PROJECT: 021-1228

RECORD OF DRILLHOLE: MW5

SHEET 1 OF 5

LOCATION: Refer to Plan

DRILLING DATE: July 10-11, 2002

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME 75

DRILLING CONTRACTOR: ALL TERRAIN DRILLING

FR/FX-FRACTURE F-FAULT SM-SMOOTH FL-FLEXURED BC-BROKEN CORE
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN MB-MECH. BREAK
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY B-BEDDING
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	COLOUR, % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION
		GROUND SURFACE		160.50												
0		Dry to slightly moist, loose-compact, yellow-brown silty sand to sandy silt, trace cobbles, gravel clay. (SM-ML)		0.00 / 159.59												
1		Firm, yellow-brown, moist to slightly moist, silty sand to sandy silt, some 5% gravel. (ML-TILL)		0.91 / 158.06												BENTONITE SEAL
2		Compact, moist, yellow-brown gravelly sand, some silt, trace clay, some cobbles. (TILL) (SG-ML)		2.44 / 157.30												
3		Yellow-brown, moist, compact, cobbley silty sand TILL. (SM)		3.20 / 155.78												
4		Brown, damp, dense silty sand (SM), occ. gravel.		4.72 / 155.01												
5	AUGER	Brown, moist, dense silty sand to silty gravel. (SM-GM)		5.49 / 154.25												
6		Brown, moist, compact sand, trace some silt, some sub-ang gravel & cobbles, trace clay.		6.25 / 152.88												SAND
7		Brown-yellow brown, wet, very dense sand TILL, some silt, clay, gravel and cobbles. (SM)		7.62 / 152.12												
8		Grey, hard to very hard SILT, some sand, moist to slightly moist, some clay. (ML)		8.38												
9		Transition from moist to wet soil: water table inferred.														BENTONITE SEAL
10		*CONTINUED NEXT PAGE*														

DEPTH SCALE
1 : 50

LOGGED: MR

CHECKED:

Golder Associates

MISS_ROCK 021-1228.GPJ GLDR_CAN.GDT 15/1/04 PS

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW5

SHEET 2 OF 5

LOCATION: Refer to Plan

DRILLING DATE: July 10-11, 2002

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME 75

DRILLING CONTRACTOR: ALL TERRAIN DRILLING

FR/FX-FRACTURE F-FAULT SM-SMOOTH FL-FLEXURED BC-BROKEN CORE
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN MB-MECH. BREAK
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY B-BEDDING
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH	COLOUR, % RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	DIAMETRAL POINT LOAD INDEX, (MPa)	NOTES WATER LEVELS INSTRUMENTATION
10		— CONTINUED FROM PREVIOUS PAGE —		159.44													
		Brown, dense, moist silty coarse gravelly sand to silty gravel TILL. (SM-GM)		10.06													
				149.68													
11		Brown, dense moist SILT, trace gravel.		10.82													
				148.92													
		Wet, dense, grey SAND and GRAVEL, some silt. (TILL) (SG-GM)		11.58													
12				148.16													
		Brown, moist, hard, cobbley, gravelly SILT TILL. (SM)		12.34													
13	AUGER																
				146.63													BENTONITE SEAL
14		BEDROCK, highly weathered, very weak, friable red shale, easily augered.		13.87													
15																	
				144.85													
16	HQ CORE	Red SHALE, finely laminated, weak to moderately strong, slightly weathered.		15.85	1									B			
														B			
17																	
														B,FX			
		Core is highly discked, reducing RQD.			2									B,FX			
18														B,FX			SAND
														B J			
														B,FX			
19														B,FX			
					3									B,FX J			
20														B,FX			
		CONTINUED NEXT PAGE															

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MR

CHECKED:

MISS_ROCK 021-1228.GPJ GLDR_CAN.GDT 15/1/04 PS

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW5

SHEET 3 OF 5

LOCATION: Refer to Plan

DRILLING DATE: July 10-11, 2002

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME 75

DRILLING CONTRACTOR: ALL TERRAIN DRILLING

FR/FX-FRACTURE F-FAULT SM-SMOOTH FL-FLEXURED BC-BROKEN CORE
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN MB-MECH. BREAK
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY B-BEDDING
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR, % RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION
20		— CONTINUED FROM PREVIOUS PAGE —														
		Red SHALE, finely laminated, weak to moderately strong, slightly weathered. Green shale bands are slightly stronger than the red shale bands. (Metalic sound when tapped with geologic hammer)			3								B,FX			
21					4								B,FX			
													B,FX			
													B,FX			
22		Run 5: Core wet at about 22.86m below ground. Slight strength decrease and weathering increase at water table.			5								B,FX			
													B,FX			
													B,FX			
23													B,FX			
													B,FX			
													B,FX			
24					6								B,FX			
													B,FX			
													B,FX			
				135.61									B,FX			
	HQ CORE	Red and green SHALE, moderate to slightly weathered, medium strong, finely laminated, not friable. Rock is up to 10% green coloured.		24.69									B,FX			
25					7								B,FX			
													B,FX			
													B,FX			
26													B,FX			SAND
		Discontinuities are planar and rough to smooth. (DISCKING)											BC			
27					8								B,FX			
													B,FX			
													B,FX			
28													B,FX			
													B,FX			
					9								B,FX			
													B,FX J			BENTONITE SEAL
29													B,FX			
					10								B,FX			
													B,FX			
30		CONTINUED NEXT PAGE											B, gypsum, <2mm			

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MR

CHECKED:

MISS_ROCK 021-1228.GPJ GLDR_CAN.GDT 15/1/04 PS

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW5

SHEET 4 OF 5

LOCATION: Refer to Plan

DRILLING DATE: July 10-11, 2002

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME 75

DRILLING CONTRACTOR: ALL TERRAIN DRILLING

FR/FX-FRACTURE F-FAULT SM-SMOOTH FL-FLEXURED BC-BROKEN CORE
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN MB-MECH. BREAK
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY B-BEDDING
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH / COLOUR / % RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K_s cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION
30		— CONTINUED FROM PREVIOUS PAGE —														
		Red and green SHALE, moderate to slightly weathered, medium strong, finely laminated, not friable. Rock is up to 10% green coloured. * First gypsum coatings noted on fracture surfaces at 30.07m.			10								B B,FX B,FX B B			
31					11								FX, gypsum, <1mm FX			
32		Red SHALE, moderately strong, cannot be scratched with knife, slightly weathered. Finely laminated. Friable.		128.50 32.00									B,FX B,FX			BENTONITE SEAL
33					12								BC			
34					13								B,FX B,FX B,FX B,FX B,FX			
35	HQ CORE															
36		Discontinuities are planar and smooth to rough. They tend to be perpendicular to the core axis. they are interpreted as bedding/mechanically induced fractures.			14								B,FX B,FX B			
37					15								B,FX B,FX J BC			
38		Red shale, finely laminated, some debris flow/turbidity bedding. (38.46m-38.55m)											B,FX, gypsum, <1mm			
39		Note that approximately 6%-10% of the recovered core is coloured green.			16								B B,FX B,FX B,FX B,FX			SAND
40		CONTINUED NEXT PAGE			17											

DEPTH SCALE 1 : 50

LOGGED: MR

CHECKED:

Golder Associates

MISS ROCK 021-1228.GPJ GLDR_CAN.GDT 15/1/04 PS

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW5

SHEET 5 OF 5

LOCATION: Refer to Plan

DRILLING DATE: July 10-11, 2002

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME 75

DRILLING CONTRACTOR: ALL TERRAIN DRILLING

FR/FX-FRACTURE F-FAULT SM-SMOOTH FL-FLEXURED BC-BROKEN CORE
CL-CLEAVAGE J-JOINT R-ROUGH UE-UNEVEN MB-MECH. BREAK
SH-SHEAR P-POLISHED ST-STEPPED W-WAVY B-BEDDING
VN-VEIN S-SLICKENSIDED PL-PLANAR C-CURVED

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH	COLOUR, % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION
		— CONTINUED FROM PREVIOUS PAGE —															
40		Red SHALE, moderately strong, cannot be scratched with knife, slightly weathered. Finely laminated. Friable.												B,FX			
														B,FX			
					17									B,FX			
41														B,FX, gypsum coating			
														B			
														B,FX			
42														B			
					18									B,FX			SAND
														B			
43	HQ CORE													B,FX			
					19												
44																	
45					20									B,FX			
														B,FX			
														B			
46				114.48										B			
		END OF HOLE		46.02													
47																	
48																	
49																	
50																	

HYDRAULIC CONDUCTIVITY K, cm/sec: 10^{-11} 10^{-9} 10^{-7} 10^{-5}

DIAMETRAL POINT LOAD INDEX (MPa): 2 4 6

MISS_ROCK 021-1228.GPJ GLDR_CAN.GDT 15/1/04 PS

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MR

CHECKED:

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-05S

SHEET 1 OF 2

LOCATION: N 596134.0 ;E 4808769.0

DRILLING DATE: July 9, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate
BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage
PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular
PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	COLOUR % RETURN	FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: Dip w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
0		GROUND SURFACE		167.03																		
		Compact, dry, brown SILT with some clay and trace to some gravel, (0.5 cm to 3.03 cm) subangular to subrounded (TILL)		0.00																		Cement
1																						
2																						
3		Occasional cobbles after 2.74 m depth																				
4				162.83																		
		Compact, moist to wet, brown SANDY SILT with some gravel, and occasional cobble, subrounded to subangular, heterogeneous (TILL)		4.20																		
5																						Grout
6																						
				160.63																		
		Compact, saturated, brown SAND with some gravel and silt		6.40																		
7																						
8				158.87																		
		Compact, wet, brown SILT with some sand and gravel		8.16																		
		Silt layer from 28.8 m to 30.5 m																				
9		Becoming clayey at 9.29 m depth																				
10		*CONTINUED NEXT PAGE*																				

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AI
CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-05S

SHEET 2 OF 2

LOCATION: N 596134.0 ;E 4808769.0

DRILLING DATE: July 9, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH / COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: Dip w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
10		--- CONTINUED FROM PREVIOUS PAGE ---																			
		Compact, wet, brown SILT with some sand and gravel		158.73																	
		Loose, grey, poorly graded, clean, homogeneous fine SAND		10.30																	
11																					Grout
				155.45																	
		Very dense, brown SILTY fine SAND with gravel and cobbles		11.58																	
12																					
13																					Hole Plug
14																					Sand
15																					
				151.46																	
		Slightly weathered, very thinly bedded, brownish red and green SHALE		15.57										,BD,PL,UE ,BD,SH,UE							Screen
16														,SH, PL,UE,Ro ,SH, BD,UE,Ro							
														,PL,UE,Ro							
														,PL,UE,Ro							
17														,SH,BD,Ro							
														,PL,W,UE							Sand
														,PL,CU,UE							
18				148.90										,PL,UE,VR ,PL,Ro,B.C.							
		END OF DRILLHOLE		18.13																	
19																					
20																					

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AI

CHECKED: SW

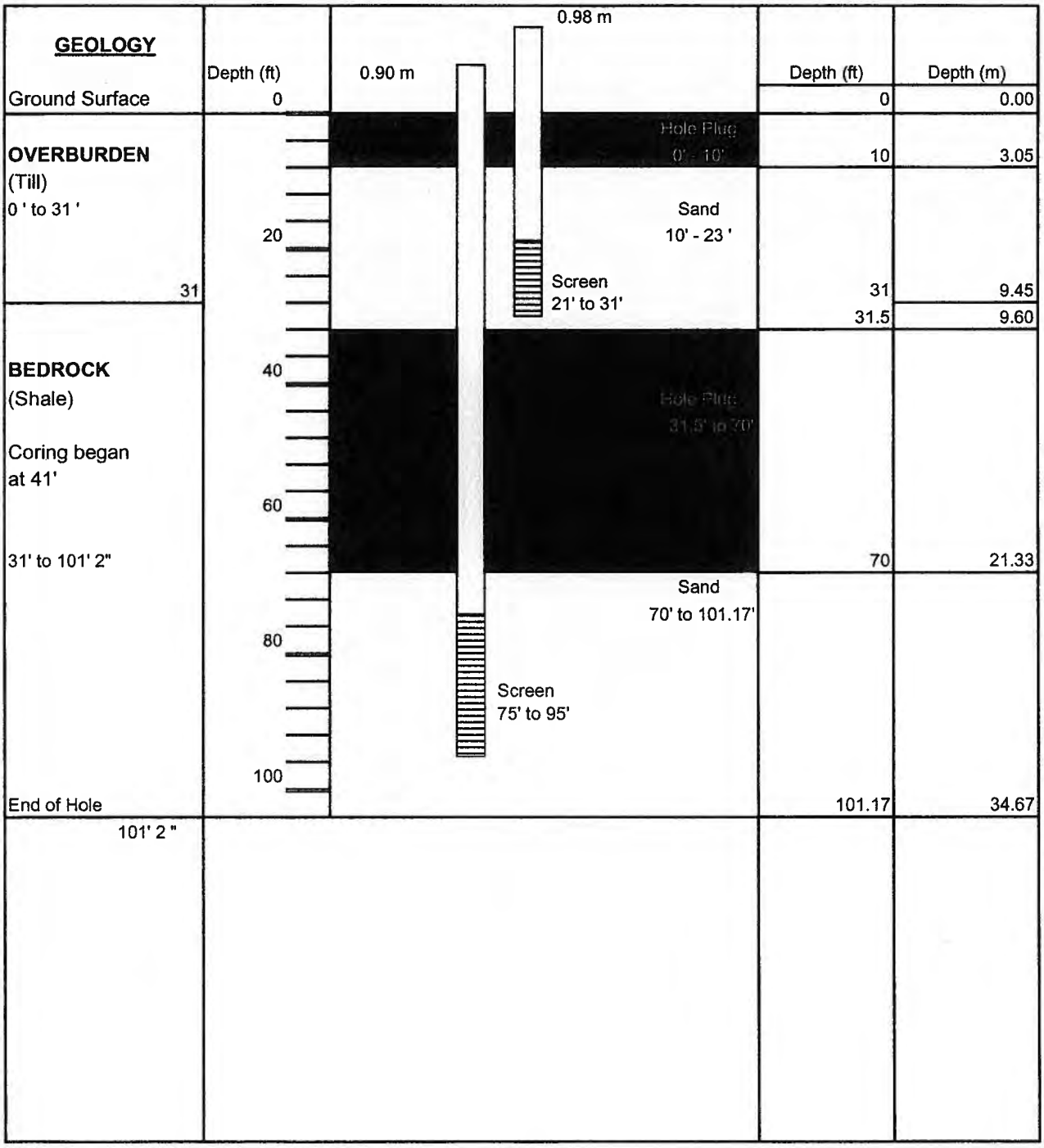
MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

CANADA BRICK - TREMAINE ROAD, BURLINGTON
WELL COMPLETION DETAILS

FIGURE A.6

MONITORING WELL MW-06

Note: Borehole logging and well completion was not supervised by Golder.



Not to Scale

Project: 021-1228 (5100)

Date: July 2002

Drawn: MR

Checked:

GOLDER ASSOCIATES

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-06S

SHEET 1 OF 2

LOCATION: N 596351.0 ;E 4808892.0

DRILLING DATE: July 6 and 10, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH % RETURN	COLOUR	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	UCS (MPa)	RMC %/ AVG.	NOTES WATER LEVELS INSTRUMENTATION
		GROUND SURFACE		166.05																			
0		Loose to compact, dry, brown SILT, some clay (TILL)		0.00																			
1																							
2																							
		Some gravel from 8.44 m to 2.84 m depth																					
3																							
				162.70																			
		Slightly moist, brown SANDY SILT, some clay, cobble/gravel bands (TILL)		3.35																			Cement
4																							
5																							
				160.27																			
		Wet, brown SAND and GRAVEL		5.78																			
6																							
7																							Hole Plug
		Silty sand, reddish brown, lens of clay, gravel at 7.32 m depth																					
				158.13																			Sand
8		Reddish brown SILT, trace gravel (TILL)		7.92																			
9																							Screen
				156.91																			
		SHALE, reddish, slightly porous, slight weathering, some gravel		9.14																			
10																							
		CONTINUED NEXT PAGE																					

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: MD

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-06S

SHEET 2 OF 2

LOCATION: N 596351.0 ;E 4808892.0

DRILLING DATE: July 6 and 10, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH % RETURN	COLOUR
10		--- CONTINUED FROM PREVIOUS PAGE ---						
		Moderately weathered, thinly bedded, redish brown and green SHALE		10.00				
11				154.80				
		END OF DRILLHOLE		11.25				
12								
13								
14								
15								
16								
17								
18								
19								
20								

JN - Joint, FLT - Fault, SHR- Shear, VN - Vein, CJ - Conjugate

BD- Bedding, FO- Foliation, CO- Contact, OR- Orthogonal, CL - Cleavage

PL - Planar, CU- Curved, UN- Undulating, ST - Stepped, IR - Irregular

PO- Polished, K - Slickensided, SM- Smooth, Ro - Rough, MB- Mechanical Break

BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

RECOVERY: TOTAL CORE %; SOLID CORE %

R.Q.D. %

FRACT. INDEX PER 0.3 m

DISCONTINUITY DATA: β Angle; Dip w.r.t. CORE AXIS; TYPE AND SURFACE DESCRIPTION; Jr; Ja; Jn

HYDRAULIC CONDUCTIVITY K, cm/sec: 10^{-4}, 10^{-3}, 10^{-2}, 10^{-1}

Diametral Point Load Index (MPa): 2, 4, 6

RMC -Qʼ AVG.

NOTES WATER LEVELS INSTRUMENTATION

Screen

Sand

DEPTH SCALE

1 : 50

LOGGED: MD

CHECKED: SW

Golder Associates

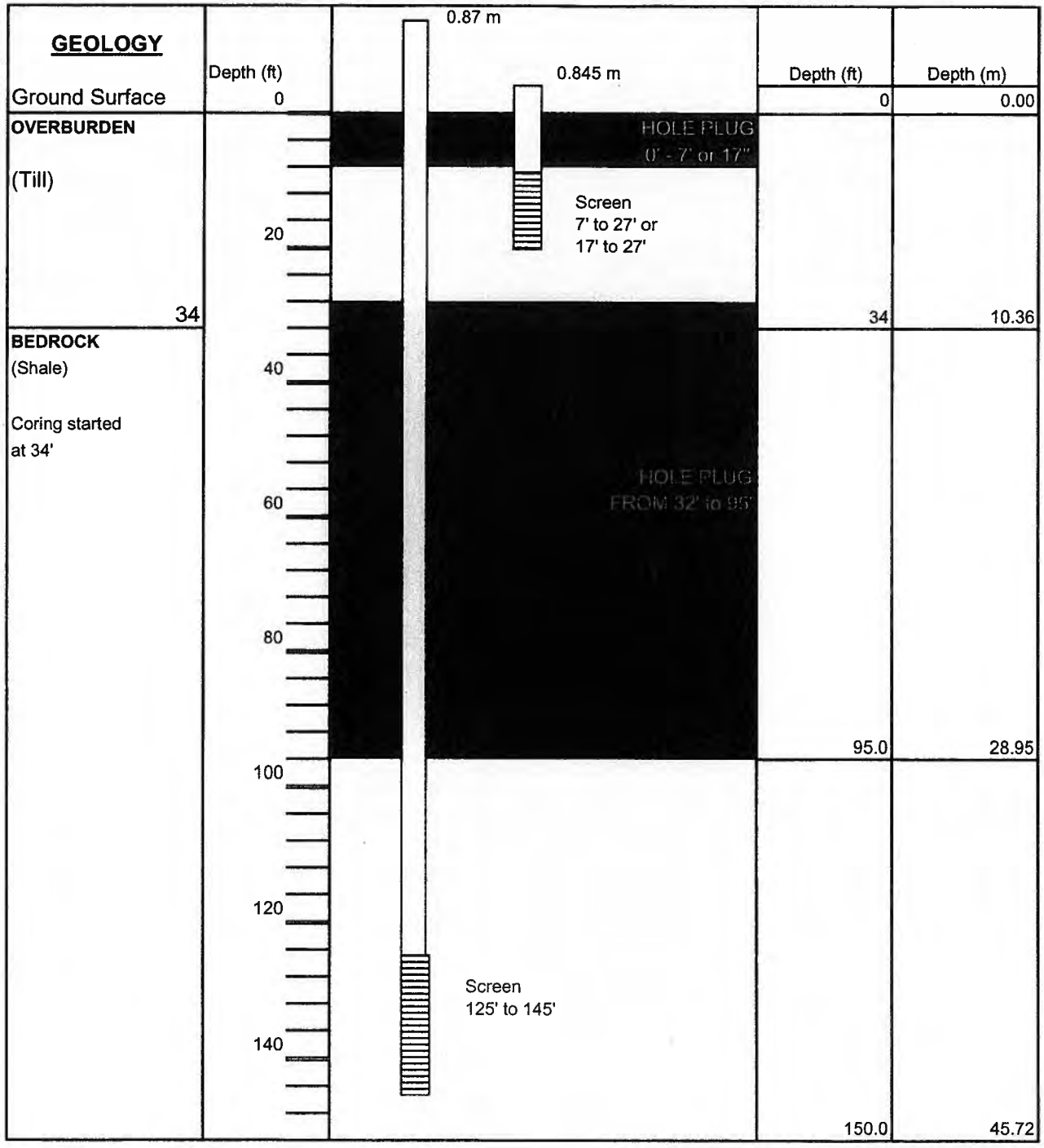
MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

CANADA BRICK - TREMAINE ROAD, BURLINGTON
WELL COMPLETION DETAILS

FIGURE A.7

MONITORING WELL MW-7

Note: Borehole logging and well completion was not supervised by Golder. This hole was originally numbered MW-12.



Not to Scale

Project: 021-1228 (5100)

Date: July 2002

Drawn: MR

Checked: D.M.

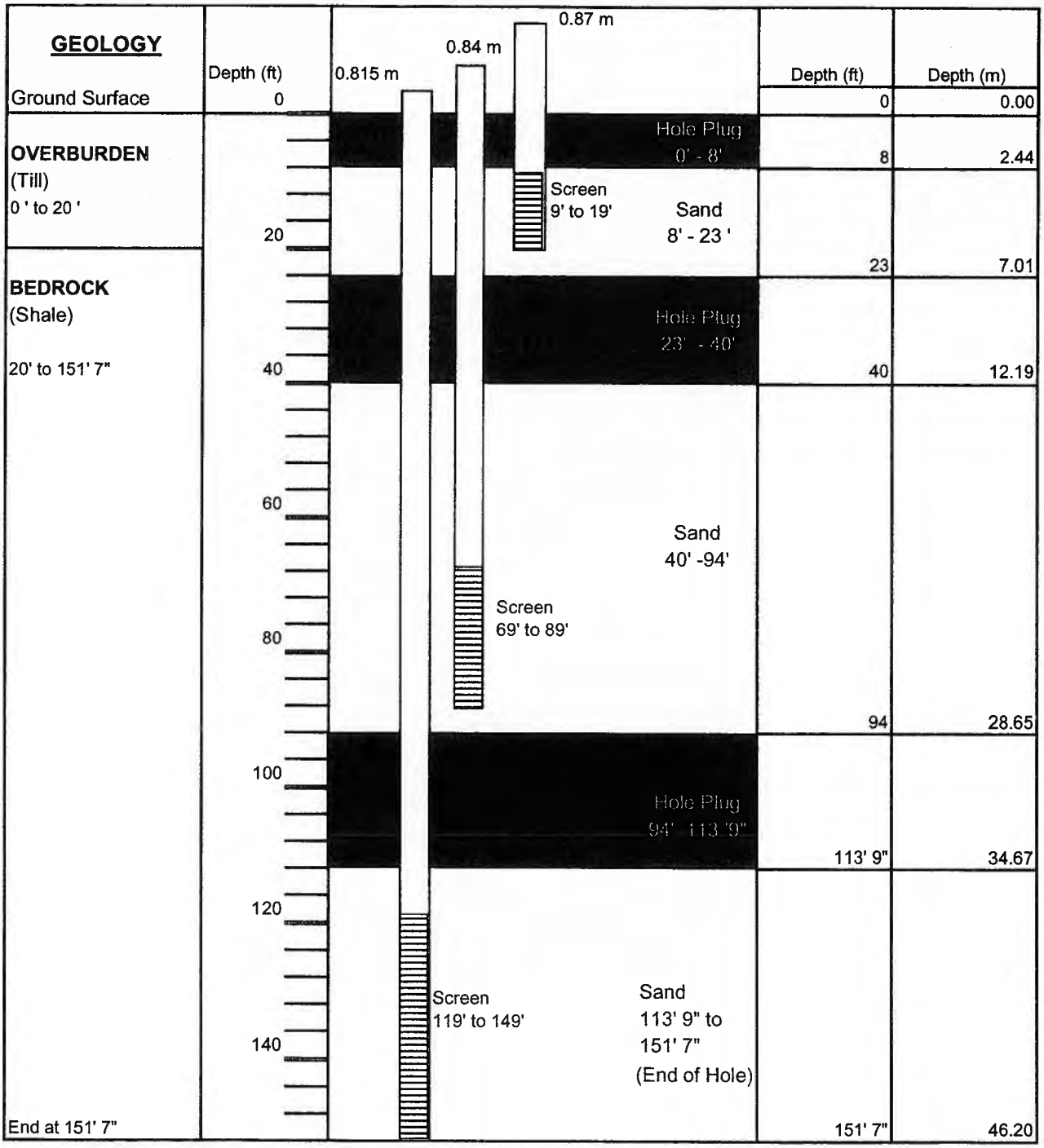
GOLDER ASSOCIATES

CANADA BRICK - TREMAINE ROAD, BURLINGTON
WELL COMPLETION DETAILS

FIGURE A.8

MONITORING WELL MW-08

Note: Borehole logging and well completion was not supervised by Golder.



Not to Scale

Project: 021-1228 (5100)

Date: July 2002

Drawn: MR

Checked: D.M.

GOLDER ASSOCIATES

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-09

SHEET 1 OF 5

LOCATION: N 596166.0 ;E 4809014.0

DRILLING DATE: July 3 to 5, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL- Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/m	COLOUR & % RETURN	FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: β Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	SMC -Qr AVG.	NOTES WATER LEVELS INSTRUMENTATION
0		GROUND SURFACE		165.53																		
		Stiff, brown clayey silt till with trace gravel and organics (TOPSOIL)		0.00																		
1				164.08																		
		Firm, brown SILT with some clay, sand, semirounded gravel and cobbles (TILL)		1.45																		
2																						
3																						
4																						
5																						
				159.75																		
6		Slightly firm, reddish brown CLAYEY SILT with very fine and very course semirounded sand, gravel and cobbles (TILL)		5.78																		(S)
7																						
8																						
				157.00																		
		Stiff, brown SILTY CLAY with very course sand and cobbles (TILL)		8.53																		
9																						(I)
				155.78																		
		Stiff, reddish brown SILTY CLAY (Weathered Shale)		9.75																		
10		*CONTINUED NEXT PAGE*																				

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 2/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-09

SHEET 2 OF 5

LOCATION: N 596166.0 ;E 4809014.0

DRILLING DATE: July 3 to 5, 2007

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: Diff w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -C' AVG.	NOTES WATER LEVELS INSTRUMENTATION
10		— CONTINUED FROM PREVIOUS PAGE —																			
		Stiff, reddish brown SILTY CLAY (Weathered Shale)																			
11																					
12				153.34																	
		Stiff, reddish brown SILTY CLAY with some broken shale (Weathered Shale)		12.19																	
13																					
				151.81																	
		Slightly weathered, weak, very thinly to thinly bedded, redish brown and green SHALE		13.72										,JN,IR,Ro							
14					1									,JN,IR,Ro							
														,JN,IR,Ro							
														,JN,IR,Ro							
														,FO,IR,Ro							
														,BD,IR,Ro							
15					2									,JN,IR,Ro							
														,FR,IR,Ro							
														,JN,IR,Ro							
16														,FO,IR,Ro							
														,JN,IR,Ro							
														,JN,ST,Ro							
					3									,JN,IR,Ro							
17														,FR,IR,Ro							
														,JN,IR,Ro							
														,JN,IR,Ro							
														,FR,IR,Ro							
					4																
18														,FR,IR,Ro							
					5									,JN,PL,SM							
														,JN,IR,Ro							
19														,FO,PL,SM							
					6									,FO,IR,Ro							
														,FO,IR,Ro							
														,JN,PL,Ro							
20		CONTINUED NEXT PAGE																			

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-09

SHEET 3 OF 5

LOCATION: N 596166.0 ;E 4809014.0

DRILLING DATE: July 3 to 5, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP to C.A. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
20		— CONTINUED FROM PREVIOUS PAGE —																				
		Slightly weathered, weak, very thinly to thinly bedded, redish brown and green SHALE			6										,JN,CU,Ro ,JN,IR,Ro							
															,FO,PL,SM							
21															,FO,IR,Ro							
					7										,JN,PL,Ro							
															,FO,IR,Ro							
															,JN,IR,Ro							
22															,BD,PL,Ro							
															,JN,IR,Ro							
															,BD,PL,Ro							
					8										,FR,IR,Ro							
23															,JN,IR,Ro							
															,JN,IR,Ro							
															,JN,IR,Ro							
															,JN,IR,Ro							
															,FO,IR,SM							
24					9										,JN,IR,Ro							
															,FO,IR,Ro							
															,JN,UE,SM							
															,FO,IR,Ro							
															,JN,IR,Ro							
25															,FR,IR,VR							
															,JN,,Ro							
															,BD,PL,Ro							
					10										,JN,PL,SM							
26															,FR,IR,Ro							
															,JN,IR,Ro							
															,FR,IR,SM							
															,JN,IR,Ro							
27					11										,JN,IR,VR							
															,JN,CU,SM							
															,JN,PL,SM							
28															,JN,CU,SM							
					12										,FR,IR,Ro							
															,JN,IR,Ro							
29															,FR,PL,Ro							
															,JN,UE,Ro							
					13																	
30		CONTINUED NEXT PAGE																				

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-09

SHEET 4 OF 5

LOCATION: N 596166.0 ;E 4809014.0

DRILLING DATE: July 3 to 5, 2007

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate

BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage

PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular

PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break

BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP W.R.T. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC 'Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
30		— CONTINUED FROM PREVIOUS PAGE —																	
		Slightly weathered, weak, very thinly to thinly bedded, redish brown and green SHALE			13										,JN,IR,SM				
31															,JN,IR,PO				
															,FR,IR,SM				
					14										,JN,UE,Ro				
32															,JN,IR,SM				
															,JN,PL,SM				
															,JN,IR,Ro				
															,JN,IR,SM				
33															,JN,IR,Ro				
					15										,FR,IR,Ro				
															,JN,IR,Ro				
34																			
															,FR,IR,Ro				
					16										,JN,UE,SM				
35															,JN,IR,Ro				
															,FR,IR,VR				
															,FR,IR,Ro				
															,JN,PL,SM				
36															,JN,UE,SM				
					17										,JN,PL,Ro				
															,FR,IR,Ro				
37																			
															,JN,IR,Ro				
					18										,JN,PL,SM				
38															,FO,IR,Ro				
															,JN,IR,Ro				
															,JN,PL,SM				
															,FR,IR,VR				
39															,JN,IR,Ro				
					19										,JN,IR,Ro				
															,FR,IR,Ro				
															,JN,IR,Ro				
40															,JN,ST,Ro				
		CONTINUED NEXT PAGE																	

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-09

SHEET 5 OF 5

LOCATION: N 596166.0 ;E 4809014.0

DRILLING DATE: July 3 to 5, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	COLOUR % RETURN / FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
40		— CONTINUED FROM PREVIOUS PAGE —																			
		Slightly weathered, weak, thinly bedded, redish brown and green SHALE		125.43 40.10	19									,JN,IR,Ro							
														,JN,IR,Ro							
														,JN,PL,SM							
41					20									,JN,IR,Ro							▽ (D)
														,JN,CU,SM							
														,FR,IR,Ro							
42														,JN,IR,Ro							
														,FR,IR,Ro							
					21									,FR,IR,VR							
														,FR,IR,VR							
														,FR,IR,Ro							
43				122.43										,JN,CU,SM							
		Slightly weathered, weak, layered, redish brown and green SHALE		43.10										,JN,IR,Ro							
														,FR,IR,Ro							
														,JN,PL,SM							
44					22									,JN,IR,Ro							
														,FR,IR,SM							
45																					
					23									,JN,PL,SM							
46				119.28																	
		END OF DRILLHOLE		46.25																	
47																					
48																					
49																					
50																					

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-10

SHEET 1 OF 5

LOCATION: N 596045.0 ;E 4809002.0

DRILLING DATE: June 20 to 21, 2007

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planer; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	COLOUR, % RETURN	FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. C.A. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC % AVG.	NOTES WATER LEVELS INSTRUMENTATION
0		GROUND SURFACE		166.78																		
		Soft, brown clayey silt with organics and trace grey silt and gravel (TOPSOIL)		0.05																		
		Stiff, brown to grey brown CLAYEY SILT with semiangular gravel (TILL)																				
1																						
2																						
3																						Hole
4				162.72																		
		Very soft, reddish brown very fine SANDY SILT with semirounded gravel and cobbles (TILL)		4.06																		
5																						
6																						(S)
7																						
8																						Grout (S)
				158.25																		
		Stiff, reddish brown CLAYEY SILT with trace sand and gravel (TILL)		8.53																		
9				157.79																		
		Soft, grey brown fine SILTY SAND with gravel (TILL)		8.99																		
				157.18																		
		Stiff, grey brown very fine SANDY SILT with coarse sand, gravel and cobble s (TILL)		9.60																		
10																						
		CONTINUED NEXT PAGE																				

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

RECORD OF DRILLHOLE: MW-10

PROJECT: 021-1228

LOCATION: N 596045.0 ;E 4809002.0

INCLINATION: -90° AZIMUTH: —

DRILLING DATE: June 20 to 21, 2007

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

DATUM:

JN - Joint, FLT - Fault, SHR- Shear, VN - Vein, CJ - Conjugate; BD- Bedding, FO- Foliation, CO- Contact, OR- Orthogonal, CL - Cleavage; PL - Planar, CU- Curved, UN- Undulating, ST - Stepped, IR - Irregular; PO- Polished, K - Slickensided, SM- Smooth, Ro - Rough, MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/m	COLOUR % RETURN FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
10		— CONTINUED FROM PREVIOUS PAGE —																
		Stiff, reddish brown CLAYEY SILT with semiangular gravel (TILL)		158.64 10.14														
				155.81														
11		SHALE		10.97														
12																		
13																		
14																		
				152.07														
15		Slightly to moderately weathered, weak, very thinly to thinly bedded, redish brown and green SHALE		14.71	1									,FO,ST,Ro ,JN,IR,SM				Grout
														,JN,IR,Ro				
16					3									,JN,IR,Ro ,JN,IR,VR				
														,FO,IR,Ro ,JN,IR,Ro				
17					2									,JN,UE,SM ,JN,IR,Ro ,FR,CU,SM				
														,FR,IR,Ro ,JN,IR,VR				
18														,JN,IR,Ro ,JN,IR,Ro ,FO,PL,SM				
					4									,JN,IR,Ro ,FO,IR,Ro ,FO,CU,Ro				
19														,JN,PL,SM ,FO,IR,Ro ,JN,IR,Ro				
					5									,JN,UE,Ro				
20		CONTINUED NEXT PAGE												,JN,UE,Ro				

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-10

SHEET 3 OF 5

LOCATION: N 596045.0 ;E 4809002.0

DRILLING DATE: June 20 to 21, 2007

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/m	FLUSH % RETURN	COLOUR	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
		— CONTINUED FROM PREVIOUS PAGE —																				
20		Slightly to moderately weathered, weak, very thinly to thinly bedded, redish brown and green SHALE			5										,JN,IR,SM							
															,FO,ST,Ro							
21					6										,FO,PL,SM							
															,BD,IR,Ro							
				145.48											,FO,IR,Ro							
		Highly weathered, very weak, thinly bedded, redish brown and green SHALE		21.30											,FO,ST,SM							
															,FO,PL,SM							
															,JN,PL,SM							
22					7										,JN,IR,Ro							
															,JN,IR,Ro							
															,JN,IR,Ro							
															,FO,ST,Ro							
				143.98																		
		Slightly weathered, weak, redish brown and green SHALE		22.80											,JN,IR,Ro							
23															,FR,PL,SM							
															,FR,ST,SM							
					8										,JN,PL,SM							
															,JN,IR,Ro							
24															,JN,UE,SM							
															,FR,IR,Ro							
															,JN,IR,Ro							
															,BD,PL,SM							
															,BD,IR,Ro							
25					9										,FO,PL,SM							Grout
															,JN,ST,Ro							
															,FO,IR,SM							
															,JN,PL,SM							
															,JN,PL,SM							
26															,FO,IR,Ro							
															,FO,IR,Ro							
					10										,JN,IR,Ro							
27																						
28					11										,FR,IR,Ro							
															,JN,IR,Ro							
29															,FO,PL,SM							
															,FO,ST,SM							
					12																	
															,JN,UE,SM							
30																						Hole Plug
		CONTINUED NEXT PAGE																				

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 2/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-10

SHEET 4 OF 5

LOCATION: N 596045.0 ;E 4809002.0

DRILLING DATE: June 20 to 21, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint, FLT - Fault, SHR- Shear, VN - Vein, CJ - Conjugate; BD- Bedding, FO- Foliation, CO- Contact, OR- Orthogonal, CL - Cleavage; PL - Planar, CU- Curved, UN- Undulating, ST - Stepped, IR - Irregular; PO- Polished, K - Slickensided, SM- Smooth, Ro - Rough, MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH COLOUR & RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: Dip w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	FMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
30		— CONTINUED FROM PREVIOUS PAGE —																			
		Slightly weathered, weak, redish brown and green SHALE			12									,JN,CU,SM ,JN,IR,Ro							
31														,FO,IR,Ro ,FO,IR,Ro							
					13									,FO,IR,Ro							
32														,JN,PL,SM							
					14									,JN,UE,SM ,JN,PL,SM ,FR,IR,Ro							
33														,JN,PL,SM							Hole Plug
														,FR,ST,SM ,FO,IR,Ro ,JN,PL,SM							
34					15									,JN,IR,Ro ,JN,PL,SM ,JN,IR,Ro							
35																					
					16									,JN,IR,Ro ,JN,PL,SM ,FO,IR,Ro ,JN,PL,SM							
36																					
37																					
					17									,JN,UE,SM ,FR,IR,Ro							Sand
38														,FR,IR,Ro							
					18									,JN,IR,Ro ,JN,PL,SM ,FO,IR,Ro							
39																					Screen
					19																
40		CONTINUED NEXT PAGE																			

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-10

SHEET 5 OF 5

LOCATION: N 596045.0 ;E 4809002.0

DRILLING DATE: June 20 to 21, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/m	COLOUR & % RETURN / FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: θ Angle	DISCONTINUITY DATA: Dip w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Cr AVG.	NOTES WATER LEVELS INSTRUMENTATION
40		— CONTINUED FROM PREVIOUS PAGE —																			
		Slightly weathered, weak, redish brown and green SHALE			19									,FR,ST,SM							
														,JN,PL,SM							
41														,FO,PL,SM							
														,JN,IR,Ro							
														,JN,IR,Ro							
					20									,JN,PL,VR							
42														,JN,PL,Ro							Screen
														,JN,IR,Ro							
					21																
43														,JN,ST,Ro							
														,JN,UE,Ro							
														,FR,UE,Ro							
44					22																
														,JN,PL,Ro							
														,JN,ST,SM							
														,JN,UE,SM							
45														,FO,PL,SM							Sand
					23																
				121.11										,JN,IR,Ro							
		END OF DRILLHOLE		45.67																	
46																					
47																					
48																					
49																					
50																					

(D)

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-11

SHEET 1 OF 5

LOCATION: N 595870.0 ;E 4808946.0

DRILLING DATE: July 11, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/m	FLUSH / % RETURN / COLOUR	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Qv AVG.	NOTES WATER LEVELS INSTRUMENTATION
		GROUND SURFACE		168.31														
0		Compact, dry, brown SILT, trace clay (TILL)		0.00														Hole Plug
1		Loose to compact silty clay till from 1.2 m to 2.4 m depth																
2		Damp from 1.8 m to 2.4 m depth																
3																		
4				164.04														
		Dry, brown to grey SILT, trace gravel/cobbles, angular to subangular gravel (TILL)		4.27														
5																		Grout
6																		
				161.60														
		Damp, brown to grey SANDY SILT with trace subangular rounded gravel, hetero (TILL)		6.71														
7																		
8																		
				159.47														
		Soft, grey to brown silty fine SAND (TILL)		8.84														
9																		
10		*CONTINUED NEXT PAGE*																

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate

BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage

PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular

PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break

BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MD & AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-11

SHEET 2 OF 5

LOCATION: N 595870.0 ;E 4808946.0

DRILLING DATE: July 11, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD - Bedding; FO - Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	NOTES WATER LEVELS INSTRUMENTATION
10		— CONTINUED FROM PREVIOUS PAGE —																
10		Soft, grey to brown silty fine SAND (TILL)																
11																		
12																		
13																		
14																		
15				153.43														
		Slightly to moderately weathered, weak, thinly bedded, redish brown and green SHALE		14.68	1										,JN,IR,Ro			Grout
															,JN,CU,SM			
16															,JN,IR,Ro			
															,JN,IR,VR			
					2										,JN,IR,Ro			
															,JN,IR,Ro			
															,JN,IR,SM			
				151.55											,JN,IR,Ro			
17		Moderately to highly weathered, thinly bedded, redish brown SHALE with some thin greyish green beds		16.76											,JN,IR,SM			
					3										,JN,IR,SM			
18															,JN,IR,Ro			
															,JN,IR,SM			
															,JN,IR,SM			
															,JN,IR,SM			
															,JN,IR,Ro			
19															,JN,IR,Ro			
															,JN,ST,Ro			
					4										,JN,IR,SM			
															,JN,IR,Ro			
															,JN,IR,SM			
															,JN,IR,Ro			
															,JN,IR,Ro			
															,JN,ST,SM			
20				148.31											,JN,IR,SM			
		CONTINUED NEXT PAGE																

DEPTH SCALE 1 : 50

Golder Associates

LOGGED: MD & AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-11

SHEET 3 OF 5

LOCATION: N 595870.0 ;E 4808946.0

DRILLING DATE: July 11, 2007

DATUM:

INCLINATION: -90° AZIMUTH: —

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD - Bedding; FO - Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE mm/(m)	COLOUR & RETURN FLUSH	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: β Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
20		*— CONTINUED FROM PREVIOUS PAGE —*																
		Slightly weathered, thinly bedded, redish brown SHALE with some thin green beds		20.00	5									,JN,IR,Ro ,JN,IR,SM ,JN,IR,Ro ,JN,IR,Ro ,JN,IR,Ro ,JN,IR,Ro				
21																		
22					6									,JN,IR,SM ,JN,IR,SM ,JN,IR,Ro ,JN,IR,Ro				
23																		
24					7									,JN,IR,Ro ,JN,IR,Ro ,JN,IR,Ro ,JN,ST,Ro ,JN,IR,SM ,JN,IR,Ro				
25					8									,JN,IR,SM ,JN,IR,Ro ,JN,IR,SM ,JN,IR,Ro ,JN,IR,SM ,JN,IR,Ro				Grout
26				142.10										,JN,IR,Ro				
		Slightly weathered, very thinly to thinly bedded, weak, redish brown and green SHALE		26.21	9									,JN,CU,SM ,JN,IR,SM ,JN,IR,SM ,JN,IR,SM ,JN,IR,Ro ,JN,IR,Ro ,JN,IR,Ro				
27																		
28					10									,JN,IR,SM ,JN,IR,Ro ,JN,IR,Ro				
29					11									,JN,IR,Ro ,JN,IR,SM ,JN,IR,Ro ,JN,IR,SM				
30		*CONTINUED NEXT PAGE*																

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MD & AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-11

SHEET 4 OF 5

LOCATION: N 595870.0 ;E 4808946.0

DRILLING DATE: July 11, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate

BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage

PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular

PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break

BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH / % RETURN / COLOUR	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jn	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Qt AVG.	NOTES WATER LEVELS INSTRUMENTATION
		— CONTINUED FROM PREVIOUS PAGE —																			
30		Slightly weathered, very thinly to thinly bedded, weak, redish brown and green SHALE			11									,JN,IR,Ro							
														,JN,IR,SM							
31														,JN,IR,Ro							
					12									,JN,IR,SM							
														,JN,IR,Ro							
														,JN,IR,Ro							Grout
32														,JN,IR,Ro							
														,JN,IR,Ro							
														,JN,IR,Ro							
					13									,JN,IR,Ro							
33														,JN,IR,Ro							
														,JN,IR,Ro							
														,JN,IR,SM							
														,JN,IR,Ro							
														,JN,UE,Ro							
34					14									,JN,IR,SM							
														,JN,IR,PO							Hole Plug
35														,JN,IR,SM							
														,JN,IR,Ro							
					15									,JN,IR,Ro							
36														,JN,PL,SM							
														,JN,IR,SM							Sand
					16									,JN,PL,PO							
37														,FR,IR,Ro							
														,JN,PL,Ro							
														,JN,CU,Ro							
38					17																Screen
														,JN,IR,Ro							
39					18																
40		*CONTINUED NEXT PAGE*																			

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: MD & AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF DRILLHOLE: MW-11

SHEET 5 OF 5

LOCATION: N 595870.0 ;E 4808946.0

DRILLING DATE: July 11, 2007

DATUM:

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME - 75 Track Mount

DRILLING CONTRACTOR: All-Terrain Drilling Limited

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate; BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage; PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular; PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break; BR - Broken Rock

NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE min/(m)	FLUSH	COLOUR % RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.3 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY K, cm/sec	Diametral Point Load Index (MPa)	RMC -Q' AVG.	NOTES WATER LEVELS INSTRUMENTATION
40		*--- CONTINUED FROM PREVIOUS PAGE ---*																	
		Slightly weathered, very thinly to thinly bedded, weak, redish brown and green SHALE													,JN,IR,VR				
															,JN,PL,PO				
					18										,FR,IR,VR				
41															,FR,UE,Ro				
															,JN,IR,SM				
															,JN,IR,Ro				
															,JN,PL,Ro				
															,JN,IR,Ro				(D)
42					19										,JN,PL,Ro				
																			Screen
															,FR,ST,Ro				
															,JN,UE,Ro				
															,JN,IR,Ro				
43															,JN,IR,Ro				
															,JN,FL,Ro				
					20										,FR,PL,SM				
															,JN,CU,PO				
44																			
															,JN,UE,SM				
															,JN,IR,Ro				
					21										,FR,IR,SM				
45															,JN,IR,Ro				
																			Sand
															,JN,IR,Ro				
															,JN,ST,Ro				
					22										,JN,FL,Ro				
				122.39											,JN,IR,Ro				
46		END OF DRILLHOLE		45.92											,JN,UE,Ro				
47																			
48																			
49																			
50																			

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: MD & AK

CHECKED: SW

MIS-RCK 004 021-1228 (2007).GPJ GAL-MISS.GDT 25/9/09 DD

RECORD OF BOREHOLE: TW1

PROJECT: 021-1228

LOCATION: N 4808946.0 ;E 595581.0

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: August 29, 2007

SHEET 1 OF 2

DATUM:

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-8} 10^{-6} 10^{-4} 10^{-2}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		167.84							
0	Air Rotary Drilling 152.4 mm Diameter	Dense, brown, fine grained SILT (TILL) (HALTON TILL)		0.00							
1											
2											
3											
4											Sept. 14/07
5											
6				161.54							
		Dense, brown, fine grained SILT, some gravel , trace clay (TILL) (HALTON TILL)		6.10							
7											
8											
9											
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MD

CHECKED: SMD

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW1

SHEET 2 OF 2

LOCATION: N 4808946.0 ;E 595581.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-8} 10^{-6} 10^{-4} 10^{-2}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		— CONTINUED FROM PREVIOUS PAGE —									
	Air Rotary Drilling 152.4 mm Diameter	Dense, brown, fine grained SILT, some gravel , trace clay (TILL) (HALTON TILL)									
				151.66							
		Weathered red SHALE		15.98							Casing ends at 15.98m depth Open hole to 18.29m depth
				149.35							
		END OF BOREHOLE		18.29							

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: MD

CHECKED: SMD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW2

SHEET 1 OF 4

LOCATION: N 4810362.0 ;E 595617.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		178.33							
0	Air Rotary Drilling 152.4 mm Diameter	Dense, brown/grey fine grained SILT, trace gravel (TILL) (HALTON TILL)		0.00							
1											
2											
3											
4											
5											
6											
7											
8											
9											
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MD
CHECKED: SMD

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW2

SHEET 2 OF 4

LOCATION: N 4810362.0 ;E 595617.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q- ●, U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Air Rotary Drilling 152.4 mm Diameter	*— CONTINUED FROM PREVIOUS PAGE —*									
		Dense, brown/grey fine grained SILT, trace gravel (TILL) (HALTON TILL)									
11											
12											
13											
14											
15											
16											
17											
18				158.03							
		Dense, reddish brown fine grained SILT, some gravel (TILL) (HALTON TILL)		18.30							Casing ends at 18.3m depth Open hole to 32.01m depth
19											
20		*CONTINUED NEXT PAGE*									

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: MD

CHECKED: SMD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW2

SHEET 3 OF 4

LOCATION: N 4810362.0 ;E 595617.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Air Rotary Drilling 152.4 mm Diameter	— CONTINUED FROM PREVIOUS PAGE —											
		Dense, reddish brown fine grained SILT, some gravel (TILL) (HALTON TILL)											
21													
22													
23													
24													
25													
26													
27													
28													
29													
30		CONTINUED NEXT PAGE											

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: MD

CHECKED: SMD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW2

SHEET 4 OF 4

LOCATION: N 4810362.0 ;E 595617.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕; Q- ●, U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
30		— CONTINUED FROM PREVIOUS PAGE —									
31	Air Rotary Drilling 152.4 mm Diameter	Dense, reddish brown fine grained SILT, some gravel (TILL) (HALTON TILL)									
32		END OF BOREHOLE		144.32 32.01							
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MD
CHECKED: SMD

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW3

SHEET 1 OF 3

LOCATION: N 4810005.0 ;E 596410.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		166.85							
0	Air Rotary Drilling 152.4 mm Diameter	Dense, brown fine grained SILT, trace gravel (TILL) (HALTON TILL)		0.00							
6		Dense, brown fine grained SILT, some gravel (TILL) (HALTON TILL)		160.76 6.09							
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MD

CHECKED: SMD

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW3

SHEET 2 OF 3

LOCATION: N 4810005.0 ;E 596410.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q- ● rem V. ⊕ U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — w — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Air Rotary Drilling 152.4 mm Diameter	— CONTINUED FROM PREVIOUS PAGE —									
		Dense, brown fine grained SILT, some gravel (TILL) (HALTON TILL)									
11											
12				154.65							
		Dense, brownish grey, fine grained SILT, trace gravel, trace weathered shalt throughout (TILL) (HALTON TILL)		12.20							
13											
											Sept. 14/07
14											
15											
16											
17											
18											
19											
20		Red SHALE		147.03 19.82							
		CONTINUED NEXT PAGE									

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: MD
CHECKED: SMD

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

PROJECT: 021-1228

RECORD OF BOREHOLE: TW3

SHEET 3 OF 3

LOCATION: N 4810005.0 ;E 596410.0

BORING DATE: August 29, 2007

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q- ●, U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Air Rotary Drilling 152.4 mm Diameter	*--- CONTINUED FROM PREVIOUS PAGE ---*									
		Red SHALE									Casing ends at 20.4m depth Open hole to 23.62m depth
21											
22											
23				143.23							
		END OF BOREHOLE		23.62							
24											
25											
26											
27											
28											
29											
30											

MIS-BHS 001 021-1228 (2007).GPJ GAL-MIS.GDT 25/9/09 DD

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: MD

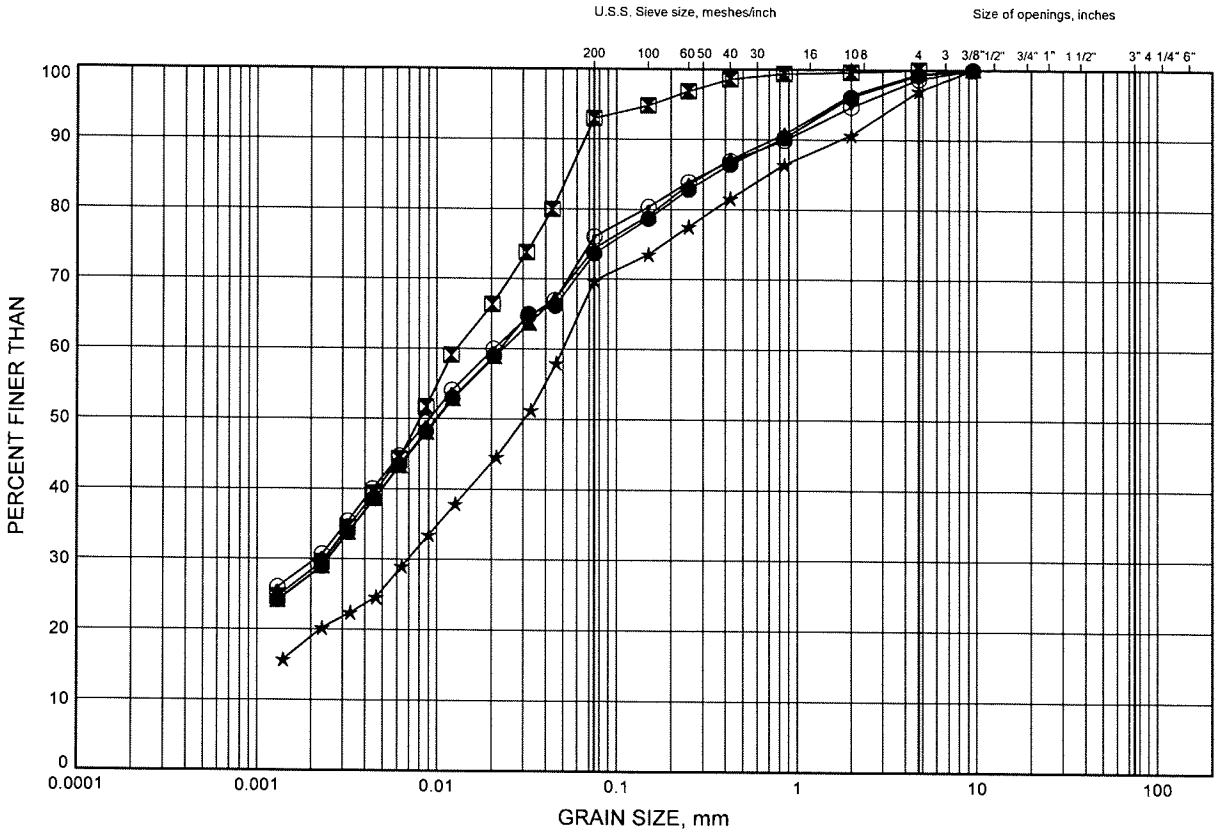
CHECKED: SMD

APPENDIX 4-3
Soil Analysis Results

Hwy 407 West Employment Lands (Bentall)

GRAIN SIZE DISTRIBUTION

FIGURE 1



SILT and CLAY	FINE	MEDIUM	COARSE	FINE	COARSE	COBBLE SIZE
FINE GRAINED	SAND			GRAVEL		

LEGEND

SYMBOL	BOREHOLE	DEPTH (m)	ELEV. (m)
●	MMM09-11	1.10	
⊠	MMM09-12	2.62	
▲	MMM09-13	0.61	
★	MMM09-17	5.56	
⊙	MMM09-18D	1.07	

W.P.# 14-09222-001-HG1
Prepared By EA
Checked By WM

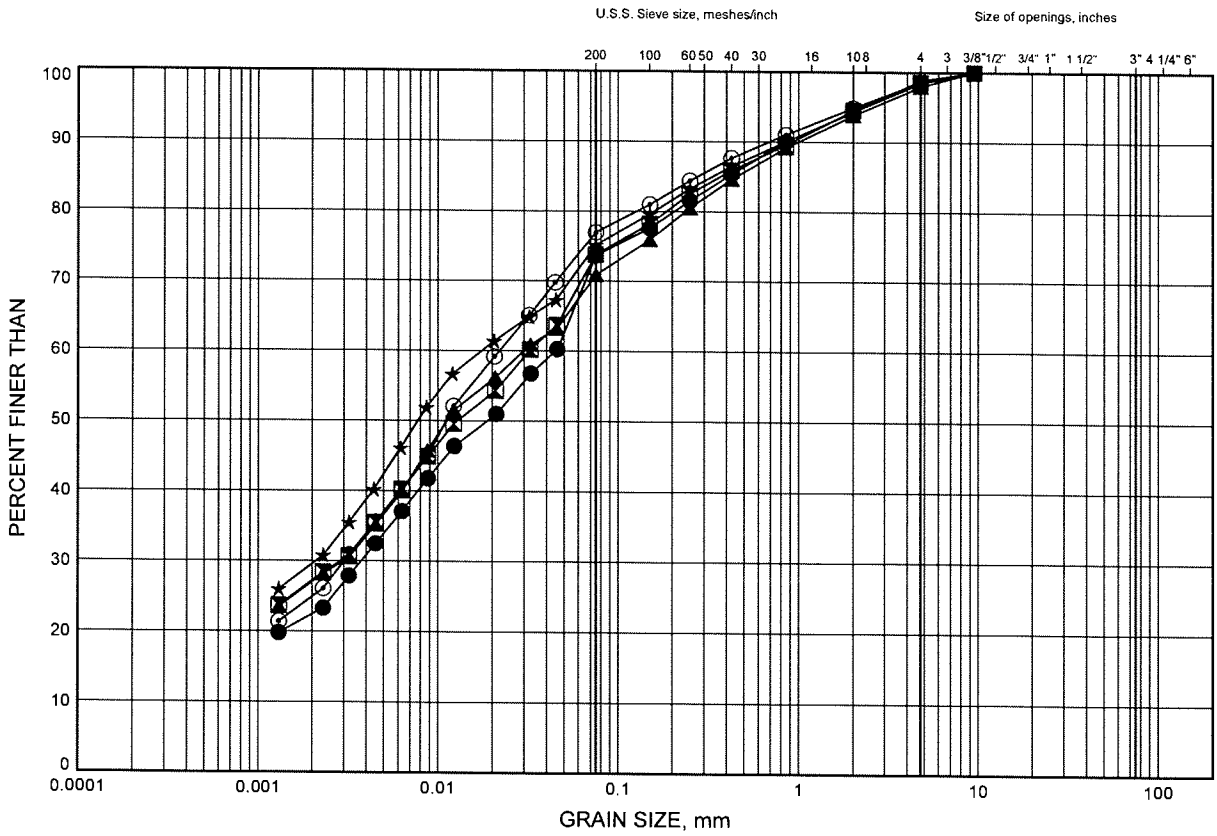
THURBER

GRAIN SIZE DISTRIBUTION - THURBER 6130.GPJ 3/11/10

Hwy 407 West Employment Lands (Bentall)

GRAIN SIZE DISTRIBUTION

FIGURE 2



SILT and CLAY	FINE	MEDIUM	COARSE	FINE	COARSE	COBBLE SIZE
FINE GRAINED	SAND			GRAVEL		

LEGEND

SYMBOL	BOREHOLE	DEPTH (m)	ELEV. (m)
●	MMM09-19D	3.76	
⊠	MMM09-1D	1.60	
▲	MMM09-5D	2.77	
★	MMM09-8	1.02	
⊙	MMM09-9	1.07	

W.P.# 14-09222-001-HG1
Prepared By EA
Checked By WM

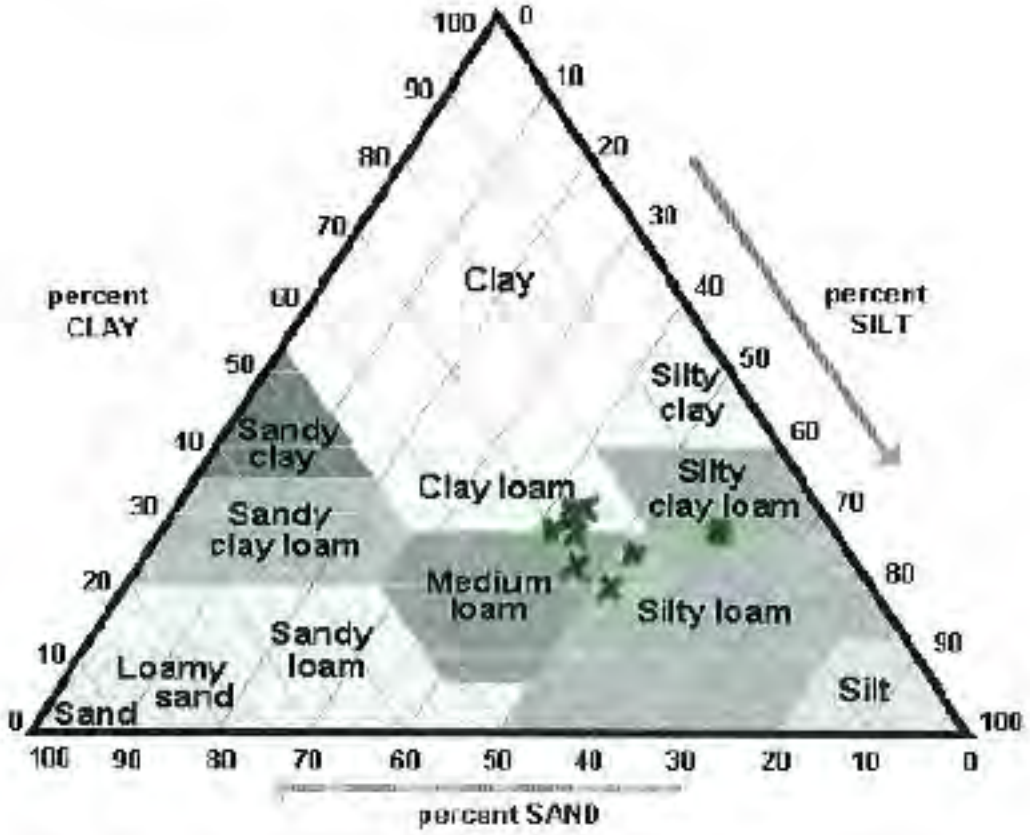
THURBER

GRAIN SIZE DISTRIBUTION - THURBER 6130.GPJ 3/11/10

Soil Classification

BH/SA	Depth (mbgs)	Description	% Content (excl. gravel content) Sand	Silt	Clay	Soil Classification	For Calculations Gravel	% Content Sand	Silt	Clay
							All values based on actual grain size (MIT/BSI classification)			
MMM-09-01D	1.60	Clayey Silt (TILL), some sand	26	45	28	CLAY LOAM	5	25	43	27
MMM-09-05D	2.77	Clayey Sandy Silt (TILL)	29	42	28	CLAY LOAM	5	28	40	27
MMM-09-08	1.02	Clayey Silt (TILL), some sand	26	43	31	CLAY LOAM	5	25	41	29
MMM-09-09	1.07	Clayey Silt (TILL), some sand	22	52	26	SILTY LOAM	5	21	49	25
MMM-09-11	1.10	Clayey Silt (TILL), some sand	27	44	29	CLAY LOAM	4	26	42	28
MMM-09-12	2.62	Clayey Silt (TILL), trace sand	12	60	28	SILTY CLAY LOAM	0	12	60	28
MMM-09-13	0.61	Clayey Silt (TILL), some sand	27	44	29	CLAY LOAM	4	26	42	28
MMM-09-17	5.56	Sandy Silt (TILL), some clay	28	52	20	SILTY LOAM	10	25	47	18
MMM-09-18D	1.07	Clayey Silt (TILL), some sand	24	45	31	CLAY LOAM	5	23	43	29
MMM-09-19D	3.76	Clayey Silt (TILL), some sand	29	47	23	MEDIUM LOAM	5	28	45	22

Soil Classification



Source: http://web.ukonline.co.uk/fred.moor/soil/formed/f0107.htm

APPENDIX 4-4
Hydraulic Conductivity Testing

MMM Group
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1

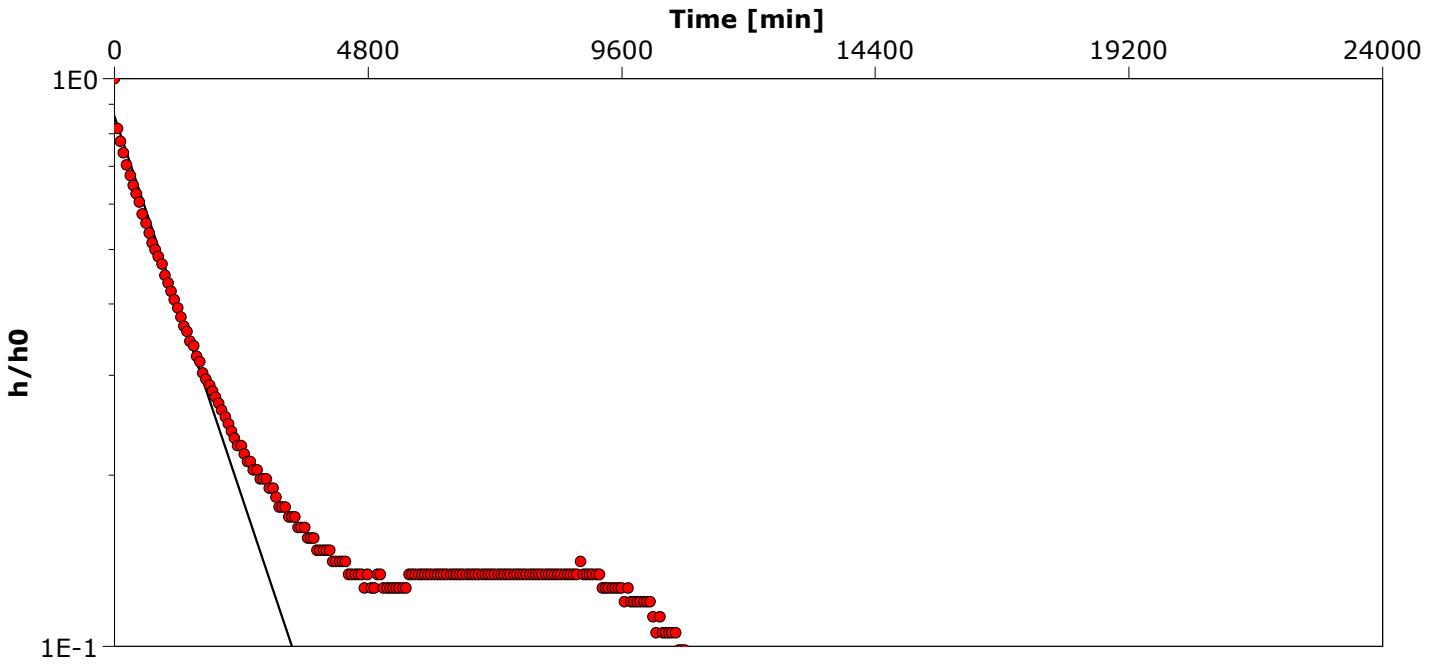
Slug Test Analysis Report

Project: Hydrogeological Evaluation and WB

Number: 14-09222-001-HG1

Client: bclMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-4	Test Well: MMM09-4
Test Conducted by: A. Blazeiko		Test Date: 12/18/2009
Analysis Performed by: N. Codoban	Rising Head test - MMM09-4	Analysis Date: 5/18/2010
Aquifer Thickness:		



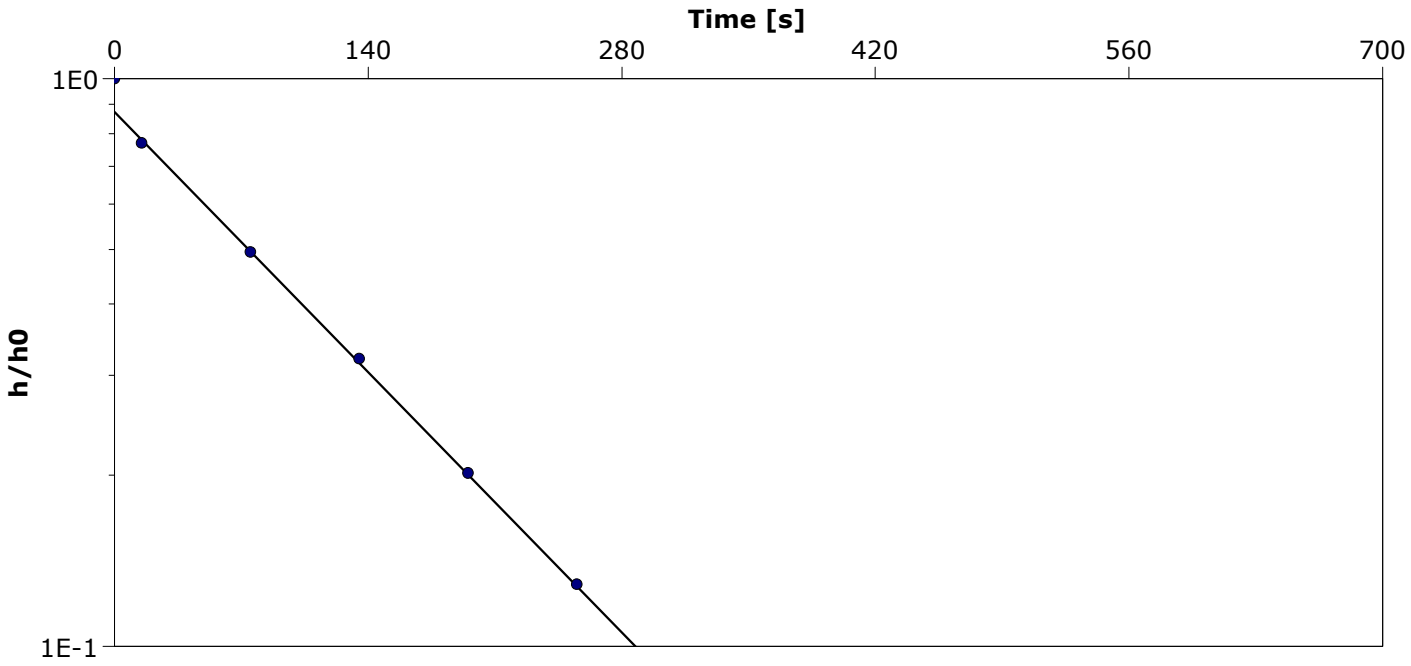
Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-4	4.37×10^{-9}	

The well is screened in Sandy Silt to Silty Sand Till, Clayey Silt Till and Sandy Silt Till at depth of 3.0 m to 6.0 m below grade.

MMM Group 100 Commerce Valley Drive West Thornhill, ON Canada L3T 0A1	**Slug Test Analysis Report**
	Project: Hydrogeological Evaluation and WB
	Number: 14-09222-001-HG1
	Client: bcIMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-9	Test Well: MMM09-9
Test Conducted by: AB		Test Date: 12/18/2009
Analysis Performed by: N. Codoban	Rising Head Test - MMM09-9	Analysis Date: 10/8/2010
Aquifer Thickness:		



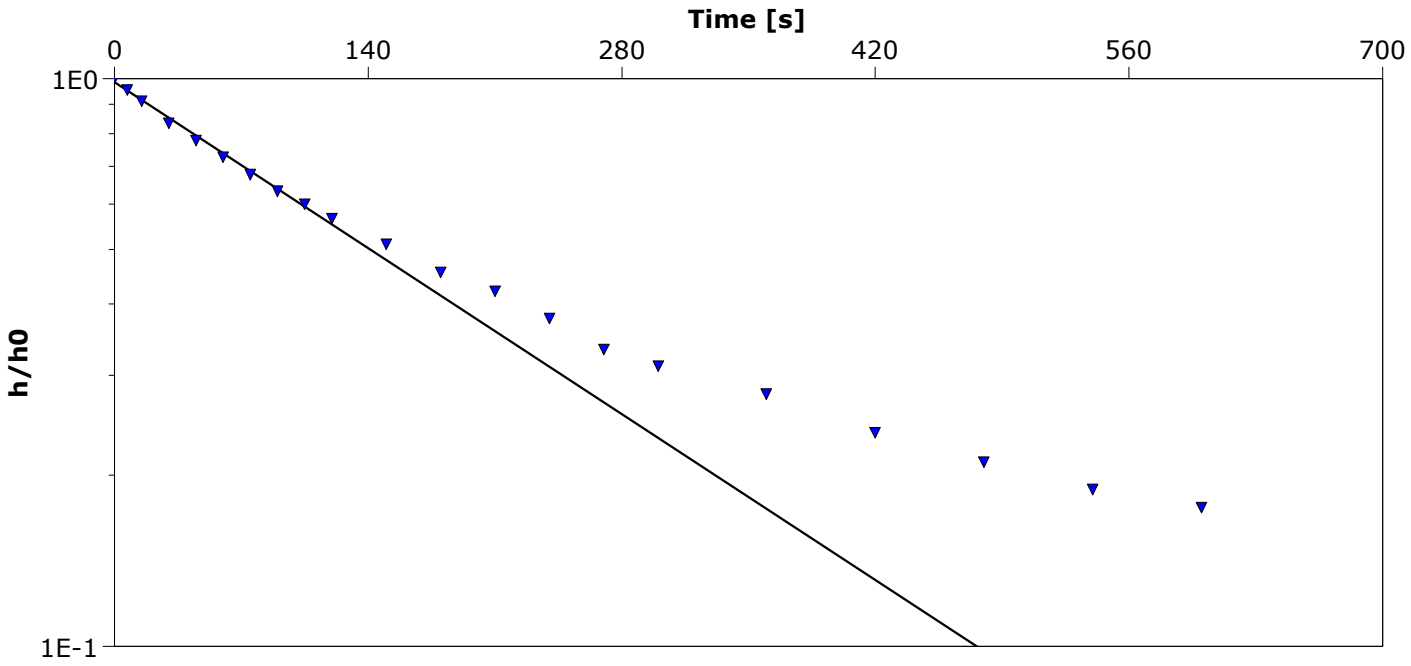
Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-9	9.00×10^{-6}	

The well is screened in Clayey Silt Till at depth of 1.8 to 2.3 m below grade.

MMM Group 100 Commerce Valley Drive West Thornhill, ON Canada L3T 0A1	**Slug Test Analysis Report**
	Project: Hydrogeological Evaluation and WB
	Number: 14-09222-001-HG1
	Client: bcIMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-10S	Test Well: MMM09-10S
Test Conducted by: AB and RS		Test Date: 10/18/2010
Analysis Performed by: Natalia Codoban	Falling H. Test - MMM09-10S	Analysis Date: 11/17/2010
Aquifer Thickness:		



Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-10S	6.40×10^{-6}	

The well is screened in Shale at depth of 1.6 to 2.1 m below grade.

MMM Group
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1

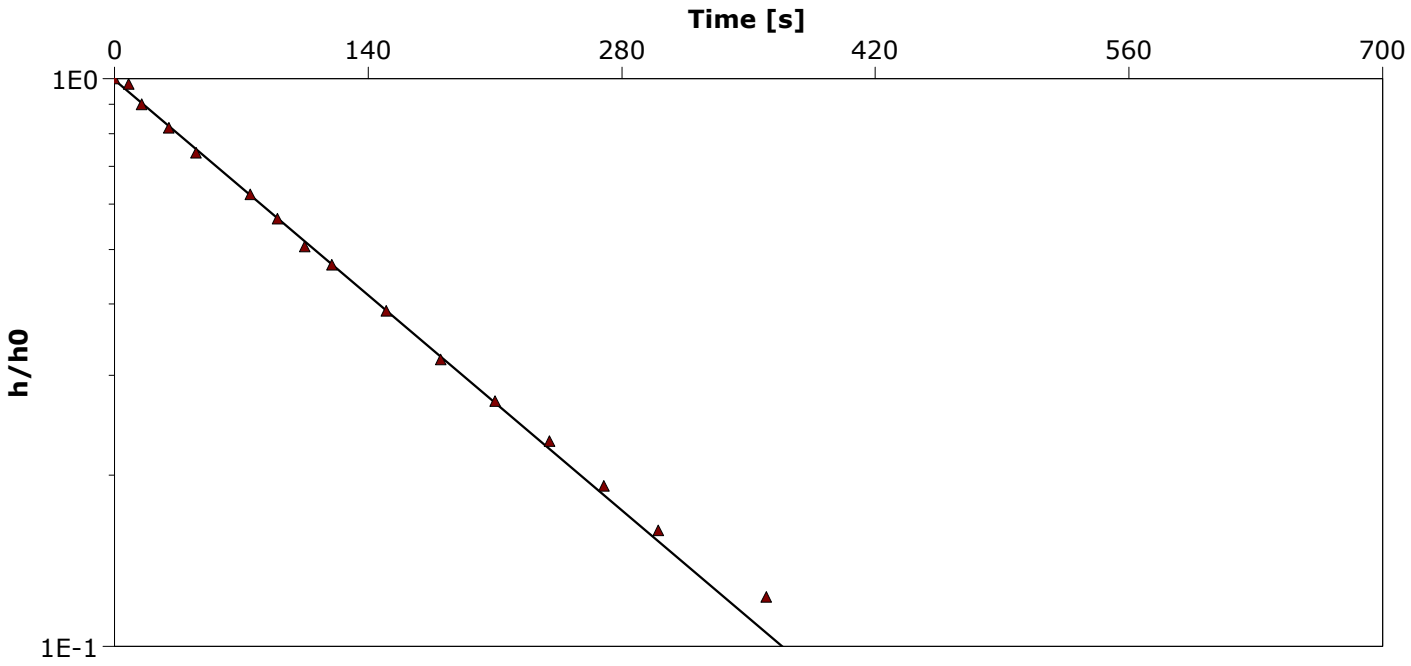
Slug Test Analysis Report

Project: Hydrogeological Evaluation and WB

Number: 14-09222-001-HG1

Client: bcIMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-10D (Rising Head)	Test Well: MMM09-10D
Test Conducted by: AB and RS		Test Date: 10/18/2010
Analysis Performed by: Natalia Codoban	Rising H. Test - MMM09-10D	Analysis Date: 11/17/2010
Aquifer Thickness:		



Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-10D	4.20×10^{-6}	

The well is screened in Shale at depth of 6.2 to 7.7 m below grade.

MMM Group
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1

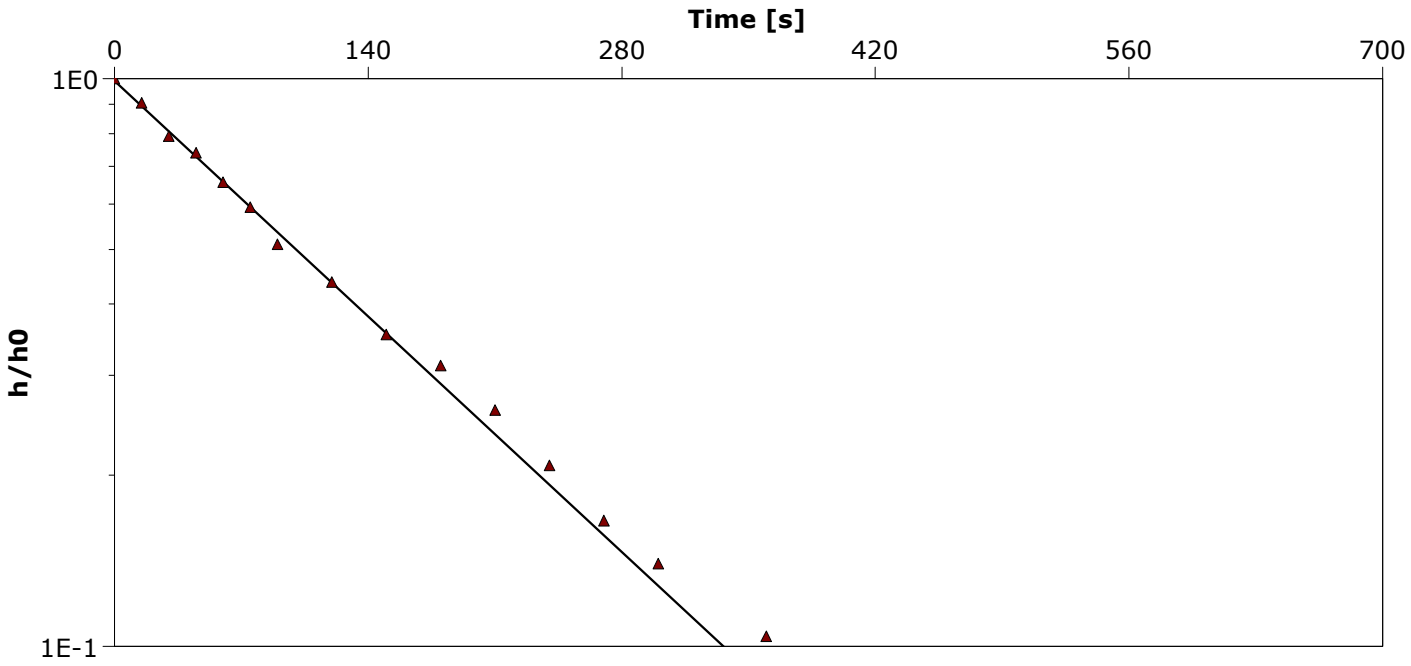
Slug Test Analysis Report

Project: Hydrogeological Evaluation and WB

Number: 14-09222-001-HG1

Client: bcIMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-10D (Falling Head)	Test Well: MMM09-10D
Test Conducted by: AB and RS		Test Date: 10/18/2010
Analysis Performed by: Natalia Codoban	Falling H. Test - MMM09-10D	Analysis Date: 11/16/2010
Aquifer Thickness:		



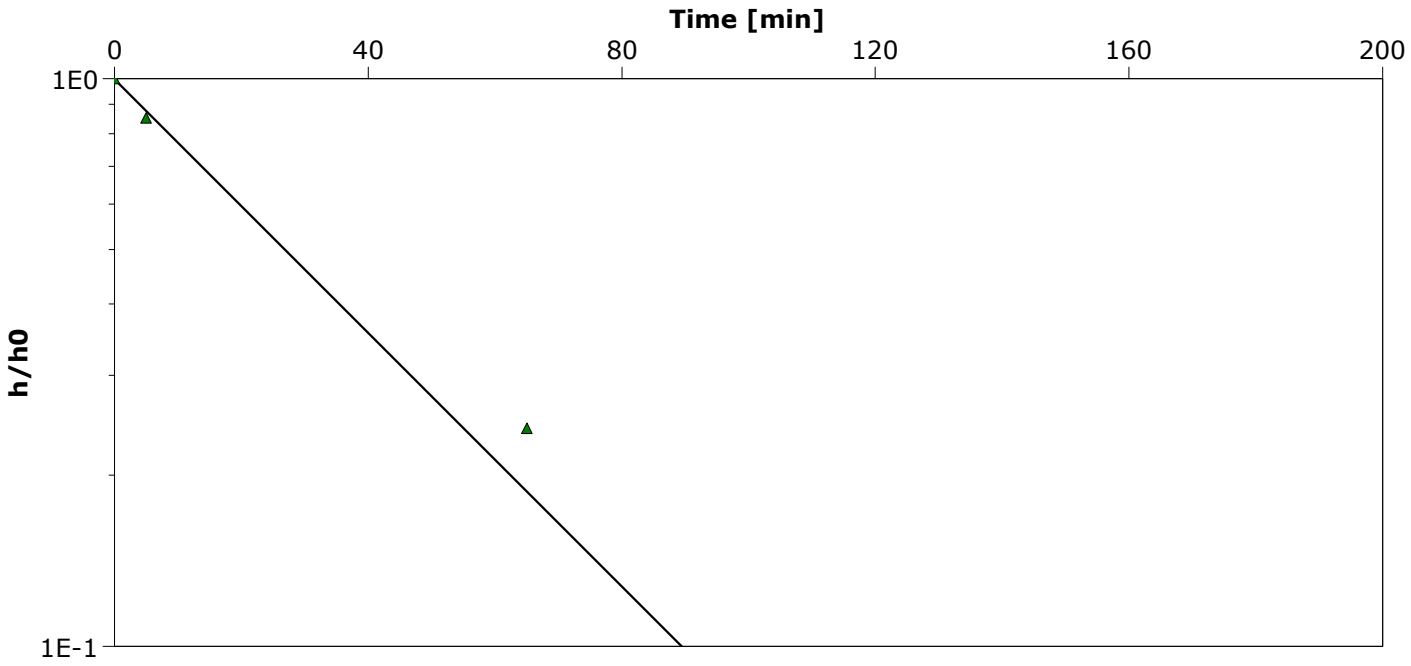
Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-10D	4.60×10^{-6}	

The well is screened in Shale at depth of 6.2 to 7.7 m below grade.

MMM Group 100 Commerce Valley Drive West Thornhill, ON Canada L3T 0A1	**Slug Test Analysis Report**
	Project: Hydrogeological Evaluation and WB
	Number: 14-09222-001-HG1
	Client: bclMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-15S	Test Well: MMM09-15S
Test Conducted by: A. Blazeiko		Test Date: 12/18/2009
Analysis Performed by: N. Codoban	Rising Head Test - MMM09-15S	Analysis Date: 5/18/2010
Aquifer Thickness:		



Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-15S	1.80×10^{-7}	

The well is screened in Shaley Till / Weathered Shale at depth of 1.5 to 4.4 m below grade.

MMM Group
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1

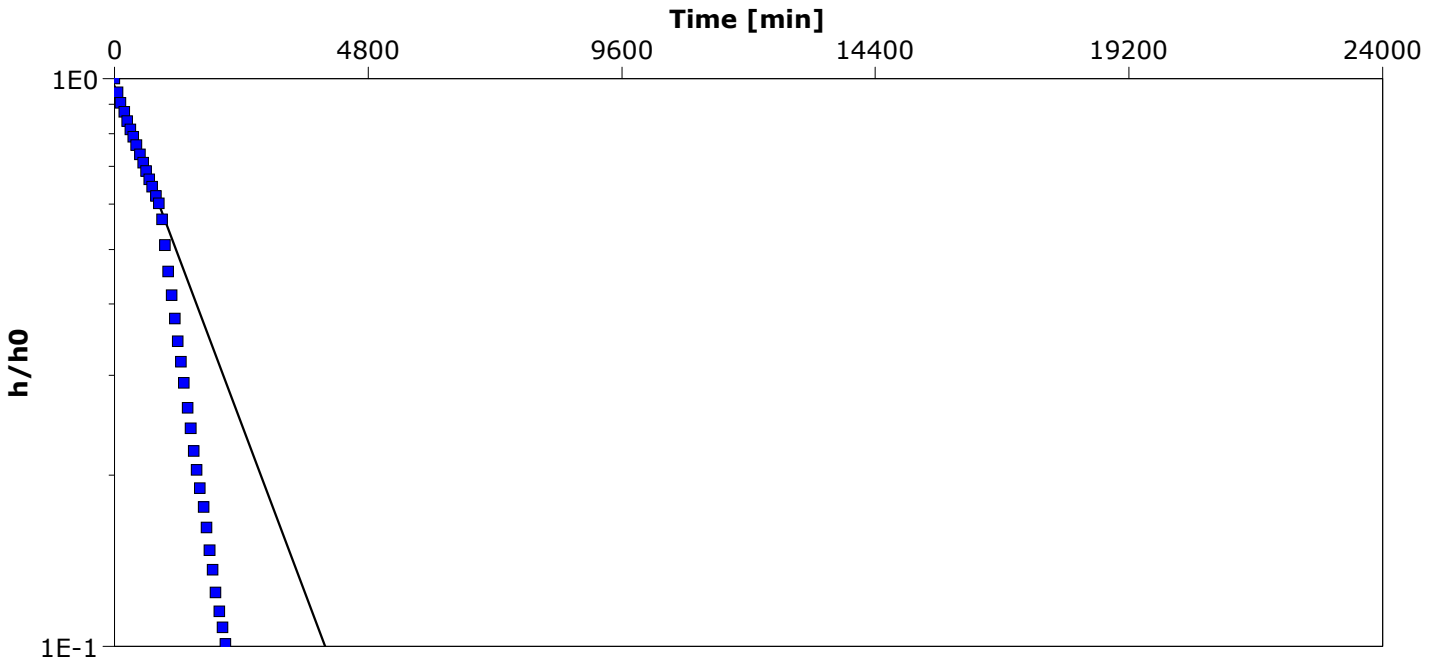
Slug Test Analysis Report

Project: Hydrogeological Evaluation and WB

Number: 14-09222-001-HG1

Client: bcIMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-17	Test Well: MMM09-17
Test Conducted by: A. Blazeiko		Test Date: 12/18/2009
Analysis Performed by: N. Codoban	Rising Head Test - MMM09-17	Analysis Date: 5/19/2010
Aquifer Thickness: 100.00 m		



Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-17	3.94×10^{-9}	

The well is screened in Clayey Silt Till and Sandy Silt Till at depth of 2.9 to 5.9 m below grade. An increased water level recovery during the test occurred above the sand pack at depth of 2.9 m below grade.

MMM Group
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1

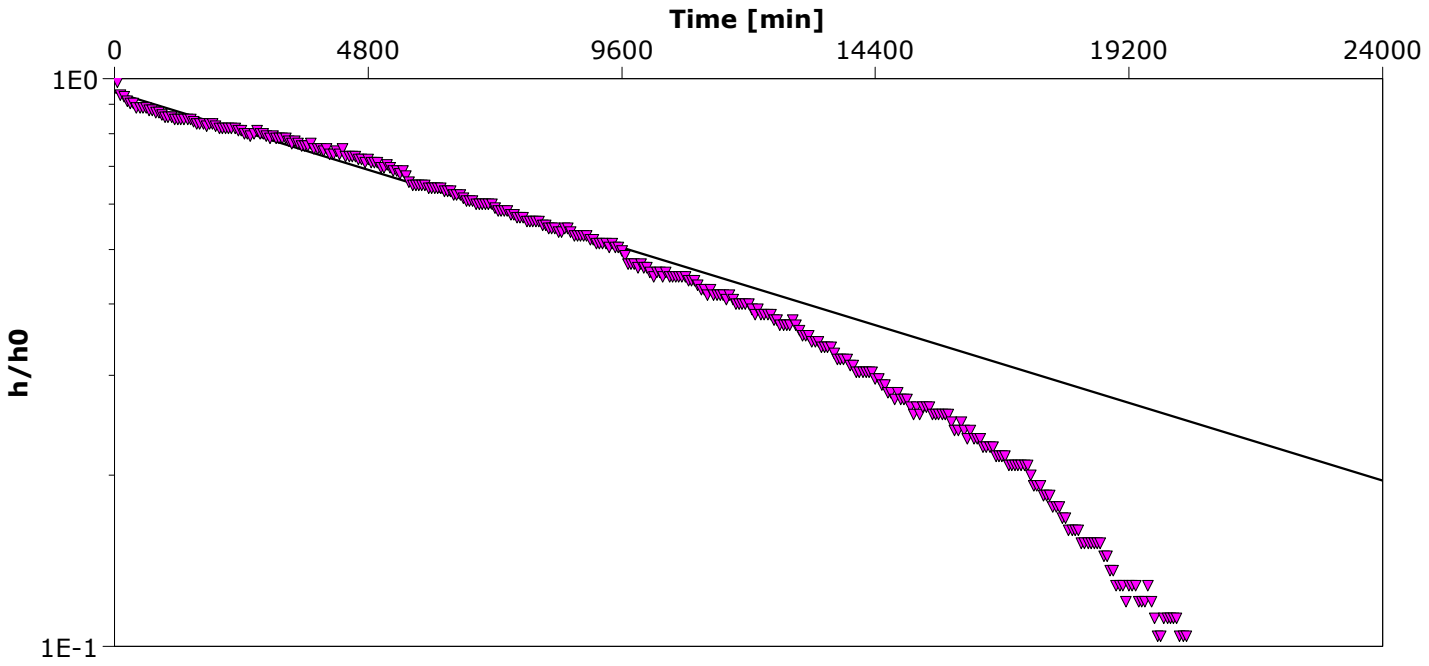
Slug Test Analysis Report

Project: Hydrogeological Evaluation and WB

Number: 14-09222-001-HG1

Client: bcIMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-19S	Test Well: MMM09-19S
Test Conducted by: A. Blazeiko		Test Date: 1/21/2010
Analysis Performed by: N. Codoban	Rising Head Test - MMM09-19S	Analysis Date: 5/21/2010
Aquifer Thickness:		



Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-19S	4.78×10^{-10}	

The well is screened in Clayey Silt Till at depth of 3.2 m to 5.9 m below grade.

MMM Group
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1

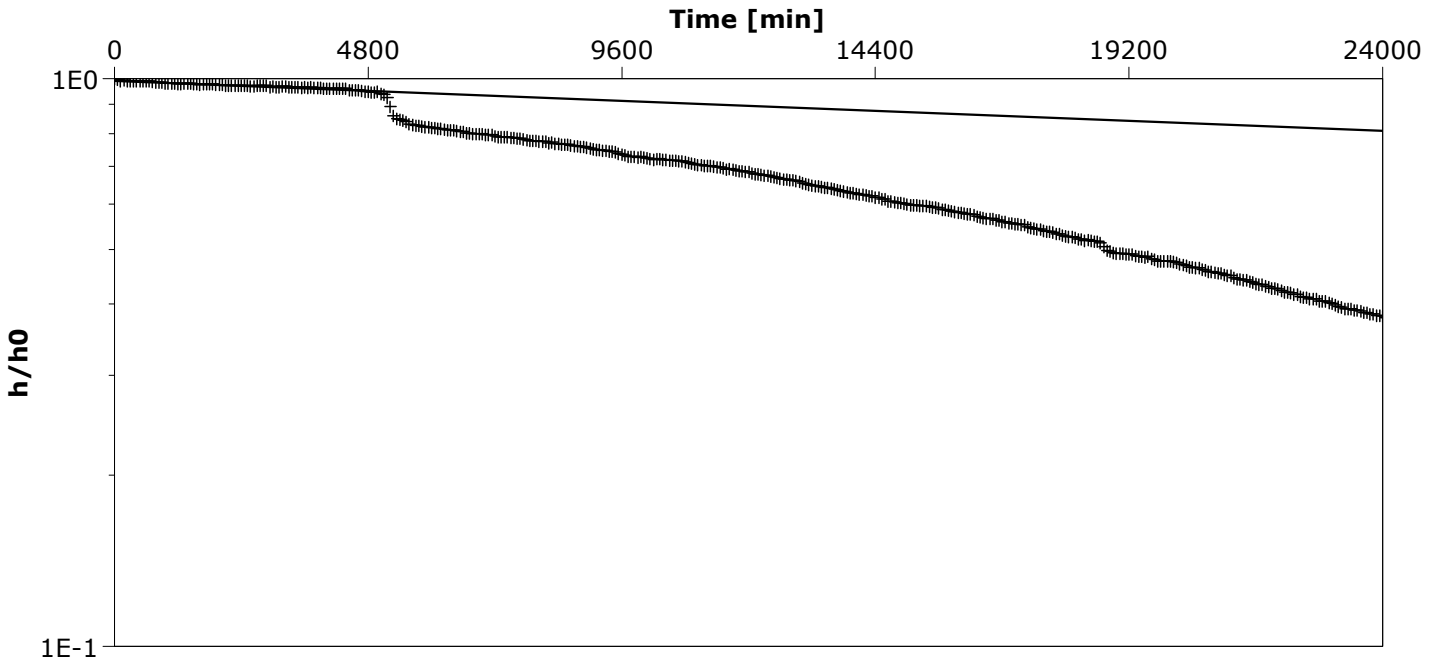
Slug Test Analysis Report

Project: Hydrogeological Evaluation and WB

Number: 14-09222-001-HG1

Client: bcIMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-19D	Test Well: MMM09-19D
Test Conducted by: A. Blazeiko		Test Date: 1/21/2010
Analysis Performed by: N. Codoban	Rising Head Test - MMM09-19D	Analysis Date: 5/25/2010
Aquifer Thickness:		



Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-19D	9.81×10^{-11}	

The well is screened in Clayey Silt Till at depth of 13.6 to 15.1 m below grade. Water level recovery increased between 5040 and 5580 min as a result of snow melt and rain on January 25, 2010.

