REPORT

June 15, 2012

GEOTECHNICAL INVESTIGATION

South of Bloomington Road East Between Highway 48 and Ninth Line Whitchurch-Stouffville, Ontario

Submitted to:
Camrock Development Corporation/RCG Haulage (1757196 Ontario Inc.)
c/o Mr. Paolo F. Albanese, P.Eng.
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Report Number: 12-1111-0008
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ATTACHMENTS

APPENDICES

This report presents the results of a preliminary geotechnical investigation carried out at the above referenced site, as shown on the Key Plan, Figure 1. The purpose of the investigation was to determine the general subsurface soil and shallow groundwater conditions at the site by means of a limited number of boreholes. Based on our interpretation of the borehole data, this report provides geotechnical information in support of a site alteration/fill permit application for agricultural use of the site. Authorization to proceed with this investigation was given by Mr. Paolo Albanese, P.Eng., of Fabian Papa & Partners ("FPP").

The factual data contained in this report pertain to a specific project as described in the report and are not applicable to any other project or site location. If the project is modified in concept, location or elevation, or if the project is not initiated within eighteen months of the date of the report, Golder Associates Ltd. ("Golder") should be given an opportunity to confirm that the information is still valid. In addition, this report should be read in conjunction with the attached "Important Information and Limitations of This Report", included in Appendix A. The reader's attention is specifically drawn to this information, as it is essential for the proper use and interpretation of this report.

1.0 SITE DESCRIPTION

The site is situated at 5783 Bloomington Road East in the Town of Whitchurch-Stouffville, Ontario, as shown on the Key Plan, Figure 1. The site currently consists of active farms to the west including approximately ten (10) structures and the associated access roads and two existing ponds. This portion of the site generally slopes from north to south. The east portion of the site is dominated by two large ponds which are remnants of an earlier gravel extraction process. The ponds extend between 12 and 15 m below the surrounding ground surfaces. The ground is primarily grass covered with the exception of the ploughed fields. Some trees are located along the property boundaries at the north and south limits of the site as well as the area of the farm structures.

2.0 BACKGROUND

It is understood that the Camrock Development Corporation is in the process of submitting for a site alteration/fill permit. It is also understood that the Town of Whitchurch-Stouffville requires a geotechnical investigation be completed to determine the suitability of the existing subsoils to receive the proposed fill. The filling/regrading of the site is to be for agricultural use.

It is to our understanding that the site was previously used for commercial aggregate extraction. The former extraction activities resulted in relatively large elevation changes of up to about 15 m between the pond water levels and Bloomington Road. It is understood that the site will be filled such that the resulting site grading will generally match the surrounding lands. Following the filling and grading operations, the site will be returned to agricultural use.

Golder had carried out a previous geotechnical investigation on a portion of the site and the results were provided in a report entitled "*Geotechnical Investigation and Baseline Groundwater Monitoring Program, 5783 Bloomington Road East ("Battistella" Lands, Part of Lot 10, Concession 8) Between Highway 48 and Ninth Line, Whitchurch-Stouffville, Ontario*", dated February 24, 2011. The investigation was generally confined to a northwest portion of the currently investigated site.

The results of our previous investigation have been reviewed and a copy of the report is provided in Appendix B for reference.

3.0 INVESTIGATION PROCEDURE

The field work for this investigation was carried out on April 13, 2012, at which time five (5) boreholes (MW201 to MW205) were advanced at the locations shown on the Borehole Location Plan, Figure 2. The boreholes were drilled using track-mounted drillrigs supplied and operated by specialist drilling contractors, under Golder's supervision. Standard penetration testing and sampling were carried out at about 1.5 m and 3.0 m intervals of depth in the boreholes using conventional 35 mm internal diameter split spoon sampling equipment. All of the soil samples obtained during this investigation were brought to our Whitby laboratory for further examination, and selective natural water content testing.

The shallow groundwater conditions were noted in the open boreholes during drilling. Monitoring wells were installed in all five boreholes to permit further groundwater level monitoring.

The field work for this investigation was directed by members of our engineering staff who also logged the boreholes and cared for the recovered soil samples. The borehole locations in the field and their corresponding ground surface elevations were provided by the project's surveyor. It is understood that the elevations are referenced to geodetic datum.

4.0 SUBSURFACE CONDITIONS

The subsurface soil and shallow groundwater conditions encountered in the boreholes, as well as the results of the field and laboratory testing, are shown in detail on the Record of Borehole sheets following the text of this report. Method of Soil Classification and Symbols and Terms Used on Records of Boreholes and Test Pits are provided to assist in the interpretation of the borehole logs. It should be noted that the boundaries between the soil strata have been inferred from drilling observations and non-continuous samples. They generally represent a transition from one soil type to another and should not be inferred to represent an exact plane of geological change. Further, conditions will vary between and beyond the boreholes. The following is a summarized account of the subsurface conditions encountered in the boreholes drilled during this investigation, followed by more detailed descriptions of the major soil strata and shallow groundwater conditions.

Underlying approximately 150 mm to 300 mm of topsoil, fill materials were encountered in all of the boreholes. The fill extended to depths ranging from 1.1 m to 4.1 m below existing ground surface. The native subsoil conditions underlain by the fills generally consist of cohesionless silt, sand, silty sand and sand and gravel. Glacial tills ranging in gradation from silty clay till to silty sand till were also encountered in four of the five boreholes. Groundwater was encountered in all of the boreholes during drilling. Groundwater levels in the monitoring wells were at depths ranging from 9.96 m to 17.74 m below the existing ground surface when measured on May 8, 2012.

4.1 Fill Materials

Fill materials were encountered in all boreholes below the surficial topsoil and extended to depths ranging from 1.1 m to 4.1 m below existing ground surface, which may relate to the reclamation work following the aggregate development. Other than the surficial topsoil fill, the fill materials mainly consisted of silty sand to sandy silt. Silty clay fill was also encountered in two (2) of the five (5) boreholes. Standard penetration testing carried out within the non-cohesive fill materials gave N values ranging from 4 to 13 blows per 0.3 m of penetration, indicating a very loose to compact relative density. Standard penetration tests carried out within the cohesive fill materials gave N values ranging from 7 to 31 blows per 0.3 m of penetration, indicating a firm and hard consistency. The in-situ water contents of the fill samples ranged from about 11 percent to 19 percent.

4.2 Clayey Silt Till and Silty Clay Till

Clayey silt till and silty clay till were encountered in Boreholes MW202, MW203, MW204 and MW205 below the fill materials and extended to depths ranging from 4.1 m to 13.1 m. Standard penetration tests carried out within the clayey silt till and silty clay till gave N values ranging from 15 blows to greater than 100 blows per 0.3 m of penetration, indicating a stiff to hard consistency. The natural water contents of the clayey silt till and silty clay till samples recovered from 35 mm ID split spoon ranged from 11 percent to 15 percent.

4.3 Sandy Silt Till and Silty Sand Till

Sandy silt till and silty sand till were encountered in Boreholes MW202 and MW204 within the sand and gravel or below the silty clay till. One standard penetration test carried out within the silty sand till gave an N value of 53 blows per 0.3 m of penetration, indicating a very dense relative density. The natural water content of a selected sample of sandy silt till recovered from 35 mm ID split spoon was about 11 percent.

4.4 Silty Sand

Silty sand was encountered below the fill or silty clay till in Boreholes MW201, MW 203 and MW205. Standard penetration tests carried out within the silty sand gave N values ranging from 26 blows to 56 blows per 0.3 m of penetration, indicating a compact to very dense relative density. The natural water content of a selected sample of silty sand was about 20 percent.

4.5 Sand

Sand was encountered below the silty sand in Boreholes MW201 and MW205. Borehole MW205 was terminated within the sand. Standard penetration tests carried out within the sand gave N values ranging from 26 blows to 76 blows per 0.3 m of penetration, indicating a compact to very dense relative density. The natural water contents of two (2) selected sand samples were about 19 percent and 20 percent.

4.6 Sand and Gravel and Sandy Gravel

Sand and gravel and sandy gravel were encountered in all boreholes with the exception of Borehole MW205. Boreholes MW202, MW203 and MW204 were terminated within the sand and gravel or gravelly sand. Standard penetration tests carried out within the sand and gravel and gravelly sand gave N values of greater than 100 blows per 0.3 m of penetration, indicating very dense relative density. The natural water contents of two sand and gravel samples were 4 percent and 6 percent.

4.7 Silt

Silt was encountered below the sand and gravel in Borehole MW201. Borehole MW201 was terminated within the silt. A single standard penetration test carried out within the silt gave an N value of 30 blows per 0.3 m of penetration, indicating a compact to dense relative density.

4.8 Shallow Groundwater

Groundwater was encountered in all the boreholes drilled as a part of this investigation drilling and are shown in detail on the Record of Borehole sheets following the text of this report. Groundwater levels measured in the monitoring wells installed in the boreholes were at depths ranging from 9.96 m to 17.74 m below the existing ground surface or at elevations ranging from 310.04 m to 313.14 m on May 8, 2012, as summarized in the table below:

Borehole Number	Groundwater Depth Below the Existing Ground Surface / Elevation May 8, 2012 (m)
MW201	17.74 / 313.14
MW202	10.66 / 313.10
MW203	9.96 / 311.6
MW204	10.40 / 310.55
MW205	15.59 / 310.04

It should be noted that these observations reflect the shallow groundwater conditions encountered in the boreholes during the time of the field investigation and some seasonal fluctuations should be anticipated.

5.0 DISCUSSION

This section of the report provides engineering information for the geotechnical aspects of the project, based on our interpretation of the borehole information and on our understanding of the project requirements. The information in this portion of the report is provided for the guidance of the design professionals, engineers and architects. Where comments are made on construction, they are provided only in order to highlight aspects of construction which could affect the design of the project. Contractors bidding on or undertaking any work at the site should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction and make their own interpretation of the factual data as it affects their proposed construction techniques, schedule, equipment capabilities, costs, sequencing and the like.

Our professional services for this assignment address only the geotechnical (physical) aspects of the subsurface conditions at this site. The geo-environmental (chemical) aspects, including the consequences of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources, are outside of the terms of reference for this report and have not been investigated or addressed.

5.1 Project Description

It is understood that the Camrock Development Corporation is in the process of submitting for a site alteration/fill permit for the subject lands located at 5783 Bloomington Road East. The purpose of the proposed re-grading is to return the property to agricultural use. Based on the existing land topography, it is understood that fills up to about 20 m in thickness will be required in some areas to bring the property surface to near the elevations of the surrounding lands.

5.2 Recommendations

Based on the results of this investigation and based on geotechnical considerations, there are no major constrains to the proposed fill placement. The type of fill and its placement will determine the future use of the property. The following are comments related to the geotechnical aspects of the fill placement:

1) From a geotechnical perspective, the existing subsurface soil conditions at the site are capable of supporting the fill materials with thicknesses anticipated to be in the order of up to about 20 m. The following are options related to filling methodology and land use related to the filling method.

2) **Option 1**: If the future land use is restricted to agricultural use and settlements do not pose a major practical restriction to land cultivation, approved fill may be placed in lifts and nominally compacted. Provided that the existing ponds are of shallow depths (pond depths are less than say 0.5 m in depth), the fill may initially be placed by spreading (bulldozing) sufficient thickness of fill until the resultant fill can safely support the weight of the construction equipment. Some pond water removal / management may be required to facilitate soil spreading, potentially requiring Permit To Take Water. From that point on, the remainder of the fill may be placed in lifts, preferably not exceeding 0.5 m in loose lift thickness and nominally compacted. The resulting fill will be subject to long term settlement which may be compensated for by some appropriate degree of overfilling at the final grading stage. It should be noted that filling as described in this option, precludes any future development of the filled areas on the property which would include structures, pavements, conventional shallow foundations and the installation of conventional underground utilities such as sewer, gas lines and the like. Future limited redevelopment of the filled portions of the land under this option would require detailed subsurface investigations at the planning stages of the development, specialized geotechnical assessments, utilization of deep foundations and/or reengineering some or all of the fill.

3) **Option 2**: Should the possible future land use include developments (such as residential or commercial subdivision or lot creation) the filling of the land and ponds should involve the use of engineered fill. Construction of engineered fill would involve removal of all topsoil, fill and other deleterious materials from areas to be filled, draining of the ponds and controlling the groundwater through dewatering as required. Further geotechnical investigation will be required to determine the quality, depth and extent of the existing fill materials at the site prior to construction. In addition, further considerations (including hydrogeological investigation) may be required to determine if a Permit To Take Water would be required for groundwater control during the draining of the existing pond and subsequent backfilling. Following the removal of the fill, topsoil, surface water and any other deleterious materials, the exposed subgrade should be proofrolled along with the inspection by the geotechnical engineer. The backfilling should consist of placement of relatively thin (in the order of 300 mm) loose lifts and compacting to 100 percent of Standard Proctor maximum dry density (SPMDD) under strict soil water content control. Placement of the fill at the existing slopes would require slope benching. Due to the thickness of the engineered fill, an assessment of the degree and time of post construction settlement would have to be carried out prior to construction. Such settlement will be dependent on the type and variability of soil materials used for construction of the engineered fill and the actual thickness of the fill. In general, settlements in the order of 1 to 2 percent at of the total depth of the fill and fill materials should be anticipated. A time delay along with surface settlement monitoring would be required between the completion of the engineered fill and construction of buildings, structures and underground utilities. The time required and the actual anticipated settlement can be assessed at the time of construction.

All soil materials for use as fill must be approved by qualified geotechnical personnel prior to placement, regardless of the selected option. Some drying may be required prior to placement during periods of wet weather. No frozen soil materials should be included as fill. Any imported materials must be approved by qualified geotechnical personnel at the source(s), prior to hauling to the site. Suitable earth borrow materials must also satisfy the appropriate analytical testing requirements as defined by the Ministry of Environment Reg. 153. The placement of fill (particularly of engineered fill) should be monitored by qualified geotechnical personnel on a full-time basis.

