

# Landfill Impact Assessment

665 Albert Street Ottawa, Ontario

Prepared for:

## **Dream Impact Master LP**

30 Adelaide Street East Toronto, Ontario M5C 3H1

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#### **EXECUTIVE SUMMARY**

Pinchin Ltd. (Pinchin) was retained on April 12, 2022 through a standard engagement letter signed by Dream Impact Master LP (Client) to conduct a Landfill Impact Assessment for the property located at 665 Albert Street, Ottawa, Ontario (hereafter referred to as the Site).

The Site is currently industrial/vacant, free of any permanent buildings or structures.

Pinchin was advised by the Client that the purpose of the Landfill Impact Assessment was to assess potential issues of environmental concern in relation to the subject property and its proximity to nearby Waste Disposal Sites (WDS). It is Pinchin's understanding that the Site consists of a 1.11 hectare (ha) parcel (approximately 2.74-acre) property located in an urban area that is to be re-developed as a residential/commercial land use. It is Pinchin's understanding that the City of Ottawa has identified the subject property as being located within a designated area related to known/proximal waste deposits (former private waste disposal sites number 6124 and number 6108). The Landfill Impact Assessment area refers to any land considered to be potentially impacted by waste disposal (landfill) site operations, generally within 500 meters of a waste disposal site (active or closed). As such the Client has retained Pinchin to conduct an assessment of the above noted property to ensure that:

- The proximity to the waste disposal site (WDS) and potential nuisance effects associated with the location of the development are clearly outlined on the title of the property to accurately inform future owners;
- To guarantee that remedial measures are complied with; and
- To ensure that property owners understand that the Landfill Impact Assessment for one development may not apply to another.

Based on the results of the Landfill Impact Assessment completed by Pinchin, no potential contaminant pathway or nuisance source was identified that is likely to result in potential subsurface impacts at the Site, as a result of the presence of the former private waste disposal facilities #6124 and #6108. As such, no additional subsurface investigation work, remedial or mitigative measures are recommended at this time in relation to redevelopment of the Site and the former waste disposal sites; however, as per the recommendations within the 2022 Golder Phase II ESA Report, soil impacts at the Site would require remediation or a risk assessment as part of the redevelopment.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.



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## 1.0 INTRODUCTION

#### 1.1 Background

Pinchin Ltd. (Pinchin) was retained on April 12, 2022 through a standard engagement letter signed by Dream Impact Master LP (Client) to conduct a Landfill Impact Assessment for the property located at 665 Albert Street, Ottawa, Ontario (hereafter referred to as the Site).

The Site consists of the municipal address 665 Albert Street and consists of the land listed at the following Property Identification Numbers:

- PIN 04112-0242(LT);
- PIN 04112-0244(LT);
- PIN 04112-0250(LT);
- PIN 04112-0251(LT); and
- PIN 04112-0263(LT).

The Site is currently vacant with the exception of the Pimisi LRT Station and associated LRT line, however; it is assumed that the land and structures associated with the LRT will not be transferred to the Client. Historic development at the Site and in the surrounding area was of mixed land use including residential, commercial, industrial and institutional land uses.

Pinchin was advised by the Client that the purpose of the landfill impact assessment was to assess potential issues of environmental concern in relation to the subject property and its proximity to nearby Waste Disposal Sites (WDS). It is Pinchin's understanding that the Site consists of a 1.11 hectares (ha) (2.74 acres) parcel located in an urban area that is to be re-developed as a residential/commercial land use. It is Pinchin's understanding that the City of Ottawa has identified the subject property as requiring a landfill impact assessment, as it located within a designated area related to known/proximal waste deposits. The landfill impact assessment has been based on the Guideline D-1, "Land Use Compatibility" (Guidelines), which specifies restrictions and controls on land use that the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ontario Ministry of Environment and Climate Change, outlines for land use in the vicinity of landfills (active or closed). Typically, official plans require the application of the D-4 Guideline D-4 assessment area refers to any land considered to be potentially impacted by waste disposal (landfill) site operations, generally within 500 meters of the waste disposal site.

Factors to be considered for land users in the vicinity of non-operating landfill sites include: (i) ground and surface water contamination by leachate, (ii) surface runoff, (iii) landfill-generated gases, (iv) ground



settlement, (v) visual impact and (vi) soil contamination and hazardous waste. The Guideline notes "particular attention shall be given to the production and migration of landfill gas".

The Client has retained Pinchin to conduct a Landfill Impact Assessment of the above noted property to ensure that:

- The proximity to the waste disposal site (WDS) and potential nuisance effects associated with the location of the development are clearly outlined on the title of the property to accurately inform future owners;
- To guarantee that remedial measures are complied with; and
- To ensure that property owners understand that the Landfill Impact Assessment for one development may not apply to another.

## 1.2 Scope of Work

The Landfill Impact Assessment was completed in general accordance with MECP Guideline D-4, "Land Use On or Near Landfills and Dumps" (1994), including the following activities, which are all subject to the limitations outlined in Section 8.0 of this report:

- Assessment of all factors listed above to evaluate the presence and impact of any adverse effects or risks to health and safety, nuisance impacts and degradation of the natural environment, taking into consideration the proposed land use(s) and the uses permitted by local zoning bylaws;
- Communication with the City of Ottawa, and the MECP to request documentation on the relevant landfill site and additional information as required; and
- Completion of a report outlining environmental considerations and, where necessary, propose appropriate engineered remedial / control measures to prevent or minimize adverse effects.

## 1.3 Key Personnel

The Competent Environmental Practitioner (CEP) for the Site is Mr. Tim McBride of Pinchin Ltd. Mr. McBride's contact information is provided below:

Mr. Tim McBride, B.Sc., P.Geo., Q.P<sub>ESA</sub> Pinchin Ltd. 662 Falconbridge Road Unit #3 Sudbury, ON P3A 4S4



#### 1.4 Site Document Review

Data available to the public (i.e. Google Earth, Canada Atlas of Topographic Maps, and historic weather data) has been utilized to support the following sections of this report.

In addition, Pinchin has reviewed the following additional environmental reports prepared for the Site to assist in the development of a conceptual model for the subject Site:

- Report entitled "Phase III Environmental Site Assessment, Risk Assessment, and Risk Management Strategy, South LeBreton, Ottawa, Ontario" prepared by Intera Engineering Ltd. (Intera) for the Nation Capital Commission (NCC), dated January 18, 2007 (2007 Intera Phase III ESA Report);
- Report entitled "Spring 2007 Groundwater Monitoring, South LeBreton, Ottawa Ontario" prepared by Intera for the NCC, dated June 13, 2007 (2007 Spring Intera Groundwater Report);
- Report entitled "*Budget Cost Estimate for Remediation of South LeBreton*" prepared by Intera for the NCC, dated October 1, 2007 (2007 Intera Remediation Budget Estimate);
- Report entitled "Fall 2007 Groundwater Monitoring, South LeBreton, Ottawa Ontario" prepared by Intera for the NCC, dated March 4, 2008 (2007 Fall Intera Groundwater Report);
- Report entitled "2008 Groundwater Monitoring, South LeBreton and Preston Extension, Ottawa Ontario" prepared by Intera for the NCC, dated January 20, 2009 (2009 Fall Intera Groundwater Report);
- Report entitled "2008 Groundwater Monitoring, South LeBreton and Preston Extension, Ottawa Ontario" prepared by Intera for the NCC, dated January 20, 2009 (2009 Fall Intera Groundwater Report);
- Report entitled "Supplemental Phase II Environmental Site Assessment, South LeBreton Flats Blocks B1, B2, C1, C2, E1, E2, E3, G, H1 and H2 Ottawa Ontario" prepared by Intera for the NCC and dated February 2012 (2012 Intera Supplemental Phase II ESA Report);
- Memorandum entitled "Remedial Options Review and Class D Remediation Cost Estimates, South LeBreton Flats, Blocks B1, B2, C1, C2, E1, E2, E3, G, H1 and H2, Ottawa, Ontario (Revised Draft #2)" prepared by Golder Associates (Golder) for NCC, dated April 5, 2012 (2012 Golder Remedial Options Review);



- Report entitled "2012 Groundwater Monitoring, South LeBreton Blocks B1, B2, C1, C2, E1, E2, E3, G, H1, and H2, Ottawa Ontario" prepared by Intera Engineering Ltd. for the NCC, dated May 2012 (2012 Fall Intera Groundwater Report);
- Report entitled "Geotechnical and Hydrogeologic Investigation Combined Sewage Storage Tunnel East-West Tunnel, Western Terminus Ottawa, Ontario" prepared by Golder for the City of Ottawa, dated May 2013 (2013 Golder CSST Geotechnical and Hydrogeological Report);
- Document entitled "OLRT Temporary Lease Property Report Card" prepared for the City of Ottawa and dated April 15, 2015;
- Document entitled "*OLRT Temporary Lease Property Report Card*" prepared for the City of Ottawa and dated June 9, 2015;
- Report entitled "Summary of Subsurface Conditions & Construction Considerations South LeBreton Flats, Block B, C, D, E, F, G, and H, Ottawa, Ontario" prepared by Golder for the NCC and dated November 2015 (2015 Golder Subsurface Condition Summary Report);
- Memorandum entitled "Geotechnical Desk-Top Study NCC Property at 584 Wellington St. Potential Future Location of City of Ottawa Central Library, Ottawa, Ontario" prepared by Stantec for the City of Ottawa and dated April 5, 2016 (2016 Stantec Geotechnical Study);
- Figure entitled "*LeBreton Flats: Library Parcel*" provided by the NCC and dated Mary 27, 2021;
- Report entitled "*Phase One Environmental Site Assessment, 665 Albert Street, LeBreton Flats, Ottawa, Ontario*" prepared by Golder for the Client and dated March 2022 (2022 Golder Phase I ESA); and
- Report entitled "Draft *Phase Two Environmental Site Assessment, 665 Albert Street, LeBreton Flats, Ottawa, Ontario*" prepared by Golder for the Client and dated March 14, 2022 (2022 Golder Phase II ESA).

## 2.0 SITE DESCRIPTION

## 2.1 Site Location and Physical Description

The Site property is located within the City of Ottawa within the area known as LeBreton Flats. The Site consists of five individual parcels and is bounded to the northwest by the LRT rail line and Pimisi Station, to the southwest by Booth Street, to the south/southwest by Albert Street. The northeast boundary of the Site is situated approximately 166 m northeast of Booth Street. The Site location is indicated on Figure 1



(all Figures are provided in Appendix I). The Site is currently vacant land and is situated in an urban area that predominantly consists of residential and commercial land uses. Figure 2 illustrates the Site and surrounding area.

## 2.2 Legal Description of Site

The Site is located at 665 Albert Street, Ottawa, Ontario and occupies approximately 1.11 hectares of vacant land located within the area known as LeBreton Flats. The Site is zoned as MD[2509] H(83)-h, intended to accommodate mixed use land uses within the downtown of the City of Ottawa. The legal description of each of the parcels making up the Site are listed in Table 1 below.

## Table 1: Legal Land Descriptions

Information	Description
Property Identification Number	PIN 04112-0242(LT)
Legal Description	Part of Wellington Street (Closed by By-Law Inst. No. LT1243128), Plan No. 2, being Parts 1 to 4, ON Plan 4R-32303;
	Part of Wellington Street, Closed by By-LayLT1243128 & OC1457912, Plan No. 2, being Parts of 11 to 17, Plan 4R-32006; Subject to an Easement in Gross over Parts 15 & 16 4R32006 and Part 3 4R32303 as in OC2376918; City of Ottawa.
Property Identification Number	PIN 04112-0244(LT)
Legal Description	Part Lloyd Street, Plan No. 2, being Part 9, Plan 4R-32006; S/T LT 1243142; City of Ottawa
Property Identification Number	PIN 04112-0250(LT)
Legal Description	Parts of Lots 6 & 7, Part of the Water Works Reserve, Part Alley closed by By-Law LT1243120 Plan 9481, being Part 2 on 4R-32006; City of Ottawa.
Property Identification Number	PIN 04112-0251(LT)
Legal Description	Lots 1, 2, 3, 4, 5, 6, 7 & 8 Plan 9481, Water Works Reserve On Plan 9481, Alley ON Plan 9481 (Closed by By-law LT1243120), Except Part 40 Plan 5R12914, Part 10- Plan 4R23452, Part 1 4R30019, Parts 20, 21, 22, 25 & 41 ON 4R32151 and Parts 2, 23 & 25 ON 4R32006; Subject to an Easment in Gross Over Parts 3, 24 & 26 ON 4R32006 and Parts 23, 26, 27, 29, 37, 38 & 42 ON 4R32151 as in OC2177774; Subject to an Easement in Gross over Part Lots 1, 2, & 3 Plan 9481, Part 5, 4R32006 and Parts 27 & 28, 4R32151 as in OC2376919; City of Ottawa



Information	Description
Property Identification Number	Part of PIN 04112-0263(LT)
Legal Description	-

#### 2.3 Site History

The history of the Site and surrounding area (LeBreton Flats South) has been well documented with numerous previous environmental investigations having been conducted since 2007. Based on a review of these previous reports the Site was first developed with residential, institutional and commercial land uses in 1878. The Site and surrounding area underwent a transition from predominantly residential land uses to industrial and commercial land uses in the early 1900's. Following the Great Fire in approximately 1902 the Site was redeveloped and occupied by Continental Paper Products Company Ltd. (then called The Continental Bag & Paper Co. Ltd.) and a historical laundry service until approximately 1966 when it was acquired by the NCC. By 1965 the majority of buildings at the Site had been cleared with Wellington Street running approximately southwest to northeast, through the Site and the remainder of the Site occupied by a parking lot. In the 1980's/90s a transit way, in the form of a bus lane occupied the north most portion of the Site, which, in the mid 2010's was replaced by the light rail transport (LRT) and Pimisi Station which currently occupies the north portion of the Site. Wellington Street was diverted south of the Site in the 2000's with the remaining pavement removed in the 2010's. Most recently the Site was leased and used as a laydown area for the construction of the LRT line and Station. In its current state the Site consists of a gravel surfaced parking lot with the LRT line and Pimisi Station occupying the north portion.

Development of the Site and surrounding LeBreton Flats has been hindered by the presence contaminated soil and groundwater as a result of both the Great Fire in 1902, as well as previous land uses. Previous investigations have included the Site and surrounding area of LeBreton Flats and identified similar conditions. The majority of exceedances throughout the Site investigations appear to be within the surficial fill material. An investigation into the subsurface conditions at the Site was conducted and presented most recently within the 2022 Golder Phase II ESA. The findings of the 2022 Golder Phase II ESA Report identified elevated levels of PAHs, PHCs and metals relative to Table 3 of the MECP Site Condition Standards (SCS) for non-potable groundwater conditions. The exceedances listed were limited to the surficial two meters of soil. Groundwater samples at the Site, collected as part of the 2022 Golder Phase II ESA Report identified diversed the remediation of all fill materials at the Site prior to development. Several additional environmental investigations have included the characterization of the soil and groundwater conditions of the Site, as well as the surrounding area. The 2012 Intera Phase II ESA Report indicated PHCs, benzene and ethylene, as well as six instances of elevated metals at the Site, in addition to similar exceedances in the surrounding area. An analysis of the



frequency of exceedances with respect was conducted with the results indicating a decrease in observed contamination with respect to depth. Based on a review of the historic reports provided to Pinchin, contamination at the Site is a result of previous land uses (i.e. industrial), as well as the use of contaminated fill following the decommissioning of the former Canadian National Railway line within the South LeBreton Flats area (2022 Golder Phase II ESA Report and 2012 Intera Supplemental Phase II ESA Report). In general, contamination appears to be limited to imported fill material overlying native soil in the area.

## 2.4 Physical Setting

## 2.4.1 Topography and Hydrology

The physical setting of the Site is dominated by the Ottawa River situated approximately 550 m northwest of the Site, which flows southwest to northeast. An open aqueduct is situated approximately 50 m north of the Site in addition to a covered aqueduct situated approximately 80 m to the north. According to topographic information obtained from geoOttawa, the Site and surrounding area generally slope towards the Ottawa River and associated aqueducts to the north and northwest of the Site. According to ground surface elevations observed in borehole logs provided in the 2012 Intera Phase II ESA Report, ground surface at historic borehole 11-39, situated near the southeast corner of the Site is 62.81 meters above sea level (masl) while elevation at monitoring well 22-04, as observed in the 2022 Golder Phase II ESA Report is 60.47. In general, the Site slopes to the north and northwest toward the Ottawa River and aqueducts. Surface runoff is expected to follow the natural contours at the Site and flow towards the north; however, natural flow may be intercepted by engineered structures such as the LRT may deviate from natural flow patterns.

## 2.4.2 Geology

According to the *Ontario Geological Survey (2000)* Quaternary geology, seamless coverage of the *Province of Ontario; Ontario Geological Survey, Data Set 14---Revised*, the quaternary geology at the Site is made up of glacial till consisting of undifferentiated, predominantly sandy silt to silt matrix, commonly rich in clasts, often high in total matrix carbonate content. The Site Specific surficial geology has been well documented and was summarized within the 2012 Intera Supplemental Phase II ESA as consisting of five distinct lithologies. Cross sections of the geology encountered throughout the investigations area presented in Figures 4. The surficial layer throughout the majority of the study area (consisting of the south portion of LeBreton Flats) consisting of construction debris/fill overlying black sand fill. Underlying black sand fill was a third category of fill that was interpreted to consist of a mixture of imported fill and reworked native glacial till. This layer predominantly consisted of sand and gravel with some silt, clay and/or cobbles and boulders. A layer of organics was identified in the north portion of



LeBreton Flats south and was found to be between layers of fill. The thickness of the various layers of fill at the Site was reported as being between 1.5 and 4.4 m. Underlying fill glacial till, characterized as being dense to very dense, sand, silty sand, gravel and occasional cobbles, was observed. This layer was identified between 2.1 to 8.0 meters below ground surface (mbgs).

Underlying the glacial till and fill stratum is bedrock of the Verulam Formation. Limestone observed within this formation was characterized as being weathered near the surface, with weathering and fractures decreasing with increased depth. Bedrock was described as being grey to black with thin to medium bedding, and intermittent shale layers (2022 Golder Phase II ESA Report). Bedrock at the Site was encountered between 11.2 mbgs and 14.7 mbgs in the 2022 Golder Phase II ESA Report. The 2012 Intera Phase II ESA Report reported bedrock between 2.9 mbgs and 10.1 mbgs. Based on the cross section provided in this report bedrock at the Site, located on the east portion of the LeBreton Flats South, lies at approximately 56 masl to 58 masl. The bedrock between the east and west situated as low as approximately 48 masl.

Using the historic borehole logs provided by the Client, Pinchin constructed a conceptual model of the Site and surrounding areas. Three transects of the model are present in Figure 4a, b and c.

## 2.4.3 Hydrogeology

Groundwater elevations at the Site were most recently evaluated using the monitoring wells installed during the 2022 Golder Phase II ESA. The results indicated that the groundwater depth ranged between 2.6 to 3.3 mbgs. The 2007, 2008, 2009 and 2012 Intera Groundwater Monitoring Reports indicated that ground water elevations generally ranged from 1.4 mbgs to 5.7 mbgs within the South LeBreton Flats. The groundwater elevations provided indicate a groundwater flow direction generally directed towards the northwest, towards the open aqueduct and the Ottawa River throughout each of the monitoring reports. The hydraulic gradient for the Site was calculated using the EPA On-Line Hydraulic Gradient Calculator. A gradient of 0.14 was calculated with a direction of 331°, approximately north-northwest.

Natural groundwater flow paths my be interrupted by the presence of underground structures and utilities. The 2016 Stantec Geotechnical Study indicated a utility corridor (municipal sewer) running approximately southwest to northeast through the Site, trending along former Wellington Street. Additionally, utilities appear to run north-south along Booth Street, west of the Site. These utilities may provide a preferential flow pathway, altering groundwater flow from the expected, natural pathways.

An analysis of hydraulic conductivity of the various lithologies within the South LeBreton flats was conducted and presented within the 2015 Golder Construction Considerations Report. This analysis indicated the hydraulic conductivity within the undifferentiated fill layers ranged from 1.0E<sup>-03</sup> m/s to 3.5E<sup>-06</sup>



m/s. Hydraulic conductivity within the glacial till ranged from 1E<sup>-05</sup> m/s to 1E<sup>-07</sup> m/s and 1E<sup>-06</sup> m/s to 1E<sup>-09</sup> m/s within the bedrock (below significant weathering at the bedrock contact). The porosity of each formation was estimated. Considering the poorly sorted nature of the fill material porosity was estimated to be 20%. Similar to fill porosity in the glacial till was estimated to be 15%. Porosity within unfractured limestone was estimated at 15%. Using the hydraulic conductivity provided within the 2015 Golder Construction Considerations Report, the calculated gradient and estimated porosity the groundwater velocity was estimated to be 7E<sup>-04</sup> m/s to 7E<sup>-06</sup> m/s within the undifferentiated fill, 9.33E<sup>-06</sup> m/s to 9.33E<sup>-08</sup> m/s in glacial till and 9.33E<sup>-07</sup> m/s to 9.33E<sup>-10</sup> m/s in unfractured limestone.

Based on the information provided groundwater at the Site behaves as an unconfined aquifer. Groundwater flow is generally directed towards the north-northwest with groundwater velocity decreasing with depth as the strata transitions from fill to glacial till, to limestone.

## 2.5 Proposed Site Operations

The Site currently consists of a vacant lot that is to be re-developed as residential/commercial land use. Detailed drawings of the proposed development were not provided to Pinchin however, based on information obtained from the 2022 Golder Phase I ESA Report, development is proposed to consist of two towers, one 30 storey and one 35 storey, mixed-use residential/commercial buildings.

Торіс	Findings							
Water Supply Source	According to the 2022 Golder Phase I ESA the Site is situated in an area that is serviced by municipal drinking water.							
Water Use	Water would primarily be used for domestic-related activities.							
Sanitary/Process Wastewater Receptor	Wastewater would be disposed of via the municipal wastewater systems.							
Pits, Sumps or Lagoons	None reported.							
Storm Water Flow and Receptor	Storm water conveyance would consist of overland flows via diffuse overland runoff, roadside ditching and natural percolation through the soil. Paved roads and access ways would likely rely on and off Site catch basins discharging into the municipal storm sewer.							
Wells	Pinchin completed a search of the MECP Water Well Records database and did not identify the presence of wells on Site or within 250 m of the Site that supply water for human consumption or for agricultural purposes. The results of the search of the Water Well Information System (WWIS) database records indicated that all records in the area were listed as monitoring or observation wells.							

## 2.6 Proposed Water and Wastewater Supply Systems



## 3.0 ACTIVITIES ON ADJACENT PROPERTIES

The Site is located in an urban area that predominantly consists of residential and commercial land. A description of the adjacent properties is summarized in the following table, based on Pinchin's observations from the Site and publicly accessible locations:

	North	East	South	West
Operation or Activity	Pimisi Station and LRT Line followed by an uncovered aqueduct then a paved parking lot	Vacant land the Albert Street and Slater Street.	Albert Street followed by residential dwellings.	Booth Street followed by Pimisi Station and vacant land.
Direction with Respect to Inferred Groundwater Flow	Upgradient.	Transgradient.	Downgradient.	Transgradient.

## 4.0 LANDFILLS LOCATED WITHIN GUIDELINE D-4 ASSESSMENT AREA

According to the City of Ottawa Former Landfill Database, the subject Site property is within 500 m of the following two non-operating Waste Disposal Sites (WDS):

- WDS Activity ID 6124; and
- WDS Activity ID 6108 (Nepean Bay Landfill).

In addition, Pinchin contacted the City of Ottawa Environmental Remediation Unit (ERU) to inquire about any information regarding former WDSs in the vicinity of LeBreton Flats. The ERU confirmed the presence of the two WDSs and provided additional information.

The location of these WDS relative to the subject property are indicated on Figure 2.

#### 4.1 Landfill Background and Site Boundary Information

#### Waste Disposal Site, Activity No. 6124 (WDS# 6124)

According to the City of Ottawa's Old Landfill Management Strategy a historic landfill, WDS #6124, is located northwest of the Site. This landfill is bounded to the south by the open aqueduct, the Ottawa River to the west, Booth Street to the east. The north boundary of the historic landfill is situated approximately 90 m south of the Ottawa River. Information provided by the ERU indicated that this landfill operated from approximately 1910 to 1920. The 2022 Golder Phase I ESA Report for the Site identified two former facilities within the footprint of the WDS 6124. The Sachs Brothers Junk Yard operated from 1912 to 1956 and was situated approximately 215 m west-northwest of the Site and M. Levinson Salvage Co. Limited situated approximately 130 m west of the Site operated as a wholesaler of waste materials from 1920 to 1922 and 1960. Based on the information provided Pinchin is unable to determine the approximate



footprint of the facility, or the classification and quantity of the waste accepted at this facility. The footprint of the WDS # 6124, as specified by the City of Ottawa Former Landfills database, is currently bisected by the Sir John A Macdonald Parkway with vacant land and covered aqueduct in the south portion, and green space and Vimy Place followed by the Canadian War Museum in the north.

## Nepean Bay Landfill, Activity No. 6108 (Nepean Bay Landfill)

The Nemean Landfill, Activity No. 6108 is a non operating landfill located approximately 400 m west of the Site. According to the summary of information provided by the ERU the Nepean Bay Landfill is located within UTM NAD Zone 27 Easting 443540 Northing 5028720 with an approximately area of 7.5 ha. The former landfill is bounded by the Ottawa River to the North, the LeBreton Flats aqueducts to the east, the Trillium pathway to the west and an LRT line to the south. Currently the Sir John A. Macdonald Parkway transects the former landfill with the remainder occupied by vacant greenspace. According to the City of Ottawa Former Landfills database, this facility operated between March 1963 to February 1964 and accepted domestic and industrial solid waste. In addition, the database specified an approximate waste depth of 3 to 12 mbgs and indicated that substantial fill cover consisting of sand or clay fill ranging in thickness from 0.5 to several meters was applied in approximately 1980. The database reported that during Site operation, a temporary dam was constructed across the bay with wastes deposited behind the dam face. The 2015 Golder Construction Considerations Report included the eastern most portion of the Nepean Bay Landfill (Block F) as well as the adjacent areas to the south and southeast (Blocks E and G, respectively). This report indicated that fill was present to a depth of approximately 12 mbgs within the footprint of the former Nepean Bay Landfill.

## 4.2 Topographic, Geologic and Hydrogeological Setting Relative to Landfill

Tania	Findings									
Горіс	WDS # 6124	Nepean Bay Landfill								
Topography of Site and Surrounding Area	WDS #6124 is situated hydraulically downgradient of the Site. Topography at this location varies, with the south portion of the property sloping south toward the uncovered aqueduct. The remainder of the Site slopes north or west towards the Ottawa River.	The Nepean Bay Landfill is situated hydraulically crossgradient relative to the Site. The ground surface at Nepean Bay Landfill generally slopes north, toward the Ottawa River.								
Subsurface Soils	The subsurface conditions at the Site consist of varying layers of fill	Surficial cover ranges from 0.5 m to several m followed by varying								

The following is a description of the Site relative to private WDS # 6124 and the Nepean Bay Landfill, located north and northwest of the Site, respectively.



Topio	Findings									
Горіс	WDS # 6124	Nepean Bay Landfill								
	overlying native glacial till.	depths of waste deposits.								
Fill Materials	Fill ranges from 2.1 mbgs to 5.2 mbgs based on borehole logs MW01-07 and MW06-06.	Fill depth, included waste, ranges from 4 mbgs to 12 mbgs.								
Bedrock Type	Bedrock is located at approximately 77 mbgs, based on the Ontario MECP well records database. The type of bedrock was not specified in the records.	Bedrock is located at approximately 76 mbgs, based on the Ontario MECP well records database. The type of bedrock was not specified in the records.								
Nearest Open Water Body	The property is bounded to the west by the Ottawa River and to the south by an uncovered aqueduct.	The Site is bounded to the north by the Ottawa River.								
Inferred Groundwater Flow Direction	Based on the proximity to the Ottawa River groundwater at this location is expected to flow east toward the Ottawa River or south toward the aqueducts depending on the area of the property.	North and west toward the Ottawa River and the aqueduct inlet.								

## 4.3 Landfill Site Impacts – WDS # 6124

#### 4.3.1 Groundwater Contamination by Leachate

Very little information is available regarding the subsurface conditions at this former landfill. A portion of the former landfill known as the Preston Street Extension underwent a Phase II ESA as reported in the 2009 Intera Groundwater Monitoring Report. The Preston Street Extension occupies the southwest portion of the former landfill footprint. This report identified wide-spread, low-level impacts of metals, and PAHs as well as localized PHC impacts. In addition, PAH and metals impacts were observed within groundwater monitoring wells during a previous Phase II ESA. The spatial extent of the impacts were not reported. Two monitoring wells were sampled on this portion of the property. MW06-13 was sampled once in 2006 and identified groundwater impacts including chromium, cobalt, copper, iron, manganese, sodium, vanadium and zinc. MW03-518 was sampled in 2006, 2008 and 2009 and identified impacts of various metals including boron, chromium, cobalt, copper, and sodium as well as PAHS in 2006 and 2009.

WDS #6124 is situated approximately 40 m northwest of the Site. The calculated hydraulic gradient at the Site indicated local groundwater flow was directed approximately north-northwest toward the uncovered aqueduct and the Ottawa River and placing the WDS #6124 hydraulically downgradient relative to the



Site. The Groundwater elevations presented in the 2009 Intera Groundwater Monitoring report indicate groundwater flow along the Preston Extension situated approximately 280 m west of the Site, was directed approximately south toward the uncovered aqueduct in 2006. Based on water levels observed at monitoring wells south of the uncovered aqueduct, which indicated a groundwater flow direction approximately north, the uncovered aqueduct creates a boundary condition for the shallow groundwater flow system. Deeper, regional groundwater flow is expected to be controlled by the Ottawa River, and flow towards the north.