MMM Group
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1

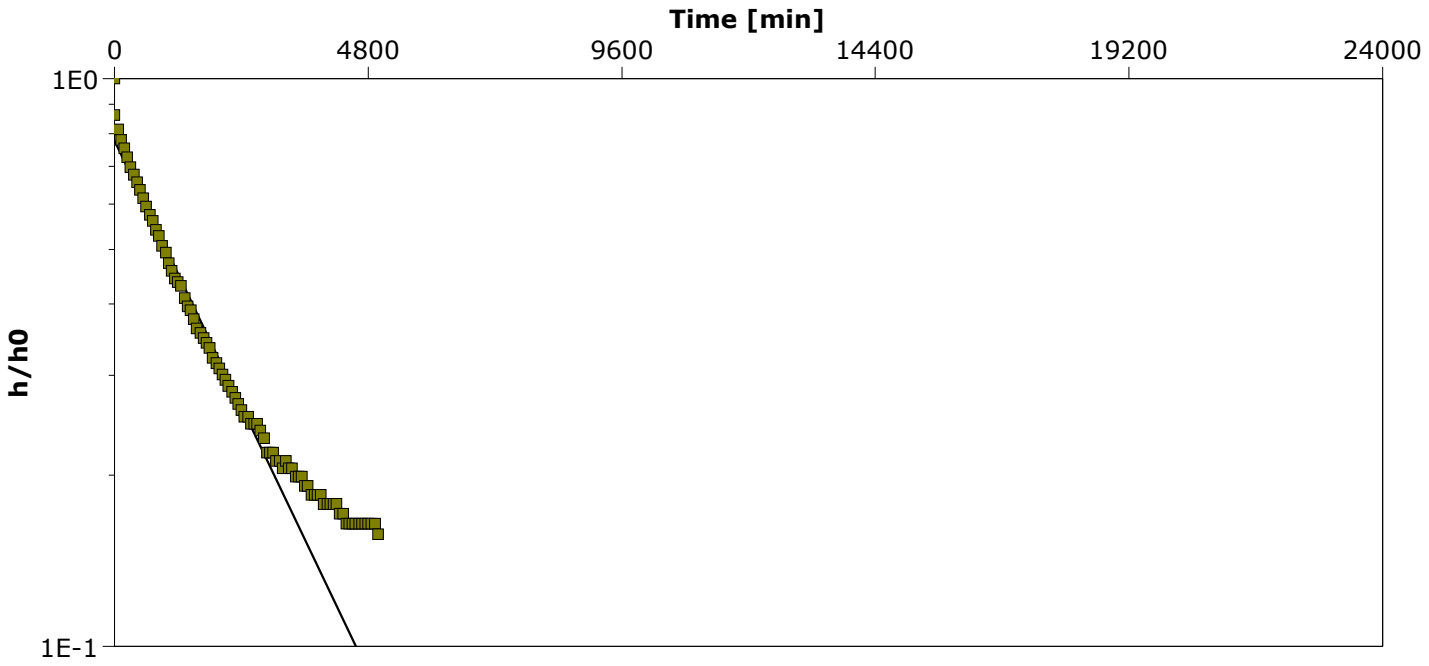
Slug Test Analysis Report

Project: Hydrogeological Evaluation and WB

Number: 14-09222-001-HG1

Client: bclMC Realty Corporation c/o Bentall LP

Location: 407 West Employment Area, Oakville, ON	Slug Test: Slug Test - MMM09-20	Test Well: MMM09-20
Test Conducted by: A. Blazeiko		Test Date: 5/25/2010
Analysis Performed by: N. Codoban	Rising Head Test - MMM09-20	Analysis Date: 5/25/2010
Aquifer Thickness:		



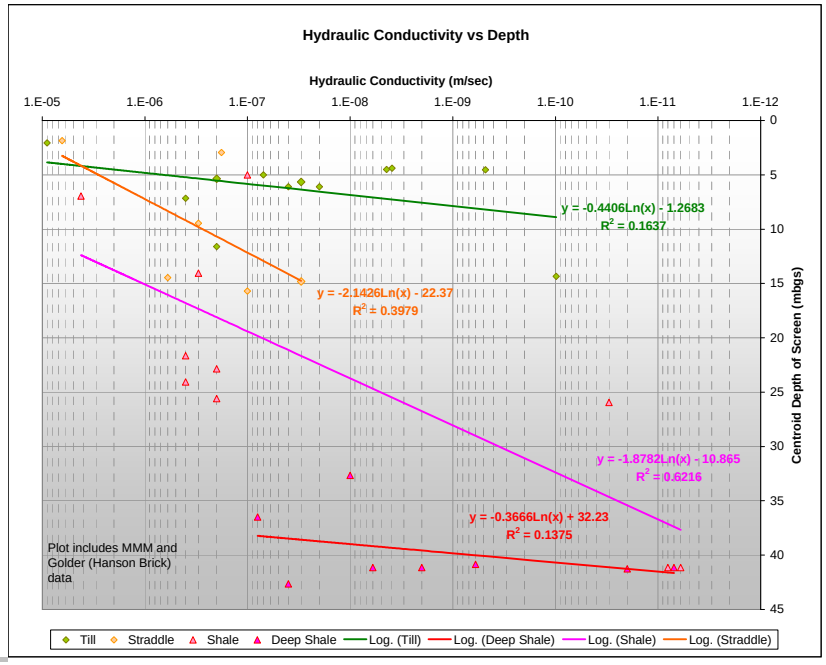
Calculation after Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
MMM09-20	3.09×10^{-9}	

The well is screened in Clayey Silt Till at depth of 4.2 to 7.2 m below grade.

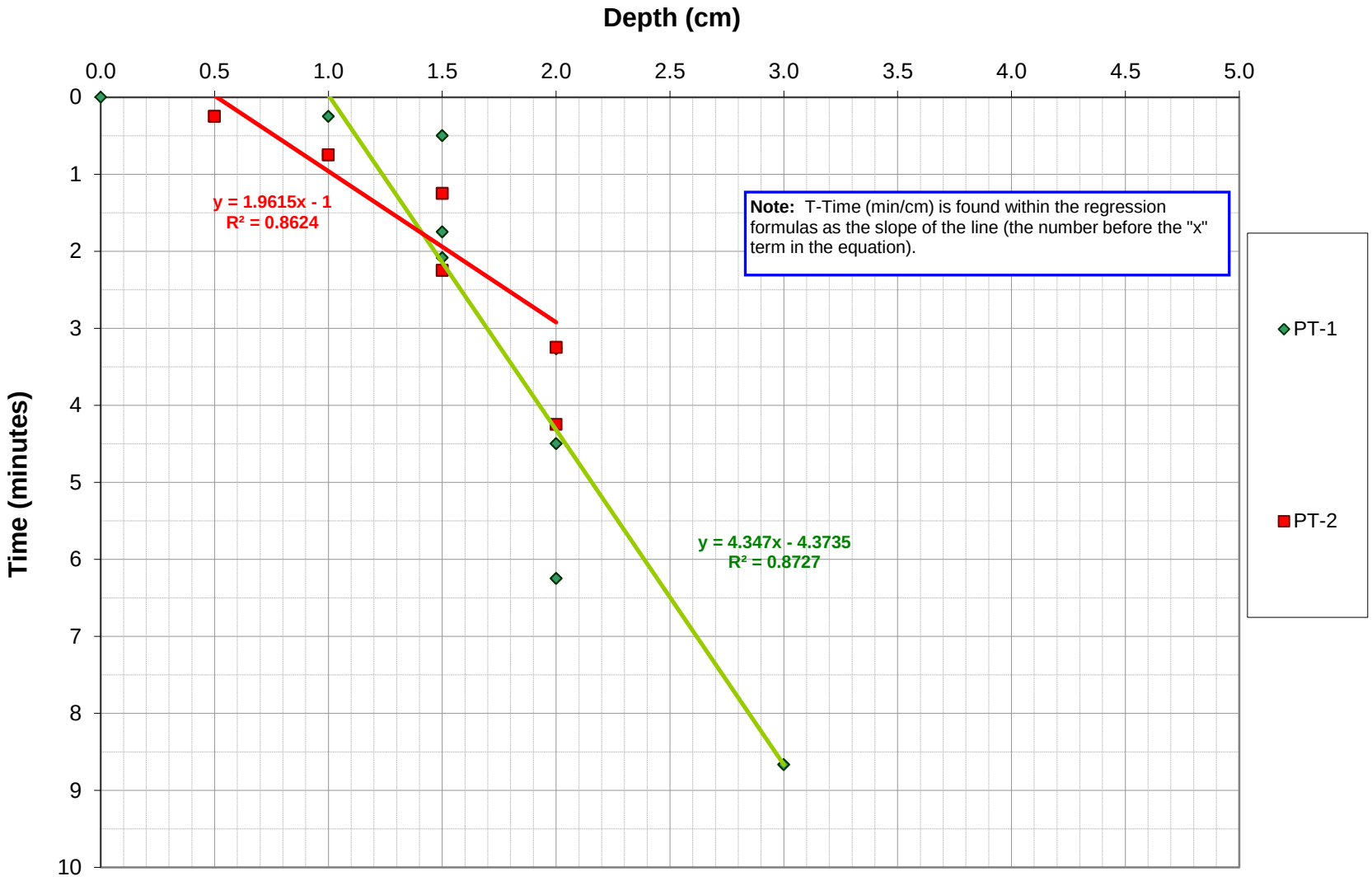
Hydraulic Conductivity Measurements

Monitor	Till	Till/Bedrock Interface	Shale	Deeper Shale	Screen Top (mbgs)	Screen Bottom (mbgs)	Screen Centroid (mbgs)
MMM Monitors							
MMM-09-04	4.4E-09				3.0	6.0	4.5
MMM-09-09	9.0E-06				1.8	2.3	2.1
MMM-09-10S		6.4E-06			1.6	2.1	1.9
MMM-09-10D			4.2E-06		6.2	7.7	7.0
MMM-09-15S		1.8E-07			1.5	4.4	3.0
MMM-09-17	3.9E-09				2.9	5.9	4.4
MMM-09-19S	4.8E-10				3.2	5.9	4.55
MMM-09-19D	9.8E-11				13.6	15.1	14.35
Hanson Brick Monitors (Golder Associates)							
MW-1			1.0E-07		2.7	7.3	5.0
MW-1				1.0E-08	25.7	39.6	32.7
MW-2	7.0E-08				2.7	7.3	5.0
MW-2			2.0E-07		24.4	26.8	25.6
MW-2				4.0E-08	39.6	45.7	42.7
MW-3	2.0E-07				9.3	13.9	11.6
MW-3				8.0E-08	33.5	39.5	36.5
MW-4	4.0E-08				4.6	7.6	6.1
MW-4			2.0E-07		19.8	25.9	22.9
MW-4				2.0E-09	38.1	44.2	41.2
MW-5	4.0E-07				5.6	8.7	7.2
MW-5		1.0E-07			14.2	17.2	15.7
MW-5			4.0E-07		18.6	24.7	21.7
MW-5				2.0E-11	38.2	44.3	41.3
MW-6		3.0E-07			7.9	11.0	9.5
MW-6			3.0E-11		22.9	29.0	26.0
MW-7	3.0E-09						
MW-7				6.0E-09	38.1	44.2	41.2
MW-8			4.0E-07		21.0	27.1	24.1
MW-8				6.0E-10	36.3	45.4	40.9
MW-9	2.0E-07				3.8	6.9	5.4
MW-9			3.0E-07		11.0	17.1	14.1
MW-9				7.0E-12	38.1	44.2	41.2
MW-10	2.0E-08				4.6	7.6	6.1
MW-10		3.0E-08			11.8	17.8	14.8
MW-10			8.0E-12		38.1	44.2	41.2
MW-11	3.0E-08				4.1	7.2	5.7
MW-11		6.0E-07			11.4	17.5	14.5
MW-11			6.0E-12		38.1	44.2	41.2
Min	9.8E-11	3.0E-08	6.0E-12	7.0E-12			
Max	9.0E-06	6.4E-06	4.2E-06	8.0E-08			
Geomean	**2.3E-08**	**2.9E-07**	**1.6E-08**	**1.5E-09**			



Notes:
Hydraulic Conductivities are reported in m/sec
Hydraulic Conductivities from the Hanson Brick monitors are taken from information presented on Figures C-1 through C-11 in the 2008 Annual Monitoring Report (Golder Associates, November 2009)

Percolation Testing



APPENDIX 4-5
Water Level Data

Table SWL-1: Static Water Levels at Monitoring Wells

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Stick-up mag	Top Elevation masl	Screen Bottom mbg	Screen Top mbg	Screen Length m	Install Date	Water Level 05-May-09 mbtop	Water Level 05-May-09 masl	Water Level 19-Jun-09 mbtop	Water Level 19-Jun-09 masl	Water Level 24-Sep-09 mbtop	Water Level 24-Sep-09 masl	Water Level 17-Nov-09 mbtop	Water Level 17-Nov-09 masl	Water Level 18-Nov-09 mbtop	Water Level 18-Nov-09 masl	Water Level 18-Dec-09 mbtop	Water Level 18-Dec-09 masl	Water Level 21-Jan-10 mbtop	Water Level 21-Jan-10 masl	Water Level 22-Jan-10 mbtop	Water Level 22-Jan-10 masl	Water Level 13-Apr-10 mbtop	Water Level 13-Apr-10 masl	Water Level 06-Aug-10 mbtop	Water Level 06-Aug-10 masl	Water Level 18-Oct-10 mbtop	Water Level 18-Oct-10 masl	Water Level 19-Oct-10 mbtop	Water Level 19-Oct-10 masl	Water Level 17-Feb-11 mbtop	Water Level 17-Feb-11 masl	Water Level 18-Feb-11 mbtop	Water Level 18-Feb-11 masl
MMM09-01-S	598300	4809022	148.48	1.00	149.48	5.18	2.18	3.00	9-Jun-09			5.77	143.71	5.99	143.49					4.60	144.88			5.45	144.03	4.22	145.25	5.47	144.01	4.75	144.73					5.19	144.29
MMM09-01-D	598301	4809024	148.27	1.05	149.32	8.89	7.39	1.50	9-Jun-09			5.65	143.67	6.21	143.11					5.15	144.18			5.59	143.73	5.05	144.28	5.47	143.85	5.23	144.09					5.02	144.30
MMM09-02	598132	4809239	151.16	1.10	152.26	5.21	2.21	3.00	1-Jun-09			5.92	146.34	5.00	147.26					3.99	148.27	4.72	147.54			3.87	148.40	4.73	147.54	4.26	148.00					4.02	148.24
MMM09-03	597983	4809410	151.40	1.13	152.53	3.07	1.57	1.50	1-Jun-09			2.68	149.85	2.77	149.76					1.50	151.03	2.12	150.41			1.39	151.15	2.38	150.16	1.99	150.54					1.83	150.71
MMM09-04	597761	4809653	152.35	1.09	153.44	6.02	3.02	3.00	8-Jun-09			4.82	148.62	2.50	150.94					2.10	151.34	2.38	151.06			2.21	151.22	2.42	151.02	2.26	151.17					2.22	151.22
MMM09-05-S	597485	4809933	159.00	1.23	160.23	8.66	5.66	3.00	5-Jun-09			6.86	153.37	2.39	157.84							2.23	158.00			1.86	158.36	2.40	157.83	2.46	157.77					2.21	158.02
MMM09-05-D	597482	4809935	159.31	1.09	160.40	16.41	14.91	1.50	5-Jun-09			5.07	155.33	12.10	148.30							11.39	149.01			11.26	149.14	11.34	149.06	11.41	149.00					11.22	149.18
MMM09-06-S	597170	4809527	155.18	1.19	156.37	5.84	3.34	2.50	4-Jun-09			4.64	151.73	1.74	154.63							1.93	154.44			1.67	154.70	1.76	154.61	1.95	154.43					1.99	154.38
MMM09-06-D	597170	4809529	155.36	1.15	156.51	10.87	9.37	1.50	4-Jun-09			1.88	154.63	1.72	154.79							1.89	154.62			2.23	154.28	1.76	154.75	1.68	154.83					2.09	154.42
MMM09-07	597526	4809600	153.82	1.06	154.88	5.84	2.84	3.00	8-Jun-09			2.19	152.69	2.34	152.54							2.59	152.29			2.44	152.44	2.31	152.58	2.58	152.31					2.54	152.34
MMM09-08	597395	4809298	158.01	0.95	158.95	7.87	4.37	3.50	2-Jun-09			3.02	155.93	3.06	155.89							2.97	155.98			2.46	156.49	2.92	156.04	2.47	156.49					2.83	156.12
MMM09-09	597550	4809184	151.64	1.08	152.72	2.26	1.76	0.50	2-Jun-09			1.95	150.77	2.11	150.61					1.63	151.09	1.73	150.99			1.66	151.06	2.08	150.64	1.67	151.05					1.40	151.32
MMM09-10-S	597811	4809270	149.69	1.08	150.77	2.13	1.63	0.50	2-Jun-09			1.50	149.27	1.75	149.02					1.14	149.63	1.37	149.40			1.18	149.58	1.59	149.18	1.36	149.41					1.14	149.63
MMM09-10-D	597813	4809270	149.65	1.07	150.72	7.67	6.17	1.50	2-Jun-09			1.41	149.31	1.59	149.13					1.08	149.64	1.28	149.44			1.05	149.68	1.40	149.32	1.19	149.53					1.06	149.66
MMM09-11	597840	4808917	153.52	1.06	154.58	5.51	2.51	3.00	8-Jun-09			2.08	152.50	2.50	152.08							2.21	152.37			1.60	152.98			1.74	152.84					2.29	152.29
MMM09-12	598015	4808712	152.71	1.09	153.80	3.38	1.88	1.50	9-Jun-09			2.71	151.09	3.20	150.60							2.47	151.33			1.97	151.83	2.91	150.89	2.17	151.63					2.22	151.58
MMM09-13	597431	4808891	157.30	1.08	158.38	3.20	1.83	1.37	9-Nov-09											1.43	156.96			2.11	156.27	1.43	156.95	2.54	155.84			1.80	156.58	2.24	156.14		
MMM09-14	597154	4809172	155.53	0.98	156.51	5.13	2.24	2.90	10-Nov-09							2.09	154.42							1.82	154.69	1.54	154.97	1.93	154.58			1.57	154.94	1.79	154.72		
MMM09-15S	597151	4808905	159.18	1.02	160.20	4.42	1.52	2.90	11-Nov-10							1.36	158.84	1.36	158.84	1.18	159.02			1.35	158.85	1.25	158.95	1.61	158.59			1.23	158.97	1.23	158.97		
MMM09-15D	597153	4808903	159.13	1.09	160.22	12.50	11.13	1.37	11-Nov-10							1.87	158.35	1.89	158.33	2.51	157.71			3.00	157.22	7.88	152.34	6.16	154.06			6.12	154.10	6.12	154.10		
MMM09-16	596526	4809514	163.75	1.15	164.90	5.94	2.97	2.97	13-Nov-09							Dry to 7.11		6.95	157.95	5.30	159.60			3.24	161.66	1.55	163.35	2.33	162.57			2.73	162.18	2.40	162.50		
MMM09-17	596202	4809823	162.72	1.00	163.72	5.92	2.97	2.95	13-Nov-09							2.51	161.21	2.29	161.43	1.25	162.47	1.40	162.32			1.21	162.51	1.10	162.63			1.23	162.49	1.17	162.55		
MMM09-18S	595803	4809213	169.36	1.11	170.47	6.10	3.20	2.90	12-Nov-09							6.13	164.34	6.01	164.46	2.28	168.19	2.31	168.16			1.70	168.77	2.48	167.99			2.27	168.20	2.26	168.21		
MMM09-18D	595805	4809215	169.38	1.06	170.43	15.37	13.94	1.42	12-Nov-09							6.21	164.22	6.25	164.18	5.74	164.69	5.90	164.53			5.01	165.42	5.83	164.61			6.02	164.42	5.91	164.52		
MMM09-19S	595387	4810334	180.22	(0.11)	180.11	5.92	3.17	2.74	17-Nov-09									Dry to 5.95		4.41	175.70	3.10	177.01			0.37	179.74	0.79	179.32			0.62	179.49	1.35	178.76		
MMM09-19D	595388	4810336	180.18	(0.08)	180.10	15.06	13.64	1.42	16-Nov-09									Dry to 15.08		13.82	166.28	8.92	171.18			5.52	174.58	4.46	175.64			4.54	175.56	4.13	175.97		
MMM09-20	594807	4809575	181.50	(0.15)	181.35	7.21	4.24	2.97	17-Nov-09									6.70	174.65	0.47	180.88	1.22	180.13			0.52	180.83	1.15	180.21			0.67	180.68			0.30	181.05
MMM11-21	598145	4809144	150.67	0.91	151.57	6.20	4.68	1.52	14-Jul-11																												
MMM11-22-S	598045	4809175	151.69	0.93	152.62	6.12	4.60	1.52	14-Jul-11																												
MMM11-22-D	598046	4809175	151.74	0.84	152.58	9.16	7.64	1.52	14-Jul-11																												
TROW MW-1	598305	4809194	149.79	(0.08)	149.72	4.60	1.60	3.00	3-Jan-01	1.47	148.25	2.32	147.40	2.75	146.97											1.38	148.34	2.27	147.45	2.01	147.71					1.84	147.88
TROW MW-2	598337	4809146	149.70	(0.08)	149.62	4.60	1.60	3.00	5-Jan-01	0.87	148.75	1.58	148.04	2.16	147.46													1.82	147.80	2.31	147.31					1.99	147.63
TROW MW-3	598131	4808935	150.94	1.00	151.94	6.10	3.10	3.00	3-Jan-01	1.77	150.17	2.70	149.24	2.80	149.14							2.44	149.50			1.98	149.96	2.66	149.28	2.08	149.86					2.17	149.77
Pond Gauge	598203	4809154	147.94	1.00	148.94				4-Jul-11																									0.40	148.57		
Pond Gauge Replaced	598155	4809153	148.48	1.32	149.80				11-Jul-11																												
Pond Gauge Replaced2	598167	4809144	148.10	1.18	149.28				6-May-14																												
EXP MW-1	5981557	4809073	146.77	0.87	147.64	6.20	4.25	1.95	14-Jul-11																												
EXP MW-2	598157	4809067	145.99	0.73	146.72	3.10	1.59	1.51	13-Jul-11																												
EXP MW-3	598200	4809077	147.78	1.10	148.88	6.08	4.08	2.00	13-Jul-11																												
EXP MW-4	598215	4809075	145.65	0.87	146.52	1.45	0.55	0.90	15-Jul-11																												
Lazy Pat Well	598308	4809122	149.66	0.15	149.81									3.95	145.86													CNL									

Upward Gradient (Nests Only)
Downward Gradient (Nests Only)
Static Water Level within 0.3 m of grade
Static Water Level is above grade

Table SWL-1: Static Water Levels at Monitoring Wells

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Stick-up mag	Top Elevation masl	Screen Bottom mbg	Screen Top mbg	Screen Length m	Install Date	Water Level 04-Jul-11 mbtop	Water Level 04-Jul-11 masl	Water Level 05-Jul-11 mbtop	Water Level 05-Jul-11 masl	Water Level 15-Jul-11 mbtop	Water Level 15-Jul-11 masl	Water Level 27-Jul-11 mbtop	Water Level 27-Jul-11 masl	Water Level 19-Aug-11 mbtop	Water Level 19-Aug-11 masl	Water Level 24-Aug-11 mbtop	Water Level 24-Aug-11 masl	Water Level 08-Sep-11 mbtop	Water Level 08-Sep-11 masl	Water Level 30-Sep-11 mbtop	Water Level 30-Sep-11 masl	Water Level 20-Oct-11 mbtop	Water Level 20-Oct-11 masl	Water Level 19-Jan-12 mbtop	Water Level 19-Jan-12 masl	Water Level 06-Jul-12 mbtop	Water Level 06-Jul-12 masl	Water Level 18-Jul-12 mbtop	Water Level 18-Jul-12 masl	Water Level 05-Nov-12 mbtop	Water Level 05-Nov-12 masl	Water Level 06-Nov-12 mbtop	Water Level 06-Nov-12 masl
MMM09-01-S	598300	4809022	148.48	1.00	149.48	5.18	2.18	3.00	9-Jun-09			5.42	144.06			5.89	143.59							5.89	143.59			4.60	144.88			5.90	143.58			4.81	144.67
MMM09-01-D	598301	4809024	148.27	1.05	149.32	8.89	7.39	1.50	9-Jun-09			5.62	143.70			6.29	143.03							5.75	143.57			5.15	144.17			6.47	142.85			5.41	143.91
MMM09-02	598132	4809239	151.16	1.10	152.26	5.21	2.21	3.00	1-Jun-09	4.66	147.60					5.60	146.66							5.41	146.85			3.92	148.34			5.30	146.96	4.58	147.68		
MMM09-03	597983	4809410	151.40	1.13	152.53	3.07	1.57	1.50	1-Jun-09	2.24	150.29													3.50	149.03			1.65	150.88					1.56	150.97		
MMM09-04	597761	4809653	152.35	1.09	153.44	6.02	3.02	3.00	8-Jun-09	2.37	151.07					2.60	150.84							2.47	150.97			2.14	151.30					2.46	150.98		
MMM09-05-S	597485	4809933	159.00	1.23	160.23	8.66	5.66	3.00	5-Jun-09	1.90	158.33													2.82	157.41			1.72	158.51					3.34	156.89		
MMM09-05-D	597482	4809935	159.31	1.09	160.40	16.41	14.91	1.50	5-Jun-09	11.17	149.23													11.31	149.09			11.32	149.08					11.49	148.91		
MMM09-06-S	597170	4809527	155.18	1.19	156.37	5.84	3.34	2.50	4-Jun-09			1.80	154.57											2.65	153.72			1.58	154.79					2.06	154.31		
MMM09-06-D	597170	4809529	155.36	1.15	156.51	10.87	9.37	1.50	4-Jun-09			1.96	154.55											2.07	154.44			1.71	154.80					2.05	154.46		
MMM09-07	597526	4809600	153.82	1.06	154.88	5.84	2.84	3.00	8-Jun-09	2.12	152.76													2.84	152.04			2.21	152.67					3.22	151.66		
MMM09-08	597395	4809298	158.01	0.95	158.95	7.87	4.37	3.50	2-Jun-09			2.55	156.40											3.42	155.53			2.10	156.85					2.71	156.24		
MMM09-09	597550	4809184	151.64	1.08	152.72	2.26	1.76	0.50	2-Jun-09			2.01	150.71			2.31	150.41							1.99	150.73			1.58	151.14					1.71	151.01		
MMM09-10-S	597811	4809270	149.69	1.08	150.77	2.13	1.63	0.50	2-Jun-09			1.43	149.34			2.01	148.76							1.93	148.84			1.10	149.67			2.02	148.75	1.40	149.37		
MMM09-10-D	597813	4809270	149.65	1.07	150.72	7.67	6.17	1.50	2-Jun-09			1.62	149.10			1.82	148.90							1.84	148.88			0.99	149.73			1.80	148.92	1.27	149.45		
MMM09-11	597840	4808917	153.52	1.06	154.58	5.51	2.51	3.00	8-Jun-09	2.36	152.22													3.49	151.09			1.46	153.12							1.95	152.63
MMM09-12	598015	4808712	152.71	1.09	153.80	3.38	1.88	1.50	9-Jun-09	2.84	150.96													4.30	149.50			1.91	151.89							2.24	151.56
MMM09-13	597431	4808891	157.30	1.08	158.38	3.20	1.83	1.37	9-Nov-09																												
MMM09-14	597154	4809172	155.53	0.98	156.51	5.13	2.24	2.90	10-Nov-09																												
MMM09-15S	597151	4808905	159.18	1.02	160.20	4.42	1.52	2.90	11-Nov-10																												
MMM09-15D	597153	4808903	159.13	1.09	160.22	12.50	11.13	1.37	11-Nov-10																												
MMM09-16	596526	4809514	163.75	1.15	164.90	5.94	2.97	2.97	13-Nov-09																												
MMM09-17	596202	4809823	162.72	1.00	163.72	5.92	2.97	2.95	13-Nov-09																												
MMM09-18S	595803	4809213	169.36	1.11	170.47	6.10	3.20	2.90	12-Nov-09																												
MMM09-18D	595805	4809215	169.38	1.06	170.43	15.37	13.94	1.42	12-Nov-09																												
MMM09-19S	595387	4810334	180.22	(0.11)	180.11	5.92	3.17	2.74	17-Nov-09																												
MMM09-19D	595388	4810336	180.18	(0.08)	180.10	15.06	13.64	1.42	16-Nov-09																												
MMM09-20	594807	4809575	181.50	(0.15)	181.35	7.21	4.24	2.97	17-Nov-09																												
MMM11-21	598145	4809144	150.67	0.91	151.57	6.20	4.68	1.52	14-Jul-11					4.54	147.04	4.79	146.78							4.97	146.60			3.74	147.83			5.04	146.53			4.38	147.19
MMM11-22-S	598045	4809175	151.69	0.93	152.62	6.12	4.60	1.52	14-Jul-11					5.19	147.43	5.34	147.28							5.60	147.02			4.31	148.31			5.53	147.09			4.92	147.70
MMM11-22-D	598046	4809175	151.74	0.84	152.58	9.16	7.64	1.52	14-Jul-11					5.32	147.26	5.68	146.90							6.08	146.50			4.74	147.84			5.90	146.68			5.41	147.17
TROW MW-1	598305	4809194	149.79	(0.08)	149.72	4.60	1.60	3.00	3-Jan-01			2.07	147.65											3.09	146.63							3.01	146.71			2.71	147.01
TROW MW-2	598337	4809146	149.70	(0.08)	149.62	4.60	1.60	3.00	5-Jan-01															Dry								2.52	147.10			2.55	147.07
TROW MW-3	598131	4808935	150.94	1.00	151.94	6.10	3.10	3.00	3-Jan-01	2.72	149.22													3.28	148.66			1.91	150.03							2.21	149.73
Pond Gauge	598203	4809154	147.94	1.00	148.94				4-Jul-11			0.71	148.65			0.47	148.41	0.32	148.26	0.30	148.24	0.25	148.19	0.23	148.17	1.39	149.33	1.18	149.12	0.60	148.54	0.52	148.46	0.97	148.91	0.94	148.88
Pond Gauge Replaced	598155	4809153	148.48	1.32	149.80				11-Jul-11																												
Pond Gauge Replaced2	598167	4809144	148.10	1.18	149.28				6-May-14																												
EXP MW-1	5981557	4809073	146.77	0.87	147.64	6.20	4.25	1.95	14-Jul-11							1.32	146.32																			1.44	146.20
EXP MW-2	598157	4809067	145.99	0.73	146.72	3.10	1.59	1.51	13-Jul-11							0.53	146.19																			0.58	146.14
EXP MW-3	598200	4809077	147.78	1.10	148.88	6.08	4.08	2.00	13-Jul-11							3.56	145.32																			3.60	145.28
EXP MW-4	598215	4809075	145.65	0.87	146.52	1.45	0.55	0.90	15-Jul-11							1.32	145.20																			1.47	145.05
Lazy Pat Well	598308	4809122	149.66	0.15	149.81																																

Upward Gradient (Nests Only)
Downward Gradient (Nests Only)
Static Water Level within 0.3 m of grade
Static Water Level is above grade

Table SWL-1: Static Water Levels at Monitoring Wells

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Stick-up mag	Top Elevation masl	Screen Bottom mbg	Screen Top mbg	Screen Length m	Install Date	Water Level 28-Nov-12		Water Level 22-Apr-13		Water Level 10-Jul-13		Water Level 11-Jul-13		Water Level 04-Sep-13		Water Level 05-Sep-13		Water Level 09-Sep-13		Water Level 10-Oct-13		Water Level 22-Oct-13		Water Level 29-Oct-13		Water Level 01-Nov-13		Water Level 11-Nov-13		Water Level 16-Dec-13		Water Level 17-Dec-13	
										mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl
MMM09-01-S	598300	4809022	148.48	1.00	149.48	5.18	2.18	3.00	9-Jun-09			4.65	144.83			5.03	144.45	6.18	143.30																	5.45	144.03
MMM09-01-D	598301	4809024	148.27	1.05	149.32	8.89	7.39	1.50	9-Jun-09			5.20	144.12			5.32	144.00	6.24	143.08																	5.58	143.74
MMM09-02	598132	4809239	151.16	1.10	152.26	5.21	2.21	3.00	1-Jun-09			4.06	148.20	4.35	147.91			5.02	147.24					4.67	147.59	4.56	147.70			4.23	148.04	4.32	147.94	4.66	147.60		
MMM09-03	597983	4809410	151.40	1.13	152.53	3.07	1.57	1.50	1-Jun-09			1.62	150.91	2.25	150.28					3.25	149.28													2.53	150.00		
MMM09-04	597761	4809653	152.35	1.09	153.44	6.02	3.02	3.00	8-Jun-09			2.33	151.11	2.03	151.41					2.74	150.70													2.38	151.06		
MMM09-05-S	597485	4809933	159.00	1.23	160.23	8.66	5.66	3.00	5-Jun-09			1.77	158.46	2.21	158.02					3.00	157.23													3.79	156.44		
MMM09-05-D	597482	4809935	159.31	1.09	160.40	16.41	14.91	1.50	5-Jun-09			10.99	149.41	11.15	149.25					11.29	149.11													11.48	148.92		
MMM09-06-S	597170	4809527	155.18	1.19	156.37	5.84	3.34	2.50	4-Jun-09			1.61	154.76	1.48	154.89					1.94	154.43													1.76	154.61		
MMM09-06-D	597170	4809529	155.36	1.15	156.51	10.87	9.37	1.50	4-Jun-09			2.49	154.02	1.83	154.68					1.62	154.89													1.64	154.87		
MMM09-07	597526	4809600	153.82	1.06	154.88	5.84	2.84	3.00	8-Jun-09			2.33	152.55	1.97	152.91					2.44	152.44													2.40	152.48		
MMM09-08	597395	4809298	158.01	0.95	158.95	7.87	4.37	3.50	2-Jun-09			2.28	156.67	2.16	156.79					3.21	155.74													2.30	156.65		
MMM09-09	597550	4809184	151.64	1.08	152.72	2.26	1.76	0.50	2-Jun-09			1.69	151.03																					1.84	150.88		
MMM09-10-S	597811	4809270	149.69	1.08	150.77	2.13	1.63	0.50	2-Jun-09			1.21	149.56	1.17	149.60			1.99	148.78					1.64	149.13	1.43	149.34			1.18	149.58	1.22	149.55	1.46	149.31		
MMM09-10-D	597813	4809270	149.65	1.07	150.72	7.67	6.17	1.50	2-Jun-09			1.10	149.62	1.03	149.69			1.91	148.81					1.53	149.20	1.34	149.38			1.06	149.66	1.04	149.68	1.31	149.41		
MMM09-11	597840	4808917	153.52	1.06	154.58	5.51	2.51	3.00	8-Jun-09			1.53	153.05							2.83	151.75																
MMM09-12	598015	4808712	152.71	1.09	153.80	3.38	1.88	1.50	9-Jun-09			1.91	151.89							3.53	150.27																
MMM09-13	597431	4808891	157.30	1.08	158.38	3.20	1.83	1.37	9-Nov-09																												
MMM09-14	597154	4809172	155.53	0.98	156.51	5.13	2.24	2.90	10-Nov-09																												
MMM09-15S	597151	4808905	159.18	1.02	160.20	4.42	1.52	2.90	11-Nov-10																												
MMM09-15D	597153	4808903	159.13	1.09	160.22	12.50	11.13	1.37	11-Nov-10																												
MMM09-16	596526	4809514	163.75	1.15	164.90	5.94	2.97	2.97	13-Nov-09																												
MMM09-17	596202	4809823	162.72	1.00	163.72	5.92	2.97	2.95	13-Nov-09																												
MMM09-18S	595803	4809213	169.36	1.11	170.47	6.10	3.20	2.90	12-Nov-09																												
MMM09-18D	595805	4809215	169.38	1.06	170.43	15.37	13.94	1.42	12-Nov-09																												
MMM09-19S	595387	4810334	180.22	(0.11)	180.11	5.92	3.17	2.74	17-Nov-09																												
MMM09-19D	595388	4810336	180.18	(0.08)	180.10	15.06	13.64	1.42	16-Nov-09																												
MMM09-20	594807	4809575	181.50	(0.15)	181.35	7.21	4.24	2.97	17-Nov-09																												
MMM11-21	598145	4809144	150.67	0.91	151.57	6.20	4.68	1.52	14-Jul-11			3.99	147.58			4.35	147.22	4.98	146.59					4.64	146.93	4.52	147.05	4.52	147.05	4.31	147.26	4.39	147.18			4.60	146.97
MMM11-22-S	598045	4809175	151.69	0.93	152.62	6.12	4.60	1.52	14-Jul-11			4.48	148.14			4.74	147.88	5.38	147.24					4.96	147.66	4.84	147.78			4.57	148.06	4.70	147.92			4.91	147.71
MMM11-22-D	598046	4809175	151.74	0.84	152.58	9.16	7.64	1.52	14-Jul-11			4.93	147.65			5.13	147.45	5.74	146.84					5.38	147.20	5.26	147.32			5.07	147.51	5.01	147.57			5.27	147.31
TROW MW-1	598305	4809194	149.79	(0.08)	149.72	4.60	1.60	3.00	3-Jan-01			1.37	148.35	1.63	148.09			2.48	147.24																	2.37	147.35
TROW MW-2	598337	4809146	149.70	(0.08)	149.62	4.60	1.60	3.00	5-Jan-01			0.78	148.84	1.64	147.98			Dry																		2.27	147.35
TROW MW-3	598131	4808935	150.94	1.00	151.94	6.10	3.10	3.00	3-Jan-01			2.03	149.91			2.16	149.78			3.15	148.78															2.30	149.64
Pond Gauge	598203	4809154	147.94	1.00	148.94				4-Jul-11	0.94	148.88	**Destroyed**																										
Pond Gauge Replaced	598155	4809153	148.48	1.32	149.80				11-Jul-11							1.05	148.75	1.34	148.46					1.09	148.71	1.00	148.80	1.05	148.75	0.84	148.96	1.06	148.74			MP-21	149.92
Pond Gauge Replaced2	598167	4809144	148.10	1.18	149.28				6-May-14																												
EXP MW-1	5981557	4809073	146.77	0.87	147.64	6.20	4.25	1.95	14-Jul-11			1.13	146.51			1.33	146.31	2.08	145.56																	1.47	146.17
EXP MW-2	598157	4809067	145.99	0.73	146.72	3.10	1.59	1.51	13-Jul-11			0.08	146.64			0.45	146.27	Dry																		0.5 to ice	
EXP MW-3	598200	4809077	147.78	1.10	148.88	6.08	4.08	2.00	13-Jul-11			3.41	145.47			3.53	145.35	4.42	144.46																	3.72	145.16
EXP MW-4	598215	4809075	145.65	0.87	146.52	1.45	0.55	0.90	15-Jul-11			1.45	145.07			1.50	145.02	2.33	144.19																	0.96	145.56
Lazy Pat Well	598308	4809122	149.66	0.15	149.81																																

Upward Gradient (Nests Only)
Downward Gradient (Nests Only)
Static Water Level within 0.3 m of grade
Static Water Level is above grade

Table SWL-1: Static Water Levels at Monitoring Wells

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Stick-up mag	Top Elevation masl	Screen Bottom mbg	Screen Top mbg	Screen Length m	Install Date	Water Level 29-Apr-14		Water Level 30-Apr-14		Water Level 06-May-14		Water Level 25-Jul-14		Water Level 05-Aug-14		Water Level 20-Oct-14		Water Level 22-Jan-15		Water Level 27-Apr-15		Water Level 04-May-15		Water Level 28-Jul-15		Water Level 30-Oct-15		Water Level 11-Nov-15		Water Level 23-Dec-15		Water Level 25-Jan-16	
										mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl	mbtop	masl
MMM09-01-S	598300	4809022	148.48	1.00	149.48	5.18	2.18	3.00	9-Jun-09	4.82	144.66					5.41	144.07			5.68	143.79	5.37	144.11	4.61	144.86			5.58	143.90	Dry				5.70	143.77	5.06	144.42
MMM09-01-D	598301	4809024	148.27	1.05	149.32	8.89	7.39	1.50	9-Jun-09	5.05	144.27					5.52	143.80			5.78	143.54	5.61	143.71	5.25	144.07			5.94	143.38	5.84	143.48			5.85	143.47	5.57	143.75
MMM09-02	598132	4809239	151.16	1.10	152.26	5.21	2.21	3.00	1-Jun-09			3.58	148.68	3.84	148.42	4.70	147.56			4.73	147.53	4.69	147.58	4.09	148.18	4.30	147.97	4.87	147.40	5.26	147.00			5.04	147.22	4.75	147.51
MMM09-03	597983	4809410	151.40	1.13	152.53	3.07	1.57	1.50	1-Jun-09			1.34	151.19			2.53	150.00			3.11	149.42	2.46	150.07	1.65	150.88			Damaged									
MMM09-04	597761	4809653	152.35	1.09	153.44	6.02	3.02	3.00	8-Jun-09			2.16	151.28			2.37	151.07			2.43	151.01	2.39	151.05	2.32	151.11			2.49	150.95	2.53	150.91			2.46	150.98	2.44	151.00
MMM09-05-S	597485	4809933	159.00	1.23	160.23	8.66	5.66	3.00	5-Jun-09			1.76	158.47			2.31	157.92			3.00	157.23	2.43	157.80	1.75	158.48			1.99	158.24	3.16	157.07					2.22	158.01
MMM09-05-D	597482	4809935	159.31	1.09	160.40	16.41	14.91	1.50	5-Jun-09			11.05	149.35			11.14	149.26			11.33	149.07	11.41	149.00	11.38	149.03			11.38	149.02	11.47	148.93					11.43	148.97
MMM09-06-S	597170	4809527	155.18	1.19	156.37	5.84	3.34	2.50	4-Jun-09			1.67	154.70			1.81	154.56			2.03	154.34	1.98	154.39	1.57	154.80	1.69	154.68	1.82	154.55	2.57	153.80	2.48	153.89			2.07	154.30
MMM09-06-D	597170	4809529	155.36	1.15	156.51	10.87	9.37	1.50	4-Jun-09			2.00	154.51			1.71	154.80			1.56	154.95	1.85	154.66	2.28	154.23	2.22	154.29	1.92	154.59	2.05	154.46	2.42	154.09			2.09	154.42
MMM09-07	597526	4809600	153.82	1.06	154.88	5.84	2.84	3.00	8-Jun-09			2.36	152.52			2.27	152.61			2.38	152.50	2.57	152.31	2.27	152.61			2.22	152.66	3.14	151.74					2.80	152.08
MMM09-08	597395	4809298	158.01	0.95	158.95	7.87	4.37	3.50	2-Jun-09			2.10	156.85			2.32	156.63			Damaged																	
MMM09-09	597550	4809184	151.64	1.08	152.72	2.26	1.76	0.50	2-Jun-09			1.42	151.30			1.98	150.74			1.90	150.81	1.92	150.79	1.70	151.02			2.19	150.53	1.93	150.79					1.87	150.85
MMM09-10-S	597811	4809270	149.69	1.08	150.77	2.13	1.63	0.50	2-Jun-09			1.10	149.67			1.65	149.11			1.56	149.21	1.56	149.21	1.26	149.50			1.78	148.99	1.91	148.86			1.60	149.16	1.48	149.29
MMM09-10-D	597813	4809270	149.65	1.07	150.72	7.67	6.17	1.50	2-Jun-09			1.05	149.68			1.47	149.26			1.37	149.35	1.37	149.35	1.07	149.66			1.55	149.18	1.87	148.85			1.50	149.22	1.31	149.41
MMM09-11	597840	4808917	153.52	1.06	154.58	5.51	2.51	3.00	8-Jun-09	1.46	153.12							1.51	153.07	2.54	152.04	2.26	152.32	1.65	152.93			2.34	152.24	3.63	150.95					1.89	152.69
MMM09-12	598015	4808712	152.71	1.09	153.80	3.38	1.88	1.50	9-Jun-09	1.79	152.01							1.91	151.89	3.03	150.77	2.65	151.15	1.99	151.81			2.84	150.96							2.41	151.39
MMM09-13	597431	4808891	157.30	1.08	158.38	3.20	1.83	1.37	9-Nov-09																												
MMM09-14	597154	4809172	155.53	0.98	156.51	5.13	2.24	2.90	10-Nov-09																												
MMM09-15S	597151	4808905	159.18	1.02	160.20	4.42	1.52	2.90	11-Nov-10																												
MMM09-15D	597153	4808903	159.13	1.09	160.22	12.50	11.13	1.37	11-Nov-10																												
MMM09-16	596526	4809514	163.75	1.15	164.90	5.94	2.97	2.97	13-Nov-09																												
MMM09-17	596202	4809823	162.72	1.00	163.72	5.92	2.97	2.95	13-Nov-09																												
MMM09-18S	595803	4809213	169.36	1.11	170.47	6.10	3.20	2.90	12-Nov-09																												
MMM09-18D	595805	4809215	169.38	1.06	170.43	15.37	13.94	1.42	12-Nov-09																												
MMM09-19S	595387	4810334	180.22	(0.11)	180.11	5.92	3.17	2.74	17-Nov-09																												
MMM09-19D	595388	4810336	180.18	(0.08)	180.10	15.06	13.64	1.42	16-Nov-09																												
MMM09-20	594807	4809575	181.50	(0.15)	181.35	7.21	4.24	2.97	17-Nov-09																												
MMM11-21	598145	4809144	150.67	0.91	151.57	6.20	4.68	1.52	14-Jul-11			3.62	147.96			4.77	146.81			4.75	146.83	4.65	146.93	4.13	147.45	4.32	147.25	4.87	146.71	5.29	146.28			5.00	146.58	4.66	146.91
MMM11-22-S	598045	4809175	151.69	0.93	152.62	6.12	4.60	1.52	14-Jul-11			4.04	148.58			5.06	147.56			4.97	147.65	4.94	147.68	4.53	148.10	4.74	147.88	5.21	147.41	5.88	146.74			5.41	147.21	5.09	147.53
MMM11-22-D	598046	4809175	151.74	0.84	152.58	9.16	7.64	1.52	14-Jul-11			4.82	147.76			5.44	147.15			5.32	147.26	5.25	147.33	4.79	147.79	5.06	147.53	5.45	147.13	6.50	146.08			5.75	146.83	5.39	147.19
TROW MW-1	598305	4809194	149.79	(0.08)	149.72	4.60	1.60	3.00	3-Jan-01					1.17	148.54	2.38	147.34			2.70	147.01	2.35	147.37	1.45	148.27			2.63	147.09	Dry						2.60	147.12
TROW MW-2	598337	4809146	149.70	(0.08)	149.62	4.60	1.60	3.00	5-Jan-01	1.00	148.63					2.06	147.57			2.57	147.06	Frozen		0.98	148.64			Dry to 2.755		Dry						Dry to 2.75	
TROW MW-3	598131	4808935	150.94	1.00	151.94	6.10	3.10	3.00	3-Jan-01	2.00	149.93					2.47	149.46			2.63	149.31	2.44	149.50	2.12	149.81			2.74	149.19	2.98	148.96					2.27	149.67
Pond Gauge	598203	4809154	147.94	1.00	148.94				4-Jul-11																												
Pond Gauge Replaced	598155	4809153	148.48	1.32	149.80				11-Jul-11	Destroyed																												
Pond Gauge Replaced2	598167	4809144	148.10	1.18	149.28				6-May-14					0.49	148.78	0.83	148.45			0.66	148.61	Frozen to 0.36		0.51	148.77	0.56	148.71	0.73	148.55	0.31	148.97						
EXP MW-1	5981557	4809073	146.77	0.87	147.64	6.20	4.25	1.95	14-Jul-11	0.99	146.65					1.53	146.11			1.55	146.09	1.47	146.17	1.06	146.58			1.73	145.91	2.16	145.48			1.77	145.87	1.48	146.17
EXP MW-2	598157	4809067	145.99	0.73	146.72	3.10	1.59	1.51	13-Jul-11	Damaged																											
EXP MW-3	598200	4809077	147.78	1.10	148.88	6.08	4.08	2.00	13-Jul-11	3.30	145.58					3.73	145.15			3.87	145.02	3.75	145.14	3.39	145.49			4.07	144.82	4.15	144.73			3.97	144.91	3.70	145.18
EXP MW-4	598215	4809075	145.65	0.87	146.52	1.45	0.55	0.90	15-Jul-11	1.08	145.45					1.62	144.90			1.68	144.85	1.61	144.92	1.49	145.04			2.03	144.49	1.61	144.91			1.57	144.96	1.54	144.98
Lazy Pat Well	598308	4809122	149.66	0.15	149.81																																

Upward Gradient (Nests Only)
Downward Gradient (Nests Only)
Static Water Level within 0.3 m of grade
Static Water Level is above grade

Table SWL-1: Static Water Levels at Monitoring Wells

Well ID	Location Easting m	Location Northing m	Ground Elevation masl	Stick-up mag	Top Elevation masl	Screen Bottom mbg	Screen Top mbg	Screen Length m	Install Date	Water Level 04-Apr-16 mbtop	Water Level 04-Apr-16 masl	Water Level 14-Jul-16 mbtop	Water Level 14-Jul-16 masl	Water Level 28-Jul-16 mbtop	Water Level 28-Jul-16 masl	Water Level 14-Oct-16 mbtop	Water Level 14-Oct-16 masl	Water Level 06-Mar-17 mbtop	Water Level 06-Mar-17 masl	Water Level 18-Apr-17 mbtop	Water Level 18-Apr-17 masl
MMM09-01-S	598300	4809022	148.48	1.00	149.48	5.18	2.18	3.00	9-Jun-09	4.05	145.43	5.73	143.75			5.89	143.59	4.51	144.97	4.98	144.50
MMM09-01-D	598301	4809024	148.27	1.05	149.32	8.89	7.39	1.50	9-Jun-09	5.01	144.31	6.51	142.82			6.41	142.92	5.20	144.12	5.31	144.01
MMM09-02	598132	4809239	151.16	1.10	152.26	5.21	2.21	3.00	1-Jun-09	3.85	148.41	5.40	146.86	5.55	146.71	5.78	146.48	4.14	148.12	4.40	147.86
MMM09-03	597983	4809410	151.40	1.13	152.53	3.07	1.57	1.50	1-Jun-09												
MMM09-04	597761	4809653	152.35	1.09	153.44	6.02	3.02	3.00	8-Jun-09	1.92	151.52	2.79	150.65			2.60	150.83	2.28	151.15	2.32	151.12
MMM09-05-S	597485	4809933	159.00	1.23	160.23	8.66	5.66	3.00	5-Jun-09	1.62	158.61	2.27	157.96			3.16	157.07	2.08	158.15	1.80	158.43
MMM09-05-D	597482	4809935	159.31	1.09	160.40	16.41	14.91	1.50	5-Jun-09	11.22	149.18	11.18	149.22			11.36	149.04	11.30	149.10	9.87	150.53
MMM09-06-S	597170	4809527	155.18	1.19	156.37	5.84	3.34	2.50	4-Jun-09	1.54	154.83	2.18	154.19			2.06	154.31	1.78	154.59	1.76	154.61
MMM09-06-D	597170	4809529	155.36	1.15	156.51	10.87	9.37	1.50	4-Jun-09	1.89	154.62	1.98	154.53			1.89	154.62	2.13	154.38	2.05	154.46
MMM09-07	597526	4809600	153.82	1.06	154.88	5.84	2.84	3.00	8-Jun-09	2.30	152.58	2.56	152.33			2.95	151.94	1.57	153.32	2.47	152.41
MMM09-08	597395	4809298	158.01	0.95	158.95	7.87	4.37	3.50	2-Jun-09												
MMM09-09	597550	4809184	151.64	1.08	152.72	2.26	1.76	0.50	2-Jun-09	1.37	151.35	2.45	150.27			2.20	150.52	1.64	151.08	1.73	150.99
MMM09-10-S	597811	4809270	149.69	1.08	150.77	2.13	1.63	0.50	2-Jun-09	1.20	149.57	2.09	148.68			2.40	148.37	1.34	149.43	1.40	149.37
MMM09-10-D	597813	4809270	149.65	1.07	150.72	7.67	6.17	1.50	2-Jun-09	Frozen to 0.97		1.81	148.91			1.92	148.81	1.18	149.54	1.24	149.48
MMM09-11	597840	4808917	153.52	1.06	154.58	5.51	2.51	3.00	8-Jun-09	1.39	153.19	2.52	152.06			3.44	151.14	1.67	152.91	1.81	152.77
MMM09-12	598015	4808712	152.71	1.09	153.80	3.38	1.88	1.50	9-Jun-09	1.73	152.07	3.38	150.42			4.21	149.59	1.99	151.81	2.08	151.72
MMM09-13	597431	4808891	157.30	1.08	158.38	3.20	1.83	1.37	9-Nov-09												
MMM09-14	597154	4809172	155.53	0.98	156.51	5.13	2.24	2.90	10-Nov-09												
MMM09-15S	597151	4808905	159.18	1.02	160.20	4.42	1.52	2.90	11-Nov-10												
MMM09-15D	597153	4808903	159.13	1.09	160.22	12.50	11.13	1.37	11-Nov-10												
MMM09-16	596526	4809514	163.75	1.15	164.90	5.94	2.97	2.97	13-Nov-09												
MMM09-17	596202	4809823	162.72	1.00	163.72	5.92	2.97	2.95	13-Nov-09												
MMM09-18S	595803	4809213	169.36	1.11	170.47	6.10	3.20	2.90	12-Nov-09												
MMM09-18D	595805	4809215	169.38	1.06	170.43	15.37	13.94	1.42	12-Nov-09												
MMM09-19S	595387	4810334	180.22	(0.11)	180.11	5.92	3.17	2.74	17-Nov-09												
MMM09-19D	595388	4810336	180.18	(0.08)	180.10	15.06	13.64	1.42	16-Nov-09												
MMM09-20	594807	4809575	181.50	(0.15)	181.35	7.21	4.24	2.97	17-Nov-09												
MMM11-21	598145	4809144	150.67	0.91	151.57	6.20	4.68	1.52	14-Jul-11	4.05	147.52	5.42	146.15	5.47	146.10	5.55	146.02	4.32	147.26	4.52	147.05
MMM11-22-S	598045	4809175	151.69	0.93	152.62	6.12	4.60	1.52	14-Jul-11	4.39	148.23	5.89	146.73			6.20	146.42	4.58	148.04	4.81	147.81
MMM11-22-D	598046	4809175	151.74	0.84	152.58	9.16	7.64	1.52	14-Jul-11	4.66	147.92	6.24	146.34			6.74	145.84	5.04	147.54	5.22	147.36
TROW MW-1	598305	4809194	149.79	(0.08)	149.72	4.60	1.60	3.00	3-Jan-01	1.26	148.46	3.22	146.50			Dry to 3.481		1.66	148.06	1.86	147.86
TROW MW-2	598337	4809146	149.70	(0.08)	149.62	4.60	1.60	3.00	5-Jan-01	1.71	147.91	2.73	146.89			Dry to 2.750		1.15	148.47	1.15	148.47
TROW MW-3	598131	4808935	150.94	1.00	151.94	6.10	3.10	3.00	3-Jan-01	1.95	149.99	3.12	148.82			3.58	148.36	2.12	149.81	2.24	149.70
Pond Gauge	598203	4809154	147.94	1.00	148.94				4-Jul-11												
Pond Gauge Replaced	598155	4809153	148.48	1.32	149.80				11-Jul-11												
Pond Gauge Replaced2	598167	4809144	148.10	1.18	149.28				6-May-14	0.40	148.88	1.05	148.23	1.17	148.11	Dry to 1.192		0.55	148.73	0.56	148.72
EXP MW-1	5981557	4809073	146.77	0.87	147.64	6.20	4.25	1.95	14-Jul-11	0.93	146.71	2.47	145.17			2.41	145.24	1.14	146.50	1.23	146.41
EXP MW-2	598157	4809067	145.99	0.73	146.72	3.10	1.59	1.51	13-Jul-11												
EXP MW-3	598200	4809077	147.78	1.10	148.88	6.08	4.08	2.00	13-Jul-11	3.24	145.64	4.73	144.16			4.61	144.28	3.39	145.49	3.48	145.40
EXP MW-4	598215	4809075	145.65	0.87	146.52	1.45	0.55	0.90	15-Jul-11	1.36	145.16	Dry to 2.565				2.46	144.06	1.44	145.08	1.46	145.06
Lazy Pat Well	598308	4809122	149.66	0.15	149.81																

Upward Gradient (Nests Only)
Downward Gradient (Nests Only)
Static Water Level within 0.3 m of grade
Static Water Level is above grade

Table SWL-2: Static Water Levels at Mini-Piezometers, Staff Gauges, and Flow Measuring Points

ID	Location[1]		Ground Elevation [2]	Stick-up	Top Elevation	Screen Bottom	Screen Top	Screen	Install Date	Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels		
	Easting	Northing								05-May-09			29-May-09			19-Jun-09			24-Sep-09			09-Nov-09			18-Dec-09			21-Jan-10			13-Apr-10			06-Aug-10		
	m	m	masl	mag	masl	mbg	mbg	m		In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta
MP-01	597409	4809840	154.59	1.22	155.81	0.64	0.39	0.25	05-May-09		1.16		1.17	1.19	(0.02)	1.18	1.02	0.16	1.20	1.14	0.06	1.17	1.20	(0.03)				1.08	1.16	N/A	1.05	1.10	(0.05)	1.22	Dry to 1.22	N/A
MP-02	597769	4809666	151.54	1.05	152.59	0.81	0.56	0.25	05-May-09		1.00		1.17	1.02	0.15	1.21	1.04	0.17	Dry to 1.47	Dry to 0.98	N/A	1.02	Dry to 1.03	N/A	0.94	0.97	N/A	1.04	1.02	N/A	0.97	0.92	0.06	1.42	Dry to 1.03	N/A
MP-03	597808	4809266	149.16	1.35	150.51	0.50	0.25	0.25	05-May-09		1.27		1.27	1.29	(0.02)	1.32	1.37	(0.05)	Dry to 1.47	Dry to 1.34	N/A							1.16	1.22	N/A	Could not locate			Dry to 1.35	Dry to 1.35	N/A
MP-04	597972	4809088	144.12	1.44	145.56	0.41	0.16	0.25	05-May-09		1.42		1.40	1.40	0.00	1.40	1.36	0.04	Dry to 1.47	Dry to 1.41	N/A							Destroyed by ice								
MP-05 (pond on hill)	597514	4809671	157.61	1.27	158.88	0.59	0.34	0.25	05-May-09		1.11		1.37	Dry to 1.27	N/A	1.57	Dry to 1.27	N/A	Dry to 1.47	Dry to 1.27	N/A	1.33	Dry to 1.27	N/A				1.19	1.10	N/A	1.11	1.09	0.02	Dry to 1.55	Dry to 1.27	N/A
MP-06	597348	4809418	152.20	1.25	153.45	0.61	0.36	0.25	05-May-09		1.12		1.22	1.14	0.08	1.29	1.16	0.13	Dry to 1.57	Dry to 1.20	N/A							1.05	1.08	N/A	1.11	1.08	0.03	1.43	Dry to 1.20	N/A
MP-07	597541	4809150	150.78	1.29	152.07	0.57	0.32	0.25	05-May-09		1.08		1.08	1.08	0.00	1.29	1.05	0.24	Dry to 1.56	Dry to 1.26	N/A							1.12	1.13	N/A	1.07	1.10	(0.03)	1.33	Dry to 1.26	N/A
MP-21	598162	4809146	148.83	1.85	150.69	0.51	0.26	0.25	04-Jul-11																											
MP-22	598051	4809192	148.76	1.84	150.60	0.55	0.30	0.25	04-Jul-11																											
MP-23	598045	4809233	148.77	1.82	150.58	0.68	0.43	0.25	04-Jul-11																											
MP-24s	597912	4809256	148.80	0.93	149.73	0.44	0.31		22-Oct-13																											
MP-24d	597912	4809256	148.80	1.30	150.11	1.28	1.19		22-Oct-13																											
Observations at Other Locations - Not Mini-Piezometers																																				
Stream Gauge #1	597677	4809113	149.61	0.95	150.57				24-Sep-09										0.14	pooled		0.18			0.19			Frozen	0.19			0.18		0.12	pooled	
Stream Gauge #2	598345	4809063	142.35	0.99	143.34				24-Sep-09										0.10	pooled					0.21			Frozen	0.18	Flow under ice		0.21		0.12	pooled	
FMP-01	597622	4809128	150.16		N/A																		0.02	pooled	0.09	0.09	average		Frozen	No Flow		0.11	average			Dry
FMP-02	597574	4809796	153.31		N/A																								Frozen	No Flow		0.04	average			Dry
FMP-03	596266	4809815			N/A																											0.10	average			Dry
FMP-04	597523	4809561																			pooled			pooled					Frozen	No Flow		0.03	average			Dry

Notes:

Difference in heads

- Negative Value = Upward Flow (from ground into channel)
- Positive Value = Downward Flow (from channel into ground)
- indicates piezometer and/or surface water were frozen (ice)

Minipiezometers are between 1.85 to 1.86 m total length from top of pipe to tip (2009 installations)

Table SWL-2: Static Water Levels at Mini-Piezometers, Staff Gauges, and Flow Measuring Points

ID	Location[1]		Ground Elevation [2]	Stick-up	Top Elevation	Screen Bottom	Screen Top	Screen	Install Date	Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels		
	Easting	Northing								18-Oct-10			17-Feb-11			05-Jul-11			27-Jul-11			30-Sep-11			19-Jan-12			18-Jul-12			05-Nov-12			06-Nov-12		
	m	m	masl	mag	masl	mbg	mbg	m		In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta
MP-01	597409	4809840	154.59	1.22	155.81	0.64	0.39	0.25	05-May-09	1.12	1.00	0.12	1.03	0.92	N/A	1.12	1.18	(0.06)				1.14	1.08	0.06	Frozen at 0.97	Frozen at 1.03	N/A									
MP-02	597769	4809666	151.54	1.05	152.59	0.81	0.56	0.25	05-May-09	1.02	0.92	0.10	0.90	0.91	N/A	1.39	Dry to 1.06					1.02	0.97	0.05	Frozen at 0.88	Frozen at 0.88	N/A				1.04	1.04	0.00			
MP-03	597808	4809266	149.16	1.35	150.51	0.50	0.25	0.25	05-May-09	1.18	1.14	0.04	1.14	0.80	N/A	Destroyed																				
MP-04	597972	4809088	144.12	1.44	145.56	0.41	0.16	0.25	05-May-09																											
MP-05 (pond on hill)	597514	4809671	157.61	1.27	158.88	0.59	0.34	0.25	05-May-09	1.28	Dry to 1.16	N/A	1.19	Dry to 1.18	N/A	Dry to 1.55	Dry to 1.22	N/A				1.39	Dry to 1.26		Frozen at 1.05	Frozen at 1.06	N/A				1.27	Dry to 1.24				
MP-06	597348	4809418	152.20	1.25	153.45	0.61	0.36	0.25	05-May-09	1.14	1.04	0.10				Dry to 1.54	Dry to 1.13	N/A																		
MP-07	597541	4809150	150.78	1.29	152.07	0.57	0.32	0.25	05-May-09	1.13	1.08	0.05																			1.14	1.15	(0.01)			
MP-21	598162	4809146	148.83	1.85	150.69	0.51	0.26	0.25	04-Jul-11							2.24	1.84	0.40				Dry to 2.26	Dry to 1.74		Frozen at 1.69	Frozen at 1.71	N/A	Dry to 2.34	Dry to 1.86					1.98	1.84	0.14
MP-22	598051	4809192	148.76	1.84	150.60	0.55	0.30	0.25	04-Jul-11							2.22	1.88	0.34				Dry to 2.25	Dry to 1.77		1.87	Frozen at 1.62	N/A	1.77	Dry to 1.84					1.84	1.83	0.01
MP-23	598045	4809233	148.77	1.82	150.58	0.68	0.43	0.25	04-Jul-11							2.03	1.73	0.30				2.39	dry to 1.71		Frozen at 1.56	Frozen at 1.61	N/A	1.69	Dry to 1.79		1.76	1.75	0.01			
MP-24s	597912	4809256	148.80	0.93	149.73	0.44	0.31		22-Oct-13																											
MP-24d	597912	4809256	148.80	1.30	150.11	1.28	1.19		22-Oct-13																											
Observations at Other Locations - Not Mini-Piezometers																																				
Stream Gauge #1	597677	4809113	149.61	0.95	150.57				24-Sep-09	0.15			0.88			0.14	pooled					0.20			0.24						0.18					
Stream Gauge #2	598345	4809063	142.35	0.99	143.34				24-Sep-09	0.20			0.90			Destroyed																				
FMP-01	597622	4809128	150.16		N/A									Frozen	No Flow																	0.08	Good			
FMP-02	597574	4809796	153.31		N/A									Frozen	No Flow			Dry														0.12	No flow			
FMP-03	596266	4809815			N/A									Frozen	No Flow																					
FMP-04	597523	4809561												Frozen	No Flow																	0.05	Average			

Notes:

Difference in heads

- Negative Value = Upward Flow (from ground into channel)
- Positive Value = Downward Flow (from channel into ground)
- indicates piezometer and/or surface water were frozen (ice)

Minipiezometers are between 1.85 to 1.86 m total length from top of pipe to tip (2009 installations)

Table SWL-2: Static Water Levels at Mini-Piezometers, Staff Gauges, and Flow Measuring Points

ID	Location[1]		Ground Elevation [2]	Stick-up	Top Elevation	Screen Bottom	Screen Top	Screen	Install Date	Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels		
	Easting	Northing								22-Apr-13			10-Jul-13			04-Sep-13			05-Sep-13			09-Sep-13			12-Sep-13			10-Oct-13			22-Oct-13			29-Oct-13		
	m	m	masl	mag	masl	mbg	mbg	m		In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta
MP-01	597409	4809840	154.59	1.22	155.81	0.64	0.39	0.25	05-May-09	1.04	1.10	(0.06)																								
MP-02	597769	4809666	151.54	1.05	152.59	0.81	0.56	0.25	05-May-09	1.01	0.97	0.04	1.05	1.08	(0.03)																					
MP-03	597808	4809266	149.16	1.35	150.51	0.50	0.25	0.25	05-May-09																											
MP-04	597972	4809088	144.12	1.44	145.56	0.41	0.16	0.25	05-May-09																											
MP-05 (pond on hill)	597514	4809671	157.61	1.27	158.88	0.59	0.34	0.25	05-May-09	1.16	1.17	(0.01)	1.53	Dry to 1.26																					
MP-06	597348	4809418	152.20	1.25	153.45	0.61	0.36	0.25	05-May-09	1.09	1.09	0.00		Not located																					
MP-07	597541	4809150	150.78	1.29	152.07	0.57	0.32	0.25	05-May-09	1.07	1.09	(0.02)		Not located																					
MP-21	598162	4809146	148.83	1.85	150.69	0.51	0.26	0.25	04-Jul-11	1.90	dry		1.91	Dry to 1.83		2.24	Dry to 1.82		2.24			2.22			2.30	Dry to 1.84		2.01	Dry to 1.81		1.98	1.85	0.13			
MP-22	598051	4809192	148.76	1.84	150.60	0.55	0.30	0.25	04-Jul-11	1.64	dry		1.65	1.88	(0.23)	1.40	Dry to 1.64		2.28	Dry to 1.64		2.27			2.26	Dryto 1.80		2.28	Dry to 1.79		2.26	1.80	0.46	2.23	1.91	0.32
MP-23	598045	4809233	148.77	1.82	150.58	0.68	0.43	0.25	04-Jul-11	1.45	dry		1.36	Dry to 1.75		1.41	Dry to 1.60		2.48	Dry to 1.60		2.42			2.40	Dry to 1.62 to		2.25	Dry to 1.66		2.10	1.68	0.42	2.00	Dry to 1.66	
MP-24s	597912	4809256	148.80	0.93	149.73	0.44	0.31		22-Oct-13																					0.96	Dry to 0.92		0.96	Dry to 0.92	
MP-24d	597912	4809256	148.80	1.30	150.11	1.28	1.19		22-Oct-13																					1.30	Dry to 1.31		1.24	Dry to 1.31	
Observations at Other Locations - Not Mini-Piezometers																																				
Stream Gauge #1	597677	4809113	149.61	0.95	150.57				24-Sep-09				0.20																							
Stream Gauge #2	598345	4809063	142.35	0.99	143.34				24-Sep-09																											
FMP-01	597622	4809128	150.16		N/A									0.09	Good																					
FMP-02	597574	4809796	153.31		N/A									0.04	Good																					
FMP-03	596266	4809815			N/A																															
FMP-04	597523	4809561												0.02	Slow Flow																					

Notes:

Difference in heads

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- Positive Value = Downward Flow (from channel into ground)
- indicates piezometer and/or surface water were frozen (ice)

Minipiezometers are between 1.85 to 1.86 m total length from top of pipe to tip (2009 installations)

Table SWL-2: Static Water Levels at Mini-Piezometers, Staff Gauges, and Flow Measuring Points

ID	Location[1]		Ground Elevation [2]	Stick-up	Top Elevation	Screen Bottom	Screen Top	Screen	Install Date	Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels		
	Easting	Northing								01-Nov-13			11-Nov-13			17-Dec-13			29-Apr-14			30-Apr-14			06-May-14			25-Jul-14			14-Oct-16			22-Jan-15		
	m	m	masl	mag	masl	mbg	mbg	m		In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta
MP-01	597409	4809840	154.59	1.22	155.81	0.64	0.39	0.25	05-May-09													1.01	1.02	(0.01)					Dry to 1.09			Dry to 1.09			Frozen to 1.06	Ice	
MP-02	597769	4809666	151.54	1.05	152.59	0.81	0.56	0.25	05-May-09							1.055 to ice	Dry to 1.03					0.94	0.94	0.00				1.14	Dry to 1.07		1.26	Dry to 1.04		Frozen to 0.99	Ice	
MP-03	597808	4809266	149.16	1.35	150.51	0.50	0.25	0.25	05-May-09																											
MP-04	597972	4809088	144.12	1.44	145.56	0.41	0.16	0.25	05-May-09																											
MP-05 (pond on hill)	597514	4809671	157.61	1.27	158.88	0.59	0.34	0.25	05-May-09							1.48	1.22	0.26				1.18	1.18	0.00				Dry to 1.28	Dry to 1.56		Dry to 1.25	Dry to 1.25		Frozen to 1.18	Dry to 1.19	
MP-06	597348	4809418	152.20	1.25	153.45	0.61	0.36	0.25	05-May-09													0.89	0.89					1.17	Dry to 1.135		1.15	Dry to 1.12		Frozen to 0.98	Ice	
MP-07	597541	4809150	150.78	1.29	152.07	0.57	0.32	0.25	05-May-09							1.185 to ice	Dry to 1.13					0.85	0.85					1.18	Dry to 1.12		1.23	Dry to 1.12		Frozen to 0.95	Dry to 1.03	
MP-21	598162	4809146	148.83	1.85	150.69	0.51	0.26	0.25	04-Jul-11	1.88	1.76	0.12	1.89	dry to 1.85		1.94	1.77	0.17	1.56	1.68	(0.12)	1.56	1.66	(0.11)	1.72	Dry to 1.82		1.91	Dry to 1.76		2.05	Dry to 1.815		1.94	Snow/ dry to 1.78	
MP-22	598051	4809192	148.76	1.84	150.60	0.55	0.30	0.25	04-Jul-11	2.24	1.66	0.58	2.22	dry to 1.84		2.18	1.79	0.39				2.06	1.53	0.53	2.04	1.82	0.23	2.06	Dry to 1.78		1.97	Dry to 1.785		Frozen to 1.55	Snow/dry to 1.75	
MP-23	598045	4809233	148.77	1.82	150.58	0.68	0.43	0.25	04-Jul-11	2.00	1.63	0.37	1.92	dry to 1.745		1.89	1.67	0.22				1.52	1.52	0.00	1.65	Dry to 1.72		1.68	Dry to 1.72		1.78	Dry to 1.73		1.83	Dry to 2.49	
MP-24s	597912	4809256	148.80	0.93	149.73	0.44	0.31		22-Oct-13	0.78	0.78	0.00	0.98			1.11	0.88	0.23				0.68	0.69	(0.01)	0.92	Dry to 0.92		1.33	Dry to 0.90		1.14	Dry to 0.89		Frozen to 0.73	Ice to 0.87	
MP-24d	597912	4809256	148.80	1.30	150.11	1.28	1.19		22-Oct-13	1.26	1.15	0.11	1.28	dry to 1.25		1.31 to ice	1.19					1.29	1.06	0.24	1.35	Dry to 1.24		1.50	Dry to 1.23		1.54	Dry to 1.23		Frozen to 1.47	Ice to 1.47	
Observations at Other Locations - Not Mini-Piezometers																																				
Stream Gauge #1	597677	4809113	149.61	0.95	150.57				24-Sep-09													0.50									0.10			Frozen to 0.30		
Stream Gauge #2	598345	4809063	142.35	0.99	143.34				24-Sep-09																											
FMP-01	597622	4809128	150.16		N/A																										0.10					
FMP-02	597574	4809796	153.31		N/A																										DRY					
FMP-03	596266	4809815			N/A																															
FMP-04	597523	4809561																													DRY					

Notes:

Difference in heads

- Negative Value = Upward Flow (from ground into channel)
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- indicates piezometer and/or surface water were frozen (ice)

Minipiezometers are between 1.85 to 1.86 m total length from top of pipe to tip (2009 installations)

Table SWL-2: Static Water Levels at Mini-Piezometers, Staff Gauges, and Flow Measuring Points

ID	Location[1]		Ground Elevation [2]	Stick-up	Top Elevation	Screen Bottom	Screen Top	Screen	Install Date	Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels			Water Levels		
	Easting	Northing								27-Apr-15			04-May-15			28-Jul-15			30-Oct-15			23-Dec-15			25-Jan-16			04-Apr-16			14-Jul-16		
	m	m	masl	mag	masl	mbg	mbg	m		In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta
MP-01	597409	4809840	154.59	1.22	155.81	0.64	0.39	0.25	05-May-09	1.15	1.15					Dry to 1.55	Dry to 1.06		1.14	Dry to 1.16					Frozen to 1.07	Dry to 1.15		1.03	1.08	(0.05)	1.26	Dry to 1.160	
MP-02	597769	4809666	151.54	1.05	152.59	0.81	0.56	0.25	05-May-09	1.03	1.03					Dry to 1.54	Dry to 1.15		1.06	Dry to 1.05		1.06	Dry to 1.07		Frozen to 0.93	Dry to 1.04		0.94	0.97	(0.03)	Dry to 1.540	Dry to 1.090	
MP-03	597808	4809266	149.16	1.35	150.51	0.50	0.25	0.25	05-May-09																								
MP-04	597972	4809088	144.12	1.44	145.56	0.41	0.16	0.25	05-May-09																								
MP-05 (pond on hill)	597514	4809671	157.61	1.27	158.88	0.59	0.34	0.25	05-May-09	1.23	1.24	(0.01)				Dry to 1.54	Dry to 1.28		1.47	Dry to 1.28					Dry to 1.54	Dry to 1.25		1.15	1.12	0.03	Dry to 1.540	Dry to 1.3	
MP-06	597348	4809418	152.20	1.25	153.45	0.61	0.36	0.25	05-May-09	1.09	1.08	0.01				Dry to 1.54	Dry to 1.02		1.11	Dry to 1.02					Frozen to 0.99	Dry/ice to 0.88		0.95	0.97	(0.02)	Dry to 1.540	Dry to 1.145	
MP-07	597541	4809150	150.78	1.29	152.07	0.57	0.32	0.25	05-May-09	1.17	1.17					Dry to 1.54	Dry to 1.08		1.20	Dry to 1.07					Frozen to 1.02	Dry to 1.07		1.01	1.01		Dry to 1.542	Dry to 1.150	
MP-21	598162	4809146	148.83	1.85	150.69	0.51	0.26	0.25	04-Jul-11	1.69	Dry to 1.81		1.68	Dry/ damp to 1.85		1.83	Dry to 1.81		2.24	Dry to 1.80		2.05	Dry to 1.76		Frozen to 1.73	Dry to 1.76		Frozen to 1.63	Dry to 1.81		Dry to 2.325	Dry to 1.815	
MP-22	598051	4809192	148.76	1.84	150.60	0.55	0.30	0.25	04-Jul-11	1.71	1.84	(0.13)	1.73	Dry to 1.81		1.89	Dry to 1.83		2.15	Dry to 1.83		1.92	Dry to 1.69		1.95	Dry to 1.72		1.53	1.76	(0.23)	2.18	Dry to 1.855	
MP-23	598045	4809233	148.77	1.82	150.58	0.68	0.43	0.25	04-Jul-11	1.82	Dry to 1.68		1.82	Dry to 1.68		1.86	Dry to 1.695		2.11	Dry to 1.68		2.05	Dry to 1.70		Dry to 2.49	Dry to 1.67		1.91	Dry to 1.65		1.86	Dry to 1.650	
MP-24s	597912	4809256	148.80	0.93	149.73	0.44	0.31		22-Oct-13	0.97	Damp to 0.94		1.04	Dry to 0.935		Dry to 1.38	Dry to 0.93		1.08	Dry to 0.93		1.08	Dry to 0.93		Frozen to 0.97	Dry to 0.90		0.89	Frozen to 0.89		Dry to 1.128	Dry to 0.963	
MP-24d	597912	4809256	148.80	1.30	150.11	1.28	1.19		22-Oct-13	1.40	Damp to 1.29		1.43	Dry to 1.30		1.83	Dry to 1.28		1.46	Dry to 1.26		1.46	Dry to 1.29		Frozen to 1.21	Dry to 1.23		1.27	Frozen to 1.26		Dry to 2.022	Dry to 1.282	
Observations at Other Locations - Not Mini-Piezometers																																	
Stream Gauge #1	597677	4809113	149.61	0.95	150.57				24-Sep-09	0.17						< 0.10																		
Stream Gauge #2	598345	4809063	142.35	0.99	143.34				24-Sep-09																								
FMP-01	597622	4809128	150.16		N/A											Dry																		
FMP-02	597574	4809796	153.31		N/A											Dry																Dry to 1.210		
FMP-03	596266	4809815			N/A											Dry																		
FMP-04	597523	4809561														Dry																		

Notes:

Difference in heads

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Table SWL-2: Static Water Levels at Mini-Piezometers, Staff Gauges, and Flow Measuring Points

ID	Location[1]		Ground Elevation [2]	Stick-up	Top Elevation	Screen Bottom	Screen Top	Screen	Install Date	Water Levels			Water Levels			Water Levels			Water Levels			Water Levels		
	Easting	Northing								28-Jul-16			14-Oct-16			04-Nov-16			06-Mar-17			18-Apr-17		
	m	m	masl	mag	masl	mbg	mbg	m		In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta	In	Out	Delta
MP-01	597409	4809840	154.59	1.22	155.81	0.64	0.39	0.25	05-May-09				1.26	Dry to 1.160					Frozen to 1.07	Frozen to 1.15		1.15	1.19	0.04
MP-02	597769	4809666	151.54	1.05	152.59	0.81	0.56	0.25	05-May-09				1.33	Dry to 1.07					Frozen to 1.04	1.05		1.05	1.06	0.01
MP-03	597808	4809266	149.16	1.35	150.51	0.50	0.25	0.25	05-May-09															
MP-04	597972	4809088	144.12	1.44	145.56	0.41	0.16	0.25	05-May-09															
MP-05 (pond on hill)	597514	4809671	157.61	1.27	158.88	0.59	0.34	0.25	05-May-09				Dry to 1.54	Dry to 1.307					1.30	1.30		1.29	1.30	0.01
MP-06	597348	4809418	152.20	1.25	153.45	0.61	0.36	0.25	05-May-09				Dry to 1.54	Dry to 1.10					1.01	Frozen to 0.98		1.07	1.10	0.03
MP-07	597541	4809150	150.78	1.29	152.07	0.57	0.32	0.25	05-May-09				1.27	Dry to 1.110					1.22	Dry to 1.118		1.19	1.21	0.02
MP-21	598162	4809146	148.83	1.85	150.69	0.51	0.26	0.25	04-Jul-11	Dry to 2.327	Dry to 1.845		Dry to 2.328	Dry to 1.834					1.97	Frozen to 1.85		1.95	Dry to 1.74	
MP-22	598051	4809192	148.76	1.84	150.60	0.55	0.30	0.25	04-Jul-11				Dry to 2.328	Dry to 1.765					1.89	frozen to 1.74		1.84	Dry to 1.80	
MP-23	598045	4809233	148.77	1.82	150.58	0.68	0.43	0.25	04-Jul-11				2.36	Dry to 1.64					Frozen to 1.41	Dry to 1.65		1.29	Dry to 1.78	
MP-24s	597912	4809256	148.80	0.93	149.73	0.44	0.31		22-Oct-13				Dry to 1.125	Dry to 0.887		1.08	Dry to 0.910		1.03	Dry to 0.94		1.02	Dry to 0.97	
MP-24d	597912	4809256	148.80	1.30	150.11	1.28	1.19		22-Oct-13				1.99	Dry to 1.235		1.45	Dry to 1.305		1.41	Dry to 1.31		1.39	Dry to 1.25	
Observations at Other Locations - Not Mini-Piezometers																								
Stream Gauge #1	597677	4809113	149.61	0.95	150.57				24-Sep-09										0.18	No flow				
Stream Gauge #2	598345	4809063	142.35	0.99	143.34				24-Sep-09															
FMP-01	597622	4809128	150.16		N/A															Frozen to 1.15	no flow			
FMP-02	597574	4809796	153.31		N/A								1.24							Frozen to 1.15	no flow			
FMP-03	596266	4809815			N/A															Frozen	no flow			
FMP-04	597523	4809561																		Frozen	no flow			

Notes:

Difference in heads

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Figure SWL-1: Static Water Levels (2009-2017)

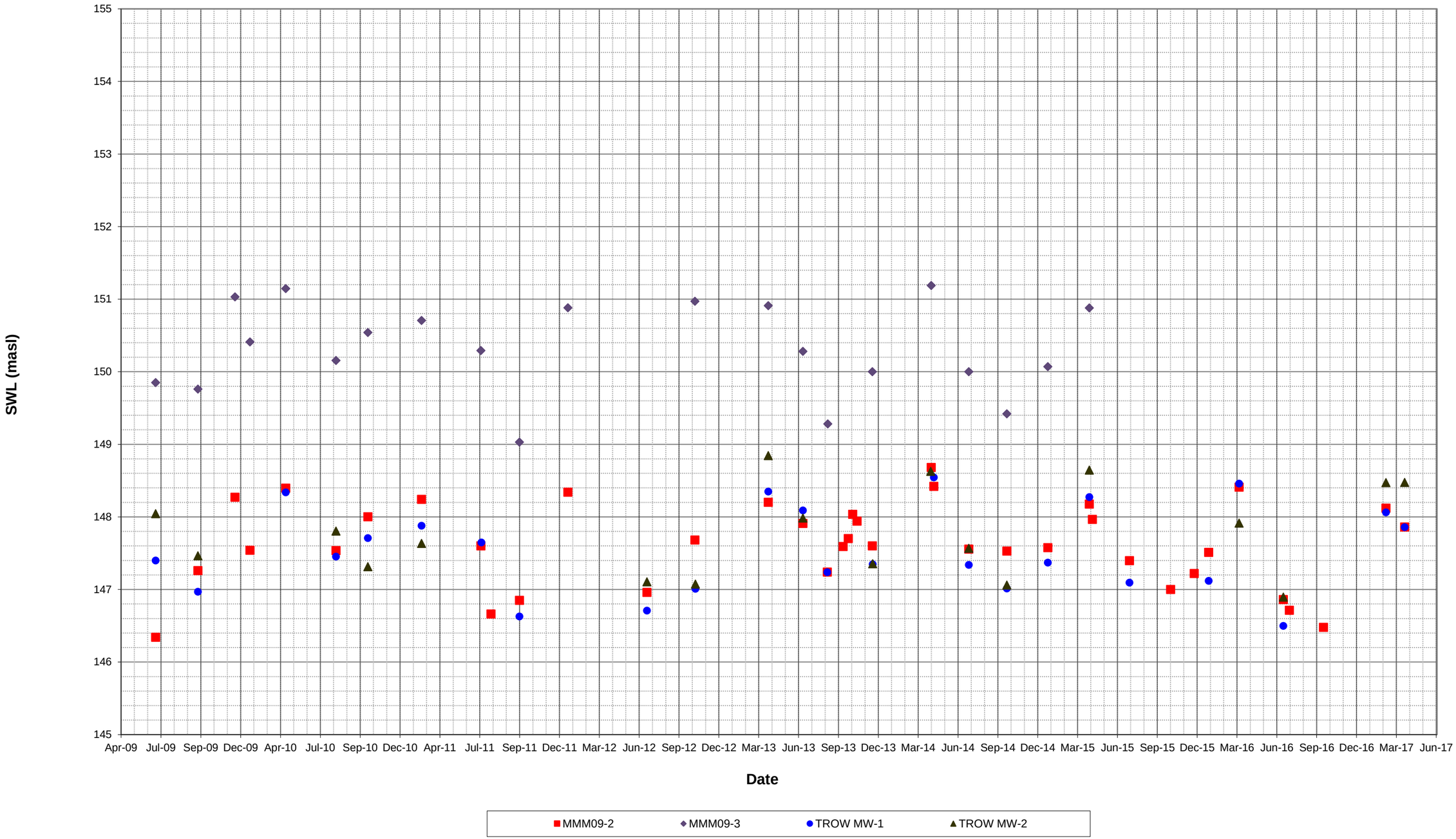


Figure SWL-2: Static Water Levels (2009-2017)

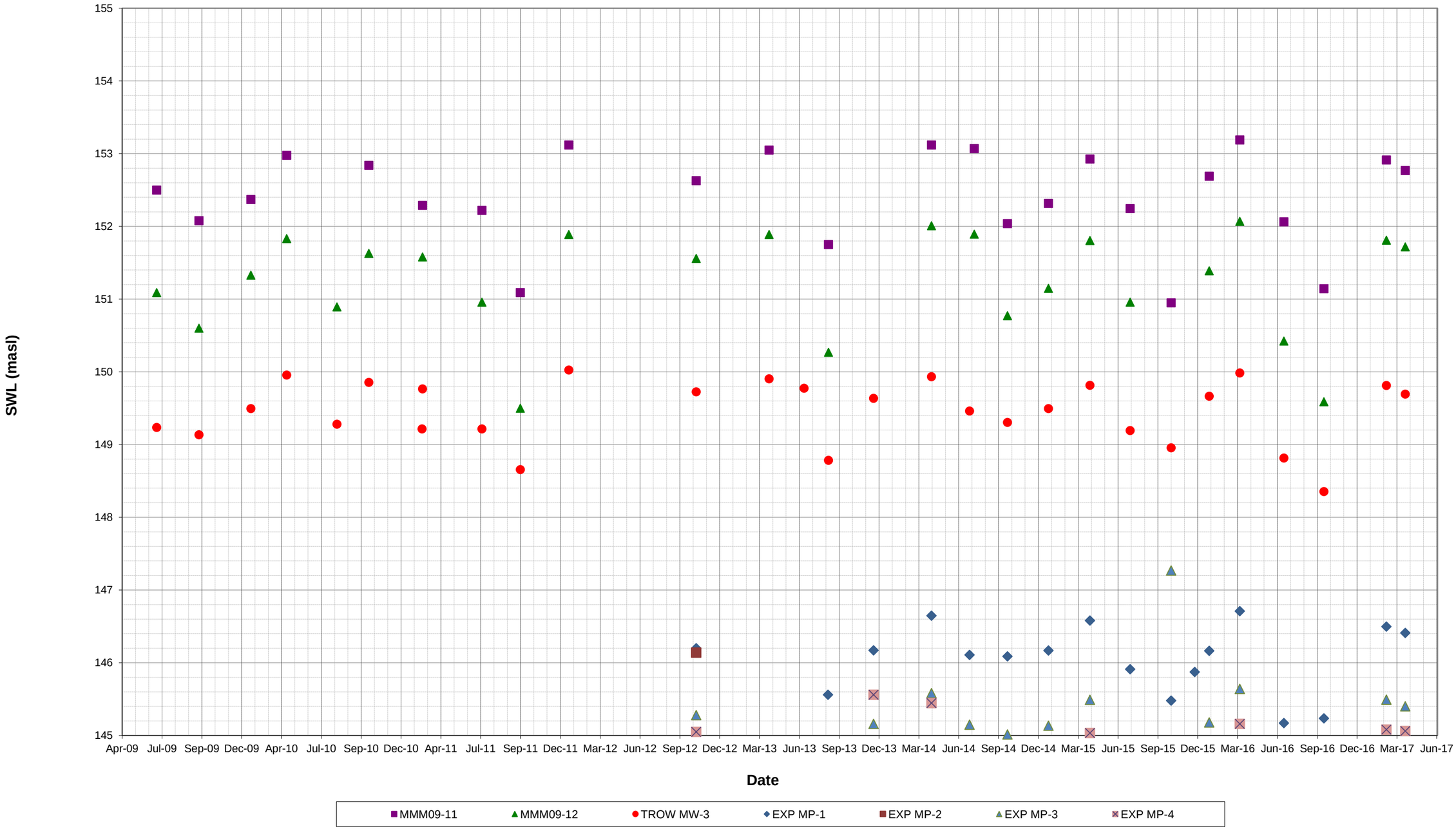


Figure SWL-3: Static Water Levels (2009-2017)

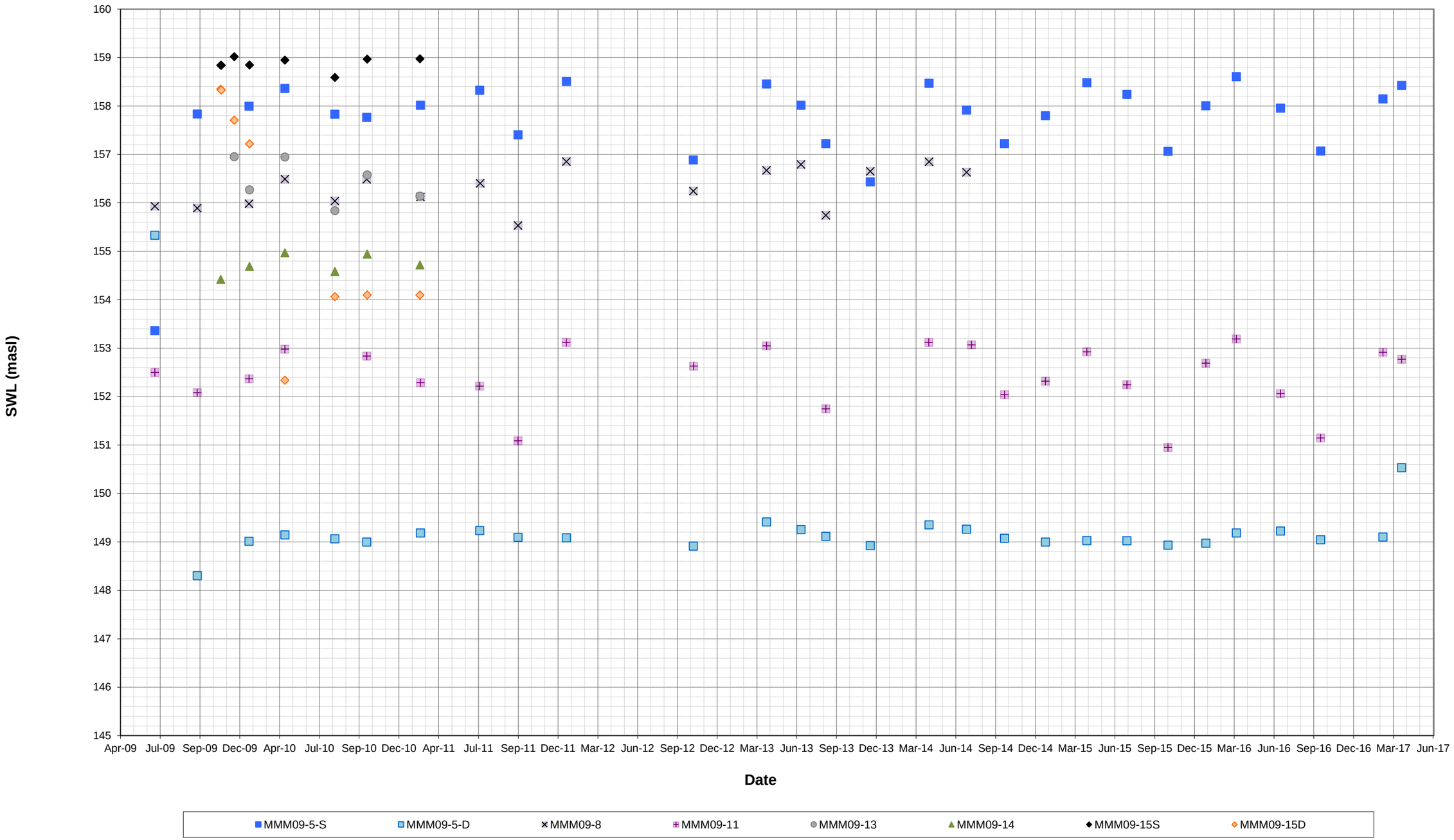


Figure SWL-4: Static Water Levels (2009-2017)

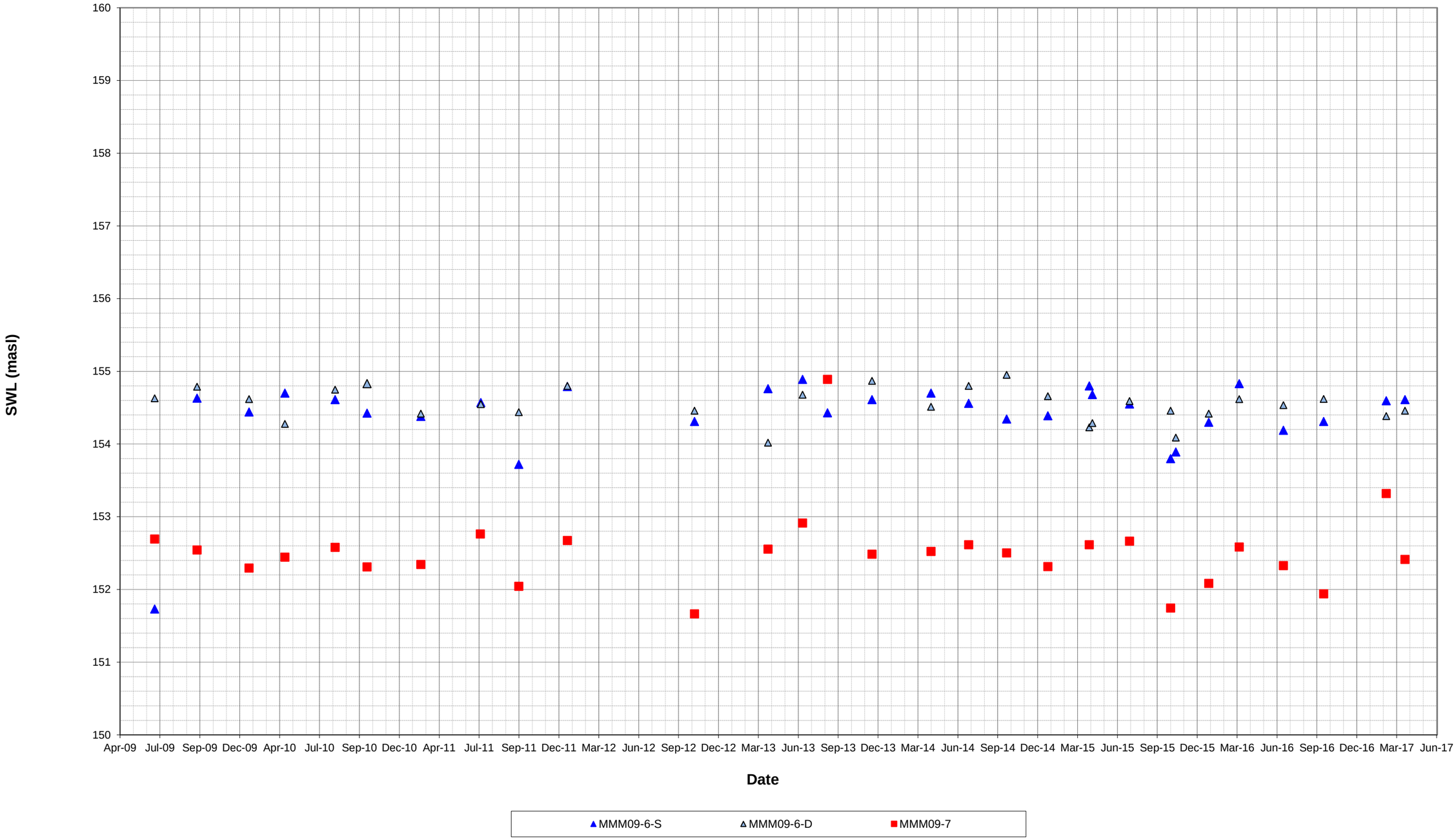


Figure SWL-5: Static Water Levels (2009-2017)

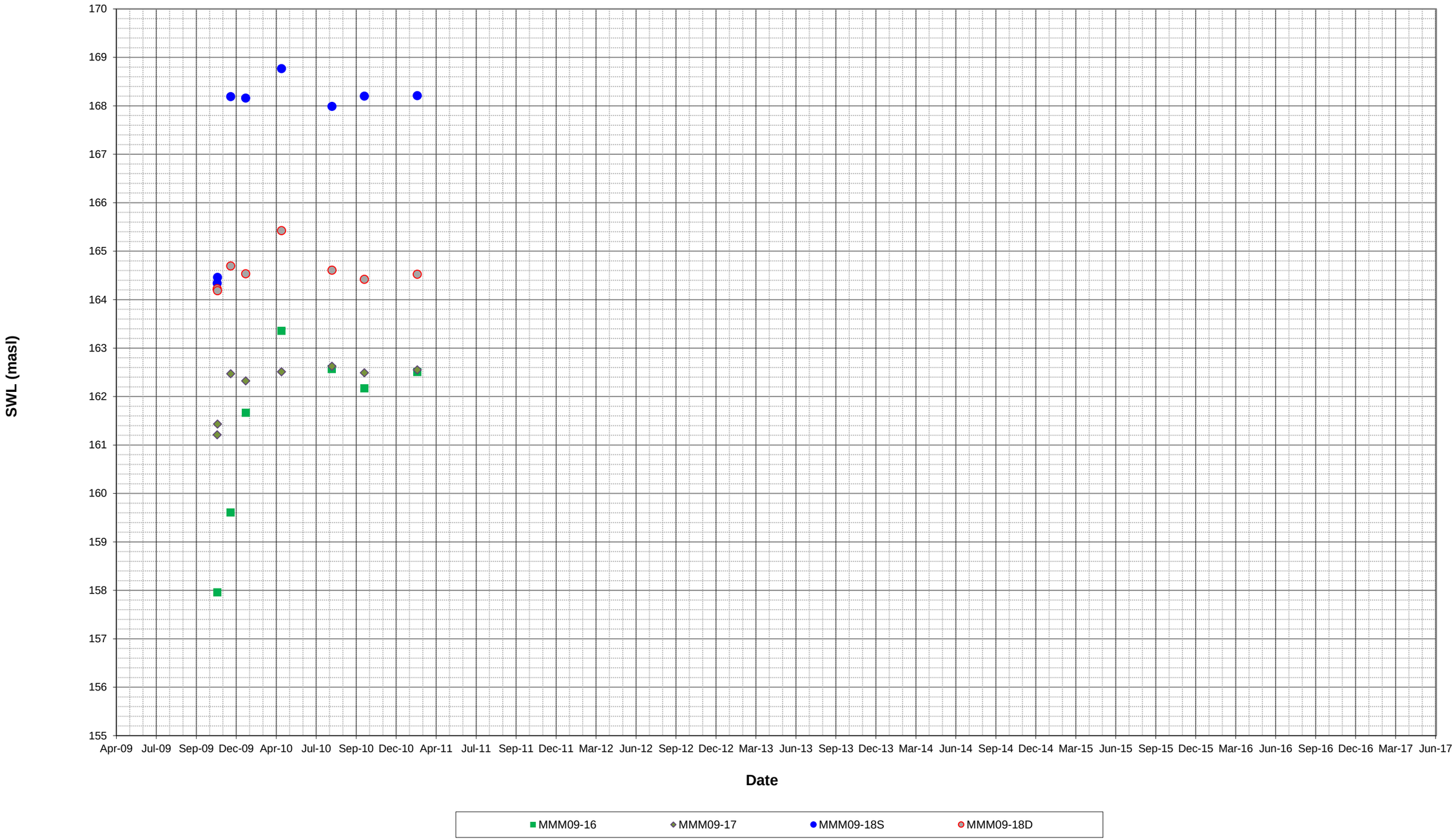


Figure SWL-6: Static Water Levels (2009-2017)

