77%
70				16	PQ	60" 100%
	22					
75				17	PQ	45" 75%
80	24		211.92			
		CLAY TO SILTY CLAY reddish brown and grey, stiff to very stiff, roughly laminated, some mottling, moist predominantly silt to sand layers (150 mm to 450 mm) with thinner clay layers interbedded (10 mm to 75 mm), gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay firm to stiff, silt and sand loose to compact, horizontal and convoluted laminations in clay	24.94	18	PQ	60" 100%
85	26					
				19	PQ	60" 100%
90						
	28			20	PQ	60" 100%
95						

WELL DETAILS

LP-MW-11-10 D	LP-MW-11-10 S	Original Borehole
GS Elev: 236.86 m AMSL	GS Elev: 236.88 m AMSL	GS Elev: n/a
TOC Elev: 237.79 m AMSL	TOC Elev: 237.81 m AMSL	TOC Elev: n/a
Easting: 549840	Easting: 549840	Easting: n/a
Northing: 4741097	Northing: 4741100	Northing: n/a
Stick-up: 0.93 m	Stick-up: 0.93 m	Stick-up: n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-11-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-17
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 25-Oct-2010 / 08-Nov-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-11-10 D GS Elev: 236.86 m AMSL TOC Elev: 237.79 m AMSL Easting: 549840 Northing: 4741097 Stick-up: 0.93 m Name: LP-MW-11-10 S GS Elev: 236.88 m AMSL TOC Elev: 237.81 m AMSL Easting: 549840 Northing: 4741100 Stick-up: 0.93 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		trace coarse sand clasts (3mm to 10 mm) from 29.1 m to 29.3 m BGS CLAY TO SILTY CLAY reddish brown and grey, stiff to very stiff, roughly laminated, some mottling, moist predominantly silt to sand layers (150 mm to 450 mm) with thinner clay layers interbedded (10 mm to 75 mm), gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay firm to stiff, silt and sand loose to compact, horizontal and convoluted laminations in clay	206.02	21	PQ	41" 68%	
105	32		INTERBEDDED CLAY TO SAND predominantly silt to sand layers (50 mm to 750 mm) with thinner clay layers interbedded (50 mm to 150 mm), gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay firm to stiff, silt and sand loose to compact, homogeneous to laminated in silt and sand, horizontal and convoluted laminations in clay	30.83	22	PQ	56" 93%	
110	34		32.9 m BGS possible organics in fine sand to silt, dark grey to black with odour		23	PQ	50" 83%	Grout
115	36		35.6 m BGS possible organics in silt, dark grey to black with odour		24	PQ	42" 70%	
120	38		trace clay clast and coarse sand clast (<5 mm)		25	PQ	57" 95%	
125	40				26	PQ	46" 77%	
130	42				27	PQ	24" 40%	
135	44		cross bedding in sand layer		28	PQ	42" 70%	
140	46				29	PQ	47" 78%	
145	48		trace clay clasts (<5 mm) in sand layers		30	PQ	53" 88%	
150	50				31	PQ	41" 68%	
155	52				32	PQ	60" 100%	
160	54		possible organics in sandy silt at 47.9 m BGS		33	PQ	57" 95%	
165	56				34	PQ	52" 87%	
170	58				35	PQ	37" 62%	
175			53.3 m BGS possible organics in sandy clayey silt, black with odour trace clay clasts (<5 mm) to bottom of unit		36	PQ	60" 100%	
180					37	PQ	60" 100%	
185					38	PQ	60" 100%	
190					39	PQ	60" 100%	
					40	PQ	60" 100%	

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-11-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-17
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 25-Oct-2010 / 08-Nov-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-11-10 D GS Elev: 236.86 m AMSL TOC Elev: 237.79 m AMSL Easting: 549840 Northing: 4741097 Stick-up: 0.93 m Name: LP-MW-11-10 S GS Elev: 236.88 m AMSL TOC Elev: 237.81 m AMSL Easting: 549840 Northing: 4741100 Stick-up: 0.93 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
195			INTERBEDDED CLAY TO SAND predominantly silt to sand layers (50 mm to 750 mm) with thinner clay layers interbedded (50 mm to 150 mm), gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay firm to stiff, silt and sand loose to compact, homogeneous to laminated in silt and sand, horizontal and convoluted laminations in clay					
	60				41	PQ	60" 100%	
200								
	62				42	PQ	60" 100%	
205								
	64				43	PQ	24" 40%	
210				172.50				
			SILTY SAND TILL (Catfish Creek Till) some gravel, some cobbles, light grey, very stiff, poorly sorted, gravel subrounded to angular, blocky	64.36 171.89				
			LIMESTONE (Possibly Dundee Formation) light grey and brown to yellowish brown, trace fossils	64.97	44	PQ	58" 97%	
215								
	66				45	PQ	25" 89%	
			End of Borehole	170.26 66.60				
220								
	68							
225								
	70							
230								
	72							
235								
	74							
240								
	76							
245								
	78							
250								
	80							
255								
	82							
260								
	84							
265								
	86							
270								
	88							
275								
280								
285								
290								

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-12-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-21
Number: 160900637

Field investigator: R. Dong / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 27-Oct-2010 / 29-Oct-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	239.44			
0	0		TOPSOIL fine to medium sand, trace organics, very dark brown, loose, homogeneous, moist	0.00 239.13 0.30			
			SAND fine to medium grained, trace gravel, yellowish brown to brown, loose, homogeneous, moist		01	CC	48" 100%
5					02	CC	21" 88%
	2				03	PQ	60" 100%
10							
	4				04	PQ	60" 100%
15			wet at 4.9 m BGS		05	PQ	60" 100%
20	6		25 mm silty clay clast at 6.0 m BGS 175 mm silt and fine sand seam black laminations (<2 mm)		06	PQ	60" 100%
25							
	8		100 mm clay seam with convoluted laminations	230.57 8.86	07	PQ	60" 100%
30			SAND AND SILT grading between silt to sand, fine grained, dark greyish brown, homogeneous to laminated, moist to wet				
	10		300 mm seam of layered (10 mm to 60 mm) convoluted sand, silt and clay		08	PQ	60" 100%
35			175 mm seam of laminated (<2 mm) clay, reddish brown to grey				
40	12				09	PQ	60" 100%
			75 mm seam of laminated (<2 mm) clay, reddish brown to grey		10	PQ	60" 100%
45	14						
50					11	PQ	60" 100%
	16		25 mm seam of clay 125 mm seam of clay		12	PQ	60" 100%
55				222.37 17.07			
			INTERBEDDED CLAY TO SAND predominantly silt to sand layers (50 mm to 750 mm) with thinner clay layers interbedded (50 mm to 150 mm), gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay soft to stiff, silt and sand loose to compact, homogeneous to laminated in silt and sand, horizontal and convoluted laminations in clay		13	PQ	60" 100%
60	18						
					14	PQ	44" 73%
65	20		alternating horizontal laminations with convoluted layers from 20.1 m to 21.6 m BGS		15	PQ	58" 97%
70							
	22				16	PQ	60" 100%
75					17	PQ	60" 100%
	24		clay with oxidation staining and little gravel from 24.2 m to 24.7 m BGS				
80				214.44 24.99	18	PQ	60" 100%
85	26		SAND & SILT TILL (Catfish Creek Till) some gravel, some cobbles (up to 130 mm), light grey, very stiff, poorly sorted, gravel subrounded to angular		19	PQ	60" 100%
90							
	28				20	PQ	42" 70%
95							

WELL DETAILS

Name:	LP-MW-12-10 S	Name:	Original Borehole
GS Elev:	239.44 m AMSL	GS Elev:	n/a
TOC Elev:	240.30 m AMSL	TOC Elev:	n/a
Easting:	552051	Easting:	n/a
Northing:	4753995	Northing:	n/a
Stick-up:	0.87 m	Stick-up:	n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Monitoring Well: LP-MW-12-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-21
Number: 160900637

Field investigator: R. Dong / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 27-Oct-2010 / 29-Oct-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-12-10 S GS Elev: 239.44 m AMSL TOC Elev: 240.30 m AMSL Easting: 552051 Northing: 4753995 Stick-up: 0.87 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		SAND & SILT TILL (Catfish Creek Till) some gravel, some cobbles (up to 130 mm), light grey, very stiff, poorly sorted, gravel subrounded to angular		21	PQ	60" 100%	
				207.71				
105	32		SILTY CLAY little fine sand inclusions (<3 mm), reddish brown, very dense, horizontal to convoluted laminations, moist	31.72	22	PQ	60" 100%	
				206.75				
			SANDY SILT trace gravel, very dense, homogeneous, moist to wet	32.69 206.69	23	PQ	60" 100%	
110	34		LIMESTONE dark grey, trace fossils	32.74				
					24	PQ	36" 100%	
				204.69				
115	36		End of Borehole	34.75				
120	38							
125	40							
130	42							
135	44							
140	46							
145	48							
150	50							
155	52							
160	54							
165	56							
170	58							
175								
180								
185								
190								

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-13-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-16
Number: 160900637

Field investigator: A. Vandenhoff / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 01-Nov-2010 / 05-Nov-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
				235.91			
0	0		Ground Surface TOPSOIL organics, little sand, trace gravel, black, loose, dry	0.00 235.60 0.30			
			SAND fine to medium grained, yellowish brown to grey brown, loose to compact, homogeneous to laminated, moist oxidation staining near top of unit		01	CC	45" 94%
5	2				02	CC	24" 100%
					03	PQ	59" 98%
10	4				04	PQ	51" 85%
15	6		wet at 5.8 m BGS		05	PQ	55" 92%
20	8		trace reddish brown clay clasts (<5 mm) from 7.9 m to 10.9 m BGS		06	PQ	56" 93%
25	10				07	PQ	59" 98%
30	12				08	PQ	56" 93%
35	14		trace grey clay clasts (<5 mm) from 12.5 m to 14.0 m BGS		09	PQ	60" 100%
40	16				10	PQ	57" 95%
45	18		10 mm clay seam		11	PQ	60" 100%
50	20		100 mm reddish brown, stiff, clay seam		12	PQ	60" 100%
55	22		200 mm laminated, firm, greyish brown, silty clay seam		13	PQ	60" 100%
60	24		300 mm silty sand seam		14	PQ	60" 100%
65	26				15	PQ	60" 100%
70	28			214.19	16	PQ	60" 100%
75	30		SANDY SILT TO SILTY SAND grading between sandy silt and silty sand with few silt seams, fine to very fine grained, greyish brown to brown, homogeneous to laminated, wet 80 mm laminated, grey, clay seam	21.72			
80	32		100 mm laminated, grey, clayey silt seam		17	PQ	60" 100%
85	34		75 mm laminated, brownish grey, clay seam 50 mm laminated silty clay seam		18	PQ	60" 100%
90	36		100 mm laminated, brown, silty clay seam		19	PQ	60" 100%
95	38		50 mm laminated, brown, silty clay seam 75 mm laminated, reddish brown, clay seam 25 mm grey clay seam		20	PQ	60" 100%

WELL DETAILS

	LP-MW-13-10 D	LP-MW-13-10 S	Original Borehole
Name:	LP-MW-13-10 D	LP-MW-13-10 S	Original Borehole
GS Elev:	235.91 m AMSL	236.02 m AMSL	n/a
TOC Elev:	236.86 m AMSL	236.95 m AMSL	n/a
Easting:	550111	550115	n/a
Northing:	4744331	4744330	n/a
Stick-up:	0.95 m	0.93 m	n/a

Above ground casing
Concrete
Groundwater Level: 4.79 m BTOC Feb. 3, 2011
51 mm Schedule 80 PVC riser
Grout and/or Holeplug
Top of sand (19.2 m BGS)
No.2 Silica Sand
Top of screen (19.8 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (21.3 m BGS)
Bottom of sand (21.9 m BGS)

Above ground casing
Concrete
51 mm Schedule 80 PVC riser
Holeplug
Groundwater Level: 4.85 m BTOC Feb. 3, 2011
Top of sand (4.0 m BGS)
No.2 Silica Sand
Top of screen (4.6 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (7.6 m BGS)
Bottom of sand (8.2 m BGS)

Grout

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-13-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-16
Number: 160900637

Field investigator: A. Vandenhoff / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 01-Nov-2010 / 05-Nov-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			SANDY SILT TO SILTY SAND grading between sandy silt and silty sand with few silt seams, fine to very fine grained, greyish brown to brown, homogeneous to laminated, wet				
100	30		25 mm grey clay seam		21	PQ	60" 100%
			50 mm laminated, reddish brown, silty clay seam		22	PQ	45" 75%
105	32						
			100 mm laminated, reddish brown, clayey silt seam		23	PQ	52" 87%
110	34				24	PQ	60" 100%
115				200.55			
	36		SAND brown, loose, some laminations, wet	35.36 199.00	25	PQ	60" 100%
120							
	38		INTERBEDDED CLAY TO SAND predominantly silt to sand layers (50 mm to 750 mm) with thinner clay layers interbedded (50 mm to 150 mm), gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay soft to stiff, silt and sand loose to compact, homogeneous to laminated in silt and sand, horizontal and convoluted laminations in clay	36.91	26	PQ	60" 100%
125					27	PQ	60" 100%
130	40				28	PQ	60" 100%
135							
	42				29	PQ	60" 100%
140				192.93			
			INTERBEDDED CLAY TO SILT predominantly silt (50 mm to 750 mm) with thinner clay layers interbedded (50 mm to 150 mm), sharp contacts with clay, light brown, grey, and reddish brown, clay soft to stiff, silt loose to compact, homogeneous to laminated	42.98	30	PQ	57" 95%
145	44		alternating sequence of silt (~100 mm) and clay (~150 mm) layers from 43.0 m to 44.5 m BGS		31	PQ	60" 100%
150	46				32	PQ	60" 100%
155				187.80			
	48		CLAY TO SILTY CLAY trace gravel, reddish brown, homogeneous, soft to stiff, moist	48.11	33	PQ	60" 100%
160							
	50				34	PQ	60" 100%
165					35	PQ	60" 100%
170	52				36	PQ	64" 100%
175				182.21			
	54		SAND & SILT TILL (Catfish Creek Till) some gravel, some cobbles (up to 130 mm), light grey, very dense, poorly sorted, gravel subrounded to angular	53.69 182.16 53.75	37	PQ	56" 100%
180			LIMESTONE light grey, fossiliferous, styolites	180.74			
			End of Borehole	55.17			
185	56						
190	58						

SAMPLE DETAILS

WELL DETAILS

Name:	LP-MW-13-10 D	Name:	LP-MW-13-10 S	Name:	Original Borehole
GS Elev:	235.91 m AMSL	GS Elev:	236.02 m AMSL	GS Elev:	n/a
TOC Elev:	236.86 m AMSL	TOC Elev:	236.95 m AMSL	TOC Elev:	n/a
Easting:	550111	Easting:	550115	Easting:	n/a
Northing:	4744331	Northing:	4744330	Northing:	n/a
Stick-up:	0.95 m	Stick-up:	0.93 m	Stick-up:	n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-14-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-04
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 08-Nov-2010 / 15-Nov-2010