6.0 CLOSURE

We trust that this report provides sufficient geotechnical engineering information and groundwater baseline conditions to aid in the planning and pertinent applications at the site. If you have any questions regarding the contents of this report or require additional information, please do not hesitate to contact this office.

Yours truly,

GOLDER ASSOCIATES LTD.

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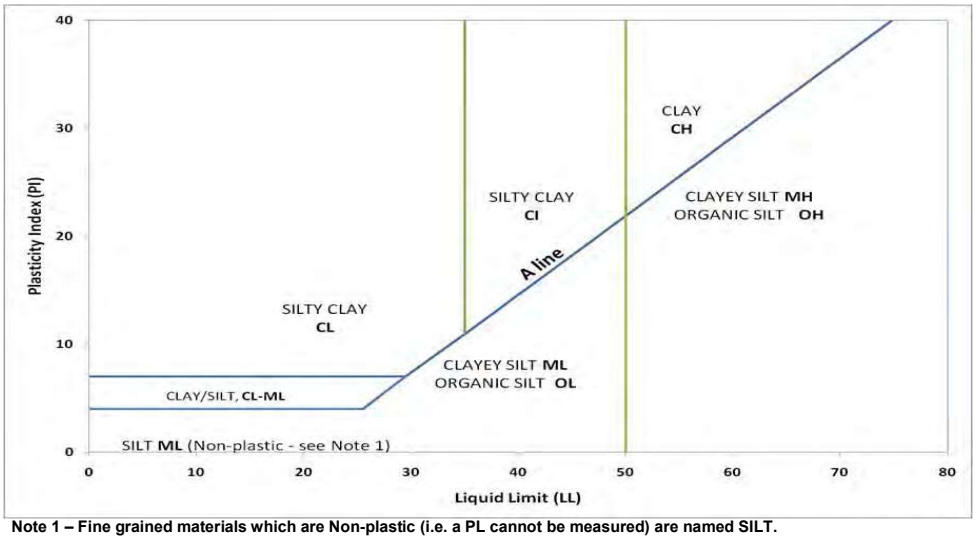
https://capws.golder.com/sites/p211110008battistella/reports/final/12-1111-0008 rep 2012'06'15 geotechnical investigation report final.docx

METHOD OF SOIL CLASSIFICATION

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{D_{30}^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content <30% by mass)	COARSE GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass is larger than 4.75 mm)	Gravels with <12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	<30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (>50% by mass is smaller than 4.75 mm)	Sands with <12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil	Laboratory Tests	Field Indicators				Organic Content	USCS Group Symbol	Group Name
				Dilatancy	Dry Strength	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content <30% by mass)	FINE GRAINED SOILS (>50% by mass is smaller than 0.075 mm)	SILTS (PI and LL plot below A-Line on Plasticity Chart)	Liquid Limit <50	Rapid	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
				Slow	None to Low	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
				Slow to very slow	Low to medium	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
			Liquid Limit >50	Slow to very slow	Low to medium	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
				None	Medium to High	1 mm to 3 mm	Medium to High	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart)	Liquid Limit <35	None	Low to medium	~ 3 mm	Low to medium	0% to 30%	CL	SILTY CLAY
			Liquid Limit 35 to 50	None	Medium to High	1 mm to 3 mm	Medium		CI	SILTY CLAY
			Liquid Limit >50	None	High	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures						30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat						>75%		PEAT

PLASTICITY CHART



Note 1 – Fine grained materials which are Non-plastic (i.e. a PL cannot be measured) are named SILT.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC, CL-ML used when the soil has between 5 and 12% fines (*i.e.* between "clean" sand and "dirty" sand) or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.

SYMBOLS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
≤ 5	trace
5 to 12	some
12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL, SAND and CLAY)

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) drive open sampler for a distance of 300 mm (12 in.).

Piezo-Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance; N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
SS	Split-spoon
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

SOIL TESTS

w	water content
PL	plastic limit
LL	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

Note: [1] Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness

Term	SPT 'N' (blows/0.3m) *
Very Loose	0 - 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D 1586, uncorrected for overburden pressure effects or energy transfer.
2. Definition of compactness descriptions based on SPT 'N' ranges from Terzaghi and Peck (1967) and correspond to typical average N_{60} values.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N' (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D 1586, uncorrected for overburden pressure effects or energy transfer.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW201

SHEET 1 OF 3

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		330.88							
0	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	TOPSOIL (FILL)		0.00							
		(ML) sandy SILT, trace gravel, trace roots; brown (FILL); moist, compact		0.15	1	50 DO	11				Concrete and Casing
1				329.81							
		(SM/ML) SAND and SILT, trace gravel; brown (PROBABLY FILL); moist, compact		1.07	2	50 DO	12				
2				328.37							
		(SM) SILTY SAND, trace gravel, zones of fine to medium sand; moist, dense		2.51	3	50 DO	40				
3											
4				326.08							
		(SW) SAND, fine to medium, trace gravel, trace to some fines; brown; moist, dense		4.80							Bentonite Seal
5					4	50 DO	44				
6											
7											
8											
9					5	50 DO	31				
10		*CONTINUED NEXT PAGE*									

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

DEPTH SCALE

1 : 50

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LOGGED: AZ

CHECKED: AH

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW201

SHEET 2 OF 3

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	(SW) SAND, fine to medium, trace gravel, trace to some fines; brown; moist, dense		319.91							
11		(SW/GW) SAND and GRAVEL, trace to some fines; brown, cobbles/ boulders; moist, very dense		10.97							
12					6	50 DO	53/ .15				
13											
14											Bentonite Seal
15					7	50 DO	50/ .1				
16											
17		(SW) SAND, medium to coarse, trace gravel, trace to some fines; brown; wet, very dense		314.12 16.76							
18											May 8, 2012
19					8	50 DO	76				Silica Sand Filter
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AZ

CHECKED: AH

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW201

SHEET 3 OF 3

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		*--- CONTINUED FROM PREVIOUS PAGE ---*									
20	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	(ML) SILT, trace fine sand; grey; wet, compact to dense		329.84 20.84							Silica Sand Filter
21											
					9	50 DO	30				
22				308.93							
		END OF BOREHOLE		21.95							Water encountered during drilling at a depth of 18.3 m below ground surface, Apr. 13/12 Water level in monitoring well at a depth of 17.74 m below ground surface, May 8/12
23											
24											
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AZ

CHECKED: AH

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW202

SHEET 1 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		323.76							
0	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	TOPSOIL (FILL)		0.00 / 323.58							
		(SM) SILTY SAND, trace gravel; dark brown to brown (FILL); moist, loose		0.18	1	50 DO	9				
1				322.69							
		(CL) SILTY CLAY, low plasticity, some sand, trace to some gravel; brown (PROBABLY FILL); Wn>PL, hard to firm		1.07							
2					2	50 DO	31				
3					3	50 DO	7				
4				319.65							Bentonite Seal
		(CL) SILTY CLAY, low plasticity, some sand, trace to some gravel; brown (TILL); Wn~PL to Wn<PL, very stiff to hard		4.11	4	50 DO	18				
5											
6		Stone obstruction at a depth of 6.22 m below ground surface			5	50 DO	50/ .13				
7											
8				315.63							
		(SW/GW) SAND and GRAVEL, trace to some fines; cobbles/ boulders; moist, very dense		8.13							
9					6	50 DO	50/ .13				Silica Sand Filter
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AM

CHECKED: AH

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW202

SHEET 2 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	*--- CONTINUED FROM PREVIOUS PAGE ---*									
		(SW/GW) SAND and GRAVEL, trace to some fines; cobbles/ boulders; moist, very dense		312.79							May 8, 2012
11		(ML) sandy SILT, some gravel; brown, cobbles/ boulders (TILL); moist		10.97							Silica Sand Filter
12					7	AS	-		○		
13											
											Cave
14		(SW/GW) SAND and GRAVEL, trace to some fines; brown, containing cobbles and boulders; wet, very dense		309.74 14.02							
15											
				308.47	8	50 DO	50/ .05		○		
		END OF BOREHOLE		15.29							
16											Water encountered during drilling at a depth of 13.7 m below ground surface, Apr. 13/12
17											Water level measured in open borehole at a depth of 10.7 m below ground surface upon completion of drilling, Apr. 13/12
18											Water level in monitoring well at a depth of 10.66 m below ground surface, May 8/12
19											
20											

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DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AM

CHECKED: AH

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW203

SHEET 1 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		321.56							
0	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	TOPSOIL (FILL)		0.00 / 321.26	1	50 DO	13				
		(ML) sandy SILT, trace to some gravel; dark brown to brown, organic inclusions (FILL); moist, compact		0.30 / 320.49							
1		(CL) SILTY CLAY, low plasticity, some sand, some gravel; brown (PROBABLY FILL); Wn~PL, stiff		1.07 / 318.97	2	50 DO	11				
2		(CL) SILTY CLAY, low plasticity, some sand, trace gravel; brown (TILL); Wn~PL, hard		2.59 / 317.45	3	50 DO	32				
3		(SM) SILTY SAND, some gravel, zones of sand and gravel; brown; moist, compact		4.11 / 315.16	4	50 DO	26				Bentonite Seal
4		(SW/GW) SAND and GRAVEL, trace to some fines; brown, cobbles/ boulders; moist, very dense		6.40 / 312.11	5	50 DO	50/ .1				
5		(GW) sandy GRAVEL, trace to some fines; brown, cobbles/ boulders; wet, very dense		9.45							Silica Sand Filter
6		*CONTINUED NEXT PAGE*									
7											
8											
9											
10											

DEPTH SCALE

1 : 50

LOGGED: AM

CHECKED: AH

Golder Associates

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW203

SHEET 2 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		*--- CONTINUED FROM PREVIOUS PAGE ---*									
10	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	(GW) sandy GRAVEL, trace to some fines; brown, cobbles/ boulders; wet, very dense									May 8, 2012
11					6	50 DO	50/ .13				Silica Sand Filter
12											
13											Cave
				307.64	7	50 DO	50/ .05				
14		END OF BOREHOLE		13.92							Water encountered during drilling at a depth of 10.4 m below ground surface, Apr. 13/13
15											Water level measured in open portion of the borehole at a depth of 10.1 m below ground surface upon completion of drilling, Apr. 13/13
16											Borehole caved at a depth of 12.5 m below ground surface upon completion of driling, Apr. 13/13
17											Water level in monitoring well at a depth of 9.96 m below ground surface, May 8/12
18											
19											
20											

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AM

CHECKED: AH

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW204

SHEET 1 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		320.95							
0	TRACK-MOUNTED POWER AUGER; 200 mm Diameter Hollow Stem Auger	TOPSOIL (FILL)		0.00 / 320.70							
		(ML) sandy SILT, trace gravel; dark brown to brown (FILL); moist, loose		0.25 / 319.88	1	50 DO	9				
1		(CL) SILTY CLAY, low plasticity, some sand, trace to some gravel, zones of silty sand; brown (TILL); moist, very stiff to hard		1.07	2	50 DO	19				
2											
3					3A	50 DO	33				
					3B						
4					4A						
5		(SM) SILTY SAND, some gravel; brown (TILL); moist, very dense		315.92 / 5.03	4B	50 DO	53				Bentonite Seal
6				314.55							
		(SW/GW) SAND and GRAVEL, trace to some fines; brown, cobbles and boulders; moist to wet, very dense		6.40							
7											
8					5	50 DO	50/.15				
9											
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AM

CHECKED: AH

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW204

SHEET 2 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		*--- CONTINUED FROM PREVIOUS PAGE ---*									
10	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	(SW/GW) SAND and GRAVEL, trace to some fines; brown, cobbles and boulders; moist to wet, very dense			6	50 DO	50/ .13				May 8, 2012 ▽
11											
12											Silica Sand Filter
13											
14				306.93	7	50 DO	50/ .13				
14		END OF BOREHOLE		14.02							Water encountered during drilling at a depth of 10.1 m below gorund surface, Apr. 13/12 Water level measured in open borehole at a depth of 10.7 m below ground surface upon completion of drilling, Apr. 13/12 Water level in monitoring well at a depth of 10.40 m below ground surface, May 8/12
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AM

CHECKED: AH

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW205

SHEET 1 OF 3

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		325.63							
0	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	TOPSOIL (FILL)		0.00							
		(ML) sandy SILT, trace gravel, trace roots, topsoil pockets; brown (FILL); moist, very loose to compact		0.15	1	50 DO	13				Concrete and Casing
1											
2					2	50 DO	4				
3					3	50 DO	12				
4				321.52							
		(ML) CLAYEY SILT, some sand, trace gravel; brown (TILL); cohesive, W~PL, stiff to very stiff		4.11	4	50 DO	15				Bentonite Seal
5											
6				319.23							
		(CL) SILTY CLAY, some sand, trace to some gravel; grey (TILL); cohesive, W>PL, stiff to very stiff		6.40							
7											
8					5	50 DO	15				
9											
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AZ

CHECKED: AH

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW205

SHEET 2 OF 3

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	TRACK-MOUNTED POWER AUGER 200 mm Diameter Hollow Stem Auger	(CL) SILTY CLAY, some sand, trace to some gravel; grey (TILL); cohesive, W>PL, stiff to very stiff									
11					6	50 DO	21				
12											
13				312.52							
		(SM) SILTY SAND, zones of silt; brown; wet, dense to very dense		13.11							Bentonite Seal
14					7	50 DO	44				
15											
16					8	50 DO	56				May 8, 2012
17				308.64							
		(SP) SAND, fine, trace to some fines; brown; wet, very dense to compact		16.99							
18											
					9	50 DO	66				
19											Silica Sand Filter
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

LOGGED: AZ

CHECKED: AH

Golder Associates

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12

PROJECT: 12-1111-0008

RECORD OF BOREHOLE: MW205

SHEET 3 OF 3

LOCATION: SEE FIGURE 2

BORING DATE: April 13, 2012

DATUM: Geodetic

HAMMER TYPE: AUTOMATIC

SPT/DCPT HAMMER: MASS, 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		*--- CONTINUED FROM PREVIOUS PAGE ---*									
	TRACK-MOUNTED POWER AUGER / 200 mm Diameter Hollow Stem Auger	(SP) SAND, fine, trace to some fines; brown; wet, very dense to compact		303.84	10	50 DO	26		W		Silica Sand Filter
21		END OF BORHOLE		21.79							Water level in monitoring well at a depth of 15.59 m below ground surface, May 8/12
22											
23											
24											
25											
26											
27											
28											
29											
30											