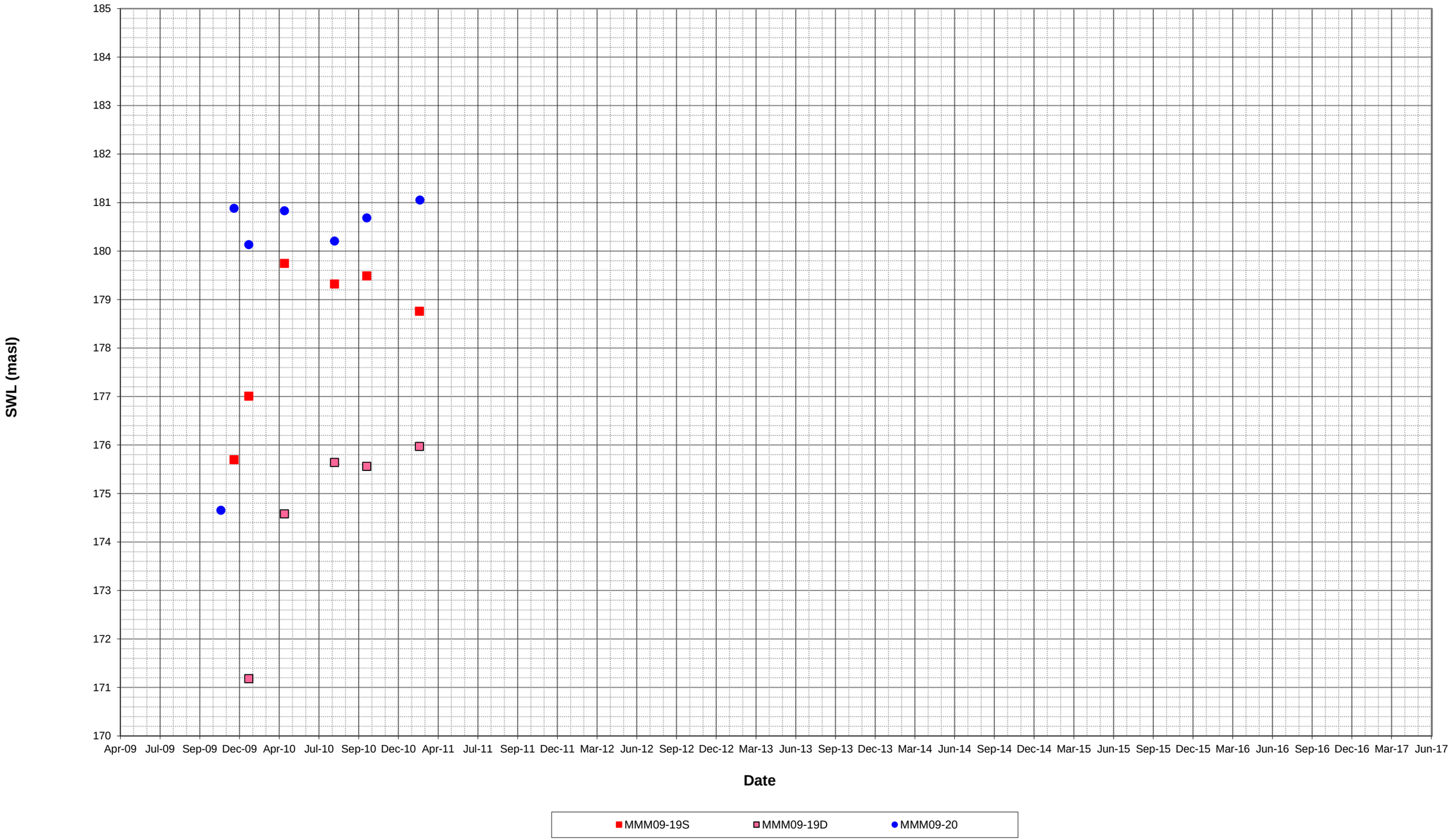


Figure SWL-7: Static Water Levels and Groundwater Temperature
MMM-09-01 Nest

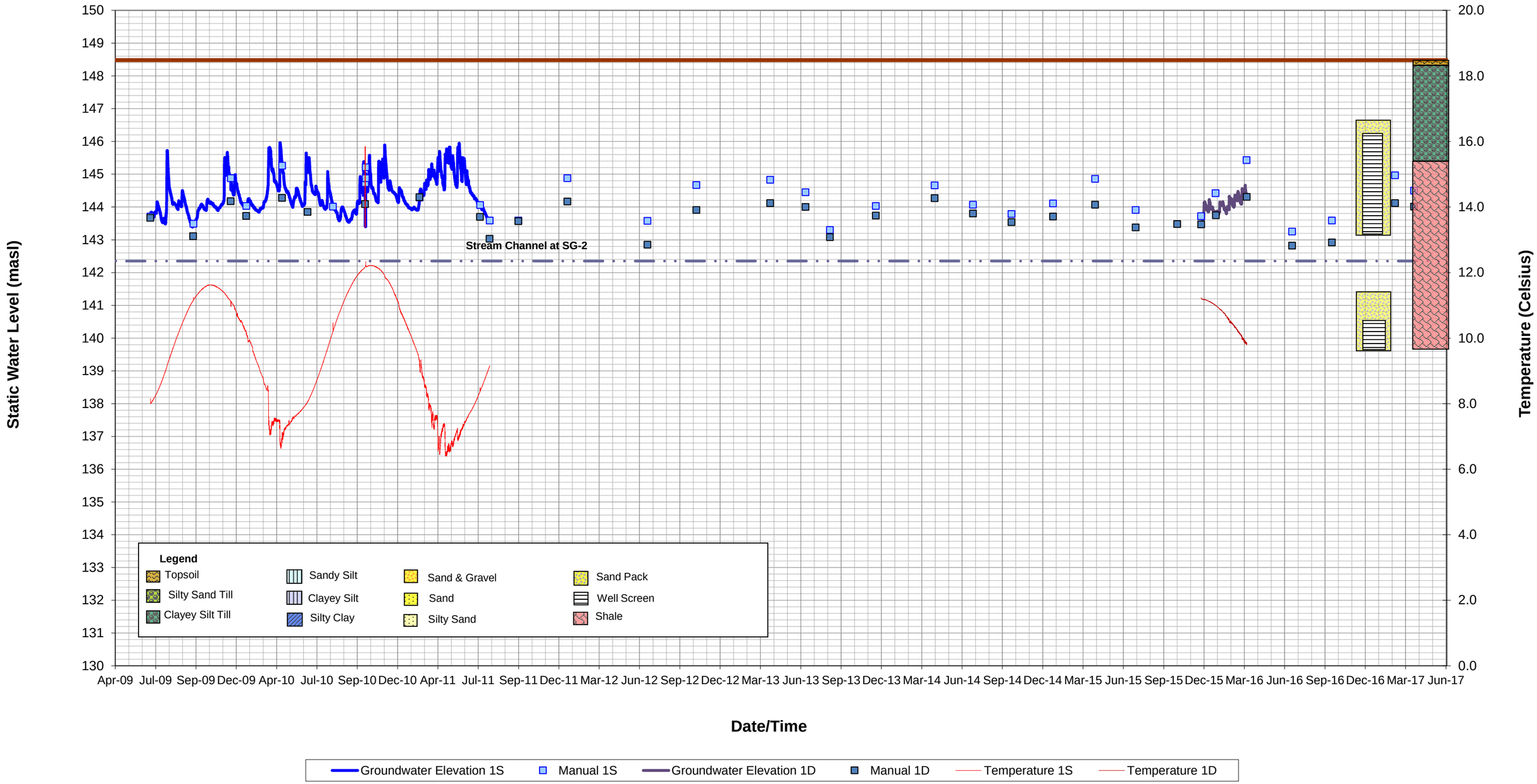


Figure SWL-7a: Static Water Levels
MMM-09-01 Nest - 5 m Vertical Scale

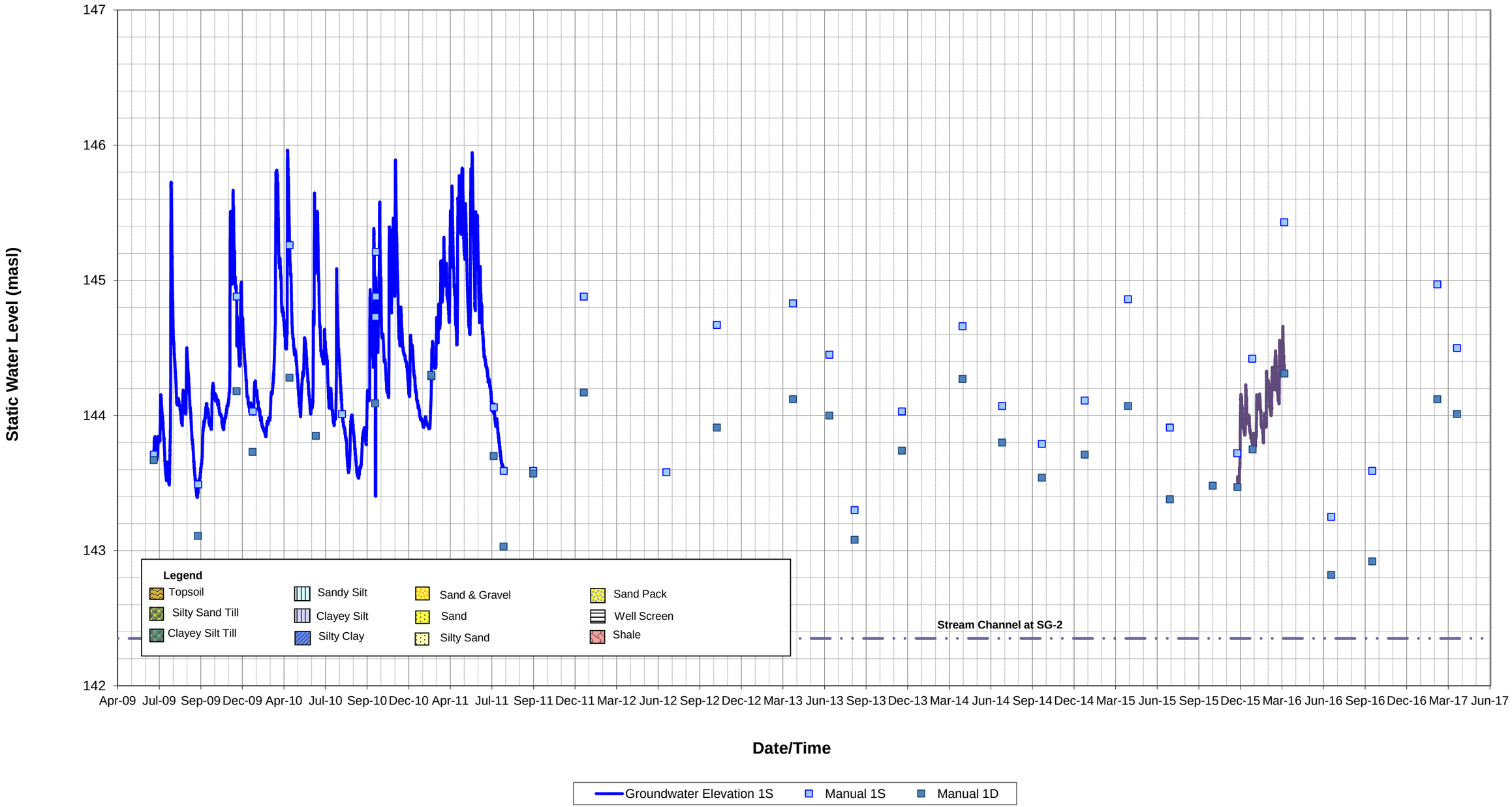


Figure SWL-8: Static Water Levels and Groundwater Temperature
MMM-09-04

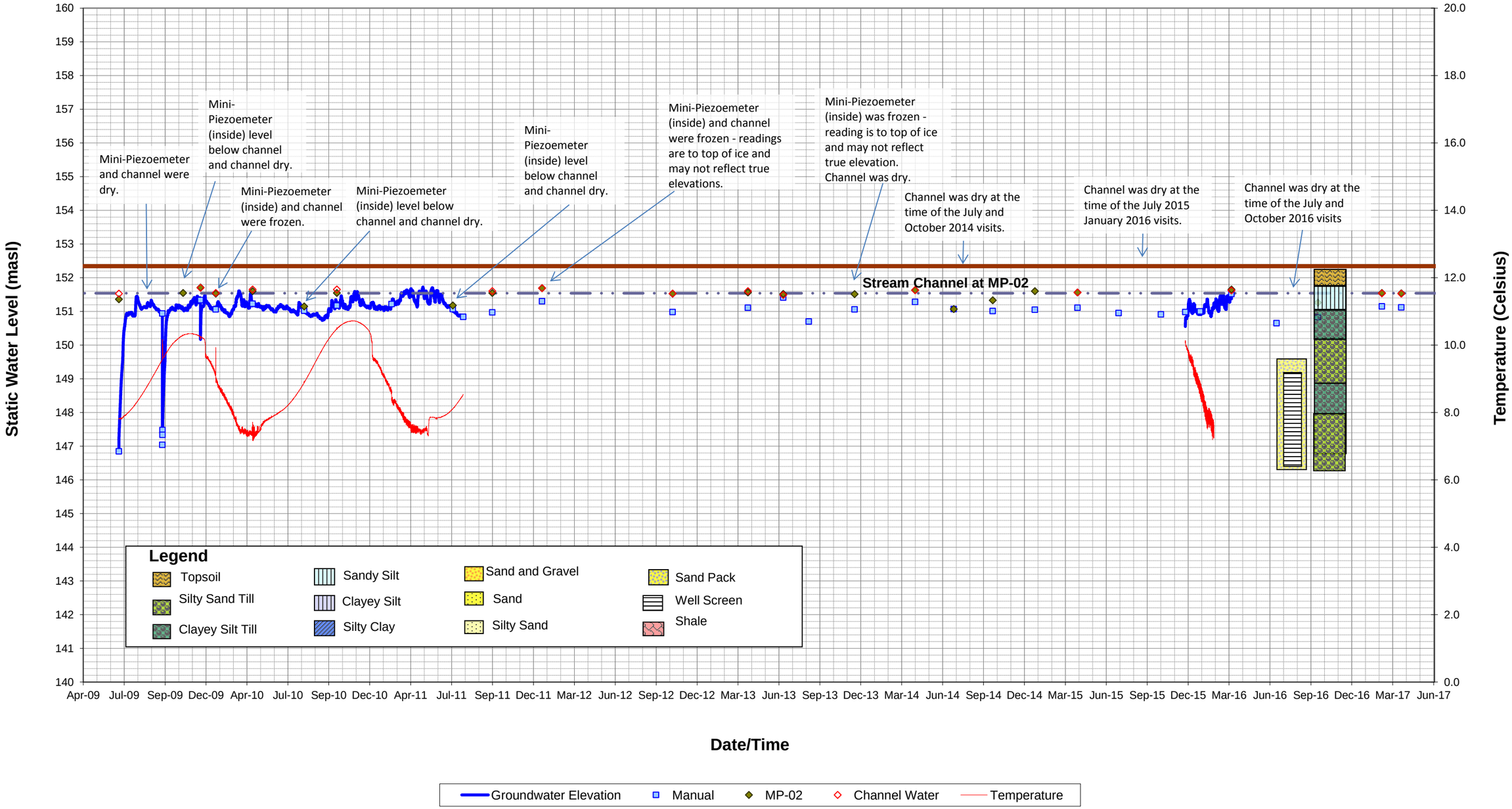


Figure SWL-8a: Static Water Levels
MMM-09-04 - 5 m Vertical Scale

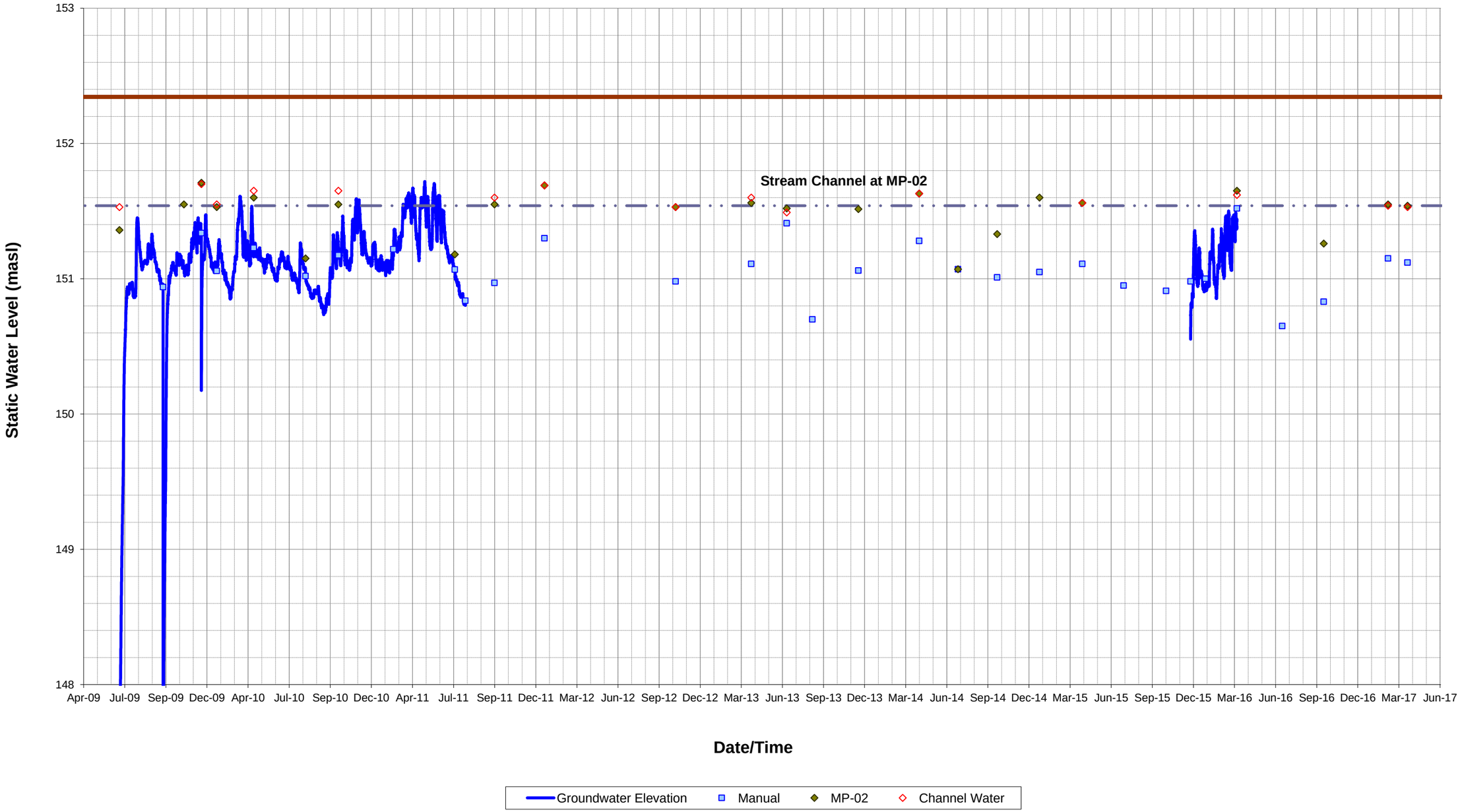


Figure SWL-9: Static Water Levels and Groundwater Temperature
MMM-09-09

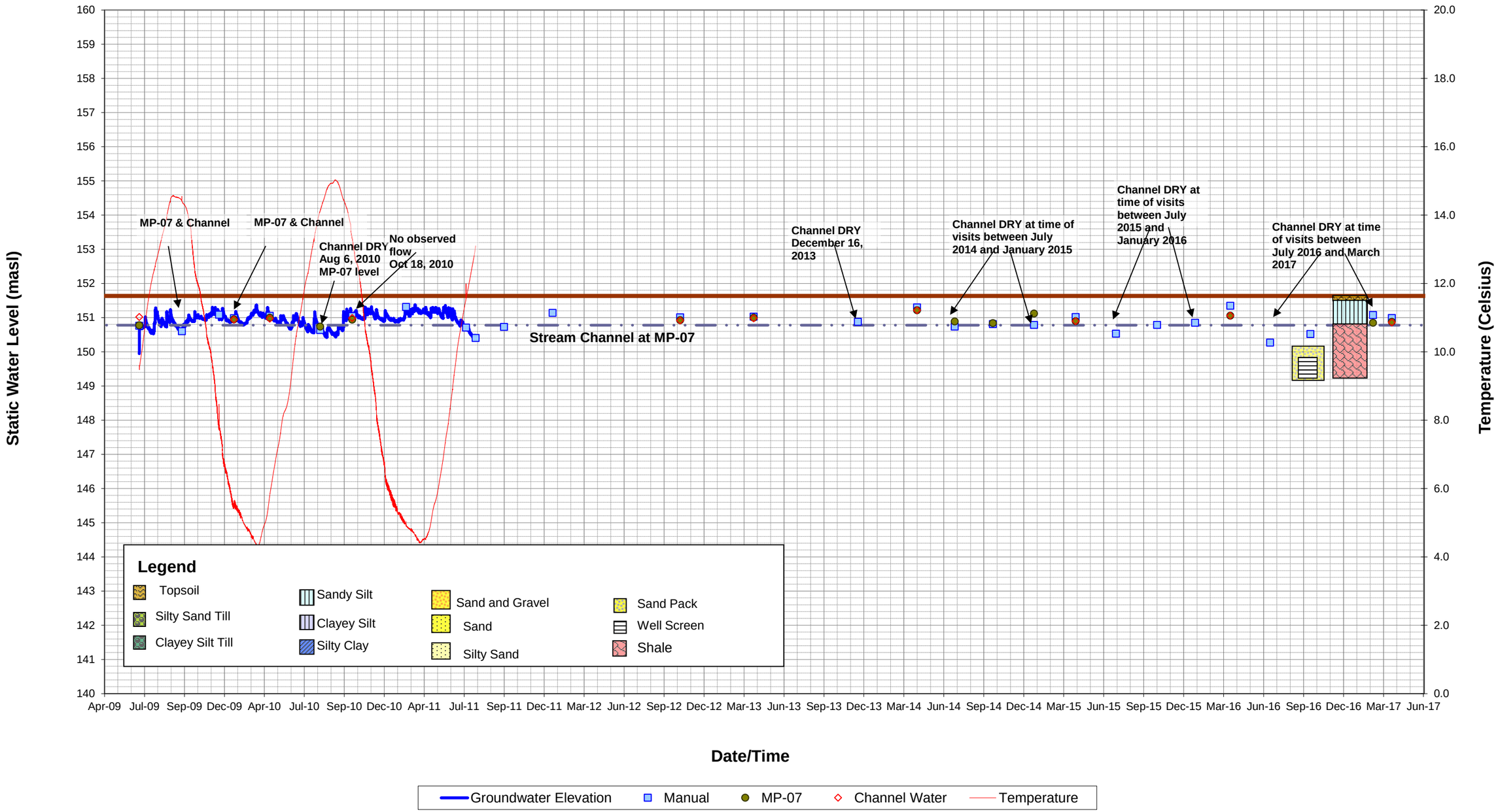


Figure SWL-9a: Static Water Levels
MMM-09-09 - 5 m Vertical Scale

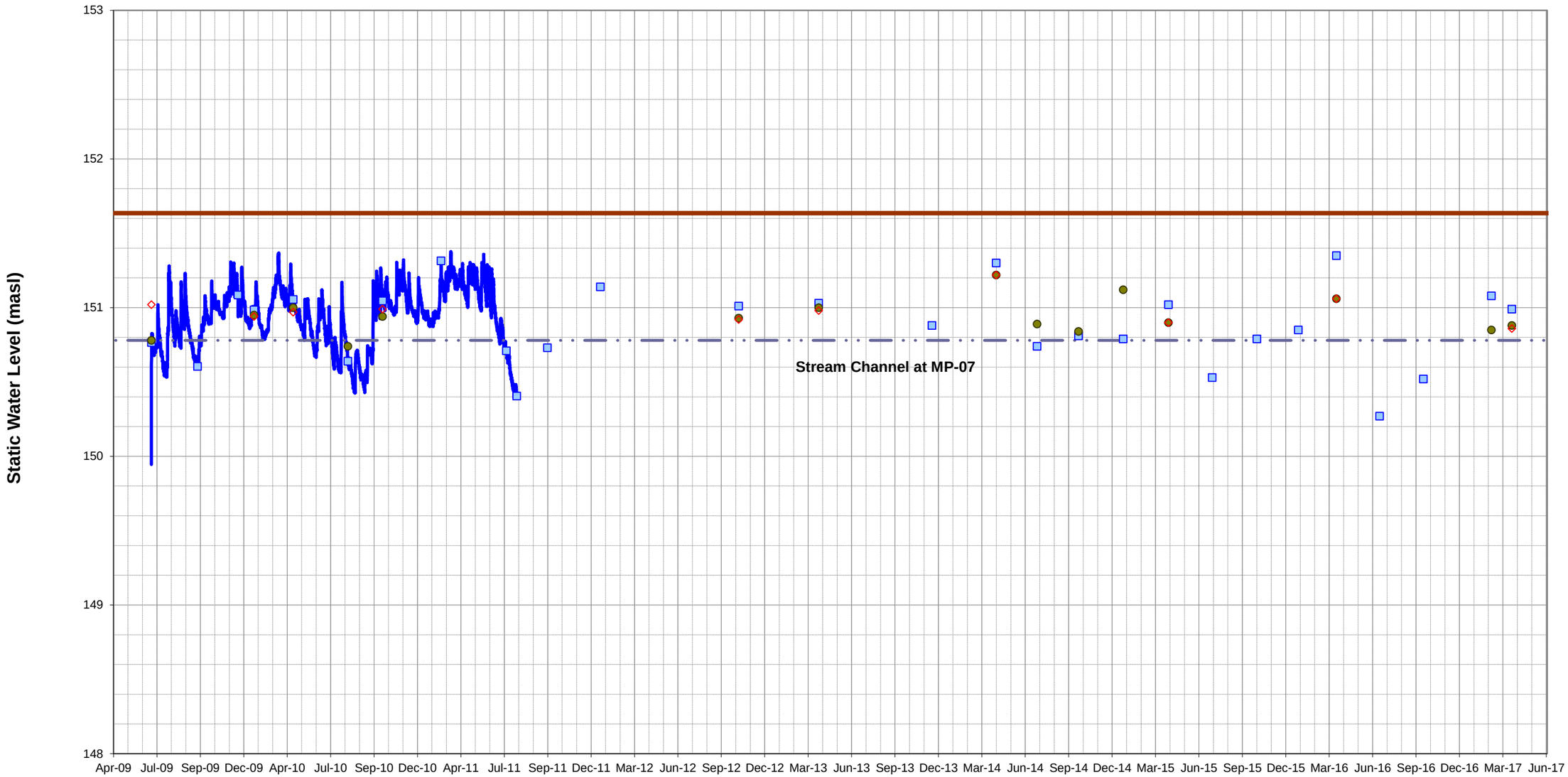


Figure SWL-10: Static Water Levels and Groundwater Temperature
MMM-09-10 Nest

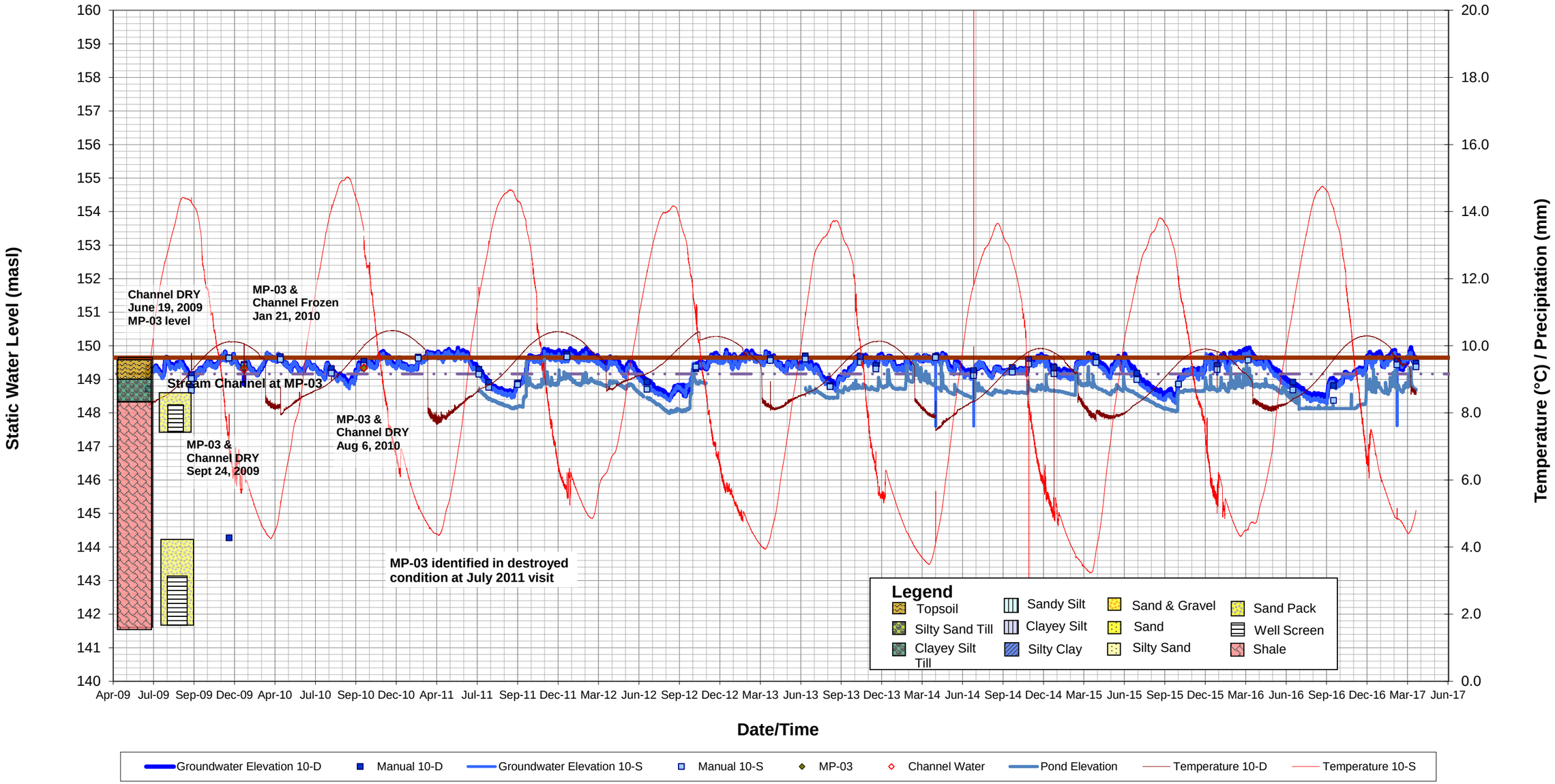


Figure SWL-10a: Static Water Level
MMM-09-10 Nest - 5 m Vertical Scale

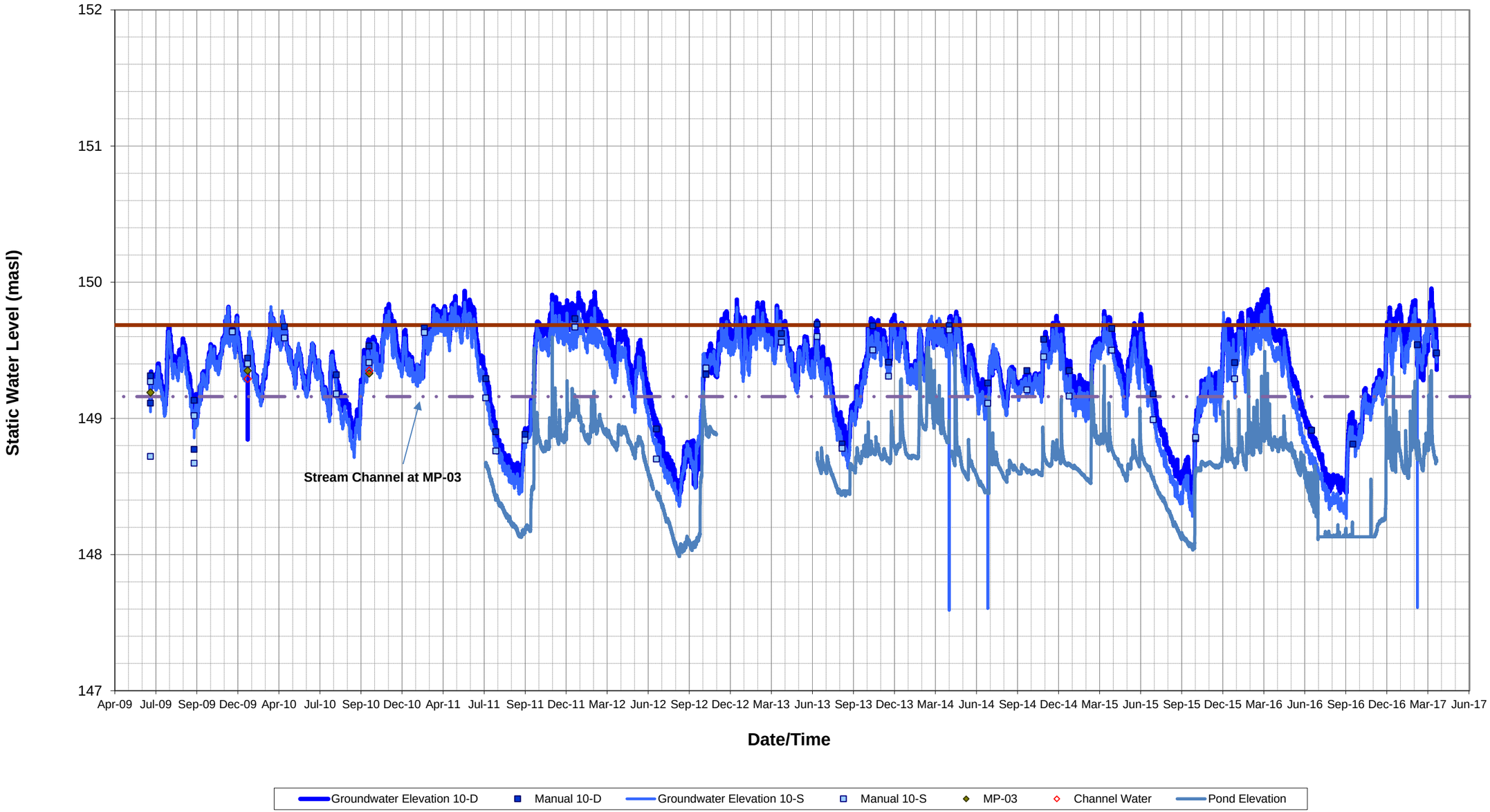


Figure SWL-11: Static Water Levels and Groundwater Temperature
MMM-09-15S (2009-2011)

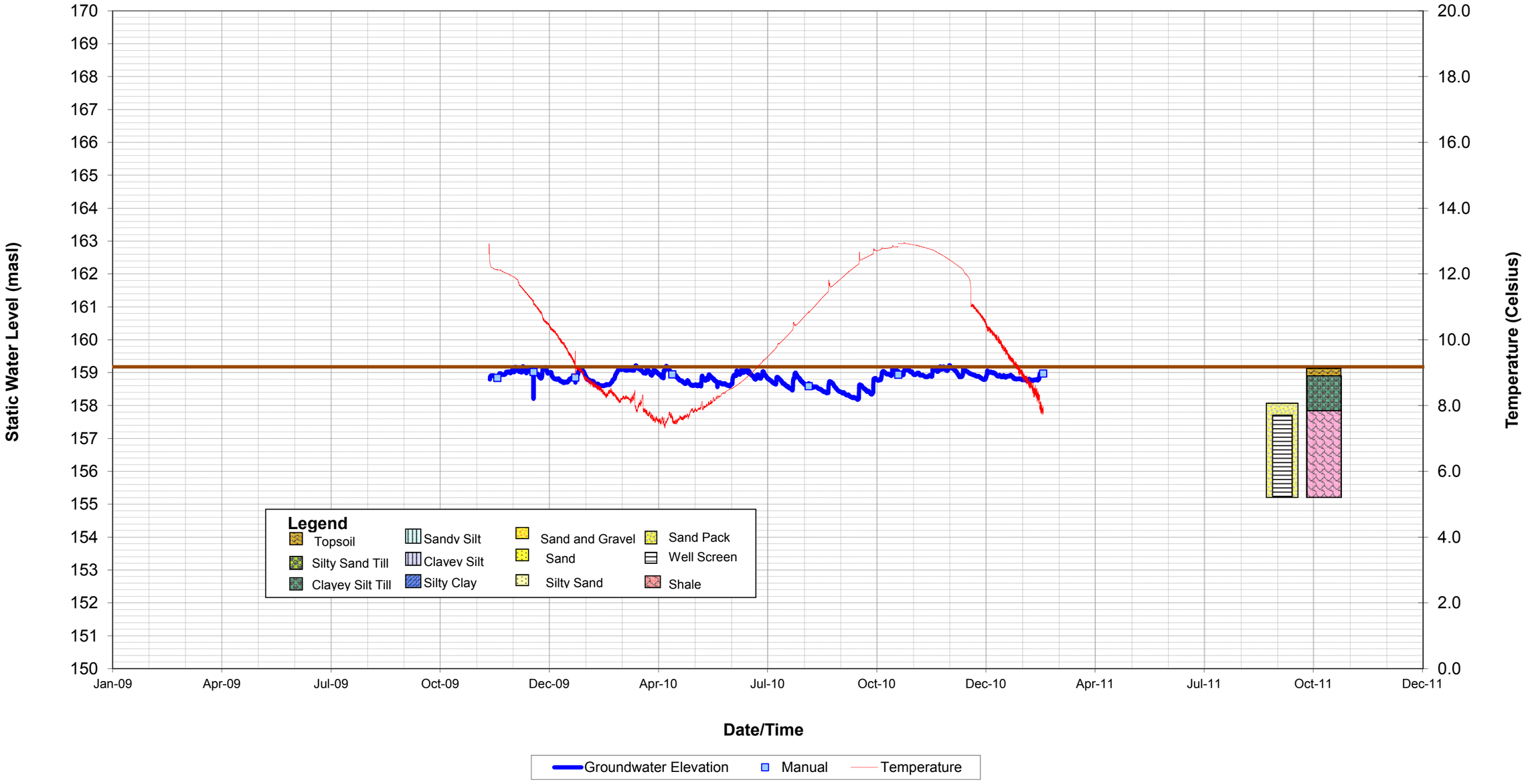


Figure SWL-11a: Static Water Levels
MMM-09-15S - 5 m Vertical Scale (2009-2011)

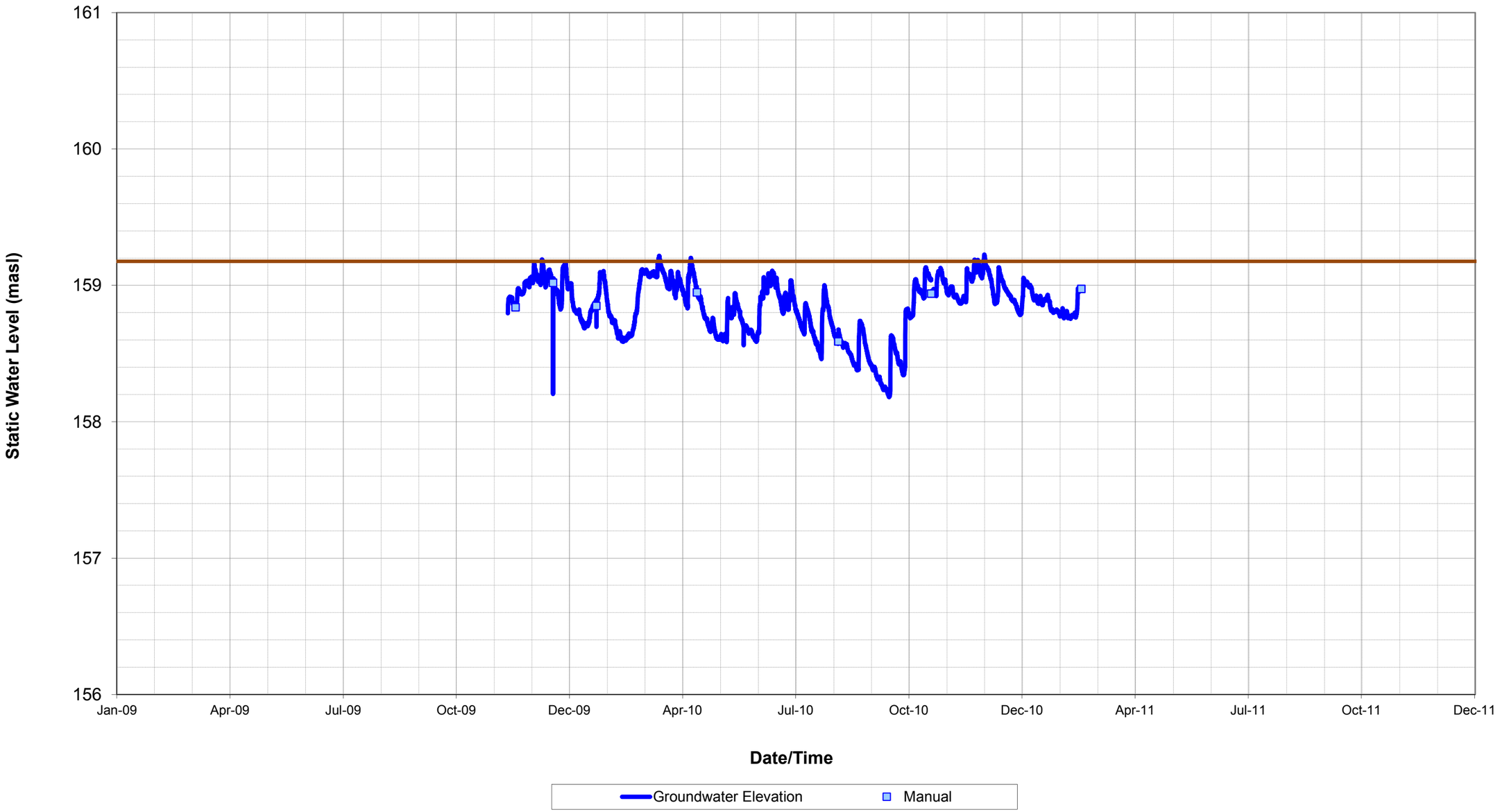


Figure SWL-12: Static Water Levels and Groundwater Temperature
MMM-09-17 (2009-2011)

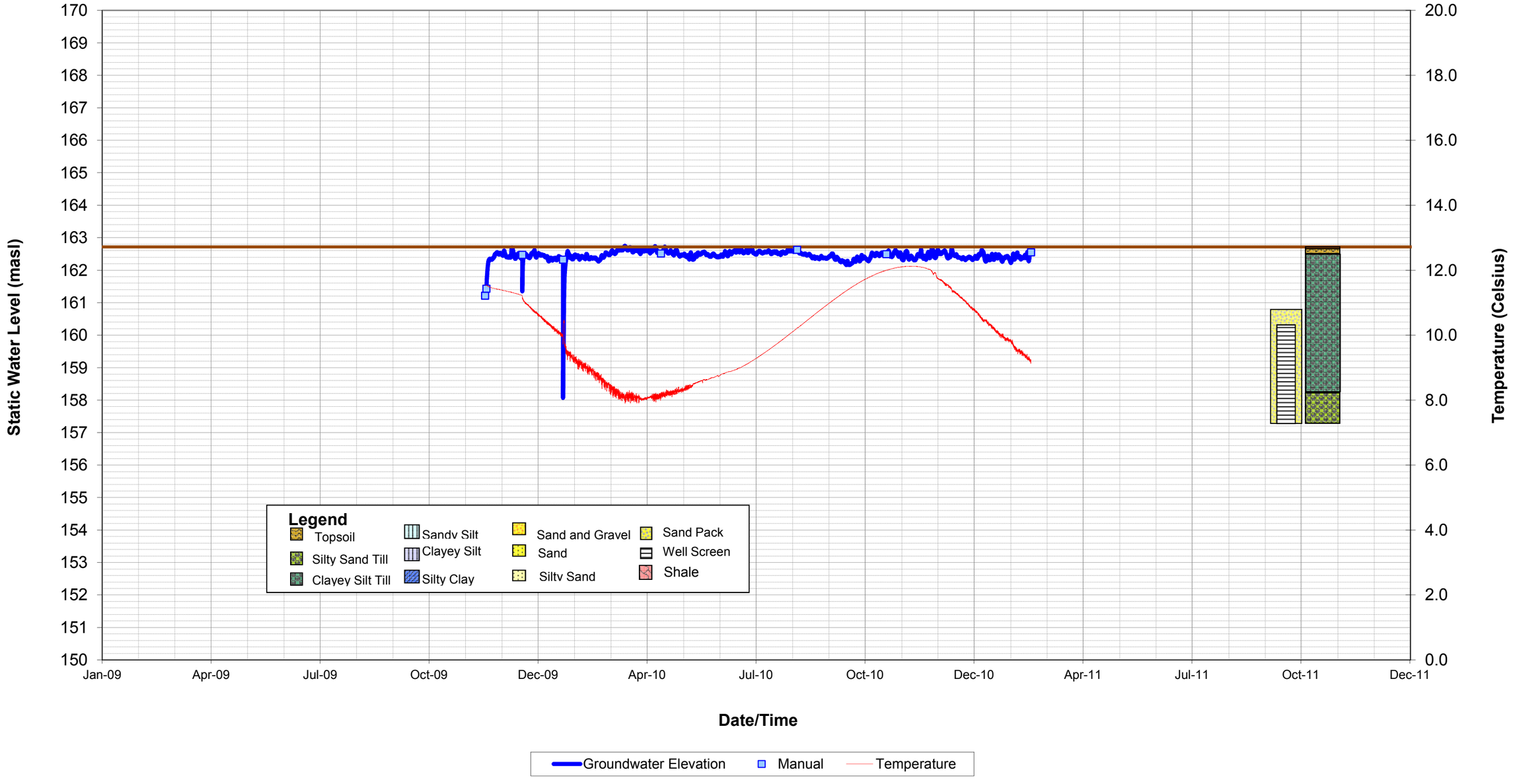


Figure SWL-12a: Static Water Levels
MMM-09-17 - 5 m Vertical Scale (2009-2011)

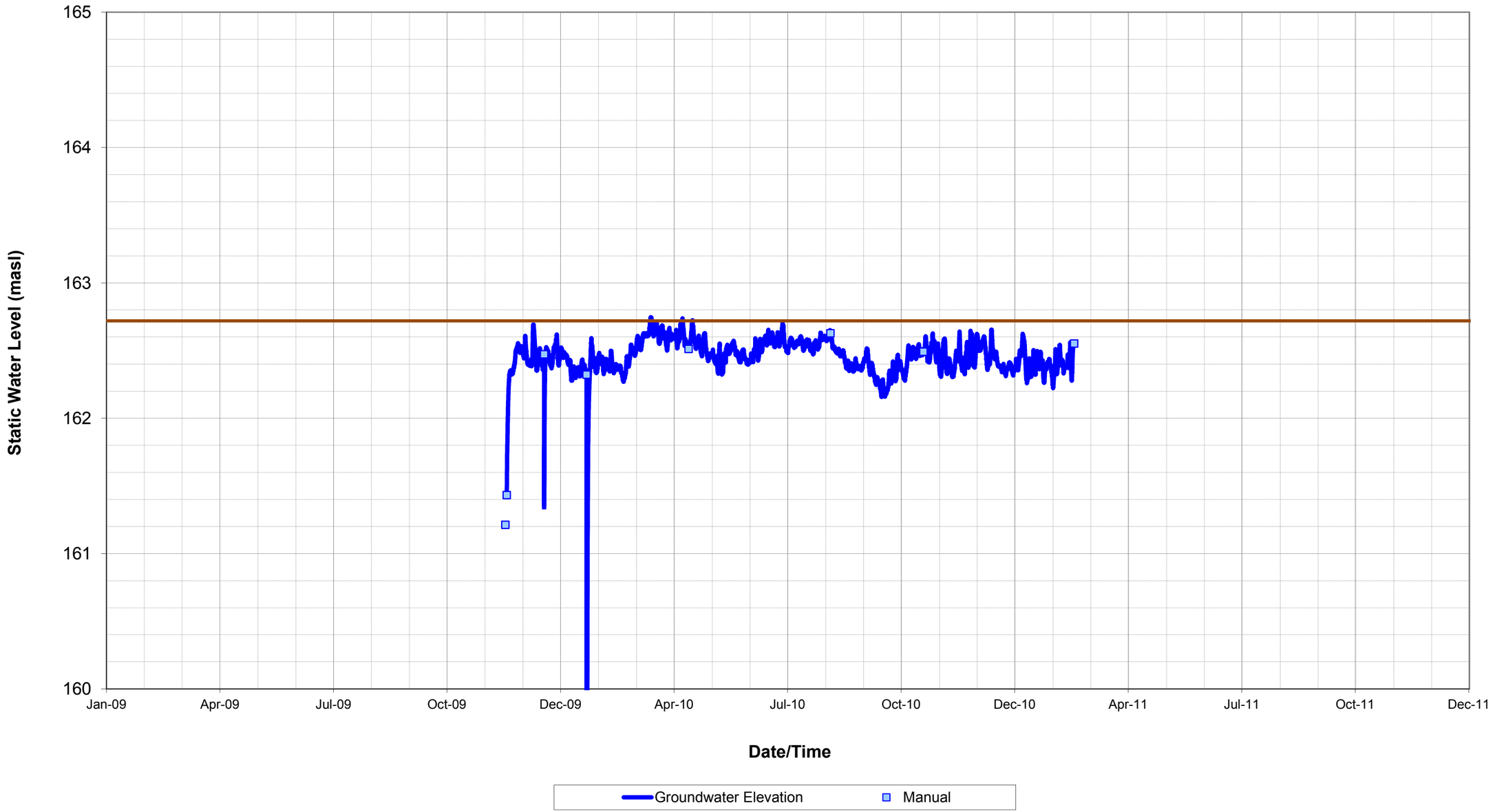


Figure SWL-13: Static Water Levels and Groundwater Temperature
MMM-09-19 Nest (2009-2011)

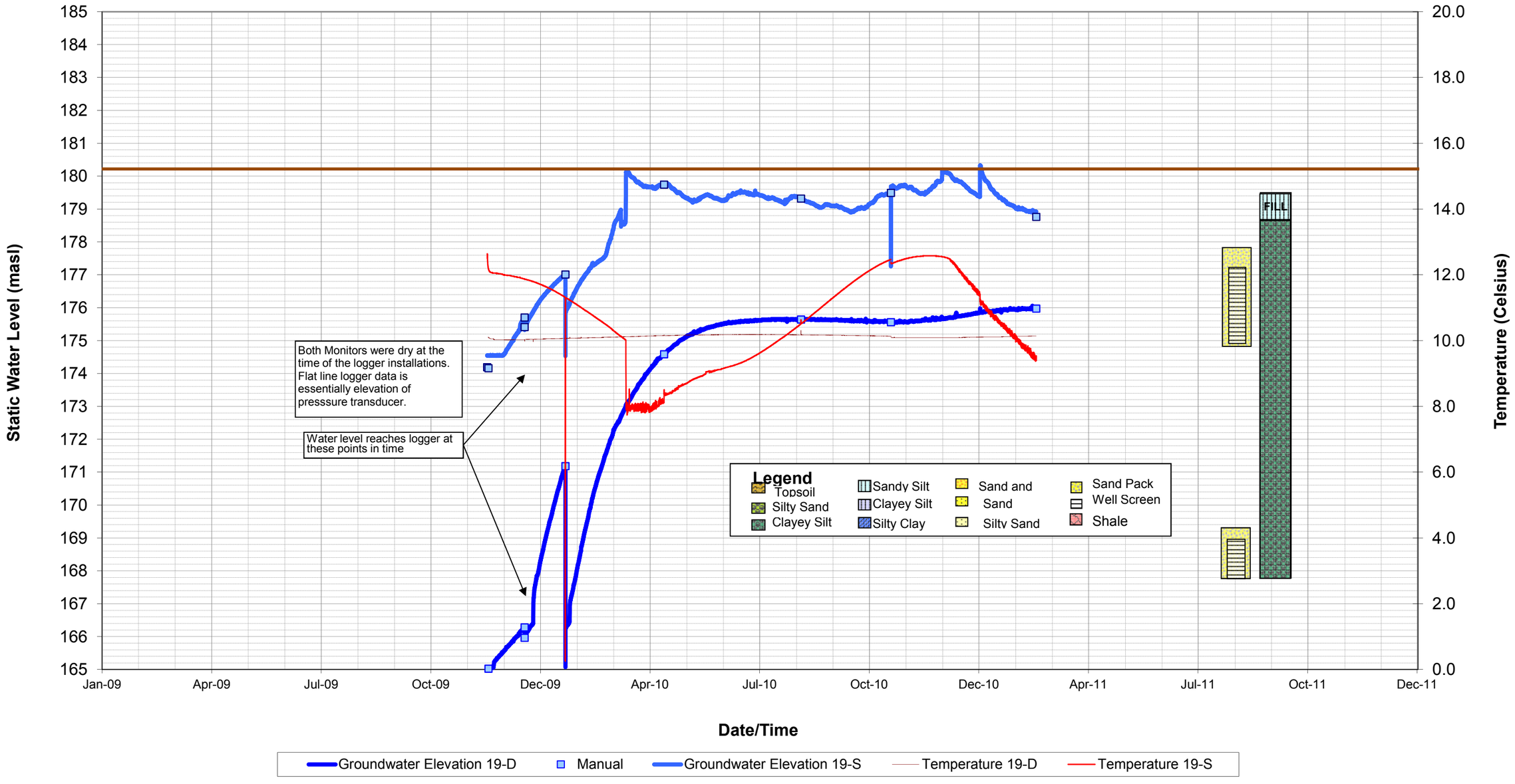


Figure SWL-13a: Static Water Levels
MMM-09-19 Nest - 5 m Vertical Scale (2009-2011)

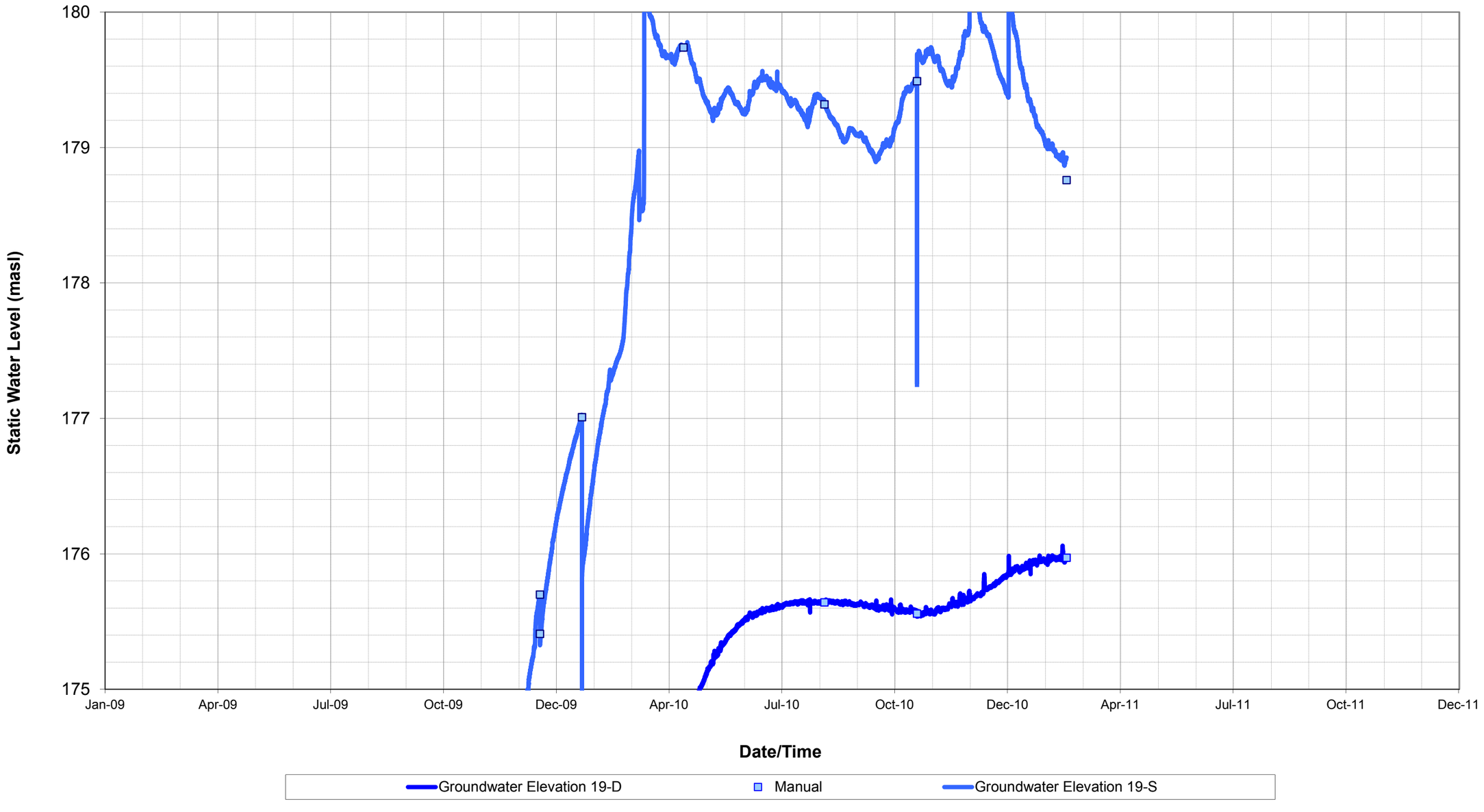


Figure SWL-14: Static Water Levels and Groundwater Temperature
MMM-09-20 (2009-2011)

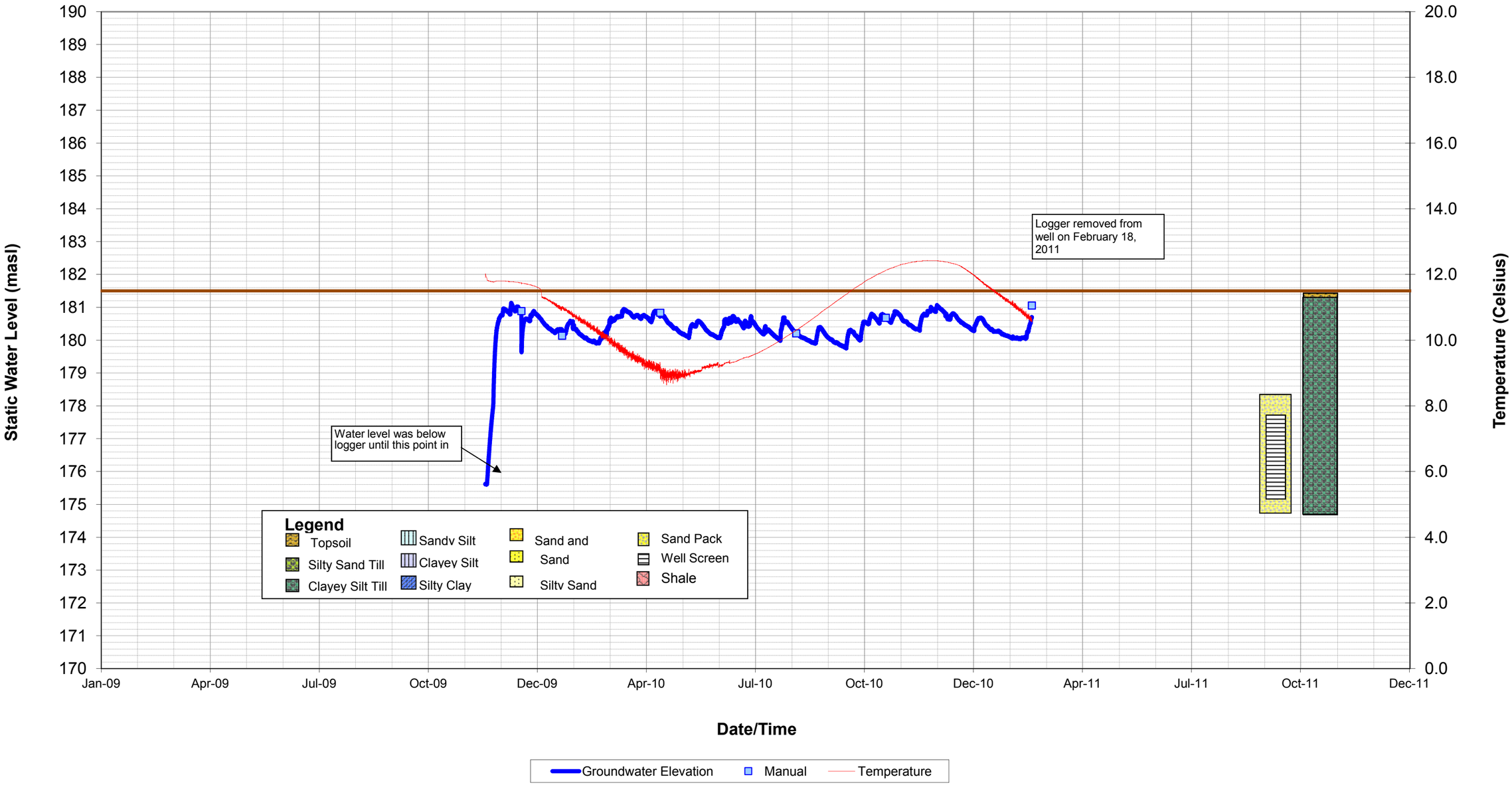


Figure SWL-14a: Static Water Levels
MMM-09-20 - 5 m Vertical Scale (2009-2011)

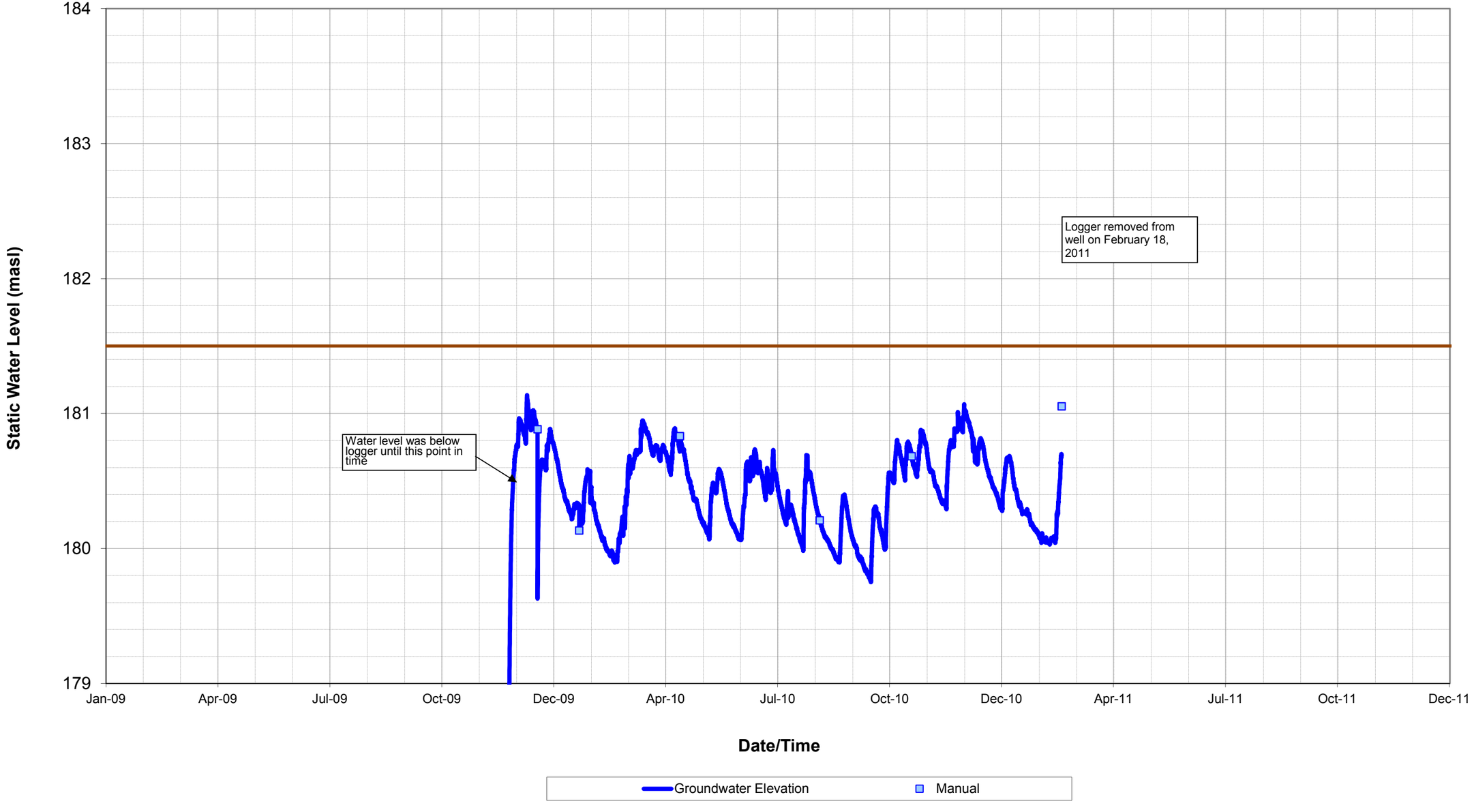


Figure SWL-15: Static Water Levels and Groundwater Temperature
MMM-09-06 Nest

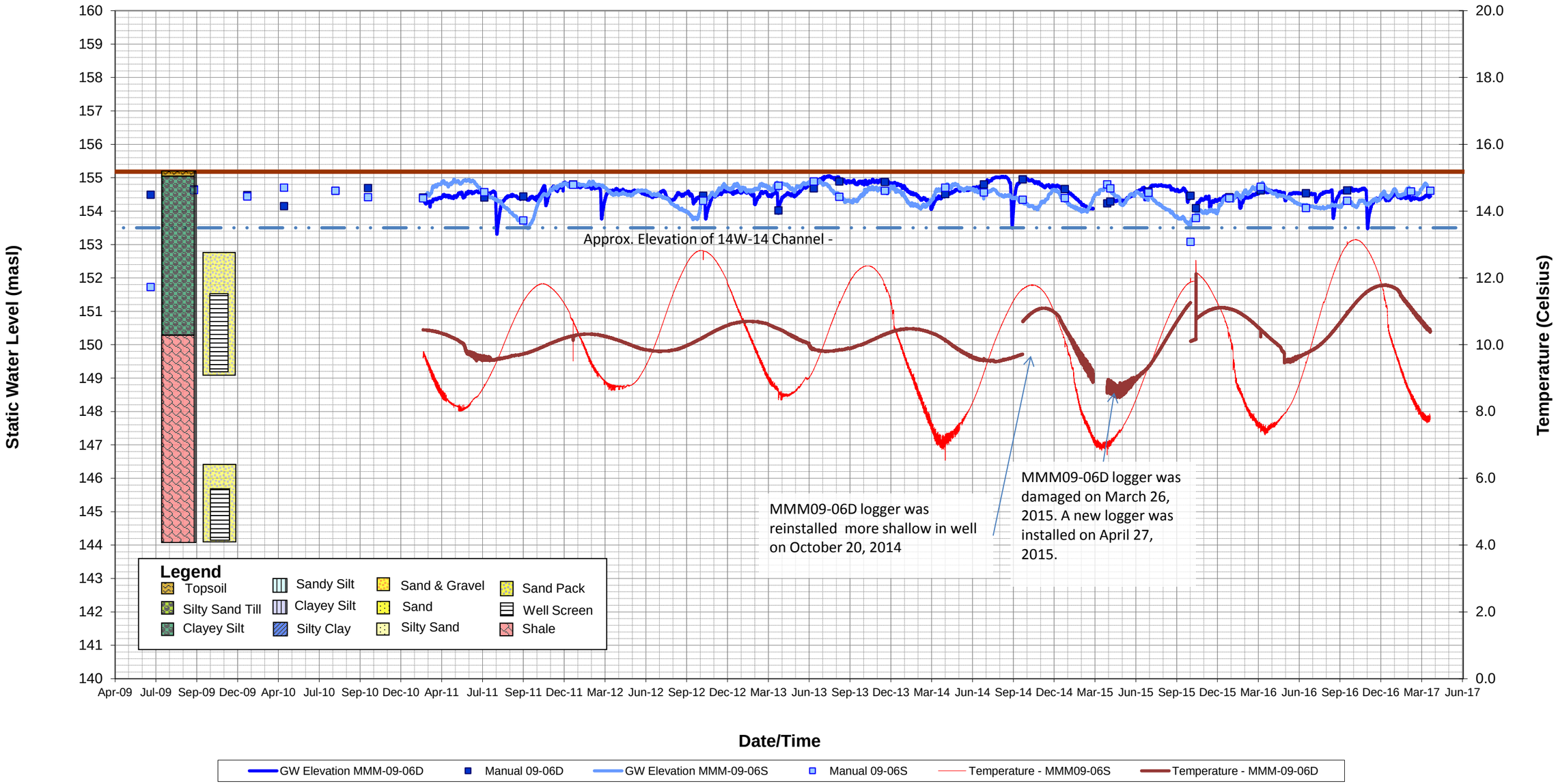


Figure SWL-15a: Static Water Levels
MMM-09-06 Nest - 5 m Vertical Scale

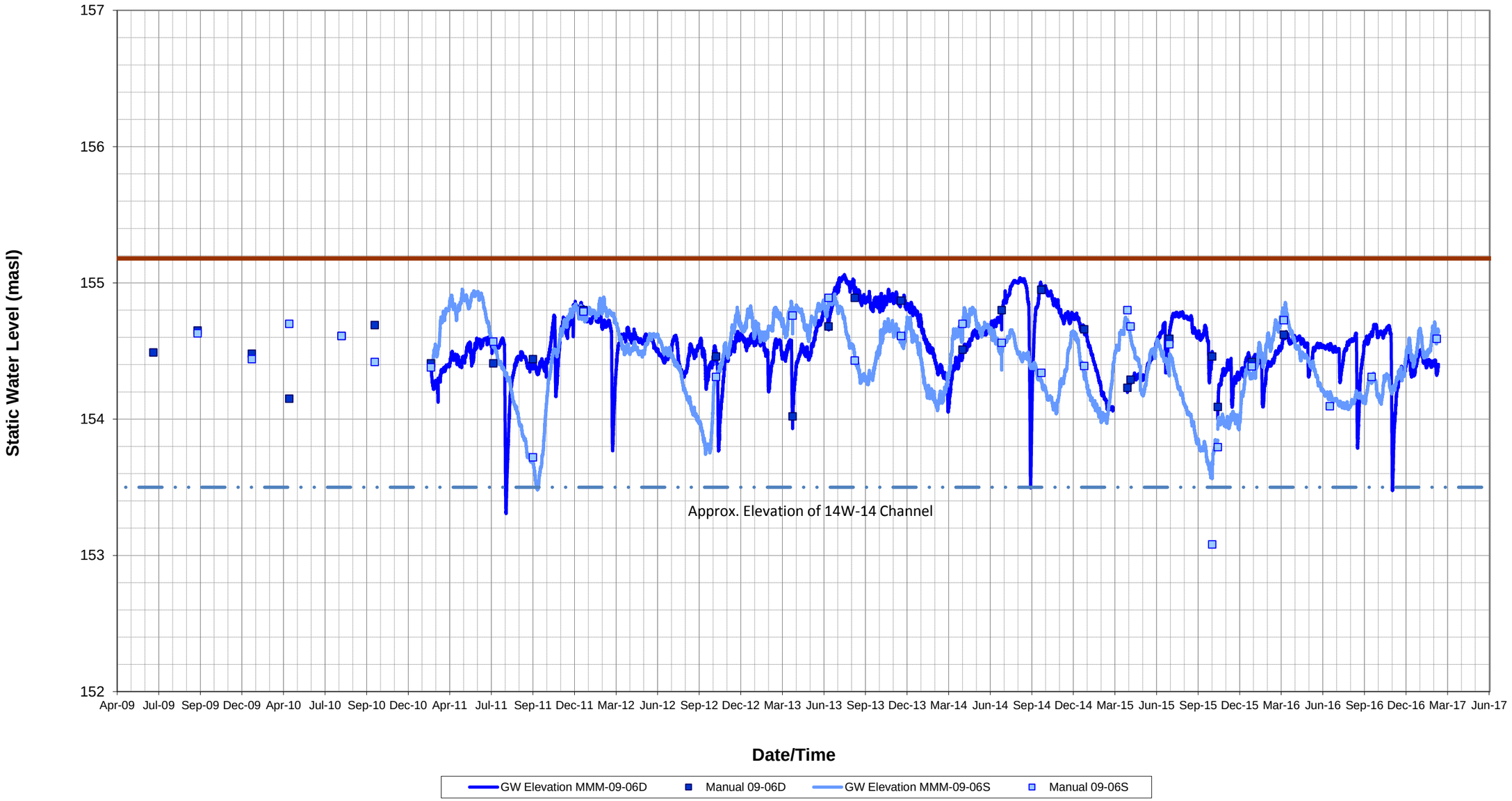


Figure SWL-16: Static Water Levels and Groundwater Temperature
MMM-09-02

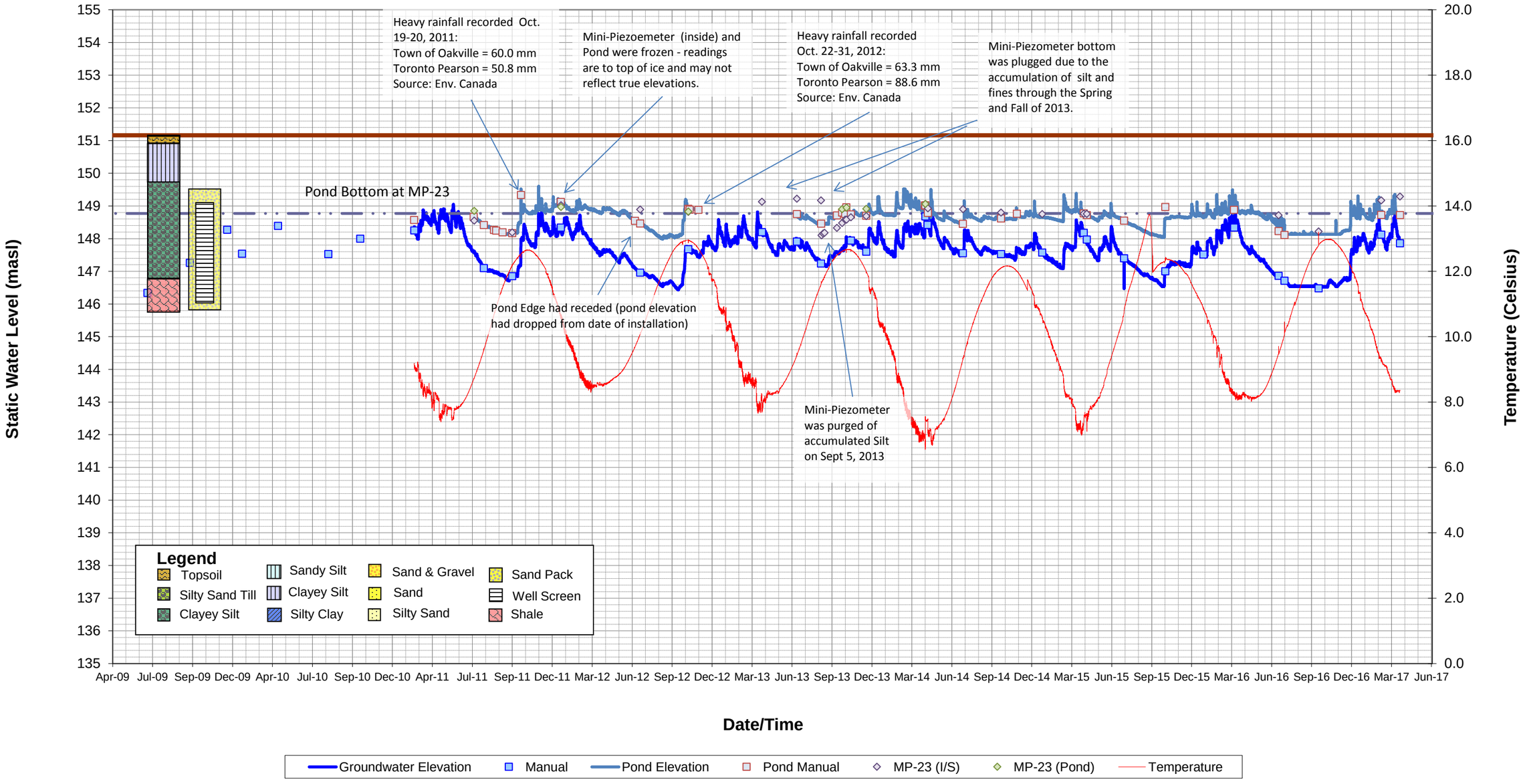


Figure SWL-16a: Static Water Levels
MMM-09-02

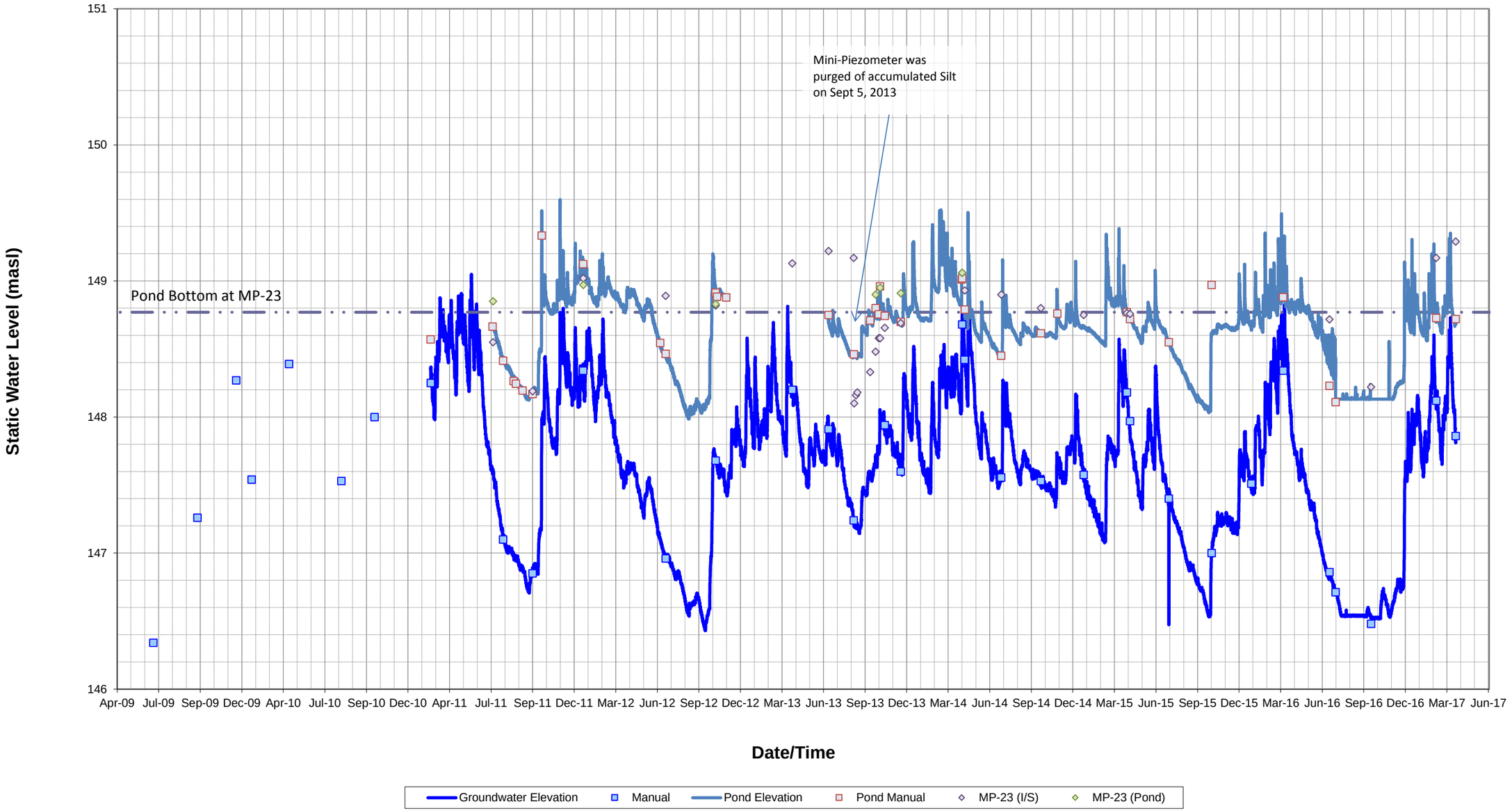


Figure SWL-17: Static Water Levels and Groundwater Temperature
MMM-11-21

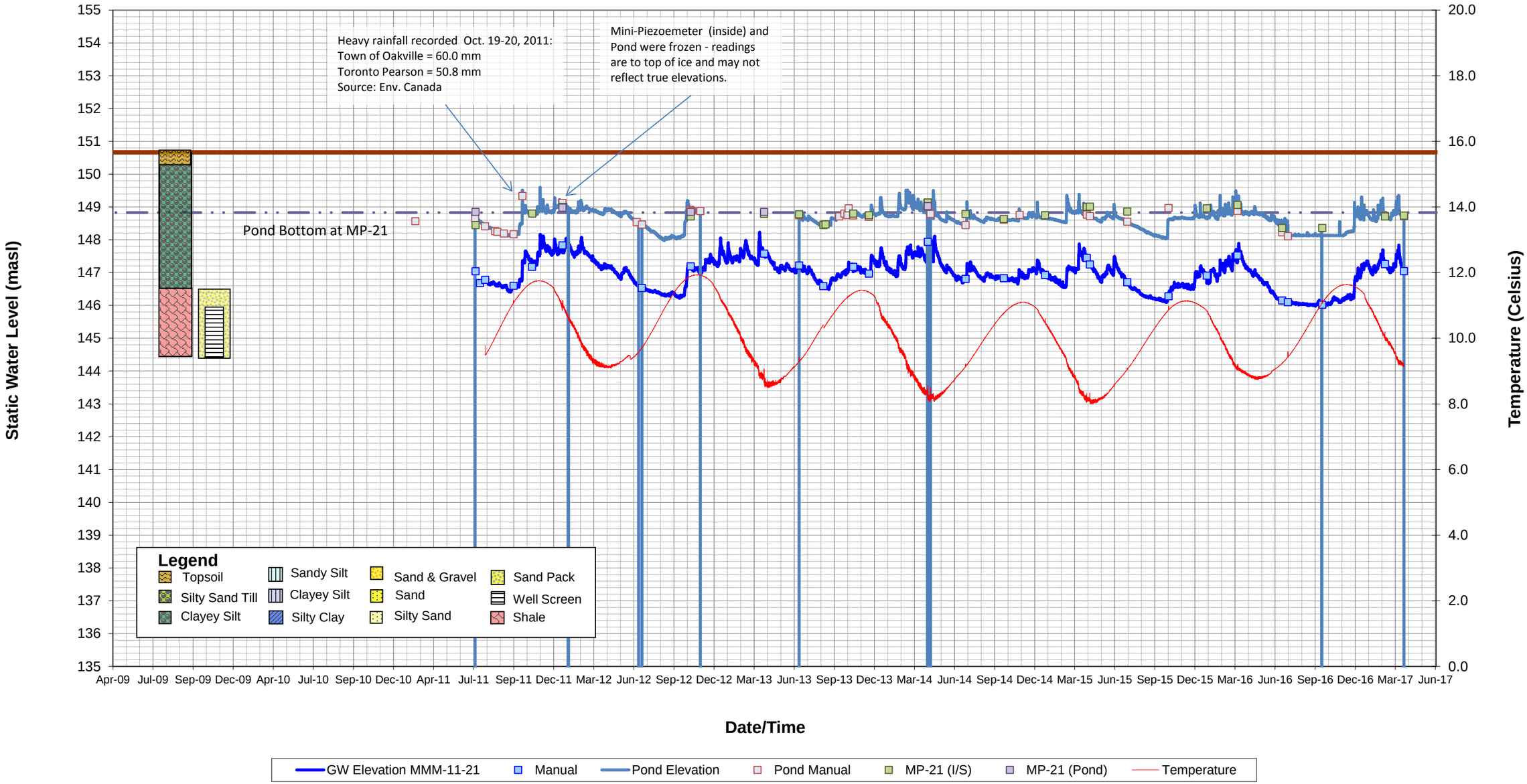


Figure SWL-17a: Static Water Levels
MMM-11-21 - 5 m Vertical Scale

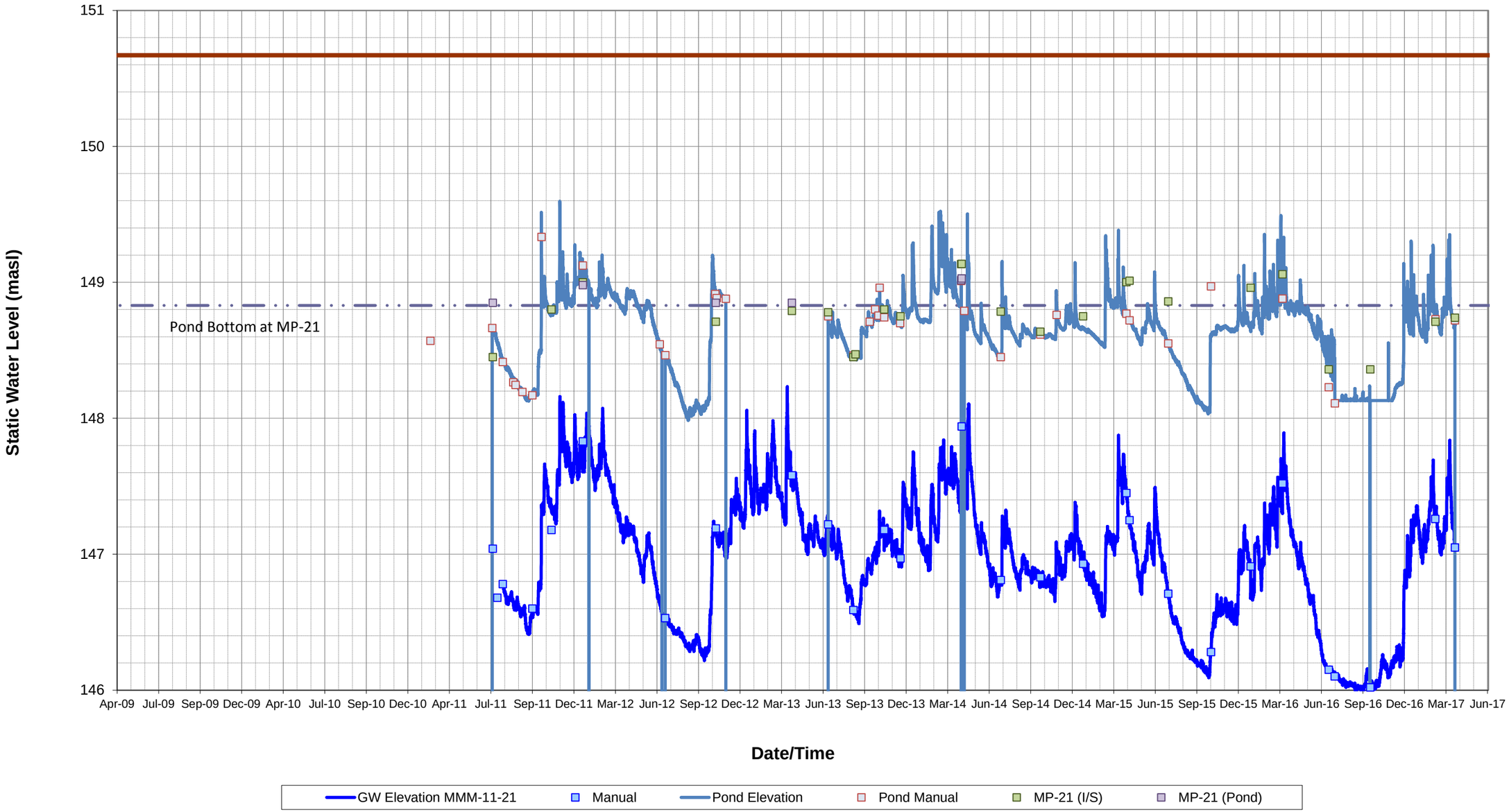


Figure SWL-18: Static Water Levels and Groundwater Temperature
MMM-11-22 Nest

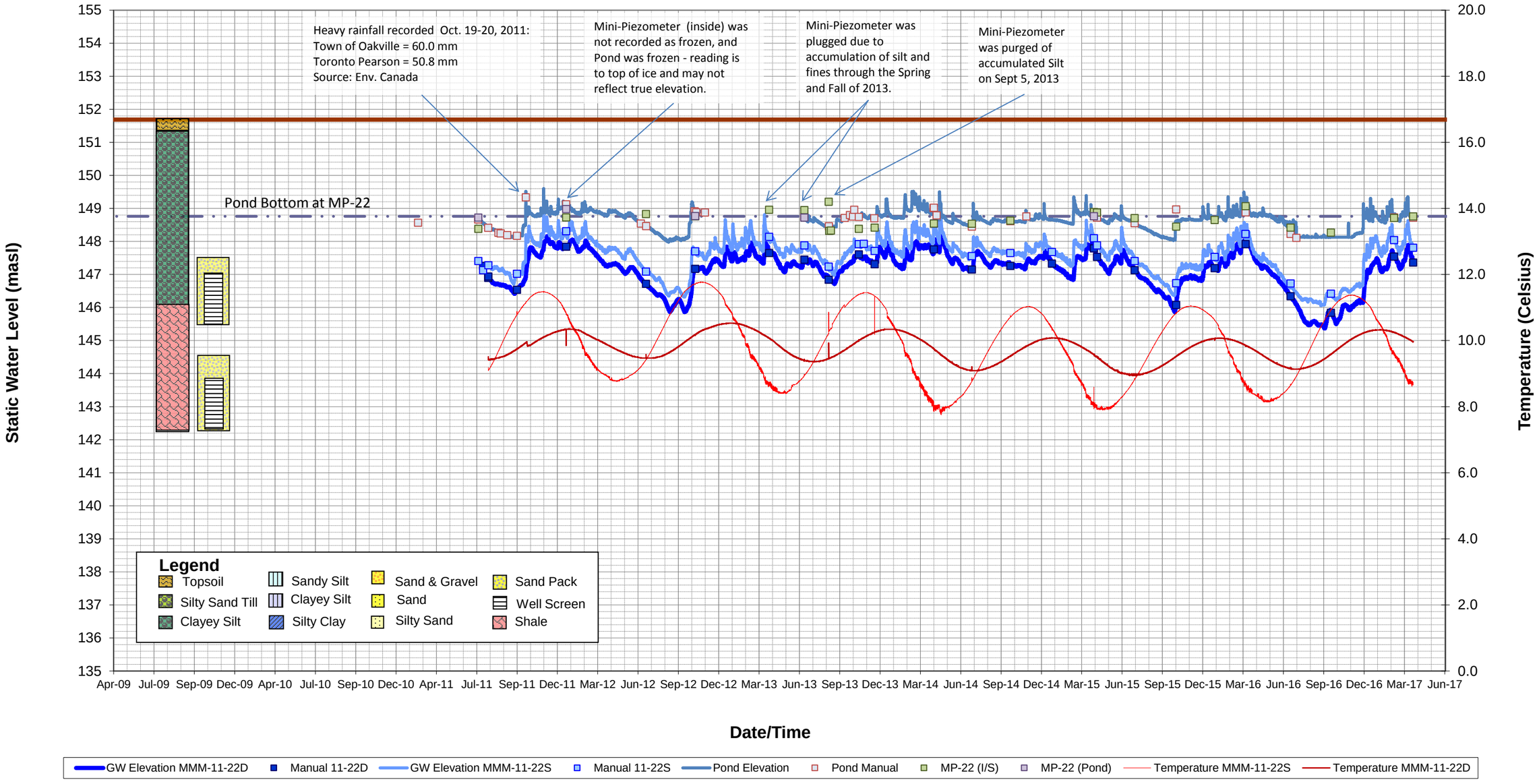


Figure SWL-18a: Static Water Levels
MMM-11-22 Nest - 5 m Vertical Scale

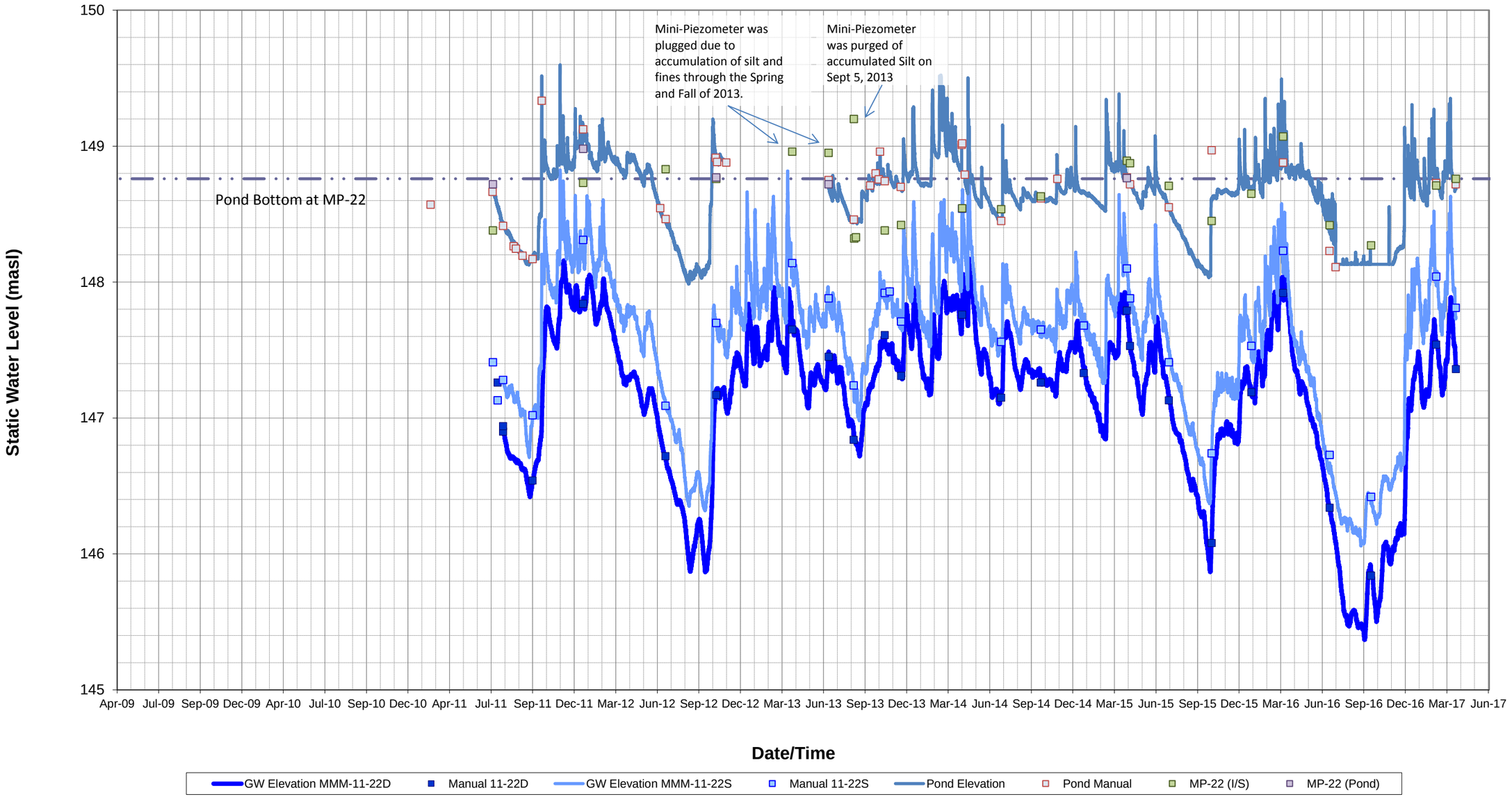


Figure SWL-19: Pond Water Level and Temperature
MMM-11-Pond

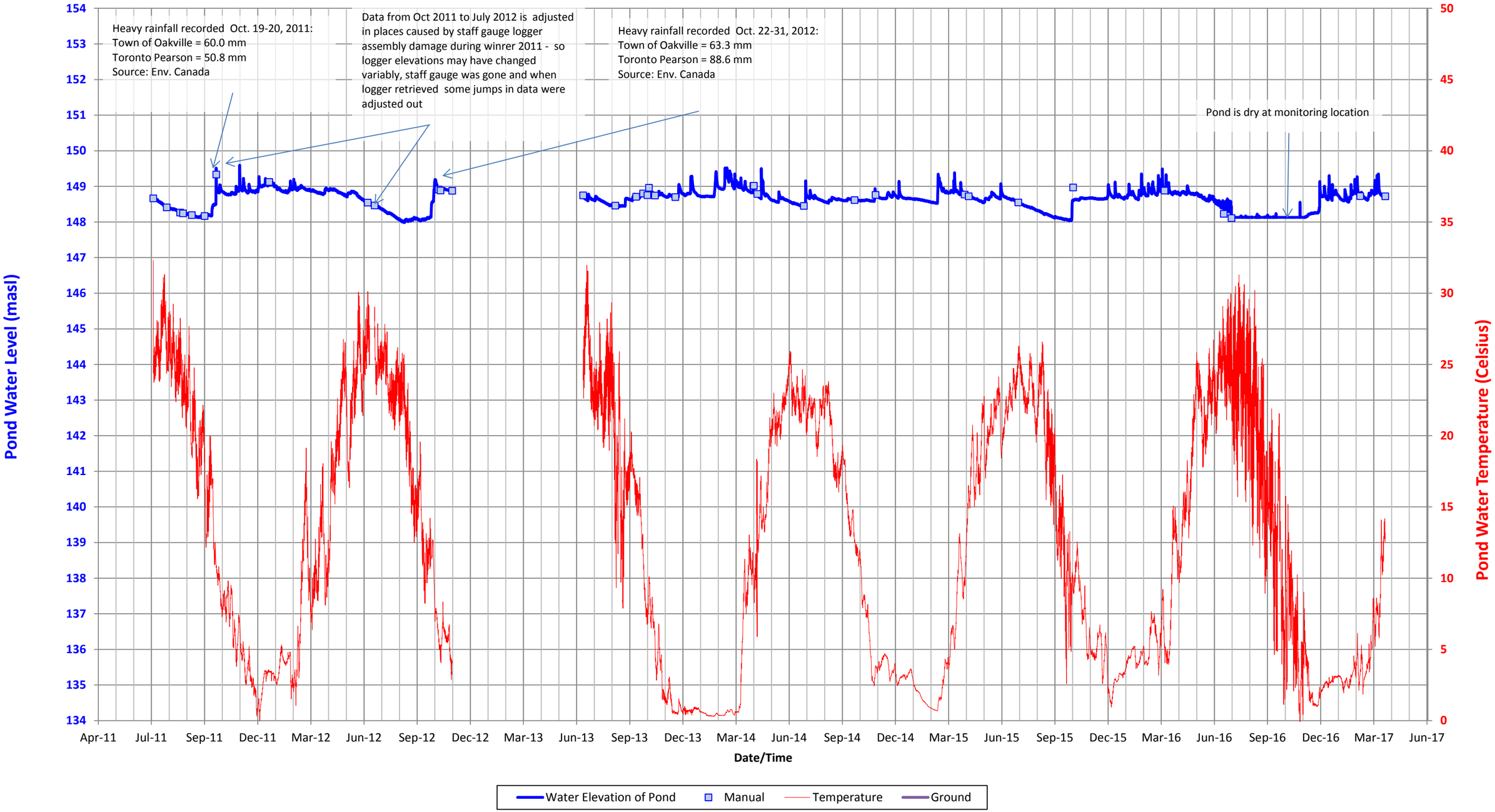


Figure SWL-19a: Pond Water Level and Temperature
MMM-11-Pond - 5 m Vertical Scale