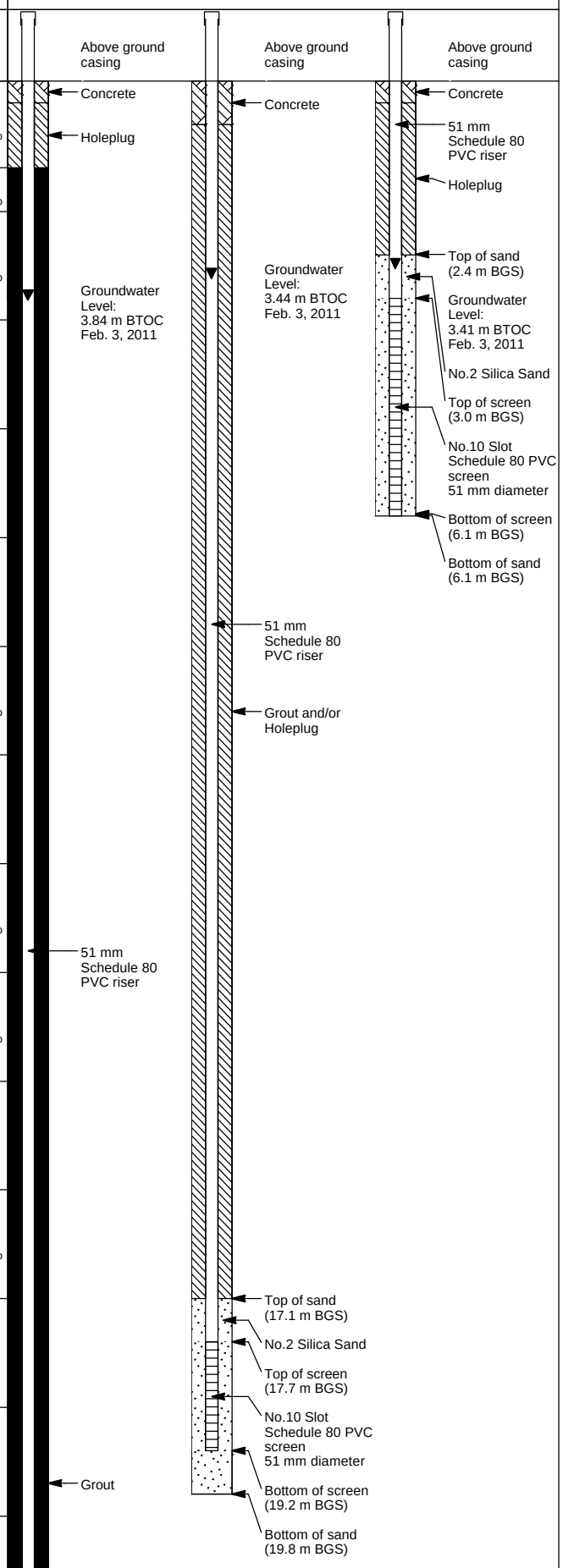
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
				238.41			
0	0		Ground Surface TOPSOIL medium grained sand, organics, trace gravel, dark brown	0.00 238.11 0.30			
			SAND fine to medium grained, yellowish brown to light grey brown, homogenous to laminated, loose to compact, moist oxidation staining from 0.3 m to 0.45 m BGS		01	CC	48" 100%
5	2		wet at 1.4 m BGS laminated to layered sandy silt with sand from 1.42 m to 2.4 m BGS		02	CC	24" 100%
					03	PQ	60" 100%
10	4		trace fine gravel		04	PQ	50" 83%
15					05	PQ	43" 72%
20	6		trace fine gravel		06	PQ	57" 95%
25	8		trace silt		07	PQ	60" 100%
30			25 mm clay seam 25 mm clay seam				
35	10				08	PQ	51" 85%
40	12				09	PQ	60" 100%
45					10	PQ	60" 100%
50	14		poorly graded, trace fine gravel from 15.5 m to 20.1 m BGS		11	PQ	55" 92%
55	16				12	PQ	60" 100%
60					13	PQ	27" 45%
65	18				14	PQ	9" 15%
	20			218.29			
			SILT TO SILTY SAND grading between silt and silty sand with few clay seams or layers, fine to very fine grained, greyish brown to brown, homogeneous to laminated, wet	20.12	15	PQ	60" 100%
70	22				16	PQ	40" 67%
75					17	PQ	51" 85%
80	24		trace grey and red clay clasts (<5 mm) in sandy silt				
			50 mm reddish brown clay seam		18	PQ	60" 100%
85	26						
90			50 mm reddish brown clay seam		19	PQ	51" 85%
	28		25 mm laminated clayey silt seam				
95				209.76 28.65	20	PQ	42" 70%

WELL DETAILS

LP-MW-14-10 D
Name: LP-MW-14-10 D
GS Elev: 238.41 m AMSL
TOC Elev: 239.18 m AMSL
Easting: 547451
Northing: 4743322
Stick-up: 0.77 m

LP-MW-14-10 I
Name: LP-MW-14-10 I
GS Elev: 238.52 m AMSL
TOC Elev: 239.20 m AMSL
Easting: 547453
Northing: 4743323
Stick-up: 0.67 m

LP-MW-14-10 S
Name: LP-MW-14-10 S
GS Elev: 238.39 m AMSL
TOC Elev: 239.17 m AMSL
Easting: 547455
Northing: 4743324
Stick-up: 0.78 m



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-14-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-04
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 08-Nov-2010 / 15-Nov-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
100	30		INTERBEDDED CLAY TO SAND predominantly silt to sand layers (25 mm to 250 mm) with thinner clay layers interbedded (10 mm to 125 mm), trace grey clay clasts, trace sand inclusions in cohesive layers, gradational between silt to sand, sharp contacts with clay, light brown, grey, and reddish brown, clay firm to very stiff, silt and sand loose to compact, homogeneous to laminated in silt and sand, horizontal and convoluted laminations in clay		21	PQ	36" 60%
105	32				22	PQ	39" 65%
110	34				23	PQ	54" 90%
115	36				24	PQ	60" 100%
120					25	PQ	60" 100%
				200.61	26	PQ	57" 95%
125	38		SAND medium to fine grained, dense, light grey brown, homogeneous to laminated	37.80	27	PQ	45" 75%
130	40				28	PQ	54" 90%
135	42				29	PQ	20" 33%
140				195.05			
145	44		INTERBEDDED CLAY TO SILTY SAND predominantly clay to clayey silt with thinner silt to silty sand layers interbedded (10 mm to 300 mm), gradational contacts, light brown, grey, and reddish brown, clay firm to very stiff, silt and sand loose to compact, homogeneous to laminated light grey clay clasts in silty sand	43.36	30	PQ	58" 97%
150			trace coarse sand inclusions in silty clay	192.54	31	PQ	60" 100%
	46		SANDY CLAYEY SILT DIAMICTON light grey brown, blocky, hard to very hard	45.87 191.93			
155			INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 250 mm), clay to clayey silt layers (10 mm to 125 mm), gradational contacts, light brown, grey, and reddish brown, clay firm to very stiff, silt and sand loose to compact, homogeneous to laminated	46.48	32	PQ	60" 100%
	48		zones with light grey and red clay clasts		33	PQ	58" 97%
160				188.65			
	50		SILTY SAND trace fine gravel, grey, blocky, poorly sorted, very dense	49.76 188.37	34	PQ	48" 80%
165			LIMESTONE light grey, fossiliferous, styolites	50.04			
170	52		End of Borehole	186.44 51.97			
175	54						
180							
	56						
185							
190	58						

Name: LP-MW-14-10 D
GS Elev: 238.41 m AMSL
TOC Elev: 239.18 m AMSL
Easting: 547451
Northing: 4743322
Stick-up: 0.77 m

Name: LP-MW-14-10 I
GS Elev: 238.52 m AMSL
TOC Elev: 239.20 m AMSL
Easting: 547453
Northing: 4743323
Stick-up: 0.67 m

Name: LP-MW-14-10 S
GS Elev: 238.39 m AMSL
TOC Elev: 239.17 m AMSL
Easting: 547455
Northing: 4743324
Stick-up: 0.78 m

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-15-10

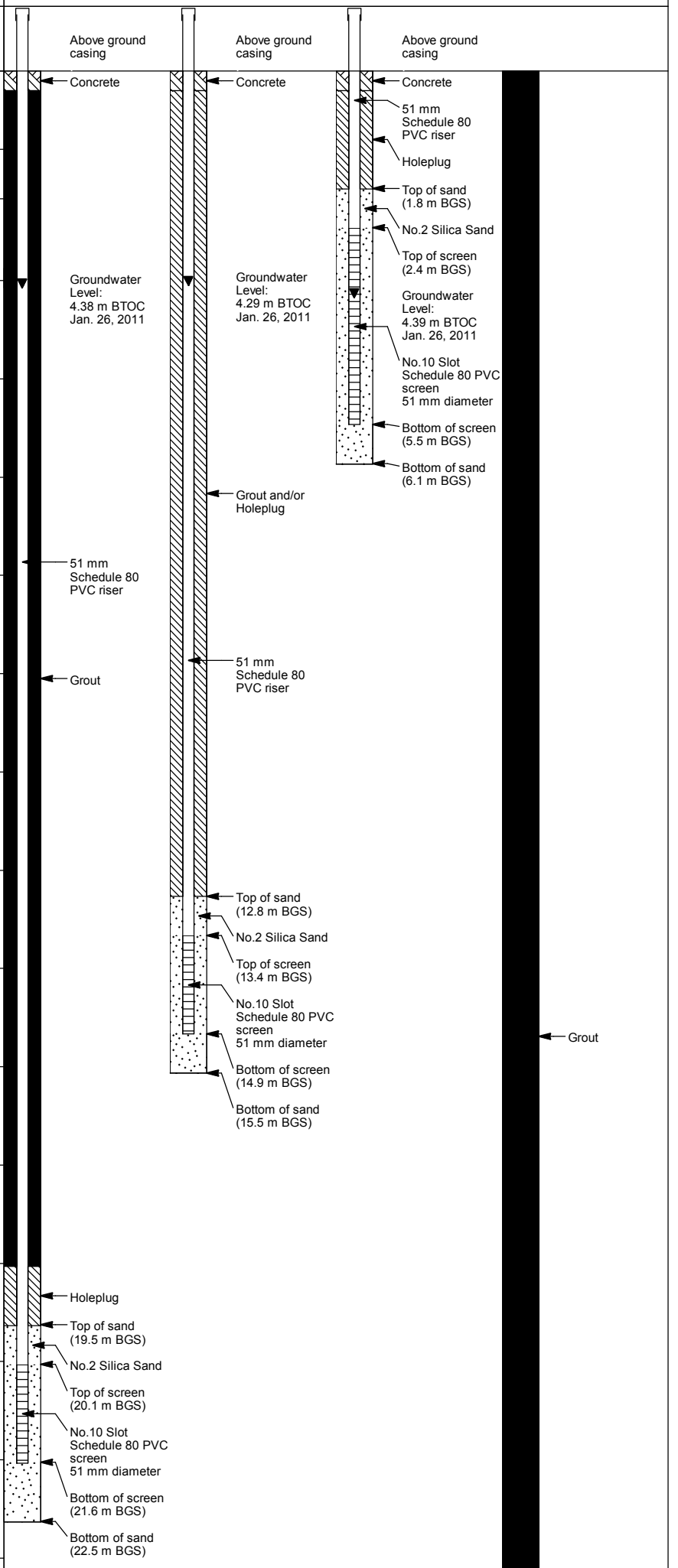
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-15
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 09-Nov-2010 / 15-Nov-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
		Ground Surface	222.76			
0	0	TOPSOIL sand and silt, very dark greyish brown (10YR3/2)	0.00 222.61			
		SAND AND GRAVEL FILL dark greyish brown (10YR4/2), well graded, moist	0.15 222.45	01	CC	44" 92%
		CLAYEY SILT trace fine sand, yellowish brown, stiff, laminated (<1 mm), moist	0.30			
5		175 mm very dark greyish brown, homogeneous seam of clayey silt		02	CC	30" 100%
	2	convoluted laminations	220.78 1.98			
		SAND fine to medium grained sand, trace to little gravel, brown (10YR4/3), loose, moist	220.37 2.39	03	PQ	44" 88%
		SANDY SILT medium grained, lenses of fine to medium grained sand, trace soft clay seams				
10		(1-3 mm), dark yellowish brown (10YR4/4) to brown (10YR4/3), loose, convoluted laminations, grading to sand at base of unit, wet	219.51 3.25			
		SAND medium grained, trace to little gravel, homogeneous, wet		04	PQ	57" 95%
15	4	175 mm gravelly sand seam (trace granite gravel), subrounded		05	PQ	60" 100%
20	6			06	PQ	60" 100%
25		gravelly sand from 7.5 m to 9.3 m BGS				
	8			07	PQ	23" 38%
30						
	10			08	PQ	60" 100%
35						
				09	PQ	60" 100%
40	12					
				10	PQ	48" 80%
45	14					
				11	PQ	48" 80%
50		trace granite gravel	206.88			
	16	INTERBEDDED CLAY TO SILTY SAND silt to silty sand layers (50 mm to 225 mm), clay to clayey silt layers (10 mm to 250 mm), gradational and sharp contacts, greyish brown (10YR5/2) to very dark grey (10YR3/1), clay firm to very stiff, silt and sand loose to compact, homogeneous to laminated, wet	15.87	12	PQ	60" 100%
55						
				13	PQ	60" 100%
60	18	sulphurous odour				
		sulphurous odour		14	PQ	44" 73%
65	20		202.74			
		SILTY SAND TO SAND predominantly fine grained sand with silty sand grading in and out of unit, greyish brown (10YR5/2) to very dark grey (10YR5/2), loose to compact, wet	20.01	15	PQ	58" 97%
70		trace soft reddish brown clay lenses (1-2 mm)				
	22			16	PQ	60" 100%
75			199.70			
		INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 225 mm) and clay to clayey silt layers (25 mm to 50 mm), greyish brown to reddish brown, sharp contacts between cohesive and non cohesive sediment, laminated, moist to wet	23.06	17	PQ	60" 100%
80	24		197.92			
		SILTY CLAY TO CLAY DIAMICTON trace to little sand, trace fine gravel, greyish brown (10YR5/2), stiff, moist	24.84	18	PQ	60" 100%
85						
	26			19	PQ	10" 17%
90						
	28		194.46			
		LIMESTONE light grey	28.29	20	PQ	58" 97%
95						

WELL DETAILS

	LP-MW-15-10 D	LP-MW-15-10 I	LP-MW-15-10 S	Original Borehole
GS Elev:	222.76 m AMSL	222.72 m AMSL	222.78 m AMSL	n/a
TOC Elev:	223.77 m AMSL	223.68 m AMSL	223.65 m AMSL	n/a
Easting:	556215	556214	556214	n/a
Northing:	4746240	4746241	4746243	n/a
Stick-up:	1.01 m	0.96 m	0.87 m	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-15-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-15
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 09-Nov-2010 / 15-Nov-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	
			LIMESTONE light grey	192.81	21	PQ	33" 107%	
	30		End of Borehole	29.95				

Name: LP-MW-15-10 D
GS Elev: 222.76 m AMSL
TOC Elev: 223.77 m AMSL
Easting: 556215
Northing: 4746240
Stick-up: 1.01 m

Name: LP-MW-15-10 I
GS Elev: 222.72 m AMSL
TOC Elev: 223.68 m AMSL
Easting: 556214
Northing: 4746241
Stick-up: 0.96 m

Name: LP-MW-15-10 S
GS Elev: 222.78 m AMSL
TOC Elev: 223.65 m AMSL
Easting: 556214
Northing: 4746243
Stick-up: 0.87 m

Name: Original Borehole
GS Elev: n/a
TOC Elev: n/a
Easting: n/a
Northing: n/a
Stick-up: n/a

100
105 — 32
110
115 — 34
120
125 — 36
130
135 — 38
140
145 — 40
150
155 — 42
160
165 — 44
170
175 — 46
180
185 — 48
190

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Monitoring Well: LP-MW-16-10