The results of the 2022 Golder Phase II ESA Report no exceedances of the Table 3 SCS observed in groundwater. This report indicated that impacts at the Site are limited to soil in the south portion of the Site and are most prominent within the surficial 1-2 mbgs, above the observed water table. Based on the results of the 2022 Golder Phase II ESA as well as the groundwater flow patterns observed at the Site and in the surrounding area it is Pinchin's opinion that this historic landfill is unlikely to result in subsurface impacts at the Site. The results of the 2022 Golder Phase II ESA infer the observed soil impacts at the Site to be the result of poor quality fill placed at the Site.

## 4.3.2 Surface Water Contamination by Leachate/Surface Water Run-off

The WDS # 6124 is bounded to the west by the Ottawa River and to the south by the uncovered aqueduct, which separates this property and the Site. Based on topographic data obtained from geoOttawa the central and south portions of the WDS #6124 slope south, toward the uncovered aqueduct the west portion slopes west towards the Ottawa River and the east portion flows east towards the uncovered aqueduct. Surface water is anticipated to following topography and flow towards the uncovered aqueduct and/or the Ottawa River.

Surface water sampling was documented within the 2007 Intera Phase III ESA. A total of 13 surface water samples were collected from 12 locations within the uncovered aqueduct. Each of the samples were analyzed for metals, PAHs and PHCs. The results were compared to the CCME Guideline for Protection of Freshwater Aquatic Life (APV) and MOE Potable Water Quality Objectives (PWQO). Aluminum was found to exceed both guidelines in all samples, including the background sample, one exceedance of copper was considered to be an anomaly. One surface water sample collected from within the uncovered aqueduct adjacent the southeast boundary of the WDS # 6124 exceeded the PWQO for several PAHs. A follow up sample was collected from this location within which no PAHs were detected. The 2007 Intera Phase III ESA concluded that the surface water quality within the aqueduct was not impacted by PAHs and metals.



Based on the surface water flow direction, approximately southwest to northeast, and topography at the Site and the WDS #6124 (i.e. the Site and immediate surroundings slope towards the north while the WDS #6124 slope toward the south) it is Pinchin's opinion that the WDS #6124 is unlikely to results in surface water impacts at the Site.

## 4.3.3 Landfill Generated Gases

Based on a review of the available historic information regarding the landfill, the former waste disposal operations ceased in 1920. As the former landfill has now been closed for greater than 100 years, there does not appear to be any concerns arising as a result of the landfill generated gases, especially given the distance between the historic waste deposits and the subject Site.

#### 4.3.4 Ground Settlement

Based on the location of the Site in relation to WDS #6124, ground settlement is not a concern.

#### 4.3.5 Visual Impacts

The northern portion of the Site has been redeveloped to be of institutional land use. According to the 2022 Golder Phase I ESA Report this property has been redeveloped several times since landfill operations ceased in 1920. As a result, it is Pinchin's opinion that former landfilling activities at this property have not resulted in visual impacts with respect to the Site.

## 4.3.6 Soil Contamination and Hazardous Waste

Soil impacts of metals, PHCs and PAHs at this property as well as the Site have been well documented within previous environmental reports. These impacts have been concluded to be the result of poor quality fill used in the LeBreton Flats area. WDS #6124 has been redeveloped with an institutional building and landscaping on the north portion while the south portion appears to consist of a paved parking lot. Based on this information it is Pinchin's opinion that soil contamination at WDS #6124 is unlikely to result in adverse effects at the Site; however, existing soil impacts are present at the Site. As per the recommendations within the 2022 Golder Phase II ESA Report, soil impacts at the Site would require remediation of risk assessment as part of the redevelopment.

## 4.3.7 Dust, Odour, Noise, Vermin or Vector Impacts

As WDS #6124 is closed and has not received or deposited waste since 1920, there is no risk to the proposed development related to dust, odour, noise, vermin or vectors originating at this WDS. In addition, the risk of fire at the subject Site associated with the former WDS does not exist.



#### 4.4 Landfill Site Impacts – Nepean Bay Landfill

#### 4.4.1 Groundwater Contamination by Leachate

Groundwater sampling data at the Nepean Bay Landfill is limited; however, it is expected that landfilling activities at this landfill likely would have resulted in the development of a leachate plume. Based on the geology observed within boreholes advanced in the LeBreton Flats area and presented in cross section A-A' and C-C' a pathway for groundwater migration from the Nepean Bay Landfill to the Site is not present. Groundwater flow at the Site, as indicated by the calculated hydraulic gradient is towards the north-northwest while groundwater elevations collected on August 2007 and presented in the 2007 Intera Phase III ESA Report indicated a groundwater flow direction from north to northeast towards the Ottawa River and aqueducts. Based on these groundwater elevations and topography groundwater originating at the Nepean Bay Landfill likely discharged into the Ottawa River and aqueducts north of the Site. Based on surface water sampling conducted in 2007 and discussed in Section 4.4.2, as well as the groundwater sampling results at the Site, presented in the 2022 Golder Phase II ESA Report, the Nepean Bay landfill has not resulted in significant groundwater impacts to the groundwater at the Site.

#### 4.4.2 Surface Water Contamination by Leachate/Surface Water Run-off

The Ottawa River is located immediately north of the former landfill site. Surface water drainage is anticipated to flow overland across the Nepean Bay Landfill from the south to the north and east. As per the database supplied by the ERU landfill cover consisting of clay and/or sand was applied in the 1980s. Surface water sampling data collected in 2007 and discussed in section 4.4.2 indicates that the former landfill did not have significant impacts to surface water in the vicinity of the Site at the time of sampling. As such, based on the inferred flow direction and the location of the former WDS #4111 with respect to the subject property, it is Pinchin's opinion that any leachate impacts to surface water are unlikely to impact the Site under review.

#### 4.4.3 Landfill Generated Gases

The most recent reported monitoring in 2013, presented in the 2015 Golder Construction Considerations Report, reported a maximum methane concentration of 30% within the former landfill footprint and no detectable methane at Block E south of the former landfill and situated approximately 350 m southwest of the Site. According to the information provide by the ERU measured methane levels reportedly vary from 0 % to 88.7% across the footprint of the former landfill. While methane concentrations above the lower explosive limit (5%) present a concern locally, considering the separation distance between the Site and Nepean Bay Landfill, it is Pinchin's opinion that the generation of methane at this former landfill does not present a hazard at the Site.



## 4.4.4 Ground Settlement

Based on the location of the Site in relation to the Nepean Bay Landfill, ground settlement is not a concern.

## 4.4.5 Visual Impacts

As a result of the WDS being closed for over 55 years, natural vegetation and trees have created a natural buffer between the former WDS site and off-Site properties. In addition, majority of the former landfill is currently occupied by greenspace in addition to the Sir John A. Macdonald Parkway. Considering the redevelopment at the Site this former landfill does not contribute to adverse visual impacts at the Site.

## 4.4.6 Soil Contamination and Hazardous Waste

The City of Ottawa Former Landfills database indicated that impacts of metals (barium, beryllium, cadmium, copper, lead, nickel, molybdenum, and zinc were observed in soil local to the facility with impacts of PAHs in soil and groundwater. The 2015 Construction Considerations report indicated impacts of metals, PAHs and PHCs were present and ranged in depth from 2 mbgs to 7 mbgs. The source of these impacts were unable to be confirmed and are assumed to be a result of a combination of poor quality fill imported to the Site as well as former landfilling activities.

While similar soil impacts have been identified at the Site these impacts have been attributed to poor quality fill and are not the result of landfilling activities at the Nepean Bay Landfill. Additionally, the Nepean Bay Landfill has been redeveloped with landscaping and the Sir John A. Macdonald Parkway with little to no bare soil present, significantly reducing the probability of wind blown particulate to be deposited at the Site. Based on these considerations it is Pinchin's opinion the contaminated soil at the former landfill is unlikely to result in adverse effects at the Site; however, existing soil impacts are present at the Site. As per the recommendations within the 2022 Golder Phase II ESA Report, soil impacts at the Site would require remediation of risk assessment as part of the redevelopment.

## 4.4.7 Dust, Odour, Noise, Vermin or Vector Impacts

As the Nepean Bay Landfill last operated in 1964 and has since been redeveloped with greenspace and the Sir John A McDonald parkway, there is no risk to the proposed development related to dust, odour, noise, vermin or vectors originating at this WDS. In addition, an increased risk of fire as a result of the former WDS at the subject Site is not present.



#### 5.0 REGULATORY INFORMATION AND CORRESPONDENCE

A Freedom of Information request was submitted to both the City of Ottawa and the MECP for information on file with respect to historic landfills in the vicinity of the Site. At the time of writing this report, no response had been received from the MECP. When a formal response is received, it will be reviewed by Pinchin. If there is any information that represents a potential issue of environmental concern, a copy of the response will be forwarded to the Client under separate cover. Our conclusions and recommendations may be amended based on this information. A copy of Pinchin's request submitted to the MECP is provided in Appendix II of this report.

Email correspondence with the County, the Town and the MECP are provided in Appendix III.

#### 6.0 OVERVIEW

The following chart provides an overview of whether or not the Site located within the Guideline D-4 Assessment area will be impacted by the either of the landfills.

Impost of Londfill Operation On Site	Private W	DS 4113	Private WDS 4111				
Impact of Landin Operation On-Site	Yes	No	Yes	No			
Groundwater Contamination by Leachate Generation		Х		Х			
Landfill Generated Gases		Х		Х			
Litter- As a result of natural sources such as wind or animals		Х		Х			
Odours- As a result of downgradient wind effects		Х		Х			
Surface Water Contamination by Leachate Generation/Surface Water Runoff		Х		Х			
Contaminant Discharge from vehicular traffic		Х		Х			
Dust Pollution		Х		Х			
Noise Pollution		Х		Х			
Visual Impacts		Х		Х			
Soil Contamination and Hazardous Waste		Х		Х			
Vermin or Vector Impacts		Х		Х			
Impacts as a result of a fire		Х		Х			



#### 7.0 FINDINGS AND RECOMMENDATIONS

Based on the results of the Landfill Impact Assessment completed by Pinchin, no potential contaminant pathway or nuisance source was identified that is likely to result in potential subsurface impacts at the Site, as a result of the presence of the former private waste disposal facilities #6124 and the Nepean Bay Landfill. As such, no additional subsurface investigation work, remedial or mitigative measures are recommended at this time in relation to redevelopment of the Site and the waste disposal sites; however, existing soil impacts are present at the Site. As per the recommendations within the 2022 Golder Phase II ESA Report, soil impacts at the Site would require remediation or a risk assessment as part of the redevelopment.

#### 8.0 TERMS AND LIMITATIONS

This Landfill Impact Assessment was performed, in order to identify potential issues of environmental concern associated with the property located at 665 Albert Street West, in Ottawa, Ontario. This Landfill Impact Assessment was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site.

This report was prepared for the exclusive use of Dream Impact Master LP (Client), subject to the terms, conditions and limitations contained within master services agreement in place with the Client. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

If additional parties require reliance on this report, written authorization from Pinchin will be required. Such reliance will only be provided by Pinchin following written authorization from Client. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law.

The information provided in this report is based upon analysis of available documents, records and drawings, and personal interviews. In evaluating the Site, Pinchin has relied in good faith on information provided by other individuals noted in this report. Pinchin has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information provided by the current owner/occupant. Pinchin accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted, or contained in reports that were reviewed.



Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

## 9.0 REFERENCES

The following documents, persons or organizations provided information used in this report:

- 1. *"Budget Cost Estimate for Remediation of South LeBreton"* prepared by Intera for the NCC, dated October 1, 2007.
- 2. City of Ottawa, Environmental Remediation Unit.
- City of Ottawa Former Landfills Database (https://open.ottawa.ca/datasets/8a6f5f176b484f2e83142e0008904e82/explore?location= 45.241121%2C-75.752150%2C1.38). Accessed online on April 18, 2022.
- 4. Draft Phase Two Environmental Site Assessment, 665 Albert Street, LeBreton Flats, Ottawa, Ontario" prepared by Golder for the Client and dated March 14 2022.
- 5. "Fall 2007 Groundwater Monitoring, South LeBreton, Ottawa Ontario" prepared by Intera for the NCC, dated March 4, 2008.
- 6. geoOttawa (https://maps.ottawa.ca/geoottawa/). Accessed online on April 18, 2022.
- "Geotechnical Desk-Top Study NCC Property at 584 Wellington St. Potential Future Location of City of Ottawa Central Library, Ottawa, Ontario" prepared by Stantec for the City of Ottawa and dated April 5, 2016.
- "Geotechnical and Hydrogeologic Investigation Combined Sewage Storage Tunnel East-West Tunnel, Western Terminus Ottawa, Ontario" prepared by Golder for the City of Ottawa, dated May 2013.
- 9. Google Earth™.
- 10. "LeBreton Flats: Library Parcel" provided by the NCC and dated Mary 27, 2021.
- Ministry of the Environment, 1994 "Guideline D-4 Land Use On or Near Landfills and Dumps".
- Ministry of the Environment, Conservation and Parks, January 24, 2020 "Map: Well Records".
- 13. Ministry of the Environment, 1991 "Waste Disposal Site Inventory".



- "Old Landfill Management Strategy, Phase I Identification of Sites, City of Ottawa
   Ontario" prepared by Golder Associates for the City of Ottawa and dated October 2003.
- 15. "OLRT Temporary Lease Property Report Card" prepared for the City of Ottawa and dated April 15, 2015;
- 16. "OLRT Temporary Lease Property Report Card" prepared for the City of Ottawa and dated June 9, 2015.
- 17. "Phase One Environmental Site Assessment, 665 Albert Street, LeBreton Flats, Ottawa, Ontario" prepared by Golder for the Client and dated March 2022.
- "Phase III Environmental Site Assessment, Risk Assessment, and Risk Management Strategy, South LeBreton, Ottawa, Ontario" prepared by Intera Engineering Ltd. (Intera) for the Nation Capital Commission (NCC), dated January 18, 2007.
- 19. "Remedial Options Review and Class D Remediation Cost Estimates, South LeBreton Flats, Blocks B1, B2, C1, C2, E1, E2, E3, G, H1 and H2, Ottawa, Ontario (Revised Draft #2)" prepared by Golder Associates (Golder) for NCC, dated April 5, 2012.
- 20. "*Spring* 2007 Groundwater Monitoring, South LeBreton, Ottawa Ontario" prepared by Intera for the NCC, dated June 13, 2007.
- 21. "Summary of Subsurface Conditions & Construction Considerations South LeBreton Flats, Block B, C, D, E, F, G, and H, Ottawa, Ontario" prepared by Golder for the NCC and dated November 2015.
- "Supplemental Phase II Environmental Site Assessment, South LeBreton Flats Blocks B1, B2, C1, C2, E1, E2, E3, G, H1 and H2 Ottawa Ontario" prepared by Intera for the NCC and dated February 2012.
- 23. "2008 Groundwater Monitoring, South LeBreton and Preston Extension, Ottawa Ontario" prepared by Intera for the NCC, dated January 20, 2009.
- 24. "2012 Groundwater Monitoring, South LeBreton Blocks B1, B2, C1, C2, E1, E2, E3, G,
  H1, and H2, Ottawa Ontario" prepared by Intera Engineering Ltd. for the NCC, dated May 2012.

Template: Master Report for Phase I ESA - Ontario, EDR, August 17, 2020

<sup>\\</sup>PIN-SUD-FS01\job\308000s\0308931.000 DreamIndust,665Albert,EDR,Landfill\Deliverables\Reports\308931 Report Landfill Impact Assessment 665 Albert Street Dream ON.docx

APPENDIX I Figures











APPENDIX II Borehole Logs PROJECT: 22511882

#### LOCATION: N 5030733.9 ;E 366525.1

RECORD OF BOREHOLE: 22-01

SHEET 1 OF 3 DATUM: Geodetic

BORING DATE: February 14-15, 2022

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

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PROJECT: 22511882

#### LOCATION: N 5030733.9 ;E 366525.1

SAMPLER HAMMER, 64kg; DROP, 760mm

## RECORD OF BOREHOLE: 22-01

BORING DATE: February 14-15, 2022

SHEET 2 OF 3

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

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PROJECT: 22511882

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SAMPLER HAMMER, 64kg; DROP, 760mm

## RECORD OF BOREHOLE: 22-02

BORING DATE: February 16, 2022

SHEET 1 OF 3

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

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			GROUND SURFACE	0,	62.47			-		<u> </u>	
0			FILL - SILTY SAND, trace gravel; brown		0.00	1	AS	- €	ND		
1						2	ss :	28			
2		-	SILTY SAND, fine, trace gravel, with		60.18 2.29	3	SS	16			
3			cobbles and boulders; and boulders; brown			4	ss	20 <b>€</b>	ND		
						5	ss 0	50/ 50/ 0.05			Bentonite Seal
4	Auger	Hollow Stem)	SILTY SAND, trace gravel; grey (GLACIAL TILL)		57.90 4.57	7	ss 0	50/ ).08			
5	Power #	200 mm Diam. (				8	SS 0	50/ 13			
6							550	50/ L 10			
7			- Auger Refusal on boulder at 7.44 m			9	ss o	50/ 0.13			Silica Sand
8			depth								
9						11	ss 0	50/ ).10			Screen
10	_[	-		_₽₽₽₽		_		-	++++++++++	+_	
DE	PTH	-  S	CONTINUED NEXT PAGE	<u> </u>					) GOLDER		
### LOCATION: N 5030713.1 ;E 366476.0

SAMPLER HAMMER, 64kg; DROP, 760mm

### RECORD OF BOREHOLE: 22-02

BORING DATE: February 16, 2022

SHEET 2 OF 3

DATUM: Geodetic

<u> </u>				SA	MPI	ES	HEADSPACE COMBUSTIBLE	HYDRAULIC CONDUCTIVITY,		
SCALE	ETHOI		DT OT	~		mo	VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected 100 200 300 400	k, cm/s 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup>	STING	PIEZOMETER OR
PTH S METR	NG M	DESCRIPTION		MBER	ΥPE	/S/0.3I		WATER CONTENT PERCENT	DDITIC	STANDPIPE INSTALLATION
DE	BOR		(m)	1 2		BLOW	ND = Not Detected $100  200  300  400$	Wp W	LAI	
10		CONTINUED FROM PREVIOUS PAGE								
- 10 - 11 - 11 - 12 - 12	Power Auger 200 mm Diam. (Hollow Stem)	SILTY SAND, trace gravel; grey (GLACIAL TILL)		12	SS	50/ 0.03 50/ 0.03				Screen
- - - - - - - - - - - - - - - - - - -		Borehole continued on RECORD OF DRILLHOLE 22-02	48.27							-
- - - - - - - - - - - - - - - - - - -										
- 17 - 17 										
2511882.GPJ GAL-MIS.GDT 3/8/22 28										
	<u> </u>								<u> </u>	<u> </u>
SHA SHA SIM 1:	EPTH : 50	SCALE					GOLDE	K	LC CH	)GGED: ALB ECKED:

PR LC IN(	OJEC CATIC	T: 22511882 DN: N 5030713.1 ;E 366476.0 TION: -90° AZIMUTH:		REC	OF	RD	OF	DRILLING DRILL RI			Febru 55	E: 22-02	2							SH D/	HEET 3 OF 3 ATUM: Geodetic	
DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	FLUSH COLOUR	JI F S V C RE TOT/ CORE	N - Joir LT - Fau HR- She N - Veii J - Cor COVER	nt ult par n njugate Y R.Q.E N R.Q.E % R.Q.E % R.Q.E % R.Q.E	BD- FO- CO- OR- CL - FR/ 0.2 97	Bedd Foliat Conta Ortho Cleav ACT. DEX ER 5 m	ion ket gonal age DIP w.r.t. CORE AXIS	PL - Planar CU- Curved UN- Undulating ST - Stepped IR - Irregular DISCONTINUITY TYPE AND SURR DESCRIPTIO	P( K SI R( M Y DA1	D- Polish - Slicke M- Smool D- Rough B- Mecha A	ed nsided th anical E m Jr Ja	Break HYD COND K, c 907	BR - I NOTE: I abbrevia of abbrevia of abbrevia symbols RAULIO UCTIVI m/sec TO C	Broke For add ations re wiations is C Dia TYPoin In (f	in Roo litional efer to s & ametra ndex MPa)	ilist IdRMC -Q' AVG.		
- - - - - - - - - - - - - - - - -	Rotary Drill NQ Core	BEDROCK SURFACE Grey, thin to medium bedded LIMESTONE and SHALE		48.27 14.20																		
- 16 - 16     - 17 		End of Drillhole Note(s): 1. Water level in screen measured at a depth of 7.88 m (Elev. 54.59 m) on February 25, 2022		46.62																		-
- - - - - - - - - - - - - - - - - - -																						-
- - - - - - - - - - - - - - - - - - -							$\overline{\mathbf{A}}$															-
21																						-
23																						-
DE 1 :	PTH S	CALE	<u> </u>		1			G	0		. C	DER						_ 1 1		LC CH	DGGED: ALB ECKED:	

#### LOCATION: N 5030756.8 ;E 366500.4

RECORD OF BOREHOLE: 22-03

SHEET 1 OF 3 DATUM: Geodetic

BORING DATE: February 22, 2022



### LOCATION: N 5030756.8 ;E 366500.4

RECORD OF BOREHOLE: 22-03

SHEET 2 OF 3

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: February 22, 2022

	-	1		-							NDUCT			
ш, Г	DOH.	SOIL PROFILE	1	S/		S		TIONS [PPN	1]⊕   <sup>HYDR</sup>	k, cm/s		VIIT,	RF	PIEZOMETER
'RES	MET			H.		.30m	100 200 30	0 400	1	0 <sup>-6</sup> 10	<sup>5</sup> 10 <sup>-</sup>	4 10 <sup>-3</sup>		
MET	<b>DN</b>	DESCRIPTION		WBE	Ъ	VS/0	HEADSPACE ORGANIC	VAPOUR	n w	ATER CC	NTENT F	PERCENT	B. TE	INSTALLATION
ŗ	BOR			₹		3LOV	ND = Not Detected		w		-0 <sup>W</sup>		LA I	
			0	+	+	ш	100 200 30	iu 400	2	:0 40	0 60 	80		
10	Ê	SILTY SAND, trace gravel; grey	67.592	+	++	+								
	v Ste	(GLACIAL TILL)												
	lollov													
	A N													Bentonite Seal
	Pov			12	ss	61/ ) 15								
11	Ju 00				ſ									
	5	Borehole continued on RECORD OF	50.48	7										
		DRILLHOLE 22-03												
										V/I				
12														
										$\wedge$	$\sim$			
											$\setminus$	> \		
											$\forall$			
13								X	$\langle \rangle$					
									$\sqrt{/}$					
									K					
									$\checkmark$					
14														
									~					
								$\langle \rangle$						
15			1					$\sim$						
						Α	$\bigcirc$							
						1	1-7							
						$\checkmark$								
16														
					$\square$									
				1	$\mathbb{N}$	N								
			$ \langle \langle \rangle$		10									
					M	Λ								
17				$\land$	ſł									
18														
19		1												
					1 1					1				
						1					I		1 1	
20														
20														
20														
20 DE	PTH	SCALE		N			) GOL	. D E	ER				LC	DGGED: ALB

PI LC	RC OC	)JEC ATIC	T: 22511882 DN: N 5030756.8 ;E 366500.4		RE	С	OF	RD	0	DF					DL Feb	.E:	<b>22-</b> 7 22, 2022	03								S D	HEET 3 OF ATUM: Geod	3 letic
ALE			TION: -90° AZIMUTH:	DOG			<u>DLOUR</u>	F	JN - FLT - SHR-	DF DF - Joint - Fault - Shea		ING	BD-B FO-F	eddi oliati		OR:	Downing PL - Planar CU- Curved UN- Undulati	Drillin	PO-P K -S SM-S	olished lickens mooth	l ided		BR NOTE	- Brok	cen Ro	ock al o list		
DEPTH SC METRE		DRILLING RE	DESCRIPTION	SYMBOLIC	ELEV. DEPTH (m)	RUN No	FLUSH % R	TOT COR 800	CJ ECO TAL ECO	VERY SOLIE CORE	R 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.Q.D. %	FRAC INDE 0.25	T. X m 07	IP w.r. CORE AXIS	t.	DISCONTIN TYPE AND S	UITY E SURFAC PTION	MB- N DATA	Jcon	jr Ja	HYE CONE 6, 90	RAUL UCTIV cm/se	IC D	iameti oint Lo Index (MPa)	ral DadRMC ( -Q' ) AVG		
- - - - - - - - - - - - - - - - - - -	2		BEDROCK SURFACE Slightly weathered to fresh, thin to medium bedded, grey black LIMESTONE and SHALE		50.48 11.17	1																					Bentonite Seal Silica Sand	1,202,202,202,202 1,202,202,202,202 1,202,202,202,202,202
- - - - - - - - - - - - - - - - - - -	3	NQ Core	Fresh, thin to medium bedded, grey to black LIMESTONE and SHALE		<u>49.38</u> 12.27	2																					- Screen	
- - - - - - - - - - - - - - - - - - -	55		End of Drillhole Note(s): 1. Water level in screen measured at a depth of 13.00 m (Elev. 48.65 m) on February 25, 2022		47.10 14.55	3									$+$ $+$ $\wedge$												-	<u>, 200</u> 100 100 100 100 100 100 100 100 100
- - - - - - - - - - - - - - - - - - -	6																											-
- 17 - 17 	3																											-
- - - - - - - - - - - - - - - - - - -	9																											-
3PJ GAL-MISS.GDT 3/8/22	))																											-
S-RCK 004 22511882. 1	EP	PTH S	GCALE									     			. [	<b>)</b>	ER											-

### LOCATION: N 5030713.2 ;E 366411.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 22-04

BORING DATE: February 23, 2022

SHEET 1 OF 3

DATUM: Geodetic

	GO	3	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION HYDRAULI		. (1)
RES	METH			гот		н		.30m	20 40 60 80 10 <sup>-6</sup>	10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup>	
MET	RING		DESCRIPTION	RATA F	ELEV. DEPTH	IUMBE	TYPE	0/S/VC	SHEAR STRENGTH nat V. + Q - ● WATE Cu, kPa rem V. ⊕ U - O Wn ⊨		INSTALLATION
	BO			STF	(m)	2		BLC	20 40 60 80 20	40 60 80	
0			GROUND SURFACE	- 	60.47						
1						2	AS	- 10			
2						3	SS	6			
3						4	SS	8			
4					•	5	SS	8			Bentonite Seal
	ger	ollow Stem)				6	SS	16			
5	Power Au	200 mm Diam. (Ho		N. N. N.		8	ss ss	14			
6			SILTY SAND, trace gravel; grey (GLACIAL TILL)		54.37 8.10	9	SS SS	27			
7						//					5
8						10	SS	78			Silica Sand
9						11	90	47			Screen
10								-+/			
.0		_`[	CONTINUED NEXT PAGE								
DEF		H S(	CALE			V		5	) GOLDER		LOGGED: ALB

PR	OJEC	T: 22511882	F	REC	OR	RD	OF BOF	REHO	LE: 2	2-04			SH	HEET 2 OF 3
LC	CATIC	N: N 5030713.2 ;E 366411.4					BORING I	DATE: Feb	bruary 23, 202	22			DA	ATUM: Geodetic
SA	MPLE	R HAMMER, 64kg; DROP, 760mm									PENETRATIC	N TEST HAN	/MER,	64kg; DROP, 760mm
Ш	ПОР	SOIL PROFILE		S	AMPL	.ES	DYNAMIC PEN RESISTANCE,	ETRATION BLOWS/0.3	3m	HYDRAULI k, c	C CONDUCTIV cm/s	TY,	2 C C	PIEZOMETER
DEPTH SCA METRES	BORING MET	DESCRIPTION	STRATA PLOT	EV. DTH n)	TYPE	BLOWS/0.30m	20 SHEAR STREI Cu, kPa 20	10 60 NGTH nat ' rem	80 V. + Q- ● V. ⊕ U- O 80	10 <sup>-6</sup> WATE Wp — 20	10 <sup>-5</sup> 10 <sup>-4</sup> R CONTENT PI	10 <sup>-3</sup> ERCENT 	ADDITION/ LAB. TESTII	OR STANDPIPE INSTALLATION
- 10	Ē	CONTINUED FROM PREVIOUS PAGE SILTY SAND_trace gravel: grey												[A] [A]
- - - - - - - - - - - - - - - - - - -	Power Auger 200 mm Diam. (Hollow Ste	(GLACIAL TILL) Borehole continued on RECORD OF DRILLHOLE 22-04		<u>9.29</u> 1.18	= ss	50/ 0.05								Screen
- - - - - - - - - - - - - - - - - - -														
- 14 					<									
- - - - - - - - - - - - - - - - - - -														
882.GPJ GAL-MIS.GDT 3/8/22 ZS 8111111111111111111111111111111111111														
001 2251														
OSHB-SIW	PTH S	CALE		V	1		) G	OL	DEI	R			LC CH	)GGED: ALB ECKED:

PROJECT: 22511882 LOCATION: N 5030713.2 ;E 366411.4 INCLINATION: -90° AZIMUTH:	RECORD OF DRILLHOLE: 22-04 DRILLING DATE: February 23, 2022 DRILL RIG: CME 55	SHEET 3 OF 3 DATUM: Geodetic
B METCRIM DESCRIPTION DESCRIPTION	DRILLING CONTRACTOR: Downing Drilling       O     J     J     Shr. Shar     BD- Bedding FO- Foliation     PL - Planar     PO- Polished C- Contact       Image: Shr. Shear     OC- Contact     UN - Undulating     N- Sitkensity     N- Sitkensity       Image: Shr. Shear     OC- Contact     UN - Undulating     N- Smooth       Image: Shr. Shear     OC- Contact     UN - Undulating     N- Rough       Image: Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Po- Polished       Image: Colspan="2">Image: Colspan="2">Colspan="2"Colspa=""2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2	BR - Broken Rock ded NOTE: For additional abbreviations refer to list of abbreviations 8. HYDRAULIC Diametral CONDUCTIVITY-Coint LoadRMC K, cm/sec Index - c7 K al 9 9 7 9
BEDROCK SURFACE Fresh, thin to medium bedded, grey black LIMESTONE and SHALE		
12     End of Drillhole       13     Note(s):       13     1. Water level in screen measured at a depth of 10.70 m (Elev. 49.77 m) on February 25, 2022       14     15       15     16       16     17       17     18       18     19		
DEPTH SCALE		LOGGED: ALB