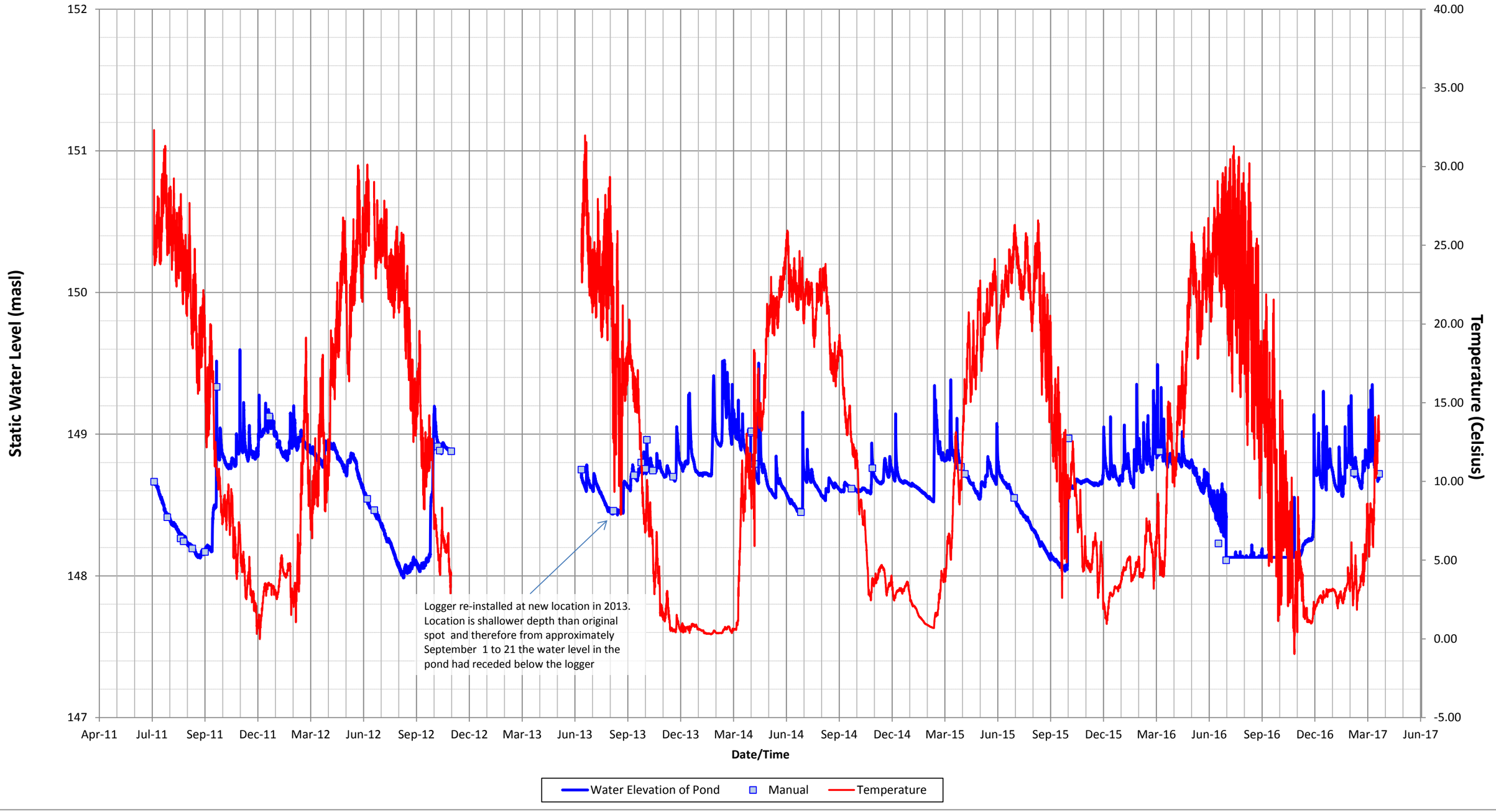


Figure SWL-19b: Pond Water Level and Temperature
MMM-11-Pond

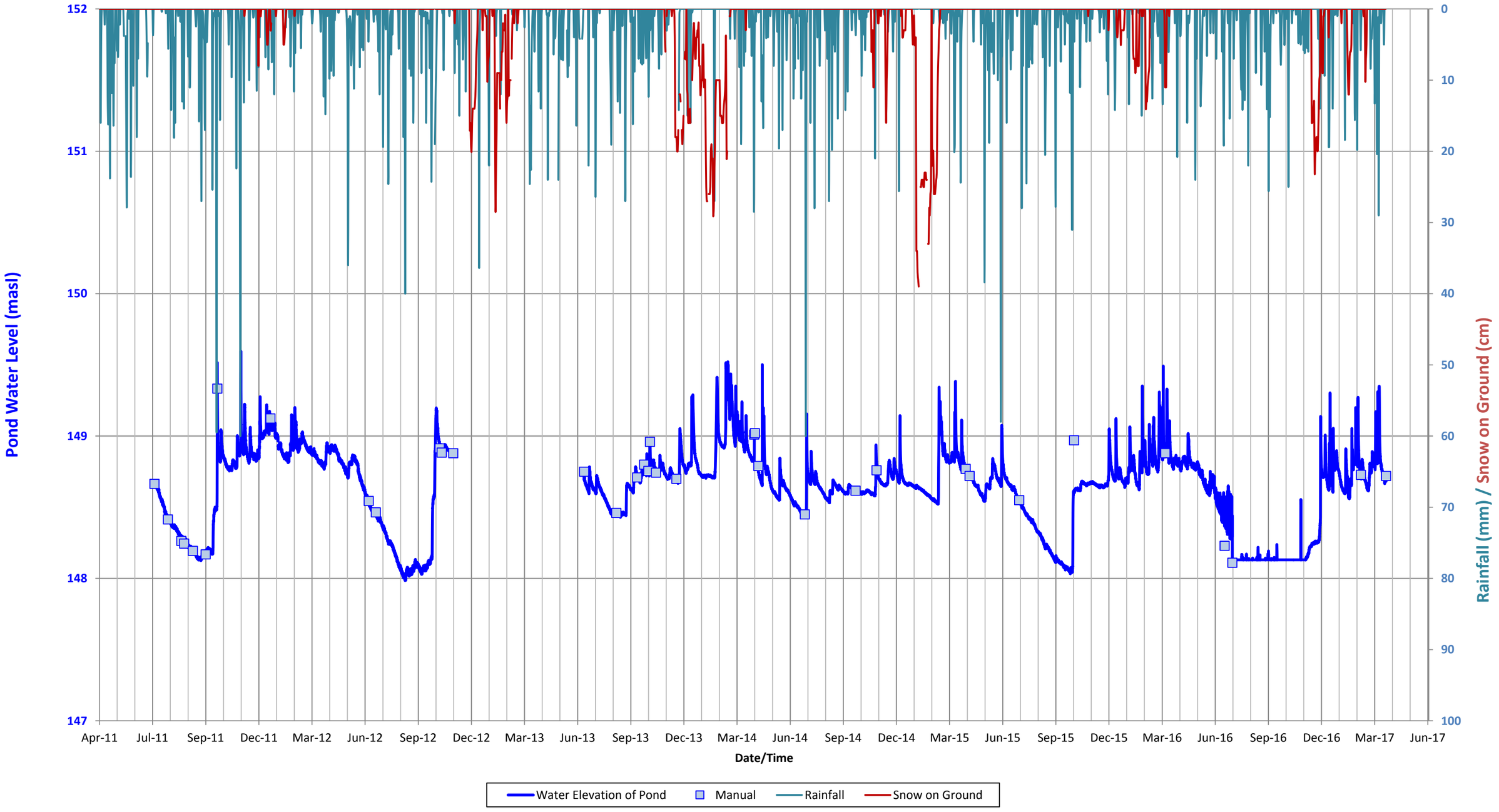


Figure SWL 20-1: Static Water Levels and Groundwater Temperature MMM-MP24 (2013-2015)

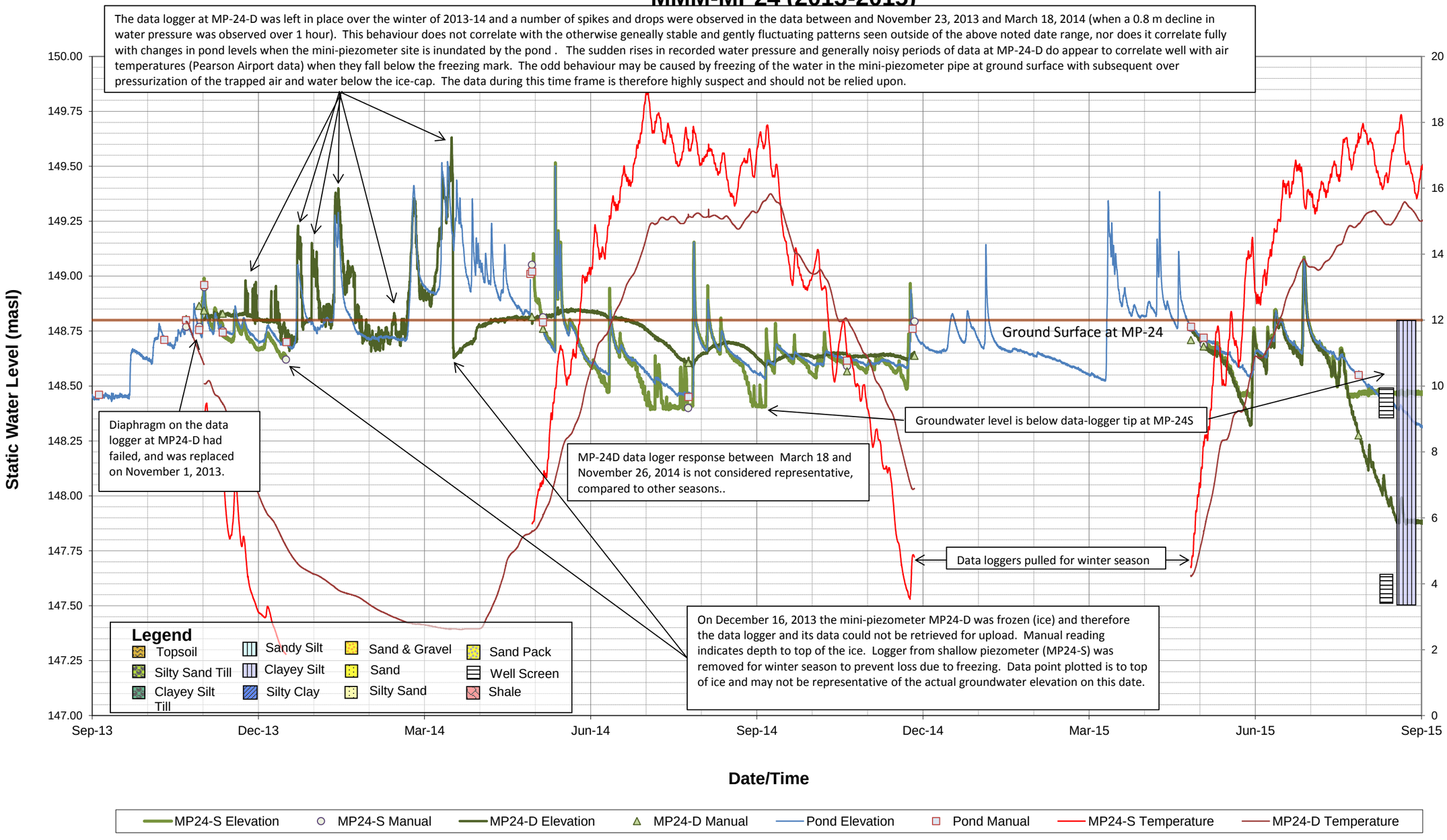


Figure SWL 20-2: Static Water Levels and Groundwater Temperature
MMM-MP24 (2015-2017)

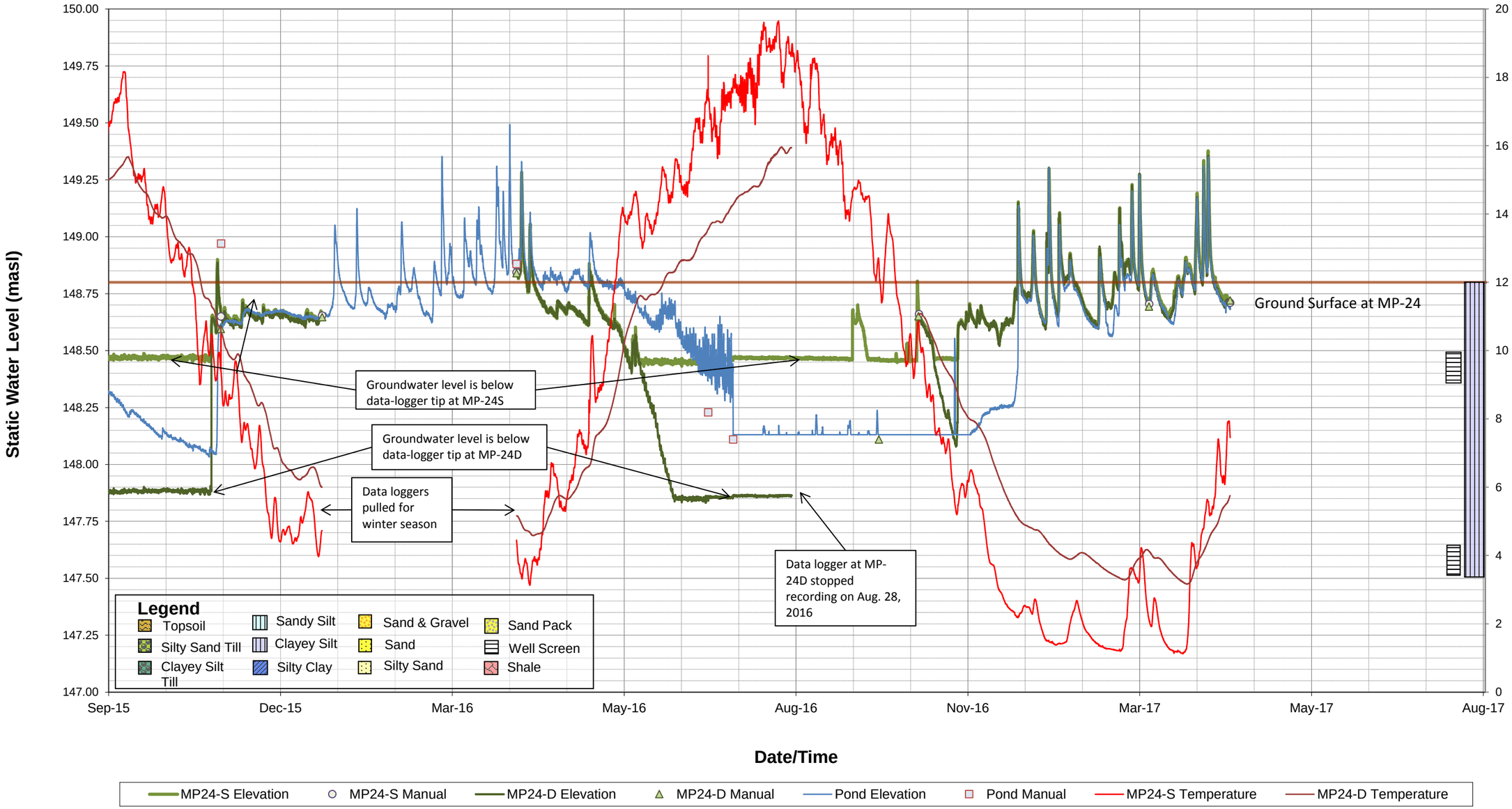


Figure SWL 20-1a: Static Water Levels
MMM-MP24 - 5 m Vertical Scale (2013-2015)

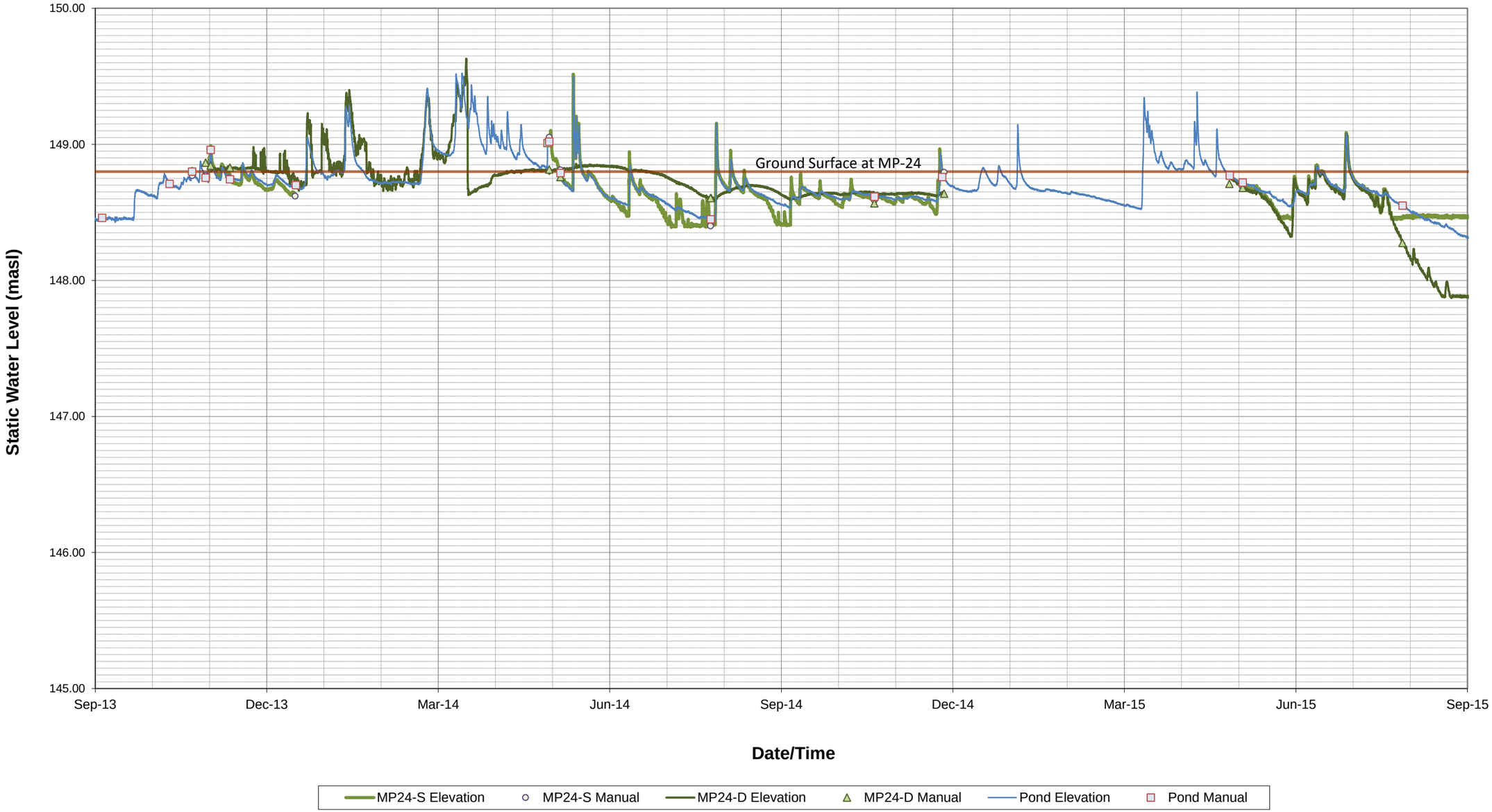
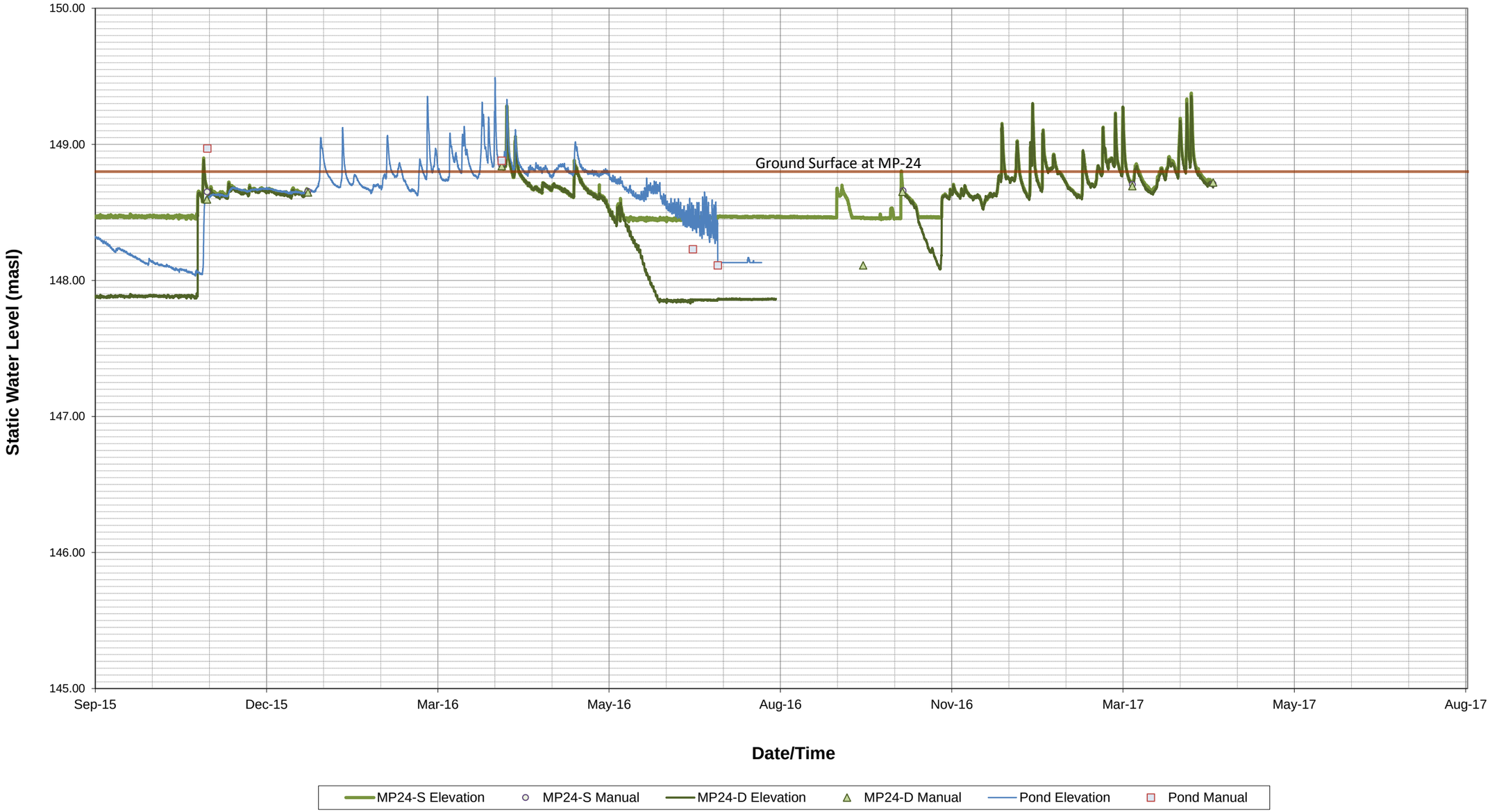


Figure SWL 20-2a: Static Water Levels
MMM-MP24 - 5 m Vertical Scale (2015-2017)



Environmental Implementation Report / Functional Servicing Study for 14 Mile Creek West and the Lazy Pat Farm Property

Onsite Monitoring Locations in Vicinity of the Pond

MMM-09-10S	(masl)	(Δm vs. Pond)
Min	147.59	-1.10
Max	149.85	+1.10
Mean	**149.24**	**+0.58**
	i_{mean}	**-0.137**
gradient is vs. nearby channel		

MMM-09-10D	(masl)	(Δm vs. Pond)
Min	148.43	-0.26
Max	149.95	+1.11
Mean	**149.33**	**+0.67**
	i_{mean}	**-0.088**
gradient is vs. nearby channel		

MP-24S	(masl)	(Δm vs. Pond)
Min	148.39	-0.32
Max	149.52	+0.71
Mean	**148.66**	**-0.00**
	i_{mean}	**+0.000**
Oct 22, 2013 to Apr 18, 2017		

MP-24D	(masl)	(Δm vs. Pond)
Min	147.86	-0.84
Max	149.63	+0.69
Mean	**148.66**	**-0.02**
	i_{mean}	**+0.007**
Oct 22, 2013 to Apr 18, 2017		

MMM-09-2	(masl)	(Δm vs. Pond)
Min	146.43	-2.07
Max	148.96	-0.07
Mean	**147.57**	**-1.06**
	i_{mean}	**+0.042**

Pond WL	(masl)
Min	147.99
Max	149.60
Mean	**148.68**

MMM-11-22S	(masl)	(Δm vs. Pond)
Min	146.06	-2.17
Max	148.82	-0.23
Mean	**147.56**	**-1.06**
	i_{mean}	**+0.048**

MMM-11-22D	(masl)	(Δm vs. Pond)
Min	145.37	-2.90
Max	148.17	-0.65
Mean	**147.15**	**-1.45**
	i_{mean}	**+0.064**

MMM-11-21	(masl)	(Δm vs. Pond)
Min	145.99	-2.51
Max	148.22	-0.91
Mean	**146.96**	**-1.70**
	i_{mean}	**+0.118**

Notes regarding the ranges shown for the monitoring locations and the pond:
Elevations (masl) are based on all data recorded from data loggers from July 4, 2011 to April 18, 2017.
Min, Max and Mean elevations are based on all data, over differing time periods for each individual monitor. Care should be exercised in comparing these between different monitors considering the different time periods.
Differences between groundwater levels at monitors and the water level on the pond are based on the differences recorded at each hourly time step, and only at times when both loggers are present and recording at the same time intervals.
The mean hydraulic gradients (iMean) are calculated using mean differences in elevation between the pond/watercourse and the monitor, and the vertical and horizontal distances from the monitor centroid to the edge of the pond at the mean pond water level.
Data is not calculated at all stations at times when the pond was dry (at the pond logger location), nor was data calculated at individual stations when they were dry.

Negative Gradients indicate flow from ground towards the pond or watercourse.

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Legend

- Pond Logger (July 2013 - Present)
- Pond Logger (July 2011 - November 2012)
- Lost / Destroyed Mini-Piezometers
- Lost / Destroyed MWs

Monitoring Locations

- EXP Monitoring Well (2011)
- MMM Monitoring Well (2009/2011)
- Mini-Piezometer
- TROW Monitoring Well (2001)
- Lazy Pat Farm Well
- Flow Monitoring Points
- Staff Gauge
- Surface Water Sampling Location at SG-01
- Supplemental Pond Study Cross Section
- Watercourse

Topographic Contours

- 5 m Interval
- 1 m Interval
- Subject Property

Scale 0 50 100 200 Metres

Client: QuadReal

Prepared By: WSP

Date: June 2017

Project No. 09M-00013-01

Scale as Shown

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Figure: HG-1

J:\1442 Projects by Job Number\2009\14-09222-001-HG1 Bentall Lands\050 Mapping\MXD\ReportFigure HG-1 On-Site Monitoring Locations - rev1.mxd

A

FACING NORTH

A'

TRIBUTARY 14-W12

MMM 11-22 (NEST)

POND
14-W14A

MMM 09-2

PROPERTY LIMIT

POND'S WATER LEVELS
RECORDED RANGE
148.0 TO 149.6 masl
(BETWEEN FEB. 2011
& APR. 2017)

148.6 (AVG)

MMM 11-22S GWL RANGE
146.1 TO 149.1 masl
(BETWEEN JULY 2011
& APR. 2017)

MMM 11-22D GWL RANGE
145.4 TO 148.2 masl
(BETWEEN JULY 2011
& APR. 2017)

MMM 09-2 GWL RANGE
146.4 TO 149.1 masl
(BETWEEN JUNE 2009
& APR. 2017)

DIRECTION
OF FLOW

ELEVATION (masl)

155
154
153
152
151
150
149
148
147
146
145
144
143
142
141
140

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340

DISTANCE (m)

LEGEND

CLAYEY SILT

CLAYEY SILT TILL

SHALE BEDROCK

GWL RANGE

SCREEN

MMM 09-2 ——— BOREHOLE ID.

NOTE:
POND BOTTOM BASED ON BATHYMETRY DATA.

Environmental Implementation Report / Functional Servicing Study for 14 Mile Creek West and the Lazy Pat Farm Property

Hydrogeological Cross-Section A-A' Through Pond

Scale: H = 1:1000 V = 1:100

Client: QuadReal

Prepared by: wsp

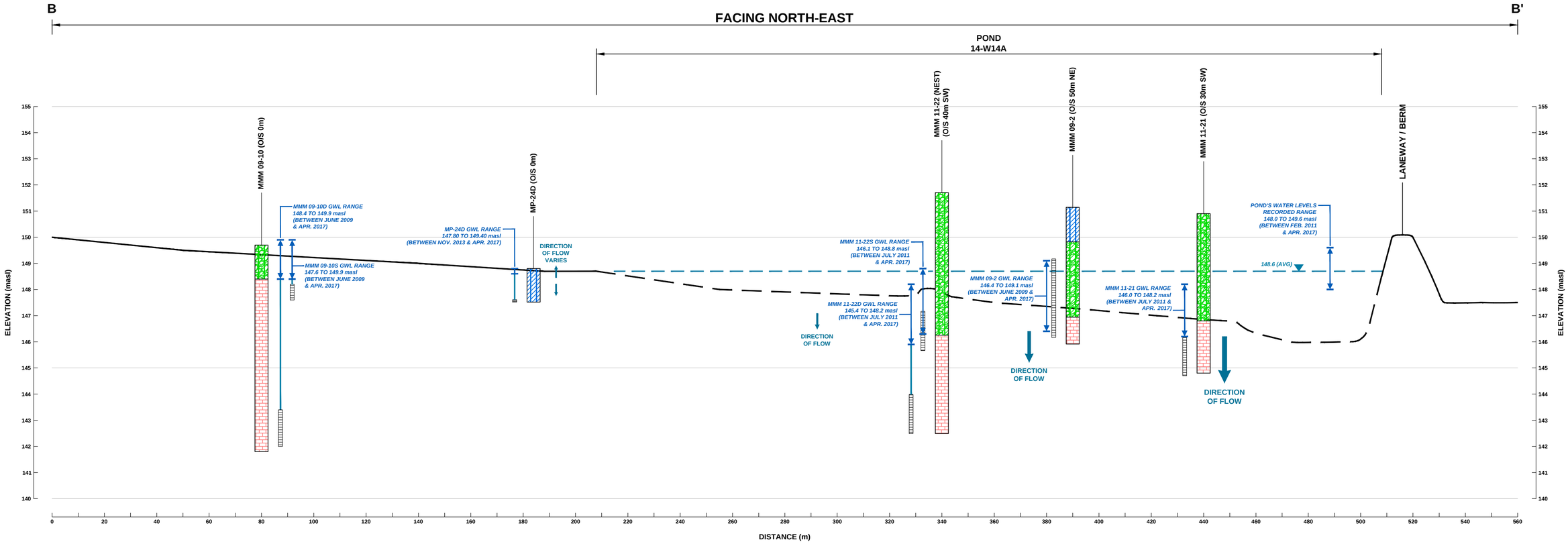
Date: JUNE 2017

Project No.: 09M-00013-01 (1409222-001)

Aerial Photo:

Figure HG2

FIGURE - Cross-Sections.dwg FIGURE HG2 - Hydrogeological Cross-Section A-A' Through Pond S:\14-42\1409222-001-HG\1005-REPORT JUNE 2014\ Jun 23, 2017 - 9:57am



Environmental Implementation Report / Functional Servicing Study for 14 Mile Creek West and the Lazy Pat Farm Property

Hydrogeological Cross-Section B-B' Through Pond

Scale: H = 1:1000 V = 1:100

Client: QuadReal

Prepared by: wsp

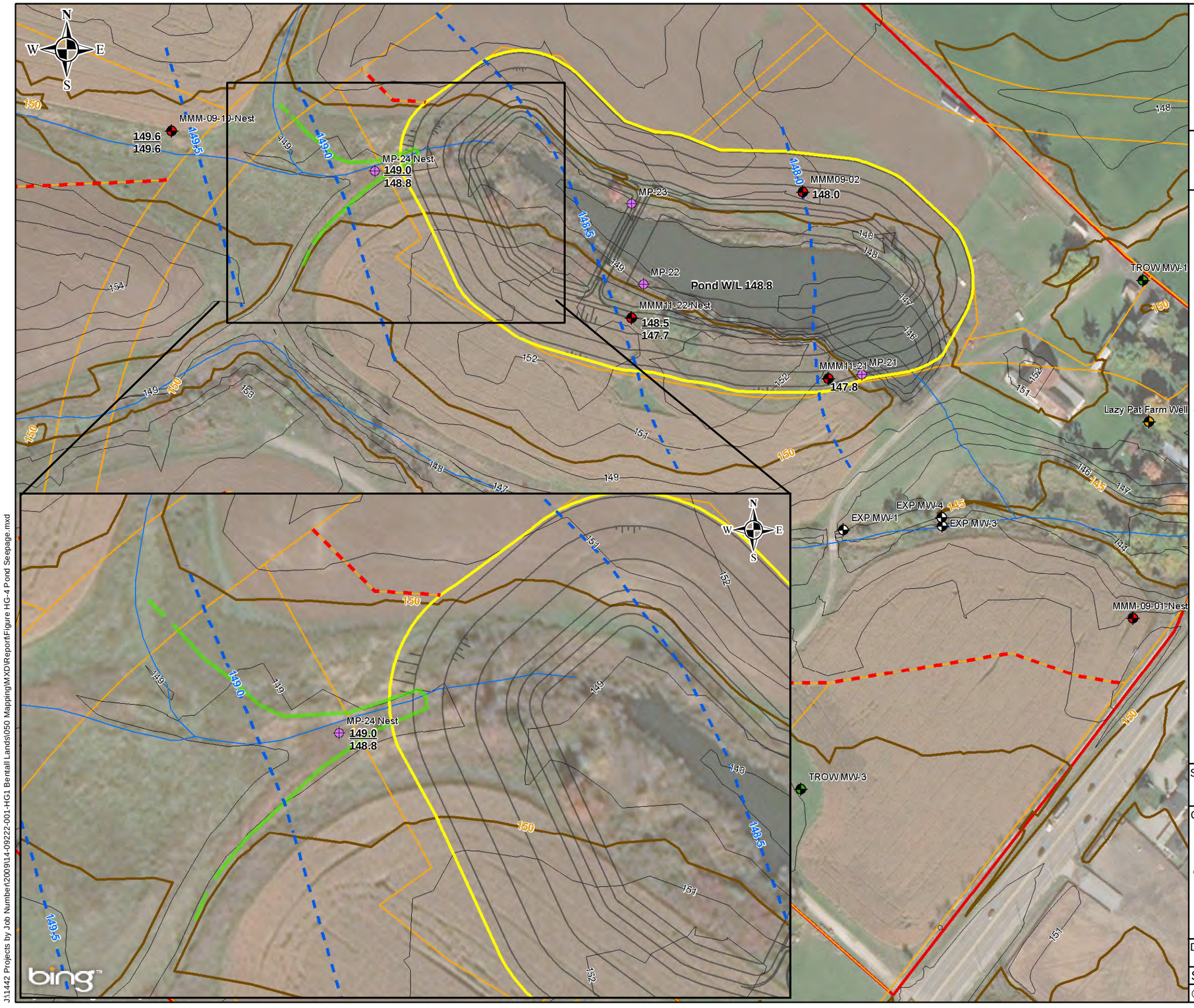
Date: JUNE 2017

Project No.: 09M-00013-01 (1409222-001)

Aerial Photo:

Figure HG3

FIGURE - Cross-Sections.dwg FIGURE HG3 - Hydrogeological Cross-Section B-B' Through Pond S:\14-42\1409222-001\HG\1000\REPORT JUNE 2014\, Jun 23, 2017 - 10:13am



Environmental Implementation Report / Functional Servicing Study for 14 Mile Creek West and the Lazy Pat Farm Property

Potential Seepage Area Near Upper End of Central Pond

Legend

Monitoring Locations

- EXP Monitoring Well (2011)
- MMM Monitoring Well (2009/2011)
- Mini-Piezometer
- TROW Monitoring Well (2001)
- Lazy Pat Farm Well
- Interpreted Contours for Seepage
- Potential Seepage Zone
- Proposed Infiltration Trenches
- Proposed Limit of SWMP Cut/Fill
- Pond Grading Contours
- Watercourse

Topographic Contours

- 5 m Interval
- 1 m Interval
- Development Parcels
- Subject Property

Note: Static water levels were taken on April 30, 2014.

Scale 0 50 100 Metres

Client: QuadReal

Prepared By: wsp

Date: June 2017

Project No. 09M-00013-01

Scale as Shown

Figure: HG-4

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J:\11442 Projects by Job Number\2009\14-09222-001-HG1 Bentall Lands\050 Mapping\MXD\Report\Figure HG-4 Pond Seepage.mxd

Flow Estimates

Bentall Lands Oakville - May 5, 2009

	Bank Edge		Bank Edge	Sums/Avgs
MP-03 Location				
Length (inches)	34.00			
Width (inches)	7.00			
Depth (inches)	2.00	3.50	3.00	
Sub-Section Location (m)	0.000	0.089	0.178	
Sub-section Width (m)		0.089	0.089	0.178
Sub-Section Depth (m)	0.051	0.089	0.076	
Areas (m^2)		0.006	0.007	0.014
Length of Run (m)	0.86			
Run # -->	1	2	3	
Time (seconds)	1.74	1.99	1.98	
	4	5	6	
	2.10	1.63	2.07	1.92
Avg. Vel	0.450	m/sec		
Q=vA	0.006	m^3/sec		
(ignores friction so these	366.0	L/min		
may be overestimated)	80.5	igpm		
MP-01 Location				
Length (inches)	24.00			
Width (inches)	9.00			
Depth (inches)	2.25	2.50	1.50	
Sub-Section Location (m)	0.000	0.114	0.229	
Sub-section Width (m)		0.114	0.114	0.229
Sub-Section Depth (m)	0.057	0.064	0.038	
Areas (m^2)		0.007	0.006	0.013
Length of Run (m)	0.61			
Run # -->	1	2	3	
Time (seconds)	2.12	2.02	1.95	
	4	5	6	
	2.00	2.35	2.10	2.09
Avg. Vel	0.292	m/sec		
Q=vA	0.004	m^3/sec		
(ignores friction so these	222.3	L/min		
may be overestimated)	48.9	igpm		

Flow Estimates

Bentall Lands Oakville - May 5, 2009

	Bank Edge		Bank Edge	Sums/Avgs
MP-07 (West of Small Pond)				
Length (inches)	14.00			
Width (inches)	15.00			
Depth (inches)	1.50	2.25	2.00	
Sub-Section Location (m)	0.000	0.191	0.381	
Sub-section Width (m)		0.191	0.191	0.381
Sub-Section Depth (m)	0.038	0.057	0.051	
Areas (m^2)		0.009	0.010	0.019
Length of Run (m)	0.36			
Run # -->	1	2	3	
Time (seconds)	0.86	0.84	0.94	
	4	5	6	
	0.85	0.95	1.05	0.92
Avg. Vel	0.389	m/sec		
Q=vA	0.008	m^3/sec		
(ignores friction so these	451.3	L/min		
may be overestimated)	99.3	igpm		

	Bank Edge		Bank Edge	Sums/Avgs
Main Tributary by Dundas Street				
Length (inches)	28.00			
Width (inches)	33.00			
Depth (inches)	5.00	7.00	5.00	
Sub-Section Location (m)	0.000	0.419	0.838	
Sub-section Width (m)		0.419	0.419	0.838
Sub-Section Depth (m)	0.127	0.178	0.127	
Areas (m^2)		0.064	0.064	0.128
Length of Run (m)	0.71			
Run # -->	1	2	3	
Time (seconds)	4.92	8.12	6.11	
	4	5	6	
	3.65	4.60	4.73	5.36
Avg. Vel	0.133	m/sec		
Q=vA	0.017	m^3/sec		
(ignores friction so these	1017.9	L/min		
may be overestimated)	223.9	igpm		

Flow Estimates

Bentall Lands Oakville - May 29, 2009

	Bank Edge		Bank Edge	Sums/Avgs
MP-02				
Length (m)	0.70			
Width (m)	0.46			
Depth (m)	0.06	0.07	0.03	
Sub-Section Location (m)	0.000	0.230	0.460	
Sub-section Width (m)		0.230	0.230	0.460
Sub-Section Depth (m)	0.060	0.070	0.030	
Areas (m^2)		0.015	0.012	0.026
Length of Run (m)	0.70			
Run # -->	1	2	3	
Time (seconds)	4.00	4.70	4.80	
	4	5	6	
				4.50
Avg. Vel	0.156	m/sec		
Q=vA	0.004	m^3/sec		
(ignores friction so these	246.9	L/min		
may be overestimated)	54.3	igpm		

MP-07				
Length (m)	0.70			
Width (m)	0.32			
Depth (m)	0.09	0.16	0.12	
Sub-Section Location (m)	0.000	0.160	0.320	
Sub-section Width (m)		0.160	0.160	0.320
Sub-Section Depth (m)	0.090	0.160	0.120	
Areas (m^2)		0.020	0.022	0.042
Length of Run (m)	0.70			
Run # -->	1	2	3	
Time (seconds)	4.00	4.00	4.00	
	4	5	6	
				4.00
Avg. Vel	0.175	m/sec		
Q=vA	0.007	m^3/sec		
(ignores friction so these	445.2	L/min		
may be overestimated)	97.9	igpm		

Flow Estimates

Bentall Lands Oakville - May 29, 2009

	Bank Edge		Bank Edge	Sums/Avgs
MP-04				
Length (m)	0.70			
Width (m)	0.30			
Depth (m)	0.04	0.05	0.03	
Sub-Section Location (m)	0.000	0.150	0.300	
Sub-section Width (m)		0.150	0.150	0.300
Sub-Section Depth (m)	0.040	0.050	0.030	
Areas (m^2)		0.007	0.006	0.013
Length of Run (m)	0.70			
Run # -->	1	2	3	
Time (seconds)	2.00	2.00	2.00	
	4	5	6	
				2.00
Avg. Vel	0.350	m/sec		
Q=vA	0.004	m^3/sec		
(ignores friction so these	267.8	L/min		
may be overestimated)	58.9	igpm		

MP-01				
Length (m)	0.60			
Width (m)	0.55			
Depth (m)	0.04	0.05	0.02	
Sub-Section Location (m)	0.000	0.275	0.550	
Sub-section Width (m)		0.275	0.275	0.550
Sub-Section Depth (m)	0.040	0.050	0.020	
Areas (m^2)		0.012	0.010	0.022
Length of Run (m)	0.60			
Run # -->	1	2	3	
Time (seconds)	6.00	6.50	6.00	
	4	5	6	
				6.17
Avg. Vel	0.097	m/sec		
Q=vA	0.002	m^3/sec		
(ignores friction so these	128.4	L/min		
may be overestimated)	28.3	igpm		

Flow Estimates

Bentall Lands Oakville - May 29, 2009

	Bank Edge		Bank Edge	Sums/Avgs
MP-03				
Length (m)	0.30			
Width (m)	0.16			
Depth (m)	0.02	0.04	0.02	
Sub-Section Location (m)	0.000	0.080	0.160	
Sub-section Width (m)		0.080	0.080	0.160
Sub-Section Depth (m)	0.020	0.040	0.020	
Areas (m^2)		0.002	0.002	0.005
Length of Run (m)	0.30			
Run # -->	1	2	3	
Time (seconds)	2.00	2.00	2.00	
	4	5	6	
				2.00
Avg. Vel	0.150	m/sec		
Q=vA	0.001	m^3/sec		
(ignores friction so these	43.2	L/min		
may be overestimated)	9.5	igpm		

Flow Estimates

Bentall Lands Oakville - June 19, 2009

	Bank Edge		Bank Edge	Sums/Avgs
MP-04				
Length (m)	1.00			
Width (m)	0.42			
Depth (m)	0.04	0.05	0.03	
Sub-Section Location (m)	0.000	0.210	0.420	
Sub-section Width (m)		0.210	0.210	**0.420**
Sub-Section Depth (m)	0.040	0.050	0.030	
Areas (m^2)		0.009	0.008	**0.018**
Length of Run (m)	**1.00**			
Run # -->	**1**	**2**	**3**	
Time (seconds)	1.50	1.78	1.70	
	4	**5**	**6**	
				1.66
Avg. Vel	**0.602**	m/sec		
Q=vA	**0.011**	m^3/sec		
(ignores friction so these	**645.2**	L/min		
may be overestimated)	**141.9**	igpm		

Flow Estimates

Bentall Lands Oakville - Nov 9, 2009

	Bank Edge			Bank Edge	Sums/Avgs
SG-1					
Length (m)	0.50				
Width (m)	0.30				
Depth (m)	0.02	0.04	0.06	0.02	
Sub-Section Location (m)	0.000	0.100	0.200	0.300	
Sub-section Width (m)		0.100	0.100	0.100	**0.300**
Sub-Section Depth (m)	0.020	0.040	0.060	0.020	
Areas (m^2)		0.003	0.005	0.004	**0.012**
Length of Run (m)	**0.50**				
Run # -->	**1**	**2**	**3**		
Time (seconds)	3.00	3.00	4.00		
	4	**5**	**6**		
	3.00	4.00			**3.40**
Avg. Vel	**0.147**	m/sec			
Q=vA	**0.002**	m^3/sec			
(ignores friction so these	**105.9**	L/min			
may be overestimated)	**23.3**	igpm			

Flow Estimates

Bentall Lands Oakville - Nov 20, 2009

	Bank Edge			Bank Edge			Sums/Avgs
SG-2							
Length (m)	1.00						
Width (m)	1.15						
Depth (m)	0.25	0.04	0.06	0.06	0.06	0.06	
Sub-Section Location (m)	0.000	0.420	0.550	0.650	1.000	1.150	
Sub-section Width (m)		0.420	0.130	0.100	0.350	0.150	**1.000**
Sub-Section Depth (m)	0.250	0.250	0.140	0.100	0.040	0.000	
Areas (m^2)		0.105	0.025	0.012	0.025	0.003	**0.167**
Length of Run (m)	**1.00**						
Run # -->	**1**	**2**	**3**				
Time (seconds)	5.00	6.50	6.00				
	4	**5**	**6**				
	7.00						**6.13**
Avg. Vel	**0.163**	m/sec					
Q=vA	**0.027**	m^3/sec					
(ignores friction so these	**1634.4**	L/min					
may be overestimated)	**359.5**	igpm					

Flow Estimates

Bentall Lands Oakville - Dec. 18, 2009

	Bank Edge				Bank Edge	Sums/Avgs
FMP-1						
Length (m)	0.50					
Width (m)	0.90					
Depth (m)	0.04	0.10	0.14	0.09	0.06	
Sub-Section Location (m)	0.000	0.225	0.450	0.675	0.900	
Sub-section Width (m)		0.225	0.225	0.225	0.225	**0.900**
Sub-Section Depth (m)	0.040	0.100	0.140	0.090	0.060	
Areas (m^2)		0.016	0.027	0.026	0.017	**0.086**
Length of Run (m)	**0.50**					
Run # -->	**1**	**2**	**3**			
Time (seconds)	4.00	5.00	4.00			
	4	**5**	**6**			**4.33**
Avg. Vel	**0.115**	m/sec				
Q=vA	**0.010**	m^3/sec				
(ignores friction so these	**591.9**	L/min				
may be overestimated)	**130.2**	igpm				

Flow Estimates

Bentall Lands Oakville - Jan 21, 2010

	Bank Edge		Bank Edge	Sums/Avgs
MP-04 Location				
Length (m)	0.20			
Width (m)	0.12			
Depth (m)	0.04			
Sub-Section Location (m)	0.000	0.060	0.120	
Sub-section Width (m)	0.12	0.120	0.100	0.220
Sub-Section Depth (m)	0.030	0.040	0.040	
Areas (m^2)		0.004	0.004	0.008
Length of Run (m)	**0.20**			
Run # -->	**1**	**2**	**3**	
Time (seconds)	1.50	1.70	1.50	
	4	**5**	**6**	
				1.57
Avg. Vel	**0.128**	m/sec		
Q=vA	**0.001**	m^3/sec		
(ignores friction so these	**62.8**	L/min		
may be overestimated)	**13.8**	igpm		

Flow Estimates

Bentall Lands Oakville - April 13, 2010

	Bank Edge			Bank Edge	Sums/Avgs
FMP-2					
Length (m)	1.00				
Upstream Cross-Section (25% weighted contribution)					
Width (m)	0.23				
Depth (m)	0.02	0.02	0.02	0.04	
Sub-Section Location (m)	0.000	0.077	0.153	0.230	
Sub-section Width (m)		0.077	0.077	0.077	0.230
Sub-Section Depth (m)	0.020	0.020	0.020	0.040	
Areas (m^2)		0.002	0.002	0.002	0.005
Midpoint Cross-Section (50% weighted contribution)					
Width (m)	0.40				
Depth (m)	0.04	0.07	0.07	0.01	
Sub-Section Location (m)	0.000	0.133	0.267	0.400	
Sub-section Width (m)		0.133	0.133	0.133	0.400
Sub-Section Depth (m)	0.040	0.070	0.070	0.010	
Areas (m^2)		0.007	0.009	0.005	0.022
Downstream Cross-Section (25% weighted contribution)					
Width (m)	0.40				
Depth (m)	0.02	0.03	0.07	0.04	
Sub-Section Location (m)	0.000	0.133	0.267	0.400	
Sub-section Width (m)		0.133	0.133	0.133	0.400
Sub-Section Depth (m)	0.020	0.030	0.070	0.040	
Areas (m^2)		0.003	0.007	0.007	0.017
Weighted Cross-Sectional Area (m^2)					0.017
Length of Run (m)	**1.00**				
Run # -->	**1**	**2**	**3**		
Time (seconds)	2.59	4.62	3.07		
	4	**5**	**6**		
	3.18	2.50	3.40		3.23
Avg. Vel	**0.310**	m/sec			
Q=vA	**0.002**	m^3/sec			
(ignores friction so these	**99.8**	L/min			
may be overestimated)	**22.0**	igpm			

Flow Estimates

Bentall Lands Oakville - April 13, 2010

	Bank Edge		Bank Edge	Sums/Avgs
FMP-4				
Length (m)	0.50			
Upstream Cross-Section (25% weighted contribution)				
Width (m)	0.30			
Depth (m)	0.03	0.04	0.03	
Sub-Section Location (m)	0.000	0.150	0.300	
Sub-section Width (m)		0.150	0.150	0.300
Sub-Section Depth (m)	0.030	0.040	0.030	
Areas (m^2)		0.005	0.005	0.011
Midpoint Cross-Section (50% weighted contribution)				
Width (m)	0.35			
Depth (m)	0.02	0.04	0.03	
Sub-Section Location (m)	0.000	0.175	0.350	
Sub-section Width (m)		0.175	0.175	0.350
Sub-Section Depth (m)	0.020	0.040	0.030	
Areas (m^2)		0.005	0.006	0.011
Downstream Cross-Section (25% weighted contribution)				
Width (m)	0.40			
Depth (m)	0.02	0.04	0.01	
Sub-Section Location (m)	0.000	0.200	0.400	
Sub-section Width (m)		0.200	0.200	0.400
Sub-Section Depth (m)	0.020	0.040	0.010	
Areas (m^2)		0.006	0.005	0.011
Weighted Cross-Sectional Area (m^2)				0.011
Length of Run (m)	**0.50**			
Run # -->	**1**	**2**	**3**	
Time (seconds)	4.10	3.60	3.20	
	4	**5**	**6**	
	3.80	3.30		3.60
Avg. Vel	**0.139**	m/sec		
Q=vA	**0.001**	m^3/sec		
(ignores friction so these	**87.5**	L/min		
may be overestimated)	**19.2**	igpm		

Flow Estimates

Bentall Lands Oakville - April 13, 2010

	Bank Edge			Bank Edge		Sums/Avgs
FMP-1						
Length (m)	1.00					
Upstream Cross-Section (25% weighted contribution)						
Width (m)	0.80					
Depth (m)	0.01	0.05	0.15	0.16	0.10	
Sub-Section Location (m)	0.000	0.200	0.400	0.600	0.800	
Sub-section Width (m)		0.200	0.200	0.200	0.200	**0.800**
Sub-Section Depth (m)	0.010	0.050	0.150	0.160	0.100	
Areas (m^2)		0.006	0.020	0.031	0.026	**0.083**
Midpoint Cross-Section (50% weighted contribution)						
Width (m)	0.90					
Depth (m)	0.01	0.05	0.12	0.16	0.14	
Sub-Section Location (m)	0.000	0.225	0.450	0.675	0.900	
Sub-section Width (m)		0.225	0.225	0.225	0.225	**0.900**
Sub-Section Depth (m)	0.010	0.050	0.120	0.160	0.140	
Areas (m^2)		0.007	0.019	0.032	0.034	**0.091**
Downstream Cross-Section (25% weighted contribution)						
Width (m)	0.90					
Depth (m)	0.04	0.09	0.16	0.14		
Sub-Section Location (m)	0.000	0.300	0.600	0.900		
Sub-section Width (m)		0.300	0.300	0.300		**0.900**
Sub-Section Depth (m)	0.040	0.090	0.160	0.140		
Areas (m^2)		0.020	0.038	0.045		**0.102**
Weighted Cross-Sectional Area (m^2)						**0.092**
Length of Run (m)	**1.00**					
Run # -->	**1**	**2**	**3**			
Time (seconds)	11.30	13.70	13.80			
	4	**5**	**6**			
	14.90	11.70			**13.08**	
Avg. Vel	**0.076**	m/sec				
Q=vA	**0.006**	m^3/sec				
(ignores friction so these	**380.7**	L/min				
may be overestimated)	**83.8**	igpm				

Flow Estimates

Bentall Lands Oakville - April 13, 2010

	Bank Edge			Bank Edge	Sums/Avgs
MP-03					
Length (m)	1.00				
Upstream Cross-Section (25% weighted contribution)					
Width (m)	0.19				
Depth (m)	0.04	0.06	0.02		
Sub-Section Location (m)	0.000	0.095	0.190		
Sub-section Width (m)		0.095	0.095		0.190
Sub-Section Depth (m)	0.040	0.060	0.020		
Areas (m^2)		0.005	0.004		0.009
Midpoint Cross-Section (50% weighted contribution)					
Width (m)	0.20				
Depth (m)	0.10	0.04	0.02		
Sub-Section Location (m)	0.000	0.100	0.200		
Sub-section Width (m)		0.100	0.100		0.200
Sub-Section Depth (m)	0.100	0.040	0.020		
Areas (m^2)		0.007	0.003		0.010
Downstream Cross-Section (25% weighted contribution)					
Width (m)	0.24				
Depth (m)	0.07	0.05	0.05	0.02	
Sub-Section Location (m)	0.000	0.080	0.160	0.240	
Sub-section Width (m)		0.080	0.080	0.080	0.240
Sub-Section Depth (m)	0.070	0.050	0.050	0.020	
Areas (m^2)		0.005	0.004	0.003	0.012
Weighted Cross-Sectional Area (m^2)					0.010
Length of Run (m)	1.00				
Run # -->	1	2	3		
Time (seconds)	2.89	2.93	2.31		
	4	5	6		
	3.12	2.79			2.81
Avg. Vel	0.356	m/sec			
Q=vA	0.003	m^3/sec			
(ignores friction so these	182.7	L/min			
may be overestimated)	40.2	igpm			

Flow Estimates

Bentall Lands Oakville - April 13, 2010

	Bank Edge			Bank Edge	Sums/Avgs
FMP-3					
Length (m)	1.00				
Upstream Cross-Section (50% weighted contribution)					
Width (m)	0.40				
Depth (m)	0.05	0.10	0.06		
Sub-Section Location (m)	0.000	0.200	0.400		
Sub-section Width (m)		0.200	0.200		0.400
Sub-Section Depth (m)	0.050	0.100	0.060		
Areas (m^2)		0.015	0.016		0.031
Downstream Cross-Section (50% weighted contribution)					
Width (m)	0.60				
Depth (m)	0.15	0.18	0.10		
Sub-Section Location (m)	0.000	0.300	0.600		
Sub-section Width (m)		0.300	0.300		0.600
Sub-Section Depth (m)	0.150	0.180	0.100		
Areas (m^2)		0.050	0.042		0.092
Weighted Cross-Sectional Area (m^2)					0.061
Length of Run (m)	1.00				
Run # -->	1	2	3		
Time (seconds)	7.14	8.68	8.32		
	4	5	6		
	7.67	7.77		7.92	
Avg. Vel	0.126	m/sec			
Q=vA	0.004	m^3/sec			
(ignores friction so these	235.0	L/min			
may be overestimated)	51.7	igpm			

Flow Estimates

Bentall Lands Oakville - April 13, 2010

	Bank Edge		Bank Edge	Sums/Avgs
FMP-6/MP-04				
Length (m)	0.60			
Upstream Cross-Section (25% weighted contribution)				
Width (m)	0.65			
Depth (m)	0.05	0.15	0.05	
Sub-Section Location (m)	0.000	0.325	0.650	
Sub-section Width (m)		0.325	0.325	0.650
Sub-Section Depth (m)	0.050	0.150	0.050	
Areas (m^2)		0.033	0.033	0.065
Midpoint Cross-Section (50% weighted contribution)				
Width (m)	0.45			
Depth (m)	0.05	0.08	0.06	
Sub-Section Location (m)	0.000	0.225	0.450	
Sub-section Width (m)		0.225	0.225	0.450
Sub-Section Depth (m)	0.050	0.080	0.060	
Areas (m^2)		0.015	0.016	0.030
Downstream Cross-Section (25% weighted contribution)				
Width (m)	0.75			
Depth (m)	0.06	0.07	0.05	
Sub-Section Location (m)	0.000	0.375	0.750	
Sub-section Width (m)		0.375	0.375	0.750
Sub-Section Depth (m)	0.060	0.070	0.050	
Areas (m^2)		0.024	0.023	0.047
Weighted Cross-Sectional Area (m^2)				0.043
Length of Run (m)	0.60			
Run # -->	1	2	3	
Time (seconds)	3.01	2.57	2.89	
	4	5	6	
	2.42	2.53		2.68
Avg. Vel	0.224	m/sec		
Q=vA	0.015	m^3/sec		
(ignores friction so these	871.8	L/min		
may be overestimated)	191.8	igpm		

Flow Estimates

Bentall Lands Oakville - October 18-19, 2010

	Bank Edge		Bank Edge	Sums/Avgs
FMP-2				
Length (m)	1.00			
Upstream Cross-Section (25% weighted contribution)				
Width (m)	0.34			
Depth (m)	0.02	0.04	0.02	
Sub-Section Location (m)	0.000	0.170	0.340	
Sub-section Width (m)		0.170	0.170	0.340
Sub-Section Depth (m)	0.020	0.040	0.020	
Areas (m^2)		0.005	0.002	0.007
Midpoint Cross-Section (50% weighted contribution)				
Width (m)	0.32			
Depth (m)	0.02	0.05	0.01	
Sub-Section Location (m)	0.000	0.160	0.320	
Sub-section Width (m)		0.160	0.160	0.320
Sub-Section Depth (m)	0.015	0.050	0.010	
Areas (m^2)		0.005	0.001	0.006
Downstream Cross-Section (25% weighted contribution)				
Width (m)	0.37			
Depth (m)	0.01	0.05	0.03	
Sub-Section Location (m)	0.000	0.185	0.370	
Sub-section Width (m)		0.185	0.185	0.370
Sub-Section Depth (m)	0.010	0.050	0.030	
Areas (m^2)		0.006	0.003	0.008
Weighted Cross-Sectional Area (m^2)				0.007
Length of Run (m)	1.00			
Run # -->	1	2	3	
Time (seconds)	12.00	11.13	12.88	
	4	5	6	
	14.65			12.67
Avg. Vel	0.079	m/sec		
Q=vA	0.001	m^3/sec		
(ignores friction so these	32.2	L/min		
may be overestimated)	7.1	igpm		

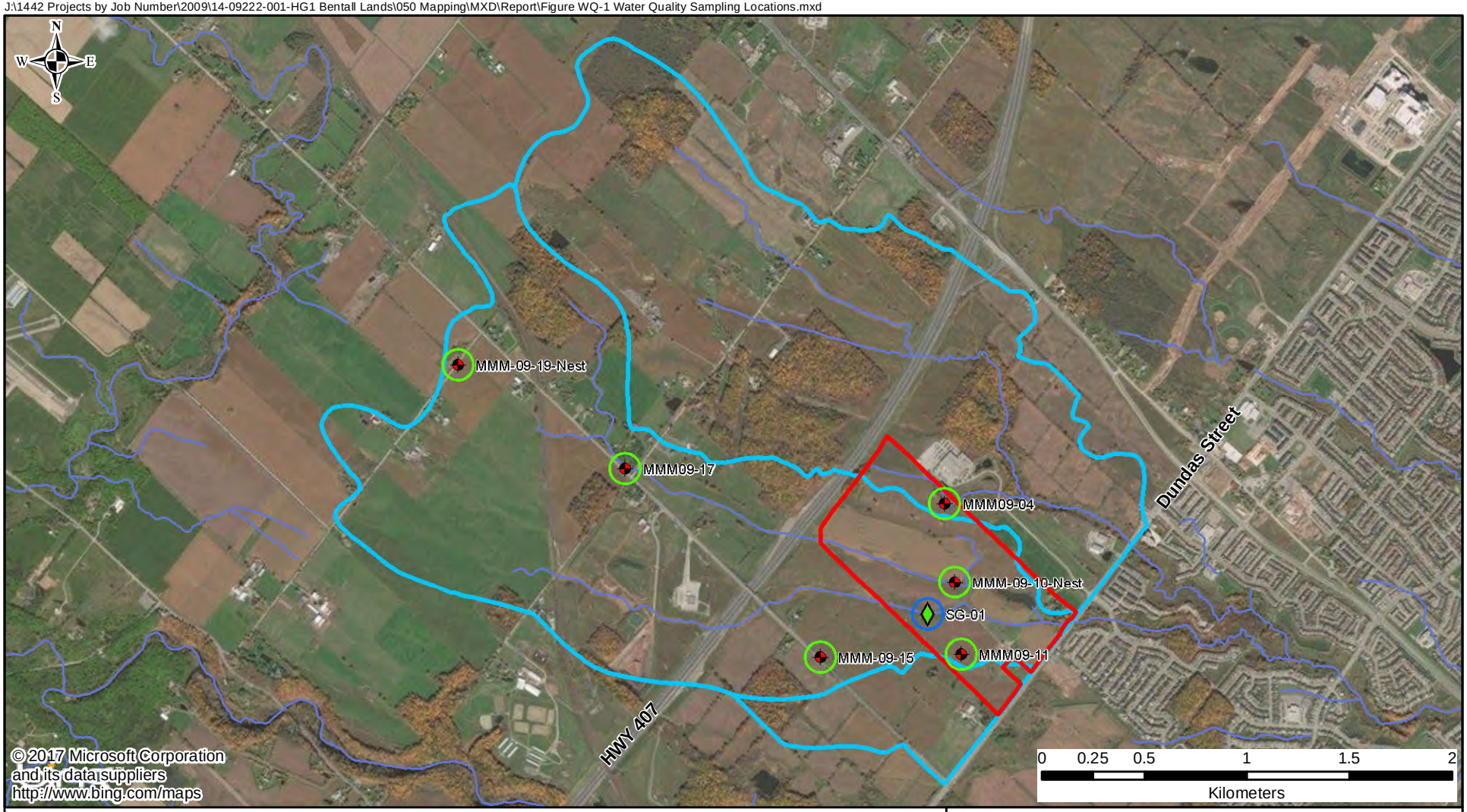
Flow Estimates

Bentall Lands Oakville - October 18-19, 2010

	Bank Edge		Bank Edge	Sums/Avgs
FMP-5/MP-03				
Length (m)	1.00			
Upstream Cross-Section (25% weighted contribution)				
Width (m)	0.20			
Depth (m)	0.04	0.04	0.04	
Sub-Section Location (m)	0.000	0.100	0.200	
Sub-section Width (m)		0.100	0.100	0.200
Sub-Section Depth (m)	0.040	0.040	0.040	
Areas (m^2)		0.004	0.002	0.006
Midpoint Cross-Section (50% weighted contribution)				
Width (m)	0.20			
Depth (m)	0.06	0.05	0.03	
Sub-Section Location (m)	0.000	0.100	0.200	
Sub-section Width (m)		0.100	0.100	0.200
Sub-Section Depth (m)	0.060	0.050	0.030	
Areas (m^2)		0.006	0.002	0.007
Downstream Cross-Section (25% weighted contribution)				
Width (m)	0.20			
Depth (m)	0.03	0.04	0.03	
Sub-Section Location (m)	0.000	0.100	0.200	
Sub-section Width (m)		0.100	0.100	0.200
Sub-Section Depth (m)	0.030	0.040	0.030	
Areas (m^2)		0.004	0.002	0.005
Weighted Cross-Sectional Area (m^2)				0.006
Length of Run (m)	1.00			
Run # -->	1	2	3	
Time (seconds)	4.24	4.77	4.30	
	4	5	6	
	4.00			4.33
Avg. Vel	0.231	m/sec		
Q=vA	0.001	m^3/sec		
(ignores friction so these	83.2	L/min		
may be overestimated)	18.3	igpm		

APPENDIX 4-6
Ground Water and Surface Water Quality

J:\1442 Projects by Job Number\2009\14-09222-001-HG1 Bentall Lands\050 Mapping\MXD\Report\Figure WQ-1 Water Quality Sampling Locations.mxd



Legend

- Subject Property
- Subcatchment Areas
- Watercourse

Monitoring Locations

- Surface Water Sample (Staff Gauge)
- Groundwater Samples (Monitoring Wells)

Client: **QuadReal**

Title: **Water Quality Sampling locations**

Prepared By: WSP

09M-00013-01	Scale as Shown	Review: AK
Date: June 2017		
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Figure: WQ-1

Figure WQ-2
Selected General Chemistry and Metal Parameter Concentrations
Oakville, Ontario

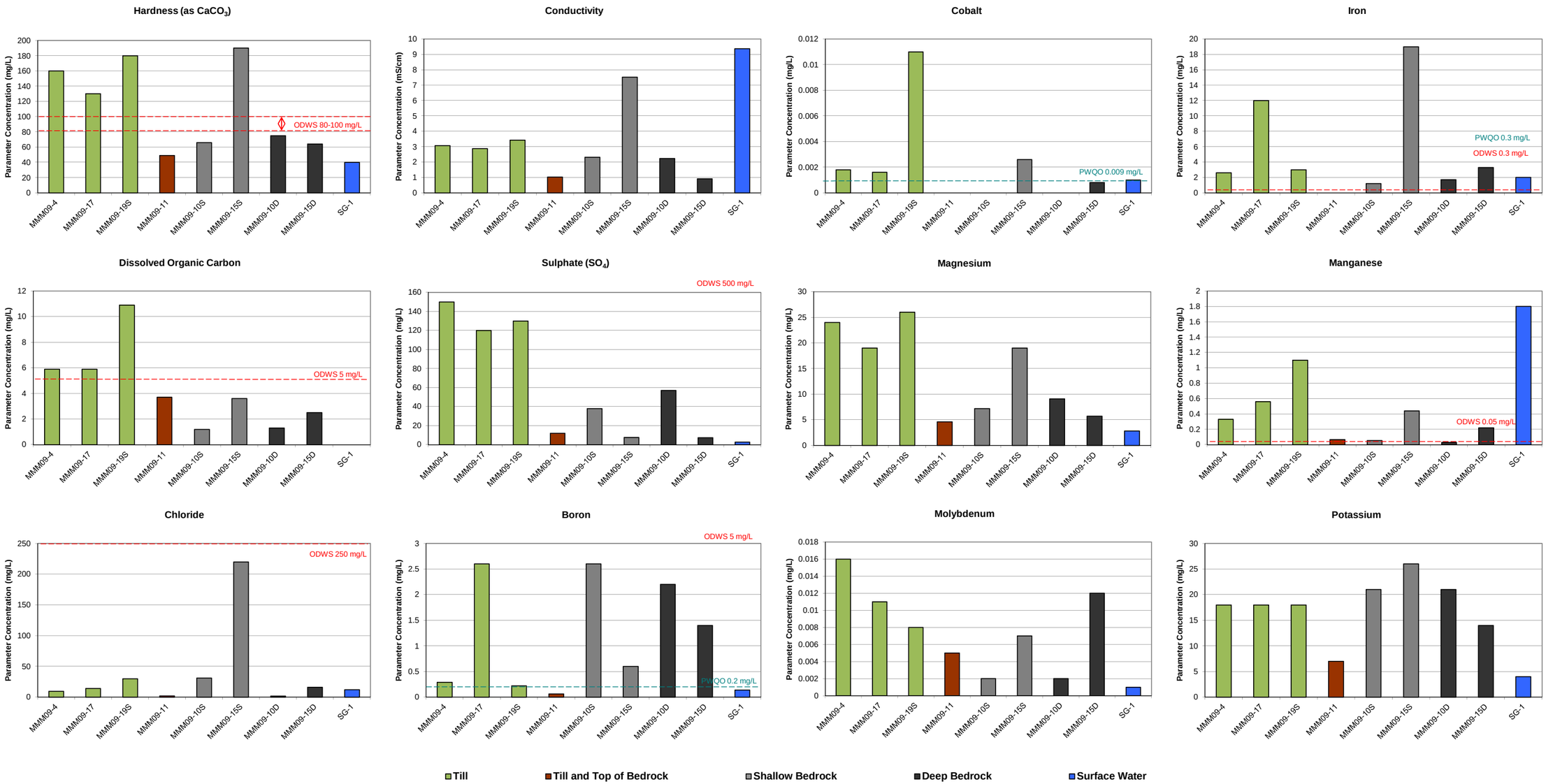
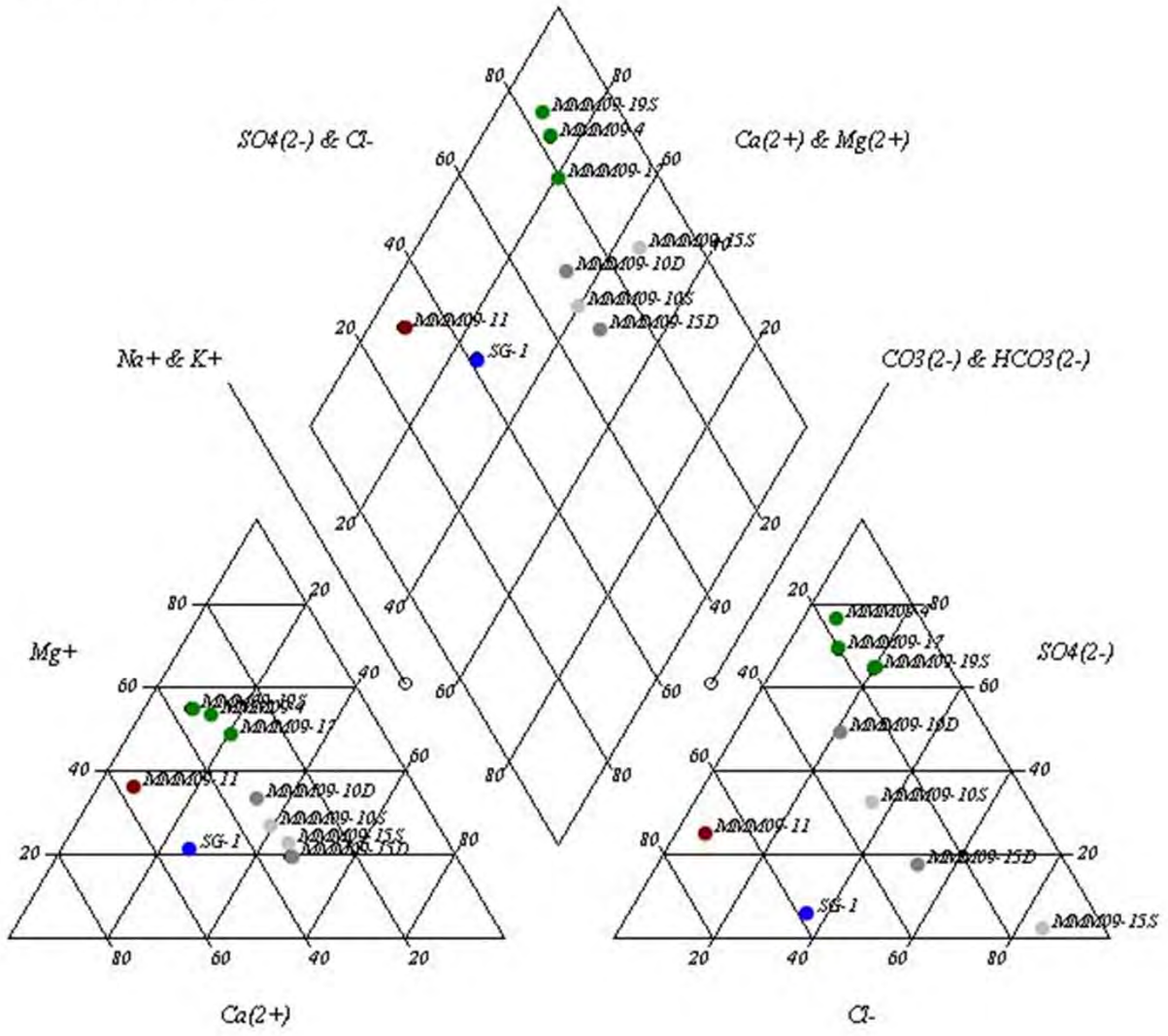


Figure WQ-3
Piper / Trilinear Plot
Oakville, Ontario

Triplot Results:

9 points (Data Provided in MEq).



Source: http://www.rime.com.au/triplot/triplot.html

Table WQ-1
Summary of Water Quality Results
Dissolved Metals
Oakville, Ontario

Parameter	PWQO	ODWS	RDL	MMM09-4	RDL	MMM09-17	FD-1 (MMM09-17)	MMM09-19S	RDL	MMM09-11	MMM09-10S	RDL	MMM09-15S	RDL	MMM09-10D	RDL	MMM09-15D	RDL	SG-1
Date Sampled -->	mg/L			24-Sept-2009		24-Jan-2010	24-Jan-2010	24-Jan-2010		24-Sept-2009	24-Sept-2009		24-Jan-2010		24-Sept-2009		24-Jan-2010		24-Sept-2009
Dissolved Aluminum (Al)	0.075	0.1	0.005	0.012	0.005	0.009	0.006	0.006	0.005	0.006	<0.005	0.005	0.005	0.005	<0.005	0.005	0.007	0.005	**(1.6)**
Dissolved Antimony (Sb)	0.02	0.006	0.0005	0.0006	0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	(<0.0005)
Dissolved Arsenic (As)	0.1	0.025	0.001	0.003	0.001	0.006	0.006	0.001	0.001	<0.001	0.003	0.001	0.006	0.001	<0.001	0.001	0.002	0.001	(0.002)
Dissolved Barium (Ba)	NV	1	0.005	0.007	0.005	0.027	0.027	0.005	0.005	0.036	0.023	0.005	0.24	0.005	0.015	0.005	0.17	0.005	(0.095)
Dissolved Beryllium (Be)	1.1	NV	0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	(<0.0005)
Dissolved Bismuth (Bi)	NV	NV	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	-
Dissolved Boron (B)	0.2	5	0.01	**0.29**	0.01	**2.6**	**2.6**	**0.22**	0.01	0.063	**2.6**	0.01	**0.6**	0.01	**2.2**	0.01	**1.4**	0.01	(0.14)
Dissolved Cadmium (Cd)	0.0002	0.005	0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0002	0.0001	<0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	(<0.0001)
Dissolved Calcium (Ca)	NV	NV	0.2	240	0.2	200	200	280	0.2	120	150	0.2	450	0.2	150	0.2	160	0.2	115 (95)
Dissolved Chromium (Cr)	NV	0.05	0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005	0.005	<0.005	0.005	<0.005	0.005	(<0.005)
Dissolved Cobalt (Co)	0.0009	NV	0.0005	**0.0018**	0.0005	**0.0016**	**0.0016**	**0.011**	0.0005	<0.0005	<0.0005	0.0005	**0.0026**	0.0005	<0.0005	0.0005	0.0008	0.0005	**(0.001)**
Dissolved Copper (Cu)	0.005	1	0.001	<0.001	0.001	<0.001	<0.001	0.002	0.001	0.003	0.002	0.001	0.002	0.001	<0.001	0.001	<0.001	0.001	**(0.006)**
Dissolved Iron (Fe)	0.3	0.3	0.1	**2.6**	0.1	**12**	**12**	**3**	0.1	<0.1	**1.2**	0.1	**19**	0.1	**1.7**	0.1	**3.3**	0.1	**(2)**
Dissolved Lead (Pb)	0.025	0.01	0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	(0.0011)
Dissolved Magnesium (Mg)	NV	NV	0.05	240	0.05	190	190	260	0.05	46	72	0.05	190	0.05	91	0.05	57	0.05	28.2 (25)
Dissolved Manganese (Mn)	NV	0.05	0.002	**0.33**	0.002	**0.56**	**0.54**	**1.1**	0.002	**0.066**	**0.055**	0.002	**0.44**	0.002	0.029	0.002	**0.22**	0.002	**(1.8)**
Dissolved Molybdenum (Mo)	0.04	NV	0.001	0.016	0.001	0.011	0.011	0.008	0.001	0.005	0.002	0.001	0.007	0.001	0.002	0.001	0.012	0.001	(0.001)
Dissolved Nickel (Ni)	0.025	NV	0.001	0.006	0.001	0.004	0.005	0.012	0.001	<0.001	<0.001	0.001	<0.005	0.001	0.002	0.001	0.002	0.001	(0.002)
Dissolved Phosphorus (P)	NV	NV	0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	(0.16)
Dissolved Potassium (K)	NV	NV	0.2	18	0.2	18	18	18	0.2	7	21	0.2	26	0.2	21	0.2	14	0.2	4 (4)
Dissolved Selenium (Se)	0.1	0.01	0.002	<0.002	0.002	<0.002	<0.002	0.005	0.002	<0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	(<0.002)
Dissolved Silicon (Si)	NV	NV	0.05	6.9	0.05	7.5	7.4	6.7	0.05	7.4	6.3	0.05	7.5	0.05	5.6	0.05	3.7	0.05	(6.1)
Dissolved Silver (Ag)	0.0001	NV	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	**0.0002**	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	(<0.0001)
Dissolved Sodium (Na)	NV	200	0.1	110	0.1	140	140	74	0.1	13	190	0.1	**700**	0.1	160	0.1	**250**	0.1	61.2 (50)
Dissolved Strontium (Sr)	NV	NV	0.001	7	0.001	5.9	5.8	1.9	0.001	1.9	23	0.001	36	0.001	25	0.001	9.3	0.001	-
Dissolved Thallium (Tl)	0.0003	NV	5E-05	0.00006	5E-05	<0.00005	<0.00005	<0.00005	5E-05	<0.00005	0.00005	5E-05	<0.00005	5E-05	<0.00005	5E-05	<0.00005	5E-05	(<0.00005)
Dissolved Titanium (Ti)	NV	NV	0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.005	<0.005	0.005	<0.005	0.005	<0.005	0.005	-
Dissolved Tungsten (W)	NV	NV	0.001	-		-	-	-	0.001	-	-		-	0.001	-		-	0.001	(<0.001)
Dissolved Uranium (U)	0.005	0.02	0.0001	**0.014**	0.0001	**0.0092**	**0.0088**	**0.016**	0.0001	**0.0058**	0.0003	0.0001	**0.011**	0.0001	0.0003	0.0001	0.0036	0.0001	(0.0015)
Dissolved Vanadium (V)	0.006	NV	0.001	<0.001	0.001	0.002	0.002	0.002	0.001	<0.001	0.002	0.001	<0.005	0.001	<0.001	0.001	<0.001	0.001	(0.003)
Dissolved Zinc (Zn)	0.03	5	0.005	<0.005	0.005	**0.22**	**0.2**	**4.4**	0.005	0.006	0.007	0.005	**0.31**	0.005	<0.005	0.005	**0.038**	0.005	**(0.032)**
Dissolved Zirconium (Zr)	NV	NV	0.001	-		-	-	-	0.001	-	-		-	0.001	-		-	0.001	(0.001)

All units in mg/L, unless otherwise stated

NV: No Value

PWQO:Water Management, Policies, Guidelines, Provincial Water Quality Objectives, Ministry of Environment and Energy, July 1994, revised February 1999, Appendix A, Table 2 - Table of PWQOs and Interim PWQOs

ODWS: Technical Support Document for Ontario Drinking Water; Standards, Objectives and Guidelines, June 2003, Table 2 - Chemical Standards and Table 4 - Chemical/Physical Objectives and Guidelines

(0.01) Total Calcium

100 Exceeds PWQO

100 Exceeds ODWS

100 Exceeds ODWS and PWQO

Table WQ-2
Summary of Water Quality Results
Inorganic Parameters
Oakville, Ontario

Parameter **Date Sampled -->**	PWQO	ODWS	Units	RDL	**MMM09-4** **24-Sept-2009**	RDL	**MMM09-17** **24-Jan-2010**	**FD-1 (MMM09-17)** **24-Jan-2010**	**MMM09-19S** **24-Jan-2010**	RDL	**MMM09-11** **24-Sept-2009**	**MMM09-10S** **24-Sept-2009**	RDL	**MMM09-15S** **24-Jan-2010**	RDL	**MMM09-10D** **24-Sept-2009**	RDL	**MMM09-15D** **24-Jan-2010**	RDL	**SG-1** **24-Sept-2009**
Anion Sum	NV	NV	me/L	N/A	40.5	N/A	35.8	36	43.1	N/A	11.9	24.5	N/A	72.2	N/A	24	N/A	8.69	N/A	-
Bicarb. Alkalinity (calc. as CaCO3)	NV	NV	mg/L	1	347	1	367	368	326	1	347	385	1	453	1	358	1	129	1	272
Carb. Alkalinity (calc. as CaCO3)	NV	NV	mg/L	1	1	1	2	2	1	1	2	2	1	1	1	2	1	1	1	2
Total Alkalinity (as CaCO3)	NV	30-500	mg/L	1	348	1	369	370	328	1	349	387	1	454	1	359	1	130	1	274
Cation Sum	NV	NV	me/L	N/A	36.8	N/A	32.8	32.6	39	N/A	10.5	22.2	N/A	69.8	N/A	22.5	N/A	24	N/A	-
Hardness (CaCO3)	NV	80-100	mg/L	1	**1600**	1	**1300**	**1300**	**1800**	1	**490**	**660**	1	**1900**	1	**750**	1	**640**	1	**400**
Ion Balance (% Difference)	NV	NV	%	N/A	4.79	N/A	4.28	4.87	4.95	N/A	6.28	5.07	N/A	1.66	N/A	3.17	N/A	46.8	N/A	-
Langelier Index (@ 20C)	NV	NV	N/A	N/A	0.898		0.959	0.962	0.834	N/A	0.842	0.85		1.02	N/A	0.852		0.856	N/A	0.852
Langelier Index (@ 4C)	NV	NV	N/A	N/A	0.656		0.716	0.718	0.592	N/A	0.595	0.605		0.783	N/A	0.607		0.61	N/A	0.605
Saturation pH (@ 20C)	NV	NV	N/A	N/A	6.76		6.79	6.79	6.72	N/A	6.88	6.84		6.44	N/A	6.87		7.2	N/A	6.98
Saturation pH (@ 4C)	NV	NV	N/A	N/A	7		7.03	7.04	6.96	N/A	7.13	7.08		6.68	N/A	7.11		7.45	N/A	7.22
Total Ammonia-N	NV	NV	mg/L	0.05	0.32	0.05	0.33	0.48	0.33	0.05	0.07	1.3	0.05	0.42	0.05	2	0.05	0.82	0.05	0.29
- Unionized Ammonia - Calculated	0.02	NV	mg/L	N/A	0.003		0.003	0.005	0.002	N/A	0.001	0.011		0.002	N/A	0.017		0.017	N/A	0.003
Calculated TDS	NV	500	mg/L	1	**2410**	1	**2110**	**2120**	**2490**	1	**665**	**1380**	1	**3930**	1	**1400**	1	**805**	1	-
Conductivity	NV	NV	umho/cm	1	3070	1	2870	2860	3430	1	1030	2310	1	7520	1	2230	1	918	1	937
Dissolved Organic Carbon	NV	5	mg/L	0.2	**5.9**	0.2	**5.9**	**5.9**	**10.9**	0.2	3.7	1.2	0.2	3.6	0.2	1.3	0.2	2.5	0.2	-
Total Organic Carbon (TOC)	NV	NV	mg/L	0.2	-	-	-	-	-	0.2	-	-	-	-	0.2	-	-	-	0.2	9.5
Orthophosphate (P)	NV	NV	mg/L	0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
pH	6.5 - 8.5	6.5-8.5	pH	pH	7.7	pH	7.7	7.8	7.6	pH	7.7	7.7	pH	7.5	pH	7.7	pH	8.1	pH	7.8
Dissolved Sulphate (SO4)	NV	500	mg/L	10	**1500**	10	**1200**	**1200**	**1300**	10	120	380	10	75	10	**570**	10	74	10	27
Dissolved Chloride (Cl)	NV	250	mg/L	1	95	1	140	140	**300**	1	21	**310**	1	**2200**	1	180	1	160	1	120
Nitrite (N)	NV	1	mg/L	0.01	<0.01	0.01	<0.01	<0.01	0.02	0.01	0.08	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
Nitrate (N)	NV	10	mg/L	0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	**25**	<0.1	0.1	<0.1	0.1	<0.1	0.1	0.4	0.1	<0.1

Notes:
All units in mg/L, unless otherwise stated
NV: No Value

Unionized Ammonia: The percentages of un-ionized ammonia (NH3) in aqueous ammonia solution is different for different temperature and pH conditions listed in a table within the PWQO that lists the percentage contribution of un-ionized ammonia relative to total ammonia. For example, at a pH of 8.0 and at a temperature of 11C, un-ionized ammonia will comprise approximately 2.0% of the total ammonia concentration.

PWQO:Water Management, Policies, Guidelines, Provincial Water Quality Objectives, Ministry of Environment and Energy, July 1994, revised February 1999, Appendix A, Table 2 - Table of PWQOs and Interim PWQOs
ODWS: Technical Support Document for Ontario Drinking Water; Standards, Objectives and Guidelines, June 2003, Table 2 - Chemical Standards and Table 4 - Chemical/Physical Objectives and Guidelines

100	Exceeds PWQO
100	Exceeds ODWS
100	Exceeds ODWS and PWQO

Your Project #: 14-09222-001-HG1
Site: 407 WEST AREA , OAKVILLE
Your C.O.C. #: 16404601, 164046-0

Attention: Annette Blazeiko
MMM GROUP LIMITED
100 Commerce Valley Dr W
Thornhill, ON
CANADA L3T 0A1

Report Date: 2009/10/02

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A9C6886
Received: 2009/09/24, 17:40

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Alkalinity	5	N/A	2009/09/30	CAM SOP-00448	SM 2320B
Carbonate, Bicarbonate and Hydroxide	5	N/A	2009/10/01		
Chloride by Automated Colourimetry	5	N/A	2009/10/01	CAM SOP-00463	SM 4500 Cl E
Conductivity	5	N/A	2009/09/30	CAM SOP-00448	SM 2510
Dissolved Organic Carbon (DOC)	4	N/A	2009/09/30	CAM SOP-00446	SM 5310 B
Hardness (calculated as CaCO3)	1	N/A	2009/09/30	CAM SOP 0102	SM 2340 B
Hardness (calculated as CaCO3)	3	N/A	2009/10/01	CAM SOP 0102	SM 2340 B
Hardness (calculated as CaCO3)	1	N/A	2009/10/02	CAM SOP 0102	SM 2340 B
Lab Filtered Metals Analysis by ICP	1	2009/10/01	2009/10/01	CAM SOP-00408	EPA 6010
Dissolved Metals by ICPMS	1	N/A	2009/09/29	CAM SOP-00447	EPA 6020
Dissolved Metals by ICPMS	3	N/A	2009/10/01	CAM SOP-00447	EPA 6020
Total Metals Analysis by ICPMS	1	N/A	2009/10/01	CAM SOP-00447	EPA 6020
Ion Balance (% Difference)	4	N/A	2009/10/01		
Anion and Cation Sum	4	N/A	2009/10/01		
Ammonia-N	5	N/A	2009/10/01	CAM SOP-00441	US GS I-2522-90
Nitrate (NO3) and Nitrite (NO2) in Water (1)	5	N/A	2009/09/29	CAM SOP-00440	SM 4500 NO3I/NO2B
pH	5	N/A	2009/09/30	CAM SOP-00448	SM 4500H
Orthophosphate	5	N/A	2009/10/01	CAM SOP-00461	SM 4500 P-F
Sat. pH and Langelier Index (@ 20C)	4	N/A	2009/10/01		
Sat. pH and Langelier Index (@ 20C)	1	N/A	2009/10/02		
Sat. pH and Langelier Index (@ 4C)	4	N/A	2009/10/01		
Sat. pH and Langelier Index (@ 4C)	1	N/A	2009/10/02		
Sulphate by Automated Colourimetry	5	N/A	2009/10/01	CAM SOP-00464	EPA 375.4
Total Dissolved Solids (TDS calc)	4	N/A	2009/10/01		
Total Dissolved Solids (TDS calc)	1	N/A	2009/10/02		
Total Organic Carbon (TOC)	1	N/A	2009/10/01	CAM SOP-00446	EPA 415.1 modified
Total Phosphorus (Colourimetric)	1	2009/09/30	2009/10/02	CAM SOP-00407	APHA 4500 P,B,F
Turbidity	1	N/A	2009/09/28	CAM SOP-00417	APHA 2130

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

../2

Maxxam Job #: A9C6886
Report Date: 2009/10/02

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

SEAN CONACHER, Project Manager
Email: Sean.Conacher@maxxamanalytics.com
Phone# (905) 817-5700 Ext:5806

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CALA have approved this reporting process and electronic report format.