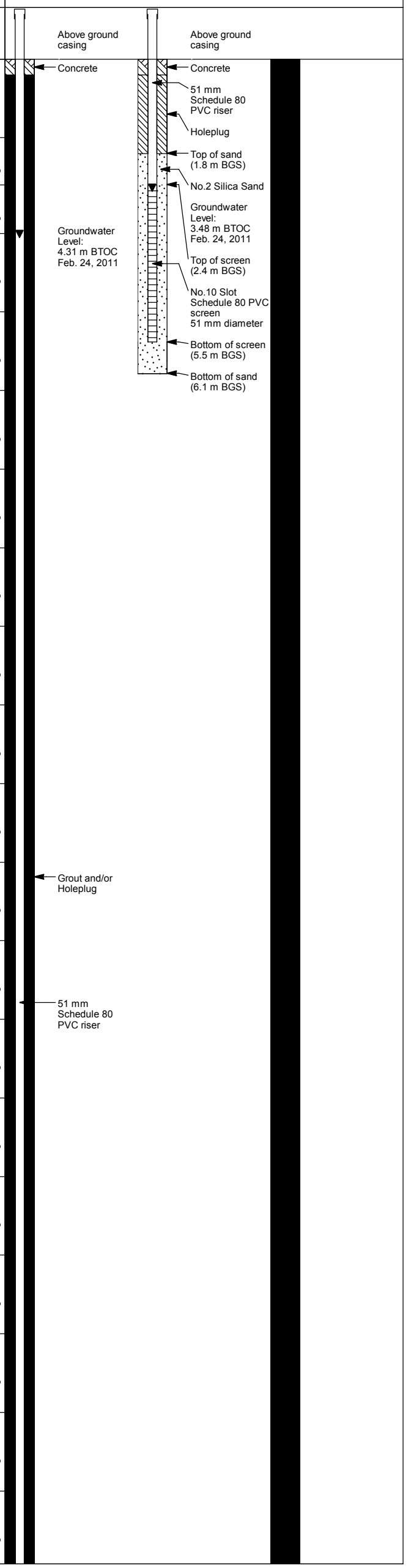
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-26
Number: 160900637

Field investigator: R. Dong / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 15-Nov-2010 / 22-Nov-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
		Ground Surface	236.04			
0	0	TOPSOIL fine grained sand, organics, very dark greyish brown (10R3/2), loose, moist	0.00 235.96			
		SAND fine grained, yellowish bronw (10YR5/4) to brown (7.5YR4/6), loose, homogeneous, moist	0.08	01	CC	51" 85%
5		little silt from 1.5 m to 2.4 m BGS				
	2	trace fine to coarse gravel		02	CC	36" 100%
		wet at 2.4 m BGS		03	PQ	37" 100%
10		black laminations (1 mm to 5 mm)		04	PQ	60" 100%
	4					
15		becoming medium grained, homogeneous		05	PQ	60" 100%
20	6		229.89			
		SILTY SAND TO SAND fine grained, yellowish brown (10YR5/4) to brown (10YR4/3), compact, laminated, moist seam of mottled soft clay	6.14 229.28			
		5 mm seam of convoluted soft clay becoming grey (10YR5/1)	6.75	06	PQ	60" 100%
25		CLAY TO SAND laminations (<6 mm) to thin layers (50 mm) of fine sand, silty clay and clay, grey (10YR5/1), convoluted to horizontal laminations and layers, very stiff and dense, moist to wet				
	8	fine sand inclusions (1 mm to 6 mm) within clay layers		07	PQ	60" 100%
30			226.57			
		CLAY DIAMICTON (Possibly Till) trace coarse and medium grained sand, greyish brown (10YR5/2), very hard, homogeneous, moist	9.47 226.26 9.78			
	10	CLAY TO SAND laminations (<6 mm) to thin layers (50 mm) of fine sand, silty clay and clay, grey (10YR5/1), convoluted structure, very stiff and dense, moist to wet	225.60 10.44	08	PQ	60" 100%
35		SILTY SAND to SAND fine grained, laminated, grading between silty sand and sand, 3 mm to 25 mm soft grey and reddish brown clay seams throughout unit, wet		09	PQ	60" 100%
40	12					
45				10	PQ	60" 100%
	14			11	PQ	60" 100%
50			220.46			
		SAND fine to medium grained, grey (10YR5/1), homogeneous to black (10YR2/1) laminations, loose, wet	15.58	12	PQ	60" 100%
55						
	16			13	PQ	60" 100%
60				14	PQ	60" 100%
65	18	becoming brown (10YR4/3)				
	20			15	PQ	60" 100%
70				16	PQ	60" 100%
	22					
75				17	PQ	60" 100%
80	24	10 mm soft, grey clay seam 10 mm soft, grey clay seam 25 mm seam of sandy silt				
				18	PQ	60" 100%
85	26					
90				19	PQ	60" 100%
	28					
95		25 mm reddish brown silty clay seam 50 mm soft, grey clay seam		20	PQ	60" 100%

WELL DETAILS

	LP-MW-16-10 D	LP-MW-16-10 S	Original Borehole
Name:	LP-MW-16-10 D	LP-MW-16-10 S	Original Borehole
GS Elev:	236.04 m AMSL	236.10 m AMSL	n/a
TOC Elev:	236.95 m AMSL	237.03 m AMSL	n/a
Easting:	544054	544057	n/a
Northing:	4740236	4740236	n/a
Stick-up:	0.91 m	0.93 m	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-16-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-26
Number: 160900637

Field investigator: R. Dong / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 15-Nov-2010 / 22-Nov-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			SAND fine to medium grained, grey (10YR5/1), homogeneous to black (10YR2/1) laminations, loose, wet		21	PQ	60" 100%
100	30						
					22	PQ	60" 100%
105	32						
					23	PQ	60" 100%
110				202.03			
	34		SANDY SILT TO SILTY SAND fine grained, grading between sandy silt and silty sand, brown, loose, wet 75 mm soft, grey silty clay seam	34.01	24	PQ	60" 100%
115				200.56			
			50 mm soft, grey clay seam	35.48			
	36		SAND fine grained grading to medium grained by 37.5 m BGS, brown, loose, laminated to homogeneous, wet		25	PQ	60" 100%
120							
					26	PQ	60" 100%
125	38						
			50 mm soft, grey clay seam		27	PQ	60" 100%
130			clayey silt grading to sand from 39.5 m to 40.0 m BGS				
	40				28	PQ	60" 100%
135			soft grey and reddish brown clay clasts (5 mm) in sand				
					29	PQ	60" 100%
140	42			193.04			
			INTERBEDDED CLAY TO SILTY SAND silt to silty sand layers (100 mm to 600 mm) and clay to clayey silt layers (50 mm to 125 mm), greyish brown to reddish brown, sharp and gradational contacts, laminated to homogeneous, moist to wet	43.00	30	PQ	60" 100%
145	44		grey clay clasts (5 mm) in silty sand				
					31	PQ	60" 100%
150	46		reddish brown clay clasts (5 mm) in silty sand				
					32	PQ	60" 100%
155							
	48		soft, angular, grey clay clasts (5 mm) at upper contact of silty sand		33	PQ	60" 100%
160							
				186.23	34	PQ	60" 100%
	50		SILTY SAND brown, loose, homogeneous, wet soft, angular, grey clay clasts in sandy silt	49.81			
165			soft, angular, grey clay clasts (5 mm)		35	PQ	60" 100%
			25 mm seam of reddish brown clay clasts (5 mm) 100 mm seam of soft, laminated, reddish brown silty clay				
170	52				36	PQ	60" 100%
			trace cobble				
175			soft, gray clay clasts (5 mm)	182.22			
	54		INTERBEDDED CLAY TO SAND silt to sand layers (100 mm to 600 mm) and clay to clayey silt layers (50 mm to 125 mm), greyish brown to reddish brown, sharp and gradational contacts, laminated to homogeneous, moist to wet	53.82	37	PQ	60" 100%
180							
	56		soft, gray clay clasts (5 mm)		38	PQ	60" 100%
185							
			convoluted laminations in clay		39	PQ	60" 100%
190	58						
				176.98	40	PQ	60" 100%
				59.06			

WELL DETAILS

	LP-MW-16-10 D	LP-MW-16-10 S	Original Borehole
GS Elev:	236.04 m AMSL	236.10 m AMSL	n/a
TOC Elev:	236.95 m AMSL	237.03 m AMSL	n/a
Easting:	544054	544057	n/a
Northing:	4740236	4740236	n/a
Stick-up:	0.91 m	0.93 m	n/a

Top of sand (31.4 m BGS)
No.2 Silica Sand
Top of screen (32.3 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (33.8 m BGS)
Bottom of sand (33.8 m BGS)
Grout

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: RD / MF

Monitoring Well: LP-MW-16-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-26
Number: 160900637

Field investigator: R. Dong / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 15-Nov-2010 / 22-Nov-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-16-10 D GS Elev: 236.04 m AMSL TOC Elev: 236.95 m AMSL Easting: 544054 Northing: 4740236 Stick-up: 0.91 m Name: LP-MW-16-10 S GS Elev: 236.10 m AMSL TOC Elev: 237.03 m AMSL Easting: 544057 Northing: 4740236 Stick-up: 0.93 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
195			trace angular, light grey clay clasts (2 mm to 10 mm) CLAY TO SILTY CLAY grading between clay and silty clay, reddish brown and grey laminations to homogeneous, very stiff, moist					
	60		50 mm convoluted gravel seam	175.97 60.07				
			SAND & SILT TILL (Catfish Creek Till) some clay, some gravel, some cobbles (up to 130 mm), light grey, very dense, poorly sorted, gravel subrounded to angular		41	PQ	60" 100%	
200								
	62				42	PQ	28" 47%	
205								
				172.41				
			LIMESTONE light grey	63.63	43	PQ	60" 100%	
210	64							
					44	PQ	30" 100%	
				170.94				
			End of Borehole	65.10				
215								
	66							
220								
	68							
225								
230	70							
235								
	72							
240								
	74							
245								
250	76							
255								
	78							
260								
	80							
265								
270	82							
275								
	84							
280								
	86							
285								
290	88							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-17-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-01
Number: 160900637

Field investigator: A. Vandenhoff / M. Fraser / R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 16-Nov-2010 / 23-Nov-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
		Ground Surface	237.53			
0	0	TOPSOIL fine grained sand, organics, trace fine grained gravel, dark yellowish brown (10YR3/4), moist	0.00 237.38 0.15			
5		SAND fine to medium grained, dark yellowish brown (10YR4/6) becoming brown (10YR4/3) with depth, homogeneous, moist mottled with light brown grey (10YR6/2) and yellowish brown (10YR5/6) wet at 1.5 m BGS		01	CC	49" 82%
10	2	convoluted black laminations (<6 mm) 130 mm seam of sandy silt		02	CC	60" 83%
15	4			03	PQ	60" 100%
		laminated		04	PQ	60" 100%
20	6	trace gravel		05	PQ	40" 67%
25	8			06	PQ	60" 100%
30	10			07	PQ	60" 100%
35				08	PQ	56" 93%
40	12	trace silt from 12.7 m to 12.8 m BGS		09	PQ	36" 60%
45	14		223.13 14.40	10	PQ	54" 90%
50		INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 250 mm) and clay to clayey silt layers (6 mm to 125 mm), greyish brown to reddish brown, sharp and gradational contacts, firm to stiff, mostly convoluted and irregular laminations with some horizontal laminations and homogeneous sections, moist to wet		11	PQ	58" 97%
55	16			12	PQ	60" 100%
60	18			13	PQ	55" 92%
65	20			14	PQ	60" 100%
70				15	PQ	56" 93%
75	22			16	PQ	58" 97%
80	24	inclined 25 mm seams of reddish brown silt in well graded sand from 23.9 m to 24.1 m BGS		17	PQ	58" 97%
85	26	trace reddish brown and light grey clay clasts (<10 mm)		18	PQ	58" 97%
90	28			19	PQ	60" 100%
95						

Name: LP-MW-17-10 D
GS Elev: 237.53 m AMSL
TOC Elev: 238.11 m AMSL
Easting: 546561
Northing: 4740782
Stick-up: 0.58 m

Above ground casing
Concrete
Holeplug
51 mm Schedule 80 PVC riser
Grout
Holeplug
Top of sand (25.3 m BGS)
No.2 Silica Sand
Top of screen (25.9 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (27.4 m BGS)
Bottom of sand (28.0 m BGS)

Name: LP-MW-17-10 I (85-90 ft)
GS Elev: 237.63 m AMSL
TOC Elev: 238.32 m AMSL
Easting: 546559
Northing: 4740784
Stick-up: 0.69 m

Above ground casing
Concrete
Holeplug
51 mm Schedule 80 PVC riser
Grout
Top of sand (13.1 m BGS)
No.2 Silica Sand
Top of screen (13.7 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (15.2 m BGS)
Bottom of sand (15.8 m BGS)

Name: LP-MW-17-10 I (45-50 ft)
GS Elev: 237.51 m AMSL
TOC Elev: 238.27 m AMSL
Easting: 546557
Northing: 4740788
Stick-up: 0.76 m

Above ground casing
Concrete
51 mm Schedule 80 PVC riser
Holeplug
Top of sand (1.2 m BGS)
No.2 Silica Sand
Top of screen (1.8 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (4.9 m BGS)
Bottom of sand (5.5 m BGS)

Name: LP-MW-17-10 S
GS Elev: 237.55 m AMSL
TOC Elev: 238.42 m AMSL
Easting: 546558
Northing: 4740785
Stick-up: 0.87 m

Above ground casing
Concrete
Holeplug
51 mm Schedule 80 PVC riser
Top of sand (1.2 m BGS)
No.2 Silica Sand
Top of screen (1.8 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (4.9 m BGS)
Bottom of sand (5.5 m BGS)

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-17-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-01
Number: 160900637

Field investigator: A. Vandenhoff / M. Fraser / R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 16-Nov-2010 / 23-Nov-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	

WELL DETAILS

Name:	LP-MW-17-10 D	Name:	LP-MW-17-10 I (85-90 ft)	Name:	LP-MW-17-10 I (45-50 ft)	Name:	LP-MW-17-10 S
GS Elev:	237.53 m AMSL	GS Elev:	237.63 m AMSL	GS Elev:	237.51 m AMSL	GS Elev:	237.55 m AMSL
TOC Elev:	238.11 m AMSL	TOC Elev:	238.32 m AMSL	TOC Elev:	238.27 m AMSL	TOC Elev:	238.42 m AMSL
Easting:	546561	Easting:	546559	Easting:	546557	Easting:	546558
Northing:	4740782	Northing:	4740784	Northing:	4740788	Northing:	4740785
Stick-up:	0.58 m	Stick-up:	0.69 m	Stick-up:	0.76 m	Stick-up:	0.87 m

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
		INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 250 mm) and clay to clayey silt layers (6 mm to 125 mm), greyish brown to reddish brown, sharp and gradational contacts, firm to stiff, mostly convoluted and irregular laminations with some horizontal laminations and homogeneous sections, moist to wet		20	PQ	60" 100%
100	30					
				21	PQ	60" 100%
105	32	trace reddish brown and light grey clay clasts (<10 mm) to bottom of unit				
				22	PQ	60" 100%
110	34					
				23	PQ	60" 100%
115	36					
				24	PQ	60" 100%
120	38					
				25	PQ	60" 100%
125	40					
				26	PQ	60" 100%
130	42					
				27	PQ	60" 100%
135	44					
				28	PQ	58" 97%
140	46	trace gravel in cohesive layers to bottom of unit				
				29	PQ	60" 100%
145	48					
				30	PQ	56" 93%
150	50					
		grading to silty sand and sand towards bottom of unit				
				31	PQ	51" 85%
155	52		189.98			
		SAND trace light grey and reddish brown clay clasts (<10 mm), fine to medium grained, light grey brown, very dense, laminated	47.55	32	PQ	58" 97%
160	54					
				33	PQ	58" 97%
165	56					
		gradational sequence from sand to silt, clay, silt and back to sand from 51.3 m to 51.7 m BGS		34	PQ	60" 100%
170	58					
				35	PQ	58" 97%
175		inclined laminations				
				36	PQ	60" 100%
180		trace gravel				
				37	PQ	60" 100%
185		predominantly homogeneous towards bottom of the unit				
				38	PQ	60" 100%
190						
				39	PQ	60" 100%