DEPTH SCALE

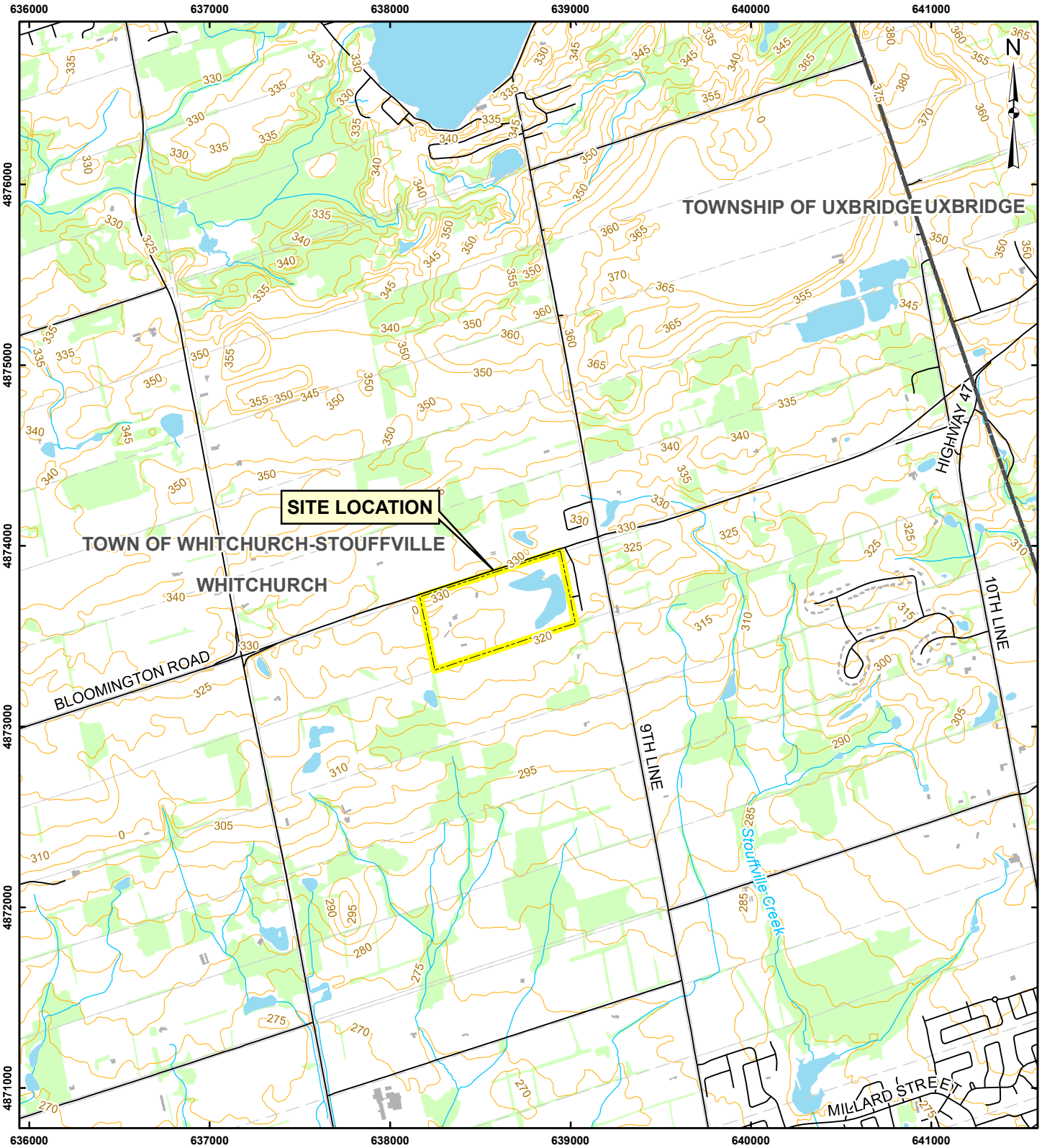
1 : 50

Golder Associates

LOGGED: AZ

CHECKED: AH

GTA-BHS 001 1211110008.GPJ GAL-MIS.GDT 6/14/12



500 0 500 1,000
SCALE 1:25,000 METRES

PROJECT
GEOTECHNICAL INVESTIGATION
SOUTH OF BLOOMINGTON ROAD EAST,
BETWEEN HIGHWAY 48 AND NINTH LINE
WHITCHURCH-STOUFFVILLE, ONTARIO

TITLE
KEY PLAN

REFERENCE

Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

Golder Associates
Whitby, Ontario

PROJECT NO. 12-1111-0008		SCALE AS SHOWN	REV. 0.0
DESIGN			
GIS	JT	MAY 2012	FIGURE 1
CHECK	AM	June 2012	
REVIEW			

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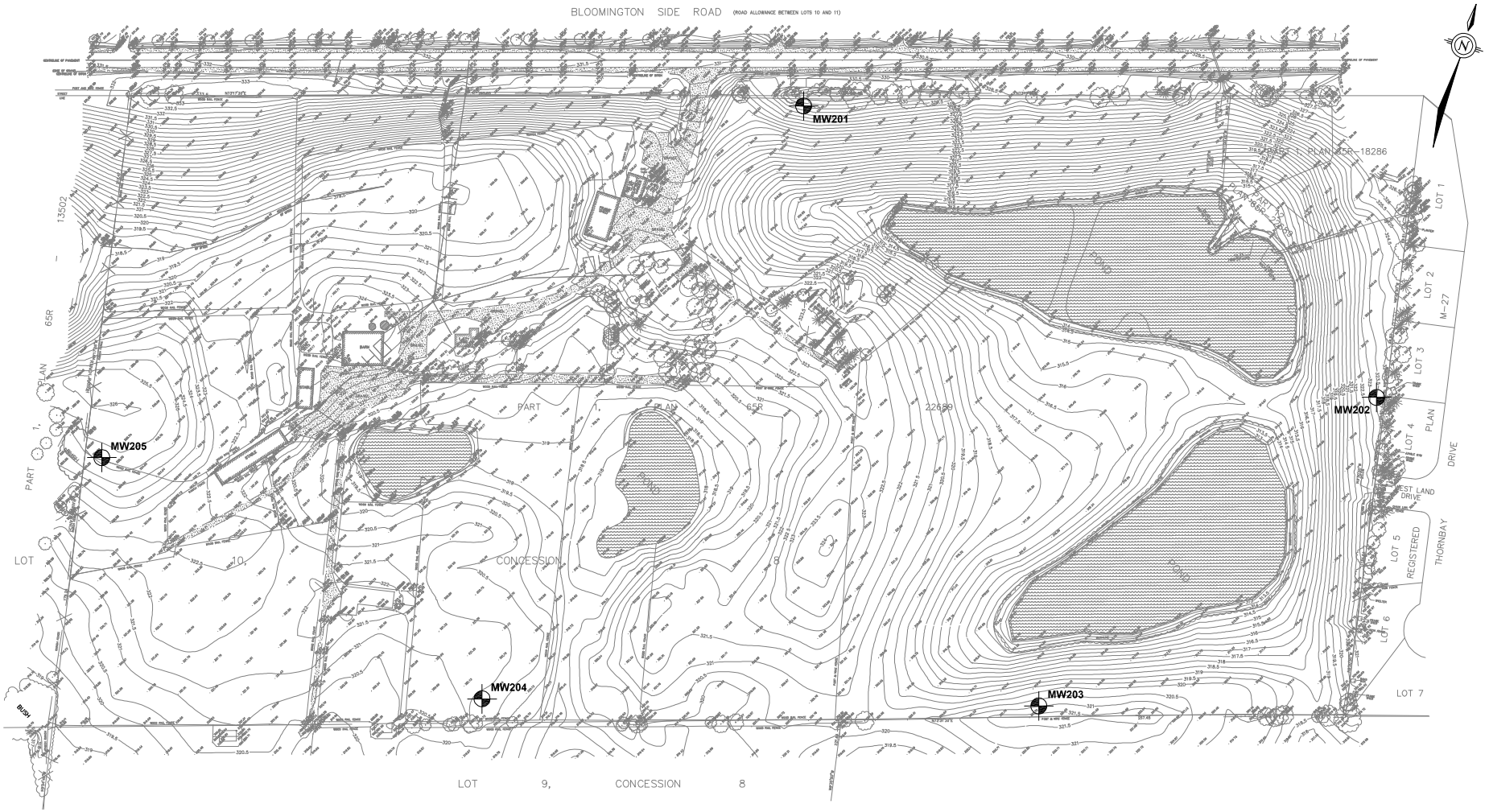

LEGEND

BOREHOLE LOCATION IN PLAN

REFERENCE

Base plan provided by Guido Papa Surveying Ltd., entitled "Part of Lots 9 and 10 Concession 8 Town of Whitchurch-Stouffville", Dated April 10, 2012.

PROJECT

GEOTECHNICAL INVESTIGATION
SOUTH OF BLOOMINGTON ROAD EAST,
BETWEEN HIGHWAY 48 AND NINTH LINE
WHITCHURCH-STOUFFVILLE, ONTARIO

TITLE

BOREHOLE LOCATION PLAN

Golder Associates

PROJECT No. 12-1111-0008			FILE No. AA02
DESIGN			SCALE AS SHOWN REV. 0
CADD	MK	May 2012	FIGURE 2
CHECK	AM	June 2012	
REVIEW			

Drawing file: T:\Projects\2012\12-1111-0008\-AA-\12111100008AA02.dwg Jun 14, 2012 - 4:10pm

APPENDIX A

Important Information and Limitations of This Report

IMPORTANT INFORMATION AND LIMITATIONS TO THIS REPORT

Standard of Care: Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

Basis and Use of the Report: This report has been prepared for the specific site, design objective, development and purpose described to Golder by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. Any change of site conditions, purpose, development plans or if the project is not initiated within eighteen months of the date of the report may alter the validity of the report. Golder can not be responsible for use of this report, or portions thereof, unless Golder is requested to review and, if necessary, revise the report.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client cannot rely upon the electronic media versions of Golder's report or other work products.

The report is of a summary nature and is not intended to stand alone without reference to the instructions given to Golder by the Client, communications between Golder and the Client, and to any other reports prepared by Golder for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. Golder cannot be responsible for use of portions of the report without reference to the entire report.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

Soil, Rock and Groundwater Conditions: Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Golder does not warrant or guarantee the exactness of the descriptions.

Special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions. The environmental, geologic, geotechnical, geochemical and hydrogeologic conditions that Golder interprets to exist between and beyond sampling points may differ from those that actually exist. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on

adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

Sample Disposal: Golder will dispose of all uncontaminated soil and/or rock samples 90 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

Follow-Up and Construction Services: All details of the design were not known at the time of submission of Golder's report. Golder should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of Golder's report.

During construction, Golder should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Golder's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Golder's report. Adequate field review, observation and testing during construction are necessary for Golder to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Golder's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

Changed Conditions and Drainage: Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Golder be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Golder be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Golder takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

APPENDIX B

Previous Golder Report 2011

REPORT

February 24, 2011

GEOTECHNICAL INVESTIGATION AND BASELINE GROUNDWATER MONITORING PROGRAM

5783 Bloomington Road East ("Battistella" Lands, Part of Lot 10, Concession 8), Between Highway 48 and Ninth Line, Whitchurch-Stouffville, Ontario

Submitted to:
Camrock Development Corporation
c/o Ms. Julia Risi, C.E.T.
SCS Consulting Group Ltd.
30 Centurian Drive, Suite 100
Markham, Ontario
L3R 8B8

Report Number: 09-1111-6090

Distribution:

6 Copies – SCS Consulting Group Ltd.

2 Copies - Golder Associates Ltd., Whitby, Ontario

Golder Associates

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ATTACHMENTS

APPENDICES

This report presents the results of a preliminary geotechnical investigation and groundwater monitoring program carried out at the above referenced site, as shown on the Key Plan, Figure 1. The purpose of the investigation was to determine the general subsurface soil and shallow groundwater conditions at the site by means of a limited number of shallow boreholes. Based on our interpretation of the borehole data, this report provides geotechnical information in support of a site grading/alteration permit at the site. The results of the groundwater monitoring and baseline conditions in accordance with Region of York's source water protection requirement are also provided in the report. Authorization to proceed with this investigation was given by Ms. Julia Risi of SCS Consulting Group Ltd.

The factual data contained in this report pertain to a specific project as described in the report and are not applicable to any other project or site location. If the project is modified in concept, location or elevation, or if the project is not initiated within twelve months of the date of the report, Golder Associates Ltd. (Golder) should be given an opportunity to confirm that the information is still valid. In addition, this report should be read in conjunction with the attached "Important Information and Limitations of This Report", included in Appendix A. The reader's attention is specifically drawn to this information, as it is essential for the proper use and interpretation of this report.

Our professional services for this assignment address only the geotechnical (physical) aspects of the subsurface conditions at this site. The geo-environmental (chemical) aspects, including the consequences of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources, are outside of the terms of reference for this report and have not been investigated or addressed.

1.0 SITE DESCRIPTION

The site ("Battistella" Lands, Part of Lot 10, Concession 8) is situated at municipal address 5783 Bloomington Road East and is along the south side of Bloomington Road East, between Highway 48 and Ninth Line in Whitchurch-Stouffville, Ontario, as shown on Figure 1. The site consists of active farms, with agricultural fields containing a barn, two horse stables and a residential dwelling.

The site is generally sloping towards the south and east. The north portion of the site slopes downwards towards the south with ground elevations ranging from 333 m to 320 m. The southwest portion of the site slopes towards the east and south, with ground elevations ranging from 322 m to 316 m. The south portion of the site slopes downwards towards the north with ground elevations ranging from 323 m to 320 m.