For Service Group specific validation please refer to the Validation Signature Page

Total cover pages: 2

Maxxam Job #: A9C6886
Report Date: 2009/10/02

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

RCAP - COMPREHENSIVE (WATER)

Maxxam ID		DU9940			DU9941			DU9942		DU9943	DU9943		
Sampling Date		2009/09/24			2009/09/24			2009/09/24		2009/09/24	2009/09/24		
	Units	**MMM09-10D**	**RDL**	**QC Batch**	**MMM09-10S**	**RDL**	**QC Batch**	**MMM09-11**	**RDL**	**MMM09-4**	**MMM09-4 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters													
Anion Sum	me/L	24.0	N/A	1950921	24.5	N/A	1950921	11.9	N/A	40.5		N/A	1950921
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	358	1	1950917	385	1	1950917	347	1	347		1	1950917
Calculated TDS	mg/L	1400	1	1950926	1380	1	1950926	665	1	2410		1	1950926
Carb. Alkalinity (calc. as CaCO3)	mg/L	2	1	1950917	2	1	1950917	2	1	1		1	1950917
Cation Sum	me/L	22.5	N/A	1950921	22.2	N/A	1950921	10.5	N/A	36.8		N/A	1950921
Hardness (CaCO3)	mg/L	750	1	1950919	660	1	1950919	490	1	1600		1	1950919
Ion Balance (% Difference)	%	3.17	N/A	1950920	5.07	N/A	1950920	6.28	N/A	4.79		N/A	1950920
Langelier Index (@ 20C)	N/A	0.852		1950923	0.850		1950923	0.842		0.898			1950923
Langelier Index (@ 4C)	N/A	0.607		1950924	0.605		1950924	0.595		0.656			1950924
Saturation pH (@ 20C)	N/A	6.87		1950923	6.84		1950923	6.88		6.76			1950923
Saturation pH (@ 4C)	N/A	7.11		1950924	7.08		1950924	7.13		7.00			1950924
Inorganics													
Total Ammonia-N	mg/L	2.0	0.05	1955758	1.3	0.05	1955758	0.07	0.05	0.32		0.05	1955758
Conductivity	umho/cm	2230	1	1956461	2310	1	1956461	1030	1	3070	3070	1	1956461
Dissolved Organic Carbon	mg/L	1.3	0.2	1955991	1.2	0.2	1955991	3.7	0.2	5.9		0.2	1955991
Orthophosphate (P)	mg/L	<0.01	0.01	1956603	<0.01	0.01	1956603	<0.01	0.01	<0.01		0.01	1956603
pH	pH	7.7		1956460	7.7		1956460	7.7		7.7	7.7		1956460
Dissolved Sulphate (SO4)	mg/L	570	5	1956605	380	1	1956605	120	1	1500		10	1956605
Alkalinity (Total as CaCO3)	mg/L	359	1	1956459	387	1	1956459	349	1	348	345	1	1956459
Dissolved Chloride (Cl)	mg/L	180	2	1956600	310	5	1956600	21	1	95		1	1956600
Nitrite (N)	mg/L	<0.01	0.01	1953404	<0.01	0.01	1953404	0.08	0.01	<0.01		0.01	1953404
Nitrate (N)	mg/L	<0.1	0.1	1953404	<0.1	0.1	1953404	25	1	<0.1		0.1	1953404
p-Alkalinity	mg/L	<1	1	1956459	<1	1	1956459	<1	1	<1	<1	1	1956459
Nitrate + Nitrite	mg/L	<0.1	0.1	1953404	<0.1	0.1	1953404	25	1	<0.1		0.1	1953404

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A9C6886
Report Date: 2009/10/02

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

RCAP - COMPREHENSIVE (WATER)

Maxxam ID		DU9940			DU9941			DU9942		DU9943	DU9943		
Sampling Date		2009/09/24			2009/09/24			2009/09/24		2009/09/24	2009/09/24		
	Units	**MMM09-10D**	**RDL**	**QC Batch**	**MMM09-10S**	**RDL**	**QC Batch**	**MMM09-11**	**RDL**	**MMM09-4**	**MMM09-4 Lab-Dup**	**RDL**	**QC Batch**
Metals													
Dissolved Aluminum (Al)	ug/L	<5	5	1956731	<5	5	1954827	6	5	12		5	1956731
Dissolved Antimony (Sb)	ug/L	<0.5	0.5	1956731	<0.5	0.5	1954827	<0.5	0.5	0.6		0.5	1956731
Dissolved Arsenic (As)	ug/L	1	1	1956731	3	1	1954827	<1	1	3		1	1956731
Dissolved Barium (Ba)	ug/L	15	5	1956731	23	5	1954827	36	5	7		5	1956731
Dissolved Beryllium (Be)	ug/L	<0.5	0.5	1956731	<0.5	0.5	1954827	<0.5	0.5	<0.5		0.5	1956731
Dissolved Bismuth (Bi)	ug/L	<1	1	1956731	<1	1	1954827	<1	1	<1		1	1956731
Dissolved Boron (B)	ug/L	2200	10	1956731	2600	10	1954827	63	10	290		10	1956731
Dissolved Cadmium (Cd)	ug/L	<0.1	0.1	1956731	<0.1	0.1	1954827	<0.1	0.1	<0.1		0.1	1956731
Dissolved Calcium (Ca)	ug/L	150000	200	1956731	150000	200	1954827	120000	200	240000		200	1956731
Dissolved Chromium (Cr)	ug/L	<5	5	1956731	<5	5	1954827	<5	5	<5		5	1956731
Dissolved Cobalt (Co)	ug/L	<0.5	0.5	1956731	<0.5	0.5	1954827	<0.5	0.5	1.8		0.5	1956731
Dissolved Copper (Cu)	ug/L	<1	1	1956731	2	1	1954827	3	1	<1		1	1956731
Dissolved Iron (Fe)	ug/L	1700	100	1956731	1200	100	1954827	<100	100	2600		100	1956731
Dissolved Lead (Pb)	ug/L	<0.5	0.5	1956731	<0.5	0.5	1954827	<0.5	0.5	<0.5		0.5	1956731
Dissolved Magnesium (Mg)	ug/L	91000	50	1956731	72000	50	1954827	46000	50	240000		50	1956731
Dissolved Manganese (Mn)	ug/L	29	2	1956731	55	2	1954827	66	2	330		2	1956731
Dissolved Molybdenum (Mo)	ug/L	2	1	1956731	2	1	1954827	5	1	16		1	1956731
Dissolved Nickel (Ni)	ug/L	2	1	1956731	<1	1	1954827	<1	1	6		1	1956731
Dissolved Phosphorus (P)	ug/L	<100	100	1956731	<100	100	1954827	<100	100	<100		100	1956731
Dissolved Potassium (K)	ug/L	21000	200	1956731	21000	200	1954827	7000	200	18000		200	1956731
Dissolved Selenium (Se)	ug/L	<2	2	1956731	<2	2	1954827	<2	2	<2		2	1956731
Dissolved Silicon (Si)	ug/L	5600	50	1956731	6300	50	1954827	7400	50	6900		50	1956731
Dissolved Silver (Ag)	ug/L	<0.1	0.1	1956731	0.2	0.1	1954827	<0.1	0.1	<0.1		0.1	1956731
Dissolved Sodium (Na)	ug/L	160000	100	1956731	190000	100	1954827	13000	100	110000		100	1956731
Dissolved Strontium (Sr)	ug/L	25000	1	1956731	23000	1	1954827	1900	1	7000		1	1956731
Dissolved Thallium (Tl)	ug/L	<0.05	0.05	1956731	0.05	0.05	1954827	<0.05	0.05	0.06		0.05	1956731
Dissolved Titanium (Ti)	ug/L	<5	5	1956731	<5	5	1954827	<5	5	<5		5	1956731
Dissolved Uranium (U)	ug/L	0.3	0.1	1956731	0.3	0.1	1954827	5.8	0.1	14		0.1	1956731
Dissolved Vanadium (V)	ug/L	<1	1	1956731	2	1	1954827	<1	1	1		1	1956731
Dissolved Zinc (Zn)	ug/L	<5	5	1956731	7	5	1954827	6	5	<5		5	1956731

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: A9C6886
Report Date: 2009/10/02

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

RCAP - SURFACE WATER (WATER)

Maxxam ID		DU9939	DU9939		
Sampling Date		2009/09/24	2009/09/24		
	Units	**SG1**	**SG1 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters					
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	272		1	1950917
Carb. Alkalinity (calc. as CaCO3)	mg/L	2		1	1950917
Hardness (CaCO3)	mg/L	400		1	1950919
Langelier Index (@ 20C)	N/A	0.852			1950923
Langelier Index (@ 4C)	N/A	0.605			1950924
Saturation pH (@ 20C)	N/A	6.98			1950923
Saturation pH (@ 4C)	N/A	7.22			1950924
Inorganics					
Total Ammonia-N	mg/L	0.29		0.05	1955758
Conductivity	umho/cm	937		1	1956461
Total Organic Carbon (TOC)	mg/L	9.5		0.2	1955919
Orthophosphate (P)	mg/L	<0.01		0.01	1956603
pH	pH	7.8			1956460
Total Phosphorus	mg/L	0.16		0.002	1956010
Dissolved Sulphate (SO4)	mg/L	27		1	1956605
Turbidity	NTU	48		0.1	1951932
Alkalinity (Total as CaCO3)	mg/L	274		1	1956459
Dissolved Chloride (Cl)	mg/L	120		1	1956600
Nitrite (N)	mg/L	<0.01		0.01	1953404
Nitrate (N)	mg/L	<0.1		0.1	1953404

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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

Maxxam Job #: A9C6886
Report Date: 2009/10/02

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

RCAP - SURFACE WATER (WATER)

Maxxam ID		DU9939	DU9939		
Sampling Date		2009/09/24	2009/09/24		
	Units	**SG1**	**SG1 Lab-Dup**	**RDL**	**QC Batch**
Metals					
Dissolved Calcium (Ca)	mg/L	115	115	0.05	1957621
Dissolved Magnesium (Mg)	mg/L	28.2	28.0	0.05	1957621
Dissolved Potassium (K)	mg/L	4	4	1	1957621
Dissolved Sodium (Na)	mg/L	61.2	61.7	0.5	1957621
Total Aluminum (Al)	ug/L	1600		5	1957498
Total Antimony (Sb)	ug/L	<0.5		0.5	1957498
Total Arsenic (As)	ug/L	2		1	1957498
Total Barium (Ba)	ug/L	95		5	1957498
Total Beryllium (Be)	ug/L	<0.5		0.5	1957498
Total Boron (B)	ug/L	140		10	1957498
Total Cadmium (Cd)	ug/L	<0.1		0.1	1957498
Total Calcium (Ca)	ug/L	95000		200	1957498
Total Chromium (Cr)	ug/L	<5		5	1957498
Total Cobalt (Co)	ug/L	1.0		0.5	1957498
Total Copper (Cu)	ug/L	6		1	1957498
Total Iron (Fe)	ug/L	2000		100	1957498
Total Lead (Pb)	ug/L	1.1		0.5	1957498
Total Magnesium (Mg)	ug/L	25000		50	1957498
Total Manganese (Mn)	ug/L	1800		2	1957498
Total Molybdenum (Mo)	ug/L	1		1	1957498
Total Nickel (Ni)	ug/L	2		1	1957498
Total Potassium (K)	ug/L	4000		200	1957498
Total Selenium (Se)	ug/L	<2		2	1957498
Total Silicon (Si)	ug/L	6100		50	1957498
Total Silver (Ag)	ug/L	<0.1		0.1	1957498
Total Sodium (Na)	ug/L	50000		100	1957498
Total Thallium (Tl)	ug/L	<0.05		0.05	1957498
Total Tungsten (W)	ug/L	<1		1	1957498
Total Uranium (U)	ug/L	1.5		0.1	1957498
Total Vanadium (V)	ug/L	3		1	1957498
Total Zinc (Zn)	ug/L	32		5	1957498
Total Zirconium (Zr)	ug/L	1		1	1957498

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: A9C6886
Report Date: 2009/10/02

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

RESULTS OF ANALYSES OF WATER

Maxxam ID		DU9939		
Sampling Date		2009/09/24		
	Units	**SG1**	**RDL**	**QC Batch**
Calculated Parameters				
Calculated TDS	mg/L	534	1	1950926

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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MMM GROUP LIMITED
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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
1951932	Turbidity	2009/09/28					<0.1	NTU	NC	25	99	85 - 115
1953404	Nitrite (N)	2009/09/29	97	75 - 125	105	80 - 120	<0.01	mg/L	NC	25		
1953404	Nitrate (N)	2009/09/29	95	75 - 125	99	80 - 120	<0.1	mg/L	NC	25		
1953404	Nitrate + Nitrite	2009/09/29					<0.1	mg/L	NC	25		
1954827	Dissolved Aluminum (Al)	2009/09/29	95	80 - 120	98	90 - 110	<5	ug/L				
1954827	Dissolved Antimony (Sb)	2009/09/29	103	80 - 120	102	90 - 110	<0.5	ug/L				
1954827	Dissolved Arsenic (As)	2009/09/29	104	80 - 120	101	90 - 110	<1	ug/L				
1954827	Dissolved Barium (Ba)	2009/09/29	NC	80 - 120	101	90 - 110	<5	ug/L				
1954827	Dissolved Beryllium (Be)	2009/09/29	96	80 - 120	100	90 - 110	<0.5	ug/L				
1954827	Dissolved Bismuth (Bi)	2009/09/29	87	80 - 120	101	90 - 110	<1	ug/L				
1954827	Dissolved Boron (B)	2009/09/29	97	80 - 120	97	90 - 110	<10	ug/L				
1954827	Dissolved Cadmium (Cd)	2009/09/29	94	80 - 120	100	90 - 110	<0.1	ug/L				
1954827	Dissolved Calcium (Ca)	2009/09/29	NC	80 - 120	99	90 - 110	<200	ug/L				
1954827	Dissolved Chromium (Cr)	2009/09/29	101	80 - 120	102	90 - 110	<5	ug/L				
1954827	Dissolved Cobalt (Co)	2009/09/29	96	80 - 120	99	90 - 110	<0.5	ug/L				
1954827	Dissolved Copper (Cu)	2009/09/29	91	80 - 120	99	90 - 110	<1	ug/L				
1954827	Dissolved Iron (Fe)	2009/09/29	99	80 - 120	102	90 - 110	<100	ug/L				
1954827	Dissolved Lead (Pb)	2009/09/29	92	80 - 120	102	90 - 110	<0.5	ug/L	NC	25		
1954827	Dissolved Magnesium (Mg)	2009/09/29	NC	80 - 120	98	90 - 110	<50	ug/L				
1954827	Dissolved Manganese (Mn)	2009/09/29	NC	80 - 120	100	90 - 110	<2	ug/L				
1954827	Dissolved Molybdenum (Mo)	2009/09/29	107	80 - 120	100	90 - 110	<1	ug/L				
1954827	Dissolved Nickel (Ni)	2009/09/29	94	80 - 120	99	90 - 110	<1	ug/L				
1954827	Dissolved Phosphorus (P)	2009/09/29	107	80 - 120	95	90 - 110	<100	ug/L				
1954827	Dissolved Potassium (K)	2009/09/29	101	80 - 120	96	90 - 110	<200	ug/L				
1954827	Dissolved Selenium (Se)	2009/09/29	94	80 - 120	99	90 - 110	<2	ug/L				
1954827	Dissolved Silicon (Si)	2009/09/29	102	80 - 120	100	90 - 110	<50	ug/L				
1954827	Dissolved Silver (Ag)	2009/09/29	85	80 - 120	100	90 - 110	<0.1	ug/L				
1954827	Dissolved Sodium (Na)	2009/09/29	NC	80 - 120	99	90 - 110	<100	ug/L				
1954827	Dissolved Strontium (Sr)	2009/09/29	NC	80 - 120	102	90 - 110	<1	ug/L				
1954827	Dissolved Thallium (Tl)	2009/09/29	91	80 - 120	101	90 - 110	<0.05	ug/L				
1954827	Dissolved Titanium (Ti)	2009/09/29	106	80 - 120	100	90 - 110	<5	ug/L				
1954827	Dissolved Uranium (U)	2009/09/29	97	80 - 120	101	90 - 110	<0.1	ug/L				
1954827	Dissolved Vanadium (V)	2009/09/29	105	80 - 120	101	90 - 110	<1	ug/L				
1954827	Dissolved Zinc (Zn)	2009/09/29	86	80 - 120	99	90 - 110	<5	ug/L				
1955758	Total Ammonia-N	2009/10/01	103	80 - 120	102	80 - 120	<0.05	mg/L	NC	25		
1955919	Total Organic Carbon (TOC)	2009/10/01	NC	75 - 125	101	75 - 125	<0.2	mg/L	1.7	20		
1955991	Dissolved Organic Carbon	2009/10/01	NC	75 - 125	105	75 - 125	<0.2	mg/L	2.0	20		
1956010	Total Phosphorus	2009/10/02	105	75 - 125	110	75 - 125	<0.002	mg/L	NC	25	108	85 - 115
1956459	Alkalinity (Total as CaCO3)	2009/09/30					<1	mg/L	0.9	25	97	85 - 115
1956459	p-Alkalinity	2009/09/30					<1	mg/L	NC	25	97	85 - 115

Maxxam Job #: A9C6886
Report Date: 2009/10/02

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	%Recovery	QC Limits	%Recovery	QC Limits	Value	Units	Value (%)	QC Limits	%Recovery	QC Limits
1956461	Conductivity	2009/09/30					<1	umho/cm	0	25	100	85 - 115
1956600	Dissolved Chloride (Cl)	2009/10/01	NC	75 - 125	102	80 - 120	<1	mg/L	1	20		
1956603	Orthophosphate (P)	2009/10/01	104	75 - 125	101	80 - 120	<0.01	mg/L	NC	25		
1956605	Dissolved Sulphate (SO4)	2009/10/01	NC	75 - 125	100	80 - 120	<1	mg/L	0.4	25		
1956731	Dissolved Aluminum (Al)	2009/10/01	84	80 - 120	99	90 - 110	<5	ug/L	NC	25		
1956731	Dissolved Antimony (Sb)	2009/10/01	102	80 - 120	100	90 - 110	<0.5	ug/L	NC	25		
1956731	Dissolved Arsenic (As)	2009/10/01	101	80 - 120	101	90 - 110	<1	ug/L	NC	25		
1956731	Dissolved Barium (Ba)	2009/10/01	95	80 - 120	99	90 - 110	<5	ug/L	NC	25		
1956731	Dissolved Beryllium (Be)	2009/10/01	93	80 - 120	97	90 - 110	<0.5	ug/L	NC	25		
1956731	Dissolved Bismuth (Bi)	2009/10/01	77(1)	80 - 120	94	90 - 110	<1	ug/L	NC	25		
1956731	Dissolved Boron (B)	2009/10/01	NC	80 - 120	99	90 - 110	<10	ug/L	1.4	25		
1956731	Dissolved Cadmium (Cd)	2009/10/01	99	80 - 120	101	90 - 110	<0.1	ug/L	NC	25		
1956731	Dissolved Calcium (Ca)	2009/10/01	NC	80 - 120	102	90 - 110	<200	ug/L	1.1	25		
1956731	Dissolved Chromium (Cr)	2009/10/01	89	80 - 120	98	90 - 110	<5	ug/L	NC	25		
1956731	Dissolved Cobalt (Co)	2009/10/01	94	80 - 120	101	90 - 110	<0.5	ug/L	NC	25		
1956731	Dissolved Copper (Cu)	2009/10/01	89	80 - 120	99	90 - 110	<1	ug/L	NC	25		
1956731	Dissolved Iron (Fe)	2009/10/01	95	80 - 120	103	90 - 110	<100	ug/L	NC	25		
1956731	Dissolved Lead (Pb)	2009/10/01	93	80 - 120	96	90 - 110	<0.5	ug/L	NC	25		
1956731	Dissolved Magnesium (Mg)	2009/10/01	NC	80 - 120	102	90 - 110	<50	ug/L	0.5	25		
1956731	Dissolved Manganese (Mn)	2009/10/01	91	80 - 120	102	90 - 110	<2	ug/L	NC(2)	25		
1956731	Dissolved Molybdenum (Mo)	2009/10/01	102	80 - 120	98	90 - 110	<1	ug/L	NC	25		
1956731	Dissolved Nickel (Ni)	2009/10/01	91	80 - 120	98	90 - 110	<1	ug/L	NC	25		
1956731	Dissolved Phosphorus (P)	2009/10/01	96	80 - 120	90	90 - 110	<100	ug/L	NC	25		
1956731	Dissolved Potassium (K)	2009/10/01	92	80 - 120	101	90 - 110	<200	ug/L	1.3	25		
1956731	Dissolved Selenium (Se)	2009/10/01	103	80 - 120	99	90 - 110	<2	ug/L	NC	25		
1956731	Dissolved Silicon (Si)	2009/10/01	92	80 - 120	101	90 - 110	<50	ug/L	1.2	25		
1956731	Dissolved Silver (Ag)	2009/10/01	84	80 - 120	91	90 - 110	<0.1	ug/L	NC	25		
1956731	Dissolved Sodium (Na)	2009/10/01	NC	80 - 120	104	90 - 110	<100	ug/L	2.8	25		
1956731	Dissolved Strontium (Sr)	2009/10/01	NC	80 - 120	99	90 - 110	<1	ug/L	2.6	25		
1956731	Dissolved Thallium (Tl)	2009/10/01	93	80 - 120	97	90 - 110	<0.05	ug/L	NC	25		
1956731	Dissolved Titanium (Ti)	2009/10/01	95	80 - 120	104	90 - 110	<5	ug/L	NC	25		
1956731	Dissolved Uranium (U)	2009/10/01	95	80 - 120	95	90 - 110	<0.1	ug/L	NC	25		
1956731	Dissolved Vanadium (V)	2009/10/01	92	80 - 120	99	90 - 110	<1	ug/L	NC	25		
1956731	Dissolved Zinc (Zn)	2009/10/01	92	80 - 120	98	90 - 110	<5	ug/L	NC	25		
1957498	Total Aluminum (Al)	2009/10/01	93	80 - 120	97	80 - 120	5, RDL=5	ug/L	4.8	25		
1957498	Total Antimony (Sb)	2009/10/01	105	80 - 120	103	82 - 120	<0.5	ug/L	NC	25		
1957498	Total Arsenic (As)	2009/10/01	100	80 - 120	100	86 - 119	<1	ug/L	NC	25		
1957498	Total Barium (Ba)	2009/10/01	96	80 - 120	96	83 - 115	<5	ug/L	3.3	25		
1957498	Total Beryllium (Be)	2009/10/01	95	75 - 125	96	85 - 132	<0.5	ug/L	NC	25		
1957498	Total Boron (B)	2009/10/01	96	75 - 125	97	78 - 133	<10	ug/L	NC	25		

Maxxam Job #: A9C6886
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Client Project #: 14-09222-001-HG1
Project name: 407 WEST AREA , OAKVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
1957498	Total Cadmium (Cd)	2009/10/01	98	80 - 120	96	85 - 116	<0.1	ug/L	NC	25		
1957498	Total Calcium (Ca)	2009/10/01	NC	75 - 125	101	75 - 125	240, RDL=200	ug/L	5.2	25		
1957498	Total Chromium (Cr)	2009/10/01	96	80 - 120	97	80 - 120	<5	ug/L	NC	25		
1957498	Total Cobalt (Co)	2009/10/01	95	80 - 120	97	82 - 117	<0.5	ug/L	NC	25		
1957498	Total Copper (Cu)	2009/10/01	94	80 - 120	97	80 - 117	<1	ug/L	5.7	25		
1957498	Total Iron (Fe)	2009/10/01	97	80 - 120	96	80 - 120	<100	ug/L	NC	25		
1957498	Total Lead (Pb)	2009/10/01	95	80 - 120	96	80 - 120	<0.5	ug/L	NC	25		
1957498	Total Magnesium (Mg)	2009/10/01	93	80 - 120	97	80 - 120	85, RDL=50	ug/L	6.8	25		
1957498	Total Manganese (Mn)	2009/10/01	95	80 - 120	97	80 - 120	<2	ug/L	4.2	25		
1957498	Total Molybdenum (Mo)	2009/10/01	101	80 - 120	100	82 - 117	<1	ug/L	NC	25		
1957498	Total Nickel (Ni)	2009/10/01	95	80 - 120	96	81 - 117	<1	ug/L	NC	25		
1957498	Total Potassium (K)	2009/10/01	97	75 - 125	101	75 - 125	<200	ug/L	7.6	25		
1957498	Total Selenium (Se)	2009/10/01	97	75 - 125	97	82 - 118	<2	ug/L	NC	25		
1957498	Total Silicon (Si)	2009/10/01	93	75 - 125	98	67 - 140	<50	ug/L	6.4	25		
1957498	Total Silver (Ag)	2009/10/01	94	80 - 120	95	80 - 120	<0.1	ug/L	NC	25		
1957498	Total Sodium (Na)	2009/10/01	NC	75 - 125	101	75 - 125	<100	ug/L	5.7	25		
1957498	Total Thallium (Tl)	2009/10/01	95	80 - 120	96	80 - 129	<0.05	ug/L	NC	25		
1957498	Total Tungsten (W)	2009/10/01	102	75 - 125	102	81 - 123	<1	ug/L	NC	25		
1957498	Total Uranium (U)	2009/10/01	99	80 - 120	98	82 - 120	<0.1	ug/L	NC	25		
1957498	Total Vanadium (V)	2009/10/01	96	80 - 120	97	82 - 118	<1	ug/L	NC	25		
1957498	Total Zinc (Zn)	2009/10/01	95	80 - 120	96	80 - 120	<5	ug/L	NC	25		
1957498	Total Zirconium (Zr)	2009/10/01	100	75 - 125	100	84 - 118	<1	ug/L	NC	25		
1957621	Dissolved Calcium (Ca)	2009/10/01	NC	85 - 115	101	85 - 115	<0.05	mg/L	0.3	25		
1957621	Dissolved Magnesium (Mg)	2009/10/01	NC	85 - 115	98	85 - 115	<0.05	mg/L	0.7	25		
1957621	Dissolved Potassium (K)	2009/10/01	103	85 - 115	94	85 - 115	<1	mg/L	NC	25		
1957621	Dissolved Sodium (Na)	2009/10/01	NC	85 - 115	102	85 - 115	<0.5	mg/L	0.8	25		

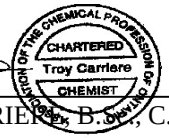
N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) - Detection Limit was raised due to matrix interferences.

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Validation Signature Page

Maxxam Job #: A9C6886

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



TROY CARRIERE, B.Sc., C.Chem, Scientific Specialist

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Your Project #: 14-09222-001-HG1/407 WEST
Site: OAKVILLE
Your C.O.C. #: OO616891

Attention: Annette Blazeiko
MMM GROUP LIMITED
100 Commerce Valley Dr W
Thornhill, ON
CANADA L3T 0A1

Report Date: 2010/02/03
This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B008307
Received: 2010/01/22, 13:57

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Alkalinity	6	N/A	2010/01/26	CAM SOP-00448	SM 2320B
Carbonate, Bicarbonate and Hydroxide	6	N/A	2010/01/27		
Chloride by Automated Colourimetry	6	N/A	2010/01/27	CAM SOP-00463	SM 4500 Cl E
Conductivity	6	N/A	2010/01/26	CAM SOP-00448	SM 2510
Dissolved Organic Carbon (DOC)	6	N/A	2010/01/26	CAM SOP-00446	SM 5310 B
Hardness (calculated as CaCO3)	5	N/A	2010/01/26	CAM SOP 00102	SM 2340 B
Hardness (calculated as CaCO3)	1	N/A	2010/01/27	CAM SOP 00102	SM 2340 B
Lab Filtered Metals by ICPMS	1	2010/01/26	2010/01/27	CAM SOP-00447	EPA 6020
Dissolved Metals by ICPMS	4	N/A	2010/01/26	CAM SOP-00447	EPA 6020
Dissolved Metals by ICPMS	1	N/A	2010/02/02	CAM SOP-00447	EPA 6020
Ion Balance (% Difference)	6	N/A	2010/01/28		
Anion and Cation Sum	6	N/A	2010/01/27		
Ammonia-N	6	N/A	2010/01/28	CAM SOP-00441	US GS I-2522-90
Nitrate (NO3) and Nitrite (NO2) in Water (1)	6	N/A	2010/01/27	CAM SOP-00440	SM 4500 NO3I/NO2B
pH	6	N/A	2010/01/26	CAM SOP-00448	SM 4500H
Orthophosphate	6	N/A	2010/01/27	CAM SOP-00461	SM 4500 P-F
Sat. pH and Langelier Index (@ 20C)	6	N/A	2010/01/28		
Sat. pH and Langelier Index (@ 4C)	6	N/A	2010/01/28		
Sulphate by Automated Colourimetry	6	N/A	2010/01/27	CAM SOP-00464	EPA 375.4
Total Dissolved Solids (TDS calc)	6	N/A	2010/01/28		

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

../2

Maxxam Job #: B008307
Report Date: 2010/02/03

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1/407 WEST
Project name: OAKVILLE

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

SEAN CONACHER, Project Manager
Email: Sean.Conacher@maxxamanalytics.com
Phone# (905) 817-5700 Ext:5806

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CALA have approved this reporting process and electronic report format.

For Service Group specific validation please refer to the Validation Signature Page

Total cover pages: 2

Maxxam Job #: B008307
Report Date: 2010/02/03

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1/407 WEST
Project name: OAKVILLE

RCAP - COMPREHENSIVE (WATER)

Maxxam ID		EX4639		EX4640		
Sampling Date		2010/01/21		2010/01/21		
	Units	**FD-1**	**RDL**	**MMM09-19S**	**RDL**	**QC Batch**
Calculated Parameters						
Anion Sum	me/L	36.0	N/A	43.1	N/A	2062861
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	368	1	326	1	2062859
Calculated TDS	mg/L	2120	1	2490	1	2062864
Carb. Alkalinity (calc. as CaCO3)	mg/L	2	1	1	1	2062859
Cation Sum	me/L	32.6	N/A	39.0	N/A	2062861
Hardness (CaCO3)	mg/L	1300	1	1800	1	2062769
Ion Balance (% Difference)	%	4.87	N/A	4.95	N/A	2062860
Langelier Index (@ 20C)	N/A	0.962		0.834		2062862
Langelier Index (@ 4C)	N/A	0.718		0.592		2062863
Saturation pH (@ 20C)	N/A	6.79		6.72		2062862
Saturation pH (@ 4C)	N/A	7.04		6.96		2062863
Inorganics						
Total Ammonia-N	mg/L	0.48	0.05	0.33	0.05	2065528
Conductivity	umho/cm	2860	1	3430	1	2064280
Dissolved Organic Carbon	mg/L	5.9	0.2	10.9	0.2	2063611
Orthophosphate (P)	mg/L	<0.01	0.01	<0.01	0.01	2064525
pH	pH	7.8		7.6		2064278
Dissolved Sulphate (SO4)	mg/L	1200	10	1300	5	2064526
Alkalinity (Total as CaCO3)	mg/L	370	1	328	1	2064277
Dissolved Chloride (Cl)	mg/L	140	1	300	2	2064522
Nitrite (N)	mg/L	<0.01	0.01	0.02	0.01	2064410
Nitrate (N)	mg/L	<0.1	0.1	<0.1	0.1	2064410
p-Alkalinity	mg/L	<1	1	<1	1	2064277
Nitrate + Nitrite	mg/L	<0.1	0.1	<0.1	0.1	2064410

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B008307
Report Date: 2010/02/03

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1/407 WEST
Project name: OAKVILLE

RCAP - COMPREHENSIVE (WATER)

Maxxam ID		EX4639		EX4640		
Sampling Date		2010/01/21		2010/01/21		
	Units	**FD-1**	**RDL**	**MMM09-19S**	**RDL**	**QC Batch**
Metals						
Dissolved Aluminum (Al)	ug/L	6	5	6	5	2063962
Dissolved Antimony (Sb)	ug/L	<0.5	0.5	<0.5	0.5	2063962
Dissolved Arsenic (As)	ug/L	6	1	1	1	2063962
Dissolved Barium (Ba)	ug/L	27	5	5	5	2063962
Dissolved Beryllium (Be)	ug/L	<0.5	0.5	<0.5	0.5	2063962
Dissolved Bismuth (Bi)	ug/L	<1	1	<1	1	2063962
Dissolved Boron (B)	ug/L	2600	10	220	10	2063962
Dissolved Cadmium (Cd)	ug/L	<0.1	0.1	0.2	0.1	2063962
Dissolved Calcium (Ca)	ug/L	200000	200	280000	200	2063962
Dissolved Chromium (Cr)	ug/L	<5	5	<5	5	2063962
Dissolved Cobalt (Co)	ug/L	1.6	0.5	11	0.5	2063962
Dissolved Copper (Cu)	ug/L	<1	1	2	1	2063962
Dissolved Iron (Fe)	ug/L	12000	100	3000	100	2063962
Dissolved Lead (Pb)	ug/L	<0.5	0.5	<0.5	0.5	2063962
Dissolved Magnesium (Mg)	ug/L	190000	50	260000	50	2063962
Dissolved Manganese (Mn)	ug/L	540	2	1100	2	2063962
Dissolved Molybdenum (Mo)	ug/L	11	1	8	1	2063962
Dissolved Nickel (Ni)	ug/L	5	1	12	1	2063962
Dissolved Phosphorus (P)	ug/L	<100	100	<100	100	2063962
Dissolved Potassium (K)	ug/L	18000	200	18000	200	2063962
Dissolved Selenium (Se)	ug/L	<2	2	5	2	2063962
Dissolved Silicon (Si)	ug/L	7400	50	6700	50	2063962
Dissolved Silver (Ag)	ug/L	<0.1	0.1	<0.1	0.1	2063962
Dissolved Sodium (Na)	ug/L	140000	100	74000	100	2063962
Dissolved Strontium (Sr)	ug/L	5800	1	1900	1	2063962
Dissolved Thallium (Tl)	ug/L	<0.05	0.05	0.07	0.05	2063962
Dissolved Titanium (Ti)	ug/L	<5	5	<5	5	2063962
Dissolved Uranium (U)	ug/L	8.8	0.1	16	0.1	2063962
Dissolved Vanadium (V)	ug/L	2	1	2	1	2063962
Dissolved Zinc (Zn)	ug/L	200	5	4400	5	2063962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B008307
Report Date: 2010/02/03

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1/407 WEST
Project name: OAKVILLE

RCAP - COMPREHENSIVE (WATER)

Maxxam ID		EX4641		EX4642			EX4643		
Sampling Date		2010/01/21		2010/01/22			2010/01/22		
	Units	**MMM09-17**	**RDL**	**MMM09-15S**	**RDL**	**QC Batch**	**MMM09-15D**	**RDL**	**QC Batch**
Calculated Parameters									
Anion Sum	me/L	35.8	N/A	72.2	N/A	2062861	8.69	N/A	2062861
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	367	1	453	1	2062859	129	1	2062859
Calculated TDS	mg/L	2110	1	3930	1	2062864	805	1	2062864
Carb. Alkalinity (calc. as CaCO3)	mg/L	2	1	1	1	2062859	1	1	2062859
Cation Sum	me/L	32.8	N/A	69.8	N/A	2062861	24.0	N/A	2062861
Hardness (CaCO3)	mg/L	1300	1	1900	1	2062769	640	1	2062769
Ion Balance (% Difference)	%	4.28	N/A	1.66	N/A	2062860	46.8	N/A	2062860
Langelier Index (@ 20C)	N/A	0.959		1.02		2062862	0.856		2062862
Langelier Index (@ 4C)	N/A	0.716		0.783		2062863	0.610		2062863
Saturation pH (@ 20C)	N/A	6.79		6.44		2062862	7.20		2062862
Saturation pH (@ 4C)	N/A	7.03		6.68		2062863	7.45		2062863
Inorganics									
Total Ammonia-N	mg/L	0.33	0.05	0.42	0.05	2065528	0.82	0.05	2065528
Conductivity	umho/cm	2870	1	7520	1	2064280	918	1	2064280
Dissolved Organic Carbon	mg/L	5.9	0.2	3.6	0.2	2063611	2.5	0.2	2063611
Orthophosphate (P)	mg/L	<0.01	0.01	<0.01	0.01	2064525	<0.01	0.01	2064525
pH	pH	7.7		7.5		2064278	8.1		2064278
Dissolved Sulphate (SO4)	mg/L	1200	10	75	1	2064526	74	1	2064526
Alkalinity (Total as CaCO3)	mg/L	369	1	454	1	2064277	130	1	2064277
Dissolved Chloride (Cl)	mg/L	140	1	2200	30	2064522	160	1	2064522
Nitrite (N)	mg/L	<0.01	0.01	<0.01	0.01	2064410	<0.01	0.01	2064410
Nitrate (N)	mg/L	<0.1	0.1	<0.1	0.1	2064410	0.4	0.1	2064410
p-Alkalinity	mg/L	<1	1	<1	1	2064277	<1	1	2064277
Nitrate + Nitrite	mg/L	<0.1	0.1	<0.1	0.1	2064410	0.4	0.1	2064410

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B008307
Report Date: 2010/02/03

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1/407 WEST
Project name: OAKVILLE

RCAP - COMPREHENSIVE (WATER)

Maxxam ID		EX4641		EX4642			EX4643		
Sampling Date		2010/01/21		2010/01/22			2010/01/22		
	Units	**MMM09-17**	**RDL**	**MMM09-15S**	**RDL**	**QC Batch**	**MMM09-15D**	**RDL**	**QC Batch**
Metals									
Dissolved Aluminum (Al)	ug/L	9	5	5	5	2063962	7	5	2069058
Dissolved Antimony (Sb)	ug/L	<0.5	0.5	<0.5	0.5	2063962	<0.5	0.5	2069058
Dissolved Arsenic (As)	ug/L	6	1	6(1)	5	2063962	2	1	2069058
Dissolved Barium (Ba)	ug/L	27	5	240	5	2063962	170	5	2069058
Dissolved Beryllium (Be)	ug/L	<0.5	0.5	<0.5	0.5	2063962	<0.5	0.5	2069058
Dissolved Bismuth (Bi)	ug/L	<1	1	<1	1	2063962	<1	1	2069058
Dissolved Boron (B)	ug/L	2600	10	600	10	2063962	1400	10	2069058
Dissolved Cadmium (Cd)	ug/L	<0.1	0.1	<0.1	0.1	2063962	<0.1	0.1	2069058
Dissolved Calcium (Ca)	ug/L	200000	200	450000	200	2063962	160000	200	2069058
Dissolved Chromium (Cr)	ug/L	<5	5	<5	5	2063962	<5	5	2069058
Dissolved Cobalt (Co)	ug/L	1.6	0.5	2.6	0.5	2063962	0.8	0.5	2069058
Dissolved Copper (Cu)	ug/L	<1	1	2	1	2063962	<1	1	2069058
Dissolved Iron (Fe)	ug/L	12000	100	19000	100	2063962	3300	100	2069058
Dissolved Lead (Pb)	ug/L	<0.5	0.5	<0.5	0.5	2063962	<0.5	0.5	2069058
Dissolved Magnesium (Mg)	ug/L	190000	50	190000	50	2063962	57000	50	2069058
Dissolved Manganese (Mn)	ug/L	560	2	440	2	2063962	220	2	2069058
Dissolved Molybdenum (Mo)	ug/L	11	1	7	1	2063962	12	1	2069058
Dissolved Nickel (Ni)	ug/L	4	1	<5(1)	5	2063962	2	1	2069058
Dissolved Phosphorus (P)	ug/L	<100	100	<100	100	2063962	<100	100	2069058
Dissolved Potassium (K)	ug/L	18000	200	26000	200	2063962	14000	200	2069058
Dissolved Selenium (Se)	ug/L	<2	2	<2	2	2063962	<2	2	2069058
Dissolved Silicon (Si)	ug/L	7500	50	7500	50	2063962	3700	50	2069058
Dissolved Silver (Ag)	ug/L	<0.1	0.1	<0.1	0.1	2063962	<0.1	0.1	2069058
Dissolved Sodium (Na)	ug/L	140000	100	700000	1000	2063962	250000	100	2069058
Dissolved Strontium (Sr)	ug/L	5900	1	36000	1	2063962	9300	1	2069058
Dissolved Thallium (Tl)	ug/L	<0.05	0.05	<0.05	0.05	2063962	<0.05	0.05	2069058
Dissolved Titanium (Ti)	ug/L	<5	5	<5	5	2063962	<5	5	2069058
Dissolved Uranium (U)	ug/L	9.2	0.1	11	0.1	2063962	3.6	0.1	2069058
Dissolved Vanadium (V)	ug/L	2	1	<5(1)	5	2063962	<1	1	2069058
Dissolved Zinc (Zn)	ug/L	220	5	310	5	2063962	38	5	2069058

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Detection Limit was raised due to matrix interferences.

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Maxxam Job #: B008307
Report Date: 2010/02/03

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1/407 WEST
Project name: OAKVILLE

RCAP - COMPREHENSIVE (WATER)

Maxxam ID		EX4643		
Sampling Date		2010/01/22		
	Units	**MMM09-15D Lab-Dup**	**RDL**	**QC Batch**
Metals				
Dissolved Aluminum (Al)	ug/L	7	5	2069058
Dissolved Antimony (Sb)	ug/L	<0.5	0.5	2069058
Dissolved Arsenic (As)	ug/L	2	1	2069058
Dissolved Barium (Ba)	ug/L	170	5	2069058
Dissolved Beryllium (Be)	ug/L	<0.5	0.5	2069058
Dissolved Bismuth (Bi)	ug/L	<1	1	2069058
Dissolved Boron (B)	ug/L	1400	10	2069058
Dissolved Cadmium (Cd)	ug/L	<0.1	0.1	2069058
Dissolved Calcium (Ca)	ug/L	160000	200	2069058
Dissolved Chromium (Cr)	ug/L	<5	5	2069058
Dissolved Cobalt (Co)	ug/L	0.8	0.5	2069058
Dissolved Copper (Cu)	ug/L	1	1	2069058
Dissolved Iron (Fe)	ug/L	3300	100	2069058
Dissolved Lead (Pb)	ug/L	<0.5	0.5	2069058
Dissolved Magnesium (Mg)	ug/L	56000	50	2069058
Dissolved Manganese (Mn)	ug/L	220	2	2069058
Dissolved Molybdenum (Mo)	ug/L	12	1	2069058
Dissolved Nickel (Ni)	ug/L	2	1	2069058
Dissolved Phosphorus (P)	ug/L	<100	100	2069058
Dissolved Potassium (K)	ug/L	14000	200	2069058
Dissolved Selenium (Se)	ug/L	<2	2	2069058
Dissolved Silicon (Si)	ug/L	3700	50	2069058
Dissolved Silver (Ag)	ug/L	<0.1	0.1	2069058
Dissolved Sodium (Na)	ug/L	250000	100	2069058
Dissolved Strontium (Sr)	ug/L	9400	1	2069058
Dissolved Thallium (Tl)	ug/L	<0.05	0.05	2069058
Dissolved Titanium (Ti)	ug/L	<5	5	2069058
Dissolved Uranium (U)	ug/L	3.6	0.1	2069058
Dissolved Vanadium (V)	ug/L	<1	1	2069058
Dissolved Zinc (Zn)	ug/L	38	5	2069058

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B008307
Report Date: 2010/02/03

MMM GROUP LIMITED
Client Project #: 14-09222-001-HG1/407 WEST
Project name: OAKVILLE

RCAP - COMPREHENSIVE (LAB FILTERED)

Maxxam ID		EX4638		
Sampling Date		2010/01/21		
	Units	**MMM09-19D**	**RDL**	**QC Batch**
Calculated Parameters				
Anion Sum	me/L	12.3	N/A	2062861
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	241	1	2062859
Calculated TDS	mg/L	704	1	2062864
Carb. Alkalinity (calc. as CaCO3)	mg/L	2	1	2062859
Cation Sum	me/L	12.3	N/A	2062861
Hardness (CaCO3)	mg/L	420	1	2062769
Ion Balance (% Difference)	%	0.0300	N/A	2062860
Langelier Index (@ 20C)	N/A	0.568		2062862
Langelier Index (@ 4C)	N/A	0.321		2062863
Saturation pH (@ 20C)	N/A	7.45		2062862
Saturation pH (@ 4C)	N/A	7.69		2062863
Inorganics				
Total Ammonia-N	mg/L	0.47	0.05	2065528
Conductivity	umho/cm	1110	1	2064280
Dissolved Organic Carbon	mg/L	7.6	0.2	2063611
Orthophosphate (P)	mg/L	<0.01	0.01	2064525
pH	pH	8.0		2064278
Dissolved Sulphate (SO4)	mg/L	270	1	2064526
Alkalinity (Total as CaCO3)	mg/L	243	1	2064277
Dissolved Chloride (Cl)	mg/L	62	1	2064522
Nitrite (N)	mg/L	<0.01	0.01	2064410
Nitrate (N)	mg/L	<0.1	0.1	2064410

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Project name: OAKVILLE

RCAP - COMPREHENSIVE (LAB FILTERED)

Maxxam ID		EX4638		
Sampling Date		2010/01/21		
	Units	**MMM09-19D**	**RDL**	**QC Batch**
Metals				
Dissolved Aluminum (Al)	ug/L	6	5	2064316
Dissolved Antimony (Sb)	ug/L	0.6	0.5	2064316
Dissolved Arsenic (As)	ug/L	1	1	2064316
Dissolved Barium (Ba)	ug/L	23	5	2064316
Dissolved Beryllium (Be)	ug/L	<0.5	0.5	2064316
Dissolved Boron (B)	ug/L	670	10	2064316
Dissolved Cadmium (Cd)	ug/L	<0.1	0.1	2064316
Dissolved Calcium (Ca)	ug/L	47000	200	2064316
Dissolved Chromium (Cr)	ug/L	<5	5	2064316
Dissolved Cobalt (Co)	ug/L	0.8	0.5	2064316
Dissolved Copper (Cu)	ug/L	1	1	2064316
Dissolved Iron (Fe)	ug/L	<100	100	2064316
Dissolved Lead (Pb)	ug/L	<0.5	0.5	2064316
Dissolved Magnesium (Mg)	ug/L	74000	50	2064316
Dissolved Manganese (Mn)	ug/L	140	2	2064316
Dissolved Molybdenum (Mo)	ug/L	21	1	2064316
Dissolved Nickel (Ni)	ug/L	2	1	2064316
Dissolved Phosphorus (P)	ug/L	<100	100	2064316
Dissolved Potassium (K)	ug/L	7800	200	2064316
Dissolved Selenium (Se)	ug/L	<2	2	2064316
Dissolved Silicon (Si)	ug/L	3700	50	2064316
Dissolved Silver (Ag)	ug/L	<0.1	0.1	2064316
Dissolved Sodium (Na)	ug/L	84000	100	2064316
Dissolved Strontium (Sr)	ug/L	2500	1	2064316
Dissolved Thallium (Tl)	ug/L	0.10	0.05	2064316
Dissolved Titanium (Ti)	ug/L	<5	5	2064316
Dissolved Uranium (U)	ug/L	6.5	0.1	2064316
Dissolved Vanadium (V)	ug/L	<1	1	2064316
Dissolved Zinc (Zn)	ug/L	650	5	2064316

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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GENERAL COMMENTS

Sample EX4643-01: Elevated ion balance result was confirmed by re-analysis.

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Project name: OAKVILLE

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2063611	Dissolved Organic Carbon	2010/01/26	NC	75 - 125	103	75 - 125	<0.2	mg/L	1.2	20		
2063962	Dissolved Aluminum (Al)	2010/01/26	97	80 - 120	92	90 - 110	<5	ug/L				
2063962	Dissolved Antimony (Sb)	2010/01/26	107	80 - 120	101	90 - 110	<0.5	ug/L				
2063962	Dissolved Arsenic (As)	2010/01/26	107	80 - 120	99	90 - 110	<1	ug/L				
2063962	Dissolved Barium (Ba)	2010/01/26	99	80 - 120	96	90 - 110	<5	ug/L				
2063962	Dissolved Beryllium (Be)	2010/01/26	99	80 - 120	100	90 - 110	<0.5	ug/L				
2063962	Dissolved Bismuth (Bi)	2010/01/26	87	80 - 120	101	90 - 110	<1	ug/L				
2063962	Dissolved Boron (B)	2010/01/26	98	80 - 120	94	90 - 110	<10	ug/L				
2063962	Dissolved Cadmium (Cd)	2010/01/26	98	80 - 120	102	90 - 110	<0.1	ug/L				
2063962	Dissolved Calcium (Ca)	2010/01/26	NC	80 - 120	93	90 - 110	<200	ug/L				
2063962	Dissolved Chromium (Cr)	2010/01/26	102	80 - 120	96	90 - 110	<5	ug/L				
2063962	Dissolved Cobalt (Co)	2010/01/26	99	80 - 120	96	90 - 110	<0.5	ug/L				
2063962	Dissolved Copper (Cu)	2010/01/26	94	80 - 120	95	90 - 110	<1	ug/L				
2063962	Dissolved Iron (Fe)	2010/01/26	103	80 - 120	101	90 - 110	<100	ug/L				
2063962	Dissolved Lead (Pb)	2010/01/26	90	80 - 120	101	90 - 110	<0.5	ug/L	NC	25		
2063962	Dissolved Magnesium (Mg)	2010/01/26	NC	80 - 120	92	90 - 110	<50	ug/L				
2063962	Dissolved Manganese (Mn)	2010/01/26	NC	80 - 120	98	90 - 110	<2	ug/L				
2063962	Dissolved Molybdenum (Mo)	2010/01/26	113	80 - 120	101	90 - 110	<1	ug/L				
2063962	Dissolved Nickel (Ni)	2010/01/26	97	80 - 120	96	90 - 110	<1	ug/L				
2063962	Dissolved Phosphorus (P)	2010/01/26	110	80 - 120	86(1)	90 - 110	<100	ug/L				
2063962	Dissolved Potassium (K)	2010/01/26	NC	80 - 120	92	90 - 110	<200	ug/L				
2063962	Dissolved Selenium (Se)	2010/01/26	103	80 - 120	103	90 - 110	<2	ug/L				
2063962	Dissolved Silicon (Si)	2010/01/26	103	80 - 120	94	90 - 110	<50	ug/L				
2063962	Dissolved Silver (Ag)	2010/01/26	93	80 - 120	99	90 - 110	<0.1	ug/L				
2063962	Dissolved Sodium (Na)	2010/01/26	S	80 - 120	93	90 - 110	<100	ug/L				
2063962	Dissolved Strontium (Sr)	2010/01/26	NC	80 - 120	99	90 - 110	<1	ug/L				
2063962	Dissolved Thallium (Tl)	2010/01/26	90	80 - 120	101	90 - 110	<0.05	ug/L				
2063962	Dissolved Titanium (Ti)	2010/01/26	108	80 - 120	96	90 - 110	<5	ug/L				
2063962	Dissolved Uranium (U)	2010/01/26	94	80 - 120	103	90 - 110	<0.1	ug/L				
2063962	Dissolved Vanadium (V)	2010/01/26	105	80 - 120	96	90 - 110	<1	ug/L				
2063962	Dissolved Zinc (Zn)	2010/01/26	91	80 - 120	100	90 - 110	<5	ug/L				
2064277	Alkalinity (Total as CaCO3)	2010/01/26					2, RDL=1	mg/L	1.0	25	94	85 - 115
2064277	p-Alkalinity	2010/01/26					<1	mg/L			94	85 - 115
2064280	Conductivity	2010/01/26					<1	umho/cm	0.1	25	101	85 - 115
2064316	Dissolved Aluminum (Al)	2010/01/27	94	80 - 120	103	90 - 110	<5	ug/L				
2064316	Dissolved Antimony (Sb)	2010/01/27	116	80 - 120	102	90 - 110	<0.5	ug/L	NC	25		
2064316	Dissolved Arsenic (As)	2010/01/27	100	80 - 120	103	90 - 110	<1	ug/L	3.2	25		
2064316	Dissolved Barium (Ba)	2010/01/27	99	80 - 120	100	90 - 110	<5	ug/L	0.08	25		
2064316	Dissolved Beryllium (Be)	2010/01/27	96	80 - 120	99	90 - 110	<0.5	ug/L	NC	25		
2064316	Dissolved Boron (B)	2010/01/27	NC	80 - 120	99	90 - 110	<10	ug/L	7.1	25		

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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2064316	Dissolved Cadmium (Cd)	2010/01/27	101	80 - 120	103	90 - 110	<0.1	ug/L	NC	25		
2064316	Dissolved Calcium (Ca)	2010/01/27	NC	80 - 120	109	90 - 110	<200	ug/L				
2064316	Dissolved Chromium (Cr)	2010/01/27	100	80 - 120	103	90 - 110	<5	ug/L	NC	25		
2064316	Dissolved Cobalt (Co)	2010/01/27	99	80 - 120	100	90 - 110	<0.5	ug/L	NC	25		
2064316	Dissolved Copper (Cu)	2010/01/27	92	80 - 120	99	90 - 110	<1	ug/L	NC	25		
2064316	Dissolved Iron (Fe)	2010/01/27	102	80 - 120	106	90 - 110	<100	ug/L				
2064316	Dissolved Lead (Pb)	2010/01/27	99	80 - 120	103	90 - 110	<0.5	ug/L	NC	25		
2064316	Dissolved Magnesium (Mg)	2010/01/27	NC	80 - 120	102	90 - 110	<50	ug/L	1.7	25		
2064316	Dissolved Manganese (Mn)	2010/01/27	NC	80 - 120	104	90 - 110	<2	ug/L				
2064316	Dissolved Molybdenum (Mo)	2010/01/27	121(1)	80 - 120	102	90 - 110	<1	ug/L	NC	25		
2064316	Dissolved Nickel (Ni)	2010/01/27	93	80 - 120	97	90 - 110	<1	ug/L	NC	25		
2064316	Dissolved Phosphorus (P)	2010/01/27	108	80 - 120	103	90 - 110	<100	ug/L	NC	25		
2064316	Dissolved Potassium (K)	2010/01/27	NC	80 - 120	103	90 - 110	<200	ug/L	2.8	25		
2064316	Dissolved Selenium (Se)	2010/01/27	98	80 - 120	102	90 - 110	<2	ug/L	NC	25		
2064316	Dissolved Silicon (Si)	2010/01/27	107	80 - 120	105	90 - 110	<50	ug/L				
2064316	Dissolved Silver (Ag)	2010/01/27	89	80 - 120	102	90 - 110	<0.1	ug/L	NC	25		
2064316	Dissolved Sodium (Na)	2010/01/27	NC	80 - 120	104	90 - 110	<100	ug/L	0.2	25		
2064316	Dissolved Strontium (Sr)	2010/01/27	NC	80 - 120	101	90 - 110	<1	ug/L				
2064316	Dissolved Thallium (Tl)	2010/01/27	100	80 - 120	104	90 - 110	<0.05	ug/L	NC	25		
2064316	Dissolved Titanium (Ti)	2010/01/27	115	80 - 120	106	90 - 110	<5	ug/L				
2064316	Dissolved Uranium (U)	2010/01/27	102	80 - 120	102	90 - 110	<0.1	ug/L				
2064316	Dissolved Vanadium (V)	2010/01/27	102	80 - 120	105	90 - 110	<1	ug/L	NC	25		
2064316	Dissolved Zinc (Zn)	2010/01/27	92	80 - 120	99	90 - 110	<5	ug/L	NC	25		
2064410	Nitrite (N)	2010/01/27	NC	75 - 125	100	80 - 120	<0.01	mg/L	0.8	25		
2064410	Nitrate (N)	2010/01/27	NC	75 - 125	97	80 - 120	<0.1	mg/L	0.8	25		
2064410	Nitrate + Nitrite	2010/01/27					<0.1	mg/L	0.8	25		
2064522	Dissolved Chloride (Cl)	2010/01/27	NC	75 - 125	101	80 - 120	<1	mg/L	0.9	20		
2064525	Orthophosphate (P)	2010/01/27	104	75 - 125	99	80 - 120	<0.01	mg/L	NC	25		
2064526	Dissolved Sulphate (SO4)	2010/01/27	NC	75 - 125	102	80 - 120	<1	mg/L	0.4	25		
2065528	Total Ammonia-N	2010/01/28	100	80 - 120	100	80 - 120	<0.05	mg/L	NC	25		
2069058	Dissolved Aluminum (Al)	2010/02/02	100	80 - 120	100	90 - 110	<5	ug/L	NC	25		
2069058	Dissolved Antimony (Sb)	2010/02/02	106	80 - 120	101	90 - 110	<0.5	ug/L	NC	25		
2069058	Dissolved Arsenic (As)	2010/02/02	103	80 - 120	100	90 - 110	<1	ug/L	NC	25		
2069058	Dissolved Barium (Ba)	2010/02/02	101	80 - 120	100	90 - 110	<5	ug/L	0.6	25		
2069058	Dissolved Beryllium (Be)	2010/02/02	101	80 - 120	100	90 - 110	<0.5	ug/L	NC	25		
2069058	Dissolved Bismuth (Bi)	2010/02/02	95	80 - 120	96	90 - 110	<1	ug/L	NC	25		
2069058	Dissolved Boron (B)	2010/02/02	NC	80 - 120	106	90 - 110	<10	ug/L	0.4	25		
2069058	Dissolved Cadmium (Cd)	2010/02/02	101	80 - 120	102	90 - 110	<0.1	ug/L	NC	25		
2069058	Dissolved Calcium (Ca)	2010/02/02	NC	80 - 120	103	90 - 110	<200	ug/L	0.3	25		
2069058	Dissolved Chromium (Cr)	2010/02/02	98	80 - 120	100	90 - 110	<5	ug/L	NC	25		

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QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
2069058	Dissolved Cobalt (Co)	2010/02/02	99	80 - 120	99	90 - 110	<0.5	ug/L	NC	25		
2069058	Dissolved Copper (Cu)	2010/02/02	95	80 - 120	97	90 - 110	<1	ug/L	NC	25		
2069058	Dissolved Iron (Fe)	2010/02/02	99	80 - 120	100	90 - 110	<100	ug/L	0.9	25		
2069058	Dissolved Lead (Pb)	2010/02/02	95	80 - 120	97	90 - 110	<0.5	ug/L	NC	25		
2069058	Dissolved Magnesium (Mg)	2010/02/02	NC	80 - 120	101	90 - 110	<50	ug/L	0.6	25		
2069058	Dissolved Manganese (Mn)	2010/02/02	98	80 - 120	100	90 - 110	<2	ug/L	1	25		
2069058	Dissolved Molybdenum (Mo)	2010/02/02	108	80 - 120	100	90 - 110	<1	ug/L	1.1	25		
2069058	Dissolved Nickel (Ni)	2010/02/02	95	80 - 120	98	90 - 110	<1	ug/L	NC	25		
2069058	Dissolved Phosphorus (P)	2010/02/02	103	80 - 120	100	90 - 110	<100	ug/L	NC	25		
2069058	Dissolved Potassium (K)	2010/02/02	NC	80 - 120	100	90 - 110	<200	ug/L	1	25		
2069058	Dissolved Selenium (Se)	2010/02/02	103	80 - 120	100	90 - 110	<2	ug/L	NC	25		
2069058	Dissolved Silicon (Si)	2010/02/02	102	80 - 120	101	90 - 110	<50	ug/L	0.7	25		
2069058	Dissolved Silver (Ag)	2010/02/02	73(1)	80 - 120	96	90 - 110	<0.1	ug/L	NC	25		
2069058	Dissolved Sodium (Na)	2010/02/02	NC	80 - 120	100	90 - 110	<100	ug/L	0.6	25		
2069058	Dissolved Strontium (Sr)	2010/02/02	NC	80 - 120	98	90 - 110	<1	ug/L	1.3	25		
2069058	Dissolved Thallium (Tl)	2010/02/02	94	80 - 120	95	90 - 110	<0.05	ug/L	NC	25		
2069058	Dissolved Titanium (Ti)	2010/02/02	102	80 - 120	101	90 - 110	<5	ug/L	NC	25		
2069058	Dissolved Uranium (U)	2010/02/02	96	80 - 120	94	90 - 110	<0.1	ug/L	0.8	25		
2069058	Dissolved Vanadium (V)	2010/02/02	102	80 - 120	98	90 - 110	<1	ug/L	NC	25		
2069058	Dissolved Zinc (Zn)	2010/02/02	97	80 - 120	101	90 - 110	<5	ug/L	0.6	25		

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Validation Signature Page

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The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

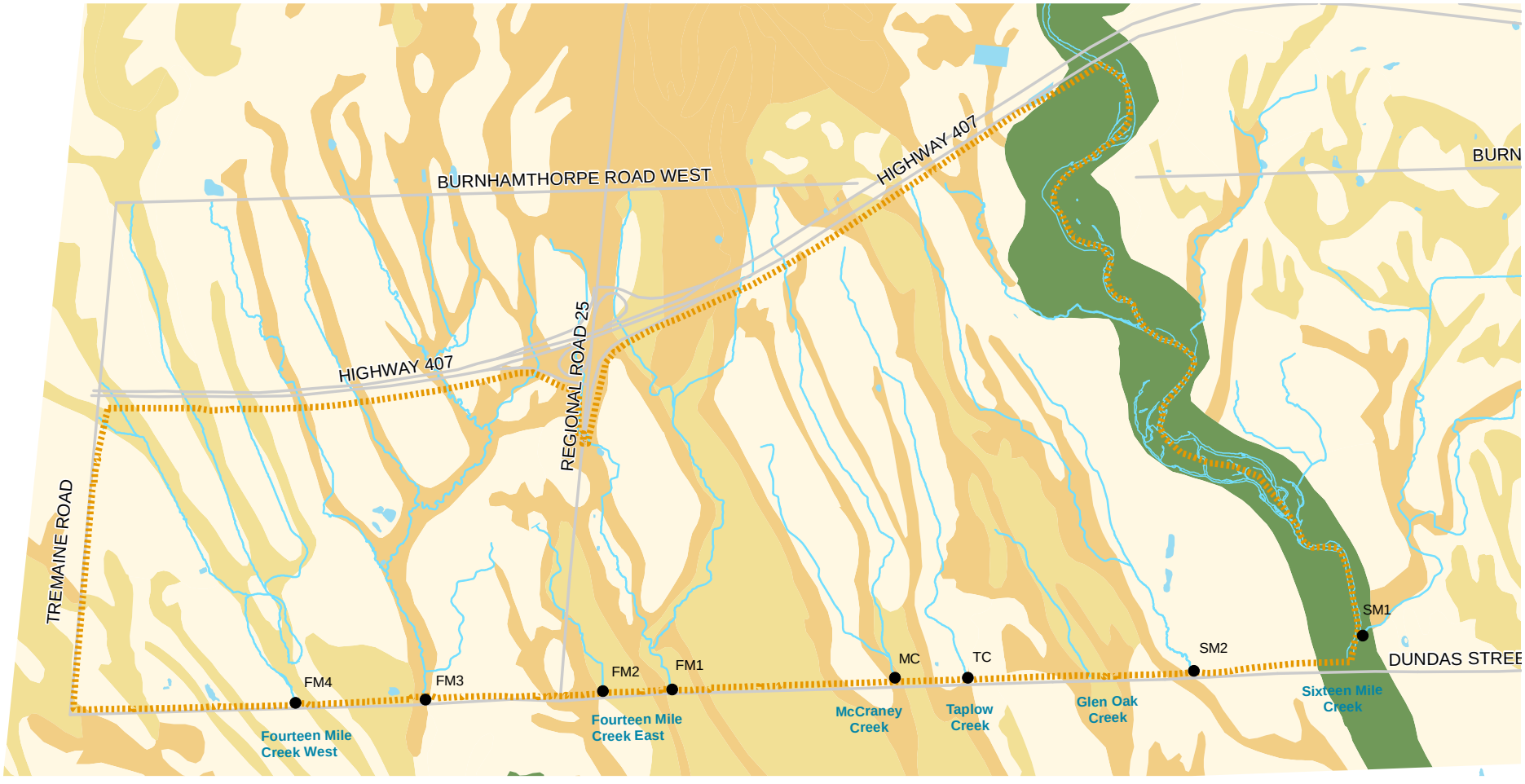
CRISTINA CARRIERE, Scientific Services

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CALA have approved this reporting process and electronic report format.

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APPENDIX 4-7
Meteorological Information and Water Balance



NORTH OAKVILLE CREEKS SUBWATERSHED STUDY

engineers architects planners
PARISH geomorphic
Natural Resource Solutions Inc.
Donald G. Weatherbe Associates
Morrison Environmental Limited
Environmental Water Resources Group Ltd.
OAKVILLE

August 2006

0 250 500
Meters

Legend

- West Study Area
- Road
- Watercourse
- Pond
- Flow Monitoring Station

Soil Type

- Bottom Land
- Brady (Sandy Loam)
- Chinguacousy (Rocky Phase)
- Chinguacousy Clay Loam
- Jeddo Clay Loam
- Lockport Clay
- Oneida (Rocky Phase)
- Onieda Clay Loam
- Trafalgar Clay

West Study Area

Soils and Flow Monitoring Locations

Figure 4W.6.1

Table WB-1: Pre and Post-Development Water Balance (mm Equivalents)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Pre-Development													
Forested Areas													
Water Holding Capacity (WHC) 400 mm													
Average Temperature (C)	-3.6	-2.7	1.2	7.2	13.1	19.1	21.9	21.4	17.3	10.3	4.8	-0.4	**9.0**
Precipitation (P) (mm)	77	53	56	74	84	63	84	59	72	60	73	64	**819**
Rainfall (mm)	36	32	38	73	84	63	84	59	72	60	70	46	
Melt (mm)	21	32	35	1	0	0	0	0	0	0	3	10	
Potential Evapotranspiration (PET) (mm)	2	3	11	34	75	117	139	126	85	43	16	5	**656**
Actual Evapotranspiration (AET) (mm)	2	3	11	34	75	117	138	122	80	41	16	5	**644**
Deficit (mm)	0	0	0	0	0	0	-1	-4	-5	-2	0	0	
Surplus - available for infiltration/runoff (mm	15	26	53	35	15	1	0	0	0	2	6	13	**166**
Snowfall (mm)	28	18	0	0	0	0	0	0	0	0	0	8	
Soil Moisture (mm)	339	374	383	388	383	328	274	211	202	220	270	309	
Change in Soil Moisture Storage (mm)	30	35	9	5	-5	-55	-54	-63	-9	18	50	39	
Data for Use with Pre-Development Water Balance													
Precipitation (P) (mm)	77.0	53.0	56.0	74.0	84.0	63.0	84.0	59.0	72.0	60.0	73.0	64.0	**819.0**
Actual Evapotranspiration (AET) (mm)	2.0	3.0	11.0	34.0	75.0	117.0	138.0	122.0	80.0	41.0	16.0	5.0	**644.0**
Surplus - available for infiltration/runoff (mm	15.0	26.0	53.0	35.0	15.0	1.0	0.0	0.0	0.0	2.0	6.0	13.0	**166.0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	6.5	11.2	22.8	15.1	6.5	0.4	0.0	0.0	0.0	0.9	2.6	5.6	**71.4**
Runoff (MOE Methodology) (m^3)	8.6	14.8	30.2	20.0	8.6	0.6	0.0	0.0	0.0	1.1	3.4	7.4	**94.6**
Open/Cropped Areas													
Water Holding Capacity (WHC) 200 mm													
Average Temperature (C)	-3.6	-2.7	1.2	7.2	13.1	19.1	21.9	21.4	17.3	10.3	4.8	-0.4	**9.0**
Precipitation (P) (mm)	77	53	56	74	84	63	84	59	72	60	73	64	**819**
Rainfall (mm)	36	32	38	73	84	63	84	59	72	60	70	46	
Melt (mm)	21	32	35	1	0	0	0	0	0	0	3	10	
Potential Evapotranspiration (PET) (mm)	2	3	11	34	75	117	139	126	85	43	16	5	**656**
Actual Evapotranspiration (AET) (mm)	2	3	11	34	75	117	135	102	68	39	16	5	**607**
Deficit (mm)	0	0	0	0	0	0	-5	-23	-18	-5	0	0	
Surplus - available for infiltration/runoff (mm	22	42	61	43	18	1	0	0	0	2	7	14	**210**
Snowfall (mm)	28	18	0	0	0	0	0	0	0	0	0	8	
Soil Moisture (mm)	179	199	200	197	189	134	83	40	45	65	114	151	
Change in Soil Moisture Storage (mm)	28	20	1	-3	-8	-55	-51	-43	5	20	49	37	
Data for Use with Pre-Development Water Balance													
Precipitation (P) (mm)	77.0	53.0	56.0	74.0	84.0	63.0	84.0	59.0	72.0	60.0	73.0	64.0	**819.0**
Actual Evapotranspiration (AET) (mm)	2.0	3.0	11.0	34.0	75.0	117.0	135.0	102.0	68.0	39.0	16.0	5.0	**607.0**
Surplus - available for infiltration/runoff (mm	22.0	42.0	61.0	43.0	18.0	1.0	0.0	0.0	0.0	2.0	7.0	14.0	**210.0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	7.3	13.9	20.1	14.2	5.9	0.3	0.0	0.0	0.0	0.7	2.3	4.6	**69.3**
Runoff (MOE Methodology) (m^3)	14.7	28.1	40.9	28.8	12.1	0.7	0.0	0.0	0.0	1.3	4.7	9.4	**140.7**
Post-Development													
Development Lands Only - Landscaped/Grassed Areas													
Water Holding Capacity (WHC) 100 mm													
Average Temperature (C)	-3.6	-2.7	1.2	7.2	13.1	19.1	21.9	21.4	17.3	10.3	4.8	-0.4	**9.0**
Precipitation (P) (mm)	77	53	56	74	84	63	84	59	72	60	73	64	**819**
Rainfall (mm)	36	32	38	73	84	63	84	59	72	60	70	46	
Melt (mm)	21	32	35	1	0	0	0	0	0	0	3	10	
Potential Evapotranspiration (PET) (mm)	2	3	11	34	75	117	139	126	85	43	16	5	**656**
Actual Evapotranspiration (AET) (mm)	2	3	11	34	75	114	106	70	63	37	16	5	**536**
Deficit (mm)	0	0	0	0	0	-3	-33	-56	-22	-6	0	0	
Surplus - available for infiltration/runoff (mm	45	60	62	43	18	1	0	0	0	2	15	34	**280**
Snowfall (mm)	28	18	0	0	0	0	0	0	0	0	0	8	
Soil Moisture (mm)	100	100	100	97	89	37	15	5	13	34	75	92	
Change in Soil Moisture Storage (mm)	8	0	0	-3	-8	-52	-22	-10	8	21	41	17	
Data for Use with Post-Development Water Balance													
Precipitation (P) (mm)	77.0	53.0	56.0	74.0	84.0	63.0	84.0	59.0	72.0	60.0	73.0	64.0	**819.0**
Actual Evapotranspiration (AET) (mm)	2.0	3.0	11.0	34.0	75.0	114.0	106.0	70.0	63.0	37.0	16.0	5.0	**536.0**
Surplus - available for infiltration/runoff (mm	45.0	60.0	62.0	43.0	18.0	1.0	0.0	0.0	0.0	2.0	15.0	34.0	**280.0**
Infiltration (MOE Methodology) (m^3) **i = 0.35**	15.8	21.0	21.7	15.1	6.3	0.4	0.0	0.0	0.0	0.7	5.3	11.9	**98.0**
Runoff (MOE Methodology) (m^3)	29.3	39.0	40.3	28.0	11.7	0.7	0.0	0.0	0.0	1.3	9.8	22.1	**182.0**
Development Lands Only - Landscaped/Grassed Areas with Additional Topsoil													
Water Holding Capacity (WHC) 100 mm													
Average Temperature (C)	-3.6	-2.7	1.2	7.2	13.1	19.1	21.9	21.4	17.3	10.3	4.8	-0.4	**9.0**
Precipitation (P) (mm)	77	53	56	74	84	63	84	59	72	60	73	64	**819**
Rainfall (mm)	36	32	38	73	84	63	84	59	72	60	70	46	
Melt (mm)	21	32	35	1	0	0	0	0	0	0	3	10	
Potential Evapotranspiration (PET) (mm)	2	3	11	34	75	117	139	126	85	43	16	5	**656**
Actual Evapotranspiration (AET) (mm)	2	3	11	34	75	114	106	70	63	37	16	5	**536**
Deficit (mm)	0	0	0	0	0	-3	-33	-56	-22	-6	0	0	
Surplus - available for infiltration/runoff (mm	45	60	62	43	18	1	0	0	0	2	15	34	**280**
Snowfall (mm)	28	18	0	0	0	0	0	0	0	0	0	8	
Soil Moisture (mm)	100	100	100	97	89	37	15	5	13	34	75	92	
Change in Soil Moisture Storage (mm)	8	0	0	-3	-8	-52	-22	-10	8	21	41	17	
Data for Use with Post-Development Water Balance													
Precipitation (P) (mm)	77.0	53.0	56.0	74.0	84.0	63.0	84.0	59.0	72.0	60.0	73.0	64.0	**819.0**
Actual Evapotranspiration (AET) (mm)	2.0	3.0	11.0	34.0	75.0	114.0	106.0	70.0	63.0	37.0	16.0	5.0	**536.0**
Surplus - available for infiltration/runoff (mm	45.0	60.0	62.0	43.0	18.0	1.0	0.0	0.0	0.0	2.0	15.0	34.0	**280.0**
Infiltration (MOE Methodology) (m^3) **i = 0.40**	18.0	24.0	24.8	17.2	7.2	0.4	0.0	0.0	0.0	0.8	6.0	13.6	**112.0**
Runoff (MOE Methodology) (m^3)	27.0	36.0	37.2	25.8	10.8	0.6	0.0	0.0	0.0	1.2	9.0	20.4	**168.0**

Notes:

1. Monthly climate data, including soil deficits, soil moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces. This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater syste
4. There is minor round-off error within the Environment Canada data

Table WB-2-1001: Pre-Development Water Balance - Subwatershed FM1001 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands													
Pervious Area (Open/Agricultural) *59.64 ha*	WHC = 200 mm												
Precipitation (m^3)	45,923	31,609	33,398	44,134	50,098	37,573	50,098	35,188	42,941	35,784	43,537	38,170	**488,452**
Total AET (m^3)	1,193	1,789	6,560	20,278	44,730	69,779	80,514	60,833	40,555	23,260	9,542	2,982	**362,015**
Water Surplus (m^3)	13,121	25,049	36,380	25,645	10,735	596	0	0	0	1,193	4,175	8,350	**125,244**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	4,330	8,266	12,006	8,463	3,543	197	0	0	0	394	1,378	2,755	**41,331**
Runoff (MOE Methodology) (m^3)	8,791	16,783	24,375	17,182	7,193	400	0	0	0	799	2,797	5,594	**83,913**
Pervious Area (Forest) *0.80 ha*	WHC = 400 mm												
Precipitation (m^3)	616	424	448	592	672	504	672	472	576	480	584	512	**6,552**
Total AET (m^3)	16	24	88	272	600	936	1,104	976	640	328	128	40	**5,152**
Water Surplus (m^3)	120	208	424	280	120	8	0	0	0	16	48	104	**1,328**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	52	89	182	120	52	3	0	0	0	7	21	45	**571**
Runoff (MOE Methodology) (m^3)	68	119	242	160	68	5	0	0	0	9	27	59	**757**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **60.44 ha**													
Precipitation (m^3)	46,539	32,033	33,846	44,726	50,770	38,077	50,770	35,660	43,517	36,264	44,121	38,682	**495,004**
Total AET (m^3)	1,209	1,813	6,648	20,550	45,330	70,715	81,618	61,809	41,195	23,588	9,670	3,022	**367,167**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	4,381	8,356	12,188	8,583	3,594	200	0	0	0	401	1,398	2,800	**41,902**
Runoff (MOE Methodology) (m^3)	8,859	16,901	24,617	17,342	7,261	404	0	0	0	808	2,824	5,654	**84,670**
Water Balance for Future Development Lands owned by others													
Pervious Area (Open/Agricultural) *44.50 ha*	WHC = 200 mm												
Precipitation (m^3)	34,265	23,585	24,920	32,930	37,380	28,035	37,380	26,255	32,040	26,700	32,485	28,480	**364,455**
Total AET (m^3)	890	1,335	4,895	15,130	33,375	52,065	60,075	45,390	30,260	17,355	7,120	2,225	**270,115**
Water Surplus (m^3)	9,790	18,690	27,145	19,135	8,010	445	0	0	0	890	3,115	6,230	**93,450**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	3,231	6,168	8,958	6,315	2,643	147	0	0	0	294	1,028	2,056	**30,839**
Runoff (MOE Methodology) (m^3)	6,559	12,522	18,187	12,820	5,367	298	0	0	0	596	2,087	4,174	**62,612**
Pervious Area (Forest) *4.10 ha*	WHC = 400 mm												
Precipitation (m^3)	3,157	2,173	2,296	3,034	3,444	2,583	3,444	2,419	2,952	2,460	2,993	2,624	**33,579**
Total AET (m^3)	82	123	451	1,394	3,075	4,797	5,658	5,002	3,280	1,681	656	205	**26,404**
Water Surplus (m^3)	615	1,066	2,173	1,435	615	41	0	0	0	82	246	533	**6,806**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	264	458	934	617	264	18	0	0	0	35	106	229	**2,927**
Runoff (MOE Methodology) (m^3)	351	608	1,239	818	351	23	0	0	0	47	140	304	**3,879**
Impervious Area (Ex. Roads, Industrial) *0.40 ha*													
Precipitation (m^3)	308	212	224	296	336	252	336	236	288	240	292	256	**3,276**
Evaporative Lossess at 10% Precipitation (m^3)	31	21	22	30	34	25	34	24	29	24	29	26	**328**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	277	191	202	266	302	227	302	212	259	216	263	230	**2,948**
Summary Total **49.00 ha**													
Precipitation (m^3)	37,730	25,970	27,440	36,260	41,160	30,870	41,160	28,910	35,280	29,400	35,770	31,360	**401,310**
Total AET (m^3)	972	1,458	5,346	16,524	36,450	56,862	65,733	50,392	33,540	19,036	7,776	2,430	**296,519**
Evaporative Lossess at 10% Precipitation (m^3)	31	21	22	30	34	25	34	24	29	24	29	26	**328**
Infiltration (MOE Methodology) (m^3)	3,495	6,626	9,892	6,932	2,908	164	0	0	0	329	1,134	2,285	**33,765**
Runoff (MOE Methodology) (m^3)	7,187	13,321	19,627	13,905	6,020	548	302	212	259	859	2,490	4,708	**69,439**

Table WB-2-1001: Pre-Development Water Balance - Subwatershed FM1001 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *218.16 ha* WHC = 200 mm													
Precipitation (m^3)	167,983	115,625	122,170	161,438	183,254	137,441	183,254	128,714	157,075	130,896	159,257	139,622	**1,786,730**
Total AET (m^3)	4,363	6,545	23,998	74,174	163,620	255,247	294,516	222,523	148,349	85,082	34,906	10,908	**1,324,231**
Water Surplus (m^3)	47,995	91,627	133,078	93,809	39,269	2,182	0	0	0	4,363	15,271	30,542	**458,136**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	15,838	30,237	43,916	30,957	12,959	720	0	0	0	1,440	5,039	10,079	**151,185**
Runoff (MOE Methodology) (m^3)	32,157	61,390	89,162	62,852	26,310	1,462	0	0	0	2,923	10,232	20,463	**306,951**
Pervious Area (Forest) *21.00 ha* WHC = 400 mm													
Precipitation (m^3)	16,170	11,130	11,760	15,540	17,640	13,230	17,640	12,390	15,120	12,600	15,330	13,440	**171,990**
Total AET (m^3)	420	630	2,310	7,140	15,750	24,570	28,980	25,620	16,800	8,610	3,360	1,050	**135,240**
Water Surplus (m^3)	3,150	5,460	11,130	7,350	3,150	210	0	0	0	420	1,260	2,730	**34,860**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	1,355	2,348	4,786	3,161	1,355	90	0	0	0	181	542	1,174	**14,990**
Runoff (MOE Methodology) (m^3)	1,796	3,112	6,344	4,190	1,796	120	0	0	0	239	718	1,556	**19,870**
Impervious Area (Ex. Roads, Industrial) *8.40 ha*													
Precipitation (m^3)	6,468	4,452	4,704	6,216	7,056	5,292	7,056	4,956	6,048	5,040	6,132	5,376	**68,796**
Evaporative Lossess at 10% Precipitation (m^3)	647	445	470	622	706	529	706	496	605	504	613	538	**6,880**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	5,821	4,007	4,234	5,594	6,350	4,763	6,350	4,460	5,443	4,536	5,519	4,838	**61,916**
Summary Total **247.56 ha**													
Precipitation (m^3)	190,621	131,207	138,634	183,194	207,950	155,963	207,950	146,060	178,243	148,536	180,719	158,438	**2,027,516**
Total AET (m^3)	4,783	7,175	26,308	81,314	179,370	279,817	323,496	248,143	165,149	93,692	38,266	11,958	**1,459,471**
Evaporative Lossess at 10% Precipitation (m^3)	647	445	470	622	706	529	706	496	605	504	613	538	**6,880**
Infiltration (MOE Methodology) (m^3)	17,193	32,585	48,702	34,117	14,313	810	0	0	0	1,620	5,581	11,253	**166,175**
Runoff (MOE Methodology) (m^3)	39,773	68,509	99,740	72,636	34,456	6,344	6,350	4,460	5,443	7,699	16,469	26,858	**388,738**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *27.20 ha* WHC = 200 mm													
Precipitation (m^3)	20,944	14,416	15,232	20,128	22,848	17,136	22,848	16,048	19,584	16,320	19,856	17,408	**222,768**
Total AET (m^3)	544	816	2,992	9,248	20,400	31,824	36,720	27,744	18,496	10,608	4,352	1,360	**165,104**
Water Surplus (m^3)	5,984	11,424	16,592	11,696	4,896	272	0	0	0	544	1,904	3,808	**57,120**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	1,975	3,770	5,475	3,860	1,616	90	0	0	0	180	628	1,257	**18,850**
Runoff (MOE Methodology) (m^3)	4,009	7,654	11,117	7,836	3,280	182	0	0	0	364	1,276	2,551	**38,270**
Pervious Area (Forest) *4.00 ha* WHC = 400 mm													
Precipitation (m^3)	3,080	2,120	2,240	2,960	3,360	2,520	3,360	2,360	2,880	2,400	2,920	2,560	**32,760**
Total AET (m^3)	80	120	440	1,360	3,000	4,680	5,520	4,880	3,200	1,640	640	200	**25,760**
Water Surplus (m^3)	600	1,040	2,120	1,400	600	40	0	0	0	80	240	520	**6,640**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	258	447	912	602	258	17	0	0	0	34	103	224	**2,855**
Runoff (MOE Methodology) (m^3)	342	593	1,208	798	342	23	0	0	0	46	137	296	**3,785**
Impervious Area (Ex. Roads, Industrial) *7.10 ha*													
Precipitation (m^3)	5,467	3,763	3,976	5,254	5,964	4,473	5,964	4,189	5,112	4,260	5,183	4,544	**58,149**
Evaporative Lossess at 10% Precipitation (m^3)	547	376	398	525	596	447	596	419	511	426	518	454	**5,815**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	4,920	3,387	3,578	4,729	5,368	4,026	5,368	3,770	4,601	3,834	4,665	4,090	**52,334**
Summary Total **38.30 ha**													
Precipitation (m^3)	29,491	20,299	21,448	28,342	32,172	24,129	32,172	22,597	27,576	22,980	27,959	24,512	**313,677**
Total AET (m^3)	624	936	3,432	10,608	23,400	36,504	42,240	32,624	21,696	12,248	4,992	1,560	**190,864**
Evaporative Lossess at 10% Precipitation (m^3)	547	376	398	525	596	447	596	419	511	426	518	454	**5,815**
Infiltration (MOE Methodology) (m^3)	2,233	4,217	6,387	4,462	1,874	107	0	0	0	214	732	1,480	**21,705**
Runoff (MOE Methodology) (m^3)	9,272	11,634	15,903	13,363	8,990	4,231	5,368	3,770	4,601	4,244	6,077	6,937	**94,389**
Water Balance Totals for Subwatershed FM1001 **395.30 ha**													
Precipitation (m^3)	304,381	209,509	221,368	292,522	332,052	249,039	332,052	233,227	284,616	237,180	288,569	252,992	**3,237,507**
Total AET (m^3)	7,588	11,382	41,734	128,996	284,550	443,898	513,087	392,968	261,580	148,564	60,704	18,970	**2,314,021**
Evaporative Lossess at 10% Precipitation (m^3)	1,224	843	890	1,177	1,336	1,002	1,336	938	1,145	954	1,161	1,018	**13,022**
Infiltration (MOE Methodology) (m^3)	27,302	51,784	77,169	54,094	22,689	1,282	0	0	0	2,564	8,845	17,818	**263,546**
Runoff (MOE Methodology) (m^3)	65,091	110,365	159,887	117,245	56,727	11,527	12,020	8,443	10,303	13,610	27,860	44,157	**637,237**
Potential Stream Base Flows (LPM) - does not account for lag	550	1,156	1,556	1,127	457	27	0	0	0	52	184	359	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater s
4. There is minor round-off error within the Environment Canada data

Table WB-3-1001: Post-Development Water Balance (No Mitigation) - Subwatershed FM1001 (Volumetric Calculations based on Pervious Area)
Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*15.02 ha*	WHC = 200 mm												
Precipitation (m^3)		11,565	7,961	8,411	11,115	12,617	9,463	12,617	8,862	10,814	9,012	10,965	9,613	**123,014**
Total AET (m^3)		300	451	1,652	5,107	11,265	17,573	20,277	15,320	10,214	5,858	2,403	751	**91,171**
Water Surplus (m^3)		3,304	6,308	9,162	6,459	2,704	150	0	0	0	300	1,051	2,103	**31,542**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	1,090	2,082	3,024	2,131	892	50	0	0	0	99	347	694	**10,409**
Runoff (MOE Methodology) (m^3)		2,214	4,227	6,139	4,327	1,811	101	0	0	0	201	704	1,409	**21,133**
Pervious Area (Forest)	*0.00 ha*	WHC = 400 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Landscaped)	*5.67 ha*	WHC = 100 mm												
Precipitation (m^3)		4,369	3,007	3,177	4,199	4,766	3,575	4,766	3,348	4,085	3,404	4,142	3,631	**46,470**
Total AET (m^3)		113	170	624	1,929	4,256	6,468	6,014	3,972	3,575	2,099	908	284	**30,413**
Water Surplus (m^3)		2,553	3,404	3,518	2,440	1,021	57	0	0	0	113	851	1,929	**15,887**
Infiltration (MOE Methodology) (m^3)	**i = 0.35**	894	1,192	1,231	854	357	20	0	0	0	40	298	675	**5,561**
Runoff (MOE Methodology) (m^3)		1,660	2,213	2,287	1,586	664	37	0	0	0	74	553	1,254	**10,327**
Impervious Area (Ex. Roads, Industrial)	*39.75 ha*													
Precipitation (m^3)		30,604	21,065	22,258	29,412	33,387	25,040	33,387	23,450	28,617	23,848	29,015	25,437	**325,520**
Evaporative Lossess at 10% Precipitation (m^3)		3,060	2,107	2,226	2,941	3,339	2,504	3,339	2,345	2,862	2,385	2,901	2,544	**32,552**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		27,544	18,959	20,032	26,471	30,048	22,536	30,048	21,105	25,755	21,463	26,113	22,894	**292,968**
Summary Total	**60.44 ha**													
Precipitation (m^3)		46,539	32,033	33,846	44,726	50,770	38,077	50,770	35,660	43,517	36,264	44,121	38,682	**495,004**
Total AET (m^3)		414	621	2,276	7,036	15,521	24,042	26,291	19,292	13,788	7,957	3,311	1,035	**121,584**
Evaporative Lossess at 10% Precipitation (m^3)		3,060	2,107	2,226	2,941	3,339	2,504	3,339	2,345	2,862	2,385	2,901	2,544	**32,552**
Infiltration (MOE Methodology) (m^3)		1,984	3,273	4,255	2,985	1,250	69	0	0	0	139	645	1,369	**15,969**
Runoff (MOE Methodology) (m^3)		31,418	25,398	28,457	32,384	32,523	22,673	30,048	21,105	25,755	21,738	27,371	25,557	**324,428**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*5.49 ha*	WHC = 200 mm												
Precipitation (m^3)		4,227	2,910	3,074	4,063	4,612	3,459	4,612	3,239	3,953	3,294	4,008	3,514	**44,963**
Total AET (m^3)		110	165	604	1,867	4,118	6,423	7,412	5,600	3,733	2,141	878	275	**33,324**
Water Surplus (m^3)		1,208	2,306	3,349	2,361	988	55	0	0	0	110	384	769	**11,529**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	399	761	1,105	779	326	18	0	0	0	36	127	254	**3,805**
Runoff (MOE Methodology) (m^3)		809	1,545	2,244	1,582	662	37	0	0	0	74	257	515	**7,724**
Pervious Area (Forest)	*4.10 ha*	WHC = 400 mm												
Precipitation (m^3)		3,157	2,173	2,296	3,034	3,444	2,583	3,444	2,419	2,952	2,460	2,993	2,624	**33,579**
Total AET (m^3)		82	123	451	1,394	3,075	4,797	5,658	5,002	3,280	1,681	656	205	**26,404**
Water Surplus (m^3)		615	1,066	2,173	1,435	615	41	0	0	0	82	246	533	**6,806**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	264	458	934	617	264	18	0	0	0	35	106	229	**2,927**
Runoff (MOE Methodology) (m^3)		351	608	1,239	818	351	23	0	0	0	47	140	304	**3,879**
Pervious Area (Landscaped)	*5.75 ha*	WHC = 100 mm												
Precipitation (m^3)		4,427	3,047	3,219	4,254	4,829	3,622	4,829	3,392	4,139	3,449	4,197	3,679	**47,083**
Total AET (m^3)		115	172	632	1,955	4,312	6,554	6,094	4,024	3,622	2,127	920	287	**30,814**
Water Surplus (m^3)		2,587	3,449	3,564	2,472	1,035	57	0	0	0	115	862	1,955	**16,097**
Infiltration (MOE Methodology) (m^3)	**i = 0.35**	905	1,207	1,247	865	362	20	0	0	0	40	302	684	**5,634**
Runoff (MOE Methodology) (m^3)		1,682	2,242	2,317	1,607	673	37	0	0	0	75	561	1,270	**10,463**
Impervious Area (Ex. Roads, Industrial)	*33.66 ha*													
Precipitation (m^3)		25,919	17,840	18,850	24,909	28,275	21,207	28,275	19,860	24,236	20,197	24,573	21,543	**275,685**
Evaporative Lossess at 10% Precipitation (m^3)		2,592	1,784	1,885	2,491	2,828	2,121	2,828	1,986	2,424	2,020	2,457	2,154	**27,569**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		23,327	16,056	16,965	22,418	25,448	19,086	25,448	17,874	21,812	18,177	22,115	19,389	**248,117**
Summary Total	**49.00 ha**													
Precipitation (m^3)		37,730	25,970	27,440	36,260	41,160	30,870	41,160	28,910	35,280	29,400	35,770	31,360	**401,310**
Total AET (m^3)		307	460	1,687	5,215	11,504	17,774	19,163	14,626	10,635	5,949	2,454	767	**90,542**
Evaporative Lossess at 10% Precipitation (m^3)		2,592	1,784	1,885	2,491	2,828	2,121	2,828	1,986	2,424	2,020	2,457	2,154	**27,569**
Infiltration (MOE Methodology) (m^3)		1,568	2,427	3,287	2,261	953	56	0	0	0	112	534	1,167	**12,365**
Runoff (MOE Methodology) (m^3)		26,169	20,451	22,764	26,425	27,133	19,183	25,448	17,874	21,812	18,372	23,074	21,478	**270,183**

Table WB-3-1001: Post-Development Water Balance (No Mitigation) - Subwatershed FM1001 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *218.16 ha* WHC = 200 mm													
Precipitation (m^3)	167,983	115,625	122,170	161,438	183,254	137,441	183,254	128,714	157,075	130,896	159,257	139,622	**1,786,730**
Total AET (m^3)	4,363	6,545	23,998	74,174	163,620	255,247	294,516	222,523	148,349	85,082	34,906	10,908	**1,324,231**
Water Surplus (m^3)	47,995	91,627	133,078	93,809	39,269	2,182	0	0	0	4,363	15,271	30,542	**458,136**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	15,838	30,237	43,916	30,957	12,959	720	0	0	0	1,440	5,039	10,079	**151,185**
Runoff (MOE Methodology) (m^3)	32,157	61,390	89,162	62,852	26,310	1,462	0	0	0	2,923	10,232	20,463	**306,951**
Pervious Area (Forest) *21.00 ha* WHC = 400 mm													
Precipitation (m^3)	16,170	11,130	11,760	15,540	17,640	13,230	17,640	12,390	15,120	12,600	15,330	13,440	**171,990**
Total AET (m^3)	420	630	2,310	7,140	15,750	24,570	28,980	25,620	16,800	8,610	3,360	1,050	**135,240**
Water Surplus (m^3)	3,150	5,460	11,130	7,350	3,150	210	0	0	0	420	1,260	2,730	**34,860**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	1,355	2,348	4,786	3,161	1,355	90	0	0	0	181	542	1,174	**14,990**
Runoff (MOE Methodology) (m^3)	1,796	3,112	6,344	4,190	1,796	120	0	0	0	239	718	1,556	**19,870**
Impervious Area (Ex. Roads, Industrial) *8.40 ha*													
Precipitation (m^3)	6,468	4,452	4,704	6,216	7,056	5,292	7,056	4,956	6,048	5,040	6,132	5,376	**68,796**
Evaporative Lossess at 10% Precipitation (m^3)	647	445	470	622	706	529	706	496	605	504	613	538	**6,880**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	5,821	4,007	4,234	5,594	6,350	4,763	6,350	4,460	5,443	4,536	5,519	4,838	**61,916**
Summary Total **247.56 ha**													
Precipitation (m^3)	190,621	131,207	138,634	183,194	207,950	155,963	207,950	146,060	178,243	148,536	180,719	158,438	**2,027,516**
Total AET (m^3)	4,783	7,175	26,308	81,314	179,370	279,817	323,496	248,143	165,149	93,692	38,266	11,958	**1,459,471**
Evaporative Lossess at 10% Precipitation (m^3)	647	445	470	622	706	529	706	496	605	504	613	538	**6,880**
Infiltration (MOE Methodology) (m^3)	17,193	32,585	48,702	34,117	14,313	810	0	0	0	1,620	5,581	11,253	**166,175**
Runoff (MOE Methodology) (m^3)	39,773	68,509	99,740	72,636	34,456	6,344	6,350	4,460	5,443	7,699	16,469	26,858	**388,738**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *19.30 ha* WHC = 200 mm													
Precipitation (m^3)	14,861	10,229	10,808	14,282	16,212	12,159	16,212	11,387	13,896	11,580	14,089	12,352	**158,067**
Total AET (m^3)	386	579	2,123	6,562	14,475	22,581	26,055	19,686	13,124	7,527	3,088	965	**117,151**
Water Surplus (m^3)	4,246	8,106	11,773	8,299	3,474	193	0	0	0	386	1,351	2,702	**40,530**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	1,401	2,675	3,885	2,739	1,146	64	0	0	0	127	446	892	**13,375**
Runoff (MOE Methodology) (m^3)	2,845	5,431	7,888	5,560	2,328	129	0	0	0	259	905	1,810	**27,155**
Pervious Area (Forest) *2.00 ha* WHC = 400 mm													
Precipitation (m^3)	1,540	1,060	1,120	1,480	1,680	1,260	1,680	1,180	1,440	1,200	1,460	1,280	**16,380**
Total AET (m^3)	40	60	220	680	1,500	2,340	2,760	2,440	1,600	820	320	100	**12,880**
Water Surplus (m^3)	300	520	1,060	700	300	20	0	0	0	40	120	260	**3,320**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	129	224	456	301	129	9	0	0	0	17	52	112	**1,428**
Runoff (MOE Methodology) (m^3)	171	296	604	399	171	11	0	0	0	23	68	148	**1,892**
Impervious Area (Ex. Roads, Industrial) *17.00 ha*													
Precipitation (m^3)	13,090	9,010	9,520	12,580	14,280	10,710	14,280	10,030	12,240	10,200	12,410	10,880	**139,230**
Evaporative Lossess at 10% Precipitation (m^3)	1,309	901	952	1,258	1,428	1,071	1,428	1,003	1,224	1,020	1,241	1,088	**13,923**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	11,781	8,109	8,568	11,322	12,852	9,639	12,852	9,027	11,016	9,180	11,169	9,792	**125,307**
Summary Total **38.30 ha**													
Precipitation (m^3)	29,491	20,299	21,448	28,342	32,172	24,129	32,172	22,597	27,576	22,980	27,959	24,512	**313,677**
Total AET (m^3)	426	639	2,343	7,242	15,975	24,921	28,815	22,126	14,724	8,347	3,408	1,065	**130,031**
Evaporative Lossess at 10% Precipitation (m^3)	1,309	901	952	1,258	1,428	1,071	1,428	1,003	1,224	1,020	1,241	1,088	**13,923**
Infiltration (MOE Methodology) (m^3)	1,530	2,899	4,341	3,040	1,275	72	0	0	0	145	497	1,003	**14,803**
Runoff (MOE Methodology) (m^3)	14,797	13,836	17,060	17,281	15,351	9,780	12,852	9,027	11,016	9,461	12,143	11,751	**154,355**
Water Balance Totals for Subwatershed FM1001 **395.30 ha**													
Precipitation (m^3)	304,381	209,509	221,368	292,522	332,052	249,039	332,052	233,227	284,616	237,180	288,569	252,992	**3,237,507**
Total AET (m^3)	5,930	8,895	32,614	100,808	222,370	346,554	397,766	304,187	204,296	115,946	47,439	14,825	**1,801,628**
Evaporative Lossess at 10% Precipitation (m^3)	7,608	5,237	5,533	7,312	8,300	6,225	8,300	5,830	7,114	5,928	7,213	6,324	**80,923**
Infiltration (MOE Methodology) (m^3)	22,276	41,183	60,584	42,404	17,791	1,008	0	0	0	2,016	7,258	14,792	**209,312**
Runoff (MOE Methodology) (m^3)	112,156	128,195	168,021	148,726	109,463	57,981	74,698	52,467	64,027	57,270	79,056	85,643	**1,137,703**
Potential Stream Base Flows (LPM) - does not account for lag	449	919	1,221	883	359	21	0	0	0	41	151	298	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater s
4. There is minor round-off error within the Environment Canada data

Table WB-4-1001: Post-Development Water Balance (With Mitigation) - Subwatershed FM1001 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*15.02 ha*	WHC = 200 mm												
Precipitation (m^3)		11,565	7,961	8,411	11,115	12,617	9,463	12,617	8,862	10,814	9,012	10,965	9,613	**123,014**
Total AET (m^3)		300	451	1,652	5,107	11,265	17,573	20,277	15,320	10,214	5,858	2,403	751	**91,171**
Water Surplus (m^3)		3,304	6,308	9,162	6,459	2,704	150	0	0	0	300	1,051	2,103	**31,542**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	1,090	2,082	3,024	2,131	892	50	0	0	0	99	347	694	**10,409**
Runoff (MOE Methodology) (m^3)		2,214	4,227	6,139	4,327	1,811	101	0	0	0	201	704	1,409	**21,133**
Pervious Area (Forest)	*0.00 ha*	WHC = 400 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Landscaped)	*5.67 ha*	WHC = 100 mm												
Precipitation (m^3)		4,369	3,007	3,177	4,199	4,766	3,575	4,766	3,348	4,085	3,404	4,142	3,631	**46,470**
Total AET (m^3)		113	170	624	1,929	4,256	6,468	6,014	3,972	3,575	2,099	908	284	**30,413**
Water Surplus (m^3)		2,553	3,404	3,518	2,440	1,021	57	0	0	0	113	851	1,929	**15,887**
Infiltration (MOE Methodology) (m^3)	**i = 0.40**	1,021	1,362	1,407	976	409	23	0	0	0	45	340	772	**6,355**
Runoff (MOE Methodology) (m^3)		1,532	2,043	2,111	1,464	613	34	0	0	0	68	511	1,157	**9,532**
Impervious Area (Ex. Roads, Industrial)	*39.75 ha*													
Precipitation (m^3)		30,604	21,065	22,258	29,412	33,387	25,040	33,387	23,450	28,617	23,848	29,015	25,437	**325,520**
Evaporative Lossess at 10% Precipitation (m^3)		3,060	2,107	2,226	2,941	3,339	2,504	3,339	2,345	2,862	2,385	2,901	2,544	**32,552**
Roof Runoff diverted to Mitigation Measures (m^3)		2,815	1,938	2,047	2,705	3,071	2,303	3,071	2,157	2,632	2,193	2,669	2,340	**29,940**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		24,729	17,021	17,985	23,766	26,977	20,233	26,977	18,948	23,123	19,269	23,444	20,554	**263,028**
Mitigations Measures	*4.06 ha*	<-- Roof Area Required of the impervious area shown above to be directed to swales												
Infiltration Swales (length)	1,620 (m)													
Infiltration Flat Bottomed-Swales (length)	- (m)													
Available Volume of Roof Water directed to mitigation (m^3)		2,815	1,938	2,047	2,705	3,071	2,303	3,071	2,157	2,632	2,193	2,669	2,340	**29,940**
Subsurface Gravel Wetland (SGW) Area	- (m^2)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration Swales connected to SGW	- (m)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (m^3) daily capacity -->	69 m^3/d	2,145	1,938	2,047	2,076	2,145	2,076	2,145	2,145	2,076	2,145	2,076	2,145	**25,159**
Runoff (m^3)		670	0	0	629	926	227	926	12	556	48	593	195	**4,781**
Summary Total	**60.44 ha**													
Precipitation (m^3)		46,539	32,033	33,846	44,726	50,770	38,077	50,770	35,660	43,517	36,264	44,121	38,682	**495,004**
Total AET (m^3)		414	621	2,276	7,036	15,521	24,042	26,291	19,292	13,788	7,957	3,311	1,035	**121,584**
Evaporative Lossess at 10% Precipitation (m^3)		3,060	2,107	2,226	2,941	3,339	2,504	3,339	2,345	2,862	2,385	2,901	2,544	**32,552**
Infiltration (MOE Methodology) (m^3)		4,257	5,381	6,478	5,183	3,446	2,148	2,145	2,145	2,076	2,290	2,763	3,611	**41,923**
Runoff (MOE Methodology) (m^3)		29,145	23,291	26,234	30,186	30,327	20,595	27,903	18,960	23,679	19,587	25,252	23,315	**298,474**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*5.49 ha*	WHC = 200 mm												
Precipitation (m^3)		4,227	2,910	3,074	4,063	4,612	3,459	4,612	3,239	3,953	3,294	4,008	3,514	**44,963**
Total AET (m^3)		110	165	604	1,867	4,118	6,423	7,412	5,600	3,733	2,141	878	275	**33,324**
Water Surplus (m^3)		1,208	2,306	3,349	2,361	988	55	0	0	0	110	384	769	**11,529**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	399	761	1,105	779	326	18	0	0	0	36	127	254	**3,805**
Runoff (MOE Methodology) (m^3)		809	1,545	2,244	1,582	662	37	0	0	0	74	257	515	**7,724**
Pervious Area (Forest)	*4.10 ha*	WHC = 400 mm												
Precipitation (m^3)		3,157	2,173	2,296	3,034	3,444	2,583	3,444	2,419	2,952	2,460	2,993	2,624	**33,579**
Total AET (m^3)		82	123	451	1,394	3,075	4,797	5,658	5,002	3,280	1,681	656	205	**26,404**
Water Surplus (m^3)		615	1,066	2,173	1,435	615	41	0	0	0	82	246	533	**6,806**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	264	458	934	617	264	18	0	0	0	35	106	229	**2,927**
Runoff (MOE Methodology) (m^3)		351	608	1,239	818	351	23	0	0	0	47	140	304	**3,879**
Pervious Area (Landscaped)	*5.75 ha*	WHC = 100 mm												
Precipitation (m^3)		4,427	3,047	3,219	4,254	4,829	3,622	4,829	3,392	4,139	3,449	4,197	3,679	**47,083**
Total AET (m^3)		115	172	632	1,955	4,312	6,554	6,094	4,024	3,622	2,127	920	287	**30,814**
Water Surplus (m^3)		2,587	3,449	3,564	2,472	1,035	57	0	0	0	115	862	1,955	**16,097**
Infiltration (MOE Methodology) (m^3)	**i = 0.40**	1,035	1,380	1,426	989	414	23	0	0	0	46	345	782	**6,439**
Runoff (MOE Methodology) (m^3)		1,552	2,070	2,139	1,483	621	34	0	0	0	69	517	1,173	**9,658**
Impervious Area (Ex. Roads, Industrial)	*33.66 ha*													
Precipitation (m^3)		25,919	17,840	18,850	24,909	28,275	21,207	28,275	19,860	24,236	20,197	24,573	21,543	**275,685**
Evaporative Lossess at 10% Precipitation (m^3)		2,592	1,784	1,885	2,491	2,828	2,121	2,828	1,986	2,424	2,020	2,457	2,154	**27,569**
Roof Runoff diverted to Mitigation Measures (m^3)		1,750	1,204	1,272	1,681	1,909	1,432	1,909	1,341	1,636	1,363	1,659	1,454	**18,610**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		21,578	14,852	15,693	20,737	23,539	17,654	23,539	16,533	20,176	16,814	20,457	17,935	**229,507**
Mitigations Measures	*2.52 ha*	<-- Roof Area Required of the impervious area shown above												
Infiltration Swales (length)	1,190 m													
Infiltration Bio-Swales (length)	- m													
Available Volume of Water directed to mitigation (m^3)		1,750	1,204	1,272	1,681	1,909	1,432	1,909	1,341	1,636	1,363	1,659	1,454	**18,610**
Infiltration (m^3) daily capacity -->	43 m^3/d	1,333	1,204	1,272	1,290	1,333	1,290	1,333	1,333	1,290	1,333	1,290	1,333	**15,638**
Runoff (m^3)		416	0	0	391	575	141	575	7	346	30	368	121	**2,972**
Summary Total	**49.00 ha**													
Precipitation (m^3)		37,730	25,970	27,440	36,260	41,160	30,870	41,160	28,910	35,280	29,400	35,770	31,360	**401,310**
Total AET (m^3)		307	460	1,687	5,215	11,504	17,774	19,163	14,626	10,635	5,949	2,454	767	**90,542**
Evaporative Lossess at 10% Precipitation (m^3)		2,592	1,784	1,885	2,491	2,828	2,121	2,828	1,986	2,424	2,020	2,457	2,154	**27,569**
Infiltration (MOE Methodology) (m^3)		3,031	3,803	4,738	3,675	2,338	1,349	1,333	1,333	1,290	1,451	1,868	2,598	**28,808**
Runoff (MOE Methodology) (m^3)		24,706	19,074	21,314	25,011	25,748	17,890	24,115	16,541	20,522	17,033	21,740	20,047	**253,741**

Table WB-4-1001: Post-Development Water Balance (With Mitigation) - Subwatershed FM1001 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *218.16 ha* WHC = 200 mm													
Precipitation (m^3)	167,983	115,625	122,170	161,438	183,254	137,441	183,254	128,714	157,075	130,896	159,257	139,622	**1,786,730**
Total AET (m^3)	4,363	6,545	23,998	74,174	163,620	255,247	294,516	222,523	148,349	85,082	34,906	10,908	**1,324,231**
Water Surplus (m^3)	47,995	91,627	133,078	93,809	39,269	2,182	0	0	0	4,363	15,271	30,542	**458,136**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	15,838	30,237	43,916	30,957	12,959	720	0	0	0	1,440	5,039	10,079	**151,185**
Runoff (MOE Methodology) (m^3)	32,157	61,390	89,162	62,852	26,310	1,462	0	0	0	2,923	10,232	20,463	**306,951**
Pervious Area (Forest) *21.00 ha* WHC = 400 mm													
Precipitation (m^3)	16,170	11,130	11,760	15,540	17,640	13,230	17,640	12,390	15,120	12,600	15,330	13,440	**171,990**
Total AET (m^3)	420	630	2,310	7,140	15,750	24,570	28,980	25,620	16,800	8,610	3,360	1,050	**135,240**
Water Surplus (m^3)	3,150	5,460	11,130	7,350	3,150	210	0	0	0	420	1,260	2,730	**34,860**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	1,355	2,348	4,786	3,161	1,355	90	0	0	0	181	542	1,174	**14,990**
Runoff (MOE Methodology) (m^3)	1,796	3,112	6,344	4,190	1,796	120	0	0	0	239	718	1,556	**19,870**
Impervious Area (Ex. Roads, Industrial) *8.40 ha*													
Precipitation (m^3)	6,468	4,452	4,704	6,216	7,056	5,292	7,056	4,956	6,048	5,040	6,132	5,376	**68,796**
Evaporative Lossess at 10% Precipitation (m^3)	647	445	470	622	706	529	706	496	605	504	613	538	**6,880**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	5,821	4,007	4,234	5,594	6,350	4,763	6,350	4,460	5,443	4,536	5,519	4,838	**61,916**
Summary Total **247.56 ha**													
Precipitation (m^3)	190,621	131,207	138,634	183,194	207,950	155,963	207,950	146,060	178,243	148,536	180,719	158,438	**2,027,516**
Total AET (m^3)	4,783	7,175	26,308	81,314	179,370	279,817	323,496	248,143	165,149	93,692	38,266	11,958	**1,459,471**
Evaporative Lossess at 10% Precipitation (m^3)	647	445	470	622	706	529	706	496	605	504	613	538	**6,880**
Infiltration (MOE Methodology) (m^3)	17,193	32,585	48,702	34,117	14,313	810	0	0	0	1,620	5,581	11,253	**166,175**
Runoff (MOE Methodology) (m^3)	39,773	68,509	99,740	72,636	34,456	6,344	6,350	4,460	5,443	7,699	16,469	26,858	**388,738**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *19.30 ha* WHC = 200 mm													
Precipitation (m^3)	14,861	10,229	10,808	14,282	16,212	12,159	16,212	11,387	13,896	11,580	14,089	12,352	**158,067**
Total AET (m^3)	386	579	2,123	6,562	14,475	22,581	26,055	19,686	13,124	7,527	3,088	965	**117,151**
Water Surplus (m^3)	4,246	8,106	11,773	8,299	3,474	193	0	0	0	386	1,351	2,702	**40,530**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	1,401	2,675	3,885	2,739	1,146	64	0	0	0	127	446	892	**13,375**
Runoff (MOE Methodology) (m^3)	2,845	5,431	7,888	5,560	2,328	129	0	0	0	259	905	1,810	**27,155**
Pervious Area (Forest) *2.00 ha* WHC = 400 mm													
Precipitation (m^3)	1,540	1,060	1,120	1,480	1,680	1,260	1,680	1,180	1,440	1,200	1,460	1,280	**16,380**
Total AET (m^3)	40	60	220	680	1,500	2,340	2,760	2,440	1,600	820	320	100	**12,880**
Water Surplus (m^3)	300	520	1,060	700	300	20	0	0	0	40	120	260	**3,320**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	129	224	456	301	129	9	0	0	0	17	52	112	**1,428**
Runoff (MOE Methodology) (m^3)	171	296	604	399	171	11	0	0	0	23	68	148	**1,892**
Impervious Area (Ex. Roads, Industrial) *17.00 ha*													
Precipitation (m^3)	13,090	9,010	9,520	12,580	14,280	10,710	14,280	10,030	12,240	10,200	12,410	10,880	**139,230**
Evaporative Lossess at 10% Precipitation (m^3)	1,309	901	952	1,258	1,428	1,071	1,428	1,003	1,224	1,020	1,241	1,088	**13,923**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	11,781	8,109	8,568	11,322	12,852	9,639	12,852	9,027	11,016	9,180	11,169	9,792	**125,307**
Summary Total **38.30 ha**													
Precipitation (m^3)	29,491	20,299	21,448	28,342	32,172	24,129	32,172	22,597	27,576	22,980	27,959	24,512	**313,677**
Total AET (m^3)	426	639	2,343	7,242	15,975	24,921	28,815	22,126	14,724	8,347	3,408	1,065	**130,031**
Evaporative Lossess at 10% Precipitation (m^3)	1,309	901	952	1,258	1,428	1,071	1,428	1,003	1,224	1,020	1,241	1,088	**13,923**
Infiltration (MOE Methodology) (m^3)	1,530	2,899	4,341	3,040	1,275	72	0	0	0	145	497	1,003	**14,803**
Runoff (MOE Methodology) (m^3)	14,797	13,836	17,060	17,281	15,351	9,780	12,852	9,027	11,016	9,461	12,143	11,751	**154,355**
Water Balance Totals for Subwatershed FM1001 **395.30 ha**													
Precipitation (m^3)	304,381	209,509	221,368	292,522	332,052	249,039	332,052	233,227	284,616	237,180	288,569	252,992	**3,237,507**
Total AET (m^3)	5,930	8,895	32,614	100,808	222,370	346,554	397,766	304,187	204,296	115,946	47,439	14,825	**1,801,628**
Evaporative Lossess at 10% Precipitation (m^3)	7,608	5,237	5,533	7,312	8,300	6,225	8,300	5,830	7,114	5,928	7,213	6,324	**80,923**
Infiltration (MOE Methodology) (m^3)	26,011	44,668	64,258	46,015	21,372	4,380	3,478	3,478	3,366	5,505	10,710	18,465	**251,708**
Runoff (MOE Methodology) (m^3)	108,421	124,710	164,348	145,114	105,882	54,609	71,220	48,988	60,661	53,780	75,604	81,970	**1,095,307**
Potential Stream Base Flows (LPM) - does not account for lag	524	997	1,296	959	431	91	70	70	70	111	223	372	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this case water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used.
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is described in the text and presented on Table 4.6 of the main report.
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater syst
4. There is minor round-off error within the Environment Canada data.