Top of sand (47.9 m BGS)
No.2 Silica Sand
Top of screen (50.3 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (51.8 m BGS)
Bottom of sand (52.4 m BGS)

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-17-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-01
Number: 160900637

Field investigator: A. Vandenhoff / M. Fraser / R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 16-Nov-2010 / 23-Nov-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	
195			SAND trace light grey and reddish brown clay clasts (<10 mm), fine to medium grained, light grey brown, very dense, laminated					Name: LP-MW-17-10 D GS Elev: 237.53 m AMSL TOC Elev: 238.11 m AMSL Easting: 546561 Northing: 4740782 Stick-up: 0.58 m ← Grout and/or Holeplug
	60				40	PQ	60" 100%	
200				176.26				
			SILTY SAND sand grading to silty sand, trace light grey and grey clay clasts, light grey brown to reddish brown	61.26				
	62				41	PQ	57" 95%	
205			50 mm stiff clay seam					
			12 mm stiff clay seam	174.74				
			INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 250 mm) and clay to clayey silt layers (6 mm to 125 mm), trace light grey clay clasts (<10 mm), greyish brown to reddish brown, sharp and gradational contacts, firm to stiff, convoluted to horizontal and draped laminations, moist to wet	62.79				
210	64		sulphurous odour at top of unit		42	PQ	60" 100%	
				172.53	43	PQ	36" 60%	
			SAND & SILT TILL (Catfish Creek Till) some clay, some gravel, trace cobbles, light grey, very dense, poorly sorted, gravel subrounded to angular	65.00 171.69				
215	66		LIMESTONE light grey, fossiliferous	65.84				
					44	PQ	60" 100%	
220				170.17				
			End of Borehole	67.36				
	68							
225								
230	70							
235								
	72							
240								
	74							
245								
250	76							
255								
	78							
260								
	80							
265								
270	82							
275								
	84							
280								
	86							
285								
290	88							

Name: LP-MW-17-10 I (85-90 ft)
GS Elev: 237.63 m AMSL
TOC Elev: 238.32 m AMSL
Easting: 546559
Northing: 4740784
Stick-up: 0.69 m

Name: LP-MW-17-10 I (45-50 ft)
GS Elev: 237.51 m AMSL
TOC Elev: 238.27 m AMSL
Easting: 546557
Northing: 4740788
Stick-up: 0.76 m

Name: LP-MW-17-10 S
GS Elev: 237.55 m AMSL
TOC Elev: 238.42 m AMSL
Easting: 546558
Northing: 4740785
Stick-up: 0.87 m

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-18-10

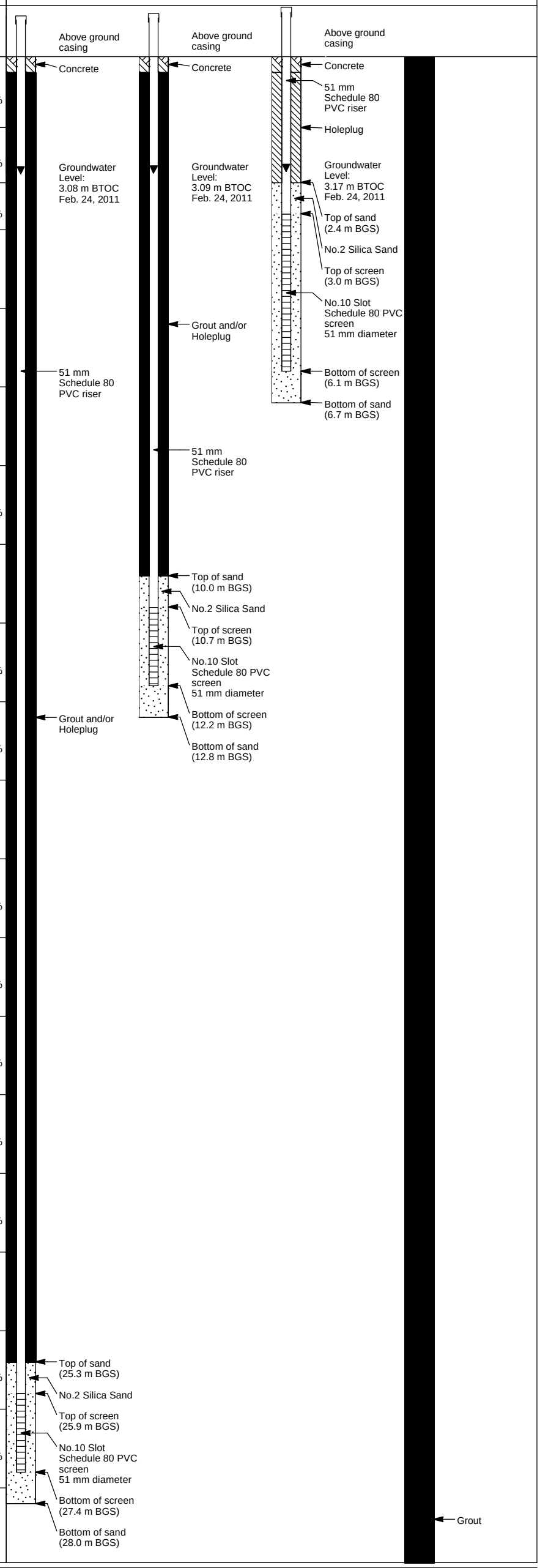
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-05
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 23-Nov-2010 / 30-Nov-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
		Ground Surface	238.08			
0	0	TOPSOIL fine grained sand, some coarse grained sand, some silt, some organics, dark brown	0.00 237.91 0.18	01	CC	54" 100%
		SAND fine to medium grained, yellowish brown to brown, compact, homogenous oxidation staining				
5		trace to some silt from 0.18 m to 2.21 m BGS		02	CC	42" 100%
	2	black laminations from 1.8 m to 2.2 m BGS				
10				03	PQ	36" 100%
		wet at 3.7 m BGS		04	PQ	58" 97%
15				05	PQ	30" 50%
20	6			06	PQ	50" 83%
25				07	PQ	60" 100%
	8			08	PQ	54" 90%
30				09	PQ	60" 100%
35	10					
40	12	10 mm seam of grey clay	224.83	10	PQ	60" 100%
45		SILTY CLAY TO CLAYEY SILT light grey brown and reddish brown, trace gravel (carbonate), very stiff to hard, horizontal to convoluted laminations, some loading structures,	13.26			
	14	10 mm seam of fine grained sand 25 mm seam of fine grained sand		11	PQ	58" 97%
50		lense of fine grained sand (<5 mm) lense of fine grained sand (<5 mm) 75 mm seam of fine grained sand	222.49			
		SAND trace to little silt grading in and out of unit to 24.7 m BGS, fine and medium grained, light grey brown, dense, laminated to homogeneous cross-bedding	15.59	12	PQ	60" 100%
55				13	PQ	60" 100%
	16	75 mm seam of silty clay				
60		75 mm of dark grey silt and possible organics with strong odour		14	PQ	60" 100%
65	18			15	PQ	60" 100%
70		trace light grey clay clasts (<10 mm)		16	PQ	60" 100%
	20					
75				17	PQ	40" 67%
	22	75 mm seam of grey silt grading to reddish brown clay				
80		fining upward sequence trace grey silt clasts (<10 mm)		18	PQ	60" 100%
85	24					
				19	PQ	60" 100%
90	26					
				20	PQ	33" 55%
95	28					

WELL DETAILS

Name:	LP-MW-18-10 D	LP-MW-18-10 I	LP-MW-18-10 S	Original Borehole
GS Elev:	238.08 m AMSL	238.08 m AMSL	238.04 m AMSL	n/a
TOC Elev:	238.91 m AMSL	238.95 m AMSL	239.03 m AMSL	n/a
Easting:	547644	547641	547638	n/a
Northing:	4744614	4744614	4744613	n/a
Stick-up:	0.82 m	0.87 m	0.99 m	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-18-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-05
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 23-Nov-2010 / 30-Nov-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			SAND trace to little silt grading in and out of unit to 24.7 m BGS, fine and medium grained, light grey brown, dense, laminated to homogeneous		21	PQ	42" 70%
100	30						
					22	PQ	30" 50%
105	32		trace silt				
					23	PQ	42" 70%
110	34		silt content increasing to silty sand with depth		24	PQ	58" 97%
115							
	36		75 mm laminated silty clay seam		25	PQ	60" 100%
120			50 mm laminated reddish brown and grey clay	200.70			
			INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 250 mm) and clay to clayey silt layers (75 mm to 175 mm), greyish brown to reddish brown, sharp and gradational contacts, firm to stiff, convoluted to horizontal laminations and homogeneous sections, moist to wet	37.39 199.68	26	PQ	60" 100%
125	38						
			CLAY TO CLAYEY SILT trace sand, trace gravel, trace light grey clay clasts, grading between clay and clayey silt, brown and reddish brown, stiff to very stiff, convoluted and horizontal laminations	38.40	27	PQ	60" 100%
130							
	40				28	PQ	55" 92%
135							
	42				29	PQ	60" 100%
140							
			100 mm seam of silty sand		30	PQ	60" 100%
	44		100 mm seam of silty sand				
145							
					31	PQ	60" 100%
150				192.36			
	46		CLAYEY SILT TILL little fine sand, trace gravel, light grey brown, very stiff	45.72 192.06			
			SAND & SILT TILL (Catfish Creek Till) some clay, some gravel, trace cobbles, light grey, very dense, poorly sorted, gravel subrounded to angular	46.02	32	PQ	42" 70%
155							
	48				33	PQ	60" 100%
160							
					34	PQ	60" 100%
	50						
165							
					35	PQ	60" 100%
170				186.32			
	52		SILTY CLAY TO CLAY trace lenses and pockets of silty fine sand, light grey brown to reddish brown, very hard, horizontal and convoluted laminations	51.76	36	PQ	60" 100%
175							
	54				37	PQ	60" 100%
180				183.20			
			SILTY SAND fine grained, trace clay laminations, light grey brown	54.89 183.02			
			LIMESTONE light grey, fossiliferous	55.07	38	PQ	60" 100%
	56						
185				181.39			
			End of Borehole	56.69			
190	58						

WELL DETAILS

	Name:	GS Elev:	TOC Elev:	Easting:	Northing:	Stick-up:
LP-MW-18-10 D	LP-MW-18-10 D	238.08 m AMSL	238.91 m AMSL	547644	4744614	0.82 m
LP-MW-18-10 I	LP-MW-18-10 I	238.08 m AMSL	238.95 m AMSL	547641	4744614	0.87 m
LP-MW-18-10 S	LP-MW-18-10 S	238.04 m AMSL	239.03 m AMSL	547638	4744613	0.99 m
Original Borehole	Original Borehole	n/a	n/a	n/a	n/a	n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-19-10

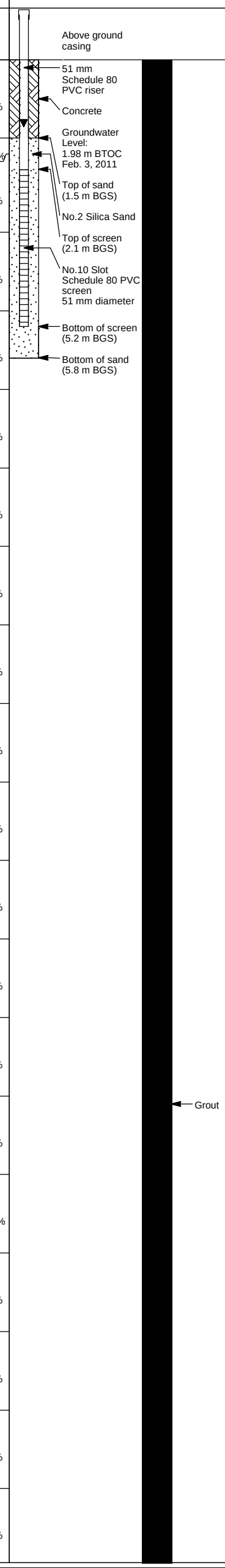
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-02
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 24-Nov-2010 / 26-Nov-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	234.82			
0	0		TOPSOIL sand, little silt, organics, very dark greyish brown (10YR3/2), loose, moist	0.00 234.57 0.25			
			SAND trace gravel, fine to medium grained, trace coarse grained, brown (10YR5/3), homogeneous, moist 15 mm seam of clay and silt		01	CC	39" 65%
5			becoming greyish brown (10YR5/2)				
	2		wet at 1.5 m BGS		02	CC	12" 100%
					03	PQ	33" 55%
10							
	4				04	PQ	35" 58%
15							
					05	PQ	29" 48%
20	6						
					06	PQ	41" 68%
25							
	8				07	PQ	12" 20%
30							
	10		becoming fine grained and laminated trace soft grey clay clasts (<5 mm)		08	PQ	58" 97%
35			10 mm seam of laminated soft very dark clay and silty sand				
					09	PQ	58" 97%
40	12		25 mm seam of silty sand				
					10	PQ	33" 55%
45							
	14				11	PQ	32" 53%
50			150 mm seam of silty sand to sandy silt 2 mm seam of very dark grey clay				
	16				12	PQ	26" 43%
55			75 mm seam of silty sand to sandy silt 3 mm seam of soft very dark grey clay				
			15 mm seam of convoluted silty clay trace to little clasts of soft grey clay		13	PQ	41" 68%
60	18			216.23			
			SANDY SILT TO SILTY SAND greyish brown, loose, wet	18.59 215.98			
			SILTY CLAY TO CLAY greyish brown, soft, laminated, wet	18.85 215.55	14	PQ	43" 72%
65	20		INTERBEDDED CLAY TO SAND silt to sand layers (90 mm to 300 mm) and clay to clayey silt layers (90 mm to 225 mm), greyish brown to reddish brown, sharp and gradational contacts, convoluted to horizontal laminations in cohesive layers and homogeneous in non cohesive layers, moist to wet trace soft grey clay clasts (<3 mm)	19.28			
					15	PQ	52" 87%
70							
	22				16	PQ	60" 100%
75							
					17	PQ	59" 98%
80	24			210.14			
			CLAY DIAMICTON trace sand, trace gravel, greyish brown, stiff to very stiff, massive, moist	24.69	18	PQ	57" 95%
85	26			208.90			
			SILTY SAND laminated (1 mm) sand and silty sand, brown, wet	25.93 208.69			
			CLAY DIAMICTON trace coarse sand, greyish brown (10YR5/2), massive, moist	26.14 207.80	19	PQ	53" 88%
90			CLAY trace sand clasts (<5 mm), greyish brown (10YR5/2), laminated, stiff to very stiff, moist	27.02 207.09			
	28		LAMINATED CLAY TO SAND silt to sand layers (3 mm to 15 mm) and clay to clayey silt layers (3 mm to 15 mm), greyish brown to reddish brown, moist to wet	27.74 206.28	20	PQ	53" 88%
95			CLAY DIAMICTON little to some sand, trace gravel, massive, very hard, moist	28.55			