SZ

22511882.GPJ GAL-MIS.GDT 3/8/22

MIS-BHS 001

#### LOCATION: N 5030679.9 ;E 366442.7

RECORD OF BOREHOLE: 22-05

SHEET 1 OF 3 DATUM: Geodetic

BORING DATE: February 24, 2022

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

SAMPLER HAMMER, 64kg; DROP, 760mm HYDRAULIC CONDUCTIVITY, k, cm/s HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected 100 200 300 400 SOIL PROFILE SAMPLES BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER 30m STRATA PLOT 10<sup>-6</sup> 10<sup>-5</sup> 10-4 10<sup>-3</sup> OR NUMBER STANDPIPE INSTALLATION ELEV. TYPE HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected BLOWS/0. WATER CONTENT PERCENT DESCRIPTION DEPTH -0<sup>W</sup> - WI WpH (m) 100 200 40 300 400 20 60 80 GROUND SURFACE 62.34 0 FILL - SILTY SAND, trace gravel; brown 0.00 AS 1 ND 2 SS 33 60.82 1.52 SILTY SAND, trace gravel, with cobbles and boulders; brown 3 SS 31 2 4 SS 84 Bentonite Seal 3 5 SS 94 4 50 0 ND 6 SS 57.92 SILTY SAND, fine, trace gravel; brown 4 42 Stem) 50/ 0.05 7 SS Power Auger 5 8 8 مهمهمهم بملع المع Silica Sand 6 SILTY SAND, trace gravel; grey (GLACIAL TILL); very dense 50/ 9 ss 7 Screen ss 0.10 ND 10 8 9 11 SS 50/ 10 CONTINUED NEXT PAGE **\\\)** GOLDER DEPTH SCALE LOGGED: ALB 1:50 CHECKED:

### LOCATION: N 5030679.9 ;E 366442.7

SAMPLER HAMMER, 64kg; DROP, 760mm

### RECORD OF BOREHOLE: 22-05

BORING DATE: February 24, 2022

SHEET 2 OF 3

DATUM: Geodetic

JEPTH SCALE METRES	RING METHOD	SOIL PROFILE DESCRIPTION	ATA PLOT	SA	TYPE TYPE	HEADSF VAPOUF ND = No 100 HEADSF CONCEI	PACE COMBUS R CONCENTRA t Detected 200 31 PACE ORGANIC NTRATIONS [PI t Detected	TIBLE TIONS [PPM] 00 400 	HYDRAULIC CONDUC k, cm/s 10 <sup>-6</sup> 10 <sup>-5</sup> WATER CONTEN WP	TIVITY, 0 <sup>-4</sup> 10 <sup>-3</sup> Γ PERCENT	ADDITIONAL .AB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
	BC		LE (m)	2		100	) 200 3	00 400	20 40	60 <u>80</u>		
- 10 	(μ	CONTINUED FROM PREVIOUS PAGE SILTY SAND, trace gravel; grey (GLACIAL TILL); very dense		12	ss 50	/ 3						
- - - - - - - - - - - - - - - - - - -	Power Auger 200 mm Diam. (Hollow Ste			13	SS 84							
- - - - - - - - - - - - - - - - - - -		Borehole continued on RECORD OF DRILLHOLE 22-05	48.50	14	SS 0.							
- - - - - - - - - - - - - - - - - - -							>					
DT 3/8/22 ZS 18												
1 22511882.GPJ GAL-MIS.GI 07 07 07 07 07 07 07 07 07 07 07 07 07 0												
DE DE 1 :	PTH 8 50	SCALE		V	15	<b>P</b>	GOL	DE	R		LC CHI	)gged: Alb Ecked:

PF LC IN	ROJE DCATI CLIN/	CT: 22511882 ON: N 5030679.9 ;E 366442.7 \TION: -90° AZIMUTH:	RECORD OF DRILLHOLE: 22-05 DRILLING DATE: February 24, 2022 DRILL RIG: CME 55 DRILLING CONTRACTOR: Downing Drilling	SHEET 3 OF 3 DATUM: Geodetic
DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	OD FORME         OD FORME         JN FLT FLT FLT FLT FLT FLT FLT FLT FLT FLT	BR - Broken Rock NOTE: For additional atbreviations a first of atbreviations & atbreviations & HYDRAULIC Diametrial ONDUCTIVITY Point LoadRMC K, cmise U(MPa) VC, org o
- 14 - 14          -	Rotary Drill	BEDROCK SURFACE Slightly weathered to fresh, thin to medium bedded, grey black LIMESTONE and SHALE		
- - - - - - - - - - - - - - - - - - -		End of Drillhole Note(s): 1. Water level in screen measured at a depth of 8.22 m (Elev. 54.12 m) on February 25, 2022		
- - - - - - - - - - - - - - - - - - -				
- - - - - - - - - - - - - - - - - - -				
- 20 - 20 				
.GDT 3/8/22 ZS				
04 22511882.GPJ GAL-MISS				
DI WIS-KCK O MIS-KCK O	EPTH 50	SCALE	SOLDER	LOGGED: ALB CHECKED:

#### LOCATION: See Site Plan

### RECORD OF BOREHOLE: 11-33

BORING DATE: December 8, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ		a Ģ	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN RESISTANCE,	ETRAT	ON 5/0.3m	ì	HYDR	AULIC C k, cm/s		FIVITY,		٥	DIEZOMETED
H SCAL TRES		METH		РГОТ		ER		30m	20 4	10	60	80	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	TIONAL	OR
METH		RING	DESCRIPTION	RATA	DEPTH	IUMBI	ТҮРЕ	0/S/V	SHEAR STREN Cu, kPa	IGTH	nat V. ⊣ rem V. ∉	- Q - O	W			PERCE	NT	ADDI AB. T	INSTALLATION
		8		STF	(m)	2		BLO	20 4	10	60	80	2	20 4	<u>40 e</u>	30 E	0		
— o			GROUND SURFACE		62.22														
			bense brown fine to medium sand, some coarse sand, some gravel, trace		0.08 61.69 0.53	1	50 DO	46											
- - - 1			Loose to very dense dark brown silty sand, trace to some gravel, brick, wood, organics, concrete, occasional grey silty clay laver (EII 1)			2	50 DO	9											-
						3	50 DO	60											
- - 2 -						4	50 DO	12											-
-						5	50 DO	56											
- 3			Compact to very dense brown to grey brown SILTY SAND to SANDY SILT, trace to some gravel (GLACIAL TILL)		<u>59.32</u> 2.90	6	50 DO	23											-
						7	50 DO	48											
- 4 - - -		stem)				8	50 DO	74											
- - - - 5	wer Auger	iam. (Hollow §				9	50 DO	49											-
	Pc	200 mm D				10	50 DO	55											
- - 6 -	;					11 12	50 DO 50 DO	>89 >100											-
-						13	50	>100											
- 7 - 7 -						14	50 DO	>100											-
- - - - 8			Very dense grey brown SILTY SAND, trace to some gravel, occasional grey silt seam, occasional fine to medium sand		54.60 7.62	15	50 DO	>111											-
-			seam (GLACIAL TILL)			16	50 DO	>105											
						17	DO	>50											-
						18 19	50 DO 50 DO	>100 >50											
			End of Borehole Split Spoon Refusal		52.26 9.96	20	50 DO	>110											-
- - - 11																			-
	EPT	THS	CALE							oldo	<b></b>							LC	DGGED: RI
2 1	: 55								TASS	OCI	ates							СН	ECKED: GDC

#### LOCATION: See Site Plan

# RECORD OF BOREHOLE: 11-35

BORING DATE: December 12, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

: December 12, 2011

		_				64	MDI	ES	DYNAM	IC PEN	ETRATI	ON	<u>\</u>	HYDR	AULIC C	ONDUCI	FIVITY,			
JALE	,	гно	301E FROHLE	TE	1	34			RESIST	ANCE,	BLOWS	/0.3m	Ľ,		k, cm/s				ING	PIEZOMETER
H SC		ME		PLO		ER		).30n	20	4	0 6	50 8 	30	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0-4 1	0 <sup>-3</sup>	TION	OR STANDPIPE
TT T		RING	DESCRIPTION	ATA	DEPTH	JMB	TΥΡΕ	NS/0	SHEAR Cu, kPa	STREN	IGTH I	natV.+ remV.⊕	Q - ● U - ○	W	ATER C	ONTENT	PERCE	NT	AB. T	INSTALLATION
ä		BOF		STR/	(m)	Ĩ	Ċ	BLO	20		0 4	s0 s	20	W	p —	 10 F		WI	ΓA	
			GROUND SURFACE		62.56			-	20	4					20 2					
-	0		Dense grey sand and gravel (Gravel lot	***	02.30															
F			BASE)		62.25	1	50	52												
F			trace gravel (Gravel lot SUBBASE)		× 0.31		20													
-					Ś															
F			Compact dark brown to black silty sand	-	61.65	2	50 DO	17												
E	'		trace gravel, ash, wood, brick, mortar													1				-
F			(FILL)		×.															
E					A 60.99	3	50 DO	19												
E		stem)	Compact brown fine to medium sand,		1.68															
F	2 2	low S	trace gravel (FILL)			4	50 DO	24												-
F	ar Auc	n. (Ho	Dense to very dense light brown to	<b>XX</b>	2.13		50													
-	Power	Diar	brown SILTY SAND, occasional gravel and medium sand layers, trace gravel		× ×	5	DO	45												
E		00 mn	(GLACIAL TILL)			6	50	65												
E		20			Ś	0	DO	60												
F	3				1															-
F						7	50	176					К							
F							DO													
F																				
F					\$															
E	4					8	50 DO	>50												-
E					58.16															
F			End of Borehole Auger Refusal		4.40						ĺ									
F																				
-	5			1																-
-																				
E																				
E																				
F					K															
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1122	0																			-
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	л::P	IH S	UALE							G	olde	r,							LC	JGGED: BM
<b>≓I</b> 1	: 50	,								ACC	AC12	ATAS							CH	EUKED: GDC

#### LOCATION: See Site Plan

## RECORD OF BOREHOLE: 11-37

BORING DATE: December 12, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

Ш	1	Ģ	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	
DEPTH SCA METRES		SORING MET	DESCRIPTION	TRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	LOWS/0.30m	20 40 60 80 SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - C	10 <sup>6</sup> 10 <sup>5</sup> 10 <sup>4</sup> 10 <sup>3</sup> WATER CONTENT PERCENT Wp	OR OR STANDPIPE INSTALLATION
		<u></u>	GROUND SURFACE	LS	62.76			BI	20 40 60 80	20 40 60 80	
- 0			Compact sand and gravel (Gravel lot		0.00						
-			Compact brown medium to fine sand, trace gravel (Gravel lot SUBBASE)		62.46 0.30	1	50 DO	29			
- - 1 -			Loose dark brown to black silty sand, trace gravel, occasional layers of ash, gravel, sandy mortar, glass, construction debris (FILL)		61.85 0.91	2	50 DO	20			
						3	50 DO	6			
- 2			Compact brown medium to fine sand, trace gravel (FILL)		60.63 2.13 60.32 2.44	4	50 DO	34			
- 3	er Auger	n. (Hollow Stem)	(GLACIAL TILL)			5	50 DO	73			
-	Powe	200 mm Dian				6	50 DO	>75			
- 4						7	50 DO	>65			
						8	50 DO	>75			
						9	50 DO	40			
- - - 6 -						10	50 DO	>50			
-			End of Borehole		56.23 6.53						
- - - - - -			Auger Refusal								
- - - - - - 8											
-											
- - - 9											
- - - - 10											
DE 1 :	PT 50	THS	CALE	<u> </u>	I	I			Golder		LOGGED: BM CHECKED: GDC

#### LOCATION: See Site Plan

## **RECORD OF BOREHOLE: 11-38**

BORING DATE: December 19, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш		DO	SOIL PROFILE			SA	MPL	.ES		FION	HYDRAULIC CC	ONDUCTIVITY,	.0	
SCALI	RES	METH		LOT		۲		30m	20 40	60 80	10 <sup>-6</sup> 10	<sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup>	STINC	PIEZOMETER
HTH	METE	ING N	DESCRIPTION	VTA PI	ELEV.	IMBE	ЧF	VS/0.3	SHEAR STRENGTH Cu. kPa	nat V. + Q - ● rem V. ⊕ U - C	WATER CC		DDIT B. TE	STANDPIPE INSTALLATION
DE		BOR		STR∕	(m)	۲	[	BLOV	20 40	60 80	Wp	→ WI 0 60 80	<b>₽</b> ₽]	
	0		GROUND SURFACE		62.11									
-	Ū		Compact to dense brown sand and gravel (Gravel lot BASE)/ Loose to compact brown medium to fine sand, some gravel (Gravel lot SUBBASE)		0.00 0.10	1	50 DO	35						
-	1				60.89	2	DO	8						-  
-		er Crevit	Compact to very dense grey brown sand, some gravel, trace silt (FILL)		1.22	3	50 DO	15						-
-	2.	Power Aug	n Dlam. (Hol		50.67	4	50 DO	52						
-	3		Very dense grey brown SILTY SAND, some gravel, medium brown sand seams (GLACIAL TILL)		2.44	5	50 DO	61						
-						6	50 DO	112						-
-	4				57.94	7	50 DO	148						- - - -
Ē			End of Borehole Auger Refusal		4.17									-
	5													
- - - - - - - -	7													
AIS.GDT 02/24/15 JE	8													
111220199.GPJ GAL-N	10													
01 1														
MIS-BHS 0	DEF 1 : 5	РТН Ю	1 SCALE						Golde	er iates			LC CHE	)GGED: JDR ECKED: GDC

#### LOCATION: See Site Plan

**RECORD OF BOREHOLE: 11-39** 

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: December 15, 2011

	SAN	1PLE	R HAMMER, 64kg; DROP, 760mm							PENETRATION TEST HAMME	R, 64kg; DROP, 760mm
ш	Τ	DO	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION	HYDRAULIC CONDUCTIVITY, k. cm/s	
I SCAL		METH		PLOT		Ř		.30m	20 40 60 80		
DEPTH	ME	ORING	DESCRIPTION	RATA	DEPTH	NUMBI	TYPE	0/S/VO	SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - ○		
_		M	GROUND SURFACE	STI	(m)			B	20 40 60 80	20 40 60 80	-
Ē	0		Compact sand and gravel (Gravel lot	×	62.81 0.00						
-			Compact brown to red sandy silt, trace gravel (FILL)			1	50 DO	15			
-					× ~ ~ ~						
-	1		Compact to dense light brown fine to medium sand, trace gravel, silt, and		0.91	2	DO	20			
-			mortar (FILL)		X		50				
-					×	3	DO	40			
E	2				60.68	4	50	120			-
Ē			Dense sandy gravel to brown fine to medium sand and gravel (FILL)		2.13						
-		(me			×	5	50	67			
-	3	Iger ollow St				Ľ	DO	07			-
-		ower Au Diam. (H			X	6	50	99			-
-		500 mm			59.15						
-	4		SAND, some gravel (GLACIAL TILL)		5.00	7	50 DO	34			_
-											
-						8	50 DO	27			
-	5										
-	Ĵ					9	50 DO	33			
-						10	50	.50			
-	6						DO	-50			
-	Ů				56,46	11	50 DO 50	>100 >100			
-			End of Borehole Auger Refusal		6.35						
-											
-	7										
-											
-											
15 JEN	8		· · · · · · · · · · · · · · · · · · ·								
02/24/											
GDT											
AL-MIS	9										-
sPJ G/											
0199.G											
11122	10										-
001					1						
IS-BHS	DEF	PTH S	SCALE					(	Golder	~	LOGGED: BM/JD
Σ		-							ASSUCIALCS	Ċ	

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 11-40

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: December 16, 2011

щ	Τ	DD	SOIL PROFILE			SA	MPLE	ES	DYNAMIC PER		ON /0.3m	ì	HYDRA	AULIC CO	ONDUCT	IVITY,		ں.	
H SCAL		3 METH		PLOT	EL EV	ER	ш	0.30m	20	40 E	i0 8		10	) <sup>-6</sup> 1	0 <sup>-5</sup> 10	)-4 1(	D <sup>-3</sup>	TIONAL	OR STANDPIPE
DEPTI		ORING	DESCRIPTION	IRATA	DEPTH (m)	NUMB	ТҮР	-OWS/	SHEAR STRE Cu, kPa	NGTH r	at V. + em V.⊕	Q - ● U - O	Wp Wp				NT WI	ADDI LAB. T	INSTALLATION
-	+		GROUND SURFACE	S	62 77			BI	20	40 E	3 Oi	0	2	0 4	0 6	0 8	0		
-	0 -		Compact red to fine brown sand, some gravel (Gravel lot BASE)		0.00														-
-			Compact fine to medium brown sand,		62.39 0.38	1	DO	13											-
Ē			some gravel, red brick (FILL)																
-	1					2	50 DO	19											-
È			Compact light brown fine to medium		61.55 1.22														-
-						3	50 DO	15											
E	2																		-
È	-					4	50 DO	25											-
-		Ê																	
-		low Ster			59.78	5	50 DO	51											-
-	3	am. (Hol	Very dense grey brown SAND, some gravel, trace silt (GLACIAL TILL)		2.99	-													-
-	ć	Di Di				6	50 DO	59											-
-		20(	Very dense grey brown SILTY SAND,		<u>59.11</u> 3.66														-
-	4					7	50 DO	100											-
-						8	50 DO	>50											-
-						9	50 DO	>100											-
E	5																		-
E																			
Ē						10	50 DO	187											-
-	6					11	50	>50											-
-	_		End of Borebole		56.52		00												-
Ē			Auger Refusal																
-																			
-	7																		
-																			-
_																			-
2 JEM	8																		-
2/24/1																			
SDT 0																			
-MIS.(	9																		-
J GAL																			
99.GF																			
11220	0																		-
01 11																			
BHS 0	DEP	TH S	SCALE					(	<b>A</b>	olde	r							LC	OGGED: JD
SIW 1	: 5	0							<b>V</b> Aš	socia	ites							CH	ECKED: GDC

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 11-01

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: November 23, 2011

щ	Т	00	SOIL PROFILE			SA	MPL	ES	DYNAMIC PE RESISTANCI	NETRATI	ON 5/0.3m	$\overline{)}$	HYDR/	AULIC Co	ONDUCT	FIVITY,		<u>ں</u>	DIEZOMETED
H SCAL TRES		3 METH		PLOT	ELEV	ßER	ш	/0.3m	20	40	60 8	30 <b>`</b>	10	0 <sup>-6</sup> 1			0 <sup>-3</sup>	ITIONAI FESTIN	OR STANDPIPE
DEPTI		BORING	DESCRIPTION	TRATA	DEPTH (m)	NUME	ΤYΡ	<b>SNOUS</b>	Cu, kPa	NGTH	nat v. + rem V. ⊕	Q-● U-O	W				WI	ADDI LAB. 7	INSTALLATION
	_	ш	GROUND SURFACE	Ś	56.36			Ш	20	40 0	60 E	30	2	0 4	06	50 E	30		
E	0		TOPSOIL Dark brown to black silty sand (FILL)		0.00	1	50	5											
E			Compact fine to medium brown silty		55.95 0.41	I	DO	22											
E			Sand, Some graver, trace blick (File)			0	50	54											
E	1	w Stem)				2	DO	51											
E	Auger	n. (Hollo				_	50												-
È	Powe	nm Dian			54.53	3	DO	24											-
-	2	200 n	Gravel (FILL)		1.83 54.23		50	44											-
-			Dense medium to fine grey to brown sand, trace gravel and silt (FILL)		2.13	4	DO	41											-
È					53.62	5	50	>50											-
-	3		GRAVEL and COBBLES (GLACIAL TILL)		2.74 53.44 2.92														-
Ē			Auger Refusal																-
Ē																			-
-																		-	
Ē	4																		
Ē																			-
-																			-
	5																		-
-																			-
È																			-
-	6																		-
Ē																			-
Ē																			-
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_																			
3 JEN	8																		
1/28/1																			-
GDT																			-
- L -	9																		-
PJ G/																			-
1199.G																			-
111220	0																		
100																			
-BHS (	DEP	TH S	CALE					(	<b>M</b> a	olde	r							LC	DGGED: BM
<u>м</u> 1	: 50	)							<b>V</b> As	socia	<u>ates</u>							CH	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

### RECORD OF BOREHOLE: 11-02

BORING DATE: November 24, 2011

SHEET 1 OF 2

DATUM: Geodetic

щ	G	<u>p</u>	SOIL PROFILE			SA	MPL	.ES	DYNAMIC F	PENETI CE, BL	RATIC OWS/	N 0.3m	$\overline{)}$	HYDR	AULIC C k, cm/s	ONDUCT	IVITY,		<u>_</u> 0	DIEZOMETED
H SCAL TRES	Ľ	ME		РГОТ		ER		0.3m	20	40	6	D 8	10	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0-3	TIONAL	OR
DEPTH		DAING	DESCRIPTION	RATA I	DEPTH	NUMBI	ТҮРЕ	OWS/I	SHEAR ST Cu, kPa	RENGT	TH n re	atV.+ emV.⊕	Q - ● U - O	w	ATER C	ONTENT	PERCE	NT WI	ADDI -AB. T	INSTALLATION
		ž	0001000 0100000	STF	(m)	-		В	20	40	6	о e	0	2	20 4	ю е Т	- 80 8	30 T		
0		$\square$	TOPSOIL	ESS	55.00 0.00					_										
-			Compact black silty sand, trace ash and clay, occasinal layers of medium brown sand and gravel (FILL)		0.15	1	50 DO	12												
- - - 1 -			Compact medium to fine brown sand,	) XXX	53.96	2	50 DO	35												
			some gravel, trace silt (FILL)		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3	50 DO	17												
- 2 - 2 			Carroo brown cond como aroual troco		52.61	4	50 DO	25												
- - - - - - -		w Stem)	(FILL)		× 2.00	5	50 DO	38												
	Power Auger	mm Diam. (Hollc	Compact to dense coarse area sand		51.34	6	50 DO	59												
- - - 4 -		200	some gravel, trace silt, with cobbles and boulders (FILL)		50.78	7	50 DO	24												
			COBBLES, BOULDERS, and GRAVEL (GLACIAL TILL)		4.22	C1	NQ RC	DD												
- - - 5 -					49.82	C2	NQ RC	DD												
			Very dense grey coarse SAND, some silt, some gravel (GLACIAL TILL)		5.18	8	50 DO	>50												
- - 6 -			COBBLES, BOULDERS, and GRAVEL		48.90	СЗ	NQ RC	DD												
			GRAVEL, trace cobbles		48.29	9	50 DO	78												
- - - 7			End of Borehole		6.71															
-																				
- 9 -																				
-																				
- - 10																				
				1																
DE 1 ·	PT 50	ΉS	CALE					(	( <b>M</b>	Gol	der	tor							L( CH	DGGED: BM ECKED: JW

PF LC IN	RO DC. CL	JEC ATIC INAT	T: 11-1122-0199 N: See Site Plan TION: -90° AZIMUTH:		RE	0	RD	0			RII ING RIC	DA DA G: C	HC TE: ME 3	No 350	LE oven	nbe	er 24 Ma	<b>1</b> ' 4, 2	<b>1-02</b> 2011 non Drilli	ng									SH DA	EET TUM:	2 OF Geo	<sup>:</sup> 2 odetic	
DEPTH SCALE METRES		DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH <u>COLOUR</u>	JN FLT SHF VN CJ RE TOT COR	- Joi - Fa R- Sh - Ve - Co ECOV	nt ear njuga 'ERY SOLII XORE	ate	Bi Fi O C .Q.D. %	D- Be D- Fo D- Co R- Ori L - Cle FRA IND PE 0.3	dding iatio ntac hogo avag CT. EX EX m	g onal ge B An	gle 822		- Pl J- Ci N- Ui - Si - Iri ISC( W.r.t. )RE (IS (IS) (IS) (IS) (IS) (IS) (IS) (IS)	lanar urved ndulating tepped regular ONTINUITY TYPE AND DESCR	PO- K - SM- Ro - MB- / DATA	Polis Slick Smo Rou Mecl	hed ensic oth hanic	al Br	reak YDR/ NDU K, crr	BR abbr of at syml AULIC CTIVI h/sec t 00	- Br eviatio obrevia bols. C Di TYPC	oker r addit ons rel ations iamel jint Lo Index (MPa	tional fer to l tral oad RI x a) A	ck list MC Q' VG.				
5	_	stem)	BEDROCK SURFACE COBBLES, BOULDERS, and GRAVEL (GLACIAL TILL)		50.78 4.22	C1 C2																											
	Dower Aurer	00 mm Diam. (Hollow S	Very dense grey coarse SAND, some silt, some gravel (GLACIAL TILL)		49.82 5.18 49.23 5.77	C3																											
	_	20	Very dense grey coarse SAND and GRAVEL, trace cobbles End of Borehole		48.90 6.10 48.29 6.71																												
- 7 - 8 - 9 - 10 - 10 - 11																																	
004 1111220199.GPJ GAL-MISS.GDT 1/28/13 JEM + + + + + + + + + + + + + + + + + + +																																	
DE US-KCK 0 1:	ΞP'	TH S	CALE					Ĝ		A	Go SS		lei Lia	te	S													C	LO CHE	ggei Eckei	D: BI	v V	

### RECORD OF BOREHOLE: 11-03

LOCATION: See Site Plan

### SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: November 28, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш		3	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRA RESISTANCE, BLOV	TION VS/0.3m	ì	HYDRA	ULIC CO	ONDUCT	IVITY,		, U	
I SCAL RES		ШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШШ		PLOT	E E ·	R.		).3m	20 40	60	80	10	-6 10	) <sup>-5</sup> 1(	)-4 1(	) <sup>-3</sup>	FIONAL	
EPTH		ט אוג	DESCRIPTION	ATA F	DEPTH	IUMBE	TYPE	0/S/MC	SHEAR STRENGTH Cu, kPa	nat V.  + rem V. ∉	- Q- ● 9 U- O	WA	ATER CO		PERCE		ADDIT AB. TI	INSTALLATION
		22		STR	(m)	2		B	20 40	60	80	20	) 4	0 6	0 8	0	L.	
— o			GROUND SURFACE Compact dark brown silty sand, trace	223	54.93					_								
E			gravel, organics (TOPSOIL)		0.18	1	50	10										
Ē			ash, slag (FILL)		54.32		00											
F			Compact brown fine to medium sand, Some gravel, some silt, brick (FILL) /	<b>***</b>	0.61		50											
- 1 - 1			Compact to loose black silty sand, some gravel, ash, slag (FILL)			2	DO	14										-
-			l oose brown fine to coarse sand some		53.58													
-			gravel, trace silt (FILL)			3	50 DO	9										
È.			Compact brown medium to coarse sand,		53.10 1.83													
- 2			some gravel, some fine sand, trace silt (FILL)			4	50 DO	11										-
Ē		Stem)			52.49													
-	Auger	Hollow	gravel, trace to some clay, organics	$\bigotimes$	2.51	5	50	38										
- 3	ower /	Diam. (	brown SILTY SAND, some gravel, with cobbles and boulders	$\bigotimes$														-
-		00 mm		$\bigotimes$	\$	6	50	33										
-		2		$\bigotimes$			DO	35										
Ē				$\bigotimes$		7	50 DO	>50										
- 4 -				$\bigotimes$														-
-				$\bigotimes$	8													
-			Very dense grey SILTY SAND, some		50.36 4.57	8	50 DO	74										
- - 5			TILL)															-
Ē						9	50 DO	54										
-						10	50	~50										
-			End of Borehole	ØKKR	49.24 5.69	10	DO	-30										
- 6 -			Possible Bedrock															-
-																		
Ē																		
-																		_
ŧ ′																		
E																		
Ē																		
- 8																		-
Ē																		
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- 9 -																		-
È																		
E																		
_ 10																		-
<u> </u>																		
D	EPT	нs	CALE					1		or							LC	DGGED: RI
1	: 50								Assoc	iates							СН	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

## RECORD OF BOREHOLE: 11-04

BORING DATE: December 1, 2011

SHEET 1 OF 1

DATUM: Geodetic

ц			SOIL PROFILE		1	SA	MPL	ES	DYNAMIC PENE RESISTANCE, B	TRA LOW	ГІОN 'S/0.3m	$\tilde{\boldsymbol{\lambda}}$	HYDRA	ULIC CO k, cm/s	ONDUCT	IVITY,		4 G F	PIEZOMETER
METRES		IKING MEI	DESCRIPTION	ATA PLOT	ELEV. DEPTH	JUMBER	TYPE	OWS/0.3m	20 40 SHEAR STRENG Cu, kPa	STH	60 nat V. rem V.	80 + Q-● ⊕ U-O	10 <sup>-</sup> WA Wp	6 10 TER C0	0 <sup>-5</sup> 10 ONTENT W	0 <sup>-4</sup> 1 PERCE	0 <sup>-3</sup> NT	ADDITION/	OR STANDPIPE INSTALLATION
	6	2		STF	(m)	2		ВГ	20 40		60	80	20	) 4	0 6	i0 8	30 		
0	-		TOPSOIL	EEE	56.16 0.00						_								
			Compact black silty sand, some gravel, trace brick, ash, slag, wood and glass (FILL)		0.15	1	50 DO	8											
1						2	50 DO	16											
						3	50 DO	10											
2			Loose dark brown to red coarse sand, some gravel, trace brick, ash, silt and slag (FILL)		54.33 1.83	4	50 DO	5											
			Loose medium to fine orange sand, trace		5 <u>3.42</u> 2.74	5	50 DO	3											
3			slag and silt (FILL) Very loose red coarse sand, trace silt (FILL)		53.11 3.05 52.81	6	50	2											
			Very loose black crushed asphaltic concrete (FILL)		3.35	_	DO												
4			ORGANICS Crow CLAX		3.96	7	50 DO	2											
	_	ow Stem)	Grey SILTY SAND, some gravel	×	4.11	8	50 DO	>50											
5	Power Auge	m Diam. (Holl	SAND and GRAVEL, trace silt		4.57		50												
		200 m				9	DO	49											
6				$\bigotimes$	49.96	10	50 DO	54											
7			Very dense SAND and GRAVEL, some cobbles, trace boulders (GLACIAL TILL)		6.20														
						11	50	112											
8						12	50 DO	>75											
9						13	50 DO	58											
					46.46	14	50 DO	27											
		-	End of Borehole Auger Refusal	r uer le	9.70														
10																			
DE	PT	нs	CALE	1		<u>،</u>	<u>ı                                    </u>		G	Ida	er		<u> </u>			1	1	L	OGGED: BM
1:	50								Asso	DĈi	ates	5						CH	ECKED: JW