Table WB-2-1109: Pre-Development Water Balance - Subwatershed FM1109 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*9.15 ha*	WHC = 200 mm												
Precipitation (m^3)		7,046	4,850	5,124	6,771	7,686	5,765	7,686	5,399	6,588	5,490	6,680	5,856	**74,939**
Total AET (m^3)		183	275	1,007	3,111	6,863	10,706	12,353	9,333	6,222	3,569	1,464	458	**55,541**
Water Surplus (m^3)		2,013	3,843	5,582	3,935	1,647	92	0	0	0	183	641	1,281	**19,215**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	664	1,268	1,842	1,298	544	30	0	0	0	60	211	423	**6,341**
Runoff (MOE Methodology) (m^3)		1,349	2,575	3,740	2,636	1,103	61	0	0	0	123	429	858	**12,874**
Pervious Area (Forest)	*0.80 ha*	WHC = 400 mm												
Precipitation (m^3)		616	424	448	592	672	504	672	472	576	480	584	512	**6,552**
Total AET (m^3)		16	24	88	272	600	936	1,104	976	640	328	128	40	**5,152**
Water Surplus (m^3)		120	208	424	280	120	8	0	0	0	16	48	104	**1,328**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	52	89	182	120	52	3	0	0	0	7	21	45	**571**
Runoff (MOE Methodology) (m^3)		68	119	242	160	68	5	0	0	0	9	27	59	**757**
Impervious Area (Ex. Roads, Industrial)	*0.00 ha*													
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total	**9.95 ha**													
Precipitation (m^3)		7,662	5,274	5,572	7,363	8,358	6,269	8,358	5,871	7,164	5,970	7,264	6,368	**81,491**
Total AET (m^3)		199	299	1,095	3,383	7,463	11,642	13,457	10,309	6,862	3,897	1,592	498	**60,693**
Evaporative Lossess at 10% Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		716	1,358	2,024	1,419	595	34	0	0	0	67	232	467	**6,912**
Runoff (MOE Methodology) (m^3)		1,417	2,693	3,981	2,796	1,172	66	0	0	0	132	456	918	**13,631**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*78.02 ha*	WHC = 200 mm												
Precipitation (m^3)		60,075	41,351	43,691	57,735	65,537	49,153	65,537	46,032	56,174	46,812	56,955	49,933	**638,984**
Total AET (m^3)		1,560	2,341	8,582	26,527	58,515	91,283	105,327	79,580	53,054	30,428	12,483	3,901	**473,581**
Water Surplus (m^3)		17,164	32,768	47,592	33,549	14,044	780	0	0	0	1,560	5,461	10,923	**163,842**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	5,664	10,814	15,705	11,071	4,634	257	0	0	0	515	1,802	3,605	**54,068**
Runoff (MOE Methodology) (m^3)		11,500	21,955	31,887	22,478	9,409	523	0	0	0	1,045	3,659	7,318	**109,774**
Pervious Area (Forest)	*16.00 ha*	WHC = 400 mm												
Precipitation (m^3)		12,320	8,480	8,960	11,840	13,440	10,080	13,440	9,440	11,520	9,600	11,680	10,240	**131,040**
Total AET (m^3)		320	480	1,760	5,440	12,000	18,720	22,080	19,520	12,800	6,560	2,560	800	**103,040**
Water Surplus (m^3)		2,400	4,160	8,480	5,600	2,400	160	0	0	0	320	960	2,080	**26,560**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	1,032	1,789	3,646	2,408	1,032	69	0	0	0	138	413	894	**11,421**
Runoff (MOE Methodology) (m^3)		1,368	2,371	4,834	3,192	1,368	91	0	0	0	182	547	1,186	**15,139**
Impervious Area (Ex. Roads, Industrial)	*4.80 ha*													
Precipitation (m^3)		3,696	2,544	2,688	3,552	4,032	3,024	4,032	2,832	3,456	2,880	3,504	3,072	**39,312**
Evaporative Lossess at 10% Precipitation (m^3)		370	254	269	355	403	302	403	283	346	288	350	307	**3,931**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		3,326	2,290	2,419	3,197	3,629	2,722	3,629	2,549	3,110	2,592	3,154	2,765	**35,381**
Summary Total	**98.82 ha**													
Precipitation (m^3)		76,091	52,375	55,339	73,127	83,009	62,257	83,009	58,304	71,150	59,292	72,139	63,245	**809,336**
Total AET (m^3)		1,880	2,821	10,342	31,967	70,515	110,003	127,407	99,100	65,854	36,988	15,043	4,701	**576,621**
Evaporative Lossess at 10% Precipitation (m^3)		370	254	269	355	403	302	403	283	346	288	350	307	**3,931**
Infiltration (MOE Methodology) (m^3)		6,696	12,602	19,352	13,479	5,666	326	0	0	0	653	2,215	4,499	**65,489**
Runoff (MOE Methodology) (m^3)		16,195	26,616	39,140	28,866	14,406	3,336	3,629	2,549	3,110	3,820	7,360	11,269	**160,294**

Table WB-2-1109: Pre-Development Water Balance - Subwatershed FM1109 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *183.33 ha* WHC = 200 mm													
Precipitation (m^3)	141,164	97,165	102,665	135,664	153,997	115,498	153,997	108,165	131,998	109,998	133,831	117,331	**1,501,473**
Total AET (m^3)	3,667	5,500	20,166	62,332	137,498	214,496	247,496	186,997	124,664	71,499	29,333	9,167	**1,112,813**
Water Surplus (m^3)	40,333	76,999	111,831	78,832	32,999	1,833	0	0	0	3,667	12,833	25,666	**384,993**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	13,310	25,410	36,904	26,015	10,890	605	0	0	0	1,210	4,235	8,470	**127,048**
Runoff (MOE Methodology) (m^3)	27,023	51,589	74,927	52,817	22,110	1,228	0	0	0	2,457	8,598	17,196	**257,945**
Pervious Area (Forest) *66.40 ha* WHC = 400 mm													
Precipitation (m^3)	51,128	35,192	37,184	49,136	55,776	41,832	55,776	39,176	47,808	39,840	48,472	42,496	**543,816**
Total AET (m^3)	1,328	1,992	7,304	22,576	49,800	77,688	91,632	81,008	53,120	27,224	10,624	3,320	**427,616**
Water Surplus (m^3)	9,960	17,264	35,192	23,240	9,960	664	0	0	0	1,328	3,984	8,632	**110,224**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	4,283	7,424	15,133	9,993	4,283	286	0	0	0	571	1,713	3,712	**47,396**
Runoff (MOE Methodology) (m^3)	5,677	9,840	20,059	13,247	5,677	378	0	0	0	757	2,271	4,920	**62,828**
Impervious Area (Ex. Roads, Industrial) *6.50 ha*													
Precipitation (m^3)	5,005	3,445	3,640	4,810	5,460	4,095	5,460	3,835	4,680	3,900	4,745	4,160	**53,235**
Evaporative Lossess at 10% Precipitation (m^3)	501	345	364	481	546	410	546	384	468	390	475	416	**5,324**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	4,505	3,101	3,276	4,329	4,914	3,686	4,914	3,452	4,212	3,510	4,271	3,744	**47,912**
Summary Total **256.23 ha**													
Precipitation (m^3)	197,297	135,802	143,489	189,610	215,233	161,425	215,233	151,176	184,486	153,738	187,048	163,987	**2,098,524**
Total AET (m^3)	4,995	7,492	27,470	84,908	187,298	292,184	339,128	268,005	177,784	98,723	39,957	12,487	**1,540,429**
Evaporative Lossess at 10% Precipitation (m^3)	501	345	364	481	546	410	546	384	468	390	475	416	**5,324**
Infiltration (MOE Methodology) (m^3)	17,593	32,833	52,037	36,008	15,173	891	0	0	0	1,781	5,948	12,182	**174,444**
Runoff (MOE Methodology) (m^3)	37,205	64,530	98,262	70,393	32,701	5,292	4,914	3,452	4,212	6,724	15,140	25,861	**368,684**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **0.00 ha**													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance Totals for Subwatershed FM1109 **365.00 ha**													
Precipitation (m^3)	281,050	193,450	204,400	270,100	306,600	229,950	306,600	215,350	262,800	219,000	266,450	233,600	**2,989,350**
Total AET (m^3)	7,074	10,611	38,907	120,258	265,275	413,829	479,991	377,414	250,500	139,607	56,592	17,685	**2,177,743**
Evaporative Lossess at 10% Precipitation (m^3)	870	599	633	836	949	712	949	667	814	678	825	723	**9,255**
Infiltration (MOE Methodology) (m^3)	25,005	46,793	73,413	50,906	21,434	1,250	0	0	0	2,501	8,395	17,148	**246,845**
Runoff (MOE Methodology) (m^3)	54,816	93,839	141,383	102,055	48,279	8,694	8,543	6,000	7,322	10,675	22,956	38,047	**542,610**
Potential Stream Base Flows (LPM) - does not account for lag	504	1,044	1,480	1,061	432	26	0	0	0	50	175	346	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater s
4. There is minor round-off error within the Environment Canada data

Table WB-3-1109: Post-Development Water Balance (No Mitigation) - Subwatershed FM1109 (Volumetric Calculations based on Pervious Area)
Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*2.63 ha*	WHC = 200 mm												
Precipitation (m^3)		2,025	1,394	1,473	1,946	2,209	1,657	2,209	1,552	1,894	1,578	1,920	1,683	**21,540**
Total AET (m^3)		53	79	289	894	1,973	3,077	3,551	2,683	1,788	1,026	421	132	**15,964**
Water Surplus (m^3)		579	1,105	1,604	1,131	473	26	0	0	0	53	184	368	**5,523**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	191	365	529	373	156	9	0	0	0	17	61	122	**1,823**
Runoff (MOE Methodology) (m^3)		388	740	1,075	758	317	18	0	0	0	35	123	247	**3,700**
Pervious Area (Forest)	*0.50 ha*	WHC = 400 mm												
Precipitation (m^3)		385	265	280	370	420	315	420	295	360	300	365	320	**4,095**
Total AET (m^3)		10	15	55	170	375	585	690	610	400	205	80	25	**3,220**
Water Surplus (m^3)		75	130	265	175	75	5	0	0	0	10	30	65	**830**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	32	56	114	75	32	2	0	0	0	4	13	28	**357**
Runoff (MOE Methodology) (m^3)		43	74	151	100	43	3	0	0	0	6	17	37	**473**
Pervious Area (Landscaped)	*1.07 ha*	WHC = 100 mm												
Precipitation (m^3)		824	567	599	792	899	674	899	631	770	642	781	685	**8,763**
Total AET (m^3)		21	32	118	364	802	1,220	1,134	749	674	396	171	54	**5,735**
Water Surplus (m^3)		482	642	663	460	193	11	0	0	0	21	161	364	**2,996**
Infiltration (MOE Methodology) (m^3)	**i = 0.35**	169	225	232	161	67	4	0	0	0	7	56	127	**1,049**
Runoff (MOE Methodology) (m^3)		313	417	431	299	125	7	0	0	0	14	104	236	**1,947**
Impervious Area (Ex. Roads, Industrial)	*5.75 ha*													
Precipitation (m^3)		4,428	3,048	3,220	4,255	4,830	3,623	4,830	3,393	4,140	3,450	4,198	3,680	**47,093**
Evaporative Lossess at 10% Precipitation (m^3)		443	305	322	426	483	362	483	339	414	345	420	368	**4,709**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		3,985	2,743	2,898	3,830	4,347	3,260	4,347	3,053	3,726	3,105	3,778	3,312	**42,383**
Summary Total	**9.95 ha**													
Precipitation (m^3)		7,662	5,274	5,572	7,363	8,358	6,269	8,358	5,871	7,164	5,970	7,264	6,368	**81,491**
Total AET (m^3)		84	126	462	1,428	3,150	4,882	5,375	4,042	2,863	1,627	672	210	**24,919**
Evaporative Lossess at 10% Precipitation (m^3)		443	305	322	426	483	362	483	339	414	345	420	368	**4,709**
Infiltration (MOE Methodology) (m^3)		392	645	876	609	256	15	0	0	0	29	130	277	**3,228**
Runoff (MOE Methodology) (m^3)		4,728	3,974	4,555	4,986	4,832	3,288	4,347	3,053	3,726	3,160	4,023	3,832	**48,504**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*26.40 ha*	WHC = 200 mm												
Precipitation (m^3)		20,328	13,992	14,784	19,536	22,176	16,632	22,176	15,576	19,008	15,840	19,272	16,896	**216,216**
Total AET (m^3)		528	792	2,904	8,976	19,800	30,888	35,640	26,928	17,952	10,296	4,224	1,320	**160,248**
Water Surplus (m^3)		5,808	11,088	16,104	11,352	4,752	264	0	0	0	528	1,848	3,696	**55,440**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	1,917	3,659	5,314	3,746	1,568	87	0	0	0	174	610	1,220	**18,295**
Runoff (MOE Methodology) (m^3)		3,891	7,429	10,790	7,606	3,184	177	0	0	0	354	1,238	2,476	**37,145**
Pervious Area (Forest)	*16.00 ha*	WHC = 400 mm												
Precipitation (m^3)		12,320	8,480	8,960	11,840	13,440	10,080	13,440	9,440	11,520	9,600	11,680	10,240	**131,040**
Total AET (m^3)		320	480	1,760	5,440	12,000	18,720	22,080	19,520	12,800	6,560	2,560	800	**103,040**
Water Surplus (m^3)		2,400	4,160	8,480	5,600	2,400	160	0	0	0	320	960	2,080	**26,560**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	1,032	1,789	3,646	2,408	1,032	69	0	0	0	138	413	894	**11,421**
Runoff (MOE Methodology) (m^3)		1,368	2,371	4,834	3,192	1,368	91	0	0	0	182	547	1,186	**15,139**
Pervious Area (Landscaped)	*7.43 ha*	WHC = 100 mm												
Precipitation (m^3)		5,723	3,939	4,162	5,500	6,243	4,682	6,243	4,385	5,351	4,459	5,425	4,756	**60,868**
Total AET (m^3)		149	223	818	2,527	5,574	8,472	7,878	5,202	4,682	2,750	1,189	372	**39,836**
Water Surplus (m^3)		3,344	4,459	4,608	3,196	1,338	74	0	0	0	149	1,115	2,527	**20,810**
Infiltration (MOE Methodology) (m^3)	**i = 0.35**	1,171	1,561	1,613	1,119	468	26	0	0	0	52	390	884	**7,283**
Runoff (MOE Methodology) (m^3)		2,174	2,898	2,995	2,077	870	48	0	0	0	97	725	1,642	**13,526**
Impervious Area (Ex. Roads, Industrial)	*48.99 ha*													
Precipitation (m^3)		37,721	25,964	27,433	36,251	41,150	30,862	41,150	28,903	35,271	29,393	35,761	31,352	**401,212**
Evaporative Lossess at 10% Precipitation (m^3)		3,772	2,596	2,743	3,625	4,115	3,086	4,115	2,890	3,527	2,939	3,576	3,135	**40,121**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		33,949	23,367	24,690	32,626	37,035	27,776	37,035	26,013	31,744	26,454	32,185	28,217	**361,091**
Summary Total	**98.82 ha**													
Precipitation (m^3)		76,091	52,375	55,339	73,127	83,009	62,257	83,009	58,304	71,150	59,292	72,139	63,245	**809,336**
Total AET (m^3)		997	1,495	5,482	16,943	37,374	58,080	65,598	51,650	35,434	19,606	7,973	2,492	**303,124**
Evaporative Lossess at 10% Precipitation (m^3)		3,772	2,596	2,743	3,625	4,115	3,086	4,115	2,890	3,527	2,939	3,576	3,135	**40,121**
Infiltration (MOE Methodology) (m^3)		4,119	7,009	10,573	7,273	3,068	182	0	0	0	364	1,413	2,998	**36,999**
Runoff (MOE Methodology) (m^3)		41,382	36,066	43,308	45,501	42,456	28,093	37,035	26,013	31,744	27,086	34,695	33,521	**426,901**

Table WB-3-1109: Post-Development Water Balance (No Mitigation) - Subwatershed FM1109 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *183.33 ha* WHC = 200 mm													
Precipitation (m^3)	141,164	97,165	102,665	135,664	153,997	115,498	153,997	108,165	131,998	109,998	133,831	117,331	**1,501,473**
Total AET (m^3)	3,667	5,500	20,166	62,332	137,498	214,496	247,496	186,997	124,664	71,499	29,333	9,167	**1,112,813**
Water Surplus (m^3)	40,333	76,999	111,831	78,832	32,999	1,833	0	0	0	3,667	12,833	25,666	**384,993**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	13,310	25,410	36,904	26,015	10,890	605	0	0	0	1,210	4,235	8,470	**127,048**
Runoff (MOE Methodology) (m^3)	27,023	51,589	74,927	52,817	22,110	1,228	0	0	0	2,457	8,598	17,196	**257,945**
Pervious Area (Forest) *66.40 ha* WHC = 400 mm													
Precipitation (m^3)	51,128	35,192	37,184	49,136	55,776	41,832	55,776	39,176	47,808	39,840	48,472	42,496	**543,816**
Total AET (m^3)	1,328	1,992	7,304	22,576	49,800	77,688	91,632	81,008	53,120	27,224	10,624	3,320	**427,616**
Water Surplus (m^3)	9,960	17,264	35,192	23,240	9,960	664	0	0	0	1,328	3,984	8,632	**110,224**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	4,283	7,424	15,133	9,993	4,283	286	0	0	0	571	1,713	3,712	**47,396**
Runoff (MOE Methodology) (m^3)	5,677	9,840	20,059	13,247	5,677	378	0	0	0	757	2,271	4,920	**62,828**
Impervious Area (Ex. Roads, Industrial) *6.50 ha*													
Precipitation (m^3)	5,005	3,445	3,640	4,810	5,460	4,095	5,460	3,835	4,680	3,900	4,745	4,160	**53,235**
Evaporative Lossess at 10% Precipitation (m^3)	501	345	364	481	546	410	546	384	468	390	475	416	**5,324**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	4,505	3,101	3,276	4,329	4,914	3,686	4,914	3,452	4,212	3,510	4,271	3,744	**47,912**
Summary Total 256.23 ha													
Precipitation (m^3)	197,297	135,802	143,489	189,610	215,233	161,425	215,233	151,176	184,486	153,738	187,048	163,987	**2,098,524**
Total AET (m^3)	4,995	7,492	27,470	84,908	187,298	292,184	339,128	268,005	177,784	98,723	39,957	12,487	**1,540,429**
Evaporative Lossess at 10% Precipitation (m^3)	501	345	364	481	546	410	546	384	468	390	475	416	**5,324**
Infiltration (MOE Methodology) (m^3)	17,593	32,833	52,037	36,008	15,173	891	0	0	0	1,781	5,948	12,182	**174,444**
Runoff (MOE Methodology) (m^3)	37,205	64,530	98,262	70,393	32,701	5,292	4,914	3,452	4,212	6,724	15,140	25,861	**368,684**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total 0.00 ha													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance Totals for Subwatershed FM1109 **365.00 ha**													
Precipitation (m^3)	281,050	193,450	204,400	270,100	306,600	229,950	306,600	215,350	262,800	219,000	266,450	233,600	**2,989,350**
Total AET (m^3)	6,075	9,113	33,414	103,279	227,822	355,146	410,100	323,697	216,081	119,955	48,602	15,188	**1,868,472**
Evaporative Lossess at 10% Precipitation (m^3)	4,715	3,246	3,429	4,532	5,144	3,858	5,144	3,613	4,409	3,674	4,470	3,919	**50,154**
Infiltration (MOE Methodology) (m^3)	22,103	40,487	63,486	43,890	18,497	1,087	0	0	0	2,174	7,491	15,457	**214,671**
Runoff (MOE Methodology) (m^3)	83,315	104,570	146,126	120,880	79,989	36,673	46,296	32,517	39,682	36,970	53,857	63,214	**844,089**
Potential Stream Base Flows (LPM) - does not account for lag	446	904	1,280	914	373	23	0	0	0	44	156	312	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater s
4. There is minor round-off error within the Environment Canada data

Table WB-4-1109: Post-Development Water Balance (With Mitigation) - Subwatershed FM1109 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*2.63 ha*	WHC = 200 mm												
Precipitation (m^3)		2,025	1,394	1,473	1,946	2,209	1,657	2,209	1,552	1,894	1,578	1,920	1,683	**21,540**
Total AET (m^3)		53	79	289	894	1,973	3,077	3,551	2,683	1,788	1,026	421	132	**15,964**
Water Surplus (m^3)		579	1,105	1,604	1,131	473	26	0	0	0	53	184	368	**5,523**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	191	365	529	373	156	9	0	0	0	17	61	122	**1,823**
Runoff (MOE Methodology) (m^3)		388	740	1,075	758	317	18	0	0	0	35	123	247	**3,700**
Pervious Area (Forest)	*0.50 ha*	WHC = 400 mm												
Precipitation (m^3)		385	265	280	370	420	315	420	295	360	300	365	320	**4,095**
Total AET (m^3)		10	15	55	170	375	585	690	610	400	205	80	25	**3,220**
Water Surplus (m^3)		75	130	265	175	75	5	0	0	0	10	30	65	**830**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	32	56	114	75	32	2	0	0	0	4	13	28	**357**
Runoff (MOE Methodology) (m^3)		43	74	151	100	43	3	0	0	0	6	17	37	**473**
Pervious Area (Landscaped)	*1.07 ha*	WHC = 100 mm												
Precipitation (m^3)		824	567	599	792	899	674	899	631	770	642	781	685	**8,763**
Total AET (m^3)		21	32	118	364	802	1,220	1,134	749	674	396	171	54	**5,735**
Water Surplus (m^3)		482	642	663	460	193	11	0	0	0	21	161	364	**2,996**
Infiltration (MOE Methodology) (m^3)	**i = 0.40**	193	257	265	184	77	4	0	0	0	9	64	146	**1,198**
Runoff (MOE Methodology) (m^3)		289	385	398	276	116	6	0	0	0	13	96	218	**1,798**
Impervious Area (Ex. Roads, Industrial)	*5.75 ha*													
Precipitation (m^3)		4,428	3,048	3,220	4,255	4,830	3,623	4,830	3,393	4,140	3,450	4,198	3,680	**47,093**
Evaporative Lossess at 10% Precipitation (m^3)		443	305	322	426	483	362	483	339	414	345	420	368	**4,709**
Roof Runoff diverted to Mitigation Measures (m^3)		742	511	540	714	810	607	810	569	694	579	704	617	**7,897**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		3,242	2,232	2,358	3,116	3,537	2,653	3,537	2,484	3,032	2,526	3,074	2,695	**34,486**
Mitigations Measures	*1.07 ha*	<-- Roof Area Required of the impervious area shown above to be directed to swales												
Infiltration Swales (length)	505 (m)													
Infiltration Flat Bottomed-Swales (length)	- (m)													
Available Volume of Roof Water directed to mitigation (m^3)		742	511	540	714	810	607	810	569	694	579	704	617	**7,897**
Subsurface Gravel Wetland (SGW) Area	- (m^2)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration Swales connected to SGW	- (m)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (m^3) daily capacity -->	18 m^3/d	566	511	540	548	566	548	566	566	548	566	548	566	**6,636**
Runoff (m^3)		177	0	0	166	244	60	244	3	147	13	156	51	**1,261**
Summary Total	**9.95 ha**													
Precipitation (m^3)		7,662	5,274	5,572	7,363	8,358	6,269	8,358	5,871	7,164	5,970	7,264	6,368	**81,491**
Total AET (m^3)		84	126	462	1,428	3,150	4,882	5,375	4,042	2,863	1,627	672	210	**24,919**
Evaporative Lossess at 10% Precipitation (m^3)		443	305	322	426	483	362	483	339	414	345	420	368	**4,709**
Infiltration (MOE Methodology) (m^3)		982	1,188	1,449	1,180	831	563	566	566	548	596	685	861	**10,014**
Runoff (MOE Methodology) (m^3)		4,138	3,431	3,982	4,415	4,257	2,740	3,781	2,487	3,178	2,593	3,467	3,248	**41,718**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*26.40 ha*	WHC = 200 mm												
Precipitation (m^3)		20,328	13,992	14,784	19,536	22,176	16,632	22,176	15,576	19,008	15,840	19,272	16,896	**216,216**
Total AET (m^3)		528	792	2,904	8,976	19,800	30,888	35,640	26,928	17,952	10,296	4,224	1,320	**160,248**
Water Surplus (m^3)		5,808	11,088	16,104	11,352	4,752	264	0	0	0	528	1,848	3,696	**55,440**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	1,917	3,659	5,314	3,746	1,568	87	0	0	0	174	610	1,220	**18,295**
Runoff (MOE Methodology) (m^3)		3,891	7,429	10,790	7,606	3,184	177	0	0	0	354	1,238	2,476	**37,145**
Pervious Area (Forest)	*16.00 ha*	WHC = 400 mm												
Precipitation (m^3)		12,320	8,480	8,960	11,840	13,440	10,080	13,440	9,440	11,520	9,600	11,680	10,240	**131,040**
Total AET (m^3)		320	480	1,760	5,440	12,000	18,720	22,080	19,520	12,800	6,560	2,560	800	**103,040**
Water Surplus (m^3)		2,400	4,160	8,480	5,600	2,400	160	0	0	0	320	960	2,080	**26,560**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	1,032	1,789	3,646	2,408	1,032	69	0	0	0	138	413	894	**11,421**
Runoff (MOE Methodology) (m^3)		1,368	2,371	4,834	3,192	1,368	91	0	0	0	182	547	1,186	**15,139**
Pervious Area (Landscaped)	*7.43 ha*	WHC = 100 mm												
Precipitation (m^3)		5,723	3,939	4,162	5,500	6,243	4,682	6,243	4,385	5,351	4,459	5,425	4,756	**60,868**
Total AET (m^3)		149	223	818	2,527	5,574	8,472	7,878	5,202	4,682	2,750	1,189	372	**39,836**
Water Surplus (m^3)		3,344	4,459	4,608	3,196	1,338	74	0	0	0	149	1,115	2,527	**20,810**
Infiltration (MOE Methodology) (m^3)	**i = 0.40**	1,338	1,784	1,843	1,278	535	30	0	0	0	59	446	1,011	**8,324**
Runoff (MOE Methodology) (m^3)		2,007	2,676	2,765	1,917	803	45	0	0	0	89	669	1,516	**12,486**
Impervious Area (Ex. Roads, Industrial)	*48.99 ha*													
Precipitation (m^3)		37,721	25,964	27,433	36,251	41,150	30,862	41,150	28,903	35,271	29,393	35,761	31,352	**401,212**
Evaporative Lossess at 10% Precipitation (m^3)		3,772	2,596	2,743	3,625	4,115	3,086	4,115	2,890	3,527	2,939	3,576	3,135	**40,121**
Roof Runoff diverted to Mitigation Measures (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		33,949	23,367	24,690	32,626	37,035	27,776	37,035	26,013	31,744	26,454	32,185	28,217	**361,091**
Mitigations Measures	*0.00 ha*	<-- Roof Area Required of the impervious area shown above												
Infiltration Swales (length)	- m													
Infiltration Bio-Swales (length)	- m													
Available Volume of Water directed to mitigation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (m^3) daily capacity -->	0 m^3/d	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total	**98.82 ha**													
Precipitation (m^3)		76,091	52,375	55,339	73,127	83,009	62,257	83,009	58,304	71,150	59,292	72,139	63,245	**809,336**
Total AET (m^3)		997	1,495	5,482	16,943	37,374	58,080	65,598	51,650	35,434	19,606	7,973	2,492	**303,124**
Evaporative Lossess at 10% Precipitation (m^3)		3,772	2,596	2,743	3,625	4,115	3,086	4,115	2,890	3,527	2,939	3,576	3,135	**40,121**
Infiltration (MOE Methodology) (m^3)		4,286	7,232	10,804	7,432	3,135	186	0	0	0	371	1,469	3,125	**38,040**
Runoff (MOE Methodology) (m^3)		41,215	35,843	43,078	45,341	42,389	28,089	37,035	26,013	31,744	27,079	34,639	33,395	**425,860**

Table WB-4-1109: Post-Development Water Balance (With Mitigation) - Subwatershed FM1109 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *183.33 ha* WHC = 200 mm													
Precipitation (m^3)	141,164	97,165	102,665	135,664	153,997	115,498	153,997	108,165	131,998	109,998	133,831	117,331	**1,501,473**
Total AET (m^3)	3,667	5,500	20,166	62,332	137,498	214,496	247,496	186,997	124,664	71,499	29,333	9,167	**1,112,813**
Water Surplus (m^3)	40,333	76,999	111,831	78,832	32,999	1,833	0	0	0	3,667	12,833	25,666	**384,993**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	13,310	25,410	36,904	26,015	10,890	605	0	0	0	1,210	4,235	8,470	**127,048**
Runoff (MOE Methodology) (m^3)	27,023	51,589	74,927	52,817	22,110	1,228	0	0	0	2,457	8,598	17,196	**257,945**
Pervious Area (Forest) *66.40 ha* WHC = 400 mm													
Precipitation (m^3)	51,128	35,192	37,184	49,136	55,776	41,832	55,776	39,176	47,808	39,840	48,472	42,496	**543,816**
Total AET (m^3)	1,328	1,992	7,304	22,576	49,800	77,688	91,632	81,008	53,120	27,224	10,624	3,320	**427,616**
Water Surplus (m^3)	9,960	17,264	35,192	23,240	9,960	664	0	0	0	1,328	3,984	8,632	**110,224**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	4,283	7,424	15,133	9,993	4,283	286	0	0	0	571	1,713	3,712	**47,396**
Runoff (MOE Methodology) (m^3)	5,677	9,840	20,059	13,247	5,677	378	0	0	0	757	2,271	4,920	**62,828**
Impervious Area (Ex. Roads, Industrial) *6.50 ha*													
Precipitation (m^3)	5,005	3,445	3,640	4,810	5,460	4,095	5,460	3,835	4,680	3,900	4,745	4,160	**53,235**
Evaporative Lossess at 10% Precipitation (m^3)	501	345	364	481	546	410	546	384	468	390	475	416	**5,324**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	4,505	3,101	3,276	4,329	4,914	3,686	4,914	3,452	4,212	3,510	4,271	3,744	**47,912**
Summary Total 256.23 ha													
Precipitation (m^3)	197,297	135,802	143,489	189,610	215,233	161,425	215,233	151,176	184,486	153,738	187,048	163,987	**2,098,524**
Total AET (m^3)	4,995	7,492	27,470	84,908	187,298	292,184	339,128	268,005	177,784	98,723	39,957	12,487	**1,540,429**
Evaporative Lossess at 10% Precipitation (m^3)	501	345	364	481	546	410	546	384	468	390	475	416	**5,324**
Infiltration (MOE Methodology) (m^3)	17,593	32,833	52,037	36,008	15,173	891	0	0	0	1,781	5,948	12,182	**174,444**
Runoff (MOE Methodology) (m^3)	37,205	64,530	98,262	70,393	32,701	5,292	4,914	3,452	4,212	6,724	15,140	25,861	**368,684**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total 0.00 ha													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance Totals for Subwatershed FM1109 **365.00 ha**													
Precipitation (m^3)	281,050	193,450	204,400	270,100	306,600	229,950	306,600	215,350	262,800	219,000	266,450	233,600	**2,989,350**
Total AET (m^3)	6,075	9,113	33,414	103,279	227,822	355,146	410,100	323,697	216,081	119,955	48,602	15,188	**1,868,472**
Evaporative Lossess at 10% Precipitation (m^3)	4,715	3,246	3,429	4,532	5,144	3,858	5,144	3,613	4,409	3,674	4,470	3,919	**50,154**
Infiltration (MOE Methodology) (m^3)	22,861	41,253	64,289	44,620	19,139	1,639	566	566	548	2,748	8,102	16,167	**222,498**
Runoff (MOE Methodology) (m^3)	82,557	103,804	145,322	120,150	79,347	36,121	45,730	31,952	39,135	36,395	53,246	62,504	**836,263**
Potential Stream Base Flows (LPM) - does not account for lag	461	921	1,296	930	386	34	11	11	11	55	169	326	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this case water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used.
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is described in the text and presented on Table 4.6 of the main report.
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater syst
4. There is minor round-off error within the Environment Canada data.

Table WB-2-1102: Pre-Development Water Balance - Subwatershed FM1102 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*4.70 ha*	WHC = 200 mm												
Precipitation (m^3)		3,619	2,491	2,632	3,478	3,948	2,961	3,948	2,773	3,384	2,820	3,431	3,008	**38,493**
Total AET (m^3)		94	141	517	1,598	3,525	5,499	6,345	4,794	3,196	1,833	752	235	**28,529**
Water Surplus (m^3)		1,034	1,974	2,867	2,021	846	47	0	0	0	94	329	658	**9,870**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	341	651	946	667	279	16	0	0	0	31	109	217	**3,257**
Runoff (MOE Methodology) (m^3)		693	1,323	1,921	1,354	567	31	0	0	0	63	220	441	**6,613**
Pervious Area (Forest)	*0.00 ha*	WHC = 400 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial)	*0.00 ha*													
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total	**4.70 ha**													
Precipitation (m^3)		3,619	2,491	2,632	3,478	3,948	2,961	3,948	2,773	3,384	2,820	3,431	3,008	**38,493**
Total AET (m^3)		94	141	517	1,598	3,525	5,499	6,345	4,794	3,196	1,833	752	235	**28,529**
Evaporative Lossess at 10% Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		341	651	946	667	279	16	0	0	0	31	109	217	**3,257**
Runoff (MOE Methodology) (m^3)		693	1,323	1,921	1,354	567	31	0	0	0	63	220	441	**6,613**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*34.55 ha*	WHC = 200 mm												
Precipitation (m^3)		26,604	18,312	19,348	25,567	29,022	21,767	29,022	20,385	24,876	20,730	25,222	22,112	**282,965**
Total AET (m^3)		691	1,037	3,801	11,747	25,913	40,424	46,643	35,241	23,494	13,475	5,528	1,728	**209,719**
Water Surplus (m^3)		7,601	14,511	21,076	14,857	6,219	346	0	0	0	691	2,419	4,837	**72,555**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	2,508	4,789	6,955	4,903	2,052	114	0	0	0	228	798	1,596	**23,943**
Runoff (MOE Methodology) (m^3)		5,093	9,722	14,121	9,954	4,167	231	0	0	0	463	1,620	3,241	**48,612**
Pervious Area (Forest)	*3.90 ha*	WHC = 400 mm												
Precipitation (m^3)		3,003	2,067	2,184	2,886	3,276	2,457	3,276	2,301	2,808	2,340	2,847	2,496	**31,941**
Total AET (m^3)		78	117	429	1,326	2,925	4,563	5,382	4,758	3,120	1,599	624	195	**25,116**
Water Surplus (m^3)		585	1,014	2,067	1,365	585	39	0	0	0	78	234	507	**6,474**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	252	436	889	587	252	17	0	0	0	34	101	218	**2,784**
Runoff (MOE Methodology) (m^3)		333	578	1,178	778	333	22	0	0	0	44	133	289	**3,690**
Impervious Area (Ex. Roads, Industrial)	*0.70 ha*													
Precipitation (m^3)		539	371	392	518	588	441	588	413	504	420	511	448	**5,733**
Evaporative Lossess at 10% Precipitation (m^3)		54	37	39	52	59	44	59	41	50	42	51	45	**573**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		485	334	353	466	529	397	529	372	454	378	460	403	**5,160**
Summary Total	**39.15 ha**													
Precipitation (m^3)		30,146	20,750	21,924	28,971	32,886	24,665	32,886	23,099	28,188	23,490	28,580	25,056	**320,639**
Total AET (m^3)		769	1,154	4,230	13,073	28,838	44,987	52,025	39,999	26,614	15,074	6,152	1,923	**234,835**
Evaporative Lossess at 10% Precipitation (m^3)		54	37	39	52	59	44	59	41	50	42	51	45	**573**
Infiltration (MOE Methodology) (m^3)		2,760	5,225	7,844	5,490	2,304	131	0	0	0	262	899	1,814	**26,727**
Runoff (MOE Methodology) (m^3)		5,911	10,634	15,652	11,198	5,029	651	529	372	454	885	2,214	3,933	**57,462**

Table WB-2-1102: Pre-Development Water Balance - Subwatershed FM1102 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **0.00 ha**													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **0.00 ha**													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance Totals for Subwatershed FM1102 **43.85 ha**													
Precipitation (m^3)	33,765	23,241	24,556	32,449	36,834	27,626	36,834	25,872	31,572	26,310	32,011	28,064	**359,132**
Total AET (m^3)	863	1,295	4,747	14,671	32,363	50,486	58,370	44,793	29,810	16,907	6,904	2,158	**263,364**
Evaporative Lossess at 10% Precipitation (m^3)	54	37	39	52	59	44	59	41	50	42	51	45	**573**
Infiltration (MOE Methodology) (m^3)	3,101	5,876	8,790	6,157	2,583	146	0	0	0	293	1,007	2,031	**29,984**
Runoff (MOE Methodology) (m^3)	6,604	11,957	17,572	12,552	5,596	682	529	372	454	948	2,434	4,374	**64,075**
Potential Stream Base Flows (LPM) - does not account for lag	63	131	177	128	52	3	0	0	0	6	21	41	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater s
4. There is minor round-off error within the Environment Canada data

Table WB-3-1102: Post-Development Water Balance (No Mitigation) - Subwatershed FM1102 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*0.00 ha*	WHC = 200 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest)	*0.00 ha*	WHC = 400 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Landscaped)	*0.68 ha*	WHC = 100 mm												
Precipitation (m^3)		522	359	380	502	570	427	570	400	488	407	495	434	**5,553**
Total AET (m^3)		14	20	75	231	509	773	719	475	427	251	108	34	**3,634**
Water Surplus (m^3)		305	407	420	292	122	7	0	0	0	14	102	231	**1,898**
Infiltration (MOE Methodology) (m^3)	**i = 0.35**	107	142	147	102	43	2	0	0	0	5	36	81	**664**
Runoff (MOE Methodology) (m^3)		198	264	273	190	79	4	0	0	0	9	66	150	**1,234**
Impervious Area (Ex. Roads, Industrial)	*4.02 ha*													
Precipitation (m^3)		3,097	2,132	2,252	2,976	3,378	2,534	3,378	2,373	2,896	2,413	2,936	2,574	**32,940**
Evaporative Lossess at 10% Precipitation (m^3)		310	213	225	298	338	253	338	237	290	241	294	257	**3,294**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		2,787	1,918	2,027	2,679	3,041	2,280	3,041	2,136	2,606	2,172	2,642	2,317	**29,646**
Summary Total	**4.70 ha**													
Precipitation (m^3)		3,619	2,491	2,632	3,478	3,948	2,961	3,948	2,773	3,384	2,820	3,431	3,008	**38,493**
Total AET (m^3)		14	20	75	231	509	773	719	475	427	251	108	34	**3,634**
Evaporative Lossess at 10% Precipitation (m^3)		310	213	225	298	338	253	338	237	290	241	294	257	**3,294**
Infiltration (MOE Methodology) (m^3)		107	142	147	102	43	2	0	0	0	5	36	81	**664**
Runoff (MOE Methodology) (m^3)		2,986	2,183	2,300	2,868	3,120	2,285	3,041	2,136	2,606	2,181	2,709	2,467	**30,880**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*0.00 ha*	WHC = 200 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest)	*3.90 ha*	WHC = 400 mm												
Precipitation (m^3)		3,003	2,067	2,184	2,886	3,276	2,457	3,276	2,301	2,808	2,340	2,847	2,496	**31,941**
Total AET (m^3)		78	117	429	1,326	2,925	4,563	5,382	4,758	3,120	1,599	624	195	**25,116**
Water Surplus (m^3)		585	1,014	2,067	1,365	585	39	0	0	0	78	234	507	**6,474**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	252	436	889	587	252	17	0	0	0	34	101	218	**2,784**
Runoff (MOE Methodology) (m^3)		333	578	1,178	778	333	22	0	0	0	44	133	289	**3,690**
Pervious Area (Landscaped)	*4.07 ha*	WHC = 100 mm												
Precipitation (m^3)		3,132	2,156	2,278	3,010	3,417	2,563	3,417	2,400	2,929	2,441	2,970	2,603	**33,316**
Total AET (m^3)		81	122	447	1,383	3,051	4,637	4,312	2,848	2,563	1,505	651	203	**21,804**
Water Surplus (m^3)		1,831	2,441	2,522	1,749	732	41	0	0	0	81	610	1,383	**11,390**
Infiltration (MOE Methodology) (m^3)	**i = 0.35**	641	854	883	612	256	14	0	0	0	28	214	484	**3,987**
Runoff (MOE Methodology) (m^3)		1,190	1,586	1,639	1,137	476	26	0	0	0	53	397	899	**7,404**
Impervious Area (Ex. Roads, Industrial)	*31.18 ha*													
Precipitation (m^3)		24,010	16,527	17,462	23,075	26,193	19,645	26,193	18,397	22,451	18,709	22,763	19,957	**255,382**
Evaporative Lossess at 10% Precipitation (m^3)		2,401	1,653	1,746	2,307	2,619	1,964	2,619	1,840	2,245	1,871	2,276	1,996	**25,538**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		21,609	14,874	15,716	20,767	23,574	17,680	23,574	16,558	20,206	16,838	20,487	17,961	**229,843**
Summary Total	**39.15 ha**													
Precipitation (m^3)		30,146	20,750	21,924	28,971	32,886	24,665	32,886	23,099	28,188	23,490	28,580	25,056	**320,639**
Total AET (m^3)		159	239	876	2,709	5,976	9,200	9,694	7,606	5,683	3,104	1,275	398	**46,920**
Evaporative Lossess at 10% Precipitation (m^3)		2,401	1,653	1,746	2,307	2,619	1,964	2,619	1,840	2,245	1,871	2,276	1,996	**25,538**
Infiltration (MOE Methodology) (m^3)		892	1,290	1,772	1,199	508	31	0	0	0	62	314	702	**6,770**
Runoff (MOE Methodology) (m^3)		23,133	17,038	18,533	22,682	24,383	17,729	23,574	16,558	20,206	16,936	21,017	19,149	**240,937**

Table WB-3-1102: Post-Development Water Balance (No Mitigation) - Subwatershed FM1102 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **0.00 ha**													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **0.00 ha**													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance Totals for Subwatershed FM1102 **43.85 ha**													
Precipitation (m^3)	33,765	23,241	24,556	32,449	36,834	27,626	36,834	25,872	31,572	26,310	32,011	28,064	**359,132**
Total AET (m^3)	173	259	951	2,940	6,484	9,973	10,413	8,080	6,110	3,355	1,383	432	**50,554**
Evaporative Lossess at 10% Precipitation (m^3)	2,711	1,866	1,971	2,605	2,957	2,218	2,957	2,077	2,535	2,112	2,570	2,253	**28,832**
Infiltration (MOE Methodology) (m^3)	999	1,433	1,919	1,301	551	33	0	0	0	67	350	783	**7,435**
Runoff (MOE Methodology) (m^3)	26,118	19,221	20,834	25,550	27,503	20,014	26,614	18,693	22,812	19,116	23,725	21,615	**271,817**
Potential Stream Base Flows (LPM) - does not account for lag	20	32	39	27	11	1	0	0	0	1	7	16	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater s
4. There is minor round-off error within the Environment Canada data

Table WB-4-1102: Post-Development Water Balance (With Mitigation) - Subwatershed FM1102 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Bentall Lands														
Pervious Area (Open/Agricultural)	*0.00 ha*	WHC = 200 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest)	*0.00 ha*	WHC = 400 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Landscaped)	*0.68 ha*	WHC = 100 mm												
Precipitation (m^3)		522	359	380	502	570	427	570	400	488	407	495	434	**5,553**
Total AET (m^3)		14	20	75	231	509	773	719	475	427	251	108	34	**3,634**
Water Surplus (m^3)		305	407	420	292	122	7	0	0	0	14	102	231	**1,898**
Infiltration (MOE Methodology) (m^3)	**i = 0.40**	122	163	168	117	49	3	0	0	0	5	41	92	**759**
Runoff (MOE Methodology) (m^3)		183	244	252	175	73	4	0	0	0	8	61	138	**1,139**
Impervious Area (Ex. Roads, Industrial)	*4.02 ha*													
Precipitation (m^3)		3,097	2,132	2,252	2,976	3,378	2,534	3,378	2,373	2,896	2,413	2,936	2,574	**32,940**
Evaporative Lossess at 10% Precipitation (m^3)		310	213	225	298	338	253	338	237	290	241	294	257	**3,294**
Roof Runoff diverted to Mitigation Measures (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		2,787	1,918	2,027	2,679	3,041	2,280	3,041	2,136	2,606	2,172	2,642	2,317	**29,646**
Mitigations Measures	*0.00 ha*	<-- Roof Area Required of the impervious area shown above to be directed to swales												
Infiltration Swales (length)	- (m)													
Infiltration Flat Bottomed-Swales (length)	- (m)													
Available Volume of Roof Water directed to mitigation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Subsurface Gravel Wetland (SGW) Area	- (m^2)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration Swales connected to SGW	- (m)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (m^3) daily capacity -->	0 m^3/d	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total	**4.70 ha**													
Precipitation (m^3)		3,619	2,491	2,632	3,478	3,948	2,961	3,948	2,773	3,384	2,820	3,431	3,008	**38,493**
Total AET (m^3)		14	20	75	231	509	773	719	475	427	251	108	34	**3,634**
Evaporative Lossess at 10% Precipitation (m^3)		310	213	225	298	338	253	338	237	290	241	294	257	**3,294**
Infiltration (MOE Methodology) (m^3)		122	163	168	117	49	3	0	0	0	5	41	92	**759**
Runoff (MOE Methodology) (m^3)		2,970	2,163	2,279	2,854	3,114	2,285	3,041	2,136	2,606	2,180	2,703	2,455	**30,785**
Water Balance for Future Development Lands owned by others														
Pervious Area (Open/Agricultural)	*0.00 ha*	WHC = 200 mm												
Precipitation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	**i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest)	*3.90 ha*	WHC = 400 mm												
Precipitation (m^3)		3,003	2,067	2,184	2,886	3,276	2,457	3,276	2,301	2,808	2,340	2,847	2,496	**31,941**
Total AET (m^3)		78	117	429	1,326	2,925	4,563	5,382	4,758	3,120	1,599	624	195	**25,116**
Water Surplus (m^3)		585	1,014	2,067	1,365	585	39	0	0	0	78	234	507	**6,474**
Infiltration (MOE Methodology) (m^3)	**i = 0.43**	252	436	889	587	252	17	0	0	0	34	101	218	**2,784**
Runoff (MOE Methodology) (m^3)		333	578	1,178	778	333	22	0	0	0	44	133	289	**3,690**
Pervious Area (Landscaped)	*4.07 ha*	WHC = 100 mm												
Precipitation (m^3)		3,132	2,156	2,278	3,010	3,417	2,563	3,417	2,400	2,929	2,441	2,970	2,603	**33,316**
Total AET (m^3)		81	122	447	1,383	3,051	4,637	4,312	2,848	2,563	1,505	651	203	**21,804**
Water Surplus (m^3)		1,831	2,441	2,522	1,749	732	41	0	0	0	81	610	1,383	**11,390**
Infiltration (MOE Methodology) (m^3)	**i = 0.40**	732	976	1,009	700	293	16	0	0	0	33	244	553	**4,556**
Runoff (MOE Methodology) (m^3)		1,098	1,464	1,513	1,050	439	24	0	0	0	49	366	830	**6,834**
Impervious Area (Ex. Roads, Industrial)	*31.18 ha*													
Precipitation (m^3)		24,010	16,527	17,462	23,075	26,193	19,645	26,193	18,397	22,451	18,709	22,763	19,957	**255,382**
Evaporative Lossess at 10% Precipitation (m^3)		2,401	1,653	1,746	2,307	2,619	1,964	2,619	1,840	2,245	1,871	2,276	1,996	**25,538**
Roof Runoff diverted to Mitigation Measures (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)		21,609	14,874	15,716	20,767	23,574	17,680	23,574	16,558	20,206	16,838	20,487	17,961	**229,843**
Mitigations Measures	*0.00 ha*	<-- Roof Area Required of the impervious area shown above												
Infiltration Swales (length)	- m													
Infiltration Bio-Swales (length)	- m													
Available Volume of Water directed to mitigation (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (m^3) daily capacity -->	0 m^3/d	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (m^3)		0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total	**39.15 ha**													
Precipitation (m^3)		30,146	20,750	21,924	28,971	32,886	24,665	32,886	23,099	28,188	23,490	28,580	25,056	**320,639**
Total AET (m^3)		2,560	1,892	2,623	5,017	8,595	11,165	12,313	9,445	7,928	4,975	3,551	2,394	**72,458**
Evaporative Lossess at 10% Precipitation (m^3)		2,416	3,455	4,589	3,114	1,317	80	0	0	0	159	844	1,890	**17,864**
Infiltration (MOE Methodology) (m^3)		984	1,412	1,898	1,287	544	33	0	0	0	66	345	771	**7,340**
Runoff (MOE Methodology) (m^3)		1,432	2,042	2,691	1,828	773	47	0	0	0	93	499	1,119	**10,524**

Table WB-4-1102: Post-Development Water Balance (With Mitigation) - Subwatershed FM1102 (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for Lands North of 407 (Excluding Hanson Brick) - These Lands within Greenbelt and Other Designated Areas are not expected to change over time													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **0.00 ha**													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance for Hanson Brick Property													
Pervious Area (Open/Agricultural) *0.00 ha* WHC = 200 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Pervious Area (Forest) *0.00 ha* WHC = 400 mm													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Impervious Area (Ex. Roads, Industrial) *0.00 ha*													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Summary Total **0.00 ha**													
Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total AET (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Evaporative Lossess at 10% Precipitation (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Water Balance Totals for Subwatershed FM1102 **43.85 ha**													
Precipitation (m^3)	33,765	23,241	24,556	32,449	36,834	27,626	36,834	25,872	31,572	26,310	32,011	28,064	**359,132**
Total AET (m^3)	2,574	1,912	2,697	5,247	9,104	11,938	13,032	9,920	8,355	5,226	3,660	2,428	**76,092**
Evaporative Lossess at 10% Precipitation (m^3)	2,725	3,668	4,814	3,412	1,655	333	338	237	290	401	1,138	2,147	**21,158**
Infiltration (MOE Methodology) (m^3)	1,106	1,575	2,066	1,403	593	36	0	0	0	72	385	863	**8,099**
Runoff (MOE Methodology) (m^3)	4,402	4,205	4,971	4,681	3,887	2,331	3,041	2,136	2,606	2,273	3,203	3,574	**41,309**
Potential Stream Base Flows (LPM) - does not account for lag	22	35	42	29	12	1	0	0	0	1	8	17	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this case water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used.
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is described in the text and presented on Table 4.6 of the main report.
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater syst
4. There is minor round-off error within the Environment Canada data.

Table WB-2-14W-11A: Pre-Development Water Balance - Tributary 14W-11A on Bentall Site (Volumetric Calculations based on Pervious Area)

Weather Station Data: Gerard, ON (1990-2006) **Latitude: 43 degrees 26 minutes N**

Data Provided by Environment Canada - Atmospheric Environment Services - data may exhibit round off error

PARAMETER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Water Balance for the Tributary to FM1109 that passes through Northeast corner of Bentall Lands													
Pervious Area (Open/Agricultural) *18.40 ha* WHC = 200 mm													
Precipitation (m^3)	14,168	9,752	10,304	13,616	15,456	11,592	15,456	10,856	13,248	11,040	13,432	11,776	**150,696**
Total AET (m^3)	368	552	2,024	6,256	13,800	21,528	24,840	18,768	12,512	7,176	2,944	920	**111,688**
Water Surplus (m^3)	4,048	7,728	11,224	7,912	3,312	184	0	0	0	368	1,288	2,576	**38,640**
Infiltration (MOE Methodology) (m^3) **i = 0.33**	1,336	2,550	3,704	2,611	1,093	61	0	0	0	121	425	850	**12,751**
Runoff (MOE Methodology) (m^3)	2,712	5,178	7,520	5,301	2,219	123	0	0	0	247	863	1,726	**25,889**
Pervious Area (Forest) *16.90 ha* WHC = 400 mm													
Precipitation (m^3)	13,013	8,957	9,464	12,506	14,196	10,647	14,196	9,971	12,168	10,140	12,337	10,816	**138,411**
Total AET (m^3)	338	507	1,859	5,746	12,675	19,773	23,322	20,618	13,520	6,929	2,704	845	**108,836**
Water Surplus (m^3)	2,535	4,394	8,957	5,915	2,535	169	0	0	0	338	1,014	2,197	**28,054**
Infiltration (MOE Methodology) (m^3) **i = 0.43**	1,090	1,889	3,852	2,543	1,090	73	0	0	0	145	436	945	**12,063**
Runoff (MOE Methodology) (m^3)	1,445	2,505	5,105	3,372	1,445	96	0	0	0	193	578	1,252	**15,991**
Impervious Area (Ex. Roads, Industrial) *1.30 ha*													
Precipitation (m^3)	1,001	689	728	962	1,092	819	1,092	767	936	780	949	832	**10,647**
Evaporative Lossess at 10% Precipitation (m^3)	100	69	73	96	109	82	109	77	94	78	95	83	**1,065**
Water Surplus (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Infiltration (MOE Methodology) (m^3)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Runoff (MOE Methodology) (m^3)	901	620	655	866	983	737	983	690	842	702	854	749	**9,582**
Summary Total 36.60 ha													
Precipitation (m^3)	28,182	19,398	20,496	27,084	30,744	23,058	30,744	21,594	26,352	21,960	26,718	23,424	**299,754**
Total AET (m^3)	706	1,059	3,883	12,002	26,475	41,301	48,162	39,386	26,032	14,105	5,648	1,765	**220,524**
Evaporative Lossess at 10% Precipitation (m^3)	100	69	73	96	109	82	109	77	94	78	95	83	**1,065**
Infiltration (MOE Methodology) (m^3)	2,426	4,440	7,555	5,154	2,183	133	0	0	0	267	861	1,795	**24,814**
Runoff (MOE Methodology) (m^3)	5,058	8,302	13,281	9,538	4,647	957	983	690	842	1,141	2,295	3,727	**51,462**
Water Balance Totals for Tributary to Subwatershed FM1109 passing through Northeast Corner of Bentall Lands **36.60 ha**													
Precipitation (m^3)	28,182	19,398	20,496	27,084	30,744	23,058	30,744	21,594	26,352	21,960	26,718	23,424	**299,754**
Total AET (m^3)	706	1,059	3,883	12,002	26,475	41,301	48,162	39,386	26,032	14,105	5,648	1,765	**220,524**
Evaporative Lossess at 10% Precipitation (m^3)	100	69	73	96	109	82	109	77	94	78	95	83	**1,065**
Infiltration (MOE Methodology) (m^3)	2,426	4,440	7,555	5,154	2,183	133	0	0	0	267	861	1,795	**24,814**
Runoff (MOE Methodology) (m^3)	5,058	8,302	13,281	9,538	4,647	957	983	690	842	1,141	2,295	3,727	**51,462**
Potential Stream Base Flows (LPM) - does not account for lag	49	99	152	107	44	3	0	0	0	5	18	36	

Notes:

1. Monthly climate data, including soil deficits, sol moisture storage, evapotranspiration and water surplus were provided by Environment Canada, and modeled for different soil water holding capacities. In this ca water holding capacities of 400 mm and 200 mm (pre-development), and 100 mm (post-development) are used
2. Infiltration and Runoff volumes are calculated using the methodology described in the MOE Stormwater Design Manual (2003). Calculation of the infiltration factors used in the analyses is describe in the text and presented on Table 4.6 of the main report
3. Evaporative losses of 10% are modeled for impervious surfaces (none under pre-development condition). This accounts for losses of water, such as water that collects in shallow depressions on these surfaces and does not reach the stormwater s
4. There is minor round-off error within the Environment Canada data

WBNRMSD.400

Oakville Gerard, ON WATER BUDGET MEANS FOR THE PERIOD 1990-2006 DC20492

LAT.... 43.43 WATER HOLDING CAPACITY...400 MM HEAT INDEX... 42.62
LONG... 79.70 LOWER ZONE.....240 MM A..... 1.168

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.6	77	36	21	2	2	0	15	28	339	277
28- 2	-2.7	53	32	32	3	3	0	26	18	374	328
31- 3	1.2	56	38	35	11	11	0	53	0	383	386
30- 4	7.2	74	73	1	34	34	0	35	0	388	464
31- 5	13.1	84	84	0	75	75	0	15	0	383	546
30- 6	19.1	63	63	0	117	117	0	1	0	328	611
31- 7	21.9	84	84	0	139	138	-1	0	0	274	697
31- 8	21.4	59	59	0	126	122	-4	0	0	211	754
30- 9	17.3	72	72	0	85	80	-5	0	0	202	827
31-10	10.3	60	60	0	43	41	-2	2	0	220	59
30-11	4.8	73	70	3	16	16	0	6	0	270	132
31-12	-.4	64	46	10	5	5	0	13	8	309	193
AVE	9.0 TTL	821	717	102	656	644	-12	166			

Oakville Gerard, ON STANDARD DEVIATIONS FOR THE PERIOD 1990-2006 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.0	41	31	17	2	2	0	30	29	69	59
28- 2	2.2	22	24	23	2	2	0	35	27	42	58
31- 3	1.7	27	22	29	5	5	0	47	0	32	68
30- 4	1.3	34	34	3	6	6	0	34	0	26	77
31- 5	1.7	37	37	0	12	12	0	22	0	33	79
30- 6	1.3	27	27	0	9	9	0	6	0	47	88
31- 7	1.5	40	40	0	11	10	5	0	0	69	104
31- 8	1.3	34	34	0	9	12	9	0	0	68	97
30- 9	1.5	36	36	0	8	9	10	0	0	84	113
31-10	1.0	35	35	0	5	6	6	8	0	88	35
30-11	1.5	25	26	6	5	5	0	24	0	88	52
31-12	2.2	33	32	10	3	3	0	27	20	85	53

WBNRMSD.200

Oakville Gerard, ON WATER BUDGET MEANS FOR THE PERIOD 1990-2006 DC20492

LAT.... 43.43 WATER HOLDING CAPACITY...200 MM HEAT INDEX... 42.62
LONG... 79.70 LOWER ZONE.....120 MM A..... 1.168

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.6	77	36	21	2	2	0	22	28	179	277
28- 2	-2.7	53	32	32	3	3	0	42	18	199	328
31- 3	1.2	56	38	35	11	11	0	61	0	200	386
30- 4	7.2	74	73	1	34	34	0	43	0	197	464
31- 5	13.1	84	84	0	75	75	0	18	0	189	546
30- 6	19.1	63	63	0	117	117	0	1	0	134	611
31- 7	21.9	84	84	0	139	135	-5	0	0	83	697
31- 8	21.4	59	59	0	126	102	-23	0	0	40	754
30- 9	17.3	72	72	0	85	68	-18	0	0	45	827
31-10	10.3	60	60	0	43	39	-5	2	0	65	59
30-11	4.8	73	70	3	16	16	0	7	0	114	132
31-12	-.4	64	46	10	5	5	0	14	8	151	193
AVE	9.0 TTL	821	717	102	656	607	-51	210			

Oakville Gerard, ON STANDARD DEVIATIONS FOR THE PERIOD 1990-2006 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.0	41	31	17	2	2	0	31	29	30	59
28- 2	2.2	22	24	23	2	2	0	37	27	6	58
31- 3	1.7	27	22	29	5	5	0	40	0	0	68
30- 4	1.3	34	34	3	6	6	0	32	0	8	77
31- 5	1.7	37	37	0	12	12	0	25	0	17	79
30- 6	1.3	27	27	0	9	9	0	6	0	35	88
31- 7	1.5	40	40	0	11	11	11	0	0	52	104
31- 8	1.3	34	34	0	9	24	25	0	0	41	97
30- 9	1.5	36	36	0	8	19	22	0	0	52	113
31-10	1.0	35	35	0	5	9	10	8	0	56	35
30-11	1.5	25	26	6	5	5	0	24	0	53	52
31-12	2.2	33	32	10	3	3	0	27	20	49	53

WBNRMSD.100

Oakville Gerard, ON WATER BUDGET MEANS FOR THE PERIOD 1990-2006 DC20492

LAT.... 43.43 WATER HOLDING CAPACITY...100 MM HEAT INDEX... 42.62
LONG... 79.70 LOWER ZONE..... 60 MM A..... 1.168

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-3.6	77	36	21	2	2	0	45	28	100	277
28- 2	-2.7	53	32	32	3	3	0	60	18	100	328
31- 3	1.2	56	38	35	11	11	0	62	0	100	386
30- 4	7.2	74	73	1	34	34	0	43	0	97	464
31- 5	13.1	84	84	0	75	75	0	18	0	89	546
30- 6	19.1	63	63	0	117	114	-3	1	0	37	611
31- 7	21.9	84	84	0	139	106	-33	0	0	15	697
31- 8	21.4	59	59	0	126	70	-56	0	0	5	754
30- 9	17.3	72	72	0	85	63	-22	0	0	13	827
31-10	10.3	60	60	0	43	37	-6	2	0	34	59
30-11	4.8	73	70	3	16	16	0	15	0	75	132
31-12	-.4	64	46	10	5	5	0	34	8	92	193
AVE	9.0 TTL	821	717	102	656	536	-120	280			

Oakville Gerard, ON STANDARD DEVIATIONS FOR THE PERIOD 1990-2006 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.0	41	31	17	2	2	0	38	29	2	59
28- 2	2.2	22	24	23	2	2	0	36	27	0	58
31- 3	1.7	27	22	29	5	5	0	39	0	0	68
30- 4	1.3	34	34	3	6	6	0	32	0	8	77
31- 5	1.7	37	37	0	12	12	0	25	0	17	79
30- 6	1.3	27	27	0	9	8	11	6	0	28	88
31- 7	1.5	40	40	0	11	33	37	0	0	24	104
31- 8	1.3	34	34	0	9	30	33	0	0	18	97
30- 9	1.5	36	36	0	8	23	25	0	0	28	113
31-10	1.0	35	35	0	5	10	12	8	0	37	35
30-11	1.5	25	26	6	5	5	0	35	0	26	52
31-12	2.2	33	32	10	3	3	0	36	20	16	53

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
01/01/09	-3.8		-15.6		-9.7	0		0		0		2
01/02/09	0.7		-4.7		-2	0		1.2		0.6		2
01/03/09	-1.9		-11.8		-6.9	0		0		0		2
01/04/09	-0.7		-12.2		-6.5	0	T	0		0	T	2
01/05/09	0.6		-7.7		-3.6	0	T	0		0	T	1
01/06/09	-0.6		-10		-5.3	0	T	3.6		3.4		1
01/07/09	0.7		-2.8		-1.1	1		9		10		5
01/08/09	-2.8		-12		-7.4	0		0.2		0.2		11
01/09/09	-6		-12.2		-9.1	0		0	T	0	T	11
01/10/09	-6.8		-14.9		-10.9	0		3.8		3.4		11
01/11/09	-6.3		-12.8		-9.6	0		0.2		0.2		14
01/12/09	-3.5		-10.6		-7.1	0		0		0		14
01/13/09	1.1		-16.9		-7.9	0		4		4.6		15
01/14/09	-13.1		-22.1		-17.6	0		0.8		0.8		18
01/15/09	-10.8		-19.3		-15.1	0		0.6		0.6		18
01/16/09	-12.7		-18		-15.4	0		0		0		18
01/17/09	-6.9		-20		-13.5	0		4.8		4		18
01/18/09	-3		-8.6		-5.8	0		2.8		2.8		21
01/19/09	-5.6		-11.6		-8.6	0		0.8		0.8		24
01/20/09	-10.2		-17.5		-13.9	0		0	T	0	T	24
01/21/09	-5.5		-19		-12.3	0		0	T	0	T	24
01/22/09	-1.9		-6		-4	0		0	T	0	T	24
01/23/09	3.6		-6.8		-1.6	0		0	T	0	T	24
01/24/09	-6.7		-19.2		-13	0		0		0		21
01/25/09	-8.9		-15.6		-12.3	0		0		0		21
01/26/09	-8.8		-16.9		-12.9	0		0		0		21
01/27/09	-4		-13.8		-8.9	0		0	T	0	T	21
01/28/09	-3.4		-8.2		-5.8	0		13.4		12.6		23
01/29/09	-3.1		-10.2		-6.7	0		0.4		0.4		32
01/30/09	-3.2		-10.8		-7	0		0	T	0	T	32
01/31/09	-4.7		-16.7		-10.7	0		0.4		0	T	32
02/01/09	4.4		-4.8		-0.2	0		0		0		32
02/02/09	2		-7.9		-3	0		0		0		28
02/03/09	-3.8		-10.5		-7.2	0		7.4		6.2		27
02/04/09	-10.2		-18		-14.1	0		1.6		1		35
02/05/09	-9		-22.2		-15.6	0		0	T	0	T	35
02/06/09	-2		-11.8		-6.9	0		0		0		35
02/07/09	7.9		-8.3		-0.2	0		0		0		32
02/08/09	4		-4.8		-0.4	0		0		0		9
02/09/09	3.2		-6.2		-1.5	0		0		0		6
02/10/09	9.3		-0.1		4.6	0	T	0		0	T	3
02/11/09	8.9		6.5		7.7	25.8		0		25.8		1
02/12/09	7.8		-2.1		2.9	11.8		0	T	11.8		0
02/13/09	-0.9		-7.4		-4.2	0		0		0		0
02/14/09	-1.8		-8.2		-5	0		0		0		0
02/15/09	1.3		-8.9		-3.8	0		0		0		0
02/16/09	0.7		-7.5		-3.4	0		0		0		0
02/17/09	2.2		-6.8		-2.3	0		0		0		0
02/18/09	1		-0.8		0.1	0		8.2		12.4		0
02/19/09	1.3		-7.9		-3.3	0		0.4		0.4		3
02/20/09	-2.6		-8.8		-5.7	0		0	T	0	T	3
02/21/09	-0.5		-11.2		-5.9	0		4.6		3.6		2
02/22/09	-2		-8.3		-5.2	0		0	T	0	T	5
02/23/09	-6		-11.4		-8.7	0		0		0		4
02/24/09	-3.2		-15.1		-9.2	0		0		0		4
02/25/09	2.8		-6.9		-2.1	0.8		2.2		2.8		3
02/26/09	6.5		-0.5		3	3.8		0		3.8		1
02/27/09	9.4		-12		-1.3	5.8		0	T	5.8		0
02/28/09	-6.5		-16.4		-11.5	0		0		0		0
03/01/09	-4.2		-12.5		-8.4	0		0		0		0
03/02/09	-9.5		-15.4		-12.5	0		0		0		0
03/03/09	-3.9		-15.7		-9.8	0		0		0		0
03/04/09	1.6		-12.5		-5.5	0		0		0		0
03/05/09	5.6		-7.1		-0.8	0	T	0		0	T	0
03/06/09	18.9		1.3		10.1	0		0		0		0
03/07/09	4.6		-2		1.3	19.8		0		19.8		0
03/08/09	5.5		1.1		3.3	9.8		0	T	9.8		0
03/09/09	4.4		-0.5		2	1.4		0.6		2.2		0
03/10/09	3.7		0.2		2	6.4		0		6.4		0
03/11/09	9.5		-5.2		2.2	5.4		0	T	5.4		0
03/12/09	-2.1		-9.5		-5.8	0		0	T	0	T	0
03/13/09	-0.7		-10.3		-5.5	0		0		0		0
03/14/09	6.9		-6.1		0.4	0		0		0		0
03/15/09	9.6		-3.8		2.9	0		0		0		0
03/16/09	10		-2.4		3.8	0		0		0		0

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
03/17/09	11.8		-1.8		5	0		0		0		0
03/18/09	15		2.5		8.8	0	T	0		0	T	0
03/19/09	4.3		-3.6		0.4	0		0		0		0
03/20/09	2.8		-6.4		-1.8	0		0		0		0
03/21/09	5.9		-5.7		0.1	0		0		0		0
03/22/09	5.8		-4.3		0.8	0		0		0		0
03/23/09	2.6		-6.4		-1.9	0		0		0		0
03/24/09	4		-2.9		0.6	0		0		0		0
03/25/09	8.6		1.9		5.3	2.6		0		2.6		0
03/26/09	10.4		2		6.2	0	T	0		0	T	0
03/27/09	12.3		-3		4.7	0		0		0		0
03/28/09	13.2		0.3		6.8	0		0		0		0
03/29/09	10.8		2.6		6.7	22.6		0		22.6		0
03/30/09	5.6		-2.7		1.5	0		0		0		0
03/31/09	5.6		-3.1		1.3	0	T	0		0	T	0
04/01/09	14		2.5		8.3	1.8		0		1.8		0
04/02/09	15.1		1.3		8.2	0.2		0		0.2		0
04/03/09	10		3.1		6.6	40.2		0		40.2		0
04/04/09	5.6		2.5		4.1	0	T	0		0	T	0
04/05/09	12.1		0.3		6.2	0.2		0		0.2		0
04/06/09	4.8		-3.3		0.8	13.8		3.8		17.8		0
04/07/09	-0.1		-3.9		-2	0		0	T	0	T	1
04/08/09	8.3		-1.7		3.3	0		0	T	0	T	0
04/09/09	11.7		-1.7		5	0		0		0		0
04/10/09	10.7		-0.6		5.1	0		0		0		0
04/11/09	8.9		-0.8		4.1	0		0		0		0
04/12/09	6.7		-2.5		2.1	0		0		0		0
04/13/09	6.8		-3.9		1.5	0		0		0		0
04/14/09	11.8		3.9		7.9	0		0		0		0
04/15/09	14.5		3.6		9.1	0		0		0		0
04/16/09	14.5		2.5		8.5	0		0		0		0
04/17/09	20.9		3.9		12.4	0		0		0		0
04/18/09	21.2		8		14.6	0		0		0		0
04/19/09	12.4		5.2		8.8	0	T	0		0	T	0
04/20/09	9.3		4.3		6.8	25.8		0		25.8		0
04/21/09	12		3.9		8	1		0		1		0
04/22/09	8		3.5		5.8	0	T	0		0	T	0
04/23/09	12		3.6		7.8	0	T	0		0	T	0
04/24/09	19.8		4.8		12.3	0		0		0		0
04/25/09	27.9		10.5		19.2	9.8		0		9.8		0
04/26/09	16.2		8.1		12.2	3		0		3		0
04/27/09	27.5		7		17.3	0		0		0		0
04/28/09	17.3		4.4		10.9	10.4		0		10.4		0
04/29/09	12.5		3.6		8.1	0		0		0		0
04/30/09	17.5		7.3		12.4	23.4		0		23.4		0
05/01/09	19.5		5.5		12.5	0.4		0		0.4		0
05/02/09	14.6		2.5		8.6	0.6		0		0.6		0
05/03/09	19.8		3.8		11.8	0		0		0		0
05/04/09	17.3		5.4		11.4	0		0		0	Prev. 5 days	0
05/05/09	18		5.1		11.6	0		0		0	24.4	0
05/06/09	17.6		7.4		12.5	2.6		0		2.6		0
05/07/09	19.4		11.9		15.7	2		0		2		0
05/08/09	24.9		12.2		18.6	0	T	0		0	T	0
05/09/09	19.8		8		13.9	10.8		0		10.8		0
05/10/09	12.7		3.3		8	0		0		0		0
05/11/09	13.9		1.4		7.7	0		0		0		0
05/12/09	16.5		3.3		9.9	0		0		0		0
05/13/09	20.1		5.6		12.9	0	T	0		0	T	0
05/14/09	21.7		8.6		15.2	2.4		0		2.4		0
05/15/09	16.9		7.4		12.2	0	T	0		0	T	0
05/16/09	20.3		4.2		12.3	5.2		0		5.2		0
05/17/09	12.5		1.5		7	0		0		0		0
05/18/09	14.7		0.3		7.5	0		0		0		0
05/19/09	22.6		5.7		14.2	0		0		0		0
05/20/09	27.6		13.3		20.5	0		0		0		0
05/21/09	29.1		14.4		21.8	0		0		0		0
05/22/09	21.1		11.7		16.4	0		0		0		0
05/23/09	20.1		9.1		14.6	0		0		0		0

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
05/24/09	22.8		9.9		16.4	0.2		0		0.2		0
05/25/09	18.8		8.2		13.5	0		0		0		0
05/26/09	13.9		9.4		11.7	0.2		0		0.2		0
05/27/09	16		10.5		13.3	16.6		0		16.6		0
05/28/09	17.5		12.2		14.9	12.4		0		12.4	Prev. 5 days	0
05/29/09	23.4		10.4		16.9	3		0		3	32.4	0
05/30/09	20.3		7.5		13.9	4.4		0		4.4		0
05/31/09	12.7		4.6		8.7	0		0		0		0
06/01/09	17.5		8.3		12.9	0	T	0		0	T	0
06/02/09	16.8		8.4		12.6	0		0		0		0
06/03/09	19.5		7.5		13.5	0		0		0		0
06/04/09	18.2		6.8		12.5	0		0		0		0
06/05/09	21		6.9		14	0		0		0		0
06/06/09	23		10.9		17	0		0		0		0
06/07/09	17.8		9.9		13.9	0	T	0		0	T	0
06/08/09	16.3		11.6		14	9.4		0		9.4		0
06/09/09	18.8		10.3		14.6	0	T	0		0	T	0
06/10/09	19.4		8.6		14	0		0		0		0
06/11/09	20.4		10.5		15.5	2.8		0		2.8		0
06/12/09	23.8		11.7		17.8	0		0		0		0
06/13/09	22.8		13.2		18	0		0		0		0
06/14/09	24.3		11.3		17.8	0	T	0		0	T	0
06/15/09	23.6		13.2		18.4	0		0		0		0
06/16/09	24.3		12.3		18.3	0		0		0		0
06/17/09	20.7		14.1		17.4	10.8		0		10.8	Prev. 5 days	0
06/18/09	17.8		13.3		15.6	1.4		0		1.4	12.2	0
06/19/09	23.1		11.6		17.4	0		0		0		0
06/20/09	17.7		14.9		16.3	14.4		0		14.4		0
06/21/09	26.5		14.4		20.5	0		0		0		0
06/22/09	26.1		16.6		21.4	0		0		0		0
06/23/09	27.2		17		22.1	0		0		0		0
06/24/09	31.4		18.4		24.9	0		0		0		0
06/25/09	28.9		20.4		24.7	1.2		0		1.2		0
06/26/09	27.2		18.2		22.7	0		0		0		0
06/27/09	27.9		16.3		22.1	0		0		0		0
06/28/09	21.5		14.7		18.1	9		0		9		0
06/29/09	24		14		19	4.8		0		4.8		0
06/30/09	20.8		14.9		17.9	16.4		0		16.4		0
07/01/09	23.3		14.1		18.7	0	T	0		0	T	0
07/02/09	21.9		15.3		18.6	0.4		0		0.4		0
07/03/09	23.3		13.9		18.6	0		0		0		0
07/04/09	22.4		12		17.2	0		0		0		0
07/05/09	23.5		10.6		17.1	0		0		0		0
07/06/09	25.1		13.6		19.4	0	T	0		0	T	0
07/07/09	20.2		13.8		17	0.4		0		0.4		0
07/08/09	24.1		12.6		18.4	0		0		0		0
07/09/09	24.1		13.5		18.8	0		0		0		0
07/10/09	26.5		14.8		20.7	0		0		0		0
07/11/09	28.3		14.6		21.5	7.4		0		7.4		0
07/12/09	23.4		9.4		16.4	0		0		0		0
07/13/09	23.4		10.6		17	0		0		0		0
07/14/09	25.4		11.6		18.5	0		0		0		0
07/15/09	23.9		11.7		17.8	0.4		0		0.4		0
07/16/09	27.8		15.3		21.6	0		0		0		0
07/17/09	21.2		14.3		17.8	0.2		0		0.2		0
07/18/09	23.2		14.2		18.7	0	T	0		0	T	0
07/19/09	23		12		17.5	0		0		0		0
07/20/09	24.8		12.5		18.7	0		0		0		0
07/21/09	24.2		14.4		19.3	4.6		0		4.6		0
07/22/09	22.7		16		19.4	2.4		0		2.4		0
07/23/09	23.4		17.4		20.4	31.4		0		31.4		0
07/24/09	24.4		16.9		20.7	0	T	0		0	T	0
07/25/09	22.7		17.9		20.3	18		0		18		0
07/26/09	22.9		16.1		19.5	9		0		9		0
07/27/09	27.2		16.1		21.7	0		0		0		0
07/28/09	27.8		20.1		24	0	T	0		0	T	0
07/29/09	23.3		14.2		18.8	10.6		0		10.6		0
07/30/09	25.3		13.4		19.4	0		0		0		0
07/31/09	27.7		16.3		22	0	T	0		0	T	0
08/01/09	27.1		14.6		20.9	0		0		0		0
08/02/09	25.5		15.4		20.5	0	T	0		0	T	0
08/03/09	26.1		12.6		19.4	0	T	0		0	T	0
08/04/09	26.4		15		20.7	18		0		18		0
08/05/09	24.4		10.9		17.7	0		0		0		0
08/06/09	24.4		15		19.7	0		0		0		0

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
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Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
08/07/09	22.9		14.1		18.5	0		0		0		0
08/08/09	22		12		17	2.2		0		2.2		0
08/09/09	29.5		18.5		24	40		0		40		0
08/10/09	30		18.8		24.4	1.2		0		1.2		0
08/11/09	26.1		16		21.1	28		0		28		0
08/12/09	25.4		17.5		21.5	2.6		0		2.6		0
08/13/09	28.1		16.8		22.5	0		0		0		0
08/14/09	28.4		17.1		22.8	0		0		0		0
08/15/09	29.6		18.4		24	0		0		0		0
08/16/09	29.3		19.5		24.4	0		0		0		0
08/17/09	31.4		23		27.2	0		0		0		0
08/18/09	29.5		20.9		25.2	0.4		0		0.4		0
08/19/09	26.1		17.3		21.7	0		0		0		0
08/20/09	28.6		20.8		24.7	25.2		0		25.2		0
08/21/09	27.2		19.8		23.5	0.2		0		0.2		0
08/22/09	24.4		16.8		20.6	1.2		0		1.2		0
08/23/09	22.1		14.7		18.4	0		0		0		0
08/24/09	24		13.5		18.8	0		0		0		0
08/25/09	25.8		13.5		19.7	0		0		0		0
08/26/09	23		13.7		18.4	2.8		0		2.8		0
08/27/09	21		11.4		16.2	0		0		0		0
08/28/09	19.7		13.4		16.6	10.8		0		10.8		0
08/29/09	22.3		14.4		18.4	11.4		0		11.4		0
08/30/09	18.5		11.4		15	0	T	0		0	T	0
08/31/09	20.9		10.5		15.7	0		0		0		0
09/01/09	22.5		10.5		16.5	0		0		0		0
09/02/09	23.6		12.2		17.9	0		0		0		0
09/03/09	24.4		12.9		18.7	0		0		0		0
09/04/09	24.8		14.1		19.5	0		0		0		0
09/05/09	23.9		14.8		19.4	0		0		0		0
09/06/09	23.2		13.9		18.6	0		0		0		0
09/07/09	24.2		15.3		19.8	0		0		0		0
09/08/09	25.2		16.7		21	0		0		0		0
09/09/09	24.5		15.3		19.9	0		0		0		0
09/10/09	24.3		12.7		18.5	0		0		0		0
09/11/09	20.4		12.8		16.6	0		0		0		0
09/12/09	24.1		12.7		18.4	0		0		0		0
09/13/09	24.7		12.4		18.6	0		0		0		0
09/14/09	25.8		12.2		19	0		0		0		0
09/15/09	23.5		11.1		17.3	0		0		0		0
09/16/09	18.7		8.8		13.8	0		0		0		0
09/17/09	20.5		10.2		15.4	0		0		0		0
09/18/09	20.8		8.2		14.5	0	T	0		0	T	0
09/19/09	18.8		4.8		11.8	0		0		0		0
09/20/09	21.2		5.5		13.4	0		0		0		0
09/21/09	22		13		17.5	2.2		0		2.2		0
09/22/09	24		19.6		21.8	0	T	0		0	T	0
09/23/09	27.8		15.6		21.7	2.2		0		2.2	Prev. 5 days	0
09/24/09	22.5		12.1		17.3	0		0		0	4.4	0
09/25/09	15.8		10.9		13.4	0		0		0		0
09/26/09	17.7		8.1		12.9	12.8		0		12.8		0
09/27/09	21.2		13.7		17.5	0	T	0		0	T	0
09/28/09	18		11.1		14.6	20.4		0		20.4		0
09/29/09	16.2		7.2		11.7	2.4		0		2.4		0
09/30/09	11.8		5.6		8.7	0.2		0		0.2		0
10/01/09	12		2.4		7.2	0		0		0		0
10/02/09	12.5		4.3		8.4	10.2		0		10.2		0
10/03/09	17.2		8.1		12.7	2.6		0		2.6		0
10/04/09	14		7.2		10.6	1		0		1		0
10/05/09	17		5.9		11.5	0		0		0		0
10/06/09	15		5.9		10.5	8.6		0		8.6		0
10/07/09	13.4		6.7		10.1	0.6		0		0.6		0
10/08/09	17.6		5.5		11.6	0.2		0		0.2		0
10/09/09	11.4		7.3		9.4	20		0		20		0
10/10/09	14.2		6.4		10.3	0	T	0		0	T	0
10/11/09	10.2		-0.2		5	0		0		0		0
10/12/09	6.7		-0.6		3.1	0	T	0		0	T	0
10/13/09	10.7		2.4		6.6	0.2		0		0.2		0
10/14/09	7.3		-1.2		3.1	0		0		0		0
10/15/09	4.5		-0.7		1.9	0		0		0		0
10/16/09	7.1		-0.7		3.2	0		0		0		0
10/17/09	8.6		0.3		4.5	0		0		0		0
10/18/09	9.8		-0.7		4.6	0		0		0		0
10/19/09	15.2		0.3		7.8	0		0		0		0
10/20/09	16.4		10.9		13.7	0		0		0		0

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
10/21/09	14.4		9.5		12	2.8		0		2.8		0
10/22/09	16.5		3.8		10.2	0.6		0		0.6		0
10/23/09	11		2.9		7	14.8		0		14.8		0
10/24/09	13.5		6.2		9.9	0	T	0		0	T	0
10/25/09	13.2		4		8.6	0		0		0		0
10/26/09	11.8		5.8		8.8	0		0		0		0
10/27/09	16.3		8.2		12.3	1.2		0		1.2		0
10/28/09	13		9.6		11.3	2.2		0		2.2		0
10/29/09	11		9.2		10.1	0		0		0		0
10/30/09	15		9.7		12.4	2.6		0		2.6		0
10/31/09	16.7		6.9		11.8	3.4		0		3.4		0
11/01/09	10.7		4.1		7.4	0		0		0		0
11/02/09	10.4		1.1		5.8	1.6		0		1.6		0
11/03/09	8.9		0.9		4.9	0	T	0		0	T	0
11/04/09	6.2		-1.2		2.5	1.8		0		1.8		0
11/05/09	7.5		1.3		4.4	1.6		0		1.6		0
11/06/09	4.9		-1.1		1.9	0		0		0		0
11/07/09	16.1		4.5		10.3	0		0		0		0
11/08/09	18.1		4.7		11.4	0		0		0	Prev. 5 days	0
11/09/09	19.1		3.9		11.5	0		0		0	3.4	0
11/10/09	13.5		3.3		8.4	0		0		0		0
11/11/09	9		-0.5		4.3	0		0		0		0
11/12/09	9.6		-1.8		3.9	0		0		0		0
11/13/09	11.1		-1.5		4.8	0		0		0		0
11/14/09	15.8		3.6		9.7	0		0		0		0
11/15/09	13.5		2		7.8	0		0		0		0
11/16/09	8.8		-0.2		4.3	0		0		0		0
11/17/09	7.5		-2.3		2.6	0		0		0	Prev. 5 days	0
11/18/09	11.3		0.1		5.7	0		0		0	0	0
11/19/09	10.2		2		6.1	12.6		0		12.6	Prev. 5 days	0
11/20/09	10.4		3.7		7.1	1.2		0		1.2	13.8	0
11/21/09	11.7		3		7.4	0		0		0		0
11/22/09	11		2.8		6.9	0		0		0		0
11/23/09	9.8		2.4		6.1	0		0		0		0
11/24/09	7.8		6.2		7	1.2		0		1.2		0
11/25/09	10.6		7.5		9.1	6.2		0		6.2		0
11/26/09	9.5		1.3		5.4	0.4		0		0.4		0
11/27/09	7.1		1.4		4.3	0.4		0		0.4		0
11/28/09	6.5		0.2		3.4	0		0		0		0
11/29/09	6.9		-3		2	4.6		0		4.6		0
11/30/09	5.5		-0.7		2.4	0.6		0		0.6		0
12/01/09	7		0.3		3.7	0		0.2		0.2		0
12/02/09	10.2		0.2		5.2	15.6		0		15.6		0
12/03/09	7.6		-0.6		3.5	5		0		5		0
12/04/09	3.3		-3.8		-0.3	0		0		0		0
12/05/09	0.9		-5.7		-2.4	0		0		0		0
12/06/09	2.7		-3.8		-0.6	0		0	T	0	T	0
12/07/09	1.6		-2.7		-0.6	0		0	T	0	T	0
12/08/09	2.1		-4.5		-1.2	0		0	T	0	T	0
12/09/09	6.1		-0.9		2.6	10.2		9.6		26.2		5
12/10/09	-0.8		-9.5		-5.2	0		1.4		1		2
12/11/09	-6.4		-10.2		-8.3	0		0	T	0	T	2
12/12/09	1.7		-8.5		-3.4	0		0	T	0	T	1
12/13/09	3		-0.4		1.3	0.8		0	T	0.8		1
12/14/09	3.8		0.4		2.1	2.6		0		2.6		1
12/15/09	3		-5		-1	0		0.6		0.6		0
12/16/09	-3.6		-6.3		-5	0		0.6		0.4		0
12/17/09	-4.7		-11.7		-8.2	0		0	T	0	Prev. 5 days	0
12/18/09	-2.9		-7.1		-5	0		0	T	0	4.4	0
12/19/09	-3.3		-9.2		-6.3	0		0		0		0
12/20/09	1.1		-5.8		-2.4	0		0	T	0	T	0
12/21/09	-1.8		-6.7		-4.3	0		0	T	0	T	0
12/22/09	-5.7		-11.7		-8.7	0		0	T	0	T	0
12/23/09	-3.3		-9.9		-6.6	0		0	T	0	T	0
12/24/09	0.5		-7.3		-3.4	0		0.4		0.4		0
12/25/09	3.7		-0.1		1.8	15.6		0		15.6		0
12/26/09	4.4		-2.7		0.9	10.6		0		10.6		0
12/27/09	2		-2.2		-0.1	0		0	T	0	T	0
12/28/09	-1.6		-11.4		-6.5	0		1		0.6		0
12/29/09	-5.2		-15.7		-10.5	0		0.4		0.2		1
12/30/09	-1.2		-8.8		-5	0		0		0		1
12/31/09	2.7		-1.5		0.6	0.6		0	T	0.6		0
01/01/10	0.9		-10.4		-4.8	0		1.6		1.2		0
01/02/10	-10.2		-17.6		-13.9	0		0	T	0	T	1
01/03/10	-8.3		-15.5		-11.9	0		2		1.2		1

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
01/04/10	-7.1		-12.7		-9.9	0		0.8		0.4		2
01/05/10	-3.6		-11.1		-7.4	0		3		2		2
01/06/10	-2.1		-10.3		-6.2	0		0	T	0	T	5
01/07/10	-3		-7.3		-5.2	0		0	T	0	T	5
01/08/10	-7.3		-11.7		-9.5	0		1.4		0.8		5
01/09/10	-8.7		-14.6		-11.7	0		0		0		5
01/10/10	-3.8		-15.6		-9.7	0		0	T	0	T	4
01/11/10	-4.7		-7.8		-6.3	0		1.4		1.2		3
01/12/10	-5.7		-9.1		-7.4	0		0		0		4
01/13/10	0.4		-6.1		-2.9	0		0		0		4
01/14/10	4.8		-6		-0.6	0		0		0		3
01/15/10	4.1		1		2.6	0	T	0		0	T	0
01/16/10	2		-3.2		-0.6	0		0		0		0
01/17/10	2.7		-1.6		0.6	0		0		0		0
01/18/10	1		-2.9		-1	0		0		0		0
01/19/10	2		-3.8		-0.9	0		0.2		0.2		0
01/20/10	-1.8		-7.7		-4.8	0		0		0	Prev. 5 days	0
01/21/10	0.9		-8.9		-4	0		0		0	0.2	0
01/22/10	3.1		-5.3		-1.1	0		0		0		0
01/23/10	1.5		-3.8		-1.2	0		0		0		0
01/24/10	6		-1.3		2.4	6.2		0		6.2		0
01/25/10	6.7		0.2		3.5	10.8		0		10.8		0
01/26/10	0.3		-1.9		-0.8	0		0.2		0.2		0
01/27/10	-1.9		-5.8		-3.9	0		0.2		0.2		0
01/28/10	-3.9		-13.7		-8.8	0		0	T	0	T	0
01/29/10	-9.5		-17.7		-13.6	0		0	T	0	T	0
01/30/10	-9.4		-19		-14.2	0		0		0		0
01/31/10	-4.1		-13.5		-8.8	0		0	T	0	T	0
02/01/10	-3.3		-10.9		-7.1	0		0	T	0	T	0
02/02/10	-1.2		-9.9		-5.6	0		2.6		2		0
02/03/10	0.6		-6.1		-2.8	0		0.4		0.4		2
02/04/10	0.4		-10		-4.8	0		0		0		2
02/05/10	0.1		-6.8		-3.4	0		0		0		1
02/06/10	-5.4		-12		-8.7	0		0		0		1
02/07/10	-2.2		-11.9		-7.1	0		0		0		0
02/08/10	0.9		-11.4		-5.3	0		0		0		0
02/09/10	-3.8		-8.7		-6.3	0		0.2		0.2		0
02/10/10	-3.2		-7.6		-5.4	0		4.4		3.2		3
02/11/10	-1.4		-9.7		-5.6	0		0		0		3
02/12/10	-0.5		-11.5		-6	0		0		0		2
02/13/10	-1.2		-9.6		-5.4	0		0.6		0.6		0
02/14/10	-1.1		-3.8		-2.5	0		0	T	0	T	1
02/15/10	-1.4		-4.1		-2.8	0		0	T	0	T	0
02/16/10	0.6		-4.6		-2	0		0.2		0.2		0
02/17/10	0.6		-3.6		-1.5	0		2.2		1.8		0
02/18/10	1.4		-2.4		-0.5	0		0		0		1
02/19/10	4.1		-2		1.1	0		0		0		0
02/20/10	4.1		-5.6		-0.8	0		0		0		0
02/21/10	4.9		-5.7		-0.4	0		0		0		0
02/22/10	0.6		-6.1		-2.8	0		5		5		0
02/23/10	0.7		-3.8		-1.6	0	T	0.6		0.6		5
02/24/10	0.9		-5.4		-2.3	0		0	T	0	T	5
02/25/10	-0.4		-7.5		-4	0		3		2.8		3
02/26/10	-0.1		-6.3		-3.2	0		6.4		6.2		7
02/27/10	2.2		-0.7		0.8	0		1.8		1.8		8
02/28/10	3.1		0.2		1.7	0		0	T	0	T	4
03/01/10	2.5		-1.3		0.6	0		0		0		1
03/02/10	3		-3.4		-0.2	0		0		0		1
03/03/10	4.4		-3.1		0.7	0		0		0		0
03/04/10	3.8		-4.3		-0.3	0		0		0		0
03/05/10	3.9		-4.1		-0.1	0		0		0		0
03/06/10	9		-4		2.5	0		0		0		0
03/07/10	11.3		-2.7		4.3	0		0		0		0
03/08/10	14.2		-0.2		7	0		0		0		0
03/09/10	13		-0.1		6.5	0		0		0		0
03/10/10	9		-1.9		3.6	0	T	0		0	T	0
03/11/10	12.2		5.1		8.7	0		0		0		0
03/12/10	7.5		5.1		6.3	21.6		0		21.6		0
03/13/10	6.7		4		5.4	20.6		0		20.6		0
03/14/10	5.8		3.3		4.6	4		0		4		0
03/15/10	13.2		3		8.1	0	T	0		0	T	0
03/16/10	16		0.9		8.5	0		0		0		0
03/17/10	17.7		3.5		10.6	0		0		0		0
03/18/10	18.7		3.2		11	0		0		0		0
03/19/10	19.1		3.1		11.1	0		0		0		0