WELL DETAILS

Name:	LP-MW-19-10	Name:	Original Borehole
GS Elev:	234.82 m AMSL	GS Elev:	n/a
TOC Elev:	235.50 m AMSL	TOC Elev:	n/a
Easting:	545291	Easting:	n/a
Northing:	4744186	Northing:	n/a
Stick-up:	0.68 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Monitoring Well: LP-MW-19-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-02
Number: 160900637

Field investigator: R. Dong
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 24-Nov-2010 / 26-Nov-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	
			CLAY DIAMICTON little to some sand, trace gravel, massive, very hard, moist	205.01				Name: LP-MW-19-10 GS Elev: 234.82 m AMSL TOC Elev: 235.50 m AMSL Easting: 545291 Northing: 4744186 Stick-up: 0.68 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		INTERBEDDED CLAY TO SAND 1 mm to 75 mm layers of clay to sand, greyish brown (10YR5/2) and reddish brown (5YR5/3), convoluted laminations, moist	29.81	21	PQ	45" 75%	
					22	PQ	53" 88%	
105	32			202.52				
			CLAY DIAMICTON trace sand, trace gravel, greyish brown (10YR5/2), massive, very hard, moist	32.31	23	PQ	60" 100%	
110	34				24	PQ	60" 100%	
				199.92				
115			SAND & SILT TILL (Catfish Creek Till) some clay, some gravel, trace cobbles, greyish brown (10YR5/2), very dense, poorly sorted, gravel subrounded to angular	34.90				
	36				25	PQ	48" 80%	
120				198.07				
			CLAY trace to little sand, trace gravel, trace cobble, greyish brown and reddish brown, very hard, horizontal and convoluted laminations, moist	36.75	26	PQ	49" 82%	
125	38							
			100 mm seam of massive clay with little gravel	195.91				
			LIMESTONE light grey	38.91	27	PQ	60" 100%	
130	40							
				194.29	28	PQ	24" 100%	
			End of Borehole	40.54				
135								
	42							
140								
145	44							
150								
	46							
155								
	48							
160								
	50							
165								
170	52							
175								
	54							
180								
185	56							
190								
	58							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: RD / MF

Stantec

Monitoring Well: LP-MW-20-10

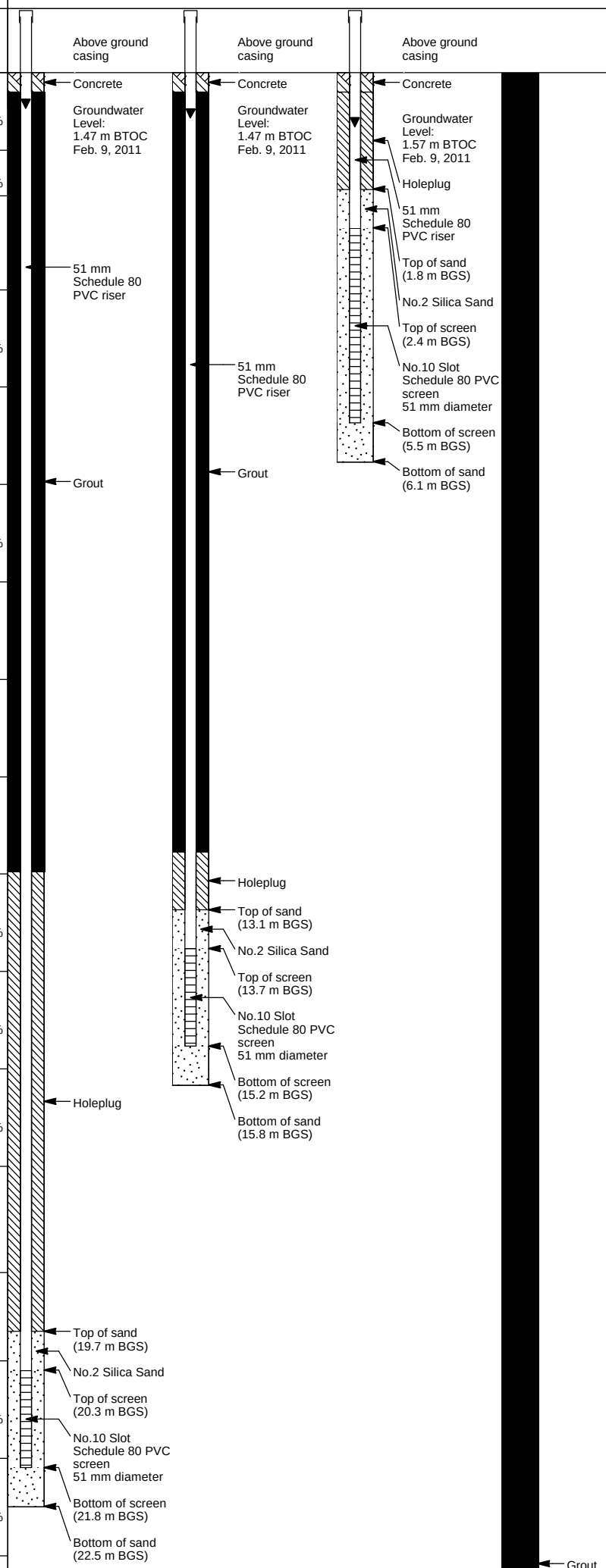
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-19
Number: 160900637

Field investigator: A. Vandenhoff / B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 01-Dec-2010 / 09-Dec-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	238.50			
0	0		TOPSOIL	0.00			
			silty fine sand and organics, trace coarse sand, dark brown to black, moist	238.27			
			SAND	0.23			
			trace silt, fine to medium grained, orangey yelllowy brown grading to light grey brown by 0.8 m BGS, homogeneous, compact, moist		01	CC	48" 100%
5					02	CC	28" 100%
	2		oxidation staining from 1.6 m to 1.7 m BGS wet at 1.7 m BGS		03	PQ	56" 97%
10				235.38			
			SILTY SAND	3.12			
			with clay laminations, trace gravel, fine grained, reddish brown and light grey brown, firm, convoluted to horizontal laminations, wet		04	PQ	60" 100%
15	4				05	PQ	56" 93%
20	6			232.05			
			SAND	6.45			
			fine to medium grained, light grey brown, loose, homogeneous, wet trace gravel (carbonate) from top of unit to 8.0 m BGS 125 mm seam of gravel (carbonate)		06	PQ	60" 100%
25	8		225 mm seam of gravel (carbonate)		07	PQ	40" 67%
30					08	PQ	38" 63%
35	10				09	PQ	41" 68%
40	12			225.96			
			SILTY SAND	12.55			
			fine grained, trace coarse grained, light grey brown, homogeneous, wet		10	PQ	60" 100%
45	14		trace inclusions (<5 mm) of grey clayey silt		11	PQ	60" 100%
50				223.26			
			SAND	15.24			
			very fine to fine grained sand, little to some medium and coarse grained sand and silt, light grey brown, homogeneous, well sorted, wet		12	PQ	60" 100%
55	16		trace inclusions (<5 mm) of grey sandy silt		13	PQ	60" 92%
60	18			219.86			
			brown and light brown laminations (2 mm to 10 mm)	18.64			
			SILTY SAND				
			very fine to fine grained, light grey brown, loose, homogeneous, well sorted, wet		14	PQ	46" 84%
65	20				15	PQ	60" 100%
70			inclusions (<5 mm) of dark grey silt slight organic odour at 21.6 m BGS				
	22		organic odour from 21.7 m to 26.3 m BGS		16	PQ	60" 100%
75					17	PQ	58" 97%
80	24		50 mm seam of grey and brown laminations (5-10 mm)		18	PQ	60" 100%
85	26		increasing silt content with depth	212.24			
			INTERBEDDED CLAY TO SANDY SILT	26.26			
90			predominantly clay to clayey silt with 25 mm to 125 mm silt to sandy silt layers, greyish brown to reddish brown, sharp and gradational contacts, convoluted to horizontal laminations in cohesive layers and homogeneous in non cohesive layers, moist to wet		19	PQ	60" 100%
	28				20	PQ	60" 100%
95							

WELL DETAILS

LP-MW-20-10 D	LP-MW-20-10 I	LP-MW-20-10 S	Original Borehole
GS Elev: 238.50 m AMSL	GS Elev: 238.63 m AMSL	GS Elev: 238.69 m AMSL	GS Elev: n/a
TOC Elev: 239.42 m AMSL	TOC Elev: 239.39 m AMSL	TOC Elev: 239.41 m AMSL	TOC Elev: n/a
Easting: 530274	Easting: 530279	Easting: 530277	Easting: n/a
Northing: 4745570	Northing: 4745570	Northing: 4745570	Northing: n/a
Stick-up: 0.92 m	Stick-up: 0.76 m	Stick-up: 0.72 m	Stick-up: n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: BK / MF

Stantec

Monitoring Well: LP-MW-20-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-19
Number: 160900637

Field investigator: A. Vandenhoff / B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 01-Dec-2010 / 09-Dec-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-20-10 D GS Elev: 238.50 m AMSL TOC Elev: 239.42 m AMSL Easting: 530274 Northing: 4745570 Stick-up: 0.92 m Name: LP-MW-20-10 I GS Elev: 238.63 m AMSL TOC Elev: 239.39 m AMSL Easting: 530279 Northing: 4745570 Stick-up: 0.76 m Name: LP-MW-20-10 S GS Elev: 238.69 m AMSL TOC Elev: 239.41 m AMSL Easting: 530277 Northing: 4745570 Stick-up: 0.72 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
				209.19				
100	30		CLAY trace grey clay clasts, dark brown, firm, homogeneous to reddish brown laminations (2 mm to 5 mm), moist	29.31	21	PQ	40" 67%	
			trace coarse sand and fine gravel		22	PQ	47" 78%	
105	32		convoluted laminations (10 mm)	206.14				
			CLAY DIAMICTON (possible till) trace to little coarse grained sand and fine to medium grained gravel, dark brown, stiff, massive	32.36	23	PQ	56" 93%	
110	34				24	PQ	52" 87%	
115	36				25	PQ	60" 100%	
120			increased gravel content from 36.8 m to 37.3 m BGS	201.24				
	38		CLAY little gravel, dark brown with convoulted lenses of reddish brown (2 mm to 20 mm), stiff to very stiff, moist trace grey clay clasts (<5 mm) to bottom of unit	37.26 200.05	26	PQ	52" 87%	
125			SAND & SILT TILL (Catfish Creek Till) some clay, some gravel, some cobbles (up to 150 mm) at top and bottom 1 m of unit, dark grey brown, very dense, poorly sorted, massive, gravel subrounded to angular	38.45	27	PQ	51" 85%	
130	40				28	PQ	60" 100%	
135			300 mm seam of convoluted and horizontal dark grey, reddish brown, and brown laminations					
	42				29	PQ	42" 70%	
140					30	PQ	60" 100%	
145	44			193.39				
			LIMESTONE light grey, upper 0.8 m highly fractured (RQD=0%)	45.11	31	PQ	60" 100%	
150	46			191.82	32	PQ	24" 100%	
			End of Borehole	46.68				
155	48							
160								
	50							
165								
170	52							
175								
	54							
180								
	56							
185								
190	58							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: BK / MF

Stantec

Monitoring Well: LP-MW-21-10

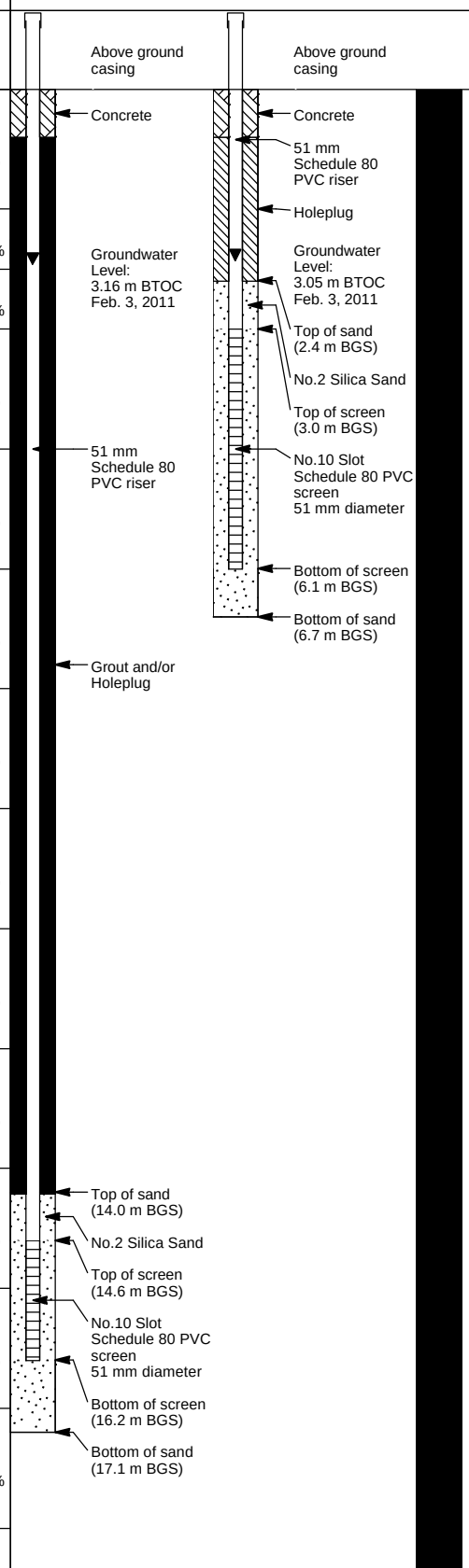
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-20
Number: 160900637

Field investigator: B. Kearney / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 06-Dec-2010 / 21-Dec-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
				235.64			
0	0		Ground Surface TOPSOIL sandy silt, some organics, black	0.00 235.34			
			SAND fine to very fine grained, brown to yellowish brown, loose, homogeneous	0.30	01	CC	42" 70%
5	2				02	CC	30" 100%
					03	PQ	30" 100%
10	4		colour change from yellowish brown to brown		04	PQ	54" 90%
15			fine to medium grained from 4.6 m to 10.7 m BGS		05	PQ	36" 60%
20	6				06	PQ	44" 73%
25	8				07	PQ	14" 23%
30					08	PQ	20" 33%
35	10		trace light grey silty sand clasts (<10 mm) trace fine gravel from 10.7 m to 12.2 m BGS		09	PQ	26" 43%
40	12		laminated		10	PQ	36" 60%
45					11	PQ	24" 40%
50	14		2 mm to 15 mm convoluted laminations of grey silty sand		12	PQ	24" 40%
55	16			218.27	13	PQ	60" 100%
60	18		SILTY SAND TO SILTY CLAY dark brown silty sand fining down to dark brown silty clay at 17.8 m BGS, laminated	17.37 217.36			
65	20		SANDY SILT TO SILTY SAND grading between silty sand to sandy silt at about 0.5 m intervals, dark grey brown, loose trace grey sitly clay clasts (< 5 mm) from 18.3 m to 18.9 m BGS	18.29 215.83	14	PQ	36" 60%
70			CLAY TO SILTY CLAY trace grey and reddish brown clay clasts (2 mm to 10 mm), dark brown to dark grey brown with reddish brown laminations (<6 mm), firm	19.81 213.70	15	PQ	24" 40%
75	22		SILTY SAND dark brown, very fine grained, loose	21.95 212.48	16	PQ	36" 60%
80	24		CLAY dark grey brown, soft	23.16 211.87	17	PQ	60" 100%
85	26		CLAY trace coarse sand and fine gravel, trace grey clay clasts (<5 mm), dark grey brown with reddish brown horizontal to convoluted laminations (<6 mm), firm 150 mm lens with some gravel becoming silty	23.77 208.21	18 19	PQ PQ	40" 67% 60" 100%
90	28		INTERBEDDED CLAY TO SAND predominantly silt to sand with layers of clay to clayey silt (up to 152 mm), trace grey clay clasts in sand (<6 mm), greyish brown to reddish brown, firm to stiff, convoluted to horizontal laminations	27.43	20	PQ	60" 100%
95							