#### LOCATION: See Site Plan

### RECORD OF BOREHOLE: 11-05

BORING DATE: November 23, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	Т	_				54	MDI	EQ	DYNAMI	C PEN	ETRATI	ON	<u> </u>	HYDR	AULIC C	ONDUCT	IVITY,			
SALE		ТНОГ	SUIL PROFILE	F		SA	MPL	ES c	RESISTA	NCE,	BLOWS	5/0.3m	<u></u> ز		k, cm/s			e-3		PIEZOMETER
TH SC		g me	DECODIDITION	A PLO	ELEV.	BER	Ъ	s/0.3n	20 SHEAR S			50 	80 	1	0 <sup>°°</sup> 1 L	D <sup>IS</sup> 1	D <sup>-*</sup> 1 I PERCE	0 <sup>-5</sup> I NT	TEST	STANDPIPE
DEPT		ORIN	DESCRIPTION	RAT/	DEPTH (m)	NUM	ТҮ	SW0-	Cu, kPa	JINEN		rem V. 6	ĐŨ-Ō	w	p <b>⊢</b>			wi	ADD LAB.	INSTALLATION
		ă		ST	(11)			BI	20	4	40 (	60	80	2	20 4	0 6	30 0	30		
- (	┝		TOPSOIL	ESS	56.91 0.00															
E			Dark brown to black silty sand, some		0.13	1	50	24												
F			Compact brown medium to fine sand,		0.30		DO													
E			Dark brown to black silty sand, some	₩	56.20 0.71															
			gravel (FILL)	₩	56.00 0.91	2	50 DO	15												-
F		(m	trace silt (FILL)		×															
E		ow Ste					50	_												
E	Aude	(Holl				3	DO	<i>'</i>												
F.	Powel	Diam			×															
- 2 -	2	0 mm	Compact brown medium to fine SAND.	颷	54.81 2.10	4	50 DO	24												-
E		20	trace silt, gravel	$\bigotimes$	3															
F				$\otimes$	Ŕ		-													
Ē				$\otimes$	Š	5	DO	21												
- :	3			$\otimes$	8															-
F				$\otimes$	E2.46	6	50 DO	>50												
E		-	End of Borehole	$\Gamma^{\sim}$	3.45															
F			Possible Boulder																	
- 4																				-
E																				
Ę																				
E																				
- 6	5																			-
F																				
Ē																				
E																				
÷,																				
	Ŷ																			-
E																				
F																				
E																				
- 7	7																			-
F																				
E																				
È																				
<u>≥</u> _ 8	3																			-
13 1																				
1/28/																				
LQ.																				
JIS.6																				_
SAL-N																				
PJ -																				
99.G																				
2201																				
10 10	)																			-
001				1	1				Ā			1		1	I	I		1		
SH <sup>d</sup>	EP1	ΉS	CALE					(		G	olde	r							LC	DGGED: BM
ິ ₩ 1	: 50								<u>V</u>	<u>155</u>	ocia	ites							CH	ECKED: JW

# RECORD OF BOREHOLE: 11-06

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: November 23, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш		ДĊ	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN		ON	<u>}</u>	HYDRAULIC	CONDUC	TIVITY,		0	
SCALI		ЛЕТНО		-oT		~		Зm	20	40	60 8	0	10 <sup>-6</sup>	10 <sup>-5</sup>	10 <sup>-4</sup> 1	0-3	STINC	PIEZOMETER OR
PTH (		NGN	DESCRIPTION	TA PI	ELEV.	MBEF	ΥPE	NS/0.	SHEAR STRE	NGTH	nat V. +	Q - ●	WATER		T PERCE	NT	B. TE	STANDPIPE INSTALLATION
DE		BORI		STRA	(m)	R	-	BLOV	00, KF a	10		0-0	Wp —	O <sup>W</sup>		WI	LAI	
			GROUND SURFACE	0,	54.79				20	+0	00 8		20	40	200			
Ē	0		Loose dark brown silty sand, trace		0.00													
-			Loose black silty sand, some gravel,			1	50 DO	9									1	-
Ę			asn, brick, clay (FILL)														1	
Ē			Loose brown fine to medium sand, some	***	54.03 0.76		50											
-	1		gravel, trace silt (FILL)		Š	2	DO	9										
-			Loose black silty sand, some gravel,		53.57 1.22													-
-			ash, organics (FILL)	₩	53.27 1.52	3	50 DO	6									1	
E																	1	
-	2				52.66		50											-
-			Very dense brown fine to coarse SAND,	Ŵ	2.13	4	DO	53										
-	┝		End of Borehole	$\bowtie$	52.33 2.46				-									
E			Auger Refusal															
E	3																	-
-																		-
E																		
F																		-
E	4																	
-																		
Ē																		
E																		-
-	_																	-
-	5																	
-																		-
Ē																		
F																		
-	6																	
-																		
-																		
E																		-
-	7																	-
E																		-
F																		-
Ē																		-
₩ Р	8																	
8/13																		-
1/2																		-
<u>9</u> -																		-
- MIS	9																	
GAL																		
GPJ																		
0199																		-
1122	10																	-
1																		
HS OC	DEF	PTH S	SCALE														10	OGGED: RI
IIS-B	 I : 5	50								olde	r Mes						СН	ECKED: JW
1 I I I I I I I I I I I I I I I I I I I	DEF I : 5	PTH S	SCALE					(	<b>E</b>	olde Socia	r <u>Ates</u>						LC CH	)gged: Ri Ecked: Jw

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

## RECORD OF BOREHOLE: 11-07

BORING DATE: November 25 & 28, 2011

SHEET 1 OF 1

DATUM: Geodetic

		3	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	$\overline{\mathbf{x}}$	HYDRAULIC C k, cm/s	ONDUCTI	VITY,	_0	DIEZOMETED
RES	MFTH			LOT		н		).3m	20 40 60 8	10	10 <sup>-6</sup> 1	0 <sup>-5</sup> 10	<sup>-4</sup> 10 <sup>-3</sup>	IONAL STIN	
MET	UND N		DESCRIPTION	VTA F	ELEV.	IMBE	ΓΥΡΕ	WS/0	SHEAR STRENGTH nat V. + Cu, kPa rem V. +	Q - ● U - O	WATER C	ONTENT I	PERCENT	DDIT B. TE	INSTALLATION
	BOB	ŝ		STR/	(m)	z	ľ	BLO	20 40 60 8	80	Wp ├──			< ⊲	
_			GROUND SURFACE		54.92								<u> </u>		
0			Compact dark brown silty sand, trace		54:74										
			Compact black silty sand, some gravel,		0.18	1	50 DO	12							
			ash, siag, organics (FILL)												
					54.01		50								
1		Ī	Compact to loose brown fine to coarse		0.91	2	DO	19							
			brown silt pockets (FILL)												
					×.	3	50	6							
					53.09										
2		Ī	Loose dark brown silty sand, some		1.83										
			wood, ash, with brown clayey silt layers		×	4	50 DO	5							
					52.48										
			trace sand (FILL)		52.18	Ļ	50	P							
		ļ	Loose to very dense brown silty sand, some gravel (FILL)	Æ	2.74		DO	0							
3			Very dense to dense grey to brown fine to coarse SAND, some gravel, trace to		Š										
			some silt, with brown medium to coarse sand trace to some fine sand trace silt	$\otimes$	Ŕ	6	50 DO	94							
			layers, with cobbles and boulders		Š										
				$\otimes$	Ŕ		50								
4		Stem			Š	7	DO	127							
	uger	Hollow		$\otimes$	Ŕ										
	werA	iam. (F			Š	8	50 DO	41							
	۳	D m m		$\otimes$	Ŕ										
5		200			Š		50								
				$\otimes$	Ś	9	DO	50							
					3	-									
				$\otimes$	Ŕ	10	50	51							
6					Š										
				$\otimes$	Ŕ										
					3	11	50 DO	43							
				$\otimes$	Ŕ										
7					Š	12	50	63							
				$\otimes$	Ś	-	DO								
				$\otimes$											
				$\otimes$	Å	13	50 DO	63							
					3										
ø				$\bigotimes$	k	14	50	46							
				$\bigotimes$	40.00	"	DO	-10							
		ł	Compact to dense brown medium to	×	8.54	$\vdash$	50								
			sand, trace silt	$\bigotimes$	45.95	15	DO	>50	]						
9		1	End of Borehole Auger Refusal		8.97	$\left[ \right]$									
			Possible Bedrock												
10															
DEI	PTł	чs	CALE					1	Coldor					L	OGGED: RI
1:	50								VAssociates					CH	IECKED: JW

#### LOCATION: See Site Plan

## **RECORD OF BOREHOLE: 11-08**

BORING DATE: November 30, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ	Τ		3	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN RESISTANCE,	ETRATI	ON 5/0.3m	2	HYDR	AULIC C	ONDUCT	TIVITY,		ı۵	
SCAL		METH			LOT		щ		.3m	20 4	0	60 E	30	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	IONAL	OR
TH	ME	UD UD		DESCRIPTION	TA P	ELEV.	IMBE	γPE	NS/0	SHEAR STREM	IGTH	nat V. + rem V. ⊕	Q - ●	N	ATER C	ONTENT	PERCE	NT	DDITI B. TE	STANDPIPE INSTALLATION
DE		BOR			STRA	(m)	Z		BLO	20	0	60 5	30	W	p —			WI	LA	
				GROUND SURFACE	0,	54.29				20 2				-						
-	0			Loose dark brown silty sand and sandy	<u>Ess</u>	0.00														
-				Loose dark brown to black silty sand,		53.88	1	50 DO	8											
-				Some gravel, brick (FILL)		0.41														
-			ſ	trace to some gravel (FILL)	1	0.61		50												
_	1			some gravel, trace to some silt,			2	DO	17											
-																				
F							3	50	16											
E			Ê			3														
E	2	-	ow Ste																	-
F		Auge	(Holl				4	50 DO	15											
E		Powel	Diam			51.85														
F			mm OC	Firm grey SILTY SAND, trace sand,	Ī	2.59	5	50	12											
-			×	Compact to very dense grey SILTY	$\mathbb{W}$	2.74		DO	12											
E	3			SAND, some gravel, with cobbles and boulders			6	50 DO	<100											
F						3														
Ē					$\otimes$	Ś														
F						3	_	50												
-	4					3	7	DO	59											
-						Š	0	50	-100											
E	ŀ		_	End of Borehole	$\sim$	49.77 4.52		DO	-100											
-				Auger Refusal																
-	5																			-
-																				
E																				
F																				
-	6																			-
E																				
F																				
F																				
E	7																			
F																				
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E																				
Ę																				
	8																			
1 1														1						
++																				
S.GD																				
μ. - Μί	9																			-
GA L																				
GP.																				
20195																				
1112	10																			
-13																				
3HS 0	DEF	PTH	чs	CALE					1		<b>.</b> 14-								LC	DGGED: RI
HIS-F	1:5	50									лие <u>OCi</u>	<u>ates</u>							СН	ECKED: JW

#### LOCATION: See Site Plan

### RECORD OF BOREHOLE: 11-09

BORING DATE: November 23, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

November 23, 2011

ш		ОC	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEI		ION S/0.3m	}	HYDRAU		ONDUCT	IVITY,		0	
SCALI		ЛЕТНО		-OT		~		Зm	20	40	60 E	30	10-6	<sup>3</sup> 10	)-5 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	STINC	PIEZOMETER OR
PTH S		NGN	DESCRIPTION	TA PL	ELEV.	MBEF	ΥPE	VS/0.3	SHEAR STRE	NGTH	nat V. +	Q - ●	WA	TER CO	ONTENT	PERCE	NT	DITIO	STANDPIPE INSTALLATION
DEP		BORI		TRA	DEPTH (m)	Ñ	Ĥ.	BLOW	Си, кра		rem v. ⊕	U- O	Wp		-0 <sup>W</sup>		WI	LAE	
		ш	GROUND SURFACE	S	50.00			-	20	40	<u>60 8</u>	30	20	4	06	30 E	30		
-	0		TOPSOIL	Ezz	0.00														
-			Dark brown to black silty sand (FILL)	××	0.13	1	50 DO	33	Í I										
E					56.22				Í I										
-			Loose black silty sand, trace brick and glass (FILL)		0.61				Í I										
_	1				55.84	2	50 DO	12	Í I										-
-			silt (FILL)				-		Í I										
E		(L			X		50		Í I										
F		w Stei			X	3	DO	9	Í I										
F		olloH)	Compact medium to fine brown to grey	₩	54.95 1.88	$\vdash$	1		Í I										
E		Diam.	sand, some silt and gravel, trace brick		×.	4	50 DO	39	Í I										-
F	1				X				Í I										
F		20(			×				Í I										
E					×.	5	DO	32	Í I										
F	3		Brown to grev SILTY SAND trace gravel		53.78 3.05		50	. 50	Í I										-
F			and clay	₩	53.59 3.24	6	DO	>50	Í I										
Ē			COBBLES and BOULDERS	$\otimes$	8				Í I										
F				$\bigotimes$	Ś	7	50	>60	Í I										
È.	4		End of Borehole	×	52.85 3.98	-	DO	-00											-
E			Auger Refusal						Í I										
Ę									Í I										
-									Í I										
Ē	5								Í I										_
-	Ŭ								Í I										
F									Í I										
Ē									Í I										
-									Í I										
-	6								Í I										-
E									Í I										
Ē									Í I										
F									Í I										
F	7								Í I										-
Ę									Í I										
F									Í I										
E									Í I										
2	8								Í I										
9- -									Í I										
/28/1									Í I										
10-									Í I										
AL-M	y																		-
2 - 0 -																			
99.GF																			
2016																			
1111	0																		-
, 00				1															
SH8	DEP	TH S	CALE							olya	r							LC	DGGED: BM
ŚW 1	: 50	)							<b>V</b> As	<u>SOCI</u>	âtes							CH	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

# RECORD OF BOREHOLE: 11-10

BORING DATE: November 23, 2011

SHEET 1 OF 1

DATUM: Geodetic

		3	SOIL PROFILE			SA	AMPL	ES	DYNAMIC PER RESISTANCE	NETRATI	ON /0.3m	$\overline{)}$	HYDR/	AULIC C k, cm/s	ONDUCT	FIVITY,		٥	
RES	METL			PLOT		R.		).3m	20	40	60 I	80	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	TIONAL	
MET	UNIC		DESCRIPTION	ATA F	ELEV.	JMBE	TYPE	WS/0	SHEAR STRE Cu, kPa	NGTH	nat V.   + rem V. €	- Q- ● 9 U- O	W	ATER C	ONTENT	PERCE	NT	AB. TE	INSTALLATION
	G			STR.	(m)	Ī		BLC	20	40 (	50	80	2	20 4	40 E	 30 8	VVI 60	L A	
0			GROUND SURFACE		54.76														
Ŭ			Loose dark brown sandy silt, trace gravel, organics (TOPSOIL)		54.58		50												
			Loose black silty sand, some gravel, ash_slag (FILL)		. 0.10	1	DO	8											
						2	50	8											
1					53.59	-	DO												
		Stem	Very loose brown fine to medium sand, trace to some silt, some gravel, with		1.17														
	Nuger	Hollow	black silty sand, organic layers (FILL)		×.	3	50 DO	4											
	ower A	jam. (			52.93														
2	Å	D m m	SAND, some gravel		1.03	Ι.	50												
		200			Š	4	DO	11											
					X .														
					Š	5	50 DO	41											
3					2														
					Š	6	50 DO	>50											
ŀ		Ц	End of Borehole		51.33 3.43		-												
			Auger Refusal																
4																			
_																			
5																			
6																			
7																			
8																			
9																			
Ŭ																			
										1									
10																			
					1	I	1	1		1	1		1		1	<u> </u>	1		
DEI	PT	НS	CALE					(	<b>( / )</b> G	olde	r,							LC	DGGED: RI
1:5	50								VAS	socia	tes							CH	ECKED: JW

### **RECORD OF BOREHOLE: 11-11**

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: November 24 & 25, 2011

SHEET 1 OF 1

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

ц	ģ		SOIL PROFILE			SA	MPL	.ES	DYNAMIC PENE RESISTANCE, I	ETRAT BLOWS	ION 5/0.3m		HYDR	AULIC k, crr	CON 1/s	NDUCT	IVITY,		0	
RES				LOT		н.		).3m	20 4	0	60	80	1	0-6	10-5	1	)-4	10-3	TONAL	
MET		אואפ	DESCRIPTION	ATA P	ELEV.	JMBE	TYPE	0/S/0	SHEAR STREN Cu, kPa	GTH	nat V. + rem V. €	- Q - ● 9 U - O	W	ATER	CON		PERCE	INT	B. TE	INSTALLATION
ĩ				STR/	(m)	ž		BLC	20 4	D	60	80		p — 20	40	-0	0	WI 80		
0			GROUND SURFACE		54.84															
			compact dark brown slity sand, trace gravel, organics (TOPSOIL)	<u> </u>	0.00		50	40												
			Compact black silty sand, some gravel, mortar, ash, slag (FILL)				DO	13												
			Compact brown fine to medium sand,		0.63															
1			sand, occasional brown silt pocket,	₩	53.90 0.94	2	50 DO	6												
			Compact brown fine to coarse sand,		X															
			occasional brown silt pocket (FILL)		X	3	50	26												
					53.01															
2			Loose grey silty clay, trace gravel, trace sand, black staining, occasional grey		1.83		50													
			silty sand layer (FILL)		×	4	DO	8												
					52.25															
			Loose dark brown to black silty ORGANICS		2.59	5	50 DO	6												
3			CLAYEY SILT, trace sand	×	51.79 3.05															
		(je	Compact to very dense brown to grey	$\bigotimes$		6	50 DO	28												
	л.	ow Ste	gravel, trace to some silt																	
	er Aug	n. (Hol			§ .	-	50	40												
4	Pow	nm Diar			8	ĺ	DO	40												
		200 m		$\otimes$	8															
					8	8	50 DO	36												
5				$\bigotimes$																
					<pre>X</pre>	9	50 DO	36												
			Compact to very dense brown medium	$\bigotimes$	49.35															
			to coarse SAND, some gravel, trace fine sand, trace silt, occasional fine to	$\otimes$		10	50	21												
6			medium sand layer, with cobbles and boulders		Š.															
			Very dense fine to coarse grey and		48.59 6.25		50													
			brown SAND, some gravel, trace to some silt, with cobbles and boulders			11	DO	53												
					47.98															
7			very dense brown sity inte SAND,		7.01	12	50 DO	100												
			Very dense grey SILTY SAND, some gravel, with cobbles and boulders																	
			(GLACIAL TILL)		47.07	13	50 DO	>50												
0			End of Borehole Auger Refusal		7.77															
0																				
9																				
10																				
				1																
DE	PT	нs	CALE					1	C C	Jde	r								L	OGGED: RI
1:	50								VIASS	OCI	âtes								CH	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 11-12

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: December 1, 2011

	Τ	Q	SOIL PROFILE			SA	MPL	.ES		PEN		ON /0.2m	)	HYDF	AULIC		CTIVI	TY,		(1)	
CALE	ŝ	ETHO		от				E	20 RESISTAL	NCE, 4	0 0	/0.3m 50	80 \		к, ст/	s 10 <sup>-5</sup>	10⁻⁴	1(	) <sup>-3</sup>	STING	PIEZOMETER OR
SHL	Ц Ц	ЫM	DESCRIPTION	A PL	ELEV.	<b>1</b> BER	Ŕ	S/0.3	SHEAR S	TREN	IGTH	nat V.	+ Q-	v	VATER (	CONTE	NT PE	RCE	Í NT	DITIC . TES	STANDPIPE
DEP	≥	ORIN		IRAT	DEPTH (m)	NUN	≿	LOW	Cu, kPa			rem V. (	⊕ U-C	) w	'p ——	-0	W		WI	ADI	INSTALLATION
_	_	8		S	(,			8	20	4	0	50 	80		20	40	60	8	0		
-	0		Loose dark silty sand to sandy silt, trace	EEE	54.55 0.00									_							
F			gravel, organics (TOPSOIL)		0.12	1	50	8													
-			some gravel, ash, slag (FILL)		53.94																
E			Compact brown silty sand, some gravel	Ŵ	0.61																
F	1					2	50 DO	19													-
F					53.33																
E			sand, trace to some silt, trace to some		1.22		50	10													
F						з	DO	13													
F																					
E	2	1				4	50 DO	8													-
F		ger																			
Ē	ŀ	ver Au	Very loose dark brown to black silty		51.96 2.59		50														
F	ſ	o No No			2.74	5	DO	4													
-	3	000	SILT, trace sand	'88	2.90																-
E			SAND, some gravel		3	6	50 DO	24													
F					Å																
E				$\bigotimes$		7	DO	>50													
F	4				)																
Ē			Very dense grey brown SILTY fine to		50.28 4.27																
F			fine to coarse sand pockets (GLACIAL			8	50 DO	66													
Ē			TILL)																		-
-	5				49.37	9	50 DO	>50													_
-			End of Borehole		5.18																
E																					
F																					
F	6																				-
F																					
E																					
F																					
F	7																				-
F																					
E																					
F																					
⊻	8																				-
113 .																					
1/26																					
GDT																					
- MIS.	9																				
GAL																					
GPJ															1						
0199.																					
1122(	10														1						-
7																					
HS 0C	DEF	тн	SCALE						Â											LC	DGGED: RI
AIS-B	1:5	0								G Lss	olde OCi2	r Mes	,							СН	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

### RECORD OF BOREHOLE: 11-13

BORING DATE: November 22, 2011

SHEET 1 OF 1

DATUM: Geodetic

щ		Ģ	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	<u> </u>	HYDRAULIC C k, cm/s	ONDUCTIVITY,	_ 0	
EPTH SCAL METRES		RING METH	DESCRIPTION	ATA PLOT	ELEV.	JMBER	түре	WS/0.3m	20 40 60 I I SHEAR STRENGTH nat V. Cu, kPa rem V.	80 + Q - ● ⊕ U - O	10 <sup>-6</sup> 1 WATER C	0 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup>	ADDITIONAL	OR STANDPIPE INSTALLATION
ā		ġ		STR	(m)	ž		BLC	20 40 60	80	20 4	40 60 80		
— o	-		GROUND SURFACE TOPSOIL	223	56.59 0.00								$\left  \right $	
			Dark brown to black silty sand, trace gravel and brick (FILL)		0.15	1	50 DO	9						
- - - 1 -			Loose to compact medium to fine brown		55.37 1.22	2	50 DO	17						
			sand, trace gravel and silt (FILL)		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	3	50 DO	4						
- 2 - - - -	2				XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	4	50 DO	14						
- - - - 3	5				X X X X X X X X X X X X X X X X X X X	5	50 DO	14						
		w Stem)	Dense coarse brown to black SAND and		52.93 3.66	6	50 DO	46						
- - 4 - 4	Power Auger	nm Diam. (Hollo	GRAVEL, trace cobbles and silt			7	50 DO	30						
		200 r				8	50 DO	33						
- 5 - - - -	5					9	50 DO	55						
- - - - 6	5					10	50 DO	50						
						11	50 DO	19						
- - - - -			Cobbles and boulders (GLACIAL TILL)		49.63 6.96	12	DO	>80	)					
- - - -					48.61	13	50 DO 50	105 >50	5 0.					
T 1/28/13 JE			End of Borehole Auger Refusal		7.98									
SAL-MIS.GD														
0199.GPJ G														
111122														
UIS-BHS 001	EP1 : 50	THS	CALE	<u> </u>	<u> </u>			L(	Golder		<u>   </u>		LC CH	

### LOCATION: See Site Plan

### RECORD OF BOREHOLE: 11-14

BORING DATE: November 22 & 23, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш	Τ	DO	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k. cm/s	
H SCALI		G METH	DECODIDE C'	<b>V PLOT</b>	ELEV.	BER	Ä	\$/0.3m	20 40 60 80	10 <sup>6</sup> 10 <sup>5</sup> 10 <sup>4</sup> 10 <sup>3</sup>	PIEZOMETER OR STANDPIPE
DEPT	M	BORING	DESCRIPTION	STRATA	DEPTH (m)	NUME	TYF	BLOWS	Cu, kPa rem V. ⊕ U - C	Wp - W WI 20 40 60 80	
	0		GROUND SURFACE		55.28						
Ē			Compact dark brown silty sand, some gravel, organics (TOPSOIL)		0.00 54.95	1	50	26			
-			Compact dark brown fine to medium sand, some gravel, asphalt pieces (FILL)		0.33						
-	1		Compact black to dark brown silty sand, some gravel, ash, coal (FILL)		0.74	2	50 DO	22			-
			Compact brown fine to medium sand, some silt (FILL)		54.06	3	50	13			
-			Compact black silty sand, some gravel, ash (FILL)		1.62 53.45						
	2	Stem)	Compact dark brown sandy silt, some clay, trace to some gravel, organics, occasional brown fine to medium sand, occasional grey brown clayey silt to silty clay layers (EII 1)		1.83 52.84	4	50 DO	14			-
	3	n Diam. (Hollow	Very loose to dense grey brown fine to medium SAND, some silt, trace gravel		2.44	5	50 DO	2			
-		200 mr	Dense to compact to very dense brown medium to coarse SAND, some gravel,		51.93 3.35	6	50 DO	33			
	4		trace fine sand, trace silt			7	50 DO	15			-
						8	50 DO	85			
	5		Very dense grey fine to coarse sand, some gravel, some silt, with cobbles and boulders (GLACIAL TILL)		50.40 4.88	9	50 DO	102			-
-	╞		End of Borehole Auger Refusal	61283	49.77 5.51						
-	6										-
-											
Ē											
E	7										-
-											
-											
≥	8										-
/13 JE											
L 1/28											
S.GD											
	9										-
E G											
199.G											
11220	10										-
11											
BHS 0	DEP	TH	SCALE						Golder		LOGGED: RI
AIS-	1:5	0							Associates		CHECKED: JW

# RECORD OF BOREHOLE: 11-15

LOCATION: See Site Plan

### SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: November 24, 2011

SHEET 1 OF 1

DATUM: Geodetic

щ	Τ	DO	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN RESISTANCE,	ETRAT BLOW	ION S/0.3m	<u>\</u>	HYDR/	AULIC C	ONDUC	TIVITY,		.0	
PTH SCAL		RING METH	DESCRIPTION	VTA PLOT	ELEV.	JMBER	гүре	WS/0.3m	20 4 SHEAR STREN Cu, kPa	0 IGTH	60 nat V. + rem V. 4	80 - Q-● → U- O	10 W	0 <sup>-6</sup> 1 ATER C	0 <sup>-5</sup> 1 ONTEN	IO <sup>-4</sup> 1	0 <sup>-3</sup>	DDITIONAL B. TESTIN	PIEZOMETER OR STANDPIPE INSTALLATION
DE		BOR		STRA	(m)	N		BLO	20 4	0	<u>60</u>	<u>80</u>	Wp 2	o	+0	60 E	WI 30	LAI	
_	0		GROUND SURFACE		54.87														
- - -			Compact dark brown silty sand, trace gravel, organics (TOPSOIL) Compact black silty sand, some gravel, ash (FILL)		0.05 54.54 0.33	. 1	50 DO	10											
- - -			Compact to very loose brown fine to medium sand, some coarse sand, trace to some gravel, trace to some silt, occasional brown silt oockets.			2	50 DO	14											
	1		occasional cobble (FILL)		53.55														
-		Stem)	sand, trace gravel, trace clay, occasional grey silty clay to clayey silt layers (ORGANICS)			3	50 DO	4											
-	2	wer Auger am. (Hollow \$			52 43	4	50 DO	4											
- - -	ć	200 mm Di	Loose dark brown to black fine to medium SAND, some silt, some gravel, organics		2.44	5	50 DO	9											
 - -	3		Very dense to compact grey to brown SILTY SAND, some gravel, occasional cobble and boulder, with fine to medium		51.82 3.05	6	50	57											
			sand, some gravel, some silt layers				50												
-	4					7	50 DO 50 DO	14 >50											-
F	-		End of Borehole		50.35 4.52														
-	5																		
-	7																		
-																			
-	8																		-
-	a																		
- 1	0																		
	DEP	TH S	GCALE	_				(	G	olde	r							L	DGGED: RI
1	: 5	υ							<b>V</b> ASS	<u> </u>	ates							CH	EGRED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