It is to our understanding that the site was previously used for commercial aggregate extraction.

2.0 INVESTIGATION PROCEDURE

The field work for this investigation was carried out on November 29th, 2010, at which time five (5) boreholes (BH 1 and 2, MW 3 to 5) were advanced at the locations shown on the Borehole Location Plan, Figure 2. The boreholes were drilled using a track-mounted drillrig supplied and operated by Drilltech Ltd., under our supervision. Standard penetration testing and sampling were carried out at regular intervals of depth in the boreholes using conventional 35 mm internal diameter split spoon sampling equipment. All of the soil samples obtained during this investigation were brought to our Whitby laboratory for further examination, natural water content testing and selective classification testing.

The shallow groundwater conditions were noted in the open boreholes during drilling. Monitoring wells were installed in MW 3, 4 and 5, to permit further groundwater level monitoring and associated sampling to establish baseline conditions in general accordance with the Region of York's source water protection requirements. The other boreholes were loosely backfilled and sealed at the surface upon completion of drilling.

In addition to the boreholes and monitoring wells, eight shallow test pits were manually excavated at the locations shown on Figure 2 to determine topsoil thickness.

The corresponding ground surface elevations were interpolated from the drawing (Drawing No. SAP-2, titled "Site Alteration Plan 2") dated November 2010 prepared by SCS Consulting Group Ltd. and these elevations should be considered to be approximate only. It is understood that the elevations are referenced to geodetic datum.

3.0 SUBSURFACE CONDITIONS

The subsurface soil and shallow groundwater conditions encountered in the boreholes, as well as the results of the field and laboratory testing, are shown in detail on the Record of Borehole sheets following the text of this report. Lists of abbreviations and symbols are provided to assist in the interpretation of the borehole logs. The laboratory soil gradation results are shown on Figures 3 to 5. It should be noted that the boundaries between the soil strata have been inferred from drilling observations and non-continuous samples. They generally represent a transition from one soil type to another and should not be inferred to represent an exact plane of geological change. Further, conditions will vary between and beyond the boreholes. The following is a summarized account of the subsurface conditions encountered in the boreholes drilled during this investigation, followed by more detailed descriptions of the major soil strata and shallow groundwater conditions.

Underlying 130 mm to 350 mm of topsoil, fill materials were encountered in all of the boreholes. The fill extended to depths ranging from 1.9 to 6.4 m below existing ground surface. The native subsoil conditions underlain by the fills generally consist of cohesionless silt, silty sand/sandy silt, sand and gravel. Glacial tills ranging in gradation from clayey silt to sandy silt were also encountered in two of the five boreholes. All of the boreholes, with the exception of MW 4, were dry upon completion of drilling. Groundwater levels in the monitoring wells MW 4 and 5 were at depths of 8.1 m and 4.8 m below the existing ground surface when measured on December 15, 2010. The monitoring well in MW 3 was dry on December 15, 2010.

3.1 Topsoil

Topsoil was encountered at ground surface in all boreholes advanced at the site. The topsoil thickness encountered at the borehole locations ranged from 200 to 330 mm, as summarized in the following table:

BH/MW	TOPSOIL THICKNESS (mm)
1	200
2	310
3	230
4	330
5	250

The topsoil thickness encountered at the test pit locations ranged from 130 to 350 mm, as summarized in the following table:

TEST PIT	TOPSOIL THICKNESS (mm)
1	200
2	350
3	200
4	130
5	200
6	180
7	180
8	200

3.2 Fill Materials

Fill materials were encountered in all boreholes below the surficial topsoil and extended to depths ranging from 1.9 to 6.4 m below existing ground surface, which may relate to the reclamation work following the aggregate development. The fill materials mainly consisted of silty sand to sandy silt. Clayey silt fill was encountered in one of the five boreholes. Pockets of topsoil, trace organics and wood fragments were observed from the fill samples, most of which are from the lower portion of the existing fills in Boreholes 1, 2 and 3.

Standard penetration tests carried out within the sandy fill materials gave N values ranging from 2 blows per 0.3 m of penetration to greater than 100 blows per 0.3m of penetration, indicating a generally very loose to compact relative density, with high N values indicating the presence of cobbles within the fill. Two Standard penetration tests carried out within the clayey fill materials gave N values of 5 blows per 0.3 m of penetration and 9 blows per 0.3 m of penetration, indicating a firm and stiff consistency. The in-situ water contents of the fill samples ranged from 5 percent to 15 percent.

3.3 Sandy Silt Till

Sandy silt till was encountered underlying fill in BH 1 and silt in MW 5. Two standard penetration tests carried out within the sandy silt till gave N values of 19 blows per 0.3 m of penetration and 39 blows per 0.3 m of penetration, indicating a compact to dense relative density. The natural water contents of two sandy silt till samples were 8 percent and 10 percent.

3.4 Clayey Silt Till

Clayey silt till was encountered in MW 5 below the sandy silt till. MW 5 was terminated in this clayey silt till. Standard penetration tests carried out within the clayey silt till gave N values ranging from 16 blows to 39 blows per 0.3 m of penetration, indicating a very stiff to hard consistency. The natural water contents of the clayey silt till samples ranged from 11 percent to 12 percent. One grain size distribution for the clayey silt till sample is shown on Figure 3.

3.5 Silty Fine Sand and Fine Sandy Silt

Silty fine sand and fine sandy silt were encountered below the sandy silt till or the fills in BH 1 and 2 and MW 3 and 4. MW 3 was terminated in the silty fine sand. Standard penetration test carried out within the silty fine sand and fine sandy silt gave N values ranging from 17 blows per 0.3 m of penetration to greater than 100 blows per 0.3 m of penetration, indicating a compact to very dense relative density. The natural water contents of the silty fine sand and fine sandy silt samples ranged from 3 percent to 19 percent. One grain size distribution for a sample of the silty fine sand is shown on Figure 4.

3.6 Sand and Gravel

Sand and gravel were encountered below the silty fine sand or fine sandy silt in BH 2 and MW 4. BH 2 was terminated in the sand and gravel deposit. Two standard penetration tests carried out within the sand and gravel gave N values of 52 blows per 0.3 m of penetration and 53 blows per 0.3 m of penetration, indicating very dense relative density. The natural water contents of two sand and gravel samples were 2 percent and 3 percent.

3.7 Silt

Silt was encountered below the fills or silty fine sand in all of the boreholes except BH 2. BH 1 and MW 4 were terminated in the silt. Standard penetration test carried out within the silt gave N values ranging from 18 blows per 0.3 m of penetration to greater than 100 blows per 0.3 m of penetration, indicating a compact to very dense relative density. The natural water contents of the silt samples ranged from 12 percent to 21 percent. One grain size distribution for a sample of silt is shown on Figure 5.

3.8 Shallow Groundwater

All boreholes, with the exception of MW 4, were dry upon completion of drilling. Groundwater levels, in the monitoring wells in MW 4 and 5, were at depths of 8.1 and 4.8 m, respectively, below the existing ground surface when measured on December 15, 2010. The monitoring well in MW 3 was dry when checked on December 15, 2010. It should be noted that these observations reflect the shallow groundwater conditions encountered in the boreholes during the time of the field investigation (late November to mid December, 2010) and some seasonal fluctuations should be anticipated.

3.9 Baseline Groundwater Sampling

The monitoring wells were developed and sampled between November 30 and December 22, 2010. Locations of the monitoring wells are shown on Figure 2.

Prior to sampling, the wells were developed by purging until dry, to ensure the sampling of fresh formation water. Monitoring Well MW 4 was developed on November 30, 2010 and sampled on December 15, 2010. Monitoring Well MW 5 was developed on December 15, 2010 and sampled on December 22, 2010. The depth to groundwater was measured at 8.1 m below ground surface (“bgs”) in monitoring well MW 4 and at 4.8 m bgs in monitoring well MW 5 on December 15, 2010. Monitoring well MW 3 was dry when measured on November 30, 2010, December 15, 2010 and December 22, 2010. The groundwater samples were stored in a cooler on ice until delivered to Maxxam Analytics Inc. for analysis.

Table 1 provides a summary of the laboratory analytical results and a comparison to standards provided by Region of York for fill permits at a similar site (“Region of York standards”). The groundwater samples from MW 4 and MW 5 exceeded the Region of York standards for total coliforms, hardness as calcium carbonate

($CaCO_3$), dissolved manganese and total dissolved solids and had detection limits higher than the Region of York's groundwater standard for dissolved iron. The laboratory analytical results are provided in Appendix B.

4.0 CLOSURE

We trust that this report provides sufficient geotechnical engineering information and groundwater baseline conditions to aid in the planning and pertinent applications at the site. If you have any questions regarding the contents of this report or require additional information, please do not hesitate to contact this office.

Yours truly,

GOLDER ASSOCIATES LTD.

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Chris Kellestine (A.Sc.T.), Associate
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AM/DBL/HD/EH/CLK/CLK/dbl/sv

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LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures and in the text of the report are as follows:

I SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO	Drive open
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

II. PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:
The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) drive open sampler for a distance of 300 mm (12 in.).

Dynamic Penetration Resistance; N_d:
The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

Piezo-Cone Penetration Test (CPT):
An electronic cone penetrometer with a 60° conical tip and a projected end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (Q_t), porewater pressure (PWP) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III. SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	N Blows/300 mm or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

Consistency	c_u, s_u kPa	c_u, s_u psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	over 200	over 4,000

IV. SOIL TESTS

w	water content
w_p	plastic limit
w_l	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, G_S)
DS	direct shear test
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V	field vane test (LV-laboratory vane test)
γ	unit weight

Note:
1. Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π = 3.1416
ln x, natural logarithm of x
$\log_{10}$ x or log x, logarithm of x to base 10
g acceleration due to gravity
t time
F factor of safety
V volume
W weight

II. STRESS AND STRAIN

γ shear strain
Δ change in, e.g. in stress: $\Delta\sigma$
ε linear strain
ε_v volumetric strain
η coefficient of viscosity
ν Poisson's ratio
σ total stress
σ' effective stress ($\sigma' = \sigma - u$)
σ'_{vo} initial effective overburden stress
$\sigma_1, \sigma_2, \sigma_3$ principal stresses (major, intermediate, minor)
σ_{oct} mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ shear stress
u porewater pressure
E modulus of deformation
G shear modulus of deformation
K bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$ bulk density (bulk unit weight*)
$\rho_d(\gamma_d)$ dry density (dry unit weight)
$\rho_w(\gamma_w)$ density (unit weight) of water
$\rho_s(\gamma_s)$ density (unit weight) of solid particles
γ' unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R relative density (specific gravity)of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e void ratio
n porosity
S degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density x acceleration due to gravity)

(a) Index Properties (con't.)

w water content
w_l liquid limit
w_p plastic limit
I_P plasticity Index = $(w_l - w_p)$
w_S shrinkage limit
I_L liquidity index = $(w - w_p) / I_p$
I_C consistency index = $(w_l - w) / I_p$
e_{max} void ratio in loosest state
e_{min} void ratio in densest state
I_D density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(c) Hydraulic Properties

h hydraulic head or potential
q rate of flow
v velocity of flow
i hydraulic gradient
k hydraulic conductivity (coefficient of permeability)
j seepage force per unit volume

(d) Consolidation (one-dimensional)

C_c compression index (normally consolidated range)
C_r recompression index (overconsolidated range)
C_S swelling index
C_α coefficient of secondary consolidation
m_v coefficient of volume change
c_v coefficient of consolidation
T_v time factor (vertical direction)
U degree of consolidation
σ'_p pre-consolidation pressure
OCR Overconsolidation ratio $= \sigma'_p / \sigma'_{vo}$

(e) Shear Strength

τ_p, τ_r peak and residual shear strength
ϕ' effective angle of internal friction
δ angle of interface friction
μ coefficient of friction = tan δ
c' effective cohesion
c_u, s_u undrained shear strength ($\phi = 0$ analysis)
p mean total stress $(\sigma_1 + \sigma_3)/2$
p' mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q $(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u compressive strength $(\sigma_1 - \sigma_3)$
S_t sensitivity

Notes: 1. $\tau = c' + \sigma' \tan \phi'$
2. Shear strength = (Compressive strength)/2

PROJECT: 09-1111-6090

RECORD OF BOREHOLE BH 1

SHEET 1 OF 1

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM:

SAMPLER HAMMER, 63.5kg, DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg, DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. ⊕ - ⊕ rem V. ⊕ U - ⊖) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	WATER CONTENT PERCENT (Wp ⊢ ○ W ⊣ Wl) (10 20 30 40)	ADDITIONAL LAB TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
0		GROUND SURFACE		327.50										
		TOPSOIL		0.00	1A	50 DO	7					○		
		Loose to compact brown sandy silt to silty sand, trace to some clay, trace to some gravel, trace organics, trace wood pieces (FILL)		0.20	1B	50 DO		327				○		
1					2	50 DO	22					○		
								326						
					3	50 DO	15					○		
2														
					4	50 DO	19	325				○		
3														
					5	50 DO	12					○		
								324						
4														
								323						
5					6	50 DO	12					○		
								322						
6														
					7A	50 DO	19					○		
		Compact brown and grey mottled SANDY SILT, some clay, trace gravel (TILL)		321.10 6.40	7B			321						
7														
		Dense brown SILTY FINE SAND, trace gravel		320.34 7.16										
					8	50 DO	33	320				○		
8														
				318.81				319						
		Very dense brown SILT, trace fine sand, trace clay		8.69										
9					9	50 DO	50/ 13	318				○		
				317.90										
		END OF BOREHOLE		9.60										Borehole dry and open upon completion of drilling, Nov 29/10
10														

TRACK MOUNTED POWER AUGER
110 mm Diameter Solid Stem Auger

LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 24/2/11 DATA NPJT JT 12/20/10