WELL DETAILS

Name:	LP-MW-21-10 D	Name:	LP-MW-21-10 S	Name:	Original Borehole
GS Elev:	235.64 m AMSL	GS Elev:	235.66 m AMSL	GS Elev:	n/a
TOC Elev:	236.58 m AMSL	TOC Elev:	236.54 m AMSL	TOC Elev:	n/a
Easting:	535154	Easting:	535154	Easting:	n/a
Northing:	4741098	Northing:	4741097	Northing:	n/a
Stick-up:	0.94 m	Stick-up:	0.87 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: BK / MF

Stantec

STANTEC BOREHOLE AND WELL - CLUST 11X17 160900637.GPJ EQUIS DATA TEMPLATE.GDT 2/17/11 MJFRASER

Monitoring Well: LP-MW-21-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-20
Number: 160900637

Field investigator: B. Kearney / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 06-Dec-2010 / 21-Dec-2010

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-21-10 D GS Elev: 235.64 m AMSL TOC Elev: 236.58 m AMSL Easting: 535154 Northing: 4741098 Stick-up: 0.94 m Name: LP-MW-21-10 S GS Elev: 235.66 m AMSL TOC Elev: 236.54 m AMSL Easting: 535154 Northing: 4741097 Stick-up: 0.87 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		INTERBEDDED CLAY TO SAND predominantly silt to sand with layers of clay to clayey silt (up to 152 mm), trace grey clay clasts in sand (<6 mm), greyish brown to reddish brown, firm to stiff, convoluted to horizontal laminations		21	PQ	60" 100%	
					22	PQ	60" 100%	
105	32			203.64				
			SAND trace grey clay clasts (<4 mm), very fine to fine grained, dark grey brown, homogeneous, loose	32.00	23	PQ	60" 100%	
110	34			201.51				Grout
			CLAY TO SILTY CLAY DIAMICTON trace to little coarse sand and fine gravel, dark grey to brown, firm to stiff, homogeneous	34.14	24	PQ	58" 97%	
115	36				25	PQ	60" 100%	
120					26	PQ	60" 100%	
125	38			197.54				
			CLAY TO SILTY CLAY little coarse sand and fine gravel, trace reddish brown silty clasts (<4 mm), mottled dark brown and reddish brown, very stiff trace cobble (>100 mm)	38.10	27	PQ	51" 85%	
130	40		convoluted laminations (<10 mm)		28	PQ	60" 100%	
135			convoluted laminations (<10 mm)	194.19				
			SILT AND CLAY grading between silt (up to 150 mm) and clay (up to 100 mm), dark brown and dark reddish brown convoluted laminations, firm to stiff	41.45	29	PQ	60" 100%	
140	42				30	PQ	60" 100%	
145	44		trace coarse sand		31	PQ	60" 100%	
150	46				32	PQ	60" 100%	
155				188.40				
			SILTY CLAY TO CLAYEY SILT trace coarse sand and fine gravel, dark grey and reddish brown horizontal and convoluted laminations, firm to stiff	47.24	33	PQ	60" 100%	
160	48							
	50		trace cobble		34	PQ	60" 100%	
165					35	PQ	60" 100%	
170	52				36	PQ	60" 100%	
				182.30				
175			SILTY CLAY trace to little coarse sand and fine gravel, reddish brown, homogeneous, firm	53.34	37	PQ	60" 100%	
	54							
180					38	PQ	56" 93%	
	56							
185				178.95				
			SILTY CLAY trace light grey and red clay clasts (<4 mm), reddish brown and grey brown convoluted laminations (<6 mm), soft to firm	56.69 178.34	39	PQ	60" 100%	
			SILTY CLAY DIAMICTON little coarse sand, some fine gravel, reddish brown to brown, stiff	57.30 178.19				
190	58		SILTY CLAY reddish brown and grey brown convoluted laminations (<6 mm), soft to firm	57.45 177.78				
			SILTY CLAY DIAMICTON trace to little carse sand and fine gravel, reddish brown to brown mottling, very stiff, subrounded to angular	57.86	40	PQ	46" 77%	

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: BK / MF

Stantec

Monitoring Well: LP-MW-21-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-20
Number: 160900637

Field investigator: B. Kearney / M. Fraser
Contractor: Aardvark Drilling Inc.
Drilling method: CME 850, Track Mount, Christianson PQ Coring
Date started/completed: 06-Dec-2010 / 21-Dec-2010

SUBSURFACE PROFILE				SAMPLE DETAILS		
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
195			SILTY CLAY DIAMICTON trace to little carse sand and fine gravel, reddish brown to brown mottling, very stiff, subrounded to angular		41	PQ	31" 52%
200	60						
	62				42	PQ	20" 33%
205				173.16			
			SAND very fine to medium grained, light grey brown, loose, wet	62.48	43	PQ	60" 100%
210	64			171.79			
			SAND & SILT TILL (Catfish Creek Till) some clay, little to some gravel, trace cobbles, greyish brown, very dense	63.86	44	PQ	31" 52%
215	66			170.10			
			LIMESTONE light grey, possible cherty nodules	65.55	45	PQ	n/a
220				168.59			
	68		End of Borehole	67.06			
225							
230	70						
235	72						
240							
245	74						
250	76						
255							
260	78						
265	80						
270	82						
275	84						
280							
285	86						
290	88						

WELL DETAILS

Name:	LP-MW-21-10 D	Name:	LP-MW-21-10 S	Name:	Original Borehole
GS Elev:	235.64 m AMSL	GS Elev:	235.66 m AMSL	GS Elev:	n/a
TOC Elev:	236.58 m AMSL	TOC Elev:	236.54 m AMSL	TOC Elev:	n/a
Easting:	535154	Easting:	535154	Easting:	n/a
Northing:	4741098	Northing:	4741097	Northing:	n/a
Stick-up:	0.94 m	Stick-up:	0.87 m	Stick-up:	n/a

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: BK / MF

Monitoring Well: LP-MW-22-10

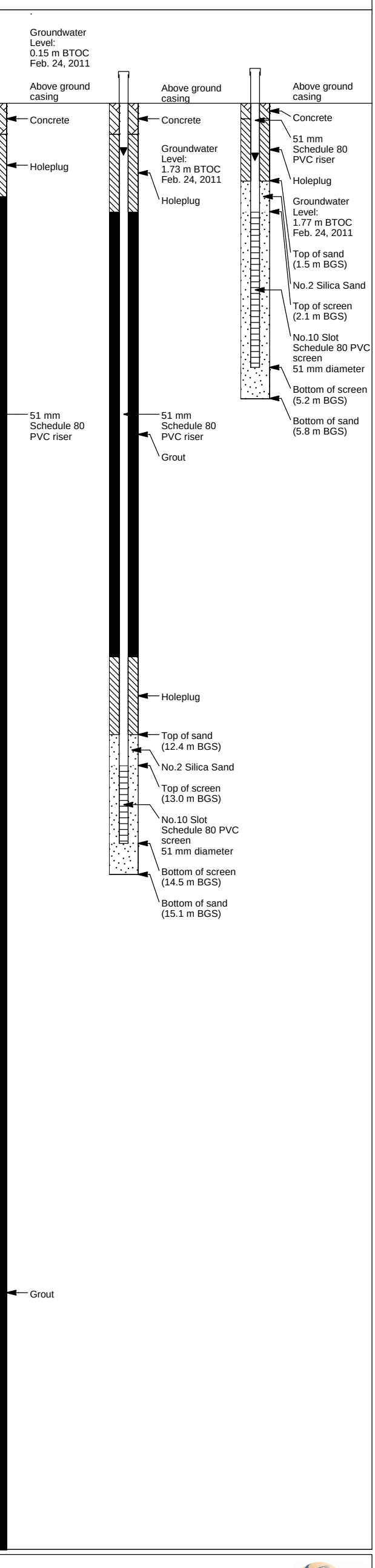
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-22
Number: 160900637

Field investigator: A. Vandenhoff / B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 02-Dec-2010 / 10-Dec-2010

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	236.93			
0	0		TOPSOIL sand with organics, well graded, dark brown	0.00 236.80			
			SAND medium grained, trace fine and coarse grained, light yellowish brown	0.12 235.56	01	CC	24" 50%
5	2		SILTY SAND fine grained, light grey brown to dark grey, black organics mottling, wet	1.37	02	CC	40" 83%
			coarsening with depth	233.88	03	PQ	24" 100%
10	4		SAND trace fine gravel, trace cobble (carbonate), medium grained, light grey brown, homogeneous, wet	3.05	04	PQ	0" 0%
15					05	PQ	2" 3%
20	6		trace reddish brown clay clasts (<5 mm) and angular gravel from 6.1 m to 7.6 m BGS		06	PQ	32" 53%
25				229.00			
	8		INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 200 mm) and clay to clayey silt layers (10 mm to 100 mm), light grey brown, reddish brown and grey, sharp and gradational contacts, horizontal laminations in cohesive layers and homogeneous in non cohesive layers, moist to wet	7.92	07	PQ	54" 90%
30	10				08	PQ	56" 93%
35			convoluted lamination		09	PQ	57" 95%
40	12		convoluted lamination becoming predominantly silty sand and sandy silt with depth		10	PQ	48" 80%
			light grey and red clay clasts (<5 mm) convoluted laminated clay layer	223.21			
45	14		SILTY SAND TO SAND silt content grading in and out with depth, light grey brown, loose, predominantly homogeneous with some sections laminated, wet 125 mm seam of reddish brown, stiff, silty clay grading to clay	13.72	11	PQ	54" 75%
50			10 mm seam of silty clay		12	PQ	60" 100%
55	16		40 mm seam of reddish brown and dark grey, firm, laminated clay 75 mm seam of silt				
60	18		50 mm stiff clay seam		13	PQ	56" 93%
				218.34			
65	20		SANDY SILT TO SILTY SAND trace light grey silty clay clasts, light grey brown, fine grained, loose, homogeneous, wet 75 mm stiff, convoluted laminated silt grading to clay	18.59	14	PQ	60" 100%
			10 mm seam of clay		15	PQ	60" 100%
70			50 mm seam of laminated silt and clay 25 mm seam of silt 25 mm seam of silt				
75	22		50 mm seam of laminated silt and clayey silt 25 mm seam of silty clay		16	PQ	42" 70%
			silt content increasing with depth	213.59			
80	24		CLAY TO SILTY CLAY trace grey and reddish brown clay clasts (<5 mm), discontinuous lenses or laminations of sandy silt, light grey brown, stiff to very stiff, homogeneous to reddish brown laminations (2 mm to 5 mm), moist	23.34	17	PQ	22" 37%
					18	PQ	53" 88%
85	26		SILT trace clay laminations (convoluted and horizontal), trace light grey and reddish brown clay clasts (<5 mm), light grey brown, dense	211.12 25.80 210.72 26.21			
90	28		INTERBEDDED CLAY TO SAND silt to sand layers (25 mm to 200 mm) and clay to clayey silt layers (10 mm to 50 mm), light grey brown, reddish brown and grey, sharp and gradational contacts, horizontal laminations in cohesive layers and homogeneous in non cohesive layers, moist to wet		19	PQ	55" 92%

WELL DETAILS

LP-MW-22-10 D	LP-MW-22-10 I	LP-MW-22-10 S
Name: LP-MW-22-10 D	Name: LP-MW-22-10 I	Name: LP-MW-22-10 S
GS Elev: 236.93 m AMSL	GS Elev: 236.94 m AMSL	GS Elev: 236.90 m AMSL
TOC Elev: 237.63 m AMSL	TOC Elev: 237.59 m AMSL	TOC Elev: 237.62 m AMSL
Easting: 548077	Easting: 548076	Easting: 548078
Northing: 4747497	Northing: 4747494	Northing: 4747495
Stick-up: 0.70 m	Stick-up: 0.65 m	Stick-up: 0.71 m



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-22-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-22
Number: 160900637

Field investigator: A. Vandenhoff / B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 02-Dec-2010 / 10-Dec-2010

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			208.31	20	PQ	52" 87%
95		CLAY TO SILTY CLAY light grey brown and reddish brown laminations, sitff to very stiff, moist	28.62			
	30			21	PQ	54" 90%
100						
				22	PQ	60" 100%
105	32	trace orangey brown silt clast (<10 mm) trace coarse sand inclusions (<10 mm) and trace light grey and reddish brown clay clasts (<5 mm)				
			203.63	23	PQ	56" 93%
110		SILT TILL with coarse sand, trace clay, reddish brown, very stiff, poorly sorted	33.30 203.48			
	34	CLAY TO SILTY CLAY trace coarse sand inclusions (<10 mm), light grey brown and reddish brown laminations to homogeneous, very stiff, moist trace coarse gravel 100 mm seam of reddish brown sandy silt	33.45	24	PQ	57" 95%
115		50 mm seam of increased gravel content				
	36			25	PQ	58" 97%
120			199.51			
		SAND & SILT TILL (Catfish Creek Till) some clay, some gravel, trace cobbles, grey, very dense, poorly sorted, massive, gravel subangular to angular	37.41	26	PQ	60" 100%
125	38					
				27	PQ	51" 85%
130	40					
				28	PQ	26" 43%
135			195.48			
	42	CLAY trace sand and fine grained gravel grading in and out with depth, dark grey brown and reddish brown, laminated, very stiff	41.45	29	PQ	43" 72%
140						
	44			30	PQ	36" 60%
145		convoluted laminations				
				31	PQ	47" 78%
150						
	46	trace orangey brown silt clasts (<3 mm)				
			190.29	32	PQ	46" 77%
155		SAND & SILT DIAMICTON some clay, some gravel, trace cobbles, grey, very dense, poorly sorted, massive, gravel subangular to angular	46.63 189.99			
	48	COBBLES highly fractured limestone, some sand and gravel within upper 0.6 m of unit, light grey	46.94	33	PQ	60" 100%
160						
			187.55			
	50	LIMESTONE light grey, horizontal fractures every 50 mm to 125 mm length of core	49.38	34	PQ	48" 100%
165						
		End of Borehole	186.64 50.29			
170	52					
175						
	54					
180						
	56					
185						
190	58					

SAMPLE DETAILS

WELL DETAILS

	LP-MW-22-10 D	LP-MW-22-10 I	LP-MW-22-10 S
Name:	LP-MW-22-10 D	LP-MW-22-10 I	LP-MW-22-10 S
GS Elev:	236.93 m AMSL	236.94 m AMSL	236.90 m AMSL
TOC Elev:	237.63 m AMSL	237.59 m AMSL	237.62 m AMSL
Easting:	548077	548076	548078
Northing:	4747497	4747494	4747495
Stick-up:	0.70 m	0.65 m	0.71 m

Holeplug

Top of sand (47.9 m BGS)

No.2 Silica Sand

Top of screen (48.5 m BGS)

No.10 Slot Schedule 80 PVC screen 51 mm diameter

Bottom of screen (50.0 m BGS)

Bottom of sand (50.3 m BGS)

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-23-10

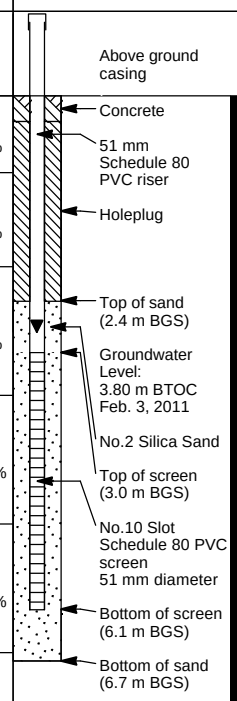
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-24
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 14-Dec-2010 / 07-Jan-2011