## RECORD OF BOREHOLE: 11-16

BORING DATE: November 28 & 29, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш			3	SOIL PROFILE			SA	MPL	ES	DYNAMIC P RESISTANC	ENETR		N .3m	$\sum_{i=1}^{n}$	HYDR	AULIC C	ONDUCT	TIVITY,		. (7)	
SCAL	IRES	METH			PLOT		Яï	101	J.3m	20	40	60	8	i0 `	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	FIONAL ESTIN	
EPTH	MET	UNIC		DESCRIPTION	ATA F	DEPTH	IUMBE	TYPE	D/S/MC	SHEAR STF Cu, kPa	ENGTH	l na rer	tV. + mV.⊕	Q - ● U - O	W			PERCE	NT	ADDIT AB. TE	INSTALLATION
	_	ä	3		STR	(m)	2		BLO	20	40	60	8	0	2	20 4	ιο ε	• 80 8	80 I	L.	
F	0			GROUND SURFACE TOPSOIL	EEE	54.61 0.00					_										
F				Compact black silty sand, some gravel, trace ash, brick, occasional layers of fine		0.15	1	50 DO	12												-
F				to medium brown sand and gravel (FILL)																	-
Ē							2	50	22												
Ē	1					53.39		00													
Ē				Very loose black coarse sand, some ash, gravel, trace silt and brick (FILL)		1.22		50	_												-
-						52.78	3	DO	5												
F	2			Very loose brown to grey coarse sand, trace silt and gravel (FILL)		1.83		50													-
F							4	DO	4												-
Ē																					-
Ē			v Stem				5	50 DO	5												-
Ē	3	r Auger	. (Hollo				⊢														
Ē		Powe	m Diam	Compact medium to fine grey SAND,		51.26 3.35	6	50 DO	19												-
Ē			200 m		$\bigotimes$																-
F	4				$\bigotimes$	X	7	50 DO	18												-
E					$\bigotimes$																-
E					$\bigotimes$		8	50 DO	12												-
F	_				$\bigotimes$																-
F	5				$\bigotimes$																
Ē					$\bigotimes$																-
Ē					$\bigotimes$		9	50	12												-
F	6				$\bigotimes$	8															-
Ē					$\bigotimes$	48.18	10	50 DO	>50												-
Ē				End of Borehole Auger Refusal		6.43															-
Ē	7																				-
Ē																					-
Ē																					-
F																					
NEN L	8																				
28/13																					-
DT 1																					
MIS.G	9																				
GAL-I	-																				
GPJ																					-
20199																					-
11112	10																				_
001					L																
S-BHS	DEF	PTI	H S	CALE					(		Gold	ler								LC	DGGED: BM
ЯW	1:5	50								<b>V</b> AS	<u>550(</u>	ciat	tes							CH	ECKED: JW

### RECORD OF BOREHOLE: 11-17 LOCATION: See Site Plan

BORING DATE: November 21, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш	Т	OD	SOIL PROFILE			SA	MPL	ES	DYNAMIC PER	NETRA	TION /S/0.3m	<u> </u>	HYDF	RAULIC	CONDU /s	CTIVITY,		.0	
H SCAL TRES		METH		PLOT		КШ		0.3m	20	40	60	80		10 <sup>-6</sup>	10 <sup>-5</sup>	10 <sup>-4</sup>	10 <sup>-3</sup>	TIONAL	OR STANDPIPE
DEPTH		DRING	DESCRIPTION	RATA	DEPTH	NUMBI	TYPE	NSWO.	SHEAR STRE Cu, kPa	NGTH	nat V. rem V.	+ Q- ⊕ U- (		VATER /p ——		NT PERC	ENT WI	ADDI LAB. T	INSTALLATION
_		BC		STI	(m)	-		В	20	40	60	80	_	20	40	60	80		
-	0		Compact dark grey crushed stone with	<b>**</b>	56.66 0.00	-													
			Corganics (FILL) Compact brown to dark brown silty sand, some gravel, trace clay, brick (FILL)	1	0.13 56.05	1	50 DO	17											
-	1		Compact dark brown and black silty sand to sandy silt, some gravel, ash, brick (FILL)		0.61	2	50 DO	22											
-			Compact brown sand, some silt, some gravel, with grey brown silty clay layers (FILL)		0.99	_													
-			Loose to very loose arey brown SILTY		54.98 1.68	3	DO	14											
-	2		CLAY, trace to some sand, trace gravel, occasional sand pockets			4	50	7											
-																			
-	3					5	50 DO	4											
			Very dense to loose brown SAND, trace to some silt, some gravel, occasional cobble and boulder, occasional coarse sand lavers occasional silty sand lavers		53.46 3.20	6	50 DO	16											
-	4 Japan	Hollow Stem)	occasional fine sand layers			7	50 DO	34											-
	Power /	200 mm Diam. (				8	50 DO	46											
-	5					9	50 DO	26											
-	6					10	50 DO	4											
						11	50 DO	62											
-	7					12	50 DO	27											
					48.89	13	50 DO	104											
- - - - -	8_		Very dense grey SANDY SILT, some gravel, trace clay (GLACIAL TILL)		7.77	14	50 DO	>100	2										-
/28/13							50												
		-	End of Borehole Auger Refusal	<u>-</u> 674	¥8.07 8.59	15	DO	>70											
-MIS	9		Possible Bedrock																
J GAL																			
99.GP																			
12201																			-
- 1 - 1 - 1 - 1	U																		
OO SH D	)EP	TH S	SCALE											-				L	JGGED: RI
ISIM	: 50								<b>U</b> As	<b>010</b> 50Ci	er iates	5						СН	ECKED: JW

# RECORD OF BOREHOLE: 11-18

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: November 22, 2011

SHEET 1 OF 1

DATUM: Geodetic

ואואס אובו	DESCRIPTION	LOT		ı					۰ <b>۱</b>							
1 7		RATA F	ELEV.	NUMBER	ТҮРЕ	OWS/0.3m	20 40 I I SHEAR STRENGT Cu, kPa	60 H nat V. rem V	80 + Q- ⊕ U- C	0 W	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1 ONTENT	0 <sup>-4</sup> 1 PERCE	0 <sup>-3</sup> NT WI	ADDITION -AB. TESTI	OR STANDPIPE INSTALLATION
ň		STF	(m)	-		BL	20 40	60	80	2	20 4	40 6 	50 8	30		
$\square$	Compact dark brown silty sand, trace	EEE	56.83 0.00													
-	Veravel, organics (TOPSOIL) Compact dark brown to brown fine to medium sand, some gravel, some silt, ash, brick, with occasional brown clayey silt layers, some sand, trace gravel (FILL) Compact to dense dark brown to black fine to medium sand, some gravel, some silt, brick, ash, organics, occasional grey brown silty clay layers (FILL)		0.13 <u>55.69</u> 1.14	2	50 DO DO 50 DO	18 22 11										
			54.39	4	50 DO	>50										
	Compact grey fine to medium sand, some gravel, some silt, brick (FILL)/ Compact black silty sand, some gravel, ash (FILL)		2.44 2.59 53.93 2.90	5	50 DO	16										
(-	Some gravel, trace silt (FILL) / Compact dark brown to black silty sand, Some gravel, ash, coal (FILL) / Compact grey brown SILTY CLAY to CLAYEY SILT, some sand, trace gravel,		53.48 3.35	6	50 DO	14										
m. (Hollow Ster	occasional fine to coarse sand layer		52.61 4.22 52.41	7	50 DO	21										
200 mm Dia	to some gravel (FILL) Loose black silty ORGANICS Loose to dense brown fine to medium SAND, trace to some silt, trace gravel		4.42	8	50 DO	7										
-	Dense to loose brown medium to coarse SAND, trace gravel, trace silt, trace fine sand		51.65 5.18	9	50 DO	30										
	Very loose brown fine to medium SAND,		50.73 6.10	10	50 DO	6										
				11	50 DO	4										
	Very loose to compact brown medium to		49.51 7.32	12	50 DO	19										
	occasional fine to medium sand layer			13	50 DO	1										
	End of Borehole		48.29 8.54	14	50 DO	11										
	Auger Refusal															
	200 mm Diam. (Hollow Stern)	Compact dark brown to brown fine to medium sand, some gravel, some silt, ash, brick, with occasional brown clayey silt layers, some sand, trace gravel (FILL) Compact to dense dark brown to black fine to medium sand, some gravel, some silt, brick, ash, organics, occasional grey brown silty clay layers (FILL) Compact black silty sand, some gravel, ash (FILL) Compact brown fine to coarse sand, some gravel, trace silt (FILL) Compact dark brown to black silty sand, some gravel, trace silt (FILL) Compact dark brown to black silty sand, some gravel, trace silt (FILL) Compact grey brown SILTY CLAY to CLAYEY SILT, some sand, trace gravel, occasional fine to coarse sand layer Loose brown sandy silt, some clay, trace to some gravel (FILL) Loose brown fine to medium to coarse SAND, trace to some silt, trace fine sand Very loose brown fine to medium SAND, trace silt Very loose brown fine to medium SAND, trace silt Very loose brown fine to medium SAND, trace silt Very loose to compact brown medium to coarse SAND, trace fine sand, trace silt, occasional fine to medium sand layer	Compact dark brown to brown fine to medium sand, some gravel, some silt, ash, brick, with occasional brown clayey silt layers, some sand, trace gravel (FILL)         Compact to dense dark brown to black fine to medium sand, some gravel, some silt, brick, ash, organics, occasional grey brown silty clay layers (FILL)         Compact grey fine to medium sand, some gravel, some gravel, some silt, brick (FILL)         Compact grey fine to medium sand, some gravel, some silt, brick, silty sand, some gravel, ash (FILL)         Compact brown fine to coarse sand, some gravel, ash (FILL)         Compact dark brown to black silty sand, some gravel, ash, coal (FILL)         Compact grey brown SILTY CLAY to Compact grey brown SILTY CLAY to CLAYEY SILT, some sand, trace gravel, occasional fine to coarse sand layer         Loose brown sandy silt, some clay, trace to some gravel (FILL)         Loose brown sandy silt, some clay, trace fine sand         Very loose to compact brown medium to coarse SAND, trace gravel, trace silt, trace fine sand         Very loose brown fine to medium SAND, trace silt         Very loose brown fine to medium to coarse SAND, trace fine sand         Very loose brown fine to medium to coarse SAND, trace fine sand         Very loose brown fine to medium sand tayer         Very loose brown fine to medium sand layer         Very loose to compact brown medium to coarse sit diverse silt, occasional fine to medium sand layer         End of Borehole         Auger Refusal	Compact dark brown to brown fine to medium sand, some gravel, some silt, fine to medium sand, some gravel, some silt, brick, ush, organics, occasional grey brown silty clay layers (FILL) Compact grey fine to medium sand, some gravel, some silt, brick (FILL) Compact black silty sand, some gravel, ash (FILL) Compact dark brown to black silty sand, some gravel, some silt, brick (FILL) Compact dark brown to black silty sand, some gravel, sah, coal (FILL) Compact dark brown to black silty sand, some gravel, sah, coal (FILL) Compact dark brown to black silty sand, some gravel, taxe silt (FILL) Compact dark brown to black silty sand, some gravel, taxe silt, coarse sand, some gravel, taxe silt, some clay, trace Loose brown sandy silt, some clay, trace brown sandy silt, some clay, trace SAND, trace to some silt, trace fine sand Very loose brown fine to medium to coarse SAND, trace gravel, trace silt, trace fine sand Very loose brown fine to medium SAND, trace silt Very loose to compact brown medium to coarse SAND, trace fine sand, trace silt, occasional fine to medium SAND, trace silt Very loose to compact brown medium to coarse SAND, trace fine sand, trace silt, occasional fine to medium sand layer 44.51 SAND, trace fine sand, trace silt, occasional fine to medium sand layer 44.52 SAND, trace fine sand, trace silt, occasional fine to medium sand layer 44.53 SAND, trace fine sand, trace silt, sand 44.54 SAND, trace fine sand, trace silt, sand 51.65 SAND, trace silt 51.65 SAND, trace fine sand, trace silt, sand 51.65 SAND, trace silt 51.65 SAND, trace silt 51.65 SAND, trace silt 51.65 SAND, trace silt 51.65 SAND, t	Compact dark brown to brown fine to medium sand, some gravel, some silt layers, some sand, trace gravel (FILL) 2 Compact to dense dark brown to black fine to medium sand, some gravel, some silt, brick, ash, organics, occasional grey brown silty clay layers (FILL) 3 Compact dark brown to black fine to medium sand, some gravel, some gravel, some silt, brick (FILL) Compact black silty sand, some gravel, ash (FILL) Compact brown fine to coarse sand, some gravel, trace silt (FILL) Compact dark brown to black silty sand, some gravel, trace silt (FILL) Compact dark brown to black silty sand, some gravel, trace silt (FILL) Compact dark brown to black silty sand, some gravel, trace silt (FILL) Compact dark brown to black silty sand, some gravel, trace silt (FILL) Compact dark brown fine to coarse sand. Some gravel, trace silt (FILL) Compact dark brown fine to medium SAND, trace to some silt, trace gravel bose brown sandy silt, some clay, trace sAND, trace to some silt, trace gravel sand 4.47 Very loose brown fine to medium to coarse SAND, trace gravel, trace silt, trace fine sand 4.47 Very loose brown fine to medium SAND, trace silt 11 Very loose brown fine to medium SAND, trace sAND, trace fine sand, trace silt, sand 4.48 4.48 4.48 4.48 4.48 4.48 4.48 4.4	Compact dark brown to brown fine to medium sand, some gravel, some silt, ash, brick, with occasional brown clayey silt layers, some sand, trace gravel       1       1       00         Compact to dense dark brown to black fine to medium sand, some gravel, some silt, brick, ash, organics, occasional grey brown silty clay layers (FILL)       55.69       50         Compact grey fine to medium sand, some gravel, some sand, trace gravel, some gravel, some gravel, some sand, trace gravel, occasional fine to coarse sand layer       7       50         Compact dark brown to black silly sand, some gravel, some gravel (FILL)       3.38       6       50         Compact dark brown to black silly sand, some gravel, some gravel, some sand, trace gravel, occasional fine to coarse sand layer       7       50         Compact gravel (FILL)       51.66       9       50         Loose brown sandy sill, some clay, trace fine sand, trace gravel       4.57       8       50         Dense to loose brown fine to medium SAND, trace silt, occasional fine to medium SAND, trace silt, occasional fine to medium SAND, trace silt, occasional fine to medium sand layer       11       50         Very loose to compact brown medium to coarse SAND, trace fine sand, trace silt, occasional fine to medium sand layer       13       50<	Compact dark brown to brown fine to medium sand, some gravel, some silt, ash, brick, with occasional brown clayey silt layers, some sand, trace gravel (FILL)       1	Compact dark brown to brown fine to medium sand, some gravel, some sit, sith kyrck, with occasional brown clayey sith layers, some sand, trace gravel (FIL)       2       00       22         Compact to dense dark brown to black fine to medium sand, some gravel, some sith brick, sah, organic, soccasional grey brown sity clay layers (FIL)       3       00       11         Compact to dense dark brown to black fine to medium sand, some gravel, Compact grey fine to medium sand, some gravel, some sith, brick (FIL)       5       00       16         Compact to dense dark brown to black fine to medium sand, compact grey fine to medium sand, some gravel, some sith, track sithy sand, compact dark brown to black sithy sand, compact dark brown fine to coarse sand compact sith (FIL)       7       60       21         Compact dark brown to black sithy sand, compact dark brown fine to coarse sand some gravel, sith, some daw, trace sand       7       60       21         Compact dark brown sith trace gravel       61.66       9       50       30         Doose brown fine to coarse sand layer       61.66       9       50       11         Doose brown fine to medium SAND, trace sith       7.7.2       13       50       1         Uoose brown fine to medium SAND, trace sith       6.10       10       50       1         Uoose brown fine to medium SAND, trace sith       7.32	Compact dark brown to brown files to medium sand, some gravel, some silt, ash, brick, with occasional brown clayey silt layers, some sand, trace gravel (FLL)     1     1     0     1       Compact for the to medium sand, some gravel, some silt, trace gravel, some gravel, trace gravel, trace gravel, trace silt, trace fine sone gravel, trace silt, trace fine some gravel, trace silt, trace silt, some some silt, trace silt, some some some some some some some some	Compact dark brown to brown fine to medium sand, some gravel, some sint, some sand, trace gravel (rLL).     1     00     19       Compact dark brown to black fine to medium sand, some gravel, some sint, brick, sah, organics, occasional grey brown silt, brick (rLL).     3     50     11       Compact dark brown to black filt     4     50     -50       Compact dark silt wait, come gravel, some silt, trace gravel, some silt, trace gravel, trace silt, trace gravel, trace silt, trace gravel, some silt, trace silt, occasional fine to medium sond, trace silt, occasional fine to medium sond layer     1     5     6     0	Compact dark brown to brown fine to medium sand, some gravel, some sitt, and, brick, with occasional brown days gravel (FILL)     500     10       Compact forme addrix brown to black fine to medium sand, some gravel, some sitt, brick, seth, organics, occasional gravel (FILL)     500     11       Compact forme addrix brown to black fine to medium sand, some gravel, some sitt, brick, seth, organics, occasional gravel (FILL)     500     10       Compact forme addrix block (FILL)     500     10       Compact forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme addrix block (FILL)     52.66     600     14       Compact forme forme forme forme forme forme addrix fo	Compact dark brown to brown fine to medium sol some gravel, some gravel, some gravel, some sold, race gravel     1     0     1       Compact to dense dark brown to black some gravel, fine to medium sold, some gravel, some gravel, some sold, race gravel, fine to medium sold, some gravel, some sold, race sol	Compact dirk torown to consider a source gravel, some gravel, som	Compact disk torown to brown fine to medun sand, some gravel, some sitt, kick, some sadt, some gravel, some sitt, kick, some gravel, some sitt, kick, some gravel, some sitt, kick, some sadt, some sadt, some some sitt, kick, some sadt, some sadt, some gravel, trace sitt, like, some some gravel, trace sitt, kick, some some sitt, kick, some sadt, kick, some some sitt, kick, some sadt, kick, some some sitt, kick, some sitt, kick, some some sittt, kick, some sitt, kick, some s	Compact date town to brown the tom gravel, some diated gravel, some diated gravel, some gravel, some gravel, some gravel, some diated gravel, some diated gravel, some diated gravel, some gravel, some gravel, some gravel, some gravel, some diated gravel, some gravel, some diated gravel, some gravel, some diated gravel, some diated gravel, some diated gravel, some gravel, some gravel, some diated gravel, gravel, some gravel, s	Compact date town to town the town and years and
### **RECORD OF BOREHOLE: 11-19**

LOCATION: See Site Plan

BORING DATE: November 25 & December 15, 2011

SHEET 1 OF 3

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Τ	ДQ		SOIL PROFILE			SA	MPL	ES.	DYNAMIC PENETRAT RESISTANCE, BLOW	ION 3/0.3m	$\overline{\boldsymbol{\lambda}}$	HYDRA	AULIC C k, cm/s	ONDUCT	JIVITY,		<u>ې</u> ب	PIEZOMETE
	G METI			A PLOT	ELEV.	BER	 Н	\$/0.3m	20 40	60 8	30 - O - •		) <sup>-6</sup> 1	0 <sup>-5</sup> 1		0 <sup>-3</sup>	TESTIN	OR STANDPIPI
	<b>30RINC</b>		DESCRIPTION	TRATA	DEPTH (m)	NUME	TYF	SMOUS	Cu, kPa	rem V. ⊕	Ŭ-Ō	Wp				WI	ADD LAB.	INSTALLATI
+		╉	GROUND SURFACE	ω.	56.03	$\vdash$	$\vdash$		20 40	<u>60 8</u>	30	20	0 4	<u> </u>	<u>30 0</u>	30		[
"		7	TOPSOIL Compact brown silty sand, some gravel.		0.00					1								
		$\left  \right $	trace slag (FILL)	₩	55.67 0.36	1	50 DO	11										1
		ł	some gravel, trace silt (FILL)/	鬱	55.47 0.56		-											I
		ſ	Grey clay (FILL) // Compact grey gravel, some sand, trace		0.69	2	50	29										I
1			silt, slag, and brick (FILL)			-	DU											I
		╞	Black silty sand, trace brick (FILL)	×	54.71		1											I
		┢	Grey to brown fine to medium sand,	×	54.51 1.52	3	50 DO	52										I
		+	trace silt (FILL)	₩	54.25 1.78													I
2		┟	Compact brown coarse sand, some	₩	54.05 1.98		50											I
			gravel and clay, trace silt and brick (FILL)		×.	4	DO	20										I
					Š.	$\vdash$												I
		┢		₩	53.29	5	50 DO	5										1
3			Giey to black Obar	$\otimes$														1
				$\bigotimes$	Ž.		50											1
	1	Ê		$\otimes$	Ś	6	DO	4										1
	-	w Ste		$\bigotimes$	Ž.	$\vdash$	-											I
4	Land	₿ H		$\otimes$	Ŕ	7	50	4										I
1		nam.	Grey to blue CLAY	$\bigotimes$	51.92 4.11		00											I
			Dark brown silty ORGANICS		4.27													1
	2	2				8	50 DO	27										1
		╞	Loose arey brown SAND and GRAV/FL		51.15	$\vdash$	-											1
5			trace silt	$\otimes$	Š	9	50	9										1
				$\otimes$	Ŕ		DO	Ŭ										1
				$\otimes$	Š		1											1
				$\otimes$	Ŕ	10	50 DO	7										1
6				$\otimes$	Š		-											1
				$\otimes$	Ŕ	11	50	10										1
				$\otimes$	40.22	''	DO	10										1
		ł	Loose, coarse to medium brown SAND,	$\bigotimes$	6.70	┝┤												1
7			some sin	$\otimes$	Š	12	50 DO	6										1
				×	48.71													1
			SAND, trace silt	₩	48.49	13	DO	>50										1
			Coarse grey to brown SAND, some gravel, with cobbles and boulders	$\otimes$	/ 7.54 X													1
8 -	_	4	Cobbles and boulders (GLACIAL TILL)	X	48.03		-											1
			CODDIES and DOUIDERS (OLACIAL TILL)		\$	C1	NQ	DD										1
							RC											1
					Ś													1
9		Core				C2	NQ	סס										1
		ğ			\$ \$		RC											1
					46.50													1
		ſ	Fresh, grey LIMESTONE BEDROCK	Ħ	9.53		NQ											1
				臣	-		RC											1
		-  -			1					1				[		†		 
0			CONTINUED MEXTTAGE										1					



### RECORD OF BOREHOLE: 11-19

SHEET 2 OF 3 DATUM: Geodetic

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: November 25 & December 15, 2011

	Т	0	SOIL PROFILE			SAN	/PLES	DYNA	MIC PEI	NETRATI	ION	``	HYDR	AULIC C	ONDUC	FIVITY,			
CALE ES		ETHO		5	-+	_, uv	Ε	RESIS	TANCE	, BLOWS 40	60.3m	80	1	k, cm/s ∩ <sup>-6</sup> 1	6 0 <sup>-5</sup> 1	0-4 1	0 <sup>-3</sup>	TING	PIEZOMETER
TH SC ETRE		IG ME	DESCRIPTION	APLO	LEV.	BER	PE S/0.3	SHEA	R STRE	NGTH	nat V. +	- Q- ●	- N	ATER C	ONTENT	PERCE	NT	DITIO	
DEP		SORIN		IRAT.	EPTH (m)	NUN		Cu, kF	Pa		rem V. ∉	€ U- O	w	р ——	OW		WI	ADI LAB.	INSTALLATION
	+	В		ی ا	(,		8	:	20	40	60	80	1	20 4	10 E	50 E	30		
- 10	- L	Т	Fresh, grey LIMESTONE BEDROCK				NO												
-					Ľ	<sup>C3</sup>	RC												
-																			
F	Į.	Jue																	
- - 1'	1 40					~													-
E	ľ				ľ	1	RC												
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E					44 17														
- 1:	2	-	End of Borehole		11.86														-
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12201																			
111 111 111	0																		-
001										1	1	1	1	1	1	1	1		
SH <sup>a</sup>	EP	TH S	SCALE						<b>F</b> G	olde	r							LC	DGGED: BM
SIM 1	: 50	D						V	As	soci	<u>ātes</u>							CH	ECKED: JW

		NTION: -90° AZIMUTH:					JN	L C	RIL	LIN	IG (		ITR			R: N	Mar PL	rath	on Dri anar	illing	PO- F	Polis	hed			BR	- E	Broke	n Ro	ick	
	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH <u>COLOUR</u>		T - F HR- S N - \ I - C RECC	ault Shea /ein Conji OVEF	r Jgate RY DLID RE %	R.C.	40 SP 20 SP	- Foli - Cor - Orti - Cle FRA( INDE 0.3	ation nact nogo avag CT. EX R m 207	nal le B An	gle 027	IR DIP DIP COA 000	J- Cu I- Ur - St - Irr SCC w.r.t. RE IS 066	Inved indulating epped egular DNTINU TYPE AI DES	g ITY D. ND SUI CRIPTI	K - S SM- S Ro - F MB- N ATA ATA	Slicke Smoo Roug Mech	ensic oth gh hanic	al Bi	YDR NDU K, cn	NOT abb of a XAULI ICTIV m/sec 7 0 0	TE: F reviat ibbrev ibols.	Diame Point L Inde (MP	etral oad a) o	I Dist RMC -Q' AVG.	
8		BEDROCK SURFACE Cobbles and boulders (GLACIAL TILL)		48.03 8.00	C1																										
9					C2																										
0	Rotary Drill NO Core	Fresh, grey LIMESTONE BEDROCK		<u>46.50</u> 9.53	СЗ																										
1					C4																										
		End of Drillhole		44.17 11.86																											
2																															
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5																															
6																															
7																															
8																															

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

# RECORD OF BOREHOLE: 11-20

BORING DATE: November 28, 2011

SHEET 1 OF 1

DATUM: Geodetic

Normal Sector         Normal S	,
LELY         Bit Hash         Bit Hash <th< td=""><td>PIEZOMETER OR</td></th<>	PIEZOMETER OR
B         B         Column         B         Column         Column <t< td=""><td>STANDPIPE</td></t<>	STANDPIPE
Image: constraint of the bit of	1
0     1     100 8004.     100 800 Million 200	+
a     a     b     compact data thorw to black sity send.     a     a     a       a     b     a     a     b     a       b     a     b     b     a       c     b     a     b     a       c     b     a     b     a       c     c     b     a     b       c     c     b     a     b       c     c     c     b     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     c       c     c     c     c     <	
1     1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1 <td></td>	
1       1	
No.     No.     No.       14     Auger Refnal     14       2     1       3     1       4     1       5     1       4     1       5     1       4     1       5     1       4     1       5     1       4     1       5     1       6     1       7     1       7     1       8     1       9     1       9     1       9     1       9     1       9     1	
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12201996ED GALMIS.GDT 128/13 JEW	
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	OGGED BM
	HECKED: JW

### RECORD OF BOREHOLE: 11-20A

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: December 1, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш		DO	SOIL PROFILE			SAI	MPLE	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0	N N L3m L	HYDRAULIC C	ONDUCTIVITY,		
SCAL		ΠH		-oT		~		Зm	20 40 60	80	10 <sup>-6</sup> 1	0 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup>	STING	PIEZOMETER OR
AFTH S		2 UZ	DESCRIPTION	LA PL	ELEV.	ABEF	۳,	/S/0.:	SHEAR STRENGTH na	it V. + Q - ●	WATER C	ONTENT PERCENT	ΞΞ.	STANDPIPE
DEP		ORIN		TRAT	DEPTH (m)	Ŋ		ΓO	Cu, kPa rer	m V.⊕ U-O	Wp 🛏	→ <sup>W</sup> wi	AD	
	_			S			_	8	20 40 60	80	20 4	40 60 80	+	
-	0		TOPSOIL	EEE	54.88								+	
E			Compact dark brown to black silty sand,	525	0.18									
-			some gravel, trace ash and brick (FILL)	2.										
F				2										
F														
E	1				53.66									
E			Compact to dense brown to grey fine to medium sand trace silt some gravel		1.22									
F			concrete, asphalt (FILL)		×	1	50 DO	21						:
Ē					X									
-	2				52 75		50							-
E			Dense to loose dark brown with black		2.13	2	DO	35						
E			clay, ash, mica, organics, brick (FILL)		ž.									
Ē						3	50	9						
F		Stem			E1 02	Ŭ	DO	Ū						
E	o la	- Adlow	Compact grey brown clayey silt to silty		3.05									
È	A D		wood, sheen, odours (FILL)	Æ	51.53 3.35	4	50 DO	10						
F	Ğ		Compact black fine to medium sand, trace silt, trac egravel, black staining,		51.22									
Ē		200	odours, sheens (ORGANICS)	'🕅	3.66									
E	4		fine to medium sand seams/layers, trace	$\otimes$		5	50 DO	12						
E			Siit	$\otimes$	×									:
F			Compact grey CLAYEY SILT, some silt	₩	4.42		50							-
F			Compact grey brown medium to coarse SAND. trace fine sand	$\otimes$	4.57	°	DO	14						
E	5		Loose to very dense grey to brown fine	₿	<u>50.00</u> 4.88									
-			to medium SAND, trace to some coarse sand, trace silt	$\otimes$	8	7	50	7						
F				$\otimes$	X									
F				$\otimes$	8									
_				$\otimes$	Å	8	50 DO	36						
F	6			$\otimes$	X									
F					48.55	9	50	35						
E			some gravel, trace silt	$\otimes$	48.27									
E			End of Borehole Auger Refusal		6.61									
<u> </u>	7													-
-														
-														
E														
Щ Г Г	8													-
8/13														
112														:
ED -														
-MIS	9													
GAL														
GPJ														:
199.4														:
1220														
É	5													
001			L		1					I	1			1
Hanger L	)EP	TH	SCALE					(	Golder				L	OGGED: RI
SH 1	: 50	0							Associat	tes			CH	IECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