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AM

CHECKED: AM

PROJECT: 09-1111-6090

RECORD OF BOREHOLE BH 2

SHEET 1 OF 1

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (20 40 60 80); anl 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	INSTALLATION AND GROUNDWATER OBSERVATIONS
0	TRACK MOUNTED POWER AUGER 110 mm Diameter Solid Stem Auger	GROUND SURFACE		321.50								
		TOPSOIL		0.00	1A	SS	6			○		
				321.19								
		Compact to very loose brown to grey silty sand to sandy silt, trace to some clay, trace to some gravel (FILL)		0.31	1B	DO		321		○		
1					2	DO	14			○		
								320				
					3	DO	8			○		
2												
					4	DO	4	319				
				318.60								
3		Firm to stiff grey clayey silt, trace to some sand, trace to some gravel, trace wood pieces (FILL)		2.90	5	DO	5			○		
								318				
4												
								317				
					6	DO	9			⊖		
5												
				316.01				316				
		Compact brown SILTY FINE SAND, trace clay, trace gravel		5.49								
6												
					7	DO	17			○		
								315				
				314.50								
7		Very dense brown SAND and GRAVEL, trace silt		7.00								
								314				
					8	DO	52			○		
				313.58								
8		END OF BOREHOLE		7.92								Borehole dry and open upon completion of drilling, Nov. 29/10
9												
10												

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AM

CHECKED: AM

:LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 24/2/11 DATA INPUT: JT 12/2010

PROJECT: 09-1111-6090

RECORD OF BOREHOLE MW 3

SHEET 1 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
0		GROUND SURFACE		321.30								
		TOPSOIL		0.00 / 321.07	1A	50 DO	9	321				
		Loose brown sandy silt, trace to some clay, trace to some gravel, topsoil inclusions (FILL)		0.23	1B							50 mm Diameter Monitoring Well
1					2	50 DO	6					
								320				
					3A	50 DO	7					
2				319.37	3B	50 DO						
		Loose to very dense brown SILTY FINE SAND to FINE SANDY SILT		1.93				319				
					4	50 DO	34					
3												Bentonite Seal
					5	50 DO	45	318				
4												
								317				
					6	50 DO	54					
5												
								316				
6												
					7	50 DO	50/ .13	315				
7				314.29								
		Very dense brown SILT, trace to some fine sand, trace clay, zones of fine sand		7.01				314				
					8	50 DO	50/ .13					Silica Sand Filter
8												
								313				
9												
					9	50 DO	61	312			MH	
10				311.30								
		--- CONTINUED NEXT PAGE ---										

TRACK MOUNTED POWER AUGER
110 mm Diameter Solid Stem Auger

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AM

CHECKED: AM

LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 24/2/11 DATA INPUT: JT 12/2010

PROJECT: 09-1111-6090

RECORD OF BOREHOLE MW 3

SHEET 2 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. ⊕ rem V. ⊖	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7}) / WATER CONTENT PERCENT Wp, W, Wl (10 20 30 40)	ADDITIONAL LAB TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---										
10		Very dense brown SILTY FINE SAND		10.00				311				
11				310.17	10	50 DO	63			O		
		END OF BOREHOLE		11.13								Borehole dry upon completion of drilling Borehole caved in to a depth of 9.5 m below ground surface upon completion of drilling, Nov. 29/10 Monitoring well was dry, Dec. 15/10
12												
13												
14												
15												
16												
17												
18												
19												
20												

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AM
CHECKED: AM

LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 2/2/11 DATA INPUT: JR 1/2/2010

PROJECT: 09-1111-6090

RECORD OF BOREHOLE MW 4

SHEET 1 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ELEVATION	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	INSTALLATION AND GROUNDWATER OBSERVATIONS
0		GROUND SURFACE		320.50								
		TOPSOIL		0.00	1A	50 DO	19					
				320.17				320				50 mm Diameter Monitoring Well
		Compact to very loose brown to grey silty sand to sandy silt, trace to some clay, trace gravel (FILL)		0.33	1B							
1					2	50 DO	15					
								319				
					3	50 DO	6					
2												
					4	50 DO	2	318				
3												
					5	50 DO	21					
								317				Bentonite Seal
4												
								316				
				315.62	6A	50 DO	17					
5	TRACK MOUNTED POWER AUGER 110 mm Diameter Solid Stem Auger	Compact brown FINE SANDY SILT, trace clay		4.88	6B							
				314.86				315				
		Very dense brown SAND and GRAVEL, trace silt		5.64								
6					7	50 DO	53					
								314				
				313.49								
7		Dense brown SILTY FINE SAND, trace gravel		7.01								
					8	50 DO	39	313			MH	
8												
								312				
				311.81								
		Very dense brown SILT, trace to some fine sand, trace clay		8.69								Silica Sand Filter
9					9	50 DO	50/ .13					
								311				
10		--- CONTINUED NEXT PAGE ---										

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AM
CHECKED: AM

LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 24/2/11 DATA INPUT: JT 12/2010

PROJECT: 09-1111-6090

RECORD OF BOREHOLE MW 4

SHEET 2 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM:

SAMPLER HAMMER 63.5kg, DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	ELEVATION	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	INSTALLATION AND GROUNDWATER OBSERVATIONS
10		*--- CONTINUED FROM PREVIOUS PAGE ---*										
		Very dense brown SILT, trace to some fine sand, trace clay						310				Silica Sand Filter
				309.70	10	SS	50/ .13					
		END OF BOREHOLE		10.80								Water level in open borehole at a depth of 9.8 m below ground surface upon completion of drilling, Nov. 29/10 Water level measured at 8.08 m depth below ground surface, Dec. 15/10
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AM

CHECKED: AM

LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 24/2/11 DATA INPUT: JT 12/2010

PROJECT: 09-1111-6090

RECORD OF BOREHOLE MW 5

SHEET 1 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg, DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ELEVATION	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	INSTALLATION AND GROUNDWATER OBSERVATIONS
0	TRACK MOUNTED POWER AUGER 110 mm Diameter Solid Stem Auger	GROUND SURFACE		325.00				325				
		TOPSOIL		0.00 / 324.75	1A							
		Loose to compact brown sandy silt, some clay, trace gravel, cobbles (FILL)		0.25	1B	SS DO	5					50 mm Diameter Monitoring Well
1					2	SS DO	6	324				
		Sampler encountered cobble			3	SS DO	50/ .15					
2								323				
					4	SS DO	21					
3								322				
					5	SS DO	13					
												Bentonite Seal
4				320.89				321				
		Compact brown SILT, trace to some clay, trace fine sand		4.11								
					6	SS DO	18					
5								320				
				319.50								
		Dense grey SANDY SILT, some clay, trace gravel (TILL)		5.50								
6								319				
					7	SS DO	39					
				318.00								
7		Very stiff to hard grey CLAYEY SILT, some sand, trace gravel (TILL)		7.00				318				
					8	SS DO	16					
8								317				
												Silica Sand Filter
9								316				
					9	SS DO	22				MH	
10		--- CONTINUED NEXT PAGE ---						315				

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AM
CHECKED: AM

LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 24/2/11 DATA INPUT: JF 12/2010

PROJECT: 09-1111-6090

RECORD OF BOREHOLE MW 5

SHEET 2 OF 2

LOCATION: SEE FIGURE 2

BORING DATE: November 29, 2010

DATUM

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

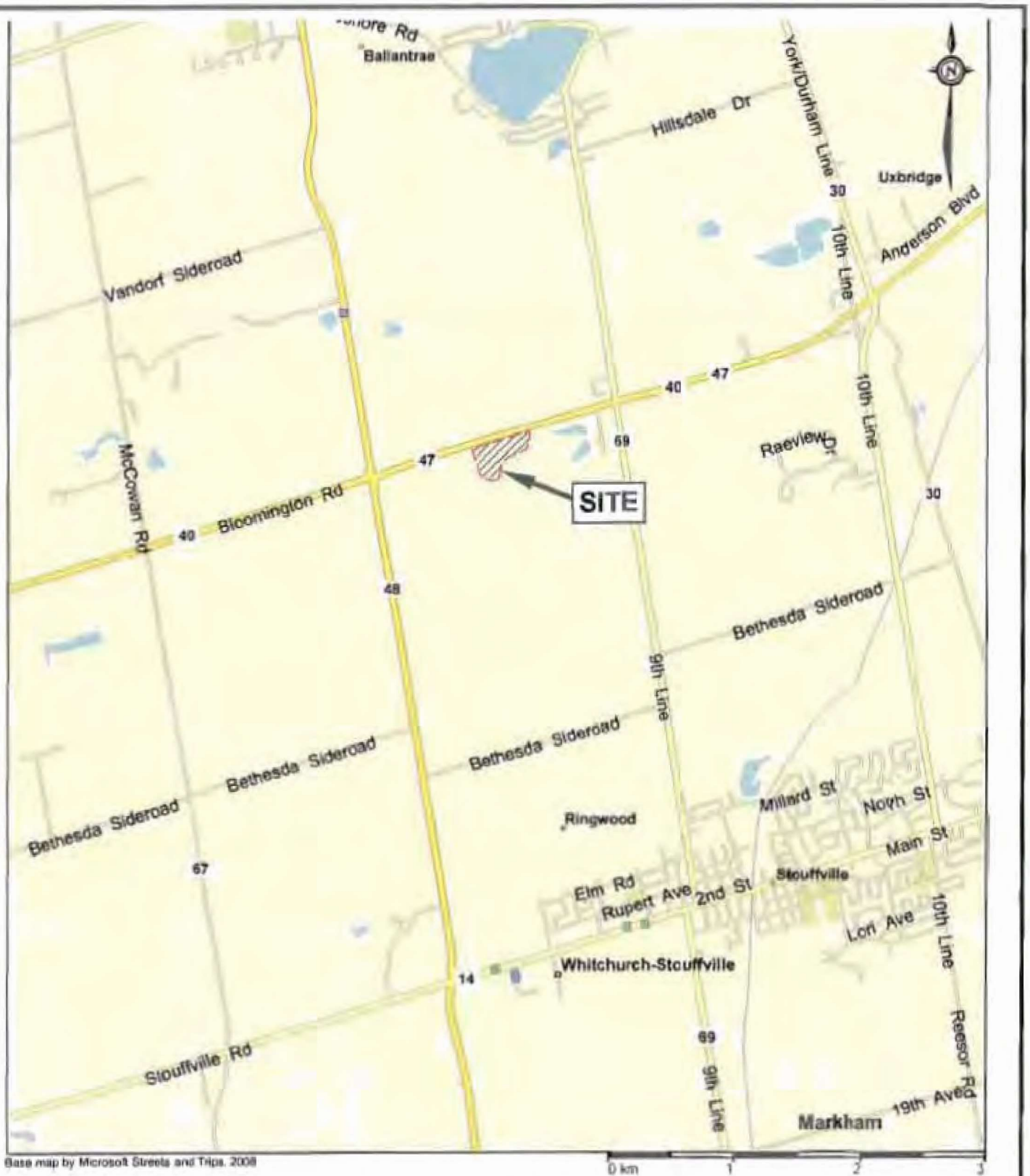
DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ⊗ rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		--- CONTINUED FROM PREVIOUS PAGE ---									
10		Very stiff to hard grey CLAYEY SILT, some sand, trace gravel (TILL)						315				Silica Sand Filter
11					10	SS DO	39	314		○		
		END OF BOREHOLE		313.87 11.13								Borehole dry and open upon completion of drilling, Nov. 29/10 Water level measured at 4.81 m below ground surface, Dec. 15/10
12												
13												
14												
15												
16												
17												
18												
19												
20												

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AM
CHECKED:

LDN_BHS 09-1111-6090.GPJ GLDR_LDN.GDT 24/2/11 DATA INPUT: JT 12/2010



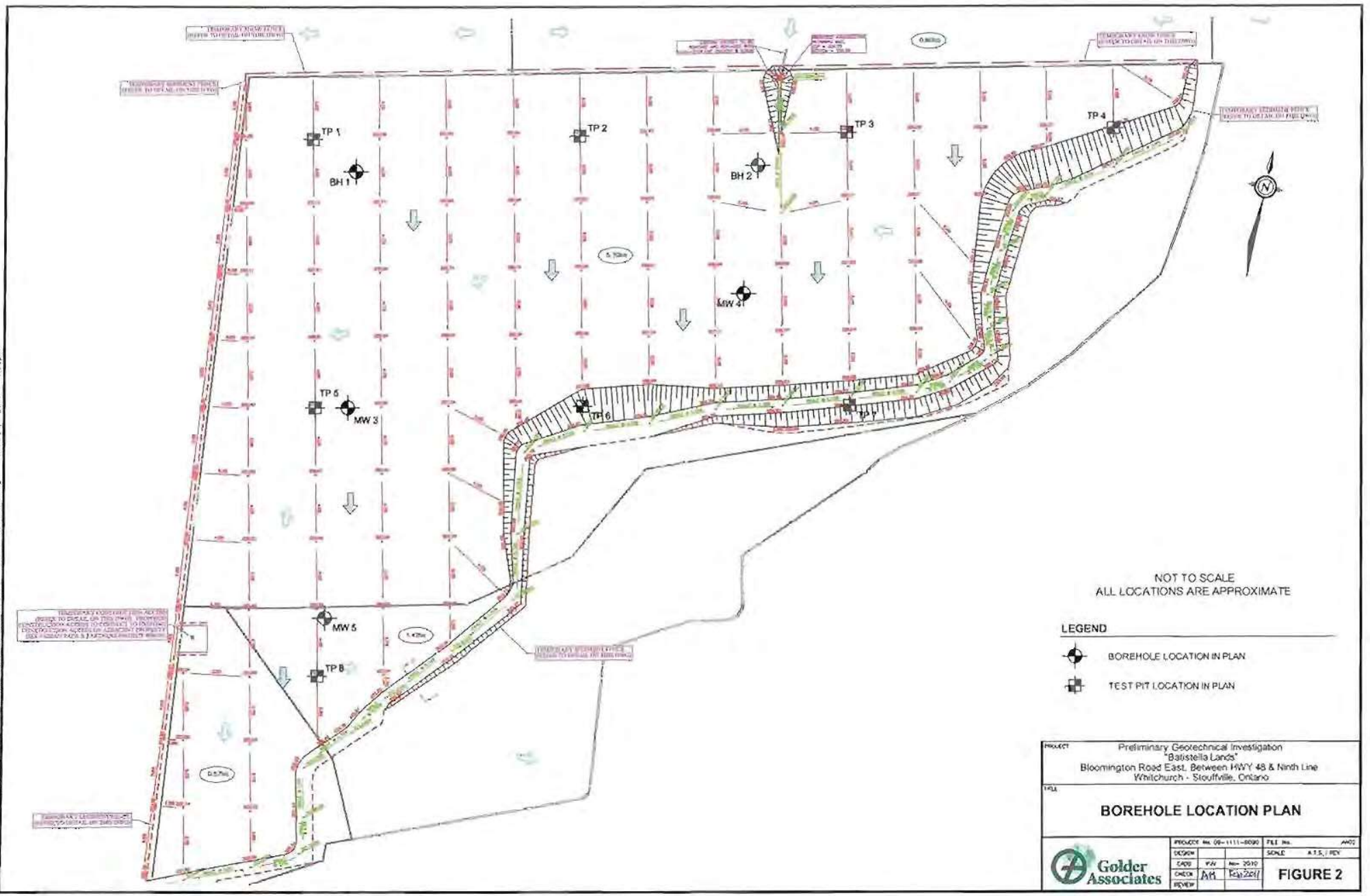
ALL LOCATIONS ARE APPROXIMATE

PROJECT: Preliminary Geotechnical Investigation
"Batistella Lands"
Bloomington Road East, Between HWY 48 & Ninth Line
Whitchurch - Stouffville, Ontario