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	270.32			
0	0		TOPSOIL sitly fine sand, trace organics, brown	0.00 270.09	01	CC	34" 94%
			SILTY SAND fine grained, trace organics, orangey brown with reddish brown and black mottling, moist	0.23 269.87			
			SAND fine grained, trace medium grained, trace to little silt grading in and out with depth, pale brown, homogeneous laminations (<6 mm) convoluted laminations (<6 mm)	0.46	02	CC	39" 89%
5	2				03	PQ	34" 57%
10			25 mm seam of clayey silt		04	PQ	60" 100%
15	4		25 mm seam of clayey silt 50 mm seam of clayey silt with convoluted laminations				
			130 mm seam of clayey silt		05	PQ	60" 100%
20	6		25 mm seam of clayey silt	264.00			
			CLAYEY SILT trace coarse sand and fine gravel, grey brown, convoluted	6.32 263.72			
			SAND fine grained, trace medium grained, light grey brown with reddish brown and dark grey black laminations trace brown clay clasts (<10 mm)	6.60 262.65	06	PQ	60" 100%
25	8		CLAYEY SILT trace coarse sand, brown, laminated (<6 mm)	7.67			
30			fine sand inclusions from 8.7 m to 8.9 m BGS 200 mm sand seam	260.67	07	PQ	58" 97%
	10		CLAYEY SILT trace coarse sand, trace gravel (carbonate), trace reddish brown clay clasts (<10 mm), brown to greyish brown, very stiff, predominantly homogeneous with some sections faintly laminated, subrounded to very angular,	9.65	08	PQ	58" 97%
35							
40	12				09	PQ	31" 52%
45					10	PQ	56" 93%
	14						
50					11	PQ	60" 100%
	16			253.79			
55			INTEBEDDED CLAY TO SANDY SILT predominantly sandy silt with inclusions and lenses of grey clay and brown silty sand, light grey brown and reddish brown, very stiff, convoluted	16.54	12	PQ	60" 100%
60	18				13	PQ	60" 100%
65	20				14	PQ	60" 100%
				250.01			
			CLAYEY SILT with inclusions of fine sand, brown, reddish brown and grey, convoluted laminations	20.32 249.01	15	PQ	60" 100%
70	22		SILTY SAND DIAMICTON fine grained, trace to coarse grained, trace fine gravel, trace light grey and red silty clay clasts (<10 mm), brown to reddish brown, very stiff, homogeneous	21.31 248.66 21.67			
75			SILTY SAND DIAMICTON (possible till) trace clay, some gravel, little cobbles (>100 mm diameter), carbonate gravel and cobbles, light brownish grey, very dense, homogeneous, subrounded to angular 175 mm seam of very hard laminated sandy silt to clay 75 mm seam of very hard laminated sandy silt to clay		16	PQ	60" 100%
80	24				17	PQ	28" 47%
				244.95			
85	26		SILTY SAND trace gravel, brown and reddish brown mottling, very stiff	25.37 244.70	18	PQ	60" 100%
			SILTY SAND DIAMICTON (possible till) trace clay, some gravel, little cobbles (>100 mm diameter), carbonate and possible shale cobbles (dark grey green), light brownish grey, very dense, homogeneous, subrounded to angular	25.63 244.44 25.88			
90	28		SILTY SAND fine grained, light grey brown with some reddish brown mottling, very dense, homogeneous	242.39	19	PQ	36" 60%
			SILTY SAND DIAMICTON (possible till) trace clay, some gravel, little cobbles (>100 mm diameter), carbonate cobbles, light brownish grey, very dense, homogeneous, subrounded to angular	27.94	20	PQ	60" 100%
95							

WELL DETAILS

Name:	LP-MW-23-10	Name:	Original Borehole
GS Elev:	270.32 m AMSL	GS Elev:	n/a
TOC Elev:	271.31 m AMSL	TOC Elev:	n/a
Easting:	516038	Easting:	n/a
Northing:	4749508	Northing:	n/a
Stick-up:	0.99 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-23-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-24
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 14-Dec-2010 / 07-Jan-2011

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
				240.58			
100	30		CLAYEY SILT (possible till) trace to little coarse sand, trace to little gravel (carbonate), brown to reddish brown, very hard, blocky, subangular to angular	29.74	21	PQ	57" 95%
105	32				22	PQ	60" 100%
110	34				23	PQ	60" 100%
115	36				24	PQ	60" 100%
120	38				25	PQ	60" 100%
125					26	PQ	60" 100%
130	40				27	PQ	60" 100%
135					28	PQ	60" 100%
140	42				29	PQ	60" 100%
145	44				30	PQ	60" 100%
				225.36			
150	46		CLAYEY SILT trace fine sand laminations, brown to light brown, very hard, convoluted laminations grading into silty fine sand by 46.1 m BGS	44.96 224.10	31	PQ	60" 100%
155			INTERBEDDED CLAY TO SANDY SILT layers of sandy silt (76 mm to 200 mm) and clayey silt to clay (25 mm to 300 mm), brown, light grey brown, and reddish brown, very stiff to very hard, convoluted laminations and lenses	46.23 222.57	32	PQ	52" 87%
160	48		SILTY CLAY TO CLAYEY SILT trace fine sand, trace light grey and reddish brown silty clay clasts, brown to reddish brown and grey brown mottling and layering, very hard, faintly laminated in sections, blockey	47.75 220.34	33	PQ	60" 100%
165	50		CLAYEY SILT TO SILT predominantly silt with clay content varying with depth, grey brown, very hard, homogeneous, blockey, fissured (horizontal)	49.99	34	PQ	60" 100%
170	52		trace coarse sand and fine gravel brown and grey brown mottling, convoluted laminations and lenses		35	PQ	60" 100%
175				216.48	36	PQ	60" 100%
	54		SILT AND SAND TO CLAY convoluted to horizontal laminations of silt, sand, and clay, brown to light grey brown, very stiff to hard	53.85 215.87			
180			CLAY TO CLAYEY SILT trace coarse sand, trace red silty clay clasts, dark greyish brown, very stiff, horizontal fissuring	54.46 214.95	37	PQ	52" 87%
185	56		CLAY TO CLAYEY SILT trace coarse sand inclusions, trace grey silty clay clasts, greyish brown to brown, very stiff to very hard, convoluted laminations and lenses	55.37	38	PQ	60" 100%
190	58				39	PQ	60" 100%
			increased silt content from 58.4 m to 59.9 m BGS		40	PQ	60"

WELL DETAILS

Name:	LP-MW-23-10	Name:	Original Borehole
GS Elev:	270.32 m AMSL	GS Elev:	n/a
TOC Elev:	271.31 m AMSL	TOC Elev:	n/a
Easting:	516038	Easting:	n/a
Northing:	4749508	Northing:	n/a
Stick-up:	0.99 m	Stick-up:	n/a

Grout

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-23-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-24
Number: 160900637

Field investigator: A. Vandenhoff
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 14-Dec-2010 / 07-Jan-2011

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-23-10 GS Elev: 270.32 m AMSL TOC Elev: 271.31 m AMSL Easting: 516038 Northing: 4749508 Stick-up: 0.99 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
195	60		CLAY TO CLAYEY SILT trace coarse sand inclusions, trace grey silty clay clasts, greyish brown to brown, very stiff to very hard, convoluted laminations and lenses				100%	
			50 mm seam of reddish brown sand and silt		41	PQ	60" 100%	
200			50 mm seam of reddish brown sand and silt	208.86				
	62		CLAYEY SANDY SILT trace sand inclusions (<5 mm), grey brown to brown	61.47 207.76	42	PQ	60" 100%	
205			SAND & SILT TILL (Catfish Creek Till) some clay, some gravel, little cobbles, light grey, very dense, poorly sorted, gravel subrounded to angular	62.56 207.43 62.89				
	64		COBBLES cobbles or highly fractured limestone, some sand and gravel between cobbles and/or fractures, light grey	205.81	43	PQ	58" 97%	
210			LIMESTONE light grey, competent, 3 fractures in upper 1 m of unit	64.51				
	66			204.28	44	PQ	60" 100%	
215			End of Borehole	66.04				
	68							
220								
	70							
225								
	72							
230								
	74							
235								
	76							
240								
	78							
245								
	80							
250								
	82							
255								
	84							
260								
	86							
265								
	88							
270								
275								
280								
285								
290								

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-24-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-03
Number: 160900637

Field investigator: A. Vandenhoff / B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 16-Dec-2010 / 07-Jan-2011

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	LP-MW-24-10 D: GS Elev: 234.57 m AMSL; TOC Elev: 235.10 m AMSL; Easting: 543511; Northing: 4743760; Stick-up: 0.53 m LP-MW-24-10 I: GS Elev: 234.52 m AMSL; TOC Elev: 235.22 m AMSL; Easting: 543510; Northing: 4743762; Stick-up: 0.70 m LP-MW-24-10 S: GS Elev: 234.54 m AMSL; TOC Elev: 235.32 m AMSL; Easting: 543510; Northing: 4743763; Stick-up: 0.78 m
-5				234.57				Groundwater Level: 0.04 m BTOC Feb. 24, 2011 (LP-MW-24-10 D); Groundwater Level: Flowing Feb. 24, 2011 (LP-MW-24-10 I); Groundwater Level: 1.68 m BTOC Feb. 24, 2011 (LP-MW-24-10 S)
0	0		Ground Surface					Above ground casing (LP-MW-24-10 D); Above ground casing (LP-MW-24-10 I); Above ground casing (LP-MW-24-10 S)
			SILTY SAND little organics, very fine to fine grained, trace gravel, dark brown with yellow orange oxidation, loose	0.00	01	CC	53" 88%	Concrete (LP-MW-24-10 D); Concrete (LP-MW-24-10 I); Concrete (LP-MW-24-10 S)
5				232.74				51 mm Schedule 80 PVC riser (LP-MW-24-10 S)
	2		CLAYEY SILT trace coarse sand and fine gravel, light grey brown, soft, homogeneous	1.83	02	CC	60" 100%	
10					03	CC	14" 100%	Holeplug; Top of sand (2.4 m BGS); No.2 Silica Sand; Top of screen (3.0 m BGS); No.10 Slot Schedule 80 PVC screen 51 mm diameter; Bottom of screen (6.1 m BGS); Bottom of sand (6.7 m BGS) (LP-MW-24-10 S)
	4		little fine sand from 3.4 m to 4.9 m BGS		04	PQ	46" 77%	
15					05	PQ	51" 85%	
20	6							51 mm Schedule 80 PVC riser (LP-MW-24-10 D); 51 mm Schedule 80 PVC riser (LP-MW-24-10 I)
					06	PQ	58" 97%	
25				226.60				
	8		SILT little clay, grey brown, very stiff 100 mm seam of fine sand	7.97	07	PQ	50" 83%	
30				225.07				
	10		SILTY CLAY trace coarse sand and fine gravel, trace grey clay clasts and reddish brown clay clasts (2-4 mm), grey brown, very stiff, laminated (<6 mm)	9.50	08	PQ	60" 100%	
35				223.55				
			INTERBEDDED CLAY TO SAND predominantly silt to silty clay with trace gravel with layers of fine sand (150 to 400 mm), trace grey clay clasts (<10 mm), dark grey brown, silt and clay are stiff, sand is loose, gradual and sharp transitions between cohesive and non cohesive material, cohesive deposits are laminated	11.02	09	PQ	60" 100%	Grout and/or Holeplug (LP-MW-24-10 I)
40	12				10	PQ	60" 100%	
45					11	PQ	60" 100%	
	14				12	PQ	60" 100%	
50								
55	16				13	PQ	56" 93%	
60								
	18				14	PQ	48" 80%	
65				214.40				
	20		CLAYEY SILT trace coarse sand and fine gravel, light grey brown, stiff to very stiff, convoluted laminations from 20.2 m to 21.7 m, horizontal laminations from 21.7 m to the bottom of the unit	20.17	15	PQ	51" 85%	Grout and/or Holeplug (LP-MW-24-10 D)
70								
	22				16	PQ	47" 78%	
75								
	24				17	PQ	60" 100%	Top of sand (23.8 m BGS); No.2 Silica Sand; Top of screen (25.9 m BGS); No.10 Slot Schedule 80 PVC screen 51 mm diameter; Bottom of screen (27.4 m BGS) (LP-MW-24-10 S)
80				209.83				
			SILTY SAND GRADING TO GRAVEL very fine grained, compact, laminated (2-20 mm), grading to very fine sand, medium sand, coarse sand, then gravel by bottom of unit, loose, gravel is rounded carbonate fine sand medium to coarse sand gravel	24.74	18	PQ	57" 95%	
85	26			208.31				
			GRAVEL trace sand (additional sand likely washed out in drilling fluids), medium to coarse grained, light grey, loose, rounded carbonate	26.26	19	PQ	28" 47%	
90	28							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-24-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-03
Number: 160900637

Field investigator: A. Vandenhoff / B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 16-Dec-2010 / 07-Jan-2011

Depth (ft)	Depth (m)	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
95		GRAVEL trace sand (additional sand likely washed out in drilling fluids), medium to coarse grained, light grey, loose, rounded carbonate	205.26	20	PQ	12" 20%
	30	SAND AND GRAVEL trace cobbles, grey brown, homogeneous, poorly sorted, loose	29.31	21	PQ	54" 90%
100			203.48			
		SAND medium grained, grades to coarse grained, grey brown, dense, homogeneous	31.09	22	PQ	40" 67%
105	32		202.21			
		GRAVEL trace cobble, fine to coarse grained, predominantly carbonate with trace granite and shale, light grey, loose, angular to rounded 130 mm seam with silty fine sand and gravel	32.36	23	PQ	37" 62%
110	34					
				24	PQ	24" 40%
115			199.16			
	36	INTERBEDDED CLAYEY SILT TO SAND layers of silt to clayey silt (5 to 25 mm) and sand (10 to 200 mm), light grey brown to reddish brown, stiff to very stiff cohesive material, horizontal to convoluted laminations in cohesive material	35.41	25	PQ	60" 100%
120			197.64			
		SILTY SAND TO SAND predominantly sand with silt content grading between trace silt to silty sand, fine grained, light grey brown, laminated 150 mm seam of laminated to layered fine sand to reddish brown and grey clay	36.93	26	PQ	60" 100%
125	38	trace grey clay clasts (<10 mm)				
		150 mm seam of silty clay with horizontal to inclined sand laminations (<1 mm)		27	PQ	54" 90%
130			194.59			
	40	SAND trace silt in sections, trace orangey brown silt clasts (<3 mm), fine to medium grained, light grey brown	39.98	28	PQ	56" 93%
135		50 mm seam of laminated clayey silt 75 mm seam of laminated clay				
	42			29	PQ	60" 100%
140		trace cobble	191.54			
		SAND AND GRAVEL predominantly carbonate with trace granite, light grey brown, loose, well graded, subrounded to angular	43.03	30	PQ	19" 33%
	44					
145				31	PQ	12" 20%
150	46			32	PQ	48" 80%
155						
	48			33	PQ	30" 50%
160			185.50			
	50	SAND WITH CLAY SILT SEAMS predominantly sand with 75 to 150 mm seams of silt to clayey silt, trace red and light grey clay clasts, fine grained, light grey brown, convoluted laminations with loading structures	49.07	34	PQ	54" 90%
165			183.36			
		CLAYEY SANDY SILT (possible till) grey brown, poorly sorted, very hard, blocky	51.21 183.16	35	PQ	60" 100%
170	52	INTERBEDDED CLAY TO SAND laminated to layered clay, silt and sand, clay and clayeye silt layers up to 50 mm, silt and sand layers up to 125 mm, trace coarse sand in cohesive material, light grey brown, very stiff to hard, horizontal laminations	51.41	36	PQ	60" 100%
175						
	54			37	PQ	56" 93%
180						
	56			38	PQ	60" 100%
185						
				39	PQ	60" 100%
190	58					