# RECORD OF BOREHOLE: 11-21

BORING DATE: December 6, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш		QD	SOIL PROFILE			SA	MPLE	s	DYNAMIC PENI RESISTANCE.	ETRA <sup>T</sup> BLOW	TION /S/0.3m	<u> </u>	HYDR	AULIC C	ONDUCT	FIVITY,		.0	
SCAL RES		METH		LOT		Ľ.		.3m	20 4	0	60	80	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0-3	IONAL STIN(	PIEZOMETER OR
METH		л S S S S	DESCRIPTION	TAP	ELEV.	MBE	ΥPE	NS/0	SHEAR STREN	GTH	nat V.	+ Q-● ⊕ U-0	w	ATER C	ONTENT	PERCE	NT	B. TE	STANDPIPE INSTALLATION
DE		BOR		STRA	(m)	P		BLO	20 4	<u>^</u>	60		W				WI	LAI	
	╈		GROUND SURFACE		59.07				20 4	0	00	0		.0 4					
- (		Π	Loose dark brown silty sand, organics		0.00														
E					58.71	1	50 DO	5											
E			gravel, brick, organics, ash (FILL)		0.36														
F						2	50 DO	>50											
È.	1																		_
-						3	50 DO	18											
-																			
-					57.04		50												:
F,			Compact to very dense grey brown		57.24	4	DO	15											
Ē	2		SILTY SAND, trace to some gravel																-
-						5	50	54											
-							DO												
-		Stem																	
- :	3 1	Pllow				6	50 DO	35											
-	Wer A	iam. (																	
-	ď	L L L L L					50												
_		200				7	DO	76											-
4	4		Very dense grey brown SILTY SAND,		55.11 3.96		50												-
-			trace to some gravel (GLACIAL TILL)			8	50 DO	>75											
-																			-
-						9	50	150											
	5																		
_			Very dense grev SILTY SAND to		53.89 5.18	40	50	100											
_			SANDY SILT, trace to some gravel			10	DO >	102											
						11	50 DO >	100											
-																			
- (	5					12	50	.05											-
					52.62	12	DO	~65											
			End of Borehole Auger Refusal		6.45														
			·																
• 7	7																		
													1						
- 8	в												1						-
													1						:
-													1						-
- `	1												1						
-																			:
-																			-
- 10	ו																		-
				1									1						l
D	EP	TH S	CALE						G	olde	er							LC	DGGED: RI
1	: 50	)							<b>V</b> Ass	OCi	ates	5						CH	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

# RECORD OF BOREHOLE: 11-22

BORING DATE: December 7, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш		DD	SOIL PROFILE			SA	MPL	ES	DYNAMIC PE RESISTANCI	NETRA	TION /S/0.3m	$\sum_{i=1}^{n}$	HYDR	AULIC C	ONDUCT	TVITY,		.0	
SCAL	N L L	METH		ъсот		н.		).3m	20	40	60	80	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 10	0 <sup>-4</sup> 10	0 <sup>-3</sup>	TIONAL	
EPTH	ME	RING	DESCRIPTION	ATA F	DEPTH	UMBE	TYPE	J/S/(C	SHEAR STRE Cu, kPa	ENGTH	nat V.  + rem V. €	- Q- ● 9 U- O	W	ATER C		PERCE	NT	ADDIT AB. TE	INSTALLATION
ā		BOI		STR	(m)	z		BLO	20	40	60	80	2	20 4	i0 6	8 0	0	L A	
-	0	_	GROUND SURFACE	223	57.34														
E			organics (TOPSOIL)	<b>F</b>	0.13		50	2											
E			Very loose grey brown silty sand to sandy silt, trace to some gravel, trace			'	DO	3											-
-			clay, bricks, organics (FILL)																-
E	1					2	50 DO	4											-
Ē					8														-
-						3	50	4											-
-					55.51		00												
<u> </u>	2		Loose grey brown silty clay, some sand, trace gravel (FILL)		1.83														-
-					X	4	DO	6											-
-		Stem)			X														
Ē			Loose dark brown to black silty		54.60	5	50 DO	7											
Ē	3	iam. (F	ORGANICS Loose to dense brown silty fine SAND,	Ŕ	2.90														-
È	ć		trace gravel, black staining (odours)	$\bigotimes$		6	50	48											:
Ē		200	Dense to very dense grey brown SILTY	$\bigotimes$	53.83 3.51		DO												
Ē			SAND, trace to some gravel, trace clay, black staining (odours), occasional black	$\otimes$	8	7	50	>80											-
-	4		tine to medium sand layer		53.27 4.07	╘													-
Ē			sandy silt, trace to some gravel, occasional fine to course sand layer			8	50 DO	42											
F			(GLACIAL TILL)			<u> </u>													-
Ē						9	50	170											-
Ē	5																		-
F						10	50 DO	>130	J										-
Ē						11	50	>160	)										-
Ē	_		End of Borehole	<u> </u>	51.45 5.89														
F	0		Auger Refusal																-
Ē																			-
F																			
Ē	7																		-
-																			-
-																			
Ē																			-
	8																		-
/13 J																			-
1/28																			-
S.GD1																			-
L-MIS	9																		-
J GA																			
99.GP																			
22019																			
1111	10																		-
001				<u> </u>	1	L							1						l
S-BHS	DEP	TH	SCALE							old	er							LC	DGGED: RI
NIN NIN	1:5	0							<b>V</b> JAs	soci	ates							CH	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

# RECORD OF BOREHOLE: 11-23

BORING DATE: December 6, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш	Т	ПО	SOIL PROFILE			SA	MPL	ES	DYNAMIC PE		FION /S/0.3m	<u>ک</u>	HYDR	AULIC C	ONDUCT	IVITY,		. (7)	
I SCAL		METH		PLOT		R.	112	J.3m	20	40	60	80	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 10	)-4 1(	) <sup>-3</sup>	FIONAL	
EPTH		RING	DESCRIPTION	ATA F	DEPTH	IUMBE	ТҮРЕ	)/S/MC	SHEAR STRE Cu, kPa	INGTH	nat V. + rem V. ∉	- Q - ● 9 U - O	W	ATER C		PERCE	T	ADDIT AB. TI	INSTALLATION
		B		STR	(m)	2		BLo	20	40	60	80	2	20 4	0 6	0 8	0	L.	
_	0		GROUND SURFACE TOPSOIL	ESS	56.36 0.00					-									
F			Compact brown fine to medium sand, trace silt, gravel, clay, brick, ash and		0.15	1	50 DO	13											-
Ē			mortar (FILL)																-
Ē						2	50	11											
-	1					-	DO		İ İ										
F							50		İ İ										-
-						3	DÖ	15	İ İ										-
-	2	tem)			54.00				İ İ										-
Ē	Joor	ollow S	Compact gravel layer (FILL)		2.13	4	50 DO	46	İ İ										-
-	Mor A	iam. (H	Compact light brown to grey fine to medium sand, some gravel, trace brick, ash and mortar (FILL)		2.29				İ İ										-
-	à					5	50 DO	18	İ İ										-
E	3	20	Loose layers of brick, brown silty sand,		53.31 3.05														
-			mortar, ash, fine to medium dark brown sand, and concrete, construction debris			6	50 DO	6	İ İ										-
-			Loose black silty sand, trace ash, slag,	×××	52.75 3.61														-
Ē	4		sand, gravel, brick, clay (FILL)		ļ	7	50 DO	7	İ İ										-
-			Compact dark grey SILTY CLAY trace	××	52.09				İ İ										-
-			gravel, trace brick	$\bigotimes$		8	50	32	İ İ										-
Ē				$\bigotimes$	51.46														-
E	5		End of Borehole Auger Refusal		4.90				İ İ										-
E																			-
F																			-
-	6								İ I										-
Ē									İ I										-
-																			-
-									İ I										-
-	7																		
-									İ I										-
E									İ I										-
≥	8								İ I										-
1 I I									İ I										-
T 1/28																			-
S.GD																			-
AL-MI	9																		
PJ G																			-
199.G																			-
11220	0																		-
01 11																			
3HS 0	DEP	TH S	SCALE					1	Â.	614	<b></b>							LC	)GGED: BM
AIS-E	: 50	)							TAS	roitti SOCi	ates							СН	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

### RECORD OF BOREHOLE: 11-24

BORING DATE: December 5 & 6, 2011

SHEET 1 OF 1

DATUM: Geodetic

ш	Τ	8	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEI RESISTANCE		FION /S/0.3m	2	HYDR	AULIC C	ONDUCT	IVITY,		. (7	
SCAL		H H		LOT		В		.3m	20	40	60	80 `	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	) <sup>-4</sup> 1	0-3	ONAL	PIEZOMETER OR
METH		DNG N	DESCRIPTION	TA PI	ELEV.	IMBE	ΥPE	NS/0.	SHEAR STRE	NGTH	nat V. rem V	+ Q-● ⊕ U-C	y v	ATER C		PERCE	NT	DDITI B. TE	STANDPIPE INSTALLATION
DE		BOR		STRA	(m)	N		BLO	20	40	60	80	W	p —	 .0		WI 80	LA	
			GROUND SURFACE		59.48														
Ē	ſ		Very loose dark brown silty sand, trace \clay, organics (TOPSOIL)		0.00		50												
-			Very loose to very dense dark brown silty sand trace clay trace gravel brick		Š.	1	DO	4											-
-			concrete, mortar, ash, metal, slag, concrete slab, grev crushed stone (FILL)		×														
<u> </u>					×	2	50 DO	8											-
-					X														-
-					X	3	50 DO	4											-
-					X														
- 2	2		~		57.35	4	50	53											
-			SILTY SAND, some gravel, ashes on top	$\bigotimes$	2.13		00												-
-				$\bigotimes$	8	-	50	24											
- :	3			$\bigotimes$	56.43	5	DO	54											-
Ē			Dense to very dense grey SILTY SAND, trace to some gravel, black staining		3.05		50												
E			(strong odours) (GLACIAL TILL)			6	DO	43											-
E					X	7	50	>70											-
- 4	i I						00												
-					X														-
Ē		v Stem				8	50 DO	175											-
-	Auder	(Hollov	Very dense grey SILTY SAND to		54.60 4.88	9	50 DO	>150											-
Ē	ower	Diam.	SANDY SILT, trace to some gravel, odours (GLACIAL TILL)		X														
-		0 mm																	-
-		5				10	50 DO	180											-
- 6	6						50												
-						11	DO	>150											-
Ē																			-
Ē,	,					12	50 DO	>100											-
-																			-
E					51.86	13	50 DO	>50											
-			Very dense grey SILTY SAND to SANDY SILT, trace to some gravel,		7.62	14	50 DO	>100											
- 8	3		slight odours (GLACIAL TILL)																-
Ē					X		- 0												-
						15	DO	134											-
	,																		-
28/15						16	50 DO	125											
111						17	50	>100											
AIS.G						40	50												
V-145		$\square$	End of Borehole	118	49.37	18	DO	>50											
SP1 (			Auger Refusal																
1 1 1																			-
1122(																			-
11																			
HS OC	EPI	TH S	CALE					4		<b>.</b> .								10	DGGED: RI
a-SIM 1	: 55	5							<b>G</b> AS	Oldo SOCi	er iates	5						СН	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

### RECORD OF BOREHOLE: 11-25

BORING DATE: December 7, 2011

SHEET 1 OF 1

DATUM: Geodetic

щ		DD	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3n		HYDRAULIC CC k, cm/s	NDUCTIVITY,		. ت	
SCAL	RES	VETH		LOT		ĸ		.3m	20 40 60	80	10 <sup>-6</sup> 10	<sup>-5</sup> 10 <sup>-4</sup> 1	0-3	STIN	PIEZOMETER OR
PTH	METF	DNG	DESCRIPTION	TAP	ELEV.	MBE	ΥPE	NS/0	SHEAR STRENGTH nat V	. + Q-● (⊕ U-0	WATER CC	NTENT PERCE	NT	B. TE	STANDPIPE INSTALLATION
DE		BOR		STRA	(m)	R		BLO			Wp I		WI	<b>L</b> A	
-			GROUND SURFACE	0,	E7 04				20 40 60	80	20 40	0 60 8			
-	0		TOPSOIL		0.00										
F			Loose to compact brown fine to medium sand, trace silt, gravel, ash, brick and		0.15	1	50 DO	7							
Ē			mortar (FILL)		8										
E					8										
F	1				8	2	50 DO	9							
F					8										
E					55.72		50								-
E			Compact grey clay (FILL)	×	1.52	3	DO	14							:
Ē			(FILL)		1.00										-
-	2		(m)			4	50	40							-
Ē		-	ow Ste		54.80										
E		r Auge	Compact brown fine to medium sand,		2.44		1								
ŧ		Power	Compact dark brown to black silty sand.	₩	54.50 2.74	5	50 DO	14							
-	3		some mica fragments (FILL)		×.										-
E			50		53.89		50								
Ē			Compact to dense grey fine to medium	Ě	3.35	6	DO	8							
F			TILL)												:
E	4					7	50 DO	>50							-
È	7														:
F															:
Ē					X	8	50 DO	68							-
E															
F	5				52.01	9	50 DO	>50							-
Ē			End of Borehole		5.23										-
E			Auger Refusal												-
Ē															
E	6														-
È															
Ē															:
F															
E	7														-
È															-
F															
Ē															-
_															:
N⊟L -	8														-
8/13															
11/2															
GD															:
-MIS	9														-
GAL					1										-
GPJ															:
1199.															
1122(	10				1										- - -
1															
.00 S															
S-BH	DEF	-11- -~	HISUALE					(	Golder	_				LC	DGGED: BM
⋝	111	JU							<b>Associate</b>	S				CH	EUNED. JW

#### LOCATION: See Site Plan

### SAMPLER HAMMER, 64kg; DROP, 760mm

### RECORD OF BOREHOLE: 11-26

BORING DATE: December 6, 2011

SHEET 1 OF 1

DATUM: Geodetic

Щ		p P	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRA RESISTANCE, BLOV	TION /S/0.3m	$\overline{\boldsymbol{\lambda}}$	HYDRAULIC k, cm	CONDUCT	IVITY,		łG L	
FH SCA		G METI	DECODIDITION	A PLOT	ELEV.	BER	E	S/0.3m	20 40 SHEAR STRENGTH	60 a	80 - Q - ●	10 <sup>-6</sup>	10 <sup>-5</sup> 10	) <sup>-4</sup> 10	- <sup>3</sup>	<b>TESTIN</b>	OR
DEPI		BORIN	DESCRIPTION	STRAT/	DEPTH (m)	NUM	ΤY	BLOW	Cu, kPa	rem V. €	⇒ū-ŏ	Wp		I V	VI	ADC LAB.	INSTALLATION
- 0			GROUND SURFACE		55.78				20 40		00	20	40 00		)		
-			TOPSOIL Loose grey clay, some sand (FILL)		0.00		50										
-			Compact dark brown silty sand, some		55.32 0.46	1	DO	9									
-			gravel, trace ash, brick and mortar, occasional layers of fine to coarse sand														
- - 1			(FILL)			2	DO	38									-
-																	
Ē						3	50 DO	25									
Ē.																	
- 2		ow Sten				4	50 DO	14									-
-	er Auge	n. (Holk															
Ē	Powe	m Diar	Very loose black silty sand, trace ash,	<b>***</b>	53.04 2.74	5	50 DO	8									
- 3		200 n	brick, wood and gravel, occasional layers of fine sand (FILL)														-
-						6	50 DO	4									
-																	
- 4						7	50 DO	9									-
Ē			Vary dance grow brown find to modium	and a	51.51												
Ē			SAND, some silt and gravel (GLACIAL TILL)		4.27	8	50 DO	110									
-			,				50										
- 5 -			End of Borehole Auger Refusal		50.78	9	ĐÔ	>/5									-
E																	
Ē																	
- - 6																	-
-																	
-																	
-																	
- '																	-
Ē																	
Ē																	
- 8																	-
Ē																	
- 9																	-
5																	
, <mark>— 10</mark>																	-
		<u> </u>		1			1				1						CGED BM
1:	50	113							Gold	er iates						CH	ECKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

### **RECORD OF BOREHOLE: 11-28**

BORING DATE: December 8, 2011

SHEET 1 OF 3

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Ш				I I		_			``			-			ĭ₹≧	PIEZOMETER
≥ 0	DESCRIPTION	A PLO	ELEV.	BER	Щ	S/0.3n	20 40 SHEAR STRENGTH	60 nat V	80 - Q - 🗭	10 <sup>-6</sup>	10 TER C0	DNTENT	0 <sup></sup> 1 PERCF	0 <sup>™</sup>  NT	TEST	OR STANDPIPE
ORIN	DESCRIPTION	RAT/	DEPTH	MUN	Σ	-OWS	Cu, kPa	rem V. e	∍ū-ŏ	Wp		W_		wi	ADC LAB.	INSTALLATIO
ñ		ST				Bl	20 40	60	80	20	4	06	60 E	30 T		
-	GROUND SURFACE		57.59					_								
	(FILL)				50	0										
		×	57.13	1	DO	2										
	trace ash (FILL)		0.40													
				2	50	17										
			56.27		DO											
	Loose to compact brown medium to fine	XX	1.22													
	SAND, some gravel, trace slit and block	$\otimes$	\$	3	50 DO	13										
			Š													
		$\otimes$														
				4	50 DO	5										
		$\otimes$	54.85													
	Very dense brown to grey fine to		2.74													
	(GLACIAL TILL)			5	50 DO	70										
				6	50 DO	>50										
Stem)				7	50 DO	112										
ollow																
E E																
m Dia				8	DO	119										
200 m																
				9	50 DO	>60										
				10	50 DO	108										
				11	50	>100										
					DO	- 100										
				12	50	>90										
			49.97	12	DO	- 50										
	trace gravel (GLACIAL TILL)		7.62		50											
				13	DO	80										
				14	50	42										
			10 75		υO											
	Grey CLAYEY SILT, some sand, trace		8.84		NO											
	GLACIAL TILL)			C1	RC	DD										
Core																
No.	Fresh, medium bedded, grey		48.06 9.53	C2		DD										
	LIMESTONE BEDROCK, with thin beds of black shale															
- ∟			+	┝┤		-	+	+	-	┟──┝				+	·	
	CONTINUED NEXT PAGE															
	Number         Number         BOR           NQ Core         200 mm Diam. (Hollow Stam)         BOR	Compact black silty sand, some gravel, frace ash (FILL)         Compact black silty sand, some gravel, frace ash (FILL)         Loose to compact brown medium to fine SAND, some gravel, trace silt and brick         Very dense brown to grey fine to medium SAND, trace gravel and silt (GLACIAL TILL)         Very dense brown to grey fine to medium SAND, trace gravel and silt (GLACIAL TILL)         Grey CLAYEY SILTY CLAY, some sand, trace gravel (GLACIAL TILL)         Grey CLAYEY SILT, some sand, trace gravel, with cobbles and boulders (GLACIAL TILL)         Fresh, medium bedded, grey LIMESTONE BEDROCK, with thin beds of black shale         CONTINUED NEXT PAGE	Compact black silty sand, some gravel, frace ash (FILL)       Compact black silty sand, some gravel, frace ash (FILL)         Loose to compact brown medium to fine SAND, some gravel, trace silt and brick       Compact gravel, trace silt and brick         Very dense brown to grey fine to medium SAND, trace gravel and silt (GLACIAL TILL)       Very dense brown to gravel and silt (GLACIAL TILL)         Compact grey SILTY CLAY, some sand, trace gravel (GLACIAL TILL)       Grey CLAYEY SILT, some sand, trace gravel (GLACIAL TILL)         Trace gravel (GLACIAL TILL)       Fresh, medium bedded, grey LIMESTONE BEDROCK, with thin beds of black shale         CONTINUED NEXT PAGE       CONTINUED NEXT PAGE	Compact black silty sand, some gravel, trace ash (FILL)       57.59         Compact black silty sand, some gravel, trace ash (FILL)       58.37         Loose to compact brown medium to fine SAND, some gravel, trace silt and brick       54.85         Very dense brown to grey fine to medium SAND, trace gravel and silt (GLACIAL TILL)       54.85         Compact grey SILTY CLAY, some sand, trace gravel (GLACIAL TILL)       49.67         Compact grey SILTY CLAY, some sand, trace gravel (GLACIAL TILL)       48.67         Compact grey SILTY CLAY, some sand, trace gravel (GLACIAL TILL)       48.67         Compact grey SILTY CLAY, some sand, trace gravel (GLACIAL TILL)       48.67         Trace gravel (GLACIAL TILL)       48.67         Compact grey SILTY CLAY, some sand, trace gravel (GLACIAL TILL)       48.67         Trace gravel (GLACIAL TILL)       48.67         Compact grey SILTY CLAY, some sand, trace gravel (GLACIAL TILL)       48.67         Trace gravel (GLACIAL TILL)       48.06         Trace gravel (GLACIAL TILL)       48.06         Trace gravel (GLACIAL TILL)       5.3         CONTINUED NEXT PAGE       5.3	Compact Discrete Situation of the same same same same same same same sam	Compact black sity sand, some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace sit and brick         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gravel (GLACIAL TILL)         Some gravel, trace gravel, trace gravel and sit (GLACIAL TILL)         Some gravel, trace gra	Box         Box         Box         Final <thfinal< th=""> <thfinal< th=""> <thfinal< t<="" td=""><td>State         Description         Z         N         Z         A           GROUND SURFACE         97.80         &lt;</td><td>B         C         <thc< th=""> <thc< th=""> <thc< th=""> <thc< th=""></thc<></thc<></thc<></thc<></td><td>G       Dom 1       Z       Q       A       Compact Processor       B         Image: Second Control of the second (FLL)       0.00</td><td>B         Comming 2         Commin</td><td>B         Comming 2         <thcomming 2<="" th=""> <thcomming< td=""><td>Sec         Main         Z         C         <thc< th="">         C         <thc< th=""> <thc< th=""></thc<></thc<></thc<></td><td>B         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S</td><td>Sec         B         mm         Z         F         B         Complete set of the set o</td><td>G         B         C         D         <thd< th=""> <thd< th=""> <thd< th=""> <thd< th=""></thd<></thd<></thd<></thd<></td></thcomming<></thcomming></td></thfinal<></thfinal<></thfinal<>	State         Description         Z         N         Z         A           GROUND SURFACE         97.80         <	B         C <thc< th=""> <thc< th=""> <thc< th=""> <thc< th=""></thc<></thc<></thc<></thc<>	G       Dom 1       Z       Q       A       Compact Processor       B         Image: Second Control of the second (FLL)       0.00	B         Comming 2         Commin	B         Comming 2 <thcomming 2<="" th=""> <thcomming< td=""><td>Sec         Main         Z         C         <thc< th="">         C         <thc< th=""> <thc< th=""></thc<></thc<></thc<></td><td>B         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S</td><td>Sec         B         mm         Z         F         B         Complete set of the set o</td><td>G         B         C         D         <thd< th=""> <thd< th=""> <thd< th=""> <thd< th=""></thd<></thd<></thd<></thd<></td></thcomming<></thcomming>	Sec         Main         Z         C <thc< th="">         C         <thc< th=""> <thc< th=""></thc<></thc<></thc<>	B         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S         S         Image: S	Sec         B         mm         Z         F         B         Complete set of the set o	G         B         C         D <thd< th=""> <thd< th=""> <thd< th=""> <thd< th=""></thd<></thd<></thd<></thd<>



#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

# RECORD OF BOREHOLE: 11-28

BORING DATE: December 8, 2011

SHEET 2 OF 3

DATUM: Geodetic

ш	Т	Q	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN		DN /0.3m		HYDR/		ONDUCT	FIVITY,		. (1)	
SCALI		ЛЕТНО		LOT		Я		3m	20	40 (	50 50	во	10	2 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0-4 1	0-3	ONAL	PIEZOMETER OR
HTH		ING N	DESCRIPTION	TA PI	ELEV.	IMBE	ΥPE	NS/0.	SHEAR STRE	NGTH I	nat V. + rem V. #	• Q - ●	w	ATER C	ONTENT	PERCE	NT	DDITI B. TE	STANDPIPE INSTALLATION
DE		BOR		STRA	(m)	N		BLO	20	10 6	so	80	Wp				WI	LAI	
			CONTINUED FROM PREVIOUS PAGE																
E	10		Fresh, medium bedded, grey			C2	NQ RC	DD											
F			of black shale																-
E	=																		
-		Q Cor		臣		C3	NQ	סס											
-	11 1	2 2		臣			RC												-
F																			
-				臣	45.90														-
-			End of Borehole Auger Refusal		11.69														
F	12																		-
E																			-
F																			
E																			-
-	13																		-
E																			-
E																			-
Ē																			-
E	14																		-
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E																			-
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Ē	15																		-
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	16																		-
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2 — -	18																		-
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≓- ⊢																			-
S.GD																			
 −	19																		-
2 - 1 C																			
99.GF																			:
22015																			
1111	20																		-
001																			
-BHS	DEP	TH S	SCALE					(	G	olde	r							LC	DGGED: BM
MIS	1:50	D							JAS	<b>SOCI</b>	ites							СН	ECKED: JW

PR LO INC	IOJ ICA	JECT ATIO NAT	Г: 11-1122-0199 N: See Site Plan ΊΟΝ: -90° AZIMUTH:		RE	CO	RD	0		<b>D</b> RILI RILI	<b>RI</b> LINC L RI	<b>LI</b> G: 0 G: 0	<b>_H</b> ATE CME ONT	0 85	ece 0 CTC	mbe	er 8 Ma	<b>1</b> ' 3, 20 arath	<b>1-2</b>	<b>28</b> Drillir	ŋg								:	SHI DA <sup>-</sup>	EET : TUM:	3 OF Geo	= 3 odetic	;	
DEPTH SCALE METRES		DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH COLOUR		N - J LT - F HR- S N - V J - C RECC DTAL DRE %	oint ault hear 'ein Onjug VER' SOL COR	gate Y I ID E % 22	R.Q.I	BD- E FO- F CO- ( OR- ( CL - ( CL - ( D. IN I C S S	Seddi Coliat Conta Drtho Cleav RACT IDEX PER .3 m 2920	ing ion ict gona age B /	I Angle		L - PI U- C N- U T - SI 2 - In 0ISCO 2 w.r.t. 0RE XIS	lanar urved ndula teppe regula ONTIN	ting d ar NUITY E AND : ESCRI	PO K SM Ro MB DAT/	- Poli - Slic - Sm - Rou - Mer	isheo kens ooth ugh chan	d sideo iical	RAU BRAU	BR -	Brol For a fation reviati ls. Dia Poir Ir (N 0	ken additi s refe ions & metr nt Lo ndex VIPa)	Rock onal er to lis adRM -C	k st MC 2' 'G.					
			BEDROCK SURFACE Grey CLAYEY SILT, some sand, trace		48.75 8.84	$\vdash$	_															_		+					+	-					
- 9 - - -			gravel, with cobbles and boulders (GLACIAL TILL)		48.06	C1		+																											-
- - - - - - - - - - -	Rotary Drill	NQ Core	Fresh, medium bedded, grey LIMESTONE BEDROCK, with thin beds of black shale		9.53	C2																							_						-
- - - - - - - - -					45.90	СЗ																													-
			End of Drillhole		11.69																														
- - - - - -																																			· - - - - - - - - - - - - - - - - - - -
DE	РТ 50	ΉS	CALE					(			G	ol so	de	r	6.5														C	LOO	ggee Ckee	D: BI	M N		

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 11-29

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: December 5, 2011

щ		дo	SOIL PROFILE			SAI	MPLE	S	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	-9	
DEPTH SCA METRES		30RING METH	DESCRIPTION	TRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	3LOWS/0.3m	20         40         60         80           SHEAR STRENGTH         nat V. + Q. ●           Cu, kPa         rem V. ⊕         U - C	10 <sup>6</sup> 10 <sup>5</sup> 10 <sup>4</sup> 10 <sup>3</sup> WATER CONTENT PERCENT         W         W         W	ADDITIONA LAB. TESTIN	OR STANDPIPE INSTALLATION
	+	ш	GROUND SURFACE	ŝ	55 GG			ш	20 40 60 80	20 40 60 80		
- 0		Γ	ORGANICS/TOPSOIL	EZZ	0.00							
-			Compact brown fine to medium sand, trace silt, gravel and ash (FILL)		0.15 55.05	1	50 DO	11				-
- - - 1	I		Loose to compact dark brown to black silty sand, trace ash and gravel (FILL)		0.61	2	50 DO	11				-
-						3	50	3				-
- - - 2	2		Loose to very loose brown fine to medium SAND	$\bigotimes$	53.98		50					-
-		(L	Compact dark brown to black SILTY SAND, trace gravel and clay	$\bigotimes$	53.37	4	DO	5				-
	Auger	(Hollow Ster		$\bigotimes$	52.61	5	50 DO	14				- - -
-	Power	00 mm Diam.	Loose dark brown SAND and GRAVEL		3.05 52.05	6	50 DO	6				-
- - - - - - -	ı	2(	Compact dark grey to grey SILTY SAND, trace gravel		3.61	7	50 DO	28				
-					50.78	8	50 DO	49				
- 5 - - - -	5		Dense dark grey to grey SILTY SAND, trace gravel (GLACIAL TILL)		4.88	9	50 DO	90				
- 6	5					10	50 DO	42				
-	┢		End of Borehole	911	49.49 6.17							-
-			Auger Relusar									-
E												-
- 7	,											-
- ·												-
-												
E												-
-												-
₩8 ₩	3											
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AIS.				1								-
J-L												-
L L				1								
99.G												-
2201												-
11111	)											-
<u>,</u>												
D SHS D	EP <sup>-</sup>	гнs	CALE								L	DGGED: BM
I-SIM	: 50	)		_					Associates		СН	ECKED: JW