TITLE: **KEY PLAN**

Golder Associates

PROJECT No. 09-1111-5090		FILE No.	A01
DESIGN		SCALE AS SHOWN	REV
CADD	PJV	Jan. 2011	**FIGURE 1**
CHECK	AM	FEB 24/11	
REVIEW			



PROJECT: Preliminary Geotechnical Investigation
"Balistella Lands"
Bloomington Road East, Between HWY 48 & Ninth Line
Whitchurch - Stouffville, Ontario

TITLE: **BOREHOLE LOCATION PLAN**

Golder Associates

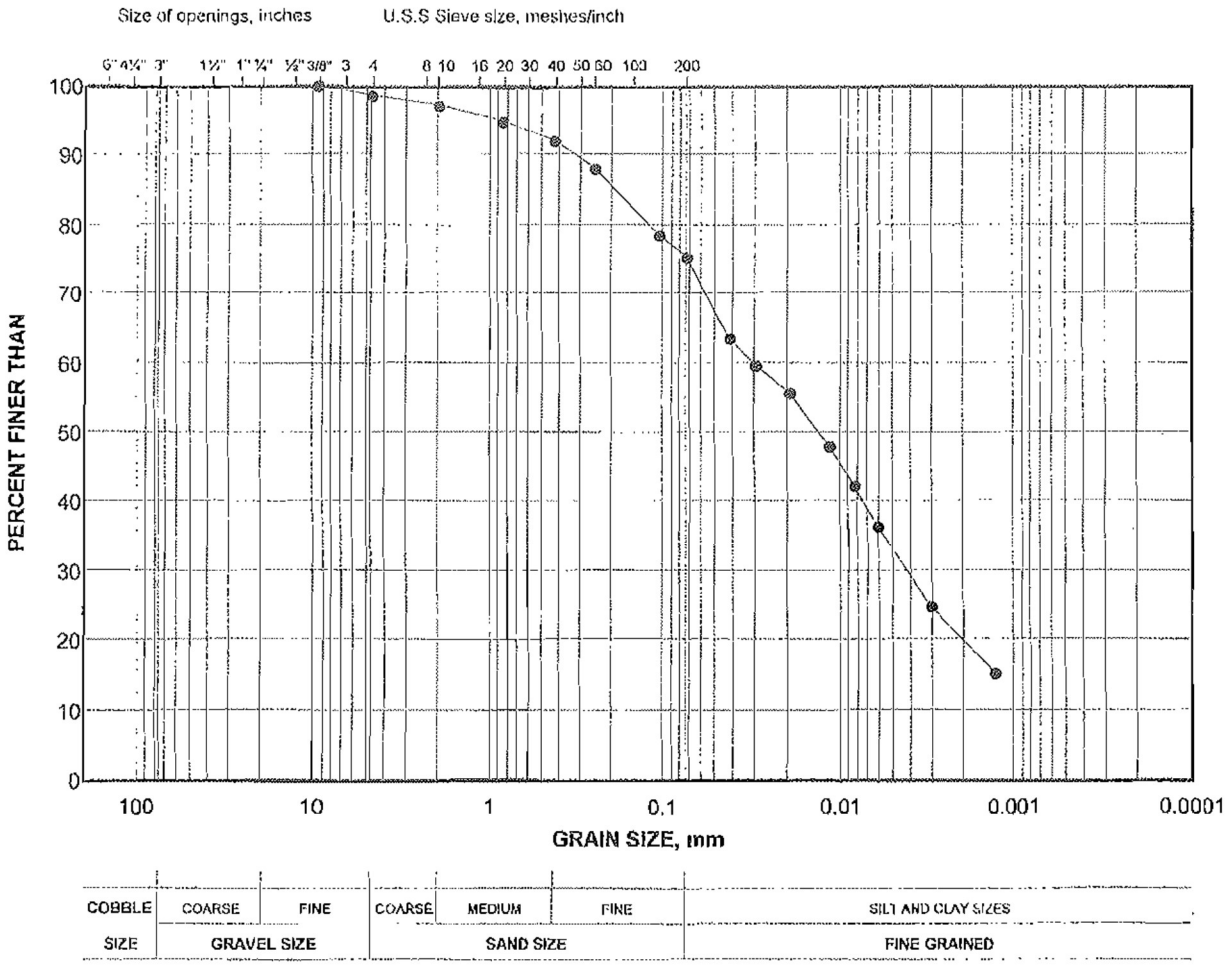
PROJECT No. 09-1111-6090 | FILE No. | AMO
DESIGN | SCALE: N.T.S. / REV
DRAFT: KW Nov 2010
CHECK: AM Feb 2011
REVIEW

FIGURE 2

Drawing File: R:\CAD_PROJECTS\2009\09-1111-6090 (Balistella Lands)\~AM~\09111160904A02.dwg Feb 24, 2011 - 1:58pm

GRAIN SIZE DISTRIBUTION
CLAYEY SILT TILL

FIGURE 3



LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
●	MW5	9	9.10 - 9.60

Project Number: 09-1111-6090

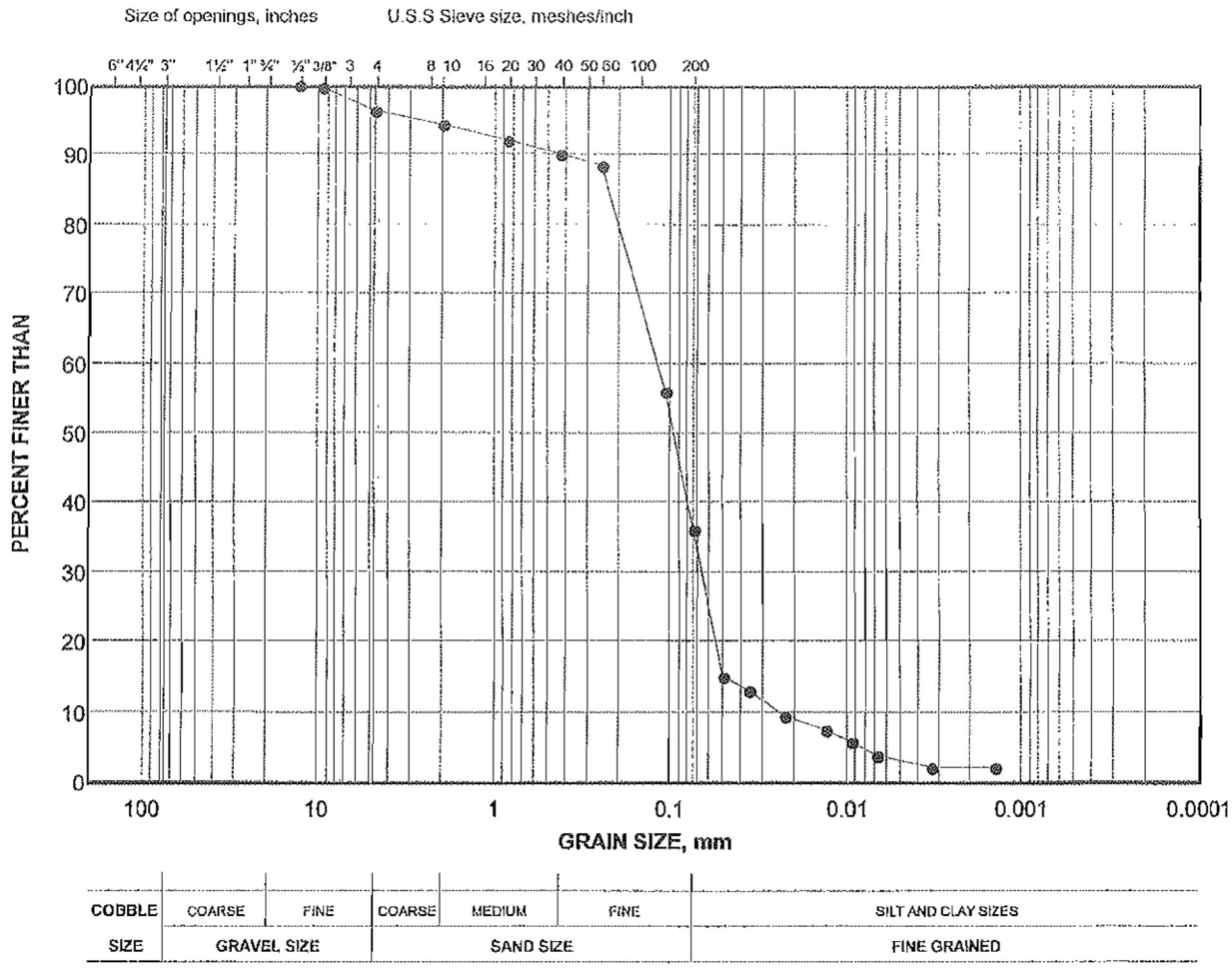
Checked By: _____

Golder Associates

Date: 18-Jan-11

GRAIN SIZE DISTRIBUTION
SILTY FINE SAND

FIGURE 4



LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
●	MW4	8	7.60 - 8.10

Project Number: 09-1111-6090

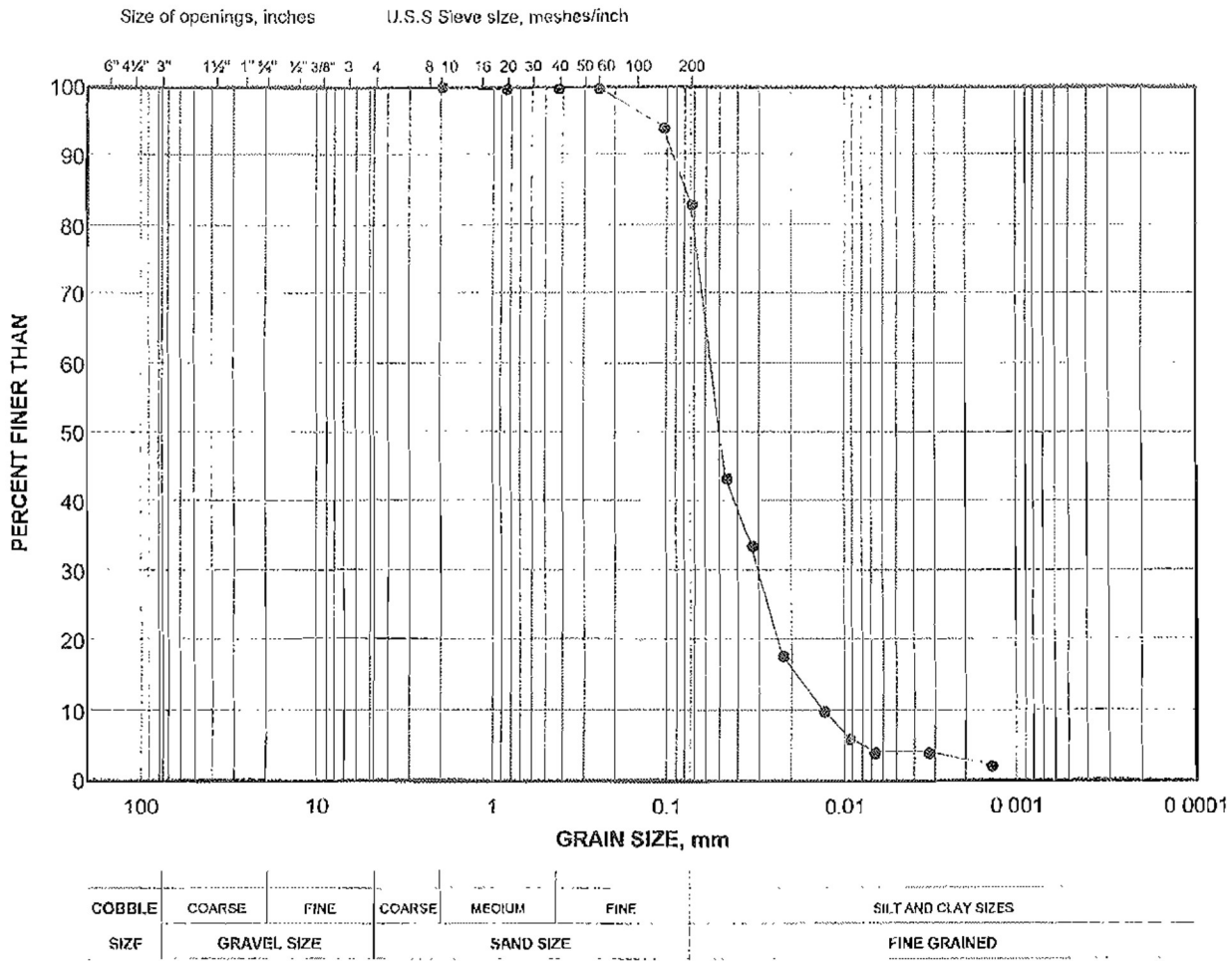
Checked By: MM

Golder Associates

Date: 18-Jan-11

GRAIN SIZE DISTRIBUTION
SILT

FIGURE 5



LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
●	MW3	9	9.10 - 9.60

Project Number: 09-1111-6090

Checked By: AM

Golder Associates

Date: 18-Jan-11

APPENDIX A

Important Information and Limitations of This Report

IMPORTANT INFORMATION AND LIMITATIONS TO THIS REPORT

Standard of Care: Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

Basis and Use of the Report: This report has been prepared for the specific site, design objective, development and purpose described to Golder by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. Any change of site conditions, purpose, development plans or if the project is not initiated within eighteen months of the date of the report may alter the validity of the report. Golder can not be responsible for use of this report, or portions thereof, unless Golder is requested to review and, if necessary, revise the report.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client cannot rely upon the electronic media versions of Golder's report or other work products.