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
03/20/10	5.3		-1.2		2.1	0		0		0		0
03/21/10	5.3		-1.6		1.9	0		0	T	0	T	0
03/22/10	7.9		-0.8		3.6	4		0		4		0
03/23/10	3.7		0.2		2	3.6		0		3.6		0
03/24/10	15.4		-2		6.7	0		0		0		0
03/25/10	9		-3.1		3	0		0		0		0
03/26/10	0.9		-6.7		-2.9	0		0		0		0
03/27/10	4.6		-6.6		-1	0		0		0		0
03/28/10	6.9		0.9		3.9	7.8		0		7.8		0
03/29/10	8.8		-0.5		4.2	1		0		1		0
03/30/10	12.6		-2		5.3	0		0		0		0
03/31/10	14.7		0.3		7.5	0		0		0		0
04/01/10	19.3		6		12.7	0		0		0		0
04/02/10	24.3		7.6		16	0		0		0		0
04/03/10	21.9		7.2		14.6	0	T	0		0	T	0
04/04/10	18.1		5.8		12	0		0		0		0
04/05/10	23.1		9.9		16.5	0	T	0		0	T	0
04/06/10	13.3		8.7		11	7.2		0		7.2		0
04/07/10	17.2		8.4		12.8	14.4		0		14.4		0
04/08/10	11.6		3.7		7.7	10.8		0		10.8		0
04/09/10	4.1		1.3		2.7	0	T	0	T	0	T	0
04/10/10	13.3		-0.8		6.3	0	T	0		0	T	0
04/11/10	17.7		3.8		10.8	0		0		0		0
04/12/10	13.6		3.9		8.8	0		0		0	Prev. 5 days	0
04/13/10	14.9		4.1		9.5	0		0		0	10.8	0
04/14/10	16.5		2.2		9.4	0		0		0		0
04/15/10	19.9		5.6		12.8	0		0		0		0
04/16/10	21.6		4.6		13.1	0	T	0		0	T	0
04/17/10	7.9		3.2		5.6	0.2		0	T	0.2		0
04/18/10	14		3.9		9	0	T	0		0	T	0
04/19/10	16.2		3.4		9.8	0		0		0		0
04/20/10	18.2		4.4		11.3	0		0		0		0
04/21/10	19.1		3.4		11.3	0	T	0		0	T	0
04/22/10	12.6		1.7		7.2	0		0		0		0
04/23/10	15		0.9		8	0		0		0		0
04/24/10	18.1		3		10.6	0		0		0		0
04/25/10	12.7		9.3		11	3.6		0		3.6		0
04/26/10	17.5		5.3		11.4	0		0		0		0
04/27/10	10.6		2.8		6.7	0		0		0		0
04/28/10	14		4		9	0		0		0		0
04/29/10	19.5		3.5		11.5	0	T	0		0	T	0
04/30/10	20.9		10.6		15.8	0		0		0		0
05/01/10	23.2		12		17.6	1.8		0		1.8		0
05/02/10	24.4		15.2		19.8	1.2		0		1.2		0
05/03/10	24.8		14.9		19.9	1.6		0		1.6		0
05/04/10	21.2		12.6		16.9	0	T	0		0	T	0
05/05/10	27.2		11.8		19.5	5.4		0		5.4		0
05/06/10	15.5		7.2		11.4	0		0		0		0
05/07/10	13.1		5.7		9.4	26		0		26		0
05/08/10	12.5		2.2		7.4	3.2		0		3.2		0
05/09/10	10.6		0.7		5.7	0		0	T	0	T	0
05/10/10	13.7		0.9		7.3	0		0		0		0
05/11/10	10.8		2.2		6.5	3.8		0		3.8		0
05/12/10	11.6		4.6		8.1	0.8		0		0.8		0
05/13/10	12.2		3		7.6	5.8		0		5.8		0
05/14/10	20.9		7.2		14.1	0		0		0		0
05/15/10	14.5		7.6		11.1	0		0		0		0
05/16/10	19.5		6.4		13	0		0		0		0
05/17/10	20.9		6.5		13.7	0		0		0		0
05/18/10	20.1		10.2		15.2	0		0		0		0
05/19/10	24.4		8.1		16.3	0		0		0		0
05/20/10	28.7		12.5		20.6	0		0		0		0
05/21/10	21.3		12.5		16.9	0		0		0		0
05/22/10	20.1		15.6		17.9	0.4		0		0.4		0
05/23/10	24.1		14.2		19.2	0		0		0		0
05/24/10	27.2		13.8		20.5	0		0		0		0
05/25/10	28.8		15.9		22.4	0		0		0		0
05/26/10	31.7		18.1		24.9	0		0		0		0
05/27/10	30.9		17		24	0.4		0		0.4		0
05/28/10	26.7		17.6		22.2	0		0		0		0
05/29/10	26.3		16.6		21.5	0		0		0		0
05/30/10	30.7		14.8		22.8	0		0		0		0
05/31/10	27.9		16.8		22.4	0.6		0		0.6		0
06/01/10	27.9		15.3		21.6	5.4		0		5.4		0
06/02/10	27.2		14.5		20.9	33.2		0		33.2		0

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
06/03/10	20.8		16.3		18.6	4.8		0		4.8		0
06/04/10	23.7		13.5		18.6	4.4		0		4.4		0
06/05/10	25.4		15.7		20.6	4		0		4		0
06/06/10	18.9		11.4		15.2	19		0		19		0
06/07/10	19.8		9.7		14.8	0		0		0		0
06/08/10	20.3		7.5		13.9	0		0		0		0
06/09/10	15.3		12.6		14	11.8		0		11.8		0
06/10/10	20.9		13.3		17.1	0	T	0		0	T	0
06/11/10	23.1		13.2		18.2	0		0		0		0
06/12/10	18.4		16.2		17.3	3.4		0		3.4		0
06/13/10	21		16.5		18.8	0.2		0		0.2		0
06/14/10	24.5		16.4		20.5	0	T	0		0	T	0
06/15/10	23		13.6		18.3	0		0		0		0
06/16/10	26.1		14.6		20.4	16.2		0		16.2		0
06/17/10	24.4		13.6		19	0		0		0		0
06/18/10	26.8		13.4		20.1	0		0		0		0
06/19/10	29.9		18.7		24.3	0	T	0		0	T	0
06/20/10	27		17.4		22.2	0		0		0		0
06/21/10	26.1		16.8		21.5	0		0		0		0
06/22/10	24.4		18.3		21.4	19.8		0		19.8		0
06/23/10	29.5		18.3		23.9	0		0		0		0
06/24/10	27.1		17.4		22.3	9		0		9		0
06/25/10	25.2		14.7		20	0		0		0		0
06/26/10	22.3		17.4		19.9	7.2		0		7.2		0
06/27/10	24.1		17		20.6	53.2		0		53.2		0
06/28/10	29.6		16.3		23	0		0		0		0
06/29/10	19.8		10.7		15.3	0		0		0		0
06/30/10	20.5		8.9		14.7	0		0		0		0
07/01/10	22		10.4		16.2	0		0		0		
07/02/10	24.8		11.4		18.1	0		0		0		
07/03/10	30.3		14.8		22.6	0		0		0		
07/04/10	31.7		16.1		23.9	0		0		0		
07/05/10	34.1		22.3		28.2	0		0		0		
07/06/10	33.7		23.3		28.5	0		0		0		
07/07/10	33.3		23		28.2	0	T	0		0	T	
07/08/10	33.3		23.6		28.5	0		0		0		
07/09/10	25		18.8		21.9	19.8		0		19.8		
07/10/10	27.8		16.7		22.3	0		0		0		
07/11/10	28		16.5		22.3	11.6		0		11.6		
07/12/10	25.2		19.8		22.5	0	T	0		0	T	
07/13/10	27.8		20.3		24.1	0		0		0		
07/14/10	27.1		20.1		23.6	0		0		0		
07/15/10	29.3		20.5		24.9	1		0		1		
07/16/10	29.7		22		25.9	0.2		0		0.2		
07/17/10	31.4		18.2		24.8	0.8		0		0.8		
07/18/10	28.6		15.2		21.9	0	T	0		0	T	
07/19/10	26.8		19.2		23	1.8		0		1.8		
07/20/10	27.8		18.3		23.1	0		0		0		
07/21/10	31		19.1		25.1	0		0		0		
07/22/10	29.2		17.6		23.4	0.6		0		0.6		
07/23/10	30.3		17.3		23.8	39		0		39		
07/24/10	27.5		19.8		23.7	11.4		0		11.4		
07/25/10	26		17.9		22	0		0		0		
07/26/10	29		16.3		22.7	0		0		0		
07/27/10	28.7		16.1		22.4	0		0		0		
07/28/10	31		18.7		24.9	3.2		0		3.2		
07/29/10	24.6		15.8		20.2	0		0		0		
07/30/10	23.3		15.6		19.5	0		0		0		
07/31/10	24.2		13.5		18.9	0.2		0		0.2		
08/01/10	25.8		17.7		21.8	0		0		0		0
08/02/10	28		17.4		22.7	0	T	0		0	T	0
08/03/10	31.9		20.7		26.3	0		0		0		0
08/04/10	31.9		20.7		26.3	0	T	0		0	Prev. 5 days	
08/05/10	31		18.9		25	0		0		0	0.2	0
08/06/10	24.4		13.1		18.8	0	T	0		0	T	0
08/07/10	25		10.6		17.8	0		0		0		0
08/08/10	27.7		18.2		23	0.2		0		0.2		0
08/09/10	28.6		20.2		24.4	9.8		0		9.8		0
08/10/10	30.5		20.6		25.6	0		0		0		0
08/11/10	28.7		19.9		24.3	0		0		0		0
08/12/10	27.3		21.5		24.4	0		0		0		0
08/13/10	27.4		19.1		23.3	0		0		0		0
08/14/10	27.1		19.7		23.4	0		0		0		0
08/15/10	30.9		21.8		26.4	1.6		0		1.6		0
08/16/10	27.6		16.7		22.2	0		0		0		0

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
08/17/10	28.3		15.4		21.9	0		0		0		0
08/18/10	24		15.8		19.9	0		0		0		0
08/19/10	29.3		16		22.7	3		0		3		0
08/20/10	23.5		13.5		18.5	0		0		0		0
08/21/10	23.6		19.5		21.6	24		0		24		0
08/22/10	22.1		19.2		20.7	17.2		0		17.2		0
08/23/10	21.3		18.2		19.8	0	T	0		0	T	0
08/24/10	23.3		15.9		19.6	0		0		0		0
08/25/10	26.1		14.9		20.5	2.8		0		2.8		0
08/26/10	21.9		11.7		16.8	0		0		0		0
08/27/10	24.8		9.7		17.3	0		0		0		0
08/28/10	28.7		14.2		21.5	0		0		0		0
08/29/10	30.9		15.4		23.2	0		0		0		0
08/30/10	34.5		20		27.3	0		0		0		0
08/31/10	33.7		21.7		27.7	0		0		0		0
09/01/10	32.7		21.4		27.1	0		0		0		
09/02/10	30.4		22.6		26.5	4.2		0		4.2		
09/03/10	25.7		15.1		20.4	9.6		0		9.6		
09/04/10	17.2		10.8		14	0.4		0		0.4		
09/05/10	19.5		10		14.8	0		0		0		
09/06/10	22.7		11.5		17.1	1.4		0		1.4		
09/07/10	30.2		15.3		22.8	0		0		0		
09/08/10	19.3		14.2		16.8	0.2		0		0.2		
09/09/10	16.8		12.4		14.6	0	T	0		0	T	
09/10/10	20.7		11.8		16.3	0		0		0		
09/11/10	21		9.7		15.4	5.8		0		5.8		
09/12/10	22.1		13.6		17.9	0.4		0		0.4		
09/13/10	24.3		12.6		18.5	1.8		0		1.8		
09/14/10	20.5		9.7		15.1	0		0		0		
09/15/10	17.9		8.2		13.1	0		0		0		
09/16/10	14.4		11.4		12.9	27.2		0		27.2		
09/17/10	16.8		8.6		12.7	0		0		0		
09/18/10	21.9		10.7		16.3	0.6		0		0.6		
09/19/10	19		7.8		13.4	0		0		0		
09/20/10	18.4		6.9		12.7	0		0		0		
09/21/10	26.9		10.8		18.9	0	T	0		0	T	
09/22/10	22.8		11.6		17.2	6		0		6		
09/23/10	20.1		9.3		14.7	0		0		0		
09/24/10	30.8		15.8		23.3	0	T	0		0	T	
09/25/10	17.5		6.9		12.2	0	T	0		0	T	
09/26/10	15.7		6.3		11	0		0		0		
09/27/10	16		8.8		12.4	8		0		8		
09/28/10	18		11.8		14.9	23.2		0		23.2		
09/29/10	19.3		10		14.7	0		0		0		
09/30/10	18.5		12.6		15.6	0	T	0		0	T	
10/01/10	16.8		7.5		12.2	0		0		0		
10/02/10	11.6		6.1		8.9	1		0		1		
10/03/10	12.4		5.8		9.1	0		0		0		
10/04/10	12.4		4		8.2	1		0		1		
10/05/10	15.6		8.9		12.3	11.8		0		11.8		
10/06/10	17.1		9		13.1	0.4		0		0.4		
10/07/10	19.9		7.6		13.8	0		0		0		
10/08/10	23.6		7.5		15.6	0		0		0		
10/09/10	16.8		5.9		11.4	0		0		0		
10/10/10	22.6		3.9		13.3	0		0		0		
10/11/10	14.8		8.3		11.6	0		0		0		
10/12/10	13		4.1		8.6	0		0		0		
10/13/10	15.3		1.1		8.2	4.2		0		4.2		
10/14/10	11.5		4.4		8	12.4		0		12.4		
10/15/10	14		2.9		8.5	0		0		0		
10/16/10	15.6		4.6		10.1	0	T	0		0	T	
10/17/10	16.8		4.1		10.5	0		0		0		
10/18/10	12.5		2.7		7.6	0		0		0	Prev. 5 days	
10/19/10	14.2		2.6		8.4	0	T	0		0	12.4	
10/20/10	16.6		4.7		10.7	2.2		0		2.2		
10/21/10	8.2		2.2		5.2	0	T	0		0	T	
10/22/10	10.6		-0.2		5.2	0	T	0		0	T	
10/23/10	14.9		6.3		10.6	10.6		0		10.6		
10/24/10	11.4		8.3		9.9	5.4		0		5.4		
10/25/10	18.8		9.6		14.2	0		0		0		
10/26/10	20.6		12.5		16.6	7.8		0		7.8		
10/27/10	19.3		11.4		15.4	0		0		0		
10/28/10	14.5		6.9		10.7	0	T	0		0	T	
10/29/10	9.3		3.5		6.4	0.2		0		0.2		
10/30/10	14.1		5.2		9.7	0		0		0		

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
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Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
10/31/10	6		-1.2		2.4	0		0.2		0.4		
11/01/10	7.1		-1.6		2.8	0		0		0		
11/02/10	8.2		-2.4		2.9	0		0		0		
11/03/10	10.4		-2.8		3.8	0.8		0		0.8		
11/04/10	8.9		4.8		6.9	1.8		0		1.8		
11/05/10	5.8		-0.2		2.8	2.8		0		2.8		
11/06/10	5.2		-1.6		1.8	0		0		0		
11/07/10	10.1		0.9		5.5	0		0		0		
11/08/10	10.3		-2		4.2	0		0		0		
11/09/10	9.7		0		4.9	0		0		0		
11/10/10	11.1		0.2		5.7	0		0		0		
11/11/10	10.9		0.2		5.6	0		0		0		
11/12/10	12.3		-1.1		5.6	0		0		0		
11/13/10	12.2		-1.7		5.3	0		0		0		
11/14/10	10.9		2.7		6.8	0.6		0		0.6		
11/15/10	12.1		2.1		7.1	0	T	0		0	T	
11/16/10	10.6		1.2		5.9	26.6		0		26.6		
11/17/10	10		2.4		6.2	1.2		0		1.2		
11/18/10	7.5		-1.2		3.2	0.8		0		0.8		
11/19/10	6.7		-1.9		2.4	0		0		0		
11/20/10	6.8		-0.4		3.2	0		0		0		
11/21/10	8.5		-1.6		3.5	0		0	T	0	T	
11/22/10	15.9		8.5		12.2	2		0		2		
11/23/10	16.5		0.9		8.7	5.8		0		5.8		
11/24/10	3.1		-1.2		1	0		0		0		
11/25/10	6.5		0.4		3.5	7.2		0		7.2		
11/26/10	6.8		-2.2		2.3	1.4		0	T	1.4		
11/27/10	4.1		-1.7		1.2	0		0	T	0	T	
11/28/10	2.3		-1.3		0.5	0		0		0		
11/29/10	6.3		-4		1.2	0		0		0		
11/30/10	11.7		4.2		8	15.2		0		15.2		
12/01/10	8.4		-0.9		3.8	10.4		0	T	10.4		
12/02/10	1.1		-1.3		-0.1	0		0	T	0	T	
12/03/10	4		-3.2		0.4	0		0		0		
12/04/10	-0.6		-6.1		-3.4	0		0	T	0	T	
12/05/10	1.2		-6.6		-2.7	0		0	T	0	T	
12/06/10	-2.8		-5.2		-4	0		1.8		1.8		0
12/07/10	-2.1		-6.8		-4.5	0		0	T	0	T	2
12/08/10	-2.8		-11.1		-7	0		0		0		1
12/09/10	-3.2		-13.8		-8.5	0		0		0		0
12/10/10	2.7		-3.3		-0.3	0.4		0	T	0.4		0
12/11/10	4.1		0.5		2.3	0		0		0		0
12/12/10	3.8		-8.5		-2.4	19		1		20		0
12/13/10	-8.3		-13.9		-11.1	0		0.8		0.8		1
12/14/10	-7.6		-11.6		-9.6	0		1.8		1.6		1
12/15/10	-4.3		-12.7		-8.5	0		1		0.8		2
12/16/10	-2.6		-7.2		-4.9	0		0	T	0	T	2
12/17/10	-0.6		-4.2		-2.4	0.2		0	T	0.2		1
12/18/10	-3.2		-7		-5.1	0		0	T	0	T	1
12/19/10	-3.7		-5.6		-4.7	0		0.6		0.6		1
12/20/10	-0.6		-6.7		-3.7	0		0	T	0	T	1
12/21/10	-3.4		-9.9		-6.7	0		0		0		
12/22/10	-2.9		-7.6		-5.3	0		0		0		1
12/23/10	-1.8		-6.1		-4	0		0	T	0	T	1
12/24/10	-2.8		-6.6		-4.7	0		0	T	0	T	1
12/25/10	-5		-7.2		-6.1	0		0		0		1
12/26/10	-5.4		-10.7		-8.1	0		0		0		1
12/27/10	-1.6		-10.8		-6.2	0		0		0		1
12/28/10	-0.2		-5.1		-2.7	0		0	T	0	T	0
12/29/10	-0.3		-5.7		-3	0		0	T	0	T	0
12/30/10	4.2		-7.9		-1.9	0	T	0		0	T	0
12/31/10	10		3.7		6.9	0.2		0		0.2		
01/01/11	12		-1.3		5.4	8.6		0		8.6		
01/02/11	-1.1		-5.5		-3.3	0		0	T	0	T	
01/03/11	0.1		-6.5		-3.2	0		0	T	0	T	
01/04/11	1.3		-3.2		-1	0.4		0		0.4		0
01/05/11	-1		-8.9		-5	0		0		0		0
01/06/11	-2.1		-9		-5.6	0		4.8		4.4		0
01/07/11	-4.3		-10.6		-7.5	0		4.2		1.6		4
01/08/11	-5.3		-10.5		-7.9	0		11.2		6.4		12
01/09/11	-4.4		-11.1		-7.8	0		0	T	0		17
01/10/11	-3.8		-13		-8.4	0		0		0		16
01/11/11	-4.7		-10		-7.4	0		2.8		2.4		16
01/12/11	-7		-11		-9	0		1.8		1.8		19
01/13/11	-5.7		-13		-9.4	0		0	T	0	T	19

Pearson Airport Daily Weather Data

Station Name	TORONTO LESTER B. PEARSON	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.68	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.63	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	173.4	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6158733	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
01/14/11	-2.2		-8.6		-5.4	0		0.2		0.2		18
01/15/11	-2.3		-8.3		-5.3	0		5.8		5.4		18
01/16/11	-5.7		-18.3		-12	0		0		0		21
01/17/11	-2.2		-21.2		-11.7	0		5.2		2.4		21
01/18/11	3.4		-2.6		0.4	2.8		0	T	2.8		21
01/19/11	-2.6		-11.6		-7.1	0		0.2		0.2		8
01/20/11	-5.6		-14.9		-10.3	0		1.8		1.6		8
01/21/11	-6.1		-15.3		-10.7	0		1		0.6		10
01/22/11	-9.1		-16.4		-12.8	0		0.8		0.8		10
01/23/11	-11.8		-20.2		-16	0		0.2		0.2		10
01/24/11	-5.3		-20.7		-13	1		1.6		2.2		10
01/25/11	-0.5		-6		-3.3	0		0	T	0	T	12
01/26/11	-1.3		-3.2		-2.3	0		0	T	0	T	12
01/27/11	-0.8		-4.6		-2.7	0		0	T	0	T	9
01/28/11	-1.3		-5.8		-3.6	0		0	T	0	T	8
01/29/11	-4.7		-10.2		-7.5	0		0	T	0	T	7
01/30/11	-4.4		-14.4		-9.4	0		0		0		7
01/31/11	-10.4		-18.6		-14.5	0		0		0		7
02/01/11	-7.1		-11.8		-9.5	0		1.6		1		7
02/02/11	-8.4		-14.9		-11.7	0		12.8		9.4		15
02/03/11	-3.8		-17.1		-10.5	0		0		0		21
02/04/11	-4.6		-10.2		-7.4	0		0		0		20
02/05/11	-0.9		-9.1		-5	0		11.6		9.8		20
02/06/11	0.6		-3.2		-1.3	0		2.6		1.4		17
02/07/11	0.4		-10.6		-5.1	0		1.2		0.7		17
02/08/11	-9.6		-16		-12.8	0		0	T	0	T	16
02/09/11	-6.3		-13.7		-10	0		0		0		17
02/10/11	-9.2		-15.3		-12.3	0		0		0		17
02/11/11	-4.4		-18		-11.2	0		0	T	0	T	16
02/12/11	-1.9		-7		-4.5	0		0.2		0	T	16
02/13/11	6.8		-6.1		0.4	0		0.2		0.2		16
02/14/11	6.8		-10.3		-1.8	0	T	0		0	T	12
02/15/11	-3.6		-13.6		-8.6	0		0		0		8
02/16/11	5.5		-6.3		-0.4	0		0	T	0	Prev. 5 days	5
02/17/11	**11.3**		-1		5.2	1.2		0		1.2	1.4	3
02/18/11	**10.8**		-1		4.9	0		0	T	0		0
02/19/11	-0.9		-6.7		-3.8	0		0	T	0	T	0
02/20/11	-3.3		-10.1		-6.7	0		4.6		4.2		0
02/21/11	-5.8		-11.8		-8.8	0		0	T	0	T	5
02/22/11	-3.7		-14.2		-9	0		0		0		2

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
01/01/09	-0.8		-16.2		-8.5	0		0		0		5
01/02/09	0.5		-5.5		-2.5	0		0	T	0	T	0
01/03/09	-2.5		-6		-4.3	0		0		0		0
01/04/09	1		-10.5		-4.8	0	T	0		0	T	0
01/05/09	-3		-5.5		-4.3	0		0		0		0
01/06/09	0.5		-8.2		-3.9	0		0		0		0
01/07/09	1		-5.5		-2.3	0		4		11.2		12
01/08/09	-4		-6.8		-5.4	0		0		0		13
01/09/09	-4		-12		-8	0		0.2		0.2		11
01/10/09	-6		-11		-8.5	0		11		11		13
01/11/09	-4.5		-15		-9.8	0		0		0		24
01/12/09	0		-12		-6	0		3		3		0
01/13/09	1		-7.5		-3.3	0		0		0		15
01/14/09	-12		-20.5		-16.3	0		6		6		14
01/15/09	-10		-17.5		-13.8	0		0		0		20
01/16/09	-11.8		-18.5		-15.2	0		0		0		20
01/17/09	-3		-21		-12	0		12		8.2		20
01/18/09	-3.5		-10.2		-6.9	0		3		1.2		29
01/19/09	-5.5		-8		-6.8	0		0	T	1		32
01/20/09	-8		-13		-10.5	0		0		0		26
01/21/09	-4		-19		-11.5	0		0		0		0
01/22/09	-1.5		-7		-4.3	0		0		0		24
01/23/09	4		-4		0	0		0		0		23
01/24/09	-10		-16.5		-13.3	0		0		0		0
01/25/09	-8		-15.5		-11.8	0		0		0		22
01/26/09	-8		-18		-13	0		0		0		22
01/27/09	-4		-14.4		-9.2	0		6.9		6.9		22
01/28/09	-3		-7.5		-5.3	0		10.1		10.1		24
01/29/09	-3		-11		-7	0		1		1		35
01/30/09	-4.5		-7		-5.8	0		0		0.5		34
01/31/09	1.5		-14.8		-6.7	0		0	T	0	T	34
02/01/09	5.5		-8.5		-1.5	0		0		0		34
02/02/09	3		-6		-1.5	0		0	T	0	T	28
02/03/09	-2.6		-11.2		-6.9	0		3		3		27
02/04/09	-10.8		-14		-12.4	0		0	T	0	T	30
02/05/09	-8.7		-22		-15.4	0		0		30.5		30
02/06/09	4.5		-12.5		-4	0		0		59.5		0
02/07/09	8.5		-9		-0.3	0		0		7		0
02/08/09	4		1		2.5	0		0		6		0
02/09/09	3		-5.5		-1.3	0.7		0		0.7		6
02/10/09	11		0		5.5	0	T	0		0	T	2
02/11/09	8.5		5		6.8	33.3		0		33.3		0
02/12/09	5		3		4	0		0		0		0
02/13/09	1		-6		-2.5	0		0		0		0
02/14/09	-0.6		-7.5		-4.1	0		0		0		0
02/15/09	2.9		-8.5		-2.8	0		0		0		0
02/16/09	2		-6.5		-2.3	0		0		0		0
02/17/09	2		-7		-2.5	0		1		1		0
02/18/09	1		-1		0	0.5		3		6.4		1
02/19/09	-3		-5.5		-4.3	0		0		0		2
02/20/09	-1.3		-7		-4.2	0		0	T	0	T	1
02/21/09	-0.8		-9.5		-5.2	0		5		5.4		0
02/22/09	-2		-5.1		-3.6	0		0		0		6
02/23/09	-4.8		-11		-7.9	0		0		0		5
02/24/09	-1.5		-15		-8.3	0		0		0		4
02/25/09	4		-6.5		-1.3	0.8		0.5		2.6		
02/26/09	9.5		1		5.3	9.2		0		9.2		
02/27/09	9.5		-5		2.3	4		0		4		0
02/28/09	-7.8		-16		-11.9	0		0		0		0
03/01/09	-4		-10.5		-7.3	0		0		0		0
03/02/09	-9		-15		-12	0		0		0		0
03/03/09	-3.5		-15.5		-9.5	0		0		0		0
03/04/09	1.2		-12		-5.4	0		0		0		0
03/05/09	12.5		-7.2		2.7	0		0		0		0
03/06/09	19		2		10.5	0		0		0		0
03/07/09	4.5		-1		1.8	16.2		0		16.2		0
03/08/09	4		1		2.5	11		0	T	22		0
03/09/09	5		0.2		2.6	0.2		0		0.2		0
03/10/09	10.5		0		5.3	13.1		0		13.1		0
03/11/09	6		0		3	0		0		0		0
03/12/09	-1.5		-7		-4.3	0		0		0		0
03/13/09	-0.5		-9.5		-5	0		0		0		0
03/14/09	7		-6		0.5	0		0		0		0
03/15/09	9.5		-3		3.3	0		0		0		0
03/16/09	8		-1.5		3.3	0		0		0		0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
03/17/09	13.2		-0.5		6.4	0		0		0		0
03/18/09	16		8		12	0		0		0		0
03/19/09	5		0		2.5	0		0		0		0
03/20/09	2		-5.2		-1.6	0		0		0		0
03/21/09	6.2		-5.5		0.4	0		0		0		0
03/22/09	5.5		2.5		4	0		0		0		0
03/23/09	2.5		-5.8		-1.7	0		0		0		0
03/24/09	4		-3.5		0.3	0		0		0		0
03/25/09	6.5		0.5		3.5	1.9		0		1.9		0
03/26/09	10.5		3.5		7	0.2		0		0.2		0
03/27/09	12.5		0.5		6.5	0		0		0		0
03/28/09	12		1.5		6.8	0		0		0		0
03/29/09												
03/30/09	6		0.5		3.3	0		0		0		0
03/31/09	5.2		-3.2		1	0.4		0		0.4		0
04/01/09	14.5		-1.2		6.7	1.8		0		1.8		0
04/02/09	15		1		8	13.5		0		13.5		0
04/03/09	9		6		7.5	27.4		0		27.4		0
04/04/09	6.5		3		4.8	0		0		0		0
04/05/09	11		0.5		5.8	4.8		0	T	4.8		0
04/06/09	2		0		1	14		4		36		0
04/07/09	0.5		-4.5		-2	0		0		0		1
04/08/09	10		-3.5		3.3	0		0		0		0
04/09/09	12.5		0		6.3	0		0		0		0
04/10/09	7.8		-0.6		3.6	0		0		0		0
04/11/09	9.5		0.5		5	0		0		0		0
04/12/09	8		-1		3.5	0		0		0		0
04/13/09		M	-1.5			0		0		0		0
04/14/09	10		3		6.5	0		0		0		0
04/15/09	12		4		8	0		0		0		0
04/16/09	14		4.4		9.2	0		0		0		0
04/17/09	21.3		3		12.2	0		0		0		0
04/18/09	22		10		16	0		0		0		0
04/19/09	10		5		7.5	6.2		0		6.2		0
04/20/09	9.2		4		6.6	25.4		0		25.4		0
04/21/09	11.5		4		7.8	1.6		0		1.6		0
04/22/09	8		4		6	0		0		0		0
04/23/09	12.5		3		7.8	0		0		0		0
04/24/09	21		4.5		12.8	0		0		0		0
04/25/09	28		10		19	11.4		0		11.4		0
04/26/09	11		7		9	0.4		0		0.4		0
04/27/09	28		6.5		17.3	11.2		0		11.2		0
04/28/09	12		8.3		10.2	5		0		5		0
04/29/09	11		5		8	0		0		0		0
04/30/09	17.5		6.5		12	22.8		0		22.8		0
05/01/09	20.5		8		14.3	0.1		0		0.1		0
05/02/09	15.5		3		9.3	0.6		0		0.6		0
05/03/09	20		4.5		12.3	0		0		0		0
05/04/09	16.1		6.4		11.3	0		0		0	Prev. 5 days	0
05/05/09	15		7.5		11.3	0		0		0	23.5	0
05/06/09	16		7.5		11.8	4.4		0		4.4		0
05/07/09	20.5		12		16.3	0	T	0		0	T	0
05/08/09	25		12.5		18.8	0		0		0		0
05/09/09	20		9.5		14.8	8		0		8		0
05/10/09	12.5		5.5		9	0		0		0		0
05/11/09	14		1		7.5	0		0		0		0
05/12/09	16.8		4		10.4	0		0		0		0
05/13/09	17		6		11.5	0.6		0		0.6		0
05/14/09	22.5		12		17.3	0.2		0		0.2		0
05/15/09	16		7.1		11.6	6		0		6		0
05/16/09	20.5		9		14.8	2.4		0		2.4		0
05/17/09	13		1.5		7.3	0		0		0		0
05/18/09	15		1.5		8.3	0		0		0		0
05/19/09	22.5		5		13.8	0		0		0		0
05/20/09	27.8		13.2		20.5	0		0		0		0
05/21/09	29		14.5		21.8	0		0		0		0
05/22/09	23		15		19	0		0		0		0
05/23/09	17.4		12		14.7	0	T	0		0	T	0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
05/24/09	23		14.2		18.6	0		0		0		0
05/25/09	18.5		8.5		13.5	0		0		0		0
05/26/09	12		8.5		10.3	1		0		1		0
05/27/09	14.8		9		11.9	11.1		0		11.1		0
05/28/09	16		10.5		13.3	4		0		4	Prev. 5 days	0
05/29/09	23.5		11.5		17.5	4.1		0		4.1	20.2	0
05/30/09	20.5		6.5		13.5	0.6		0		0.6		0
05/31/09	13.5		4		8.8	0		0		0		0
06/01/09	18		8		13	0	T	0		0	T	0
06/02/09	16.5		9		12.8	0		0		0		0
06/03/09	20		7.5		13.8	0		0		0		0
06/04/09	18.5		6		12.3	0		0		0		0
06/05/09	19		9		14	0		0		0		0
06/06/09	24		11		17.5	0.2		0		0.2		0
06/07/09	17		12		14.5	0		0		0		0
06/08/09	16		11.5		13.8	9.2		0		9.2		0
06/09/09	18.5		10.5		14.5	0		0		0		0
06/10/09	19.5		8.9		14.2	0		0		0		0
06/11/09	20		10.9		15.5	1.7		0		1.7		0
06/12/09	23.5		13.5		18.5	0		0		0		0
06/13/09	23.9		13.5		18.7	0		0		0		0
06/14/09	25		10		17.5	0		0		0		0
06/15/09	24		13.5		18.8	0		0		0		0
06/16/09	22.7		14		18.4	0		0		0		0
06/17/09	18.5		16		17.3	14.7		0		14.7	Prev. 5 days	0
06/18/09	18		13		15.5	0.7		0		0.7	15.4	0
06/19/09	24		12.4		18.2	6.2		0		6.2		0
06/20/09	24		14.5		19.3	8.3		0		8.3		0
06/21/09	28		14.5		21.3	0		0		0		0
06/22/09	25.5		17		21.3	0		0		0		0
06/23/09	28.5		17.8		23.2	0		0		0		0
06/24/09	31.5		18		24.8	0		0		0		0
06/25/09	30		20.5		25.3	5		0		5		0
06/26/09	29		19		24	0		0		0		0
06/27/09	29		15.5		22.3	0	T	0		0	T	0
06/28/09	24		16.9		20.5	13.4		0		13.4		0
06/29/09	25.5		14.5		20	7.4		0		7.4		0
06/30/09	22		16		19	15.8		0		15.8		0
07/01/09	23		17.5		20.3	0	T	0		0	T	0
07/02/09	23		16.5		19.8	15		0		15		0
07/03/09	23.2		15		19.1	0		0		0		0
07/04/09	23		12		17.5	0		0		0		0
07/05/09	25		11.5		18.3	0		0		0		0
07/06/09	24		14		19	0		0		0		0
07/07/09	19.2		14		16.6	0		0		0		0
07/08/09	24		12		18	0		0		0		0
07/09/09	22.5		15		18.8	0		0		0		0
07/10/09	26		15		20.5	0		0		0		0
07/11/09	28		18		23	13		0		13		0
07/12/09	23.5		10		16.8	0		0		0		0
07/13/09	23.5		11		17.3	0		0		0		0
07/14/09	26		11		18.5	0		0		0		0
07/15/09	23.5		11.5		17.5	0.8		0		0.8		0
07/16/09	28		15.5		21.8	0		0		0		0
07/17/09	22		15.5		18.8	1		0		1		0
07/18/09	23		11.5		17.3	0		0		0		0
07/19/09	23		12.5		17.8	0		0		0		0
07/20/09	24.5		12.5		18.5	0		0		0		0
07/21/09	21		16		18.5	10.2		0		10.2		0
07/22/09												
07/23/09												
07/24/09	26		17		21.5	5.6		0		5.6		0
07/25/09	23		17.9		20.5	26.8		0		26.8		0
07/26/09	23.4		16.5		20	18.6		0		18.6		0
07/27/09	26.5		16		21.3	1		0		1		0
07/28/09	28		19.5		23.8	12		0		12		0
07/29/09	23		17.5		20.3	0.5		0		0.5		0
07/30/09												
07/31/09												
08/01/09	27.5		14		20.8	0		0		0		0
08/02/09	26		18.4		22.2	0		0		0		0
08/03/09	25.5		12.7		19.1	0		0		0		0
08/04/09	28		20.1		24.1	0		0		0		0
08/05/09	25.5		11		18.3	0		0		0		0
08/06/09	25		14.5		19.8	0		0		0		0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
08/07/09	23		13		18	0		0		0		0
08/08/09												
08/09/09												
08/10/09	31		18		24.5	0		0		0		0
08/11/09	27		18.6		22.8	4.2		0		4.2		0
08/12/09	25.9		12.5		19.2	0		0		0		0
08/13/09	28		18		23	0		0		0		0
08/14/09	28.5		17.5		23	0		0		0		0
08/15/09	30.5		19		24.8	0		0		0		0
08/16/09	31		19		25	0		0		0		0
08/17/09												
08/18/09												
08/19/09												
08/20/09												
08/21/09	27.1		20.5		23.8	0.6		0		0.6		0
08/22/09												
08/23/09	23.5		16		19.8	0		0		0		0
08/24/09	25		14		19.5	0		0		0		0
08/25/09	26.5		14		20.3	3.6		0		3.6		0
08/26/09												
08/27/09												
08/28/09	18.8		15.4		17.1	28.4		0		28.4		0
08/29/09	22		16.1		19.1	0.4		0		0.4		0
08/30/09	19.5		14		16.8	0		0		0		0
08/31/09	21.8		10.2		16	0		0		0		0
09/01/09	22		10		16	0		0		0		0
09/02/09	23		11		17	0		0		0		0
09/03/09	24		12.5		18.3	0		0		0		0
09/04/09	26		14		20	0		0		0		0
09/05/09	23.4		13		18.2	0		0		0		0
09/06/09	23		16		19.5	0		0		0		0
09/07/09	23		17		20	0		0		0		0
09/08/09	23.5		17		20.3	0		0		0		0
09/09/09	23		16.5		19.8	0		0		0		0
09/10/09	23		15		19	0		0		0		0
09/11/09	20		14.5		17.3	0		0		0		0
09/12/09	23.8		13		18.4	0		0		0		0
09/13/09	26.6		12.5		19.6	0		0		0		0
09/14/09	26.2		12.7		19.5	0		0		0		0
09/15/09	24		16		20	0		0		0		0
09/16/09	18.8		9.8		14.3	0		0		0		0
09/17/09	20.3		11.5		15.9	0		0		0		0
09/18/09	21.5		9		15.3	0		0		0		0
09/19/09	17		6.5		11.8	0		0		0		0
09/20/09	20		7		13.5	0		0		0		0
09/21/09	22		15		18.5	3		0		3		0
09/22/09	23.9		19.2		21.6	0	T	0		0	T	0
09/23/09	27.5		18.8		23.2	0	T	0		0	Prev. 5 days	0
09/24/09	22		14		18	0		0		0	3	0
09/25/09	15.9		11		13.5	0		0		0		0
09/26/09												
09/27/09	21		14.5		17.8	8.2		0		8.2		0
09/28/09	18.4		12.8		15.6	3.2		0		3.2		0
09/29/09	17		11		14	0.3		0		0.3		0
09/30/09	12.5		6		9.3	0	T	0		0	T	0
10/01/09	13.7		5.6		9.7	0		0		0		0
10/02/09	12.1		6		9.1	14.9		0		14.9		0
10/03/09	17		7		12	3.2		0		3.2		0
10/04/09	14		7		10.5	1.2		0		1.2		0
10/05/09	16		7		11.5	0.3		0		0.3		0
10/06/09	15		5.1		10.1	7.4		0		7.4		0
10/07/09	13.5		9.5		11.5	0		0		0		0
10/08/09	18		5.5		11.8	4.8		0		4.8		0
10/09/09	11.5		9.5		10.5	19.2		0		19.2		0
10/10/09	14.9		6.5		10.7	0		0		0		0
10/11/09	9.7		0.5		5.1	0		0		0		0
10/12/09	6.5		-0.5		3	0.5		0		0.5		0
10/13/09	11.5		4.5		8	0		0		0		0
10/14/09	7.8		0.5		4.2	0		0		0		0
10/15/09	4.2		0.5		2.4	0		0		0		0
10/16/09	6.3		0.5		3.4	0		0		0		0
10/17/09	8		1		4.5	0		0		0		0
10/18/09	10.5		0		5.3	0		0		0		0
10/19/09	15.3		-1.2		7.1	0		0		0		0
10/20/09	18.8		9.1		14	0		0		0		0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
10/21/09	15		10		12.5	1.4		0		1.4		0
10/22/09	17.5		9		13.3	3		0		3		0
10/23/09	12		3.5		7.8	21.1		0		21.1		0
10/24/09	13.5		6.8		10.2	0		0		0		0
10/25/09	14		4		9	0		0		0		0
10/26/09	10.5		5.5		8	0		0		0		0
10/27/09	16.5		7.5		12	1.5		0		1.5		0
10/28/09	11.8		9.5		10.7	1.6		0		1.6		0
10/29/09	11		9.1		10.1	0.2		0		0.2		0
10/30/09	17		8.5		12.8	8.1		0		8.1		0
10/31/09	12.5		10.5		11.5	0		0		0		0
11/01/09	10.5		5		7.8	0		0		0		0
11/02/09	11		0.5		5.8	1.6		0		1.6		0
11/03/09	10		3		6.5	0	T	0		0	T	0
11/04/09	6.5		-1		2.8	4		0		4		0
11/05/09	7		2.5		4.8	0	T	0		0	T	0
11/06/09	10.9		-1		5	0		0		0		0
11/07/09												
11/08/09											Prev. 5 days	
11/09/09	19.5		5.3		12.4	0		0		0	4	0
11/10/09	14		6		10	0		0		0		0
11/11/09	8		1		4.5	0		0		0		0
11/12/09	9.2		1		5.1	0		0		0		0
11/13/09	9.6		0.5		5.1	0		0		0		0
11/14/09	13		5		9	0		0		0		0
11/15/09	11.1		5.5		8.3	0		0		0		0
11/16/09	8.7		1		4.9	0		0		0		0
11/17/09	7.5		0		3.8	0		0		0	Prev. 5 days	0
11/18/09											0	
11/19/09											Prev. 5 days	
11/20/09											0	
11/21/09												
11/22/09	10		5.8		7.9	0		0		0		0
11/23/09	8.9		4.5		6.7	0	T	0		0	T	0
11/24/09												
11/25/09												
11/26/09	9.5		6		7.8	0.9		0		0.9		0
11/27/09	6.5		0.5		3.5	2.5		0		2.5		0
11/28/09												
11/29/09	7.5		-2		2.8	6.6		0		6.6		0
11/30/09	5.5		-3		1.3	0.5		0.5		1		0
12/01/09	8		0.5		4.3	0		0		0		0
12/02/09	10.5		1.5		6	26.2		0		26.2		0
12/03/09	7.3		6.1		6.7	0		0		0		0
12/04/09	4		-0.5		1.8	0		0		0		0
12/05/09												
12/06/09												
12/07/09												
12/08/09												
12/09/09	6.4		0		3.2	10.2		0		12.2		2
12/10/09												
12/11/09												
12/12/09												
12/13/09												
12/14/09												
12/15/09	2		-6		-2	0		0	T	0.6		0
12/16/09	-3		-6.5		-4.8	0		0.5		0.5		0
12/17/09	-4		-11		-7.5	0		0		0	Prev. 5 days	0
12/18/09	-2.5		-7.5		-5	0		0		0	1.1	0
12/19/09												
12/20/09												
12/21/09	-1.4		-4.9		-3.2	0		0		0		0
12/22/09	-4.4		-10.5		-7.5	0		0	T	0	T	0
12/23/09	-3		-11		-7	0		0		0		0
12/24/09	1.5		-7.5		-3	0		0	T	0	T	0
12/25/09	4		-1		1.5	22.6		0		22.6		0
12/26/09	3		1		2	1		0		1		0
12/27/09												
12/28/09												
12/29/09	-6.4		-14.8		-10.6	0		0		0		0
12/30/09	1		-9.1		-4.1	0		0		0		0
12/31/09	3		-3.5		-0.3	0.7		0	T	0.7		0
01/01/10	-1.5		-4		-2.8	0		0.5		0.8		0
01/02/10	-9.5		-16.5		-13	0		0	T	0.5		0
01/03/10	-7		-13		-10	0		4.6		3.1		0

Oakville Town Daily Weather Data

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Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
01/04/10	-6		-12		-9	0		1		0.5		6
01/05/10	-4		-10		-7	0		1		1.6		6
01/06/10	-1.5		-8		-4.8	0		0	T	0	T	7
01/07/10	-1		-4.2		-2.6	0		2.2		1.6		6
01/08/10	-6.3		-10		-8.2	0		0	T	0	T	5
01/09/10	-6		-14.2		-10.1	0		0		0		4
01/10/10	-2.5		-15.5		-9	0		0		0		0
01/11/10	-4		-7.5		-5.8	0		0	T	0	T	2
01/12/10	-3		-8.5		-5.8	0		0		0		3
01/13/10	0.5		-8.5		-4	0		0		0		2
01/14/10	5.5		-6.5		-0.5	0		0		0		2
01/15/10	4.5		-16.5		-6	0		0		0		0
01/16/10	2		0		1	0		0		0		0
01/17/10	2.1		-1.5		0.3	0	T	0		0	T	0
01/18/10	1.6		-1		0.3	0		0		0		0
01/19/10	2		-4.5		-1.3	0		0	T	0	T	0
01/20/10	-1		-6		-3.5	0		0		0	Prev. 5 days	0
01/21/10	0.9		-8		-3.6	0		0		0	0	0
01/22/10	1.5		-1		0.3	0		0		0		0
01/23/10	3		-2.5		0.3	0		0		0		0
01/24/10	4.5		-0.5		2	19.4		0		19.4		0
01/25/10	6		1		3.5	0		0	T	0	T	0
01/26/10	0.6		-0.5		0.1	0		0	T	4.8		0
01/27/10	-3		-4		-3.5	0		0	T	0	T	0
01/28/10	-6		-10.5		-8.3	0		2		2		0
01/29/10	-9.5		-15		-12.3	0		0		0		1
01/30/10	-8		-19.2		-13.6	0		0	T	0	T	0
01/31/10	-2		-15.5		-8.8	0		0	T	0	T	1
02/01/10	-3		-5		-4	0		0		0		0
02/02/10	-2		-9		-5.5	0		0	T	0	T	0
02/03/10	1		-5.5		-2.3	0	T	0	T	0	T	0
02/04/10	0.9		-10		-4.6	0		0		0		0
02/05/10												
02/06/10												
02/07/10	-1.5		-11		-6.3	0		0		0		0
02/08/10	0		-11.3		-5.7	0		0		0		0
02/09/10	-3.5		-6		-4.8	0		4.5		4.5		0
02/10/10	-2		-5		-3.5	0		0	T	1		4
02/11/10	-0.5		-12		-6.3	0		0		0		4
02/12/10	0		-11		-5.5	0		0		0		0
02/13/10	-0.5		-8.1		-4.3	0		0.5		0.5		1
02/14/10	-0.5		-4		-2.3	0		0		0		1
02/15/10	-1		-3		-2	0		0	T	0	T	1
02/16/10	1		-5		-2	0		0	T	0	T	1
02/17/10	1		-4		-1.5	0		0	T	0	T	0
02/18/10	1.8		-3		-0.6	0		0		0		0
02/19/10	4		0		2	0		0		0		0
02/20/10	3		-4.8		-0.9	0		0		0		0
02/21/10	5.5		-6.5		-0.5	0		0		0		0
02/22/10	0.8		-4.5		-1.9	0.7		8.5		9.4		0
02/23/10	1.1		-0.5		0.3	0		0.5		0.5		8
02/24/10	2.5		-6		-1.8	0		0	T	0.2		9
02/25/10	-3.8		-5.5		-4.7	0		5		5		4
02/26/10	1		-7		-3	0		6		5		9
02/27/10	3		0.5		1.8	0		2.5		3.9		13
02/28/10	5		0.5		2.8	0	T	0	T	0	T	10
03/01/10	4.5		0		2.3	0		0		0		8
03/02/10	4		-2.5		0.8	0		0		0		4
03/03/10	4.8		-2		1.4	0		0		0		0
03/04/10	4.1		-3		0.6	0		0		0		0
03/05/10	4.5		-3		0.8	0		0		0		0
03/06/10	9		-4		2.5	0		0		0		0
03/07/10	11.5		-1		5.3	0		0		0		0
03/08/10	14.4		1		7.7	0		0		0		0
03/09/10	13.4		0.8		7.1	0		0		0		0
03/10/10	7		-1		3	0		0		0		0
03/11/10	9.2		4		6.6	0.4		0		0.4		0
03/12/10	6.1		4		5.1	28.2		0		28.2		0
03/13/10	5.1		4		4.6	34.1		0		34.1		0
03/14/10	6		2		4	3.4		0		3.4		0
03/15/10	11.5		2.5		7	0	T	0		0	T	0
03/16/10	15.5		1.5		8.5	0		0		0		0
03/17/10	18.5		3.5		11	0		0		0		0
03/18/10	19.2		3.5		11.4	0		0		0		0
03/19/10	19.2		3.5		11.4	0		0		0		0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
03/20/10	4.5		2.5		3.5	0		0		0		0
03/21/10	5.4		0.5		3	0		0		0		0
03/22/10	6.1		1.1		3.6	5.7		0		5.7		0
03/23/10	5		3		4	0.5		0		0.5		0
03/24/10	15.5		-1		7.3	0		0		0		0
03/25/10	10		2.5		6.3	0		0		0		0
03/26/10	1		-6		-2.5	0		0		0		0
03/27/10	5.5		-6.5		-0.5	0		0		0		0
03/28/10												
03/29/10												
03/30/10	13		-0.4		6.3	0		0		0		0
03/31/10	15		0.6		7.8	0		0		0		0
04/01/10	15.5		4.5		10	0		0		0		0
04/02/10	27		7		17	0		0		0		0
04/03/10	21		8.5		14.8	0		0		0		0
04/04/10	19		7		13	0.3		0		0.3		0
04/05/10	23.5		8		15.8	9.5		0		9.5		0
04/06/10	16		8		12	2		0		2		0
04/07/10	17		8		12.5	25		0		25		0
04/08/10	12		7		9.5	4.8		0	T	4.8		0
04/09/10	4.1		1.5		2.8	0		0		0		0
04/10/10	13.5		-3		5.3	0		0		0		0
04/11/10	18		4		11	0		0		0		0
04/12/10	14		3		8.5	0		0		0	Prev. 5 days	0
04/13/10	14.5		6.5		10.5	0		0		0	4.8	0
04/14/10	16.5		3		9.8	0		0		0		0
04/15/10	19.5		6.5		13	0		0		0		0
04/16/10	22		8		15	0	T	0		0	T	0
04/17/10												
04/18/10	15		3		9	0		0		0		0
04/19/10	17		5		11	0		0		0		0
04/20/10	18		3		10.5	0		0		0		0
04/21/10	21		5		13	0	T	0		0	T	0
04/22/10	12.5		3.2		7.9	0		0		0		0
04/23/10	14.5		2.5		8.5	0		0		0		0
04/24/10	15.5		4.5		10	0		0		0		0
04/25/10	12		7		9.5	6.8		0		6.8		0
04/26/10	17		7.5		12.3	0		0		0		0
04/27/10	10.5		3.5		7	0		0		0		0
04/28/10	14.5		2.5		8.5	0		0		0		0
04/29/10	20.5		3.5		12	0		0		0		0
04/30/10	18.5		12.5		15.5	0		0		0		0
05/01/10	24		9		16.5	2.4		0		2.4		0
05/02/10	25.5		14.5		20	2.2		0		2.2		0
05/03/10	24.5		15.5		20	0		0		0		0
05/04/10	22		13		17.5	0		0		0		0
05/05/10												
05/06/10	15.5		11.5		13.5	0		0		0		0
05/07/10	12.5		5.5		9	24.6		0		24.6		0
05/08/10	13		5.5		9.3	0.4		0		0.4		0
05/09/10	10.5		1.5		6	0		0		0		0
05/10/10	14.5		1		7.8	0		0		0		0
05/11/10	9		2		5.5	4		0		4		0
05/12/10	11		4.5		7.8	0		0		0		0
05/13/10												
05/14/10	21.8		5.8		13.8	0		0		0		0
05/15/10												
05/16/10	21		7.5		14.3	0		0		0		0
05/17/10	18		9		13.5	0		0		0		0
05/18/10	19		12.2		15.6	0		0		0		0
05/19/10	26		8.5		17.3	0		0		0		0
05/20/10	28		12.5		20.3	0		0		0		0
05/21/10	21		14		17.5	0		0		0		0
05/22/10	19		14.5		16.8	2.3		0		2.3		0
05/23/10	24		13		18.5	0		0		0		0
05/24/10	26.3		13.9		20.1	0		0		0		0
05/25/10	29		14.5		21.8	0		0		0		0
05/26/10	31.5		18		24.8	0		0		0		0
05/27/10	31.5		16		23.8	1		0		1		0
05/28/10	25		18.5		21.8	0		0		0		0
05/29/10	28		16		22	0		0		0		0
05/30/10	29.5		14		21.8	0		0		0		0
05/31/10	24.5		16.5		20.5	14.4		0		14.4		0
06/01/10	27.9		18.5		23.2	0		0		0		0
06/02/10	26.5		14.9		20.7	27		0		27		0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
06/03/10	21		16		18.5	5.4		0		5.4		0
06/04/10	23		15.5		19.3	12.6		0		12.6		0
06/05/10	26		16		21	30.2		0		30.2		0
06/06/10	19.5		11.5		15.5	0		0		0		0
06/07/10	20.2		11		15.6	0		0		0		0
06/08/10												
06/09/10												
06/10/10												
06/11/10	23.5		12.5		18	0		0		0		0
06/12/10	19		15		17	1.2		0		1.2		0
06/13/10	20.5		15.5		18	0.2		0		0.2		0
06/14/10	26.5		17.5		22	0		0		0		0
06/15/10	22.5		15		18.8	4		0		4		0
06/16/10	26.5		14.5		20.5	0	T	0		0	T	0
06/17/10	26		13.5		19.8	0		0		0		0
06/18/10	27		14		20.5	0		0		0		0
06/19/10	29.6		19.5		24.6	0		0		0		0
06/20/10	28.9		18		23.5	0		0		0		0
06/21/10	28		17		22.5	3		0		3		0
06/22/10	25.5		18.5		22	10.5		0		10.5		0
06/23/10	29.5		18		23.8	0.6		0		0.6		0
06/24/10	27.5		21		24.3	0		0		0		0
06/25/10	26		14		20	0		0		0		0
06/26/10	23		17.5		20.3	9.6		0		9.6		0
06/27/10	24.5		17.5		21	20.3		0		20.3		0
06/28/10	29.5		18		23.8	2.8		0		2.8		0
06/29/10	20.5		13.2		16.9	0		0		0		0
06/30/10												
07/01/10	23.5		9.5		16.5	0		0		0		0
07/02/10	25		11		18	0		0		0		0
07/03/10	30		13.5		21.8	0		0		0		0
07/04/10	32.1		17.5		24.8	0		0		0		0
07/05/10	35		22		28.5	0		0		0		0
07/06/10	34		23		28.5	0		0		0		0
07/07/10	33		22		27.5	0	T	0		0	T	0
07/08/10												
07/09/10	25.5		21.5		23.5	12.7		0		12.7		0
07/10/10	29		16		22.5	0		0		0		0
07/11/10	28		16		22	2.6		0		2.6		0
07/12/10												
07/13/10	28		20.5		24.3	0		0		0		0
07/14/10	27		21		24	0		0		0		0
07/15/10	30.5		18.5		24.5	0.3		0		0.3		0
07/16/10	30.5		21.6		26.1	0		0		0		0
07/17/10	30.5		22.5		26.5	5.8		0		5.8		0
07/18/10	28		15.5		21.8	4		0		4		0
07/19/10	28.5		21		24.8	0		0		0		0
07/20/10	27		17.5		22.3	0		0		0		0
07/21/10	30.5		18		24.3	0		0		0		0
07/22/10	29.5		17.5		23.5	37		0		37		0
07/23/10	30		18.5		24.3	0		0		0		0
07/24/10	28.5		23		25.8	34.3		0		34.3		0
07/25/10												
07/26/10												
07/27/10												
07/28/10	31		18		24.5	1.2		0		1.2		0
07/29/10	26		16		21	0		0		0		0
07/30/10	23		14.9		19	0		0		0		0
07/31/10	23.5		15		19.3	1		0		1		0
08/01/10												
08/02/10												
08/03/10	31.5		20		25.8	0		0		0		0
08/04/10	31.5		21		26.3	0		0		0	Prev. 5 days	0
08/05/10	31		22		26.5	0		0		0	1	0
08/06/10	23.5		17		20.3	0		0		0		0
08/07/10	23		10.5		16.8	0		0		0		0
08/08/10	27		18		22.5	0		0		0		0
08/09/10	28		21		24.5	4		0		4		0
08/10/10	31		21		26	0		0		0		0
08/11/10												
08/12/10	24.5		22.3		23.4	0		0		0		0
08/13/10	26		19.5		22.8	0		0		0		0
08/14/10	25		19.5		22.3	0		0		0		0
08/15/10	32.4		23		27.7	0		0		0		0
08/16/10	26.5		18.5		22.5	0		0		0		0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
08/17/10	27		16		21.5	0		0		0		0
08/18/10												
08/19/10	29.5		16		22.8	0		0		0		0
08/20/10	22		15		18.5	0		0		0		0
08/21/10	21.9		19.5		20.7	0		0		0		0
08/22/10	21.5		19.5		20.5	0		0		0		0
08/23/10	19.5		18.5		19	0	T	0		0	T	0
08/24/10	22		16.7		19.4	0		0		0		0
08/25/10	25		15		20	0		0		0		0
08/26/10	23		13		18	0		0		0		0
08/27/10	25		10.5		17.8	0		0		0		0
08/28/10	29.5		13.5		21.5	0		0		0		0
08/29/10												
08/30/10												
08/31/10												
09/01/10	33		21		27	0		0		0		0
09/02/10												
09/03/10												
09/04/10	17		12		14.5	1.4		0		1.4		0
09/05/10	19.5		10		14.8	0	T	0		0	T	0
09/06/10	23		11		17	0	T	0		0	T	0
09/07/10	30.5		16		23.3	0		0		0		0
09/08/10	19.5		14.7		17.1	0	T	0		0	T	0
09/09/10												
09/10/10	20		13		16.5	0		0		0		0
09/11/10	16		9.5		12.8	5.2		0		5.2		0
09/12/10	22.3		13.5		17.9	4.6		0		4.6		0
09/13/10	24.5		12		18.3	0		0		0		0
09/14/10	21		9.5		15.3	0		0		0		0
09/15/10	19		8.5		13.8	0	T	0		0	T	0
09/16/10	14.5		11.5		13	34.2		0		34.2		0
09/17/10	16		9.5		12.8	0		0		0		0
09/18/10	22		10		16	0		0		0		0
09/19/10	18		10		14	0		0		0		0
09/20/10	17.5		8.5		13	0		0		0		0
09/21/10	26.5		9.5		18	0		0		0		0
09/22/10	23		17.5		20.3	0		0		0		0
09/23/10	25.5		10		17.8	0		0		0		0
09/24/10	23.5		15.5		19.5	0		0		0		0
09/25/10	17.4		10		13.7	0		0		0		0
09/26/10	15.3		6		10.7	0		0		0		0
09/27/10	15		9.6		12.3	10.2		0		10.2		0
09/28/10	18.5		13		15.8	26		0		26		0
09/29/10	19.7		10		14.9	0		0		0		0
09/30/10	18.1		11.5		14.8	0	T	0		0	T	0
10/01/10	17		10		13.5	0	T	0		0	T	0
10/02/10	11.5		6		8.8	2.2		0		2.2		0
10/03/10	11.5		6.2		8.9	0		0		0		0
10/04/10	12.2		4.5		8.4	4.6		0		4.6		0
10/05/10	13.8		6.3		10.1	18.7		0		18.7		0
10/06/10	17		8.5		12.8	0	T	0		0	T	0
10/07/10	20.5		9.2		14.9	0		0		0		0
10/08/10	24		7.5		15.8	0		0		0		0
10/09/10	16		11		13.5	0		0		0		0
10/10/10	23		3.5		13.3	0		0		0		0
10/11/10	13.6		12.5		13.1	0.2		0		0.2		0
10/12/10	13.8		6		9.9	0		0		0		0
10/13/10												
10/14/10												
10/15/10												
10/16/10	16		4.4		10.2	0		0		0	T	0
10/17/10	10.5		7.5		9	0		0		0		0
10/18/10	11		4.5		7.8	0		0		0	Prev. 5 days	0
10/19/10	15		3		9	0		0		0	0	0
10/20/10	17		4		10.5	3.5		0		3.5		0
10/21/10	10		5.5		7.8	0.4		0		0.4		0
10/22/10	11		0.6		5.8	0	T	0		0	T	0
10/23/10	13.8		3.5		8.7	15.7		0		15.7		0
10/24/10	11.2		8		9.6	1.7		0		1.7		0
10/25/10	21.1		7.9		14.5	6.2		0		6.2		0
10/26/10	20.8		12.3		16.6	7		0		7		0
10/27/10	19.3		11		15.2	0		0		0		0
10/28/10	12.5		10		11.3	0		0		0		0
10/29/10	9.5		4.5		7	0		0		0		0
10/30/10	14		3.5		8.8	0		0		0		0

Oakville Town Daily Weather Data

Station Name	OAKVILLE TWN	Legend			
Province	ONTARIO	[Empty]	No Data Available	F	Accumulated and Estimated
Latitude	43.51	M	Missing	N	Temperature Missing but Known to be > 0
Longitude	-79.69	E	Estimated	Y	Temperature Missing but Known to be < 0
Elevation	168	A	Accumulated	S	More Than One Occurrence
Climate Identifier	6155750	C	Precipitation Occurred; Amount Uncertain	T	Trace
Date of Site Visits		L	Precipitation May or May Not Have Occurred	*	Data for this day has undergone only preliminary quality checking.

Date	Max Temp (°C)	Max Temp Flag	Min Temp (°C)	Min Temp Flag	Mean Temp (°C)	Total Rain (mm)	Total Rain Flag	Total Snow (cm)	Total Snow Flag	Total Precip (mm)	Total Precip Flag	Snow on Grnd (cm)
10/31/10	7		1.5		4.3	0		0		0		0
11/01/10	7.5		-2.5		2.5	0		0		0		0
11/02/10	7.4		-1		3.2	0		0		0		0
11/03/10	10.5		-1		4.8	1.2		0		1.2		0
11/04/10	4.5		4		4.3	0.8		0		0.8		0
11/05/10	5		-1		2	0.8		0		0.8		0
11/06/10	6		-0.5		2.8	0		0		0		0
11/07/10	10.2		0		5.1	0		0		0		0
11/08/10	11		0.2		5.6	0		0		0		0
11/09/10	-3		1		-1	0		0	T	0	T	0
11/10/10	9.7		-10		-0.2	0		0		0		0
11/11/10	8.5		1.6		5.1	0		0		0		0
11/12/10	10.5		0		5.3	0		0		0		0
11/13/10	10.5		-1		4.8	1.2		0		1.2		0
11/14/10	10.7		6.5		8.6	1.4		0		1.4		0
11/15/10	12		0.5		6.3	0		0		0		0
11/16/10	10		1.5		5.8	38		0		38		0
11/17/10	9		6		7.5	0	T	0		0	T	0
11/18/10	8.4		2		5.2	0		0		0		0
11/19/10	6.9		-1.4		2.8	0		0		0		0
11/20/10	7		1.8		4.4	0		0		0		0
11/21/10	13		0.5		6.8	1.6		0		1.6		0
11/22/10	16.1		2		9.1	9.1		0		9.1		0
11/23/10	14		12		13	0	T	0		0	T	0
11/24/10	4		-0.5		1.8	0		0		0		0
11/25/10	7		-0.2		3.4	8		0	T	8		0
11/26/10												
11/27/10												
11/28/10	3.5		-1.3		1.1	0		0		0		0
11/29/10	12.5		-2.3		5.1	9.4		0		9.4		0
11/30/10												
12/01/10												
12/02/10												
12/03/10	3		-3		0	0		0		0		0
12/04/10	-0.8		-5		-2.9	0		2		2		0
12/05/10	0.6		-7.5		-3.5	0		0		0		2
12/06/10	0.6		-5.2		-2.3	0		0	T	0	T	0
12/07/10	-1		-5.2		-3.1	0		0		0		0
12/08/10	-2.5		-8.3		-5.4	0		0		0		0
12/09/10	0		-13		-6.5	0		0		0		0
12/10/10	2.5		-6		-1.8	0	T	0		0	T	0
12/11/10	3.5		-5		-0.8	6		0		6		0
12/12/10	3		1.5		2.3	10		4		26.4		0
12/13/10	-10		-12.5		-11.3	0		1		16.4		4
12/14/10	-6		-12.5		-9.3	0		0	T	0	T	6
12/15/10	-3.4		-11		-7.2	0		0		0		4
12/16/10	-1.6		-8.4		-5	0		0	T	0	T	2
12/17/10	0		-6.5		-3.3	0		0		0	T	2
12/18/10	-5		-8		-6.5	0		0	T	0	T	1
12/19/10	-2.5		-6		-4.3	0		0		0		1
12/20/10	0		-5.5		-2.8	0		0	T	0	T	1
12/21/10	-2		-9.5		-5.8	0		0	T	0	T	1
12/22/10	-2		-7		-4.5	0		0	T	0	T	1
12/23/10	-1		-6		-3.5	0		0	T	0	T	0
12/24/10	-1.8		-5		-3.4	0		0		0		0
12/25/10	-5		-7.2		-6.1	0		0		0		0
12/26/10	-5		-7.5		-6.3	0		0		0	T	0
12/27/10	-1.5		-10		-5.8	0		0		0		0
12/28/10	-0.5		-7		-3.8	0		0		0		0
12/29/10	-1		-5		-3	0		0		0		0
12/30/10	7		-7		0	0	T	0		0	T	0
12/31/10	11		-3.5		3.8	3.8		0		3.8		0
01/01/11	11.8		5.5		8.7	4		0	T	4		0
01/02/11	-4.1		-3.8		-4	0		0		0		0
01/03/11	1		-6.8		-2.9	0		1		1		0
01/04/11	1.6		-5.5		-2	0		0		0		1
01/05/11	-1		-5.5		-3.3	0		0		0		0
01/06/11	-2.5		-9		-5.8	0		0		0		0
01/07/11	-4.5		-9.5		-7	0		9		6.7		5
01/08/11	-5		-8		-6.5	0		6		4.8		14
01/09/11	-4		-13.5		-8.8	0		0		0		14
01/10/11	-2.3		-13		-7.7	0		0		0		12
01/11/11	-5.1		-9		-7.1	0		6.4		6.4		12
01/12/11	-6.7		-9.6		-8.2	0		0		0		18
01/13/11	-5		-12		-8.5	0		0	T	0	T	18

Oakville Town Daily Weather Data

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01/14/11	-1.5		-9.5		-5.5	0		6		6		18
01/15/11	-1		-10		-5.5	0		0		0		23
01/16/11	-9		-10		-9.5	0		6		1.5		18
01/17/11	1.5		-21.5		-10	0		0		0		24
01/18/11	2.2		-13.5		-5.7	2		0	T	2		20
01/19/11	-6.5		-7		-6.8	0		0	T	0	T	17
01/20/11	-5		-14.5		-9.8	0		2.8		2.8		14
01/21/11	-6.3		-11.3		-8.8	0		0		0		16
01/22/11	-9		-16.4		-12.7	0		0		1		16
01/23/11	-14		-18.5		-16.3	0		0	T	0	T	17
01/24/11	-1.6		-20		-10.8	0		6		3.8		17
01/25/11	-0.5		-19.4		-10	0	T	0		0	T	19
01/26/11	0		-2.5		-1.3	0		0		0		17
01/27/11	0		-6		-3	0		0	T	0	T	17
01/28/11	-1.2		-5.5		-3.4	0		0	T	0	T	17
01/29/11	-3.7		-8		-5.9	0		0		0		17
01/30/11	-3		-9.8		-6.4	0		0		0		17
01/31/11	-10.5		-17.3		-13.9	0		0		0		16
02/01/11	-6.5		-14		-10.3	0		8.4		8.4		16
02/02/11	-8		-11		-9.5	0		0		0		27
02/03/11	-3.5		-16		-9.8	0		0		0		24
02/04/11	-3		-10.5		-6.8	0		0		0		17
02/05/11	-0.5		-9		-4.8	0		7		5.5		17
02/06/11	1		-4.5		-1.8	0		1		8		24
02/07/11	1.5		-2		-0.3	0		0	T	0	T	25
02/08/11	-8.5		-13.5		-11	0		0		0		26
02/09/11	-5.5		-14		-9.8	0		0		0		25
02/10/11	-8		-17		-12.5	0		0		25		25
02/11/11	-3		-18		-10.5	0		1.8		18		0
02/12/11	0.5		-13.1		-6.3	0		0.5		0.6		24
02/13/11	7		-7.5		-0.3	0		0		0		24
02/14/11	4.5		0.5		2.5	0		0		0		15
02/15/11	-1		-13		-7	0		0		0		10
02/16/11	5.5		-9.5		-2	2		0		2	**Prev. 5 days**	12
02/17/11	**11.2**		-1.8		4.7	0		0		0	**2.6**	12
02/18/11	**10**		2.5		6.3	0		0.8		0		0
02/19/11	-1		-6		-3.5	0		0		0		1
02/20/11		M	-10									0

Appendix 5.0

5.1 Field Work Chronology
5.2 Wildlife
5.3 Vascular Plant List
5.4 Core #1 and Linkage to Core #2 / Vegetation Community Mapping (Modified from NOCSS)
5.5 ELC Field Data Sheets
5.6 Water Temperature Monitoring Data
5.7 Field Survey Collection Sheets
5.8 Selected Agency Communications
5.9 Technical Memorandum NH#1 – Reach 14W-14A Aquatic Habitat

Appendix 5.1 – Field Work Chronology and Staff List

Appendix 5.1 – Field Work Chronology

Table 5.1.1 Summary of Environmental Fieldwork (Chronology)

Year	Date	Staff	Level of Effort	Task Description
2002	July 31	MC	-	Fish Community Sampling (on-site)
2002	September 25	MC	-	Fish Community Sampling / On-site & Zenon pond
2005	June 6	BD	-	Breeding Amphibian Survey
2005	June 7	BD	-	Breeding Amphibian Survey
2005	July 7	BD	4.0	Breeding Bird Survey
2005	July 12	BD	4.0	Breeding Bird Survey
2009	May 12	SR JS	8.0	Water Quality Monitoring/ Temperature Logger Installation/ Benthic Macroinvertebrate Sampling/Channel Morphology Mapping
2009	May 28	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	June 11	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	June 28	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	July 8	SR AS	7.5	Water Quality Monitoring / Temperature Logger Download / Fish Community Sampling
2009	July 30	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	August 18	SD	2.0	Field review of off-site portions of subcatchments – partially completed
2009	August 20	SD	7.0	Field review on-site – (south and west portions of site)
2009	August 21	SD	4.0	Field review on-site – (north and east portions of site)
2009	August 28	SR	6.0	Water Quality Monitoring / Temperature Logger Download / Off-site Fish Habitat review
2009	September 10	SR	2.5	Water Quality Monitoring / Temperature Logger Download

Year	Date	Staff	Level of Effort	Task Description
2009	September 11	SD	4.5	Complete Offsite portions of subcatchments mapping
2009	September 30	SR	2.5	Water Quality Monitoring / Temperature Logger Download
2009	October 19	SR	4.5	Water Quality Monitoring / Temperature Logger Download / On-Site Fish Habitat Review
2009	October 30	SR	4.5	Water Quality Monitoring / Temperature Logger Download / On-site overview characterization
2010	April 21	DG	3.0	Breeding Amphibian Survey
2010	April 22	SD	4.5	Spring vegetation Surveys, focus on forested units
2010	June 7	AW DG	3.0	Breeding Amphibian Survey
2010	June 25	DG	3.0	Breeding Amphibian Survey
2010	July 13	SD	6.0	Wetland/dripline flagging and summer vegetation surveys/incidental wildlife observations.
2010	July 14	SD	6.0	Wetland/dripline flagging and summer vegetation surveys/incidental wildlife observations.
2010	December 10	SR JS	4.5	Watercourse profile / Cross section measurements in 14W-12, 12A, 13 and 14
2011	May 31	JH	4.0	Breeding bird survey and Bobolink Habitat evaluation; Incidental wildlife documentation
2011	July 4	SR AS	4.0	Installation of Temperature loggers (14W-14A); water quality sampling; Secchi depth measurements
2011	July 27	SD		Wetland staking
2011	August 4	MC RR	-	Site condition/stream survey to note flow regime (14W-12); Photo record
2011	August 19	SR	2.5	Water Quality sampling (14W-14A); Secchi Depth measurements; Temperature Logger data retrieval; Habitat mapping (14W-14A)
2011	August 24	SR	2.5	Water Quality sampling (14W-14A); Secchi Depth measurements; Temperature Logger data retrieval
2011	October 6/7	SR	24	Fish Community Sampling (minnow & pot traps) in 14W-14A

Year	Date	Staff	Level of Effort	Task Description
2011	October 7	SR	3.0	Water Quality sampling (14W-14A); Secchi Depth measurements; Temperature Logger data retrieval
2012	June 8	TP	3.0	Bobolink and Eastern Meadowlark Point Count Survey #1
2012	June 20	TP	2.5	Bobolink and Eastern Meadowlark Point Count Survey #2
2012	July 3	TP	2.5	Bobolink and Eastern Meadowlark Point Count Survey #3
2013	May 31	PM	2.5	Bobolink and Eastern Meadowlark Point Count Survey #1
2013	June 11	PM	2.5	Bobolink and Eastern Meadowlark Point Count Survey #2
2013	July 4	PM	2.5	Bobolink and Eastern Meadowlark Point Count Survey #3
2015	June 4	TP	4.0	Bat Exit Surveys
2015	June 11	TP	4.0	Bat Exit Surveys
2015	June 16	TP	4.0	Bat Exit Surveys
2015	July 13	TP	4.0	Bat Exit Surveys
2016	November 18	AS	3.0	Flow Regime Observations
2017	April 4	AS	4.0	Flow Regime Observations
2017	May 10	AS	2.0	Flow Regime Observations

Table 5.1.2 Environmental Technical Staff List

MMM Environmental Technical Staff	Title
Mark Cece, B.Sc.	Senior Fisheries Biologist & Ecology Manager
Sonia Rankin, B.Sc.	Aquatic Biologist
Alex Stettler, B.Sc.	Aquatic Biologist (Fisheries)
Joel Smith, B.Sc.	Aquatic Biologist (Benthics)
Bill Draper, M.Sc.	Senior Ecologist (Botany)
Steven Dinka, M.Sc.	Ecologist (Botany)
Teresa Piraino H.B.A.	Ecologist (Birds, Wildlife, Reptiles, Amphibians)
Prachi Patel, B.Sc.	Biologist (Botany)
Patricia Mohr, B.Sc.	Ecologist (Birds, Wildlife)

Appendix 5.2 – Wildlife

Appendix 5.2 – Wildlife

Table 5.2.1. Avifauna Observed 2005, 2009, 2010, 2011 and 2012

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Alder Flycatcher	*Empidonax alnorum*	G5	S5B,SZN							E	N								X
American Crow	*Corvus brachyrhynchos*	G5	S5B,SZN							E	N								X
American Goldfinch	*Spinus tristis*	G5	S5B,SZN							E	N		X				X	X	X
American Robin	*Turdus migratorius*	G5	S5B,SZN							E	N		X		X	X	X		X
American Woodcock	*Scolopax minor*	G5	S5B,SZN							E	N								X
Baltimore Oriole	*Icterus galbula*	G5	S5B,SZN							E	N			X					X
Barn Swallow	*Hirundo rustica*	G5	S5B,SZN	THR	THR	No Status	No Schedule				N	X	X	X					X
Black-capped Chickadee	*Poecile atricapillus*	G5	S5							I/E	N							X	X
Black-crowned Night-heron	*Nycticorax nycticorax*	G5	S3B,SZN					U		S/B M/F	Y								X
Blue Jay	*Cyanocitta cristata*	G5	S5							I/E	N		X	X	X				X
Blue-winged Teal	*Anas discors*	G5	S5B,SZN					U		M/F	N								X

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Bobolink	*Dolichonyx oryzivorus*	G5	S4B,SZN	THR	THR	No Status	No schedule			E	N							X	X
Brown-headed Cowbird	*Molothrus ater*	G5	S5B,SZN							E	N				X				X
Canada Goose	*Branta canadensis*	G5	S5B,SZN					I		M/F	N	FY							X
Common Grackle	*Quiscalus quiscula*	G5	S5B,SZN							E	N								X
Common Yellowthroat	*Geothlypis trichas*	G5	S5B,SZN							I/E	N			X					X
Downy Woodpecker	*Picoides pubescens*	G5	S5							I/E	N								X
Eastern Kingbird	*Tyrannus tyrannus*	G5	S5B,SZN							E	N							X	X
Eastern Towhee	*Pipilo erythrophthalmus*	G5	S4B,SZN					U		I/E	N								X
European Starling	*Sturnus vulgaris*	G5	SE					I		E	N		X	X					X
Field Sparrow	*Spizella pusilla*	G5	S5B,SZN							E	N		X			X			X
Gadwall	*Anas strepera*	G5	S4B,SZN					U		M/F	N	FY							
Gray Catbird	*Dumetella carolinensis*	G5	S5B,SZN							I/E	N								X
Great Blue Heron	*Ardea herodias*	G5	S5B,SZN							S/B M/F	N							X	X

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Herring Gull	*Larus argentatus*	G5	S5B,SZN								N								X
Horned Lark	*Eremophila alpestris*	G5	S5B,SZN					U			N							X	X
House Sparrow	*Passer domesticus*	G5	SE					I		E	N								X
Indigo Bunting	*Passerina cyanea*	G5	S5B,SZN							E	N					X			X
Killdeer	*Charadrius vociferus*	G5	S5B,SZN								N		X					X	X
Mallard	*Anas platyrhynchos*	G5	S5B,SZN							S/B M/F	N	X							X
Mourning Dove	*Zenaida macroura*	G5	S5B,SZN							E	N	X	X					X	X
Northern Harrier	*Circus cyaneus*	G5	S4B,SZN	NAR	NAR			U	X	M/F	N								X
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	G5	S5B,SZN					U		M/F	N	X	X				X		X
Red-tailed Hawk	*Buteo jamaicensis*	G5	S5B,SZN	NAR	NAR					E	N								X
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S5B,SZN							E	N	X	X	X	X		X	X	X
Ring-billed Gull	*Larus delawarensis*	G5	S5B,SZN								N		X	X					
Rock Dove	*Columba livia*	G5	SE					I			N							X	X
Savannah	*Passerculus*	G5	S5B,SZN						X		N	X	X				X	X	X

Common Name	Scientific Name	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	SARA Status[5]	Schedule[5]	Halton Region (1993)[6]	MNR Area Sensitive[7]	Habitat Use[8]	NHIC Tracked	BB1	BB2	BB3	BB4	BB5	BB6	BB7	Incidental Observations
Sparrow	*sandwichensis*																		
Song Sparrow	*Melospiza melodia*	G5	S5B,SZN							E	N	X	X	X	X	X	X	X	X
Spotted Sandpiper	*Actitis macularia*	G5	S5B,SZN								N							X	X
Tree Swallow	*Tachycineta bicolor*	G5	S5B,SZN							E	N	X							X
Willow Flycatcher	*Empidonax traillii*	G5	S5B,SZN					U			N							X	
Wilson's Snipe	*Gallinago delicata*	G5	S5B,SZN					U			N								X
Yellow Warbler	*Dendroica petechia*	G5	S5B,SZN							E	N		X	X					X
Total No. of Species:	***44***											**10**	**14**	**9**	**5**	**4**	**6**	**14**	**38**

COSEWIC		***SARA* Schedule**		**Habitat Use**	
THR	2	No Schedule	2	Interior	0
				Interior/Edge	6
MNR		**Halton Region**			
THR	2	U=Uncommon (15-35 stations)	9		
		I=Introduced Species	4		
SARA Status					
No Status	2	**MNR Area Sensitive**	2		

Table 5.2.2 – Anuran Survey Results 2010

Survey #	Date	Station	Observations		
			Spp.	Call Code	Count
1	Apr-21-2010 (20:25-22:00)	1	No Observations		
		2	No Observations		
		3	No Observations		
		4	No Observations		
		5	No Observations		
		6	AMTO	2	4
		7	NLFR	1	1
		8	Not Surveyed		
2	June -7-2010 (21:02-23:00)	1	No Observations		
		2	No Observations		
		3	No Observations		
		4	No Observations		
		5	No Observations		
		6	No Observations		
		7	GRFR	2	4
			GRTR	1	2
		8	GRTR	1	2
3	Jun-25-2010 (20:55-22:05)	1	No Observations		
		2	No Observations		
		3	No Observations		
		4	No Observations		
		5	No Observations		
		6	No Observations		
		7	GRFR	2	5
		8	Not Surveyed		

Table 5.2.3 – Bat Exit Survey Results 2015

Survey #	Building #	Date	# of Exiting Bats	# *Myotis spp.*	# Non *Myotis spp.*	# Unknown HiF	# No Recording
1	Building 1	June 4, 2015	8	2	3	2	1
2	Building 1	July 13, 2015	12	0	11	0	1
1	Building 3	June 11, 2015	1	0	1	0	0
2	Building 3	July 13, 2015	1	0	1	0	0

Legend

[1]G-Rank (global)
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

- G1 Extremely rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2 Very rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.
- G3 Rare to uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- G4 Common - usually more than 100 occurrences; usually not susceptible to immediate threats.
- G5 Very common - demonstrably secure under present conditions.

[2]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

- S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 Secure - Common, widespread, and abundant in the nation or state/province.
- S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SAN Non-breeding accidental.
- SE Exotic - not believed to be a native component of Ontario's fauna.
- SZN Non-breeding migrants/vagrants.
- SZB Breeding migrants/vagrants.

[3]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
(federal status from COSEWIC NOVEMBER 2010)

- EXT Extinct - A species that no longer exists.
- EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
- END Endangered - A species facing imminent extirpation or extinction.
- THR Threatened - A species likely to become endangered if limiting factors are not reversed.

- SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
- NAR Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
- DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

[4]OMNR (Ontario Ministry of Natural Resources)
(provincial status from MNR September 29 2010)
The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

- EXT Extinct - A species that no longer exists anywhere.
- EXP Extirpated - A species that no longer exists in the wild in Ontario but still occurs elsewhere.
- END Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's *Endangered Species Act* (*ESA*) (END-R designations are no longer relevant as species are covered under new *ESA* April 2009)
- THR Threatened - A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
- SC Special Concern (formerly Vulnerable) - A species with characteristics that make it sensitive to human activities or natural events.
- NAR Not at Risk - A species that has been evaluated and found to be not at risk.
- DD Data Deficient (formerly Indeterminate) - A species for which there is insufficient information for a provincial status recommendation.

[5]SARA (Species at Risk Act) Status and Schedule
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented. http://www.sararegistry.gc.ca/sar/listing/listing_e.cfm

- EXT Extinct - A wildlife species that no longer exists.
- EXP Extirpated **-** A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
- END Endangered - A wildlife species that is facing imminent extirpation or extinction.
- THR Threatened - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
- SC Special Concern - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of *SARA*. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

Government of Canada. Species at Risk Public Registry. Website: [http://www.sararegistry.gc.ca/default_e.cfm November 3, 2010]

- Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e
- Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
- Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

[6] Regional Status

Halton Region
From : Halton Natural Areas Inventory (Dwyer 2006)

- A = Abundant >125 Stations
- C = Common 36-125 Stations
- U = Uncommon 15-35 Stations
- R= Rare < 15 Stations
- E = Extirpated no longer present in Halton Region
- I = Introduced an introduced species not native to Ontario
- Uncertain = Uncertain if species is present in Halton Region
- LS = Locally Significant
- M = Migration

[7] MNR Significant Wildlife Habitat Technical Guide Area Sensitive Species

- Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers
- *From: Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch, Wildlife Section. Science Development and Transfer Branch, Southcentral Science Section. 151pp. + appendices.*

[8] Habitat Use
I=interior species, I/E=interior edge species, E=edge species (Freemark and Collins, 1989); M/F=Marsh/Fen, S/B=Treed Swamp/Bog. Interior bird species require habitat which is often found 100m from the forest edge while Interior/Edge species are found within both interior and edge habitat. Often Interior and Interior/Edge are more sensitive to urban encroachment as they require these large, relatively undisturbed forest habitats to support viable populations. The increasing urbanization of rural areas often results in increased parasitism and predation as well as disturbance from human recreational activities (e.g. illegal bike trails, dumping and pets.) (Freemark, K. and Collins, B. 1989. *Landscape ecology of birds breeding in temperate forest fragments*. – In: Hagan III, J. M. and Johnston, D. W. (eds), Ecology and conservation of neotropical migrant landbirds. Smithsonian Inst. Press, pp. 443–454)

[9] Dependancy on Wetlands

- Wetlands are home to many species of birds. Wetland birds are determined by the kind of habitat nad the seasonal movement of migrating species.

- Dependant (D) - These species depend on wetlands for their survival. Most nest within wetlands, a few such as the Great Blue Heron, nest elsewhere but feed extensively in wetlands, and other such as the Wood Duck, nest away from wetlands but rear their young in marshes and fens.
- Partially Dependant (P) - These species use wetlands habitats extensively for breeding or feeding, as well as other types of habitat.

[10, 11, 12] Early Nesting Date, Late Migration Date, Late Nesting Date

LePage, Dennis. 2005. Migration and nesting dates for Ontario bird species. Bird Studies Canada: Ontario Breeding Bird Atlas.

This list was created by Dennis LePage of Bird Studies Canada. Breeding dates were provided by Mark Peck, and Charles Francis provided the migration dates based on Long Point Data. It covers the whole Southern Great Lakes region; thus some species do not occur in the Ottawa district. The early and late dates for nesting define the period during which nesting can be expected to occur. (They are the earliest and latest records known for that species in the Southern Great Lakes region) The late migration date is to show that although most birds move through the area before that date, some can be still passing through at that time. Ex: An Osprey can still be passing through until May 30, although that is unusual. Yet the earliest record for this species is May 1. What this means is, be careful about assigning a potential breeding code (possible, probable, confirmed) until after May 30 unless good evidence indicates that the bird is nesting (ie: mating with another Osprey, sitting on a nest etc.).

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED
- X Species observed in its breeding season (no breeding evidence).

POSSIBLE
- H Species observed in its breeding season in suitable nesting habitat.
- S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE
- P Pair observed in suitable nesting habitat in nesting season.
- T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more appart, at the same place.
- D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
- V Visiting probable nest site
- A Agitated behaviour or anxiety calls of an adult.
- B Brood Patch on adult female or cloacal protuberance on adult male.
- N Nest-building or excavation of nest hole.

CONFIRMED
- DD Distraction display or injury feigning.
- NU Used nest or egg shells found (occupied or laid within the period of the survey).
- FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
- AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
- FS Adult carying fecal sac.
- CF Adult carying food for young.
- NE Nest containing eggs.
- NY Nest with young seen or heard.

Appendix 5.3 – Vascular Plant List

Appendix 5.3 – Vascular Plant List

Table 5.3.1 - Summary of Vascular Plant Species

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Allegheny Blackberry	*Rubus allegheniensis*	ROSACEAE	2	2	G5	S5			X	X	X						x
Alternate-leaf Dogwood	*Cornus alternifolia*	CORNACEAE	6	5	G5	S5			X	X	X	x					
American Basswood	*Tilia americana*	TILIACEAE	4	3	G5	S5			X	X	X		x		x	x	x
American Beech	*Fagus grandifolia*	FAGACEAE	6	3	G5	S5			X	X	X				x		
American Bugleweed	*Lycopus americanus*	LAMIACEAE	4	-5	G5	S5			X	X	X	x	x				
American Elm	*Ulmus americana*	ULMACEAE	3	-2	G5?	S5			X	X	X	x	x	x		x	x
Annual Ragweed	*Ambrosia artemisiifolia*	ASTERACEAE	0	3	G5	S5			X	X	X		x				
Bird's-foot Trefoil	*Lotus corniculatus*	FABACEAE			G?	SE 5			X	X	X		x				
Black Locust	*Robinia pseudo-acacia*	FABACEAE		0	G5	SE 5			X	X	X		x				
Black Walnut	*Juglans nigra*	JUGLANDACEAE	5	3	G5	S4			X	X	X			x			
Blue Vervain	*Verbena hastata*	VERBENACEAE	4	-4	G5	S5			X	X	X	x	x			x	
Broad-leaf Cattail	*Typha latifolia*	TYPHACEAE	3	-5	G5	S5			X	X	X	x	x				
Broad-leaved Water-plantain	*Alisma plantago-aquatica*	ALISMATACEAE	3	-5	G5	S5			X	X	X	x	x	x			
Buckthorn	*Rhamnus cathartica*	RHAMNACEAE		3	G?	SE 5			X	X	X	x	x	x	x		x
Bur Oak	*Quercus macrocarpa*	FAGACEAE	5	1	G5	S5			X	X	X				x		x
Canada Anemone	*Anemone canadensis*	RANUNCULACEAE	3	-3	G5	S5			X	X	X				x		
Canada Thistle	*Cirsium arvense*	ASTERACEAE		3	G?	SE 5			X	X	X	x	x				
Carolina Rose	*Rosa carolina*	ROSACEAE	6	4	G4G5	S4			X	R	R[4]						x
Chicory	*Cichorium intybus*	ASTERACEAE		5	G?	SE 5			X	X	X		x				
Choke Cherry	*Prunus virginiana ssp virginiana*	ROSACEAE	2	1	G5T?	S5			X	X	X				x	x	
Climbing Nightshade	*Solanum dulcamara*	SOLANACEAE		0	G?	SE 5			X	X	X	x	x		x		

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Common Apple	*Malus pumila*	ROSACEAE		5	G5	SE 5			X	X	X	x	x				x
Common Boneset	*Eupatorium perfoliatum*	ASTERACEAE	2	-4	G5	S5			X	X	X		x				
Common Dandelion	*Taraxacum officinale*	ASTERACEAE		3	G5	SE 5			X	X	X		x	x			
Common Milkweed	*Asclepias syriaca*	ASCLEPIADACEAE	0	5	G5	S5			X	X	X	x	x				
Common Pear	*Pyrus communis*	ROSACEAE		5	G5	SE 4			X	X	X						x
Common Reed	*Phragmites australis*	POACEAE	0	-4	G5	S5			X	X	X		x				
Common Teasel	*Dipsacus fullonum ssp sylvestris*	DIPSACACEAE		5	G?T?	SE 5			X	X	X	x	x	x			
Corn-marigold	*Chrysanthemum segetum*	ASTERACEAE			G?	SE 1							x				
Crack Willow	*Salix fragilis*	SALICACEAE		-1	G?	SE 5							x	x			
Crested Sedge	*Carex cristatella*	CYPERACEAE	3	-4	G5	S5			X	X	X	x	x				
Cultivated Wheat	*Triticum aestivum*	POACEAE		5	G?	SE 1			X	X	X		x				
Curly Dock	*Rumex crispus*	POLYGONACEAE		-1	G?	SE 5			X	X	X	x	x			x	
Dame's Rocket	*Hesperis matronalis*	BRASSICACEAE		5	G4G5	SE 5			X	X	X			x			
Devil's Beggar's Ticks	*Bidens frondosa*	ASTERACEAE	3	-3	G5	S5			X	X	X	x	x				
Early Meadowrue	*Thalictrum dioicum*	RANUNCULACEAE	5	2	G5	S5			X	X	X				x		
Eastern Cottonwood	*Populus deltoides ssp. deltoides*	SALICACEAE			G5T?	SU										x	
Eastern Helleborine	*Epipactis helleborine*	ORCHIDACEAE		5	G?	SE 5			X	X	X				x		
Eastern Hop-hornbeam	*Ostrya virginiana*	BETULACEAE	4	4	G5	S5			X	X	X				x	x	
Eastern Red Cedar	*Juniperus virginiana*	CUPRESSACEAE	4	3	G5	S5			R[5]	R	R[8]						x
Eastern White Pine	*Pinus strobus*	PINACEAE	4	3	G5	S5			X	X	X						x
False Solomon's Seal	*Maianthemum racemosum ssp racemosum*	LILIACEAE	4	3	G5T	S5			X	X	X				x		
Field Sowthistle	*Sonchus arvensis ssp arvensis*	ASTERACEAE		1	G?T?	SE 5			X	X	X		x				
Fowl Manna Grass	*Glyceria striata*	POACEAE	3	-5	G5	S5			X	X	X				x	x	

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Fox Sedge	*Carex vulpinoidea*	CYPERACEAE	3	-5	G5	S5			X	X	X	x	x	x			
Fringed Sedge	*Carex crinita*	CYPERACEAE	6	-4	G5	S5			X[U]	X	R[6]				x		
Garlic Mustard	*Alliaria petiolata*	BRASSICACEAE		0	G?	SE5			X	X	X			x	x		
Graceful Sedge	*Carex gracillima*	CYPERACEAE	4	3	G5	S5			X	X	X		x		x	x	
Grass-leaved Goldenrod	*Euthamia graminifolia*	ASTERACEAE	2	-2	G5	S5			X	X	X	x	x				
Gray Dogwood	*Cornus foemina ssp racemosa*	CORNACEAE	2	-2	G5	S5			X	X	X	x	x	x	x	x	
Great-hairy Willow-herb	*Epilobium hirsutum*	ONAGRACEAE		-4	G?	SE5			X	X	X		x				
Green Ash	*Fraxinus pennsylvanica*	OLEACEAE	3	-3	G5	S5			X	X	X	x					
Hawthorn Species	*Crataegus sp*	ROSACEAE											x		x	x	x
Heart-leaved Willow	*Salix eriocephala*	SALICACEAE	4	-3	G5	S5			X	X	X	x	x				
Herb-robert	*Geranium robertianum*	GERANIACEAE		5	G5	SE5			X	X	X				x		
Hooked Crowfoot	*Ranunculus recurvatus var. recurvatus*	RANUNCULACEAE	4	-3	G5	S5			X	X	X					x	
Hop Sedge	*Carex lupulina*	CYPERACEAE	6	-5	G5	S5							x			x	
Jack-in-the-pulpit	*Arisaema triphyllum ssp triphyllum*	ARACEAE	5	-2	G5T5	S5			X	X	X				x		
Kentucky Bluegrass	*Poa pratensis ssp pratensis*	POACEAE	0	1	G5T	S5			X	X	X		x				
Kidney-leaved Buttercup	*Ranunculus abortivus*	RANUNCULACEAE	2	-2	G5	S5			X	X	X					x	
Lady's Thumb	*Polygonum persicaria*	POLYGONACEAE		-3	G?	SE5			X	X	X	x	x				
Large-leaved Aster	*Aster macrophyllus*	ASTERACEAE	5	5	G5	S5			X	X	X				x		
Lesser Burdock	*Arctium minus ssp minus*	ASTERACEAE		5	G?T?	SE5			X	X	X		x				
Lesser Duckweed	*Lemna minor*	LEMNACEAE	2	-5	G5	S5			X	X	X	x					
Manitoba Maple	*Acer negundo*	ACERACEAE		-2	G5	S5			X	X	X	x					
May Apple	*Podophyllum peltatum*	BERBERIDACEAE	5	3	G5	S5			X	X	X				x		
Narrow-leaved Cattail	*Typha angustifolia*	TYPHACEAE	3	-5	G5	S5			X	X	X	x	x				

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Narrow-leaved Spring Beauty	*Claytonia virginica*	PORTULACACEAE	5	3	G5	S5			X	X	X				x	x	
New England Aster	*Aster novae-angliae*	ASTERACEAE	2	-3	G5	S5			X	X	X		x				
Nipple-seed Plantain	*Plantago major*	PLANTAGINACEAE		-1	G5	SE5			X	X	X		x				
Northern Red Oak	*Quercus rubra*	FAGACEAE	6	3	G5	S5			X	X	X				x	x	x
Northern White Cedar	*Thuja occidentalis*	CUPRESSACEAE	4	-3	G5	S5			X	X	X						x
Northern Wild-raisin	*Viburnum cassinoides*	CAPRIFOLIACEAE	7	-3	G5	S5				R	E						x
Norway Maple	*Acer platanoides*	ACERACEAE		5	G?	SE5			X	X	X			x			x
Norway Spruce	*Picea abies*	PINACEAE		5	G?	SE3			X[SR]	X	X						x
Orchard Grass	*Dactylis glomerata*	POACEAE		3	G?	SE5			X	X	X		x				
Panicled Aster	*Aster lanceolatus ssp lanceolatus*	ASTERACEAE	3	-3	G5T?	S5			X[U]	X	X		x	x		x	
Purple Loosestrife	*Lythrum salicaria*	LYTHRACEAE		-5	G5	SE5			X	X	X	x	x	x			
Purple-stemmed Aster	*Aster puniceus var puniceus*	ASTERACEAE	6	-5	G5T?	S5							x				
Queen Anne's Lace	*Daucus carota*	APIACEAE			G?	SE5			X	X	X	x	x				
Red Clover	*Trifolium pratense*	FABACEAE		2	G?	SE5			X	X	X		x				
Red Raspberry	*Rubus idaeus ssp idaeus*	ROSACEAE		0	G5T5	SE1			X	X	X			x		x	
Redtop	*Agrostis gigantea*	POACEAE		0	G4G5	SE5			X	X	X		x	x			
Reed Canary Grass	*Phalaris arundinacea*	POACEAE	0	-4	G5	S5			X	X	X	x	x	x		x	
Rice Cutgrass	*Leersia oryzoides*	POACEAE	3	-5	G5	S5			X[U]	X	X		x	x		x	
Riverbank Grape	*Vitis riparia*	VITACEAE	0	-2	G5	S5			X	X	X	x		x			
Running Strawberry-bush	*Euonymus obovata*	CELASTRACEAE	6	5	G5	S5			X	X	X				x		
Sandbar Willow	*Salix exigua*	SALICACEAE	3	-5	G5	S5			X[U]	X	X		x				
Scotch Pine	*Pinus sylvestris*	PINACEAE		5	G?	SE5			X	X	X						x
Sensitive Fern	*Onoclea sensibilis*	DRYOPTERIDACEAE	4	-3	G5	S5			X	X	X				x		

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
Shagbark Hickory	*Carya ovata var ovata*	JUGLANDACEAE	6	3	G5	S5			X[U]	X	U	x	x		x	x	x
Silver Maple	*Acer saccharinum*	ACERACEAE	5	-3	G5	S5			X	X	X	x					
Smooth Brome	*Bromus inermis ssp inermis*	POACEAE		5	G4G5T?	SE5			X	X	X		x	x			
Soft Rush	*Juncus effusus ssp solutus*	JUNCACEAE	4	-5	G5T?	S5			X	X	X	x	x			x	
Soy Bean	*Glycine max*	FABACEAE		5	G?	SE2							x				
Spikerush Species	*Eleocharis sp*	CYPERACEAE											x				
Spotted Jewel-weed	*Impatiens capensis*	BALSAMINACEAE	4	-3	G5	S5			X	X	X		x			x	
Staghorn Sumac	*Rhus typhina*	ANACARDIACEAE	1	5	G5	S5			X	X	X		x				
Sugar Maple	*Acer saccharum ssp. saccharum*	ACERACEAE			G5T?	S5			X	X	X				x		
Tall Goldenrod	*Solidago altissima var altissima*	ASTERACEAE	1	3	G?	S5			X	X	X		x				
Tartarian Honeysuckle	*Lonicera tatarica*	CAPRIFOLIACEAE		3	G?	SE5			X	X	X			x		x	
Thicket Creeper	*Parthenocissus inserta*	VITACEAE	3	3	G5	S5			X	X	X			x		x	
Timothy	*Phleum pratense*	POACEAE		3	G?	SE5			X	X	X		x				
Torrey's Rush	*Juncus torreyi*	JUNCACEAE	3	-3	G5	S5			X[U]	X	X		x	x		x	
True Watercress	*Nasturtium officinale*	BRASSICACEAE		-5	G?	SE							x				
Turtlehead	*Chelone glabra*	SCROPHULARIACEAE	7	-5	G5	S5			X[U]	X	X					x	
Velvet-leaf	*Abutilon theophrasti*	MALVACEAE		4	G?	SE5			X	X	X	x					
Virginia Strawberry	*Fragaria virginiana ssp virginiana*	ROSACEAE	2	1	G5T?	SU			X	X	X		x	x	x		
Western Poison Ivy	*Rhus radicans ssp rydbergii*	ANACARDIACEAE		0	G5T	S5			X	X	X				x		
White Ash	*Fraxinus americana*	OLEACEAE	4	3	G5	S5			X	X	X				x	x	
White Avens	*Geum canadense*	ROSACEAE	3	0	G5	S5			X	X	X	x					
White Clover	*Trifolium repens*	FABACEAE		2	G?	SE5			X	X	X		x				
White Goosefoot	*Chenopodium album var album*	CHENOPODIACEAE		1	G5T5	SE5			X	X	X		x				
White Oak	*Quercus alba*	FAGACEAE	6	3	G5	S5			X	X	X				x	x	x

Common Name	Scientific Name	Family	cc[1]	cw[1]	grank[2]	Srank[3]	COSEWIC[4]	MNR[5]	Halton Region[6]	Greater Toronto Area[6]	Site District 7E-4[6]	Unit 1 (Pond)	Unit 2 (Old field and riparian wetlands)	Unit 3 (Lowland deciduous forest)	Unit 4 (North Woodlot)	Unit 5 (Valley Forest and floodplain marsh)	Other (TC, HR)
White Trillium	*Trillium grandiflorum*	LILIACEAE	5	5	G5	S5			X	X	X				x		
Wild Black Cherry	*Prunus serotina*	ROSACEAE	3	3	G5	S5			X	X	X				x	x	
Wild Mock-cucumber	*Echinocystis lobata*	CUCURBITACEAE	3	-2	G5	S5			X	X	X	x	x	x			
Wild-rye Species	*Elymus sp*	POACEAE											x				
Winterberry	*Ilex verticillata*	AQUIFOLIACEAE	5	-4	G5	S5			X	X	R[5]				x		
Wood Anemone	*Anemone quinquefolia var quinquefolia*	RANUNCULACEAE	7	0	G5	S5			X	X	X					x	
Woolgrass Bulrush	*Scirpus atrovirens*	CYPERACEAE	3	-5	G5?	S5			X	X	X		x				
Yellow Rocket	*Barbarea vulgaris*	BRASSICACEAE		0	G?	SE5			X	X	X	x		x			
Yellow Trout-lily	*Erythronium americanum ssp americanum*	LILIACEAE	5	5	G5T5	S5			X	X	X				x	x	

Legend

[1]**Coefficient of Conservatism and Coefficient of Wetness** (Oldham et al., 1995).