#### LOCATION: See Site Plan

### RECORD OF BOREHOLE: 11-31

BORING DATE: December 2, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ	Τ	DD	SOIL PROFILE			SA	MPL	.ES	DYNAMIC PEN RESISTANCE	IETRAT BLOW	FION 'S/0.3m		н	IYDRAUL k,	IC CO	NDUCT	IVITY,		ں <sub>ا</sub>	DIEZONIETED
SCAL		METH		PLOT		R		.3m	20	40	60	80		10-6	10	-5 10	)-4 1	0 <sup>-3</sup>	IONAL	OR
EPTH MFT		RING	DESCRIPTION	ATA P	ELEV.	MBE	TYPE	0/S/0	SHEAR STREI Cu, kPa	NGTH	nat V. rem V	+ Q- ⊕ U-	0	WATI	ER CO	NTENT	PERCE	NT	AB. TE	INSTALLATION
D		BOF		STR/	(m)	ž	Ľ	BLO	20	40	60	80		Wp ⊢ 20	40	<del>0''</del> ) 6		WI 30	₹ ₹	
_	0	_	GROUND SURFACE		58.81															
F			Compact fine to medium light brown		0.00 58.61		50	10												
E			sand, trace silt (FILL)		8 50.00	1	DO	12												-
Ē			Loose dark brown silty sand, trace		0.61															
E	1		gravel, ash and blick (FILL)		×.	2	50 DO	7												
F			Very loose construction debris made up	***	57.64 1.17															-
E			of layers of brick, ash, slag, mortar, insulation, and wood (FILL)		Š.	3	50	2												-
Ē					X		DO	-												
-	2				×.		1													_
E					X	4	50 DO	9												
-			Compact light brown to grey fine to	$\bigotimes$	56.37 2.44															:
-		Ê	medium SAND, trace silt and gravel	$\bigotimes$	8	5	50 DO	15												-
F	3	w Ster			<pre>X</pre>															_
Ē	Auder	(Hollo			8		50													-
-	Downer	Diam			8	6	DO	42												
E		200 mn	Dense to very dense grey brown fine to medium SAND, trace silt and gravel	Ì	3.66															-
E	4		(GLACIAL TILL)			7	50 DO	75												-
-																				
E						8	50	65												
E							DO													-
F	5						1													-
Ē						9	50 DO	84												-
-			Very dense grey fine to coarse SAND,		53.32 5.49															
F			some silt, trace gravel (GLACIAL TILL)		X	10	50 DO	97												
-	6																			-
F					X	11	50	69												-
_					52.18		00													-
-			End of Borehole Auger Refusal		6.63															
-	7																			
F																				-
E																				-
E																				-
F	8																			_
-																				-
E					1															
Ē					1															-
F	9				1															
Ē																				
F																				-
Ē					1					1										
- 1	0																			-
⊢					1					1										
	DEP	TH S	SCALE					1	C C C	olde	۲								L	OGGED: BM
1	: 50	)							VAS	<b>SOCI</b>	ate	S							CH	ECKED: JW

#### LOCATION: See Site Plan

RECORD OF BOREHOLE: 11-32

BORING DATE: December 5, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ	Т	DD	SOIL PROFILE			SA	MPL	.ES	DYNAMIC PENETF RESISTANCE, BL(	RATION DWS/0.3m	<u>\</u>	HYDRAULI k, c	C CON	DUCT	IVITY,		.0	
SCAL RES		METH		PLOT		н К		).3m	20 40	60 8	30	10-6	10-5	10	)-4 1	0 <sup>-3</sup>	TONAL	
EPTH MET		RING	DESCRIPTION	RATA F	DEPTH	IUMBE	TYPE	O/S//O	SHEAR STRENGT Cu, kPa	H nat V. + rem V. ⊕	Q - ● U - O	WATE	RCON		PERCE	NT	ADDIT AB. TI	INSTALLATION
		BO		STR	(m)	z		BLO	20 40	60 8	30	20	40	6	<u>ه</u> 0	80	L ,	
		_	GROUND SURFACE	===	56.18													-
Ē			Loose brown silty sand, some gravel	Ŵ	0.15	1	50	8										
F			(FILL)		55.57		DO											
E			Loose to compact brown fine to medium sand, some gravel, trace brick, mortar		0.61													
<u> </u>	1		and slag (FILL)		8	2	50 DO	9										
Ē					8													
F					8	3	50	20										
Ē					8													
- :	2				8		50											-
-					8 50 74	4	DÖ	4										
-		Stem)	Loose brown to black fine to medium		2.44													
F	Der	ollow S	mortar, ceramic, trace clay (FILL)			5	50 DO	4										
- :	Wer Ai	am. (H																-
-	P	mm Di			52.83	6	50	8										
-		200	and clay	$\bigotimes$	3.35													
-				$\bigotimes$	8		50											
- '	4			$\bigotimes$	§ .	7	DO	42										-
-				$\bigotimes$	8													
-				$\bigotimes$	8	8	50 DO	34										
-				X	51.30													
- '	5		and clay (GLACIAL TILL)		4.00	9	50 DO	>50										
-																		
E							50											
-					50.21	10	DO	63										
Ē	5		End of Borehole		5.97													-
F																		
-																		
-																		
E	<i>`</i>																	
-																		
-																		
- - ≥	R																	_
Π ~																		
1/28/1																		
	9				1													
GAL-					1													
GP																		
0199.																		
1122	5				1													_
1																		
D SHS U	EP.	гнs	CALE							dar							LC	DGGED: BM
J M M M	: 50	)							<b>V</b> Asso	uer <u>ciates</u>							СН	ECKED: JW

#### LOCATION: See Site Plan

### RECORD OF BOREHOLE: 11-33

BORING DATE: December 8, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

TE: December 8, 2011

щ	G	3	SOIL PROFILE			SA	MPLE	s	DYNAMIC PENETRA RESISTANCE, BLOV	TION VS/0.3m	)	HYDR	AULIC C k, cm/s	ONDUCT	TIVITY,		ں ا	DIEZONETED
H SCAL TRES	Ē			РГОТ		ER		0.3m	20 40	60 I	80	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0-3	TIONAI ESTIN	OR STANDPIPE
DEPTH		אואכ	DESCRIPTION	RATA	DEPTH	NUMBI	TYPE	NSWO.	SHEAR STRENGTH Cu, kPa	nat V. rem V.	+ Q-● ⊕ U- O	w	/ATER C p I		PERCE	NT WI	ADDI LAB. T	INSTALLATION
	È	ň		STI	(m)		_	BL	20 40	60	80	2	20 4	ю е	50 E	30		
— o -	-		Dense dark grey crushed stone (Gravel	***	62.22 0.08	-												
Ē			Dense brown fine to medium sand,		61.69	1	50 DO	46										
Ē			some coarse sand, some graver, trace silt (Gravel lot SUBBASE)		0.53	$\vdash$												
- 1			sand, trace to some gravel, brick, wood, organics, concrete, occasional grey silty			2	50 DO	9										
Ē			clay layer (FILL)				50											
Ē						3	DO	60										
- 2						4	50 DO	12										
-																		
Ē						5	DO	56										
Ë,			Compact to very dense brown to grey		59.32		50											
Ē			brown SILTY SAND to SANDY SILT, trace to some gravel (GLACIAL TILL)			6	DO	23										
_			<b>, , ,</b>				50											
E						7	DO	48										
- 4 -							50	- 1										-
-		stem)				8	DO	74										
Ē	uger	Hollow S				a	50	49										
- 5 -	ower A	Jiam. (⊦				5	DO	40										
Ē	_	0 mm [				10	50	55										
-		20					DO											
- 6						11	50 DO 50	>89										
-						12	DO	>100										
-							50											
						13	DO	>100										
-						14	DO	>100										
-			Very dense grev brown SII TY SAND		54.60 7.62		50											
- - 8			trace to some gravel, occasional grey silt seam, occasional fine to medium sand			15	DO	>111										
			seam (GLACIAL TILL)				50											
-						16	DO 50	>105										
-						17	DO	>50										
9 							50											-
-						18	DO	>100										
E					E2 00	19 20	DO 50	>50 >110										
- 10 -			End of Borehole Split Spoon Refusal	DCX58	9.96		00											-
-				1														
-  -				1														
- 11																		
				1														
D	EPT	ΉS	CALE					(	Gold	er							LC	DGGED: RI
1	55								Assoc	iates	5						CH	ECKED: JW

#### LOCATION: See Site Plan

# **RECORD OF BOREHOLE: 11-35**

BORING DATE: December 12, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш		ОD	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN RESISTANCE		ION S/0.3m	ì	HYDR	AULIC C	ONDUCT	FIVITY,		. (7	
SCAL	SES	AETH		LOT		æ		Зm	20	40	60 E	30	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0-4 1	0-3	STINC	PIEZOMETER OR
PTH 6	AETR	2 DNG NG	DESCRIPTION	LA PL	ELEV.	MBEF	ΥΡΕ	/S/0.:	SHEAR STRE	NGTH	nat V. +	Q - ●	W	I /ATER C		PERCE	NT	DITIO	STANDPIPE INSTALLATION
DEF	~	BORII		TRA	DEPTH (m)	Ñ	Ĥ	SLOW	си, кра		rem v. ⊕	U- 0	w	р ——			WI	LAB	
_			GROLIND SUBFACE	٥.				-	20	40	<u>60 8</u>	30		20 4	ю е Г	30 E	0		
-	0		Dense grey sand and gravel (Gravel lot		0.00														
Ē			Compact brown medium to fine sand		62.25 0.31	1	50 DO	52											
E			trace gravel (Gravel lot SUBBASE)		8														
F					61.65		50												
F	1		Compact dark brown to black silty sand, trace gravel ash wood brick mortar		0.91	2	DO	17											-
E			(FILL)		8														
-					8	3	50 DO	19											
Ē		1000	Compact brown fine to medium sand,		60.88 1.68														
È.	2	ger			60.43	4	50 DO	24											-
Ē		ver Au	Dense to very dense light brown to		2.13	5	50	45											
-		6 G	and medium sand layers, trace gravel																
-		.000				6	50 DO	65											
F	3																		-
Ē						_	50	470											
-						ľ	DO	170											
Ē																			
E	4					_	50												
Ē						8	DO	>50											
E	F		End of Borehole		58.16 4.40														
Ē			Auger Refusal																-
E	5																		-
F																			
E																			
Ē																			
E	6																		_
-																			
-																			
-																			
Ē	7																		_
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F																			
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3 JE	3																		
/28/1													1						
IIS.G																			
AL-N	я																		_
Ъ-																			
99.G																			
12201																			
111	10																		-
S 001				_	1	I	I			1	_1	I	1	1	L	I	1	I	1
S-BH	DEF	PTH	I SCALE					(	( <b>7</b> )G	olde	r							L	DGGED: BM
ž	1:5	U							VAS:	<u>50Cí</u>	ates							CH	EUKED: JW

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 11-37

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: December 12, 2011

1 SCALE TRES		: METHOD	SOIL PROFILE	PLOT	EI EV	SAI Y		0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup>		
DEPTH		BORING	DESCRIPTION	STRATA	DEPTH (m)	NUMB	TYPE	BLOWS/I	SHEAR STRENGTH         nat V. +         Q - ●           Cu, kPa         rem V. ⊕         U - O           20         40         60         80	WATER CONTENT PERCENT Wp		
- (	, _		GROUND SURFACE		62.76							
F			BASE)		62.46		50	20				-
E			Compact brown medium to fine sand, trace gravel (Gravel lot SUBBASE)		0.30	1	DO	29				-
F			····· 3···· (····· ··· · · · · · · · · ·									-
F.				₩	61.85	2	50 DO	20				-
E			trace gravel, occasional layers of ash, gravel sandy mortar glass, construction									-
F			debris (FILL)				50					-
Ē						3	DO	6				-
F												-
2	2		Compact brown medium to fine sand		60.63	4	50 DO	34				-
F			trace gravel (FILL)		60.32							-
Ē			Dense to very dense grey brown SILTY SAND, some gravel, trace cobbles		2.44	5	50	73				-
F		Stem	(GLACIAL TILL)			Ľ	DO					-
Ē	Ander	Hollow										-
F	OWEL 1	Diam. (										-
Ē		0 mm [					50					-
F		20				6	DO	>75				-
						7	DO	>65				-
F												-
Ē						8	50	>75				-
÷,												-
-	Ŷ											
Ē						9	50	40				-
E						Ű	DO					-
-						10	50	>50				-
Ē	ĺ											-
-					56.23							-
E			End of Borehole Auger Refusal		6.53							-
÷ ,	,											-
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Ē												-
<u></u> a - 8	3											_
13 JI												-
1/28/												-
GDT												-
- AIS	,											_
GAL												-
GPJ												-
0199												-
- 11175												_
- 10												
D BHS C	EP'	TH S	CALE						Coldar		LOGGED: BM	
ŚW 1	: 50	)							Associates		CHECKED: JW	

#### LOCATION: See Site Plan

## RECORD OF BOREHOLE: 11-38

BORING DATE: December 19, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	1	6	3	SOIL PROFILE			SA	MPL	ES	DYNA			10N S/0.3m	<u>}</u>	HYDR		ONDUCT	FIVITY,		0	
	RES		Ĕ		-OT		~		Зт	112010	20	40	60	80	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	STINC	PIEZOMETER OR
о т п	METF		2 2	DESCRIPTION	TA PI	ELEV.	MBEF	ΥPE	VS/0.	SHEA	R STRE	NGTH	nat V.	+ Q- ●	w	ATER C	ONTENT	PERCE	NT	B. TE	STANDPIPE INSTALLATION
	7				STRA	(m)	R	F	BLOV	Cu, KF	a 20	40		90- U	Wp		W		WI	LAI	
				GROUND SURFACE	0,	62.11						40	00	00		.0 4					
-	0			Compact to dense brown sand and	*	0.00															
-				Loose to compact brown medium to fine			1	50 DO	35												-
-				SUBBASE)		8															-
Ē						8	2	50	8												
-	1					60.89		DO													-
Ē				Compact to very dense grey brown sand some gravel trace silt (FILL)	×	1.22															
F			tem)	·····, ····· g. · · ·, · ··· (. ·)		8	3	50 DO	15												
Ē		jer	llow S			<sup>2</sup>															
-	2	/er Au	т. Но			Š.	4	50 DO	52												-
Ē		Pow	m Dia			59.67															
Ē			200 m	Very dense grey brown SILTY SAND, some gravel, medium brown sand		2.44															-
Ē				seams (GLACIAL TILL)			5	50 DO	61												
-	3																				-
Ē							6	50 DO	112												
Ē																					
Ē							7	50	148												
Ē	4					57.94		DO													
F				End of Borehole Auger Refusal		4.1/															-
Ē																					
Ē																					-
Ē	5																				
-																					-
Ē																					
F																					
Ē	0																				
Ē																					-
Ē																					
F	-																				
Ē	'																				
Ē																					
E																					
5																					-
B JEI	0																				
1 1																					
11																					-
IIS.G																					-
H-N	9																				
Ъ-																					
199.G																					
12201	10																				-
111	IU																				_
1S 001					-	•	•	•		Â		•			•	•			•		
IIS-BI	1:	50	.13						(	Y	Ģ		r atee							СН	ECKED: JW
≥											1100	JUU	<u>uurs</u>							5.1	

#### LOCATION: See Site Plan

### RECORD OF BOREHOLE: 11-39

BORING DATE: December 15, 2011

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ		ПО	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN RESISTANCE,	ETRATI	ON /0.3m	$\sum_{i=1}^{n}$	HYDR/	AULIC Co	ONDUCT	IVITY,		.0	
SCAL		METH		LOT		ж.		.3m	20 4	0 0	50 8	30	10	0 <sup>-6</sup> 1	) <sup>-5</sup> 10	) <sup>-4</sup> 1	0 <sup>-3</sup>	IONAL	PIEZOMETER OR
EPTH		RING	DESCRIPTION	ATA P	ELEV.	UMBE	TYPE	0/S/V	SHEAR STREM Cu, kPa	IGTH	nat V. + rem V. €	Q - • U - O	W	ATER C		PERCE	NT	AB. TE	INSTALLATION
ī		BOF		STR.	(m)	ž		BLC	20 4	0 0	50 8	30	2 W	20 4	0 6	0 8	30	~ _	
_	0	_	GROUND SURFACE	××××	62.81														
-				∕₩	0.00	1	50	15											
-			gravel (FILL)		8	'	DO	15											-
-					8 8														
<u>-</u>	1		Compact to dense light brown fine to		<u>61.90</u> 0.91	2	50 DO	20											
-			modum sand, trace gravel, slit, and mortar (FILL)		X														-
-					X	3	50 DO	40											-
-					X														
-	2				60.68	4	50	120											-
-			Dense sandy gravel to brown fine to medium sand and gravel (FILL)		2.13	Ĺ	DO												
-					X														
-		v Stem			X	5	50 DO	67											-
-	3	Hollov			X														
-		Diam			X	6	50	99											
-					59.15														
-		2	Compact to very dense grey SILTY SAND, some gravel (GLACIAL TILL)		3.66		50												-
-	4					7	DO	34											-
-					X		1												-
-						8	50 DO	27											-
-							-												
-	5					9	50	33											
-																			-
-						10	50 DO	>50											-
-	6																		
-	Ŭ					11	50 DO 50	>100											-
-			End of Borehole		6.35	_12	DO	>100											-
Ē			Auger Relusar																
-	7																		-
-																			-
-																			
-																			
⊻	8																		-
113 °																			
1/28																			-
GDT																			-
L-MIS	9																		
L GA																			:
9.GP																			-
22019																			
1111	0																		-
001	_			1	1		<u> </u>				1							I	<u> </u>
BHS	DEP	TH	SCALE						G	olde	r							L	DGGED: BM/JD
SIM 1	: 5	0							<b>V</b> Ass	<u>ocia</u>	<u>tes</u>							CH	ECKED: JW

#### LOCATION: See Site Plan

RECORD OF BOREHOLE: 11-40

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: December 16, 2011

PENETRATION TEST HAMMER, 64kg; DROP, 760mr	m
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ļĘ	2	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRA RESISTANCE, BLO	TION VS/0.3m	$\overline{\boldsymbol{\lambda}}$	HYDRAULIC ( k, cm/	CONDUCTI	VITY,	٥٢	
METRES		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20 40 SHEAR STRENGTH Cu, kPa	60 8 nat V. + rem V. ⊕	30 Q - ● U - ○	10 <sup>-6</sup> WATER ( Wp	10 <sup>-5</sup> 10 CONTENT F	4 10 <sup>-3</sup> PERCENT	ADDITIONA LAB. TESTIN	OR STANDPIPE INSTALLATION
		GROUND SURFACE	0,	62 77				20 40	00 2	50	20	40 60	80		
0		Compact red to fine brown sand, some gravel (Gravel lot BASE)		0.00		50									
		Compact fine to medium brown sand, some gravel, red brick (FILL)		62.39 0.38		DO	13								
					2	50	10								
1				61.55	2	DO	19								
		Compact light brown fine to medium sand, trace gravel, silt, red brick (FILL)		1.22	3	50	15								
						DO	15								
2						50	25								
					-	DO	25								
	stem)					50									
a suger	Hollow S	Very dense grev brown SAND, some		59.78	ð	DO	51								
Power /	Diam. (	gravel, trace silt (GLACIAL TILL)		2.00	6	50	50								
	200 mm			59.11		DO	59								
		Very dense grey brown SILTY SAND, some gravel (GLACIAL TILL)		3.66	7	50	100								
4					Ĺ	50									
					8	DO	>50								
					9	50 DO	>100	D							
5															
					10	50	187	,							
6					11	50 DO	>50								
		End of Borehole Auger Refusal		56.52 6.25											
7															
8															
9															
10															
						<u> </u>									
DEPTH	НS	CALE						Gold	er					L( CH	DGGED: JD

SPT (N) Va	alue OO Ø Natural Moist	ure 🗙	Proje	ct_Geotechr	nical Investiga	tion	Dwg.	No. <u>19</u>
Synamic C Shelby Tub	tone Test Plastic & Liqu be •• • Undrained Tri	id Limit <b>I</b>		Lebreton Flat	ts Infrastructu	ire and Ref	abilation Project	
Rock Core Tield Vane	Test + S Penetrometer	ressure 15⊕5 ailure 10 ▲		Ottawa, Ont	ərio		Project No	A15510A
Vater Leve	el: Est.: 🖞 Measured: 其	Perched: 👤	Bore	hole Location	n Refer to Dra	wing No. 1	1	
G Y V B L O	Soil Description	Geo El 55	detic D ev. p m t R 1 h	20 4 Shear Streng	N Value 10 60 80 hth	D Nat	ural Moisture Conten and Atterberg Limits % Dry Weight	t Natura Unit Weight KN/m
	<u>TOPSOIL</u> ~ 75mm <u>FILL</u> Silty sand with some g trace concrete and brick pic occasional cobbles and bou grey, wet (compact)	pravel, pcces, ulders,	0	O				
	-		1	O				
	-		2					
	FILL Silty sand and gravel, occasional cobbles and bou some clay, moist, grey to grey (loose to compact)	llders, dark _	3	<b>•</b>				
	-	-	4		OBouncing			
	-	~ 52	2.7					
	-		6	0				
	- -Sand blow-up into augers	- from -	7					
	8.2 to 7.2m depth		8	0				
			9	<b>•</b>				
		_	10					



LO	CATION	Lemieux Island Low Pressure	Tran	ismi	ssior	Main, Ottaw	a, ON	DATU	M	(	Geodeti	C COMPILED BY JF
DA	TES: BOH	RING 05-30-03 V	WATE	ERLI	EVEL	06-2	6-03	TPC E	LEV.		54.55	CHECKED BY CM
DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	NATER LEVEL	DEPTH (ft)	VAI CONCEM • %LEL	POUR TRAT	ONS ppmv	SA IAPE	NUMBER	N-VALUE	WELL
+	-4.02			-		• 20 40	60	80				
0	54.63 54.5 54.4	100 mm ASPHALT Granulars				▲ 100 200		400	GS	1		Protective Casing a Bentonite Seal
1		Compact to loose, grey to brown sand and gravel, some brick some wood FILI			- 2 -	•			SS	2	21	Bentonite Seal
		oriek, some wood. I lad			- 4 -	•			SS	3	9	51 mm, Schedule
2				×	- 6				SS	4	6	Sandpack Protective Casing Concrete Seal
				~~~~~	- 8				SS	5	7	
3				0000000	-10		+		SS	6	7	
	51.0	Very loose, sandy gravel,			-12				SS	7	3	
4 -	50.4	Very loose to compact, grey	-	VYYTYY	-14				cc	0	2	
5		clay, trace gravel, wood: FILL		XXXXXX	-16				00	0	15	
	49.1	Compact to dense, grey silty		XXXX	-18				55	9	15	
6		sand, some clay: GLACIAL TILL			-20				SS	10	21	Backfill of Auger
					-22				SS	11	25	Cuttings
7	47.4	End of Borehole		-	-24				55	12	80mm	
8		Auger Refusal on Inferred Bedrock			-26							
		Monitoring Well Installed			-28							
9					-30				-			
					-32				-			

LO	CATION	Lemieux Island Low Pressure	Tran	smi	ssior	Main, Ottawa, ON DAT	UM	0	ieodeti	C COMPILED BY JF
DA	TES: BOF	RING 05-30-03 V	VATE	RLE	EVEL	06-26-03 ТРС	ELEV.	3	5.009	CHECKED BYCM
	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	VAPOUR CONCENTRATIONS • %LEL	SA TYPE	NUMBER	N-VALUE	WELL
+	55.76					● 20 40 60 80 ▲ 100 200 300 400				
ŧ	55.70	100 mm ASPHALT					-			a Protective Casing a
	55.6	Grey sand and gravel: FILL					65	1		Bentonite Seal
1		Compact, brown sand: FILL			-2 -					Bentonite Seal
-							SS	2	12	
	54.5				-4-					51 mm Schedule 4
1		Compact, grey sand, brick,			-		SS	3	29	PVC Casing, with
1	53.9	wood: FILL			6		-			Auger Cuttings
1	0015	Dense to loose, brown to grey			0		-	4	15	
-		sand and gravel: FILL					- 55	4	45	
-					-8					
-				$\nabla$	+ -		SS	5	5	
-					10					
-							SS	6	11	
-	52.1			V V V			00		~	
1	52.1	Loose to very loose, grey		444	-12		-			
-		gravel, some sand, some rock					SS	7	8	
		fragments: FILL		X	-14					
-				×××	-		SS	8	3	
				XXX	-16		1			
-				XXX	10		22	0	3	X X
				×			- 33	9	5	
-				Â	-18		-			
-	1			X	+	<b>A</b>	- SS	10	7	$\bowtie$
-	49.7	-		×	20			-		K K
-		Loose to compact, grey silty			1		SS	11	6	
-		sand: GLACIAL TILL	1	1	22		-			
-			1		122			12	14	
-					F.		- 35	12	14	K K
-	1.1.1.1			1	-24			1		
-	48.1		- 44		+	A	SS	13	32	$\bowtie$
-		brown silty sand trace gravel		1	-26		-	-		N N
-		GLACIAL TILL	1		L		SS	14	70	
1 1					1.00		-			
111					-28	<b>A</b>	- SS	15	50/	
-				1	F				100mn	
-					-30					
			X		+		-			Bentonite Seal
	46.0		1		-32			-		
				-	1		-			

JWE. \_\_\_\_.GDT \_\_\_.GDT \_\_\_

LO	CATION	Lemieux Island Low Pressure	e Trar	nsmi	ssior	Main, Ot	tawa, ON	DA	TUM	1	(	Geodeti	COMPILED BY JF
DA	TES: BOI	RING 05-30-03	WATE	ERLI	EVEL	(	)6-26-03	TP	CELI	EV.	MPI	ES	CHECKED BY CIM
UEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION	STRATA PLOT	WATER LEVEL	DEPTH (ft)	CON • %LE		FIONS ppmv		TYPE	NUMBER	N-VALUE	WELL
	55.76					● 20 ▲ 100	40 60 200 300	80 400					
0		Poor to good, light grey limestone with occasional shale interbeds: BEDROCK			-34				-	HQ	16	49 %	51 mm, Schedule 40 PVC Casing, with Sandpack
1					-36-					HQ	17	80 %	slot #10, PVC Scree
-	44.0		1		-38-								
2		End of Borehole Monitoring Well Installed			-40 -								
					-42								
3					-44								
14					-46				1				
					-48								
15					50			_	-				
16					-52								
					54								
17					56				-			-	
10					-58								
18-					-60	-			-				
19					62	-							
					64	-			-				

### Borehole Number: BH06-9/MW06-9

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365843 E, 5030527N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG/SNG Ground Surface Elevation: 61.58 mASL

**BLOW COUNT** LAB SAMPLE DEPTH BGS SAMPLES CGI (ppm) PID (ppm) STRATIGRAPHIC DESCRIPTION INSTALLATION LOG Stick-up Casing **GROUND SURFACE** 0 FILL 9 Brown topsoil. 50 0 203 mm diameter borehole Brown silty sand fill with organic material near surface. Dry, no odour. Brown silty sand fill with some clay and trace gravel. 7 Moist, no odour. 21 0 15 11 7 Dark brown sand and gravel fill. Dry, no odour. 14 2 10 2 6 mm diameter PVC Riser Brown silty sand fill with trace gravel. Dry, no odour. 5 7 0 10 Native Soil 10 3 8 24 Grey silt fill with some clay. Moist, no odour. 3 9 5 2 Black sand fill with some silt and gravel. Wet, landfill odour. Page 1 of 3

### Borehole Number: BH06-9/MW06-9

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365843 E, 5030527N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG/SNG Ground Surface Elevation: 61.58 mASL



## Borehole Number: BH06-9/MW06-9

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365843 E, 5030527N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG/SNG Ground Surface Elevation: 61.58 mASL

	_					_		
DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	FOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
31 32 33 34 35 36 36 36 37 36 37 36 37 36 36 36 36 36 36 36 37 36 36 36 36 36 36 36 36 36 36			2 1 1	50			Sandy fill with glass and paper debris. Wet, landfill odour. Borehole terminated at 9.8 mBGS. BOREHOLE TERMINATED	Depth of MW06-9 = 9.8 mBGS
	1	<u> </u>	L	1	1	I	1	



# Borehole Number: BH06-11/MW06-11

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365928 E, 5030683 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG

Ground Surface Elevation: 56.80 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	FOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
-4 m -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 11 11 11 11 11 11 11 11 11 11 11			$ \begin{array}{c} 7\\ 11\\ 50\\ 16\\ 14\\ 22\\ 27\\ 1\\ 5\\ 10\\ 6\\ 9\\ 6\\ 10\\ 4\\ 4\\ 21\\ 19\\ 20\\ 50\\ \end{array} $	0 0 0 0			GROUND SURFACE FILL Brown sand fill with gravel and brick. Dry, no odour. Brown sand fill with gravel and minor silt. 12 cm of rock fragments. Dry, no odour.	51 mm diameter PVC screen 51 mm diameter PVC riser 51 mm diameter PVC riser 520 mm diameter borehole Water level @ 4 mBGS
Page 1	of 2							INCERA

# Borehole Number: BH06-11/MW06-11

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365928 E, 5030683 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG Ground Surface Elevation: 56.80 mASL

VB     VS     VS     VI     (iii)     STRATIGRAPHIC DESCRIPTION     INSTALLATION       HI     VS     VS     VI     (iii)     VI     VI     VI       HI     VS     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VI       HI     VI     VI     VI     VI     VI     VI     VII       HI     VII     VII     VII     VIII     VIII     VIIII     VIIII       HI     VIII     VIIII     VIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	N
Gravel fill with minor sand. Wet, no odour.	Silica sand
18     19     BOREHOLE TERMINATED     Depth of MW06-11 =5.0       20     6     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1     1	6 mBGS
	<u> </u>

PROJECT: 11-1121-0229 LOCATION: See Site Plan

### **RECORD OF BOREHOLE: 13-1**

BORING DATE: March 8, 2013

SHEET 1 OF 2

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

RES	METHOD		SOIL PROFILE	LOT		S/		ES WDE	DYNAMIC PENETRAT RESISTANCE, BLOW	FION S/0.3m 60	80	HYDR/	AULIC CO k, cm/s 0 <sup>-8</sup> 10	ONDUCT	IVITY,	IONAL STING	PIEZOMETER OR
METI	BORING		DESCRIPTION	STRATA P	ELE\ DEPT (m)		TYPE	BLOWS/0.	SHEAR STRENGTH Cu, kPa 20 40	nat V. + rem V. €	- Q - ● ∋ U - ○ 80	W ۷۲ 2	ATER CO	ONTENT	PERCENT WI 0 80	ADDITI LAB. TE	STANDPIPE INSTALLATION
_			GROUND SURFACE		58.	72											MON. V
1			(SP/GP) SAND and GRAVEL, crushed, inferred presence of cobbles and/or boulders; grey, (FILL); non-cohesive, moist, compact		0.	1	ss	28									Silica Sand
		-	(SM) SILTY SAND, some gravel; grey brown; non-cohesive, moist, compact		57. 1.	35		10									
2						2		12									
						3	ss	30				0				МН	Native Backfill and Bentonite Mix
3	Auger	(Hollow Stem)	(SM) SILTY SAND, some gravel to gravelly, inferred presence of cobbles and/or boulders; grey brown, (GLACIAL TILL); non-cohesive, moist, dense to very dense		3.	4	ss	55				0				мн	
4	Power	200 mm Diam				5	SS	>50									
6						6	ss	>50									Bentonite Seal
7																	32 mm Diam. PVC #10 Slot Screen
	ß	ğ			50.	C1	NQ RC	DD									
9			DRILLHOLE 13-1														
10																	
DEF 1:5	>T⊦ 50	нs	CALE		<u>.</u>			. (	Golde	er						L'	OGGED: HEC