The report is of a summary nature and is not intended to stand alone without reference to the instructions given to Golder by the Client, communications between Golder and the Client, and to any other reports prepared by Golder for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. Golder cannot be responsible for use of portions of the report without reference to the entire report.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

Soil, Rock and Groundwater Conditions: Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Golder does not warrant or guarantee the exactness of the descriptions.

Special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions. The environmental, geologic, geotechnical, geochemical and hydrogeologic conditions that Golder interprets to exist between and beyond sampling points may differ from those that actually exist. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on

adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

Sample Disposal: Golder will dispose of all uncontaminated soil and/or rock samples 90 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

Follow-Up and Construction Services: All details of the design were not known at the time of submission of Golder's report. Golder should be retained to review the final design, project plans and documents prior to construction, to confirm that they are consistent with the intent of Golder's report.

During construction, Golder should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Golder's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Golder's report. Adequate field review, observation and testing during construction are necessary for Golder to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Golder's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

Changed Conditions and Drainage: Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Golder be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Golder be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Golder takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

APPENDIX B

Laboratory Analytical Results

Your C.O.C. #: 22917301, 229173-01-01

Attention: Hammad Din
Golder Associates Ltd
100 Scotia Crt
Whitby, ON
L1N 8Y6

Report Date: 2010/12/22

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B0I1847
Received: 2010/12/16, 15:59

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Alkalinity	1	N/A	2010/12/17	CAM SOP-00448	SM 2320B
Chloride by Automated Colourimetry	1	N/A	2010/12/20	CAM SOP-00463	SM 4500 Cl E
Chemical Oxygen Demand	1	N/A	2010/12/22	CAM SOP-00416	APHA 5220D
Conductivity	1	N/A	2010/12/17	CAM SOP-00448	SM 2510
Dissolved Organic Carbon (DOC)	1	N/A	2010/12/17	CAM SOP-00446	SM 5310 B
Hardness (calculated as CaCO3)	1	N/A	2010/12/20	CAM SOP 00102	SM 2340 B
Mercury	1	2010/12/20	2010/12/20	CAM SOP-00453	EPA 7470
Dissolved Metals by ICPMS	1	N/A	2010/12/17	CAM SOP-00447	EPA 6020
Coliform, (CFU/100mL)	1	N/A	2010/12/16	CAM SOP-00552	MOE LSB E3371
E.coli, (CFU/100mL)	1	N/A	2010/12/16	CAM SOP-00552	MOE LSB E3371
Ammonia-N	1	N/A	2010/12/21	CAM SOP-00441	US GS I-2522-90
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2010/12/21	CAM SOP-00440	SM 4500 NO3I/NO2B
pH	1	N/A	2010/12/17	CAM SOP-00448	SM 4500H
Phenols (4AAP)	1	N/A	2010/12/17	CAM SOP-00444	MOE ROPHEN-E3179
Sulphate by Automated Colourimetry	1	N/A	2010/12/20	CAM SOP-00464	EPA 375.4
Total Dissolved Solids	1	N/A	2010/12/17	CAM SOP-00428	APHA 2540C
Total Kjeldahl Nitrogen in Water	1	2010/12/20	2010/12/21	CAM SOP-00454	EPA 351.2 Rev 2
Total Phosphorus (Colourimetric)	1	2010/12/21	2010/12/22	CAM SOP-00407	SM 4500 P,B,F
Volatile Organic Compounds in Water	1	N/A	2010/12/20	CAM SOP-00226	EPA 8260 modified

* 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.

Encryption Key

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

MATHURA THIRUKKUMARAN, CS Rep
Email: MThirukkumaran@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section

Golder Associates Ltd

Maxxam Job #: B0I1847
Report Date: 2010/12/22

Sampler Initials: KS

5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

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

Golder Associates Ltd

Maxxam Job #: B0I1847
Report Date: 2010/12/22

Sampler Initials: KS

RESULTS OF ANALYSES OF WATER

Maxxam ID		IE5393		
Sampling Date		2010/12/15 03:00		
	Units	**MW-4**	**RDL**	**QC Batch**
Calculated Parameters				
Hardness (CaCO3)	mg/L	640	1	2360740
Inorganics				
Total Ammonia-N	mg/L	0.09	0.05	2364972
Total Chemical Oxygen Demand (COD)	mg/L	310	20	2365671
Conductivity	umho/cm	1500	1	2362808
Total Dissolved Solids	mg/L	936	10	2362573
Total Kjeldahl Nitrogen (TKN)	mg/L	17	10	2364641
Dissolved Organic Carbon	mg/L	3.1	0.2	2362927
pH	pH	7.55		2362801
Phenols-4AAP	mg/L	<0.001	0.001	2362915
Total Phosphorus	mg/L	54	0.2	2365460
Dissolved Sulphate (SO4)	mg/L	38	1	2362717
Alkalinity (Total as CaCO3)	mg/L	488	1	2362807
Dissolved Chloride (Cl)	mg/L	180	1	2362713
Nitrite (N)	mg/L	<0.01	0.01	2362922
Nitrate (N)	mg/L	3.3	0.1	2362922
Nitrate + Nitrite	mg/L	3.3	0.1	2362922

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

Golder Associates Ltd

Maxxam Job #: B0I1847
Report Date: 2010/12/22

Sampler Initials: KS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		IE5393		
Sampling Date		2010/12/15 03:00		
	Units	**MW-4**	**RDL**	**QC Batch**
Metals				
Mercury (Hg)	ug/L	<0.1	0.1	2363699
Dissolved Arsenic (As)	ug/L	<1	1	2362858
Dissolved Barium (Ba)	ug/L	150	5	2362858
Dissolved Boron (B)	ug/L	59	10	2362858
Dissolved Cadmium (Cd)	ug/L	<0.1	0.1	2362858
Dissolved Calcium (Ca)	ug/L	200000	200	2362858
Dissolved Chromium (Cr)	ug/L	<5	5	2362858
Dissolved Copper (Cu)	ug/L	4	1	2362858
Dissolved Iron (Fe)	ug/L	<100	100	2362858
Dissolved Lead (Pb)	ug/L	<0.5	0.5	2362858
Dissolved Magnesium (Mg)	ug/L	35000	50	2362858
Dissolved Manganese (Mn)	ug/L	190	2	2362858
Dissolved Sodium (Na)	ug/L	70000	100	2362858
Dissolved Zinc (Zn)	ug/L	11	5	2362858

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IE5393		
Sampling Date		2010/12/15 03:00		
	Units	**MW-4**	**RDL**	**QC Batch**
Volatile Organics				
1,4-Dichlorobenzene	ug/L	<0.2	0.2	2362028
Methylene Chloride(Dichloromethane)	ug/L	<0.5	0.5	2362028
Toluene	ug/L	<0.2	0.2	2362028
Vinyl Chloride	ug/L	<0.2	0.2	2362028
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	100		2362028
D4-1,2-Dichloroethane	%	109		2362028
D8-Toluene	%	100		2362028

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Golder Associates Ltd

Maxxam Job #: B0I1847
Report Date: 2010/12/22

Sampler Initials: KS

MICROBIOLOGY (WATER)

Maxxam ID		IE5393		
Sampling Date		2010/12/15 03:00		
	Units	**MW-4**	**RDL**	**QC Batch**
Microbiological				
Background	CFU/100mL	>200000	10	2361873
Total Coliforms	CFU/100mL	70(1)	10	2361873
Escherichia coli	CFU/100mL	<10	10	2361874

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Values reported may be biased low due to overgrowth.

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

Golder Associates Ltd

Maxxam Job #: B0I1847
Report Date: 2010/12/22

Sampler Initials: KS

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
2362028	4-Bromofluorobenzene	2010/12/20	103	70 - 130	102	70 - 130	99	%				
2362028	D4-1,2-Dichloroethane	2010/12/20	108	70 - 130	107	70 - 130	109	%				
2362028	D8-Toluene	2010/12/20	101	70 - 130	102	70 - 130	100	%				
2362028	1,4-Dichlorobenzene	2010/12/20	90	70 - 130	91	70 - 130	<0.2	ug/L	NC	40		
2362028	MethyleneChloride(Dichloromethane)	2010/12/20	90	70 - 130	88	70 - 130	<0.5	ug/L	NC	40		
2362028	Toluene	2010/12/20	91	70 - 130	91	70 - 130	<0.2	ug/L	NC	40		
2362028	Vinyl Chloride	2010/12/20	102	70 - 130	93	70 - 130	<0.2	ug/L	NC	40		
2362573	Total Dissolved Solids	2010/12/17					<10	mg/L	0.4	25	97	85 - 115
2362713	Dissolved Chloride (Cl)	2010/12/20	NC	75 - 125	104	80 - 120	<1	mg/L	0.02	20		
2362717	Dissolved Sulphate (SO4)	2010/12/20	NC	75 - 125	98	80 - 120	<1	mg/L	4.2	25		
2362807	Alkalinity (Total as CaCO3)	2010/12/17					<1	mg/L	0.6	25	97	85 - 115
2362808	Conductivity	2010/12/17					<1	umho/cm	0.4	25	101	85 - 115
2362858	Dissolved Arsenic (As)	2010/12/17	97	80 - 120	100	90 - 110	<1	ug/L	0.8	25		
2362858	Dissolved Barium (Ba)	2010/12/17	93	80 - 120	97	90 - 110	<5	ug/L	0.9	25		
2362858	Dissolved Boron (B)	2010/12/17	93	80 - 120	98	90 - 110	<10	ug/L	1.5	25		
2362858	Dissolved Cadmium (Cd)	2010/12/17	97	80 - 120	99	90 - 110	<0.1	ug/L	NC	25		
2362858	Dissolved Calcium (Ca)	2010/12/17	NC	80 - 120	101	90 - 110	<200	ug/L	1	25		
2362858	Dissolved Chromium (Cr)	2010/12/17	95	80 - 120	100	90 - 110	<5	ug/L	NC	25		
2362858	Dissolved Copper (Cu)	2010/12/17	93	80 - 120	99	90 - 110	<1	ug/L	NC	25		
2362858	Dissolved Iron (Fe)	2010/12/17	95	80 - 120	100	90 - 110	<100	ug/L	NC	25		
2362858	Dissolved Lead (Pb)	2010/12/17	92	80 - 120	96	90 - 110	<0.5	ug/L	NC	25		
2362858	Dissolved Magnesium (Mg)	2010/12/17	94	80 - 120	99	90 - 110	<50	ug/L	1.6	25		
2362858	Dissolved Manganese (Mn)	2010/12/17	92	80 - 120	99	90 - 110	<2	ug/L	1.8	25		
2362858	Dissolved Sodium (Na)	2010/12/17	NC	80 - 120	104	90 - 110	<100	ug/L				
2362858	Dissolved Zinc (Zn)	2010/12/17	93	80 - 120	96	90 - 110	<5	ug/L	NC	25		
2362915	Phenols-4AAP	2010/12/17	101	75 - 125	96	75 - 125	<0.001	mg/L	NC	25		
2362922	Nitrite (N)	2010/12/21	101	80 - 120	100	85 - 115	<0.01	mg/L				
2362922	Nitrate (N)	2010/12/21	NC	80 - 120	103	85 - 115	<0.1	mg/L	0.6	25		
2362927	Dissolved Organic Carbon	2010/12/17	101	80 - 120	94	80 - 120	0.2, RDL=0.2	mg/L	1.5	20		
2363699	Mercury (Hg)	2010/12/20	100	75 - 125	95	80 - 120	<0.1	ug/L	NC	25		
2364641	Total Kjeldahl Nitrogen (TKN)	2010/12/21	NC	80 - 120	96	85 - 115	<0.1	mg/L	14.6	20	94	85 - 115
2364972	Total Ammonia-N	2010/12/21	101	80 - 120	99	85 - 115	<0.05	mg/L	NC	25		

Golder Associates Ltd

Maxxam Job #: B0I1847
Report Date: 2010/12/22

Sampler Initials: KS

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
2365460	Total Phosphorus	2010/12/22	98	80 - 120	100	85 - 115	<0.02	mg/L	NC	20	101	85 - 115
2365671	Total Chemical Oxygen Demand (COD)	2010/12/22	95	75 - 125	99	75 - 125	<4	mg/L	NC	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.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
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.