- CC = Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

- CW = Coefficient of Wetness. -Value between 5 and –5. A value of –5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.

[2]G-Rank (global)
Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

- G1 Extremely rare—usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2 Very rare—usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to extinction.

- G3 Rare to uncommon—usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- G4 Common—usually more than 100 occurrences; usually not susceptible to immediate threats.
- G5 Very common—demonstrably secure under present conditions.

[3]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

- S1 Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- S2 Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- S3 Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 Secure—Common, widespread, and abundant in the nation or state/province.
- S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SX Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.
- SE Exotic; not believed to be a native component of Ontario's flora.

[4]COSEWIC (Committee on the Status of Endangered Wildlife in Canada)
(federal status from COSEWIC NOVEMBER 2010)

- EXT Extinct - A species that no longer exists.
- EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
- END Endangered - A species facing imminent extirpation or extinction.
- THR Threatened - A species likely to become endangered if limiting factors are not reversed.
- SC Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
- NAR Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
- DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of extinction.

***** - Species on Schedule 1 of *Species at Risk Act* (*SARA*)

[5]OMNR (Ontario Ministry of Natural Resources)
(*provincial status from MNR September 2010)*
The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

- EXT Extinct—A species that no longer exists anywhere.
- EXP Extirpated—A species that no longer exists in the wild in Ontario but still occurs elsewhere.
- END Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's *Endangered Species Act* (*ESA*).
- THR Threatened—A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
- SC Special Concern (formerly Vulnerable) —A species with characteristics that make it sensitive to human activities or natural events.
- NAR Not at Risk—A species that has been evaluated and found to be not at risk.
- DD Data Deficient (formerly Indeterminate) —A species for which there is insufficient information for a provincial status recommendation.

[6] *SARA* (*Species at Risk Act*) Status and Schedule

The Act establishes Schedule 1, as the official list of species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented. http://www.sararegistry.gc.ca/sar/listing/listing_e.cfm

- EXT Extinct - A species that no longer exists.
- EXP Extirpated **-** A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
- END Endangered - A species that is facing imminent extirpation or extinction.
- THR Threatened - A species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
- SC Special Concern - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.

Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of *SARA*. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Species at Risk.

- Government of Canada. Species at Risk Public Registry. Website: [http://www.sararegistry.gc.ca/default_e.cfm November 3, 2010]
- Glossary: http://www.sararegistry.gc.ca/about/glossary/default_e.cfm#e
- Species Index A-Z: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
- Species Listing by Schedule: http://www.sararegistry.gc.ca/sar/listing/default_e.cfm

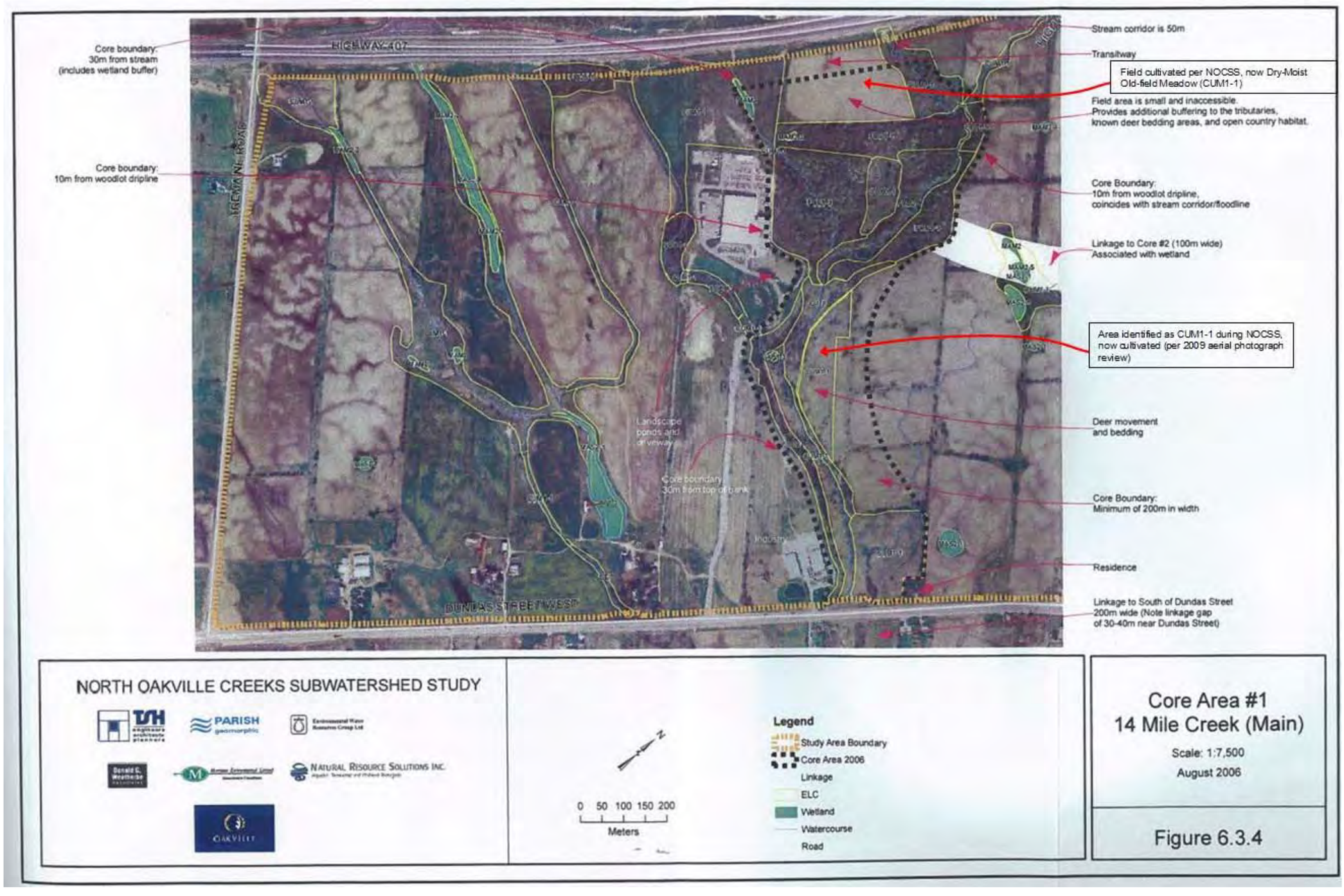
[7] Regional Status

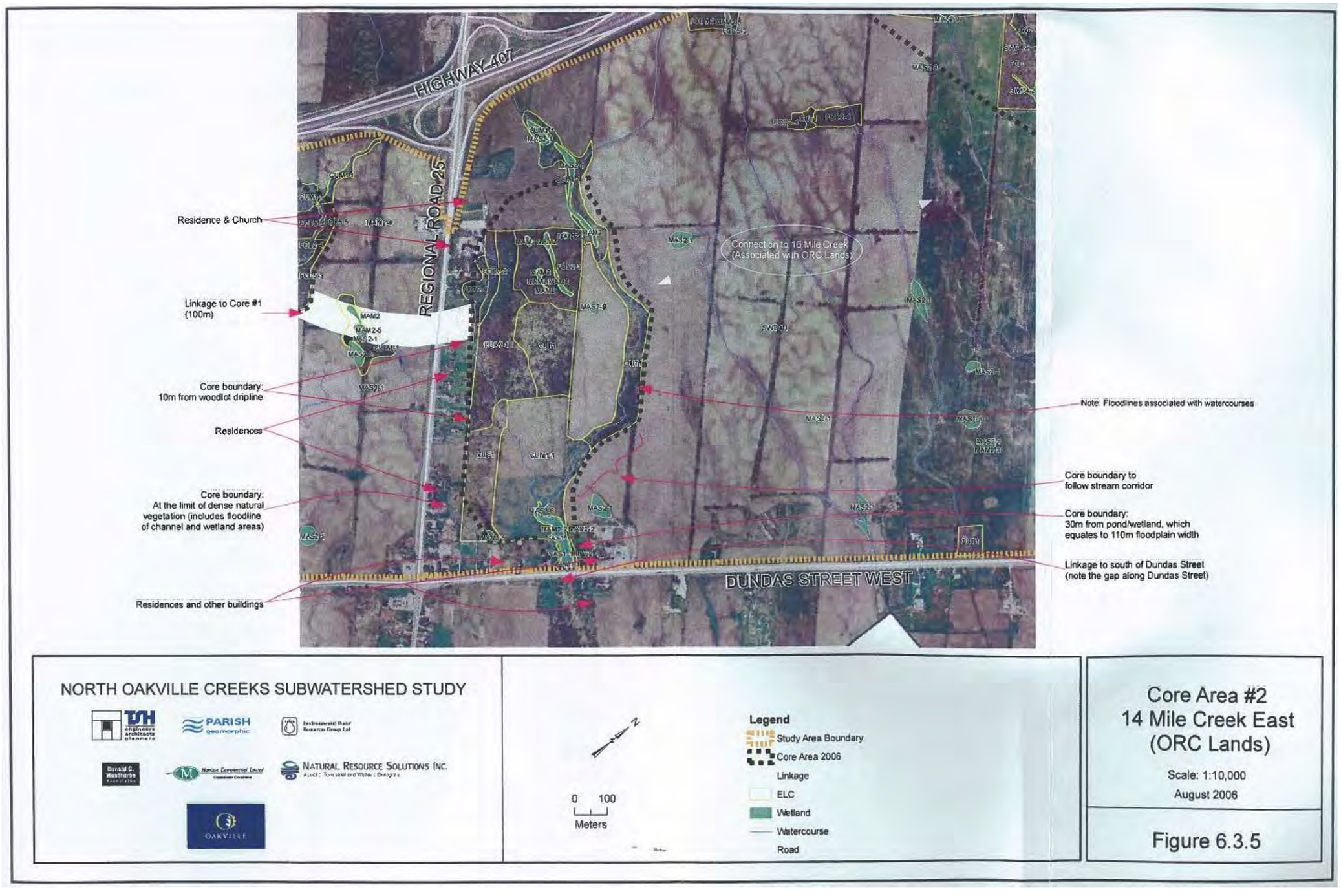
from *The Distribution and Status of the Vascular Plants of the Greater Toronto Area* (Varga et. al. 2000).

"Plant rarity is based on the number of locations for a native plant species" and also takes into account native species restricted to specialized rare habitats. For the Greater Toronto Area column, "A species is considered rare in the Greater Toronto Area if it is rare or uncommon in a least four of... Halton, Peel, Toronto, York, and Durham".

- X - Present
- U - uncommon native species
- R - rare native species
- R# - number of stations for a rare native species
- E - extirpated native species
- + - introduced species
- X+ - introduced in municipality
- SR - sight record
- LR - literature record

Appendix 5.4 – Core #1 and Linkage to Core #2 Vegetation Community Mapping (Modified by MMM from NOCSS)


Core boundary:
30m from stream
(includes wetland buffer)
Core boundary:
10m from woodlot dripline
HIGHWAY 407
TREWAN NE ROAD
DUNDAS STREET WEST
Landscape ponds and driveway
Core boundary
30m from top of bank
Stream corridor is 50m
Transitway
Field cultivated per NOCSS, now Dry-Moist Old-field Meadow (CUM1-1)
Field area is small and inaccessible.
Provides additional buffering to the tributaries, known deer bedding areas, and open country habitat.
Core Boundary:
10m from woodlot dripline,
coincides with stream corridor/floodline
Linkage to Core #2 (100m wide)
Associated with wetland
Area identified as CUM1-1 during NOCSS, now cultivated (per 2009 aerial photograph review)
Deer movement and bedding
Core Boundary:
Minimum of 200m in width
Residence
Linkage to South of Dundas Street
200m wide (Note linkage gap
of 30-40m near Dundas Street)
NORTH OAKVILLE CREEKS SUBWATERSHED STUDY
PARISH geomorphic
Natural Resource Solutions Inc.
0 50 100 150 200
Meters
Legend
Study Area Boundary
Core Area 2006
Linkage
ELC
Wetland
Watercourse
Road
Core Area #1
14 Mile Creek (Main)
Scale: 1:7,500
August 2006
Figure 6.3.4


HIGHWAY 407
REGIONAL ROAD 25
DUNDAS STREET WEST
Residence & Church
Linkage to Core #1
(100m)
Core boundary:
10m from woodlot dripline
Residences
Core boundary:
At the limit of dense natural
vegetation (includes floodline
of channel and wetland areas)
Residences and other buildings
Connection to 16 Mile Creek
(Associated with ORC Lands)
Note: Floodlines associated with watercourses
Core boundary to
follow stream corridor
Core boundary:
30m from pond/wetland, which
equates to 110m floodplain width
Linkage to south of Dundas Street
(note the gap along Dundas Street)
NORTH OAKVILLE CREEKS SUBWATERSHED STUDY
PARISH geomorphic
NATURAL RESOURCE SOLUTIONS INC.
0 100
Meters
Legend
Study Area Boundary
Core Area 2006
Linkage
ELC
Wetland
Watercourse
Road
Core Area #2
14 Mile Creek East
(ORC Lands)
Scale: 1:10,000
August 2006
Figure 6.3.5

Appendix 5.5 – ELC Field Data Sheets

- FOD
- Mid aged.
- Abrupt mature edge.
- 80% canopy cover

ELC
PLANT SPECIES LIST

SITE: Ok Lazy Pat
POLYGON: 01
DATE: Aug. 18 '09
SURVEYOR(S): SDinka

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Pinu str					
Pinu syl					
Jun vir					
Thu occ					
Acer Sacc.					
Acer neg.					
Carya					

SPECIES CODE	LAYER 1	2	3	4	COL.
Rham cat					
Frax amer.					

M'daged Mature FoD
disturbed by constructed
trail for Zenon/GE treatment plant employees.
90+ canopy cover, generally good health of trees.

ELC PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 02
DATE: Aug. 18/09
SURVEYOR(S): S Dinka

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer saca	D				
Fraxnat.					
Pinustro.					
Quer alb.					

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC
PLANT SPECIES LIST

SITE: Lacey Pat
POLYGON: 03
DATE: Aug. 18/09
SURVEYOR(S): S Dinka.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER				COL.
	1	2	3	4	
Acer saca					
Fraxinus					

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: 04
DATE: Sept 11, 2009
SURVEYOR(S): SD

Mid-aged to Mature FOD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Quebus sp					
Carya ov.					
Acer sac					

ELC
PLANT SPECIES LIST

SITE: Lazy Cat 3460
POLYGON: 105
DATE: Sept 11 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

FOD, Hickory dominant.

SPECIES CODE	LAYER 1	2	3	4	COL.
Carya ov.	A				
Pinu stro	O				
Frax pen	O				
Acer sac.					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of .....

MAM area ~~dang~~ flows thrown middle of forest block, majority is shagbark hickory dominated mid-aged. FOD

ELC
PLANT SPECIES LIST

SITE: Lazy Cat 3460
POLYGON: 06
DATE: Sept. 11, 2009.
SURVEYOR(S): SP

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Corya ova					
Fraxi amer					
Frax pen					
Acer sacc					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

mid-aged FOD, Hickory dominant, residential properties cut out of forest block.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 07
DATE: Sept. 11, 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER				COL.
	1	2	3	4	

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: 08
DATE: Sept. 11 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer Sac.	A				
Pinus Str.	F				
Carya ov	O				
Quercus sp.	O				

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

mid-aged FOD5, FOM2
moderately large pond on south corner

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: ~~09~~ 09
DATE: Sept. 11, 2009
SURVEYOR(S): SD

Mid aged to mature FOD5

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer saca	A				
Pinu stob.	F				
Carya ov.					
Populus ser					
Fax amer					
Quercus sp					

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: 10
DATE: Sept. 11, 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Pinus sp.					
Acer sac.					
Crataegus.					
Quercus sp					
Carya ov.					
Tilia amer.					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

FOM 2 -
CUS 1-1 – hawthorn cultural savannah.
FOD 5
several watercourse features + p-n's.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: A / 11
DATE: Sept. 11, 2009.
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Acer saca	A				
Carya ov.					
Pinus stro					
Quer rub.					
Quer sp.					
Ulm amer					
Frax amer					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

midaged FOD5 transected by watercourse.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 12
DATE: Sept. 11, 2009
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Phalaris arun					
Typha ang					
Typha lat					
Lythrum sal					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

- MAM2-2/CUM
- 2 ponds with ~~Stuff~~ cattail shallow marsh fringe. near 407 ROW Fence.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: 13
DATE: Sept. 11 2009
SURVEYOR(S): SD.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Ulm amer					
Phalar arun					
Lythrum sal					
Acer neg.					
Typha sp.					

SPECIES CODE	LAYER 1	2	3	4	COL.

Page ..... of ....

- MAM/CUM band surrounding watercourse with occasional trees and very small cattail shallow marsh pockets.
- watercourse surrounded by active agriculture.

ELC PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: Unit 1 wetland
DATE: Aug 20, 2009
SURVEYOR(S): KD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
(S) Salix sp	O				
Acer sac.	O				
Frax pen.	O				
Ulmus am.	O				
Malus pum	S				
Rhus cat.		O			
Cornus alt.		S			
Salix eri.			O		
Cornus foem			O		
Vitis sp			O		

SPECIES CODE	LAYER 1	2	3	4	COL.
Typha ang.				D	
Lyth sal.				F	
Phal aru.				F	
lemna minor				A	(1 root)
Spirodela poly				F	(multi root).
Eddy's thumb				O	(no bristles on achene)
Bidens frondosa				O	
Rum crisp				O	
(S) Carex vulp.				F	
grass sp.				F	
Taraxacum sp.				O	
Yellow rocket				O	
Lycopus amer				O	
Watercress				O	
Verb hast.				O	
Aster sp.				F	
Echinocystis				O	
Dips ful.				O	
Velvetleaf.				O	
Sola dulc.				O	
small arrowhead				S	→ Alisma plantago-aqu
~~Bur-reed sp.~~				O	
Grass-like aquatic				O	
Juncus effu.				O	
Typha lat.				O	

Page ..... of ....

Description
pond - fringe of cattail MAS + Duckweed floating aquatic
Fring of young trees + shrubs.
- north section beyond MAS appears to include Aster forb meadow marsh, with carex vulp (as sampled), Mixed sedge, purple loosestrife, grass like goldenrod, + unknown grasses

Willdlife
Black-capped night heron male + female.
Great blue heron
RWBB.
monarch caterpillar (pic), + butterfly.
Barn swallow
Blue jay
Flock of mourning doves

notes
* standing water to ~ 5cm in north channel but no apparent flow

ELC PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: ~~X~~ Unit 3 FOD 7-3
DATE: Aug 20, 2009
SURVEYOR(S): SDinka.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Sali. Eroq.	D				
Ulmus amer		O			
Fraxinus.		S			
Acer plat.		F			
Parth. ins.				O	
Vitis rip.				F	
Rubus idae sp.				O	
Cornus Foem				O	
Lonitat.				O	
Rhamnat.				O	

SPECIES CODE	LAYER 1	2	3	4	COL.
Carex vulp.				O	
Lyth sal.				F	
Fluid push				O	
Dipsa full.				O	
Leers ory.				O	
grass				A	
small unknown				S	
Alli ort				O	
yellow rocket				O	
wild mustard				O	
Carex sp				O	
Phal arun.				O	
Aster lace.				F	
watercress				S	
Brom. inerm				F	
Hesp mat				O	
Dandelion.					
Frag virg.					

near Dundas road only

as sampled unit 1.

as sampled unit 1.

as sampled unit 2.

→ Alisma plantago-aq

broad leaf in channel.

Page ..... of ....

wildlife American goldfinch. Blue jay, water striders in some pools.

Notes

- no flow at time of survey. but small pools of standing water & algae,
- lots of dumping etc. in channel.
- frequent canopy gaps, trees to 50cm dbh.

ELC PLANT SPECIES LIST

SITE: Lazy Pat 3460
POLYGON: Unit 4
DATE: Aug. 30
SURVEYOR(S): SDinka.

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

SPECIES CODE	LAYER 1	2	3	4	COL.
Com daisy				F	
Lady's thumb.				O	
common mugwort				A	
waterweed.				F	
Poa prat.				F	
redtop				F	
Echin crus.				O	
(5) Polygonum sp.				A	
Plant maj.				F	
Rumex crisp.				F	
Bidens frond				S	
(5) grass sp				F	
hairy willowherb				S	
Trifo rep.					

* Chrysanthemum leuc.

these 2 abundant.

— Epilobium hir.

Page ..... of ....

wildlife

* leopard frog +++
* 3 mallards in dug pond.

notes

* soils soft, esp. towards Dundas.
* dug pond has apparent overflow outlet to Dundas road ditch.
* north end appears to have been plowed.

ELC
PLANT SPECIES LIST

SITE: Lazy Cat
POLYGON: Northern Portion of Unit 2
DATE: Aug. 20/09
SURVEYOR(S): SD

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.
Crataegus sp		S			
Tili amer.		S			
Carya ovata		S			
Salix eria		S			

SPECIES CODE	LAYER 1	2	3	4	COL.
Brom. ineris				A	
Phalaris arun.				F	
Lyth sal.				F	
Aster pun.				O	
Algae.				F	→ in stagnant pools.
Soli. alt.				O	
Carex vulp.				O	→ as sampled.
Scirp atro.				S	
Leersia oryz				O	
Woolgrass bulrush.				S	
Typ cap-				S	
(S) grass				A	
Juncus torreyii				O	→ Juncus torreyii
as sampled unit					

Page ..... of ....

Brom. inermis

wildlife
* frogs (none id'd).
* mud crickets.

*notes
* narrow CUM = small MAM patches in narrow valley between raised soybean fields.
valley banders and bobolink bobolinks from point indicated on map.

ELC
PLANT SPECIES LIST

SITE: Lazy Pat
POLYGON: ~~unit 1~~ Unit 2 typical MAM2-10
DATE: Aug 20 '09
SURVEYOR(S): SDinka

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER
ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

SPECIES CODE	LAYER 1	2	3	4	COL.
Phalaris arun				F	
Aster lanceo				A	
hairy willowherb				F	
Lythrum sal.					
sampled grass from unit 3					
Euth gram.					
annual rag					
lady's thumb.					
Dandelion.					
Bromus inerm.					
sampled herb mash from unit 2.					

as sampled unit 3
Epilobium hir
Juncus tenuis

905

ELC

SOILS ONTARIO

SITE: RENTALL
POLYGON: A – pasture
DATE: Sept 24, 2014
SURVEYOR(S): LJA

Slope

UTM WP 449.

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
8cm	Ol				
0	Ap				
75	Too tough/sticks to auger				
A TEXTURE	SC	dk brown			
COURSE FRAGMENTS	2%	stony			
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS	0				
SURFACE ROCKINESS	0				
DEPTH TO / OF					
MOTTLES	15.5				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	8cm				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL

POLYGON: B - pasture

DATE: SEPT 24 2014

SURVEYOR(S): LJH

Slope

UTM WP 250

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
	0 AR 36cm				
	SC				
	55 stoney				
A TEXTURE	SC	dk Brown			
COURSE FRAGMENTS	0%				
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	11				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	6				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE:

POLYGON:

DATE:

SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: C - 2A CUM1-1
DATE: SEPT 24, 2014
SURVEYOR(S): LSA

Slope UTM WP 402

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
0	SiC				
26	SC				
53	SC				
61 TO DIFF		stoney & clay.			
A TEXTURE	SiC	DK Brown			
COURSE FRAGMENTS	< 1%				
B TEXTURE	SC	Or Brown			
COURSE FRAGMENTS	1%				
C TEXTURE	SC	Med Brown w/ dk Red & grey specks			
COURSE FRAGMENTS		& clay. & sandstone.			
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	10				
GLEY	53?				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES	∞				
DEPTH OF ORGANICS	0				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: RENTAL
POLYGON: D/2A-CUM1-1
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

Slope

UTM WP 453

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	OL 5cm				
	mSCL Ap				
23					
	CL B				
55					
	C				
62	TOO STONEY/TOUGH				
A TEXTURE	mSCL	dk brown			
COURSE FRAGMENTS	0				
B TEXTURE	CL	dk brown; Red brick spots			
COURSE FRAGMENTS	5%	Queenston Shale → Red.			
C TEXTURE	C				
COURSE FRAGMENTS	70%	red & grey stones			
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	12				
GLEY	∞				
BEDROCK	65?				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	5				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL

POLYGON: E1ZA - CUM1-1

DATE: SEPT 24, 2014

SURVEYOR(S): LJA

Slope

UTM WP458

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
O	A				
17	B				
44	STONINESS				
A TEXTURE	Si Cl	red (brick)			
COURSE FRAGMENTS	5%				
B TEXTURE	Si L	med (brown)			
COURSE FRAGMENTS	O				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:

POLYGON:

DATE:

SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: ~~3~~ 2B
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

Slope UTM

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	5 0 of SiCl 20 C 65 TOO TOUGH	VP4 Med Brown			
A TEXTURE	SiCl	Med Brown			
COURSE FRAGMENTS	0				
B TEXTURE	C	Med Brown			
COURSE FRAGMENTS	0				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	~~40~~ 3				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	5				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: 2D - MAS2-1
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

Slope

UTM WP 454

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	Ol	20			
	Oh	15			
0					
	A				
40					
	B				
60					
Oh TEXTURE	Oh	dk Brown			
COURSE FRAGMENTS	0				
A TEXTURE	SiC	dk Brown			
COURSE FRAGMENTS	1-2%				
B TEXTURE	C	Red & Grey Brown			
COURSE FRAGMENTS	50	Red Queenston Shale			
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	5cm				
GLEY	∞				
BEDROCK	?				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	20cm				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC

PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: 2G
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
0	CL	10			
	A				
20	SiCl				
	B				
50					
	C				
80	STONINESS				
A TEXTURE	SiCl				
COURSE FRAGMENTS	0	Grey Brown			
B TEXTURE	SiCl				
COURSE FRAGMENTS	15	Red Brown			
C TEXTURE	SiCl				
COURSE FRAGMENTS	50%	RED!			
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	20				
GLEY	∞				
BEDROCK	?				
WATER TABLE	15				
CARBONATES					
DEPTH OF ORGANICS	10				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: F1SA - FOD2-2
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

Slope

UTM WP 4610

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	0 – SiFS 20 ← Too Compacted				
A TEXTURE	SiFS				
COURSE FRAGMENTS	0				
B TEXTURE					
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: 5B
DATE: SEPT 24, 2014
SURVEYOR(S): LJA

Slope

UTM WP 460

	P/A	PP	Dr	Position	Aspect	%	Type	Class	Z	EASTING	NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON	OL A ~~Ahm~~ B				
A TEXTURE	mSL				
COURSE FRAGMENTS	1%				
B TEXTURE	mSCL				
COURSE FRAGMENTS					
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES					
GLEY					
BEDROCK					
WATER TABLE					
CARBONATES					
DEPTH OF ORGANICS					
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME					
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COL.

ELC

SOILS ONTARIO

SITE: BENTALL
POLYGON: G – Ag.
DATE: SEPT 24 2014
SURVEYOR(S): LJA

	P/A	PP	Dr	Position	Aspect	Slope %	Type	Class	Z	UTM EASTING	UTM NORTHING
1											
2											
3											
4											
5											

SOIL	1	2	3	4	5
TEXTURE x HORIZON					
3	OL				
0					
	A				
17					
	B				
50	auger	refused			
A TEXTURE	SiC	dk brown.			
COURSE FRAGMENTS	0				
B TEXTURE	C	mod. brown			
COURSE FRAGMENTS	15%				
C TEXTURE					
COURSE FRAGMENTS					
EFFECTIVE TEXTURE					
SURFACE STONINESS					
SURFACE ROCKINESS					
DEPTH TO / OF					
MOTTLES	7				
GLEY	∞				
BEDROCK	∞				
WATER TABLE	∞				
CARBONATES					
DEPTH OF ORGANICS	3				
PORE SIZE DISC #1					
PORE SIZE DISC #2					
MOISTURE REGIME	V. moist				
SOIL SURVEY MAP					
LEGEND CLASS					

ELC
PLANT SPECIES LIST

SITE:
POLYGON:
DATE:
SURVEYOR(S):

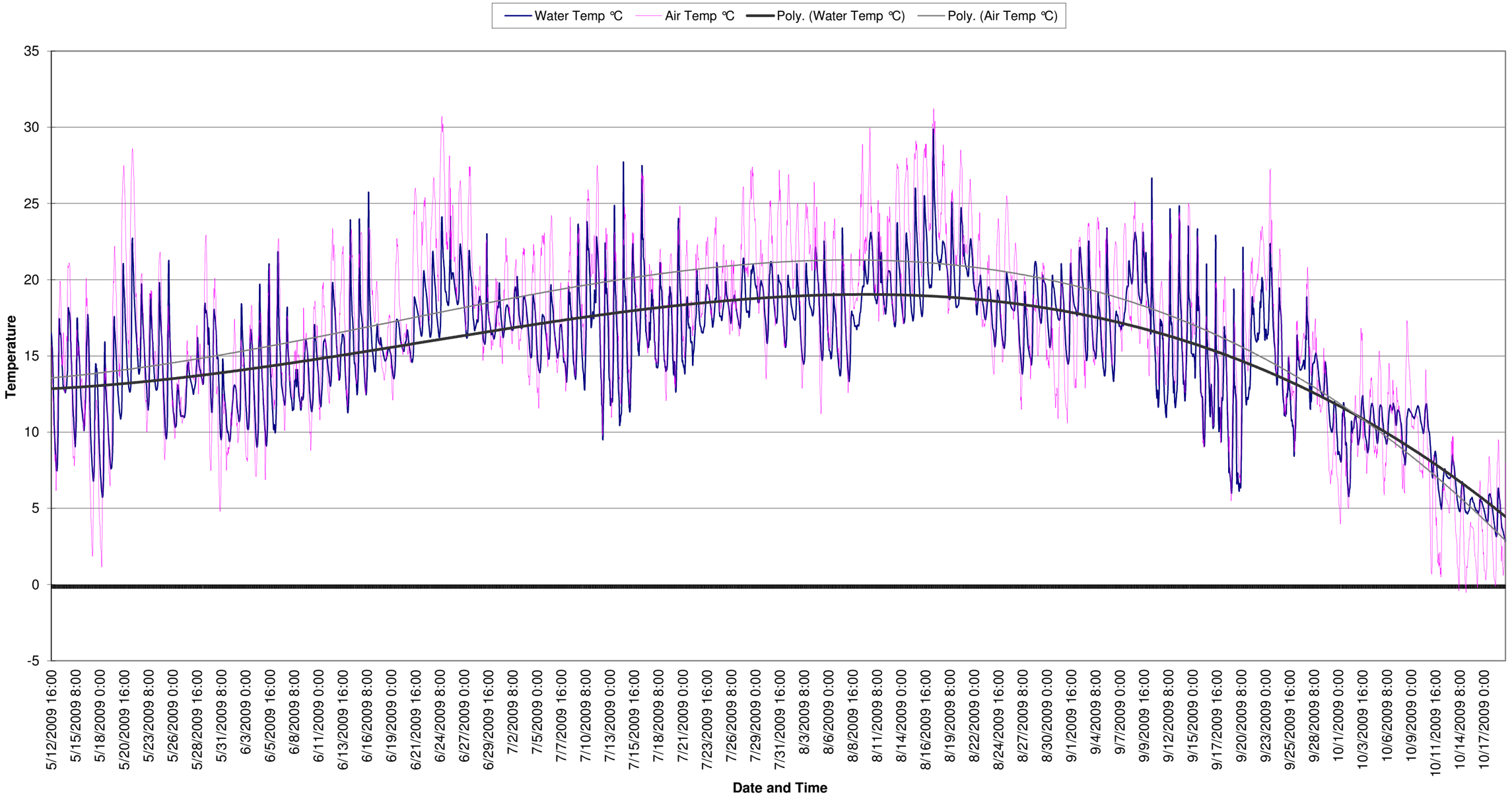
LAYERS: 1 = CANOPY 2 = SUB-CANOPY 3 = UNDERSTOREY 4 = GROUND (GRD.) LAYER

ABUNDANCE CODES: R = RARE O = OCCASIONAL A = ABUNDANT D = DOMINANT

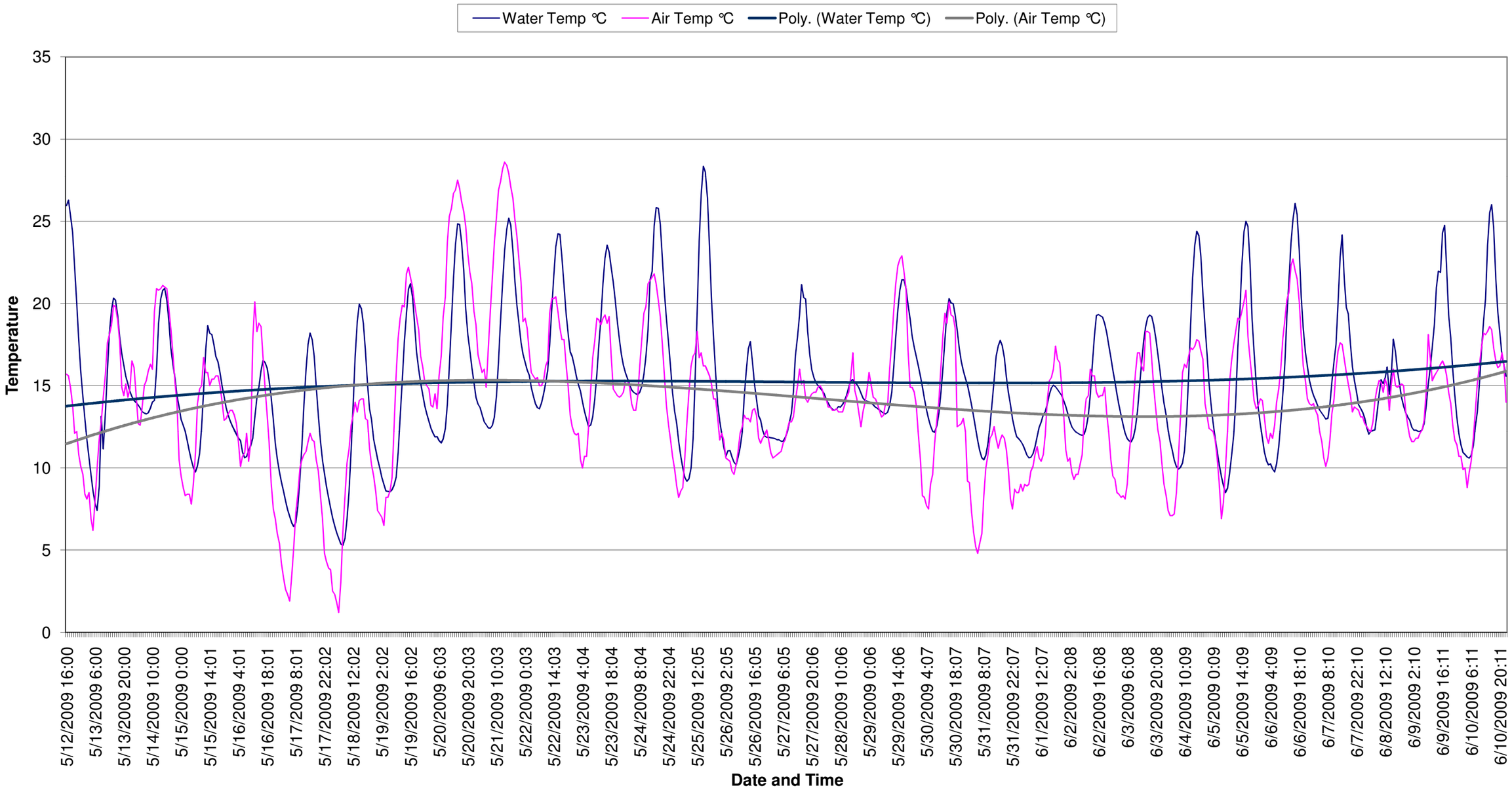
SPECIES CODE	LAYER 1	2	3	4	COL.

Appendix 5.6 – Water Temperature Monitoring Data

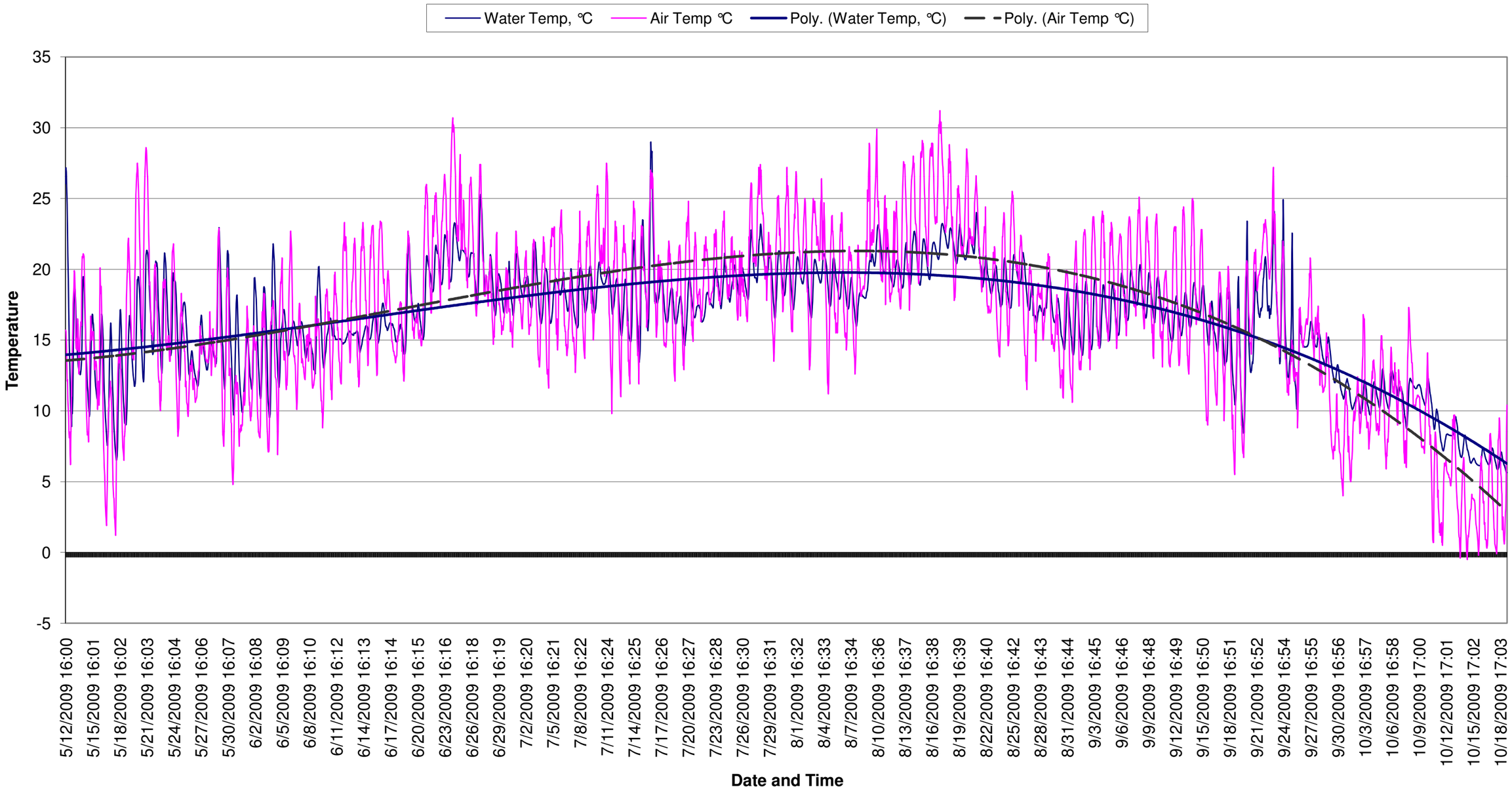
14W-11A


Water Temp ℃
Air Temp ℃
Poly. (Water Temp ℃)
Poly. (Air Temp ℃)
Temperature
35
30
25
20
15
10
5
0
-5
5/12/2009 16:00
5/15/2009 8:00
5/18/2009 0:00
5/20/2009 16:00
5/23/2009 8:00
5/26/2009 0:00
5/28/2009 16:00
5/31/2009 8:00
6/3/2009 0:00
6/5/2009 16:00
6/8/2009 8:00
6/11/2009 0:00
6/13/2009 16:00
6/16/2009 8:00
6/19/2009 0:00
6/21/2009 16:00
6/24/2009 8:00
6/27/2009 0:00
6/29/2009 16:00
7/2/2009 8:00
7/5/2009 0:00
7/7/2009 16:00
7/10/2009 8:00
7/13/2009 0:00
7/15/2009 16:00
7/18/2009 8:00
7/21/2009 0:00
7/23/2009 16:00
7/26/2009 8:00
7/29/2009 0:00
7/31/2009 16:00
8/3/2009 8:00
8/6/2009 0:00
8/8/2009 16:00
8/11/2009 8:00
8/14/2009 0:00
8/16/2009 16:00
8/19/2009 8:00
8/22/2009 0:00
8/24/2009 16:00
8/27/2009 8:00
8/30/2009 0:00
9/1/2009 16:00
9/4/2009 8:00
9/7/2009 0:00
9/9/2009 16:00
9/12/2009 8:00
9/15/2009 0:00
9/17/2009 16:00
9/20/2009 8:00
9/23/2009 0:00
9/25/2009 16:00
9/28/2009 8:00
10/1/2009 0:00
10/3/2009 16:00
10/6/2009 8:00
10/9/2009 0:00
10/11/2009 16:00
10/14/2009 8:00
10/17/2009 0:00
Date and Time

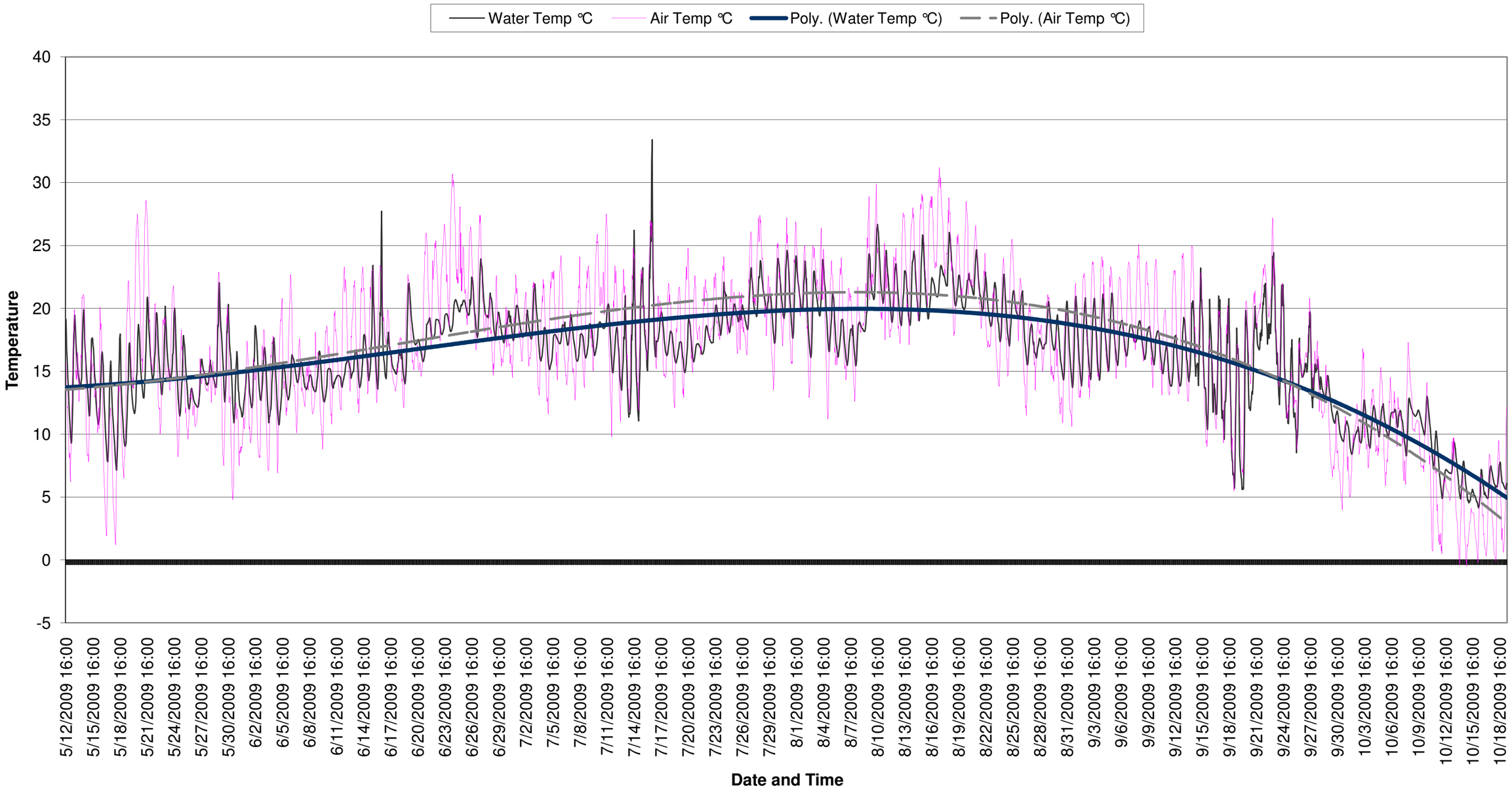
14W-12A


Water Temp ℃
Air Temp ℃
Poly. (Water Temp ℃)
Poly. (Air Temp ℃)
Temperature
35
30
25
20
15
10
5
0
5/12/2009 16:00
5/13/2009 6:00
5/13/2009 20:00
5/14/2009 10:00
5/15/2009 0:00
5/15/2009 14:01
5/16/2009 4:01
5/16/2009 18:01
5/17/2009 8:01
5/17/2009 22:02
5/18/2009 12:02
5/19/2009 2:02
5/19/2009 16:02
5/20/2009 6:03
5/20/2009 20:03
5/21/2009 10:03
5/22/2009 0:03
5/22/2009 14:03
5/23/2009 4:04
5/23/2009 18:04
5/24/2009 8:04
5/24/2009 22:04
5/25/2009 12:05
5/26/2009 2:05
5/26/2009 16:05
5/27/2009 6:05
5/27/2009 20:06
5/28/2009 10:06
5/29/2009 0:06
5/29/2009 14:06
5/30/2009 4:07
5/30/2009 18:07
5/31/2009 8:07
5/31/2009 22:07
6/1/2009 12:07
6/2/2009 2:08
6/2/2009 16:08
6/3/2009 6:08
6/3/2009 20:08
6/4/2009 10:09
6/5/2009 0:09
6/5/2009 14:09
6/6/2009 4:09
6/6/2009 18:10
6/7/2009 8:10
6/7/2009 22:10
6/8/2009 12:10
6/9/2009 2:10
6/9/2009 16:11
6/10/2009 6:11
6/10/2009 20:11
Date and Time

14W-16


Water Temp, ℃
Air Temp ℃
Poly. (Water Temp, ℃)
Poly. (Air Temp ℃)
Temperature
35
30
25
20
15
10
5
0
-5
5/12/2009 16:00
5/15/2009 16:01
5/18/2009 16:02
5/21/2009 16:03
5/24/2009 16:04
5/27/2009 16:06
5/30/2009 16:07
6/2/2009 16:08
6/5/2009 16:09
6/8/2009 16:10
6/11/2009 16:12
6/14/2009 16:13
6/17/2009 16:14
6/20/2009 16:15
6/23/2009 16:16
6/26/2009 16:18
6/29/2009 16:19
7/2/2009 16:20
7/5/2009 16:21
7/8/2009 16:22
7/11/2009 16:24
7/14/2009 16:25
7/17/2009 16:26
7/20/2009 16:27
7/23/2009 16:28
7/26/2009 16:30
7/29/2009 16:31
8/1/2009 16:32
8/4/2009 16:33
8/7/2009 16:34
8/10/2009 16:36
8/13/2009 16:37
8/16/2009 16:38
8/19/2009 16:39
8/22/2009 16:40
8/25/2009 16:42
8/28/2009 16:43
8/31/2009 16:44
9/3/2009 16:45
9/6/2009 16:46
9/9/2009 16:48
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9/15/2009 16:50
9/18/2009 16:51
9/21/2009 16:52
9/24/2009 16:54
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9/30/2009 16:56
10/3/2009 16:57
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Date and Time

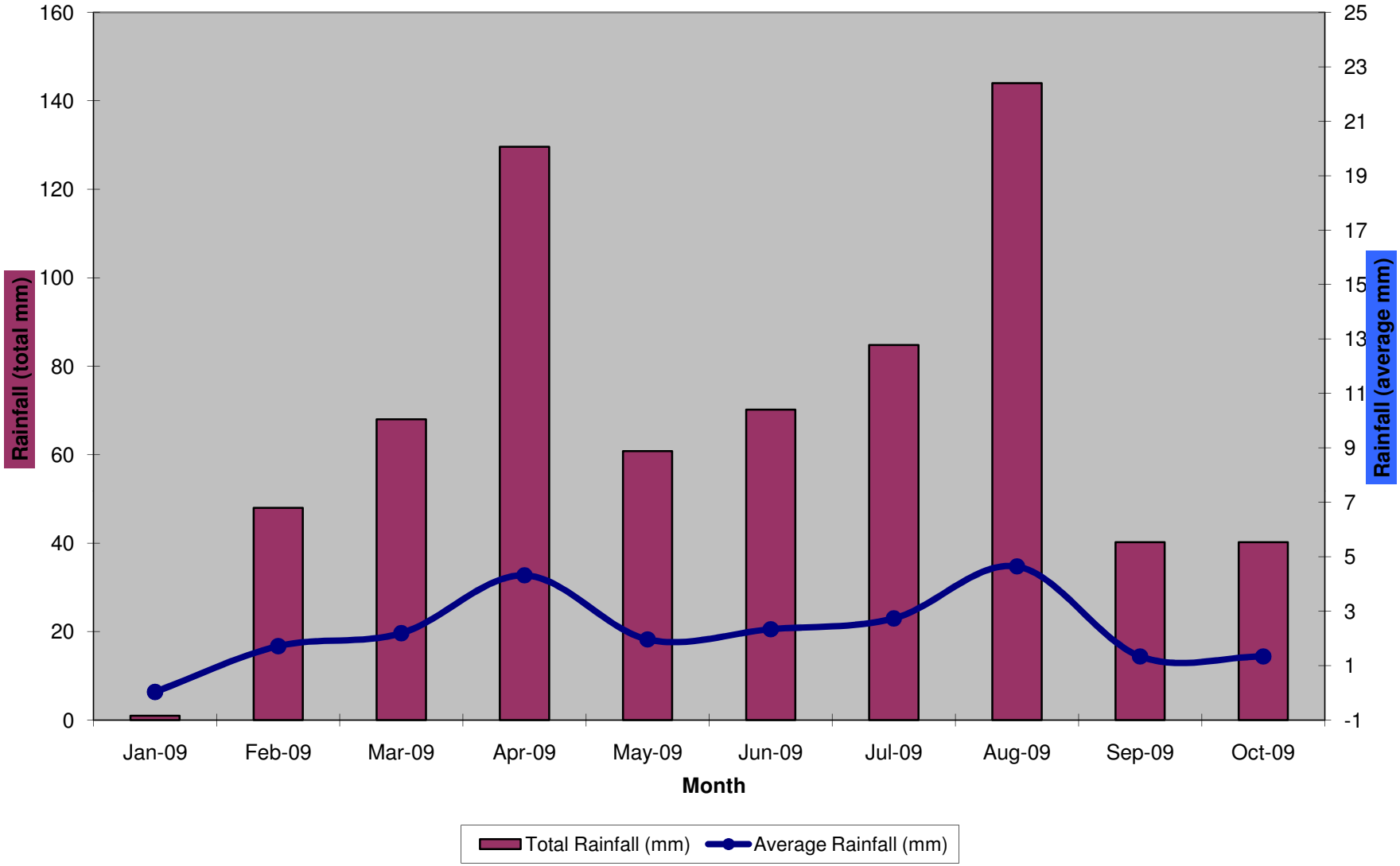
14W-12


Water Temp ℃
Air Temp ℃
Poly. (Water Temp ℃)
Poly. (Air Temp ℃)
Temperature
40
35
30
25
20
15
10
5
0
-5
5/12/2009 16:00
5/15/2009 16:00
5/18/2009 16:00
5/21/2009 16:00
5/24/2009 16:00
5/27/2009 16:00
5/30/2009 16:00
6/2/2009 16:00
6/5/2009 16:00
6/8/2009 16:00
6/11/2009 16:00
6/14/2009 16:00
6/17/2009 16:00
6/20/2009 16:00
6/23/2009 16:00
6/26/2009 16:00
6/29/2009 16:00
7/2/2009 16:00
7/5/2009 16:00
7/8/2009 16:00
7/11/2009 16:00
7/14/2009 16:00
7/17/2009 16:00
7/20/2009 16:00
7/23/2009 16:00
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8/16/2009 16:00
8/19/2009 16:00
8/22/2009 16:00
8/25/2009 16:00
8/28/2009 16:00
8/31/2009 16:00
9/3/2009 16:00
9/6/2009 16:00
9/9/2009 16:00
9/12/2009 16:00
9/15/2009 16:00
9/18/2009 16:00
9/21/2009 16:00
9/24/2009 16:00
9/27/2009 16:00
9/30/2009 16:00
10/3/2009 16:00
10/6/2009 16:00
10/9/2009 16:00
10/12/2009 16:00
10/15/2009 16:00
10/18/2009 16:00
Date and Time

Dissolved Oxygen	Result	Meaning
	<= 3	Biotic Crisis
	<4	Minimum limit in many states
	5	USEPA minimum limit
	>5	Adequate for fish
	9.8	Median of US Sites
	8.7 - 10.5	Middle 50% US Sites
DO Saturation	<80%	Evidence of elevated Oxy use
	>90%	High saturation of DO
TDS	**Result**	**Meaning**
	250	USEPA Maximum for water supply
	500	New York state Maximum
	<100	Low Concentration
	100-500	Medium Concentration
	500-1000	High Concentration
	>1000	Very High Concentration
pH	**Result**	**Meaning**
	<4	Stressed
	6.5 - 9.0	Suitable for biota
	6.5 - 8.5	Most Productive
	7.8	Median for US Sites
	7.3 - 8.1	Middle 50% US Sites
Temperature	**Result**	**Meaning**
	<18	Coldwater
	>18 to 25	Coolwater
	>25	Warmwater
Conductivity	k-value	TDS - k * SC
	0.65	Average k value
	0.55	Minimum variation of k
	0.75	Maximum variation of k

Sampling Date/Time	Temperature	TDS Value	Dissolved Oxygen	pH	Conductivity	Evaluation of TDS	Evaluation of DO	Evaluation of pH	Thermal Category	Evaluation of DO Saturation	Calculated TDS from Conductivity	Evaulation of Calculated TDS	Notes
14W-11A													
May 12, 2009 - 1015	20.2	587	10.31	8.38	1158	High	Adequate for Fish	Suitable for biota	Potential Coolwater	High Saturation Value	752.7	High	
May 28, 2009 - 0845	15.7	896	7.28	7.75	1801	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1170.65	VERY HIGH	
June 11, 2009 - 0850	14	926	4.58	7.31	1848	High	Poor for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1201.2	VERY HIGH	
June 26, 2009 - 1108	22	1141	5.3	7.42	2285	VERY HIGH	Adequate for Fish	Suitable for biota	Potential Coolwater	Oxygen Usage	1485.25	VERY HIGH	
July 8, 2009 - 0915													
July 30, 2009 - 0938	17.5	475	7.65	7.95	930	Medium	Adequate for Fish	Suitable for biota	Potential Coldwater	High Saturation Value	604.5	High	
August 28, 2009 - 1027	16.4	830	5.98	7.33	1637	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1064.05	VERY HIGH	
September 10, 2009 - 0913													No data for this location on this date. Site was dry with very wet soils. No flowing or standing water u/s or d/s.
September 30, 2009 - 0932	11	855	8.4	7.8	1679	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1091.35	VERY HIGH	
October 19, 2009 - 0910	3	848	6.14	7.46	1700	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1105	VERY HIGH	
October 30, 2009 - 0939	10	796	7.11	7.85	1588	High	Adequate for Fish	Suitable for biota	Potential Coldwater	Oxygen Usage	1032.2	VERY HIGH	
Upstream from Logger													
July 8, 2009 - 0915	22.5		4.84	8.4	2530		Poor for Fish	Suitable for biota	Potential Coolwater	Oxygen Usage	1644.5	VERY HIGH	Shocking Site at Field Crossing
14W-12													
May 28, 2009 - 0900	13.9	815	7.57	7.9	1630	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1059.5	VERY HIGH	
June 11, 2009 - 0930	15.3	813	5.67	7.54	1634	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1062.1	VERY HIGH	
June 26, 2009 - 1157	22	858	5.2	7.74	1880	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1222	VERY HIGH	
July 8, 2009 - 1420	21	1036	5.4	8.32	2062	VERY HIGH	Adequate for Fish	Suitable for biota	Potential Coolwater		1340.3	VERY HIGH	
July 30, 2009 - 1042	19	444	7.77	7.79	882	Medium	Adequate for Fish	Suitable for biota	Potential Coolwater		573.3	High	Highest volume of flowing water observed to date on site.
August 28, 2009 - 1135	20.9	899	7.28	7.89	1797	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1168.05	VERY HIGH	
September 10, 2009 - 1025	16.3	740	4.88	7.72	1489	High	Poor for Fish	Suitable for biota	Potential Coldwater		967.85	High	
September 30, 2009 - 1038	10.5	896	7.25	7.57	1752	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1138.8	VERY HIGH	
October 19, 2009 - 1255	8	639	8.93	7.83	1280	High	Adequate for Fish	Suitable for biota	Potential Coldwater		832	High	
October 30, 2009 - 1200	10.4	795	8.43	8	1591	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1034.15	VERY HIGH	
14W-12A													
May 28, 2009 - 0900	13.8	639	3.38	7.53	1276	High	Very poor for Fish	Suitable for biota	Potential Coldwater		829.4	High	
October 30, 2009 - 1136	10.5	726	6.7	7.91	1454	High	Adequate for Fish	Suitable for biota	Potential Coldwater		945.1	High	
14W-16													
May 12, 2009 - 1400	19	731	14	8.38	1434	High	Adequate for Fish	Suitable for biota	Potential Coolwater		932.1	High	
May 28, 2009 - 0900	13.1	862	8.62	7.89	1714	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1114.1	VERY HIGH	
June 11, 2009 - 0905	16	660	10.82	7.92	1317	High	Adequate for Fish	Suitable for biota	Potential Coldwater		856.05	High	
June 26, 2009 - 1130	22.6	687	8.58	8.04	1384	High	Adequate for Fish	Suitable for biota	Potential Coolwater		899.6	High	
July 8, 2009 - 1230	22	988	6.35	8.45	1971	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1281.15	VERY HIGH	
July 30, 2009 - 1012	17	586	7.89	7.77	1174	High	Adequate for Fish	Suitable for biota	Potential Coldwater		763.1	High	
August 28, 2009 - 1100	18.5	917	7.95	7.86	1807	High	Adequate for Fish	Suitable for biota	Potential Coolwater		1174.55	VERY HIGH	
September 10, 2009 - 0945	16.5	676	7.5	7.86	1350	High	Adequate for Fish	Suitable for biota	Potential Coldwater		877.5	High	
September 30, 2009 - 1007	11.5	918	8.89	7.83	1795	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1166.75	VERY HIGH	
October 19, 2009 - 1156	5.5	815	9.95	8.09	1621	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1053.65	VERY HIGH	
October 30, 2009 -1129	10.7	935	9.35	8.05	1875	High	Adequate for Fish	Suitable for biota	Potential Coldwater		1218.75	VERY HIGH	
Small and Large Pond													
Small Pond - July 8, 2009	26.3	189	5.3	9.3	380	Medium	Adequate for Fish	Alkaline	Potential Warmwater		247	Medium	
Large Pond - July 8, 2009	26	371	4.51	8.58	745	Medium	Poor for Fish	Suitable for biota	Potential Warmwater		484.25	Medium	

Recorded Rainfall



Bentall - Lazy Pat Lands Water Temperature Monitoring 2009 (Chu et.al. Method)

Water Temperature

40.00
35.00
30.00
25.00
20.00
15.00
10.00

20
22
24
26
28
30
32

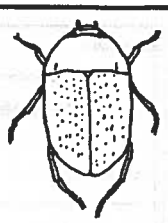
Maximum Air Temperature

14W-12
14W-11A
14W-16
Linear (14W-12)
Linear (14W-11A)
Linear (14W-16)

y = 0.7143x + 2.7511
y = 0.7258x + 1.6491
y = 0.6501x + 3.9636

Appendix 5.7 – Field Survey Collection Sheets

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS



Date: May 12/ 2009
Time 10:15am
Agency: Aurora
Investigators: SR3 JS

Stream name:
Site #: HW-11A1
Location: centroid of 3 replicates; Lat/Long or UTM
Elevation (m asl):
Datum/zone:

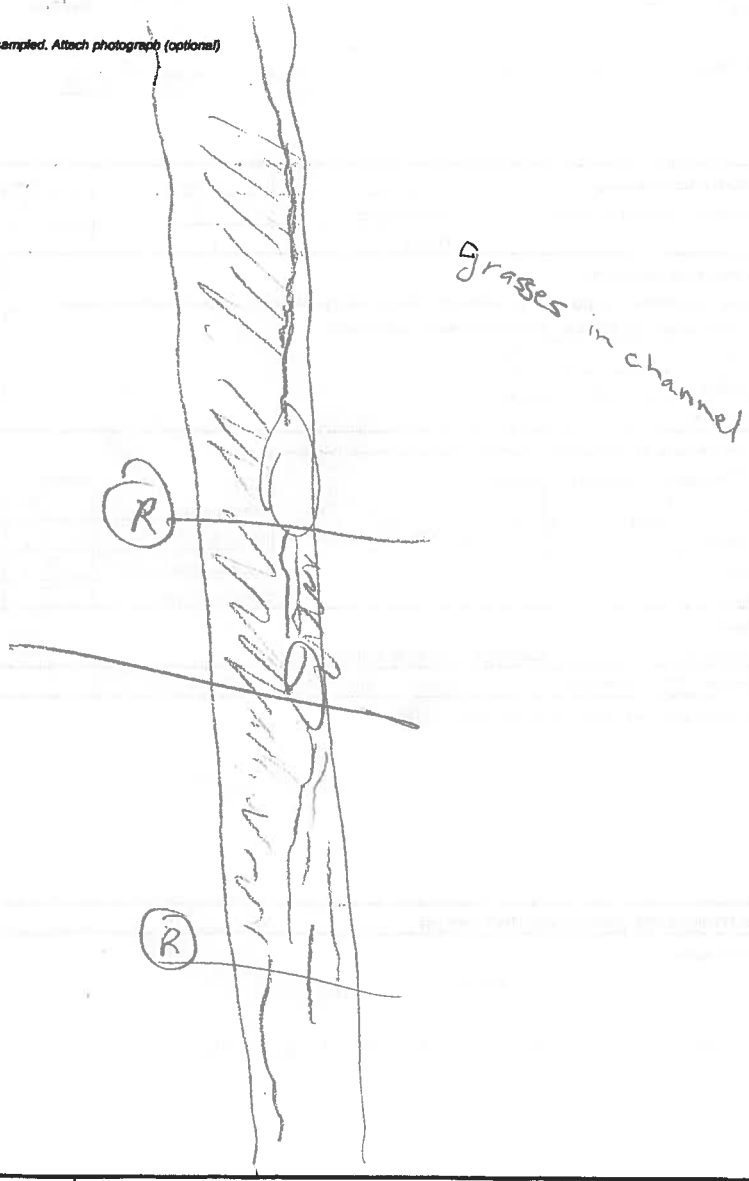
Water Quality

Water Temperature (°C): 20.2
DO (mg/l): 10.31
Conductivity (uS/cm): 1158
pH: 8.38
~~Alkalinity (mg/l as $CaCO_3$)~~: TDS 587

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):

- Traveling Kick & Sweep
- Grab Sample
- Other (specify):

Gear Type (circle one)

- D-net
- Ponar
- Other (specify):
- Ekman
- Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)				1.8		
Sample 2: Pool						
Sample 3: Riffle (cross-over)						

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	1		
2nd Dominant	2		

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes - clay then silt continues into fields

Organic Matter-Areal Coverage		Sample 1	Sample 2	Sample 3
Use 1: Abundant, 2: Present, 3: Absent	Woody Debris	3		
	Detritis	1		

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	3	3
10-30 m	2	2
30-100 m	1	2

% Canopy Cover (circle one)

0-24 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	1		
Rooted Floating	2	Pond weed (x1)	
Submergent	3		
Free Floating	3		

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3		
Filaments	1		
Attached Algae	3		
Slimes or Crusts	3		

Stream Size/Flow

Bank Full Width (m): Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) Perennial (Intermittent) Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

Candidate reference Site - Minimally Impacted? (circle one) Yes (No)

General Comments

Flows through Agri. fields

Highway run off contributes flow

Site Identification Form

Stream Name	Stream Code (Unique Code)	Site Code	Year	Sample
Tributary Fourteen Mile Creek	FOR	14W-11A	2009	1

Uncorrected Grid (XX) UTM Coordinates	Easting (XXX,XXX)	Northing (X,XXX,XXX)	OR	Lati-tude	Deg (15-60)	Min (0-60)	Sec (0-60)	Long-ilude	Deg (50-75)	Min (0-60)	Sec (0-60)

Corrected Grid (XXX) UTM Coordinates	Easting (XXX,XXX)	Northing (X,XXX,XXX)	Source of GIS Stream Layer used to correct UTM coordinate data (e.g. NRVIS 2)

Source of Coordinates (OBM Map, GPS Unit, Differential GPS)	Datum of Coordinate Source: (NAD 27, NAD 83, WGS 84) (This can be found on the legends of maps or in set-up of GP3 units)
GPS Unit	

Township/Municipality	Lot	Concession	MNR District	Watershed Code
Oakville	32	2S	Aurora	

Access Route

Exit from Dundas Street onto farm access driveway. Drive north to the end of the gravel road. Follow GPS point, northeast of the access road

Site Description

The watercourse flows between two active agricultural fields with minimal buffer veg to either side of the watercouse. Small treed stands u/s & immediately d/s of site. The channel appears to be straightened to accommodate the agricultural fields

Site Marker Description

Downstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:

Description: No permanent site marker; marked with flagging tape & GPS point

Upstream Marker

Measure from Stake to Site Bearing (Degrees):	Distance (m.):	Photograph Numbers:	Looking Upstream:	Looking Downstream:

Description: No permanent site marker; tree on left u/s bank has been flagged; GPS point

Crew S. Rankin/J. Smith Recorder S. Rankin Date (YYYY/MM/DD) 2009/05/12

Comments

Limited locations within the property limit where a 40m section of watercourse could be located in order to complete OSAP.

Site Length (m.) 40

Enter dates and initials when data entered in Computer.

	Date	Init.
Entered	05/05/21	
Verified		
Corrected		

Site Sketch Draw two sketches on the back of this sheet. First draw a map to the area of the site then draw a sketch of the site. Be sure to include enough detail to ensure that someone could find the site again, including a north arrow and the locations of all markers, as well as the locations of any noted features. The artist should also sign the sketches.

Site Features Form

Stream Name:	Stream Code:	Site Code:	Year:	Sample:	Date (YYYY/MM/DD):
		14W-11A	2009	1	2009/05/12

For each landuse, check off all boxes which apply. Be sure to include comments explaining the particulars, including names and numbers of contacts.

Site Features	Ongoing and Active	Historical Evidence	No Evidence but Reported	No Evidence	Unknown	Comments
Potential Point or Non-point Source Contaminant Sources	☐	☐	☐	☐	☒	
Major Nutrient Sources Upstream	☐	☐	☐	☒	☐	
Channel Hardening or Straightening	☒	☐	☐	☐	☐	channel realignment
Adjacent Landuses That Destabilize Banks	☒	☐	☐	☐	☐	Field crossing u/s of site
Sediment Loading or Deprivation	☐	☐	☐	☐	☒	
Instream Habitat Modifications	☐	☐	☐	☒	☐	
Barriers and/or Dams in the Vicinity of the Site	☐	☐	☐	☒	☐	
High Fishing Pressure	☐	☐	☐	☒	☐	
Log Jam Deflectors	☐	☐	☐	☒	☐	
Springs or Seeps at the Site	☐	☐	☐	☒	☐	
Impervious Substrate Limiting Burrowing Depth of Fish	☐	☐	☐	☒	☐	
Other Activities That Could Influence Biota or Habitat	☐	☐	☐	☒	☐	

Temperatures

Water Temperature(°C): ° Date: Time: Air Temperature At Same Time (°C): °

Maximum Air Temperature (°C): ° Source of Maximum Air Temp: Maximum Water Temperature(°C):: °

Crew: J. Smith & S. Rankin Recorder: S. Rankin

Comments:

Sources of Information: ☒ Visual Immediate ☐ Visual Extended ☐ Interview ☒ Maps/Photos

Riparian Vegetation Community — Only Check one box for each bank and zone

Riparian Zone	Dominant Vegetation Type: Left Bank None	Left Bank Cultivated	Left Bank Meadow	Left Bank Scrubland	Left Bank Forest	Right Bank None	Right Bank Cultivated	Right Bank Meadow	Right Bank Scrubland	Right Bank Forest
1.5-10m.	☐	☐	☒	☐	☐	☐	☐	☒	☐	☐
10-30m.	☐	☒	☐	☐	☐	☐	☒	☐	☐	☐
30-100m.	☐	☒	☐	☐	☐	☐	☒	☐	☐	☐

Entered dates and initial when data entered in computer

	Date	Init.
Entered	8/06	AR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name	Stream Code: (Unique Code)	Site Code	Year	Sample #:	Date: (YYYY/MM/DD)	Transect #
Trib of 14mile Creek	FOR	14W-11A	2009		2009/05/12	1 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0 | Site Length (m.) 40

Number of Transects 15 | Transect Spacing (m.) 2.85

Number of Points/ Transect (N) 3

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 2.4 (3.9 / 0.4)

Point Spacing (m.) .98

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 282

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	RR ooucnkd	Floatk	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.90	30	0	Si	Si	0										X		X	
2	2.7	40	0	Si	Si	2										X		X	
3	3.5	35	0	Si	Si	2										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		200	155	100	0		6			X		
Right		190	180	100	0		6			X		
Bank Particle Median Diameters (mm.)		Si	Si	C1	C1							
		Si	Si	C1	C1							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	SR
Verified		
Corrected		

Data entered.

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: MW-11A	Year: 2009	Sample #:	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 2 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length (m.) 40

Transect Spacing (m.) 2.85 = Site Length / (Number of Transects – 1)

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.9 3.4

Point Spacing (m.) 0.63 0.32

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 279

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.82	30	⊗	5;	5;	2				X						X		X	
2	2.45	50	⊗	"	"	"				X						X		X	
3	3.08	40	⊗	"	"	⊗										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		230	220	135	0	X	4			X		
Right		220	150	170	0	X	11			X		
Bank Particle Median Diameters (mm.)		5;	5;	<1	<1							
		5;	5;	<1	<1							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	06/05	AK
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14WM11A	Year: 2009	Sample #:	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 3 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 — Site Length (m.) 40

Number of Points/ Transect (N) 3 — Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.8 3.3

Point Spacing (m.) 0.6 0.3

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 279

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Root	Fish	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.80	40	0	S;	S;	2					X						X		X	
2	2.40	40	0	S;	S;	0											X		X	
3	3.00	30	0	S;	S;	0											X		X	
4																				
5																				
6																				

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; if a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		165	120	120	0	X	4		X			
Right		200	180	110	90	X	4			X		
Bank Particle Median Diameters (mm.)		S;	S;	C1	C1							
		S;	S;	C1	C1							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 4 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length / (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 2.00 3.5

Point Spacing (m.) 0.66 0.33

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 278

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.83	40	0	5.	5.	0										X		X	
2	2.49	35	0	5;	5;	0										X		X	
3	3.15	75	0	5.	5;	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		245	220	200	0	X	3		X			
Right		170	160	80	0	X	5		X			
Bank Particle Median Diameters (mm.)		5.	5;	<1	<1							
		5;	5;	<1	<1							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	JK
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W2-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 5 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Number of Transects 15

Number of Points/ Transect (N) 3

Site Length / (Number of Transects – 1)

Site Length (m.) 40

Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.7 3.2

Point Spacing (m.) 0.57 0.28

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 290

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.78	35	Ø	S;	S,	Ø										X		X	
2	2.35	85	Ø	S;	S,	Ø												X	
3	2.92	60	Ø	S;	S,	2				X						X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		240	190	155	0	X	10					X
Right		160	110	140	100	X	3		X			
Bank Particle Median Diameters (mm.)		S;	C1	C1	C1							
		S;	S;	C1	C1							

Comments: 1 tree = Forest

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	SR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: MW-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 6 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.2 2.7

Point Spacing (m.) 0.4 0.2

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.70	65	0	5;	5;	0										X		X	
2	2.10	70		5;	5;	0										X		X	
3	2.50	30		5;	5;	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		265	220	210	0	X	8		X			
Right		210	170	110	0	X	7		X			
Bank Particle Median Diameters (mm.)		5;	<1	<1	<1							
		5;	5;	<1	<1							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	JR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14WJ-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 7 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 14
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.3 2.8

Point Spacing (m.) 0.43 2.2

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 284

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock Rounded	Rock Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.72	55	0	Si	Si	0										X		X	
2	2.15	50	0	Si	Si	0										X		X	
3	2.58	50	0	Si	Si	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		240	225	140	0	X	5		X			
Right		220	120	100	50	X	6	X	X			
Bank Particle Median Diameters (mm.)		Si	Si	C1	C1							
		Si	Si	C1	C1							

Comments: Pondweed?

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	JR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 8 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.4 — 2.9

Point Spacing (m.) 0.47 — 2.3

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.73	30	Ø	Si	Si	Ø										X		X	
2	2.20	40	Ø	Si	Si	Ø										X		X	
3	2.67	20	Ø	Si	Si	Ø										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		265	120	105	Ø	X	7		X			
Right		200	130	100	Ø	X	5		X			
Bank Particle Median Diameters (mm.)		Si	Cl	Cl	Cl							
		Si	Si	<1	<1							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	AP
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 9 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40m
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.5

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.10 2.6

Point Spacing (m.) 0.37 0.18

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 290

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm.		Particle Sizes (mm.)		Cover	Cover Types Present						Aquatic Vegetation Types Present (Put X in box if present, Put – if not.)							Vegetation Types
		Depth (mm.)	Hydraulic Head (mm.)	Point	Maximum In Ring	Quality (-99, 0, 1, 2)	Wood	Rock	Bedrock	Mac	Bank	Oth	FL	AL	SS	MC	WC	GR	TR	FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants
1	1.68	40	⊘	5;	5;	⊘												X		
2	2.05	50	⊘	5;	5;	⊘												X		
3	2.42	40	⊘	5;	5;	⊘												X		
4																				
5																				
6																				

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points					Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.				
	> 2m	0 mm.	250 mm.	750 mm.	1500 mm.			None	Cultivated	Meadow	Scrubland	Forest
Left		210	160	80	⊘	X	4		X			
Right		180	130	160	⊘	X	3		X			
Bank Particle Median Diameters (mm.)		5;	5;	C1	C1							
		5;	5;	C1	C1							

Comments:

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	KR
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2004	Sample #: 1	Date: (YYYY/MM/DD): 2004/05/12	Transect # 10 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0 (2.5)

Point Spacing (m.) 0.33 (0.17)

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 189

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	120	Ø	Si	Si	Ø							X						
2	2.00	160	Ø	Si	Si	Ø							X						
3	2.33	160	Ø	Si	Si	Ø												X	X
4																			
5																			
6																			

Vegetation Types
FL = Filamentous Algae
AL = Non-Filamentous Algae
SS = Moss
MC = Macrophytes
WC = Watercress
GR = Grass
TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		260	230	165	Ø	X	5		X			
Right		245	110	170	Ø	X	6		X			
Bank Particle Median Diameters (mm.)		Si	Si	Cl	Cl							
		Si	Cl	Cl	Cl							

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	4/05	AL
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 11 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.5

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.0 2.5

Point Spacing (m.) 0.33 1.0

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 286

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.67	40	0	5;	5;	0										X		X	
2	2.00	40	0	5;	5;	0										X		X	
3	2.33	20	0	5;	5;	0										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)
Left		190	200	125	0	X	5
Right		180	160	60	0	X	7
Bank Particle Median Diameters (mm.)		5;	5;	<1	<1		
		5;	5;	<1	<1		

Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.

None	Cultivated	Meadow	Scrubland	Forest
	X			
	X			

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	9/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 12 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 — Site Length (m.) 40

Number of Points/ Transect (N) 3 — Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.3 2.8

Point Spacing (m.) 0.43 0.22

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.72	40	Ø	5;	5;	Ø										X		X	
2	2.15	30	Ø	5;	5;	Ø												X	
3	2.58	20	Ø	5;	5;	Ø										X		✓	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		210	170	120	Ø	X	3		X			
Right		190	120	130	Ø	X	7		✓			
Bank Particle Median Diameters (mm.)		5;	C1	C1	C1							
		5;	5.	C1	C1							

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Comments:

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	AR
Verified		
Corrected		

Diagnostic Indicators of Channel Stability

@13/15

Stream Name:	Stream Code (Unique Code)	Site Code: 14W-11A	Year 2009	Sample #: 1	Date (YYYY/MM/DD) 2009/05/12	Transect # 13 of 15

Record these values only on the first transect
Site Length (m): 40 | Transect Spacing (m): 2.85

Crew: SRJJS

Comments

Obstructions to Flow

(If none present, check "None Present" Otherwise check the applicable types.)

- [x] None Present
- [ ] Trampled Banks
- [ ] Wood Deflectors
- [ ] Inorganic Deflectors
- [ ] Armouring
- [ ] Inlets
- [ ] Others (List Types)

Indicators Used to Locate Bankfull Level

	Left Bank	Right Bank
Inflection Point	[x]	[x]
Bank Material	[ ]	[ ]
Top of Point Bar	[ ]	[ ]
Vegetation	[x]	[x]
Minimum Width:Depth	[ ]	[ ]
Others (List Types)		

Entrenchment

Entrenchment Height = 2 X Maximum Channel Depth

Entrenchment Width = Horizontal distance from the location of the Maximum Channel Depth to the bank at the Entrenchment Height

Record either the Left and Right widths, or the Total Width

Left Entrenchment Width (m):

Right Entrenchment Width (m):

Total Entrenchment Width (m): >40

DISCHARGE APPROXIMATES BASEFLOW YES [x] NO [ ]

Channel Profile

Feature	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)	Velocity Measurements (Recommended depth ratio from stream bottom is 0.4): Water Depth (mm)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)
Left BFD	0.8	125					
Right BFD	4.0	90					
Max Channel Depth	2.65	345					
Left Active Channel	1.5	220					
Right Active Channel	3.1	220					
Measurement 1	0.37	185					
2	2.4	300					
3	3.47	145					
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

* This column is for recording data when the minimum width:depth ratio indicator is used and the bankfull level is NOT identified in the field.

Channel Profile (continued)

Measurement	Horiz. Loc. (m)	Vert Ht to Bankfull (mm)	Vert Ht* to Tape (mm)	Velocity Measurements: Water Depth (mm.)	Observation Depth (mm)	Turns/ Min	Velocity (m/s)
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Transect and Point Layout

Use this table to provide guidance for selecting how many points per transect to measure, given the minimum width of the stream.

Minimum Width (m.)	Low variance in velocity or depth	High variance in velocity or depth
> 3.0	8 + 1 every 2 metre	10 + 1 every 1 metre
1.5 – 3.0	5	8
1.0 – 1.49	3	6
< 1.0	2	4

1.07
0.53

Active Width (W) (m.) 3.2

Point Spacing (S) (m.) = Active Width (W) (m.) / # Points per transect (N) 3

1.06

Point Spacing (S) (m.) 1.06

0.53

First point is S/2 from the left bank

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 13 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Site Length / (Number of Transects – 1)

Minimum Width (m.) 1.0	
Number of Transects 15	Site Length (m.) 40
Number of Points/ Transect (N) 3	Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)	
Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.)	1.6 (3.1)
Point Spacing (m.)	0.53 (0.27)
Point Spacing, S = Active Width W (m.) / # Points per Transect	
First point is S/2 from the left bank	
Compass Bearing:	288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.77	50	Ø	Si	Si	2				X						X		X	
2	2.30	50	Ø	Si	Si	2				X								X	
3	2.83	45	Ø	Si	Si	Ø												X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		250	170	130	Ø	X	8		X			
Right		230	170	120	Ø	X	9		X			
Bank Particle Median Diameters (mm.)		Si	Si	Cl	Cl							
		Cl	Cl	Cl	Cl							

Comments:

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/03	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 12W-11A	Year:	Sample #:	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 14 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.8

Point Spacing (m.) 0.6

Point Spacing, S = Active Width W (m.) / # Points per Transect

3.3 / 0.3

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum in Ring	Cover Quality (-99, 0, 1, 2)	Cover Types Present: Wood	Rock	Flat	Mac	Bank	Oth	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.4	15	⊗	S;	S.	⊗												X	
2	2.4	120	⊗	S;	S;	⊗												X	
3	3.0	60	⊗	Cl	S;	⊗										X		X	
4																			
5																			
6																			

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		270	190	145	⊗	X	2		X			
Right		250	150	90	⊗	X	6		X			
Bank Particle Median Diameters (mm.)		S.	Cl	Cl	Cl							
		S.	Cl	Cl	Cl							

Cover Quality: -99 = Not Measurable; 0 = No Cover; 1 = Embedded Cover; 2 = Unembedded Cover

Comments: 1 tree.

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/05	
Verified		
Corrected		

Channel Morphology Data Form

Stream Name:	Stream Code: (Unique Code):	Site Code: 14W-11A	Year: 2009	Sample #: 1	Date: 2009/05/12 (YYYY/MM/DD):	Transect # 15 of 15

Transect and Point Layout

Use this table to determine the number of transects and points required, given the minimum stream width.

Minimum Width (m.)	# Transects at Site	Points / Transect (N)
> 3.0	10	6
1.5 – 3.0	12	5
1.0 – 1.49	15	3
< 1.0	20	2

Calculate the transect spacing from the site length and number of transects:

Minimum Width (m.) 1.0

Site Length / (Number of Transects – 1)

Number of Transects 15 | Site Length (m.) 40

Number of Points/ Transect (N) 3 | Transect Spacing (m.) 2.85

Particle Size Codes (Measure all particles between 2.00 mm and 1000 mm.)

Material	Size
Unconsolidated Clay	0.01
Consolidated Clay	0.011
Silt	0.05
Sand	0.10
Large Boulders	1001
Bedrock	1111

Active Channel Width (W) (m.) 1.2 (2.7)

Point Spacing (m.) 0.4 (0.2)

Point Spacing, S = Active Width W (m.) / # Points per Transect

First point is S/2 from the left bank

Compass Bearing: 288

Point Number	Location (m.)	Measure depth and hydraulic head to nearest 5 mm. Depth (mm.)	Hydraulic Head (mm.)	Particle Sizes (mm.) Point	Maximum In Ring	Cover Quality (-99, 0, 1, 2)	Types Present: Wood	Rr Ock	Rr Ock	Rr Ock	Rr Ock	Rr Ock	Rr Ock	Aquatic Vegetation Types Present (Put X in box if present, Put – if not.): FL	AL	SS	MC	WC	GR	TR
1	1.7	40	0	Si	Si	2				X									X	
2	2.1	80	0	Si	Si	0													X	
3	2.5	60	0	Si	Si	2												X	X	
4																				
5																				
6																				

Vegetation Types: FL = Filamentous Algae; AL = Non-Filamentous Algae; SS = Moss; MC = Macrophytes; WC = Watercress; GR = Grass; TR = Terrestrial Plants

Bank	Bank Angle: Bank to tape height; If a height is >2m enter X in box only, else enter values in proper observation points: > 2m	0 mm.	250 mm.	750 mm.	1500 mm.	Amount of Undercut (mm.)	# of Vegetated Squares on Bank (out of 16)	Dominant Vegetation Type: Put X in the box of the dominant type in the 1 x 2 m. area. Put – in all others.: None	Cultivated	Meadow	Scrubland	Forest
Left		230	230	190	0	+	9		X			
Right		250	170	80	0	+	7		X			
Bank Particle Median Diameters (mm.)		Si	Si	Si	C1							
		Si	C1	C1	C1							

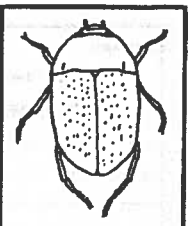
Comments:

Cover Quality
-99 = Not Measurable
0 = No Cover
1 = Embedded Cover
2 = Unembedded Cover

Enter dates and initials when data entered in computer

	Date	Init.
Entered	6/9	
Verified		
Corrected		

Ontario Benthos Biomonitoring Network Field Sheet: STREAMS



Date: May 12/2009
Time 2.8m
Agency: Aurora
Investigators: JS, SR

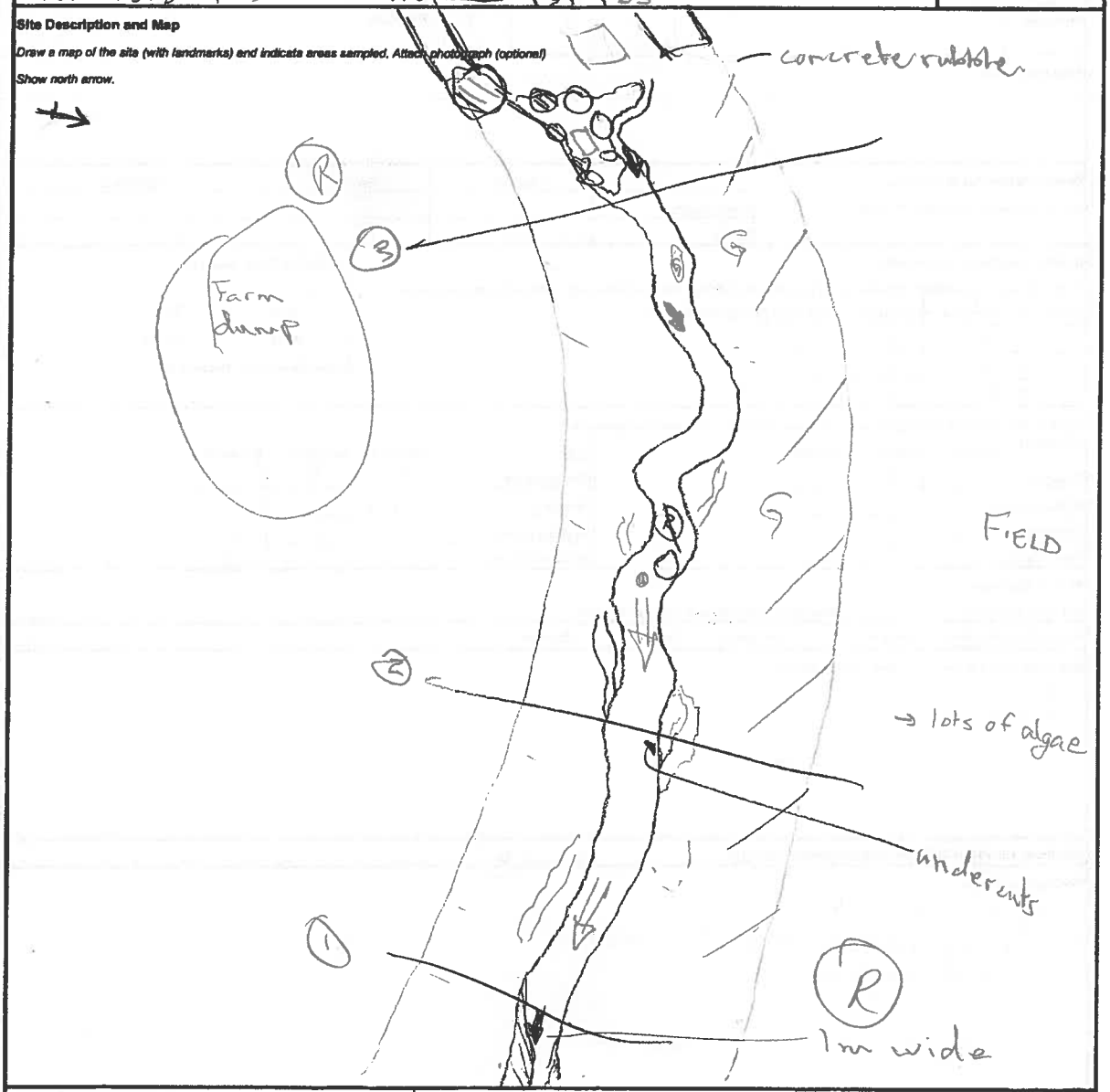
Stream name:
Site #: 14W-16
Location: centroid of 3 replicates; Lat/Long or UTM
Elevation (m asl):
Datum/zone:

Water Quality
Water Temperature (°C): 19
DO (mg/l): 13.8 - 14.5
Conductivity (uS/cm): 1434
pH: 8.38
Alkalinity (mg/l as $CaCO_3$): 731 TDS

Site Description and Map

Draw a map of the site (with landmarks) and indicate areas sampled. Attach photograph (optional)

Show north arrow.



Benthos Collection Method (circle one):
- Traveling Kick & Sweep
- Grab Sample
- Other (specify):

Gear Type (circle one)
- D-net
- Ponar
- Other (specify):
- Ekman
- Rock Baskets

Mesh Size: 500 micron (or specify)

Sub-samples	Sampling distance covered (m)	Time (min.)	Max. Depth (m)	Wetted Width (m)	Max. Hydraulic Head (mm)	# Grabs pooled per sample
Sample 1: Riffle (cross-over)		3.00	0.21	1.00	~~0~~	
Sample 2: Pool		3.00	0.31	1.1	~~0~~	
Sample 3: Riffle (cross-over)		3.00	0.08	0.4	10	

Substrate

Enter dominant substrate class and second dominant class for each sub-sample

	Sample 1	Sample 2	Sample 3
Dominant	2	2	2
2nd Dominant	1	1	4

Class	Description
1	Clay (hard pan)
2	Silt (gritty, < 0.06 mm particle diameter)
3	Sand (grainy, 0.06 - 2 mm)
4	Gravel (2 - 65 mm)
5	Cobble (65 - 250 mm)
6	Boulder (> 250 mm)
7	Bed Rock

Substrate Notes

Organic Matter-Areal Coverage		Sample 1	Sample 2	Sample 3
Use 1: Abundant, 2: Present, 3: Absent	Woody Debris	2	2	2
	Detritis	2	2	2

Riparian Vegetative Community

Use: 1 (None), 2 (cultivated), 3 (meadow), 4 (scrubland), 5 (forest, mainly coniferous), 6 (forest, mainly deciduous)

Zone (dist. From water's e	Left Bank	Right Bank (facing downstream)
1.5-10 m	3	3
10-30 m	2	
30-100 m	2	

% Canopy Cover (circle one)

0-24 (circled) 25-49 50-74 75-100

If instrument used, record type:

Aquatic Macrophytes and Algae (Use: 1 (Abundant), 2 (Present), 3 (Absent). Circle dominant type.

Macrophytes	Sample 1	Sample 2	Sample 3
Emergent	3	3	2
Rooted Floating	3	3	3
Submergent	3	3	3
Free Floating	3	3	3

Algae	Sample 1	Sample 2	Sample 3
Floating Algae	3	3	3
Filaments	1	1	1
Attached Algae	3	3	3
Slimes or Crusts	3	3	3

Stream Size/Flow

Bank Full Width (m): Discharge (m^3/s, optional, indicate method):

River Characterisation (circle one) (Perennial)? Intermittent Unknown

Notes (esp. related to land-use, habitat, obvious stressors)

- slow flow
- lots of algae

Candidate reference Site - Minimally Impacted? (circle one) Yes (No)

General Comments

- veg islands
- overflow pockets along the banks
- incised channel

Blacknose Dace
Stickleback