WELL DETAILS

	LP-MW-24-10 D	LP-MW-24-10 I	LP-MW-24-10 S
GS Elev:	234.57 m AMSL	234.52 m AMSL	234.54 m AMSL
TOC Elev:	235.10 m AMSL	235.22 m AMSL	235.32 m AMSL
Easting:	543511	543510	543510
Northing:	4743760	4743762	4743763
Stick-up:	0.53 m	0.70 m	0.78 m

Bottom of sand (28.0 m BGS)
Top of sand (40.2 m BGS)
No.2 Silica Sand
Top of screen (41.1 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (42.7 m BGS)
Bottom of sand (43.3 m BGS)
Grout and/or Holeplug

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: AV / MF

Monitoring Well: LP-MW-24-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-03
Number: 160900637

Field investigator: A. Vandenhoff / B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 16-Dec-2010 / 07-Jan-2011

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	Name: LP-MW-24-10 D GS Elev: 234.57 m AMSL TOC Elev: 235.10 m AMSL Easting: 543511 Northing: 4743760 Stick-up: 0.53 m
				175.69				
			CLAYEY SILT mottled with silt, trace sand and gravel, brown	58.88	40	PQ	58" 97%	
195				175.03				
			SILTY SAND AND GRAVEL (Catfish Creek Till)	59.54 174.63				
	60		light grey, very dense, blocky	59.94				
			LIMESTONE dark grey, fossiliferous		41	PQ	57" 95%	
200				173.30				
			End of Borehole	61.26				
	62							
205								
210	64							
215								
	66							
220								
	68							
225								
230	70							
235								
	72							
240								
	74							
245								
250	76							
255								
	78							
260								
	80							
265								
	82							
270								
275	84							
280								
	86							
285								
	88							
290								

WELL DETAILS

Name:	LP-MW-24-10 D	Name:	LP-MW-24-10 I	Name:	LP-MW-24-10 S
GS Elev:	234.57 m AMSL	GS Elev:	234.52 m AMSL	GS Elev:	234.54 m AMSL
TOC Elev:	235.10 m AMSL	TOC Elev:	235.22 m AMSL	TOC Elev:	235.32 m AMSL
Easting:	543511	Easting:	543510	Easting:	543510
Northing:	4743760	Northing:	4743762	Northing:	4743763
Stick-up:	0.53 m	Stick-up:	0.70 m	Stick-up:	0.78 m

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: AV / MF

Stantec

Monitoring Well: LP-MW-25-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-18
Number: 160900637

Field investigator: B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 04-Jan-2011 / 14-Jan-2011

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	227.98			
0	0		FILL gravel and cobbles with little fine sand and silt, fill from historic rail track foundation	0.00			
10	2			224.63	01	PQ	10" 83%
15	4		SILTY SAND with gravel, fine grained, light brown, loose, sub angular	3.35	02	PQ	14" 23%
20	6			221.58	03	PQ	10" 17%
25	8		SAND with silt and clay, trace gravel, yellowish brown and reddish brown, soft, poorly sorted	6.40	04	PQ	14" 23%
30	10			218.53	05	PQ	24" 40%
35			SANDY SILT trace fine gravel, trace grey clay clasts (<30 mm), reddish brown and yellowish brown laminations (<10 mm), soft	9.45	06	PQ	52" 87%
			sand content increasing	217.01			
40	12		SAND some silt, trace gravel, grey brown, loose, homogeneous	10.97	07	PQ	60" 100%
			silt content increasing	215.48			
45	14		SAND trace gravel, fine to medium grained, yellowish brown, loose, homogeneous	12.50	08	PQ	58" 97%
50					09	PQ	48" 80%
55	16				10	PQ	60" 100%
			100 mm seam of laminated silty sand				
60	18		becoming grey brown		11	PQ	50" 83%
			increased silt content between 18.1 m to 18.6 m BGS				
			becoming fine grained to very fine grained		12	PQ	57" 95%
65	20		100 mm seam of laminated (<10 mm) reddish brown and grey brown silty clay				
			150 mm seam of laminated (<10 mm) reddish brown and grey brown silty clay	207.86			
70			INTERBEDDED SILTY CLAY TO SAND predominantly silty sand to sand (up to 300 mm) with layers of silty clay (100 to 200 mm), non-cohesive material is dark grey, loose and homogeneous, cohesive material firm with reddish brown and grey brown laminations	20.12	13	PQ	56" 93%
				206.34			
75	22		SILTY SAND very fine grained, dark grey brown, loose	21.64	14	PQ	60" 100%
			75 mm seam of laminated (<10 mm) reddish brown and grey brown silty clay				
	24		50 mm seam of laminated (<10 mm) reddish brown and grey brown silty clay		15	PQ	10" 17%
80			50 mm seam of laminated (<10 mm) reddish brown and grey brown silty clay	203.29			
85	26		SAND WITH CLAY SEAMS predominantly sand with laminated clay seams (100 to 150 mm), silt content varies with depth, trace grey clay clasts (<20 mm), very fine to fine grained, dark grey brown, compact	24.69	16	PQ	52" 87%
90					17	PQ	60" 100%
	28				18	PQ	60" 100%

Name: LP-MW-25-10 D
GS Elev: 227.98 m AMSL
TOC Elev: 228.67 m AMSL
Easting: 557556
Northing: 4744623
Stick-up: 0.69 m

Above ground casing
Concrete
51 mm Schedule 80 PVC riser
Groundwater Level: 7.06 m BTOC Feb. 24, 2011
Grout and/or Holeplug

Name: LP-MW-25-10 I
GS Elev: 228.01 m AMSL
TOC Elev: 228.51 m AMSL
Easting: 557558
Northing: 4744623
Stick-up: 0.50 m

Above ground casing
Concrete
51 mm Schedule 80 PVC riser
Holeplug
Groundwater Level: 6.69 m BTOC Feb. 24, 2011
Top of sand (11.6 m BGS)
No.2 Silica Sand
Top of screen (12.2 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (13.7 m BGS)
Bottom of sand (13.7 m BGS)

Name: LP-MW-25-10 S
GS Elev: 228.01 m AMSL
TOC Elev: 229.20 m AMSL
Easting: 557561
Northing: 4744624
Stick-up: 1.19 m

Above ground casing
Concrete
51 mm Schedule 80 PVC riser
Groundwater Level 2.08 m BTOC Feb. 24, 2011
Holeplug
Top of sand (1.2 m BGS)
No.2 Silica Sand
Top of screen (1.5 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (4.6 m BGS)
Bottom of sand (5.2 m BGS)

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: BK / MF

Stantec

Monitoring Well: LP-MW-25-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-18
Number: 160900637

Field investigator: B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Track Mount, Christianson PQ Coring
Date started/completed: 04-Jan-2011 / 14-Jan-2011

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery
			SAND WITH CLAY SEAMS predominantly sand with laminated clay seams (100 to 150 mm), silt content varies with depth, trace grey clay clasts (<20 mm), very fine to fine grained, dark grey brown, compact	197.96			
100	30		SAND trace light grey and reddish brown clay clasts (<10 mm), fine to medium grained, dark grey brown, loose to compact, laminated	30.02	19	PQ	60" 100%
105	32		laminated clay and sand from 31.8 m to 32.3 m BGS		20	PQ	55" 92%
110	34				21	PQ	60" 100%
115			SILTY CLAY little coarse sand and fine gravel, trace light grey clay clasts (<10 mm), dark grey brown, soft to firm, laminated	193.23 34.75	22	PQ	60" 100%
	36				23	PQ	60" 100%
120			sand and gravel content removed with depth		24	PQ	60" 100%
125	38				25	PQ	60" 100%
130			300 mm lense of silty clay with gravel	188.05			
	40		SANDY CLAYEY SILT coarse sand, little fine gravel, stiff, dark brown, homogeneous	39.93 187.14	26	PQ	60" 100%
135			CLAYEY SILT trace coarse sand, firm, convoluted and inclined dark grey and reddish brown laminations	40.84 186.53			
140	42		SILTY SAND AND GRAVEL (Catfish Creek Till) light grey, very dense, blocky	41.45 184.50	27	PQ	60" 100%
145	44		LIMESTONE light grey, competent	43.48 183.48	28	PQ	58" 97%
			End of Borehole	44.50			
150	46						
155							
	48						
160							
	50						
165							
170	52						
175							
	54						
180							
	56						
185							
190	58						

WELL DETAILS

Name:	LP-MW-25-10 D	Name:	LP-MW-25-10 I	Name:	LP-MW-25-10 S
GS Elev:	227.98 m AMSL	GS Elev:	228.01 m AMSL	GS Elev:	228.01 m AMSL
TOC Elev:	228.67 m AMSL	TOC Elev:	228.51 m AMSL	TOC Elev:	229.20 m AMSL
Easting:	557556	Easting:	557558	Easting:	557561
Northing:	4744623	Northing:	4744623	Northing:	4744624
Stick-up:	0.69 m	Stick-up:	0.50 m	Stick-up:	1.19 m

Top of sand (30.8 m BGS)
No.2 Silica Sand
Top of screen (31.4 m BGS)
No.10 Slot Schedule 80 PVC screen 51 mm diameter
Bottom of screen (34.4 m BGS)
Bottom of sand (35.0 m BGS)
Grout and/or Holeplug

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
PQ - wireline continuous core sample
n/a - not available

Drawn By/Checked By: BK / MF

Stantec

Monitoring Well: LP-MW-26-10

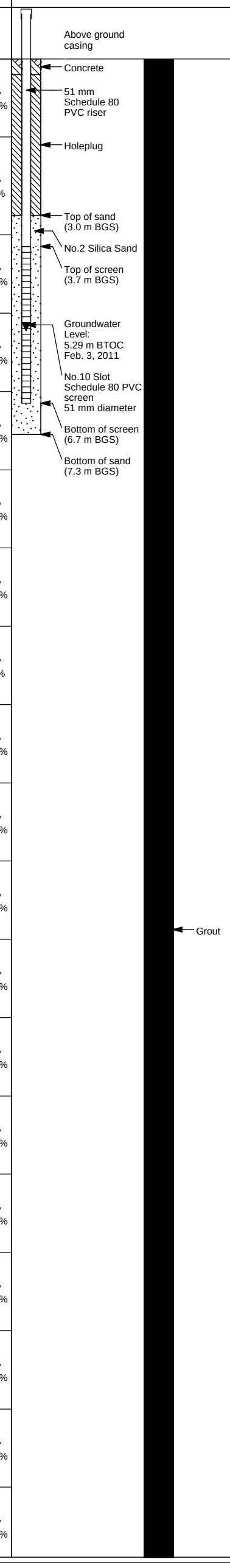
Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-25
Number: 160900637

Field investigator: B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 07-Jan-2011 / 11-Jan-2011

Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) / Depth (m BGS)	Sample Number	Sample Type	Recovery
			Ground Surface	230.07			
0	0		SAND fine to medium grained, yellowish brown, loose, massive, well sorted, dry	0.00	01	CC	60" 100%
5	2		trace to little silt from 0 m to 3.7 m BGS		02	CC	48" 64%
10	4				03	PQ	60" 100%
15	6		becoming grey brown		04	PQ	60" 100%
20					05	PQ	60" 100%
25	8		CLAYEY SILT trace to liitle light grey and reddish brown clay clasts and lenses (<20 mm), dark grey brown, firm	222.45 7.62	06	PQ	60" 100%
30	10		trace to little sand from 7.6 m to 9.5 m BGS		07	PQ	60" 100%
35					08	PQ	54" 90%
40	12			216.96	09	PQ	60" 100%
45	14		GRAVELLY SANDY SILT (Till) some clay, trace cobbles, brown, very hard, poorly sorted	13.11	10	PQ	60" 100%
50	16				11	PQ	60" 100%
55				212.54	12	PQ	60" 100%
60	18		SILT WITH SAND trace to little gravel, some layers of clayey silt (100 to 150 mm), dark brown to reddish brown horizontal and convoluted lenses and laminations (<20 mm), stiff, organic odour	17.53	13	PQ	60" 100%
65	20			209.88	14	PQ	60" 100%
70	22		INTERBEDDED CLAYEY SILT TO SILTY SAND predominantly silty sand (300 to 600 mm) with layers of clayey silt with trace gravel (25 to 150 mm), non cohesive material is dark brown, loose to compact, cohesive material is dark grey brown, firm to stiff with an organic odour	20.19	15	PQ	60" 100%
75					16	PQ	60" 100%
80	24		clayey silt layers increasing in thickness (50 to 250 mm), silty sand content decreasing (150 mm to 300 mm) towards bottom of unit		17	PQ	60" 100%
85	26				18	PQ	60" 100%
90	28		SILTY CLAY TO CLAYEY SILT DIAMICTON some to little coarse sand and fine gravel, light brown and dark grey brown, very stiff, convoluted lenses and laminations, organic odour	203.25 26.82	19	PQ	60" 100%
95							

WELL DETAILS

Name:	LP-MW-26-10	Name:	Original Borehole
GS Elev:	230.07 m AMSL	GS Elev:	n/a
TOC Elev:	231.15 m AMSL	TOC Elev:	n/a
Easting:	524291	Easting:	n/a
Northing:	4745915	Northing:	n/a
Stick-up:	1.08 m	Stick-up:	n/a



Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
PQ - wireline continuous core sample
n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: BK / MF

Stantec

Monitoring Well: LP-MW-26-10

Project: Long Point Tier 3 Assessment
Client: Grand River Conservation Authority
Location: Norfolk County, ON; LP-10-25
Number: 160900637

Field investigator: B. Kearney
Contractor: Aardvark Drilling Inc.
Drilling method: CME 75, Truck Mount, Christianson PQ Coring
Date started/completed: 07-Jan-2011 / 11-Jan-2011

SUBSURFACE PROFILE				SAMPLE DETAILS			WELL DETAILS
Depth (ft)	Depth (m)	Graphic Log	Lithologic Description	Elevation (m AMSL) Depth (m BGS)	Sample Number	Sample Type	Recovery	
			SILTY CLAY TO CLAYEY SILT DIAMICTON some to little coarse sand and fine gravel, light brown and dark grey brown, very stiff, convoluted lenses and laminations, organic odour	199.67	20	PQ	36" 60%	Name: LP-MW-26-10 GS Elev: 230.07 m AMSL TOC Elev: 231.15 m AMSL Easting: 524291 Northing: 4745915 Stick-up: 1.08 m Name: Original Borehole GS Elev: n/a TOC Elev: n/a Easting: n/a Northing: n/a Stick-up: n/a
100	30		GRAVELLY CLAYEY SILT (Catfish Creek Till) light grey to brown, very hard, poorly sorted	30.40 198.83				
			LIMESTONE light grey, competent	31.24	21	PQ	36" 60%	
105	32							
					22	PQ	60" 100%	
110	34		End of Borehole	196.16 33.91				
115	36							
120								
125	38							
130	40							
135	42							
140								
145	44							
150	46							
155	48							
160								
165	50							
170	52							
175	54							
180								
185	56							
190	58							

Notes:
m AMSL - metres above mean sea level
m BGS - metres below ground surface
m BTOC - metres below top of casing
CC - continuous core sample
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n/a - not available

Groundwater level data provided by Groundwater Science Corp.

Drawn By/Checked By: BK / MF

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