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Validation Signature Page

Maxxam Job #: B0I1847

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

CRISTINA CARRIERE, Scientific Services

KRISHNARL SUNTHARESAN, Senior Analyst

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Maxxam

Success Through Science®

Your Project #: 09-1111-6090
Site: STOUFVILLE
Your C.O.C. #: c#154546, c#154546-05-01

Attention: Kyle Shearer
Golder Associates Ltd
100 Scotia Crt
Whitby, ON
L1N 8Y6

Report Date: 2010/12/31

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B0I4942
Received: 2010/12/22, 15:25

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Alkalinity	1	N/A	2010/12/24	CAM SOP-00448	SM 2320B
Chloride by Automated Colourimetry	1	N/A	2010/12/29	CAM SOP-00463	SM 4500 Cl E
Chemical Oxygen Demand	1	N/A	2010/12/30	CAM SOP-00416	APHA 5220D
Conductivity	1	N/A	2010/12/24	CAM SOP-00448	SM 2510
Dissolved Organic Carbon (DOC)	1	N/A	2010/12/29	CAM SOP-00446	SM 5310 B
Hardness (calculated as CaCO3)	1	N/A	2010/12/24	CAM SOP 00102	SM 2340 B
Mercury	1	2010/12/24	2010/12/24	CAM SOP-00453	EPA 7470
Dissolved Metals by ICPMS	1	N/A	2010/12/24	CAM SOP-00447	EPA 6020
Coliform, (5TMPN/100mL)	1	N/A	2010/12/23	CAM SOP-00504	SM 9221
E.coli, (5TMPN/100mL)	1	N/A	2010/12/23	CAM SOP-00509	SM 9221
Ammonia-N	1	N/A	2010/12/30	CAM SOP-00441	US GS I-2522-90
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2010/12/30	CAM SOP-00440	SM 4500 NO3I/NO2B
pH	1	N/A	2010/12/24	CAM SOP-00448	SM 4500H
Phenols (4AAP)	1	N/A	2010/12/24	CAM SOP-00444	MOE ROPHEN-E3179
Sulphate by Automated Colourimetry	1	N/A	2010/12/29	CAM SOP-00464	EPA 375.4
Total Dissolved Solids	1	N/A	2010/12/29	CAM SOP-00428	APHA 2540C
Total Kjeldahl Nitrogen in Water	1	2010/12/29	2010/12/30	CAM SOP-00454	EPA 351.2 Rev 2
Total Phosphorus (Colourimetric)	1	2010/12/30	2010/12/30	CAM SOP-00407	SM 4500 P,B,F
Volatile Organic Compounds in Water	1	N/A	2010/12/24	CAM SOP 00226	EPA 8260 modified

* 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.

Encryption Key

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

MATHURA THIRUKKUMARAN, CS Rep
Email: MThirukkumaran@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section

Maxxam Job #: B0I4942
Report Date: 2010/12/31

Golder Associates Ltd
Client Project #: 09-1111-6090
Project name: STOUFVILLE
Sampler Initials: KS

5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 2

Maxxam Job #: B0I4942
Report Date: 2010/12/31

Golder Associates Ltd
Client Project #: 09-1111-6090
Project name: STOUFVILLE
Sampler Initials: KS

RESULTS OF ANALYSES OF WATER

Maxxam ID		IG0517		
Sampling Date		2010/12/22 08:45		
	Units	**MW-5**	**RDL**	**QC Batch**
Calculated Parameters				
Hardness (CaCO3)	mg/L	460	1	2367401
Inorganics				
Total Ammonia-N	mg/L	0.16	0.05	2368796
Total Chemical Oxygen Demand (COD)	mg/L	1100	40	2370276
Conductivity	umho/cm	969	1	2368859
Total Dissolved Solids	mg/L	666	10	2369764
Total Kjeldahl Nitrogen (TKN)	mg/L	38	10	2369618
Dissolved Organic Carbon	mg/L	2.7	0.2	2369207
pH	pH	7.63		2368858
Phenols-4AAP	mg/L	<0.001	0.001	2368761
Total Phosphorus	mg/L	77	1	2370300
Dissolved Sulphate (SO4)	mg/L	43	1	2369138
Alkalinity (Total as CaCO3)	mg/L	465	1	2368857
Dissolved Chloride (Cl)	mg/L	14	1	2369135
Nitrite (N)	mg/L	0.04	0.01	2369131
Nitrate (N)	mg/L	4.5	0.1	2369131
Nitrate + Nitrite	mg/L	4.6	0.1	2369131

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B0I4942
Report Date: 2010/12/31

Golder Associates Ltd
Client Project #: 09-1111-6090
Project name: STOUFVILLE
Sampler Initials: KS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		IG0517	IG0517		
Sampling Date		2010/12/22 08:45	2010/12/22 08:45		
	Units	**MW-5**	**MW-5 Lab-Dup**	**RDL**	**QC Batch**
Metals					
Mercury (Hg)	ug/L	<0.1	<0.1	0.1	2368581
Dissolved Arsenic (As)	ug/L	<1		1	2368614
Dissolved Barium (Ba)	ug/L	200		5	2368614
Dissolved Boron (B)	ug/L	37		10	2368614
Dissolved Cadmium (Cd)	ug/L	<0.1		0.1	2368614
Dissolved Calcium (Ca)	ug/L	130000		200	2368614
Dissolved Chromium (Cr)	ug/L	<5		5	2368614
Dissolved Copper (Cu)	ug/L	1		1	2368614
Dissolved Iron (Fe)	ug/L	<100		100	2368614
Dissolved Lead (Pb)	ug/L	<0.5		0.5	2368614
Dissolved Magnesium (Mg)	ug/L	32000		50	2368614
Dissolved Manganese (Mn)	ug/L	230		2	2368614
Dissolved Sodium (Na)	ug/L	47000		100	2368614
Dissolved Zinc (Zn)	ug/L	6		5	2368614

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		IG0517		
Sampling Date		2010/12/22 08:45		
	Units	**MW-5**	**RDL**	**QC Batch**
Volatile Organics				
Benzene	ug/L	<0.2	0.2	2367877
1,4-Dichlorobenzene	ug/L	<0.5	0.5	2367877
Methylene Chloride(Dichloromethane)	ug/L	<2	2	2367877
Toluene	ug/L	<0.2	0.2	2367877
Vinyl Chloride	ug/L	<0.2	0.2	2367877
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	105		2367877
D4-1,2-Dichloroethane	%	118		2367877
D8-Toluene	%	91		2367877

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B0I4942
Report Date: 2010/12/31

Golder Associates Ltd
Client Project #: 09-1111-6090
Project name: STOUFVILLE
Sampler Initials: KS

MICROBIOLOGY (WATER)

Maxxam ID		IG0517		
Sampling Date		2010/12/22 08:45		
	Units	**MW-5**	**RDL**	**QC Batch**
Microbiological				
Escherichia coli	5TMPN/100mL	<1.8	1.8	2368096
Total Coliforms	5TMPN/100mL	33	1.8	2368095

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B0I4942
Report Date: 2010/12/31

Golder Associates Ltd
Client Project #: 09-1111-6090
Project name: STOUFVILLE
Sampler Initials: KS

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
2367877	4-Bromofluorobenzene	2010/12/24	107	70 - 130	107	70 - 130	106	%				
2367877	D4-1,2-Dichloroethane	2010/12/24	103	70 - 130	104	70 - 130	111	%				
2367877	D8-Toluene	2010/12/24	99	70 - 130	99	70 - 130	94	%				
2367877	Benzene	2010/12/24	93	70 - 130	100	70 - 130	<0.2	ug/L	NC	40		
2367877	1,4-Dichlorobenzene	2010/12/24	101	70 - 130	104	70 - 130	<0.5	ug/L	NC	40		
2367877	MethyleneChloride(Dichloromethane)	2010/12/24	100	70 - 130	107	70 - 130	<2	ug/L	NC	40		
2367877	Toluene	2010/12/24	96	70 - 130	98	70 - 130	<0.2	ug/L	NC	40		
2367877	Vinyl Chloride	2010/12/24	86	70 - 130	93	70 - 130	<0.2	ug/L	NC	40		
2368581	Mercury (Hg)	2010/12/24	110	75 - 125	107	80 - 120	<0.1	ug/L	NC	25		
2368614	Dissolved Arsenic (As)	2010/12/24	100	80 - 120	102	90 - 110	<1	ug/L				
2368614	Dissolved Barium (Ba)	2010/12/24	96	80 - 120	98	90 - 110	<5	ug/L				
2368614	Dissolved Boron (B)	2010/12/24	99	80 - 120	102	90 - 110	<10	ug/L				
2368614	Dissolved Cadmium (Cd)	2010/12/24	102	80 - 120	102	90 - 110	<0.1	ug/L				
2368614	Dissolved Calcium (Ca)	2010/12/24	NC	80 - 120	106	90 - 110	<200	ug/L				
2368614	Dissolved Chromium (Cr)	2010/12/24	94	80 - 120	99	90 - 110	<5	ug/L				
2368614	Dissolved Copper (Cu)	2010/12/24	93	80 - 120	99	90 - 110	<1	ug/L				
2368614	Dissolved Iron (Fe)	2010/12/24	98	80 - 120	101	90 - 110	<100	ug/L				
2368614	Dissolved Lead (Pb)	2010/12/24	97	80 - 120	100	90 - 110	<0.5	ug/L	NC	25		
2368614	Dissolved Magnesium (Mg)	2010/12/24	NC	80 - 120	104	90 - 110	<50	ug/L				
2368614	Dissolved Manganese (Mn)	2010/12/24	NC	80 - 120	97	90 - 110	<2	ug/L				
2368614	Dissolved Sodium (Na)	2010/12/24	NC	80 - 120	102	90 - 110	<100	ug/L				
2368614	Dissolved Zinc (Zn)	2010/12/24	97	80 - 120	101	90 - 110	<5	ug/L				
2368761	Phenols-4AAP	2010/12/24	102	75 - 125	98	75 - 125	<0.001	mg/L	NC	25		
2368796	Total Ammonia-N	2010/12/30	101	80 - 120	104	85 - 115	<0.05	mg/L	NC	25		
2368857	Alkalinity (Total as CaCO3)	2010/12/24					<1	mg/L	1.0	25	99	85 - 115
2368859	Conductivity	2010/12/24					<1	umho/cm	0.08	25	101	85 - 115
2369131	Nitrite (N)	2010/12/30	101	80 - 120	103	85 - 115	<0.01	mg/L	NC	25		
2369131	Nitrate (N)	2010/12/30	106	80 - 120	108	85 - 115	<0.1	mg/L	NC	25		
2369135	Dissolved Chloride (Cl)	2010/12/29	NC	75 - 125	103	80 - 120	<1	mg/L	1.6	20		
2369138	Dissolved Sulphate (SO4)	2010/12/29	NC	75 - 125	101	80 - 120	<1	mg/L	0.2	25		
2369207	Dissolved Organic Carbon	2010/12/29	95	80 - 120	98	80 - 120	0.3, RDL=0.2	mg/L	1.5	20		
2369618	Total Kjeldahl Nitrogen (TKN)	2010/12/30	NC(1)	80 - 120	87	85 - 115	<0.1	mg/L	NC	20	95	85 - 115
2369764	Total Dissolved Solids	2010/12/29					<10	mg/L	1.1	25	100	85 - 115

Maxxam Job #: B0I4942
Report Date: 2010/12/31

Golder Associates Ltd
Client Project #: 09-1111-6090
Project name: STOUFVILLE
Sampler Initials: KS

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
2370276	Total Chemical Oxygen Demand (COD)	2010/12/30	98	75 - 125	100	75 - 125	<4	mg/L	NC	25		
2370300	Total Phosphorus	2010/12/30	95	80 - 120	98	85 - 115	<0.02	mg/L	NC	20	99	85 - 115

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.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
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) - The recovery in the matrix spike was not calculated (NC). Spiked concentration was less than 2x that native to the sample.

Validation Signature Page

Maxxam Job #: B0I4942

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

CRISTINA CARRIERE, Scientific Services

THARMINI SIVALINGAM, Team Leader

==========

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TABLE 1
SUMMARY OF GROUNDWATER MONITORING DATA
Battistella Lands, Stouffville, Ontario

Parameter	Units	Standard [2]	MW-4	MW-5
			12/15/2011	12/22/2011
pH (field paramter)	-	field monitor	7.9	8.101
Conductivity (field parameter)	uhmo/cm	field monitor	1559	1413
E.Coli	5TMPN/100m	ND	<10	<1.8
Total Coliforms	5TMPN/100m	ND	**70[1]**	**33**
Alkalinity	µg/L	30000-500000	488000	465000
Ammonia	µg/L	monitor	90	160
Dissolved Arsenic	µg/L	25	<1	<1
Dissolved Barium	µg/L	1000	150	200
Benzene	µg/L	5	<0.2	<0.2
Dissolved Boron	µg/L	5000	59	37
Dissolved Cadmium	µg/L	5	<0.1	<0.1
Dissolved Calcium	µg/L	monitor	200000	130000
Chemical Oxygen Demand	µg/L	monitor	310000	1100000
Dissolved Chloride	µg/L	250000	180000	14000
Chromium (Total)	µg/L	50	<5	<5
Conductivity	uhmo/cm	monitor	1500	969
Dissolved Copper	µg/L	23	4	1
1,4 Dichlorobenzene	µg/L	1	<0.2	<0.5
Dichloromethane	µg/L	50	<0.5	<2
Dissolved Organic Carbon	µg/L	5000	3100	2700
Hardness as $CaCO_3$	µg/L	300000	**640000**	**460000**
Dissolved Iron	µg/L	0.3	**<100**	**<100**
Dissolved Lead	µg/L	10	<0.5	<0.5
Dissolved Magnesium	µg/L	monitor	35000	32000
Dissolved Manganese	µg/L	0.05	**190**	**230**
Mercury	µg/L	0.12	<0.1	<0.1
Nitrate	µg/L	10000	3300	4500
Nitrite	µg/L	1000	<0.01	40
pH	-	6.5-8.5	7.55	7.63
Phenol	µg/L	4200	<1	<1
Sodium	µg/L	200000	70000	47000
Dissolved Sulphate	µg/L	500000	38000	43000
Toluene	µg/L	24	<0.2	<0.2
Total Dissolved Solids	µg/L	500000	**936000**	**666000**
Total Kjeldahl Nitrogen	µg/L	monitor	17000	38000
Total Phosphorous	µg/L	monitor	54000	77000
Vinyl Chloride	µg/L	1.3	<0.2	<0.2
Dissolved Zinc	µg/L	1100	11	6

Note

ND non-detect

monitor his parameter should be monitored so that it can be compared with ambient conditions.

[1] Values reported may be biased low due to overgrowth

[2] Region of York Standards

Bold and Shaded	Exceeds the Standard
Bold	Detection limit above the standard

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

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