PF	20	JEC	T: 11-1121-0229		RE	CC	ORD	0	)F	D	RI	LI	_H	0	LE		,	1:	3-1									SH	EET 2 OF 2
LC IN	CL	ATIO INAT	N: See Site Plan TION: -90° AZIMUTH:						DR DR DR	RILL RILL RILL	ing Rig Ing	DA 5: C CO	TE: ME NTR	Ma 75 AC	arch 8 TOR	3, 2 : C	013 )owr	ning	g Drilling									DA	TUM: Geodetic
DEPTH SCALE METRES		DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH <u>COLOUR</u>	JN FLT SHF VN CJ RE TOT/ CORE	- Joi - Fai - Shi - Vei - Col COV	nt ear njug ERY SOLI	ate	B F O C .Q.D. %	D- Be O- Fo O- Co R- Or L - Cle FRA IND 0.3	ddin liatic ntac thog ava CT. EX R m 22	g onal ge B Angl	e 0/7	PL - CU- UN- ST - IR - DISC DIP w.r CORE AXIS	Plar Cur Und Ste Irre	nar F ved k dulating S pped F gular N NTINUITY DA TYPE AND SUR DESCRIPTIO	PO- Po SM- SI SM- Sr Ro - Ro MB- Mo TA TA FACE N	lished ckens nooth ough echani	ided ical B + ST	ROC REN INDE	BR abb of a sym XK GTH X	- B reviati bols. WI El	roker ons re iations EATH RING NDEX	n Roo	ck list Q VG.	
- 8			BEDROCK SURFACE Fresh thinly to medium bedded grey fine to medium grained non-porous strong to very strong nodular LIMESTONE, with black shale partings occasional interlaminates		50.75	1	100											•	,BD,PL,Rc ,BD,IR,Ro ,BD,PL,Rc ,BD,PL,Rc ,BD,CU,Rc	) ) ) )	1.5 1 3 1 1.5 1 1.5 1 1.5 1								MON. WELI
- 9 - 9    - 10	Rotary Drill	NQ Core	- Broken core from 9.94 m to 9.97 m			2	100												BD,PL,Rc BD,PL,Rc BD,PL,Rc BD,PL,SN BD,PL,Rc		1.5 1 1.5 1 1.5 1 1.5 1 1.5 1								JCS = 140.8 MPa
- - - - - - - - - - - - - - - - - - -			End of Drillhole		48.11 10.61	3	100										•		,BD,PL,Rc	)	1.5 1								V.L. in Screen at Elev. 52,12 m on Drail 19, 2012
- - - - - - - - - - - - - - -																													
- - - - - - - - - - - - - - - -																													
- - 14 - - - - - -																													
T 06/07/13 PLG																													
111210229-1000.GPJ GAL-MISS.GD1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1																													
MIS-RCK 004 1:	EP"	TH S	CALE					ģ			 Go	ill olc	 der	lll te	 S														GGED: HEC ECKED: MJK

# LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 13-2

BORING DATE: March 8, 2013

SHEET 1 OF 2 DATUM: Geodetic

			SOIL PROFILE			SA	MPL	ES		TION	>	HYDR	AULIC C	ONDUCT	FIVITY,												
ES		Η		OT				Ę	20 40	60 s/u.3m	во (	1	к, cm/s 0 <sup>-8</sup> 1	0 <sup>-6</sup> 1	0-4 1	0-2	TING	PIEZOMETER OR									
TH S ETRE		ž U	DESCRIPTION	A PL(	ELEV.	1BER	붠	3/0.30	SHEAR STRENGTH	nat V. +	· Q - ●	w w	ĭ ' ATER C	ĭ ' ONTENT	ĭ PERCE	ĭ NT	TES	STANDPIPE									
MEP			DESCRIPTION	RAT,	DEPTH (m)	NUM	₽	SWO.	Cu, kPa	rem V. ∉	• U- Ó	w	p	W		WI	ADI LAB.	INSTALLATION									
		m		ST		<u> </u>		В	20 40	60	80		20 4	10 E	50 8	30											
- 0		-	GROUND SURFACE		57.40																						
-			brown, (FILL); non-cohesive, moist,		0.00																						
-			compact			1	SS	31																			
-																											
- 1						2	SS	28				0					м										
			(SP) SAND, some low to medium		55.88 1.52																						
			plasticity fines, inferred presence of cobles and/or boulders: grey brown to			3	22	6									мн										
2			brown, (FILL); non-cohesive, moist,				33										Nu I										
			(SM) SILTY SAND, some gravel,	1	2.13																						
			inferred presence of cobbles and/or boulders; grey brown, (GLACIAL TILL);					. 50																			
		(ja	non-cohesive, moist to wet, dense to			4	55	>50									IVITI										
		ow Ste																									
3	Auge	Holk (Holk																-									
	ower	Diam.				5	SS	>50																			
	ľ	m m																									
		200																									
4																											
						6	ss	>50																			
5																											
6																											
					51.08	7	ss	>50																			
	ð	g	COBBLES and BOULDERS	K¢	6.32	C1	NQ	סס																			
	-	2	Borehole continued on RECORD OF	$\sim$	50.75		RC																				
			DRILLHOLE 13-2																								
7																											
8																											
-																											
9																											
10																											
רי	יס	<u>-</u> це															17										
1.	۲۲ ا ۳۰	н5						(	Gold	er																	
11	эU								<b>V</b> ASSOC	<b>iales</b>							CH	EURED. WUK									
Pf	RC	DJEC	T: 11-1121-0229		RE	C	ORD	0	FI	DR					:	1	3-2								SF	IEET 2 OF 2	
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IN	ICL	LINA	n: See Site Plan NON: -90° AZIMUTH:						DRI DRI DRI	LLIN LL R LLIN	G: ( G: ( GC(	ATE: CME 7 ONTR/	Ма 5 АСТ	rch 8 FOR:	, 20 Do	13 wnir	ng Drilling	J							DA	ATUM: Geodetic	
DEPTH SCALE METRES		DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH <u>COLOUR</u>	JN FLT SHR VN CJ RE( TOTA CORE	- Joint - Faul - Shea - Vein - Conj COVE	t ugate RY DLID RE % 29 %	R.Q.E	BD - Bed FO - Foli CO - Con DR - Orth CL - Clea INDE PEF 0.3 1 0.2 1	ding atior tact nogo avag CT. CT. CT. CT. CT. CT. CT. CT. CT. CT.	nal le B Angle		L - Pl U- Cu N- Ur T - St 2 - Irr DISCO W.r.t. DRE XIS	lanar urved ndulating tepped regular ONTINUITY I TYPE AND S DESCRIP	PO- P K - S SM- S Ro - R MB- N DATA URFACE	olished lickens mooth ough lechani	ided ical Br STF	eak s reak s ROCK RENGT NDEX	BR - bbrevia f abbre ymbols TH	Broke For ad ations aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation aviation a	en Ro dditiona refer ti ns &	ock al o list Q AVG.		
- - - 7 - -	,		BEDROCK SURFACE Fresh thinly to medium bedded grey fine to medium grained non-porous strong nodular LIMESTONE, with black shale partings and interlaminates		50.75 6.65	1	100									•	,BD,CU ,BD,CU ,BD,PL, ,BD,PL, ,BD,PL,	,Ro ,Ro Ro Ro Ro	1.5 1 1.5 1 1.5 1 1.5 1 1.5 1					-			
- - - - - - - - - - - -	3 Ind	Kotary Unil NQ Core				2	100									• • • • •	BD,PL, BD,PL, BD,PL, BD,PL, BD,PL, BD,CU BD,CU	Ro SM SM SM Ro ,Ro ,Ro	1.5 1 1.5 1 1 1 1.5 1 1.5 1 1.5 1 1.5 1							UCS = 84.1 MPa	-
- - - - - - - -	,		End of Drillhole		<u>48.06</u> 9.34	3	100																	-			
- - - - - - - - - - - - - - - - - - -	)																										-
- - - - - - - - - - - - - - - - - - -	2																										· · · · · · · · · · · · · · · · · · ·
- - - - - - - - - - - - - - - - - - -	L																										· · · · ·
																-											
	EP : 5	PTH S	CALE					Ĵ		G As	 r <b>01</b> SO	der ciai	∐ te	 S			<u> </u>								LC CHE	DGGED: HEC ECKED: MJK	

# LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 13-3

BORING DATE: March 7, 2013

SHEET 1 OF 2

DATUM: Geodetic

	ДŎ		SOIL PROFILE			SA	MPL	.ES	DYNAMIC PENETRA RESISTANCE, BLOW	TION /S/0.3m	2	HYDR	AULIC C k, cm/s		TIVITY,		ں _	DIEZOMETED
	METH			PLOT		L.		.30m	20 40	60 80	``	1	0 <sup>-8</sup> 1	10 <sup>-6</sup> 1	0-4 10	0 <sup>-2</sup>	TIONA	
	RING		DESCRIPTION	ATAF	DEPTH	UMBE	TYPE	0/S/0	SHEAR STRENGTH Cu, kPa	nat V. + Q rem V.⊕ U	2 - • 7 - •	W	ATER C		PERCE	NT	ADDIT AB. TI	INSTALLATION
	BO			STR	(m)	z		BLO	20 40	60 80		2	20	40 E	50 8	0	<u>``</u>	
0	_	4	GROUND SURFACE	××××	55.43	5												
			fines; grey brown, contains orange brick		0.00	Ί												
			loose to compact			1	GRAI											
						2	SS	12					0				м	
		em)																
		low St																
	E Aug	н. (Но				3	SS	7										
ć	§ i	m Diar	(SM) SILTY SAND; grey brown, contains		53.30 2.13	5												
		200 m	fly ash, coal, glass, and orange brick fragments, (FILL); non-cohesive, moist,			$\vdash$	1											
			compact			4	SS	17				0						
3																		
		┢	(SM) SILTY SAND, trace gravel, inferred		52.31 3.12	5	SS	>50										
			grey brown, (GLACIAL TILL);															
			dense															
1	+	+	Borehole continued on RECORD OF	- 1912	51.52	6	ss	>50										
			DRILLHOLE 13-3															
5																		
7																		
в																		
9																		
0																		
ÆΡ	TH	I S	CALE					(	Gold	er							LC	DGGED: HEC
: 5	0								VASSOC	iates							CH	ECKED: MJK

PR	SOJ	ECI	F: 11-1121-0229		RE	EC	ORD	) (	DF	D	RI		HC	D	_E	:	1	13.	-3								SI	HEET 2 OF 2	
IN	CLI	NAT	N. See Sile Plan ION: -90° AZIMUTH:						D D D	RILL	RIG ING	COI	ME 7	5 CT	OR:	, 20 D	owni	ing [	Drilling								D.	ATOM. Geodelic	
DEPTH SCALE METRES			DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH <u>COLOUR</u>		1 - Ji T - F HR- S N - V J - C RECO	oint ault hear cein conjug VERN VERN SOLI	jate <u>/</u> R. □D 20 88	8998	P- Bedi D- Folia D- Cont R- Orth - Clea FRAC INDE PEF 0.3 n 929	ding ation tact ogor wage T. X E n S	al Angle		PL - P CU- C JN- U ST - S R - Ir DISC Pw.r.t. CORE AXIS 8888	Planar Curve Indula Indula Teppo Tegul	r PC d K ating SM ed Ro lar ME INUITY DAT. PE AND SURFA DESCRIPTION	P- Poli: - Slici 1- Smo - Rou 3- Mec A A	shed kensio ooth igh chanic	ded cal Bro STR	eak ROCK RENG NDEX	BR - NOTE: abbrev of abbr symbol TH	Brol For a iations reviations reviations Is. WEA ERIT	ken F additio s refer ons & .TH- NG EX	Rock nal r to list Q AVG.		
	Rotary Drill Rotary Drill	NG Core	BEDROCK SURFACE Slightly weathered thinly bedded grey non-porous fine grained medium strong LIMESTONE, thin black shale laminates. Fresh thinly to medium bedded grey fine to medium grained non-porous strong to very strong LIMESTONE, with black shale partings and interlaminates, occasional nodules  End of Drillhole		51.52 3.91 51.19 4.24	3													BD.PL.Ro BD.RRRo BD.RRO BD.RRO BD.RRO BD.RRO BD.PLRO BD.RRO BD.PLRO BD.RRO BD.PLRO BD.RRO BD.PLRO BD.RRO BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PLSM BD.PL									UCS = 122.1 MPa	
DE 1 :	РТ 50	НS	CALE						Į		Ga	old OO	ler Liat	tes	5												L( CH	ogged: Hec Iecked: Mjk	

#### LOCATION: See Site Plan

**RECORD OF BOREHOLE: 13-4** 

SHEET 1 OF 2

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: March 15, 2013

DD	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN RESISTANCE,	ETRA BLOW	TION /S/0.3m	ì	HYDRAUL k,	IC CONDU cm/s	CTIVITY,	10	
DRING METH	DESCRIPTION	RATA PLOT	ELEV. DEPTH	NUMBER	TYPE	DWS/0.30m	20 SHEAR STREM Cu, kPa	₩ I NGTH	60 € nat V. + rem V. ⊕	30 Q - ● U - ○	10 <sup>-8</sup> WATE Wp ⊢		10 <sup>-4</sup> 10 <sup>-2</sup>	ADDITIONAL ABD. TESTIN	OR STANDPIPE INSTALLATION
BC		STF	(m)	2		BLO	20 4	40	60 8	30	20	40	60 80		
	GROUND SURFACE		55.36					<u> </u>						$\rightarrow$	MON. WEL
	(SM) SILTY SAND, trace gravel; grey brown, contains organic matter, (FILL); non-cohesive, moist, loose		0.00	1	ss	9									
Stem)	(StWML) SILTY SAND to SANDY SILT; dark brown, contains organic matter, (FILL); non-cohesive, moist, loose		0.76	2	ss	5									_
Power Auger mm Diam. (Hollow	(SP/GP) SAND and GRAVEL, crushed; grey, (FILL); non-cohesive, moist, loose to compact		53.68 1.68	3	SS	10									_
200	(CI) SILTY CLAY; grey brown; cohesive, moist, stiff to very stiff		53.00 2.36 52.62	4	ss	7					H	-a			Bentonite Seal
	(OL) ORGANIC SILT; dark brown;		52.16	5	SS	>50									
	Grey LIMESTONE Borehole continued on RECORD OF DRILLHOLE 13-4														
															-
															-
															-
															-
EPTH 50	SCALE						G	olde	er					L	OGGED: HE HECKED: MJ

P L'	RO. OC/ ICL	JEC <sup>-</sup> ATIO INAT	T: 11-1121-0229 IN: See Site Plan FION: -90° AZIMUTH:		RE	C	ORD	C	DF DF DF	D RILLI RILLI RILLI	RI NG RIG NG		.HC TE: ME ME 7!	DL Marc 5	<b>.E</b>	5, : D	201: own	13 <sup>3</sup> hing	-4 Drilling								Sł D/	HEET 2 OF 2 ATUM: Geodetic	
DEPTH SCALE METRES		DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH COLOUR	JN FLT SHF VN CJ RE TOT CORI	- Joi - Fa R- Sh - Ve - Co ECOV	int ear in njuga /ERY SOLIE CORE ( 2000 (	te R. %	80 60 01 01 02 02 04 02 03 04 02 04 02	FRAC	ding ation tact ogon avage T. X B n 0 7 0 0		D	PL - F CU- ( UN- I ST - S IR - I DISC IP w.r. CORE AXIS	Plana Curve Undu Stepp Irregu CONT	Ir I ed I lating S bed I llar I TINUITY DA PE AND SUF DESCRIPTIO	PO- PC SM- SI SM- Sr Ro - RC MB- M MB- M ATA ATA RFACE DN	Jished ckens nooth bugh echani	ided cal Br STF	reak ROCK RENG NDEX	BR NOTE abbrev of abb symbo STH E	- Brok : For a itations reviations reviations ls. WEA ERIN INDE	ken R ddition srefer t ons & TH- NG EX	ock al to list Q AVG.		
	1		BEDROCK SURFACE Fresh thinly to medium bedded grey fine to coarse grained non-porous strong to very strong LIMESTONE, with black shale partings and interlaminates, occasional nodules - Broken core from 3.55 m to 3.63 m - Broken core from 3.78 m to 3.82 m		51.93 3.43	1	100										•		,BD,PL,SI ,BD,PL,Ri ,BD,PL,Ri ,BD,PL,SI	M D D M M	1 1 1.5 1 1.5 1 1 1 1 1							MC ∑ Bentonite Seal	DN. WELI
	Drill	ore				2	100										•		,BD,PL,SI ,BD,PL,Ri ,BD,PL,Ri ,BD,PL,SI ,BD,PL,Ri ,BD,PL,Ri	M D D M D	1 1 1.5 1 1.5 1 1 1 1.5 1 1.5 1							Silica Sand	
- - - - - - - - - - - - - - - -	Rotan	NQC				3	100												,BD,PL,R ,BD,PL,R ,BD,PL,R ,BD,PL,R		1.5 1 1.5 1 1.5 1 1.5 1							32 mm Diam. PVC #10 Slot Screen	
	- 7 - 7 - 7 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8																												
- - - - - - - - - -	8 8 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1															-													
- - - - - - - -	þ																												
0T 06/07/13 PLG	1																												
1210229-1000.GPJ GAL-MISS.GE	2																												
MIS-RCK 004 111	EP <sup>-</sup>	TH S	CALE					Ć			Go	)   old	ler Ler	tes													СН	DGGED: HEC ECKED: MJK	

#### LOCATION: See Site Plan

#### SAMPLER HAMMER, 64kg; DROP, 760mm

#### **RECORD OF BOREHOLE: 13-5**

BORING DATE: March 13, 2013

SHEET 1 OF 2

DATUM: Geodetic

щ	Т	DD	SOIL PROFILE			SA	MPL	ES	DYNAMIC PEN RESISTANCE	IETRAT BLOW	TION S/0.3m	Ì	HYE	DRAULIC k, cm	CONDUC <sup>-</sup>	FIVITY,		<u>ں</u>	
SCAL	RES	METH		JOT		R.		.30m	20	40	60	80		10 <sup>-8</sup>	10 <sup>-6</sup> 1	0 <sup>-4</sup> 10	0 <sup>-2</sup>	TONAL	
EPTH	MET	RING	DESCRIPTION	ATA F	ELEV.	UMBE	TYPE	WS/0	SHEAR STREI Cu, kPa	NGTH	nat V. rem V.	+ Q-● ⊕ U-O		WATER		PERCE	NT	AB. TE	INSTALLATION
ā		BOF		STR.	(m)	ž		BLO	20	40	60	80		20	40 6	50 8	0 0	<u>ر</u> ۹	
_	0		GROUND SURFACE		55.39														
-	Ű		(SM) SILTY SAND, trace gravel; brown, (TOPSOIL); non-cohesive, moist		0.00														
Ē			(SP/GP) SILTY SAND and GRAVEL, crushed; grey, (FILL); non-cohesive,		Š.	1	SS	12											
E			moist, dense to loose		Š.														-
F					Š.														
F	'				×.	2	SS	54										м	
-		Stem)			X		1												-
Ē		Hollow			X														
F	<	iam. (†			X	3	SS	13											
F	2				×	_													-
F		200			×.	$\vdash$													
Ē						4	SS	9											
F					52.49														
F	3		(FILL); non-cohesive, moist, very loose		52.19	⊢													-
F			(OL) ORGANIC SILT; dark brown; non-cohesvie, moist, very loose		3.20	5	SS	3									0	OC = 24.0%	
Ē	-	-	LIMESTONE	۲Ť	3.53	-													
F			DRILLHOLE 13-5																
Ē	4																		
F																			
E																			
F																			:
Ē	5																		-
F																			
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Ē	6																		-
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E																			
F	7																		-
E																			
٦																			:
3 PL																			
3/07/1	8																		-
100																			
IS.GL																			:
AL-M																			
2 - -	9																		-
00.GF																			
10																			
21022																			
1111	10																		-
001				<u> </u>	1								1						
BHS	DEP	TH S	SCALE					1		olde	۲							L	DGGED: HEC
MIS	1:5	0							<b>V</b> Ass	<b>SOCI</b>	ates							СН	ECKED: MJK

P	RO	JEC.	T: 11-1121-0229		RE	C	ORD	С	)F	D	RIL	L	.HC	)L	E:		1	3-5							S	SHEET 2 OF 2
L( IN	OC/	ATIO INAT	N: See Site Plan 10N: -90° AZIMUTH:						DR DR DR	RILLI RILL RILLI	ng e Rig: Ng (		'E: M ME 75 NTRA(	larc CTC	:h 13 DR:	8, 20 Dov	)13 vnir	ng Drilling							C	DATUM: Geodetic
DEPTH SCALE METRES		DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH <u>COLOUR</u>	JN FLT SHF VN CJ RE TOT CORI	- Joi - Fau R- She - Vei - Col ECOV	nt ear in njuga ERY SOLID	R.C	BD FC OF CL	- Beddi - Foliat - Conta - Ortho - Cleav FRACT INDEX PER 0.3 m	ing ion act gona age	al Angle	PL CU UN ST IR DI DIP V COI AX	- Pla J- Cu I- Un - Ste - Im SCC w.r.t. RE IS	anar PO urved K ndulating SM epped Ro egular MB DNTINUITY DATA TYPE AND SURFA DESCRIPTION	- Polishe - Slicker - Smootl - Rough - Mecha	ed iside nical	d Brea RO STREI IND	BF NC abl of a ik syr ICK NGTH DEX	R - B DTE: Fo breviati abbrevi mbols.	roker or addi ons re iations EATH RING NDEX	TROCK tional fer to list & Q AVC	3.
		-	BEDROCK SURFACE Fresh thinly to medium bedded grey fine to medium grained non-porous strong to very strong LIMESTONE, with black		51.78 3.61	1	100 100		4 (2 )	0.040	v ∞ő	40	φ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				90 • •	,BD,IR,Ro ,BD,CU,SM — ,BD,PL,Ro	3 1 1 1 1.5 1				5		>	-
	arv Drill	, Core	shale partings and interlaminates, occasional nodules - Broken core from 3.62 m to 3.68 m			3	100-0										• • • • • • •	BD PL,SM BD,PL,R0 BD,PL,R0 BD,PL,R0 BD,PL,R0 BD,PL,R0 BD,PL,R0 BD,PL,R0 BD,PL,SM BD,PL,R0 BD,PL,R0 BD,PL,R0 BD,PL,R0 BD,PL,R0	1 1 1.5 1 3 1 1.5 1 3 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5 11 1.5							UCS = 151.4 MPa
- - - - - - - - - - - - - - - - - -		N				4	0										•	BD,PL,SM BD,PL,SM BD,PL,Ro BD,PL,Ro BD,PL,Ro BD,PL,SM BD,PL,SM BD,PL,Ro BD,PL,Ro	1 1 1 1 1.5 1 1.5 1 1 1 1 1 1.5 1 1.5 1 1.5 1 3.1 3.5							
8         End of Drillhole         7.85         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1															-											
	8     End of Drillhole     7.85       • 10     10																									
- - - 11 - 11 -	Į																									
D	EP : 50	гн s	CALE					Ć			Go	1d	er iat	es											L Cł	.OGGED: HEC HECKED: MJK

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

**RECORD OF BOREHOLE: 13-6** 

SHEET 1 OF 2 DATUM: Geodetic

BORING DATE: March 14, 2013

	ДОН		SOIL PROFILE		1	SA	MPL	ES	DYNAMIC PE RESISTANCE	NETRA , BLOV	TION VS/0.3m	~	HYDR/	AULIC C k, cm/s	ONDUCT	TIVITY,		NG	PIEZOMETER
MEIRES	<b>30RING MET</b>		DESCRIPTION	TRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	LOWS/0.30m	20 SHEAR STRE Cu, kPa	40 I NGTH	60 nat V. + rem V. 6	80 - Q - ● ∋ U - ○	1 W	0 <sup>-8</sup> 1 ATER C	0 <sup>-6</sup> 1 ONTENT	0 <sup>-4</sup> 10 1 1 1 1 1 1 1 1 1	0 <sup>-2</sup> I NT WI	ADDITION LAB. TESTII	OR STANDPIPE INSTALLATION
+			GROUND SURFACE	ω.	55 70			В	20	40	60	80	2	20 4	ιο e	<u>50 8</u>	30		MON. WE
0 -		4)(000	ASPHALTIC CONCRETE SP/GP) SAND and GRAVEL, crushed; grey, (FILL); non-cohesive, moist, compact to dense		0.00	1	ss	20											
1			CI) SILTY CLAY; grey brown, (FILL);		54.33 1.37	2	SS	45											
2	er Official	ow Stem)	cohesive, moist, very stiff SM) SILTY SAND and GRAVEL; grey brown, contains orange brick fragments, FILL); non-cohesive, moist, loose to compact		1.52	3	ss	9											Bentonite Seal
3	Power Auge	200 mm Diam. (Holl				4	ss	9					0					м	
		(	SM) SILTY SAND, some gravel; grey		52.04 3.66	5	SS	14											Silica Sand
4			rown, (FILL); non-conesive, wet, compact			6	SS	20											32 mm Diam. PVC #10 Slot Screen
5		() r L H L	OL) ORGANIC SILT, dark brown; ion-cohesive, most, loose IMESTONE 30rehole continued on RECORD OF DRILLHOLE 13-6		4.65	7	SS	>50								0		OC = 16.2%	
6																			
7																			
8																			
9																			
10																			
 DEF 1 : 5	РТН 50	I SC/	ALE	1	I	I				old	er		I		<u> </u>		<u> </u>	L L( CH	DGGED: HEC ECKED: MJK

	PR	OJEC	T: 11-1121-0229		RE	C	ORD	0	F	DR		LHO	OL	_E:		1	3-6								SF	IEET 2 OF 2
	INC	LINA	n: See Site Plan FION: -90° AZIMUTH:						dril Dril Dril	LIN L RI	G: ( G: ( GCC	ME 7 ONTRA	iviar '5 ACT	OR:	4, 20 Dov	wnin	ng Drilling	I							DA	ATUM: Geodetic
DEPTH SCALE	METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH COLOUR RETURN	JN - FLT - SHR- VN - CJ - REC TOTAL	Joint Fault Shea Vein Conju	r Jgate RY DLID RE %	R.Q.D	D-Bed O-Foli CO-Con DR-Orth CL-Clea FRAC INDE PEF 0.3 I	Iding ation itact nogoi avago CT. CT. CT. R M 2 S	nal e 3 Angle	PL CU UN ST IR DIP COL AX	- Pla J- Cu J- Un - Ste - Irre SCO w.r.t. RE JS 006	anar urved adulating epped egular DNTINUITY I TYPE AND S DESCRIP	PO- F K - S SM- S Ro - F MB- M DATA	Polished Slickens Smooth Rough Mechan	ided ical Bi	reak ROCK RENG NDEX	BR - NOTE: abbrevi of abbr symbol TH	Brok For ac ations eviations eviations s. WEAT ERIN INDE	en Ro dditiona refer to ns &	Q AVG.	
-	5		BEDROCK SURFACE Fresh thinly to medium bedded grey fine to coarse grained non-porous strong to very strong nodular LIMESTONE, with black shale partings and interlaminates		50.80 4.90	1	100									•	,BD,PL, ,BD,PL, ,BD,PL, ,BD,PL, ,BD,PL,	Ro Ro SM Ro	1.5 1 1.5 1 1 1 1 1 1.5 1							MON. WELL
	6 7	Rotary Drill NQ Core				2	100									•	,BD,PL, ,BD,PL, ,BD,PL, ,BD,PL, ,BD,PL, ,BD,PL, ,BD,PL, ,BD,PL,	SM Ro SM SM SM SM SM SM Ro	1 1 1.5 1 1.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							Bentonite Seal
	8       3       4       8         9       4       8																	UCS = 170.6 MPa								
-	9 10 10 10 10 10 10 10 10 10 10															-		W.L. in Screen at Elev. 51.84 m on April 18, 2013								
	10																									
	12																									
.GDT 06/07/13 PLG	13																									
1111210229-1000.GPJ GAL-MISS.	14																									
MIS-RCK 004	DEPTH SCALE LOGGED: HEC 1:50 LOGGED: HEC CHECKED: MJK																									

#### LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

#### RECORD OF BOREHOLE: 13-7

BORING DATE: March 11, 2013

SHEET 1 OF 2

DATUM: Geodetic

i		<u>p</u>	SOIL PROFILE			SA	MPL	.ES	DYNAMIC PEI RESISTANCE	NETRA , BLOW	TION /S/0.3m	ì	HYD	RAULIC k, cm	CONDUC	TIVITY,		٥	
RES	T T	Ξ Ξ		РОТ		R		.30m	20	40	60	80		10 <sup>-8</sup>	10 <sup>-6</sup>	10 <sup>-4</sup> 1	0-2	TIONAL	
MET		D NIX	DESCRIPTION	ATA F	ELEV.	UMBE	TYPE	WS/0	SHEAR STRE Cu, kPa	NGTH	nat V. rem V. 6	+ Q- ⊕ U- C	8	NATER	CONTEN	T PERCE	NT	AB. TE	INSTALLATION
5	Ğ			STR	(m)	Ī		BLO	20	40	60	80	l v	Vp   20	40	60	VVI BO		
0			GROUND SURFACE		55.71														
U			(SP/GP) SAND and GRAVEL, crushed; grey, (FILL); non-cohesive, moist,		0.00														
			compact			1	GRAE												
1						2	SS	32											
						$\vdash$													
						3	SS	20					0						
2					53.58														
		(me)	(SM) SILTY SAND; grey brown, contains fly ash and orange brick fragments,		2.13	_													
	Jer	llow S	(FILL); non-cohesive, moist, loose to compact			4	SS	10											
	'er Au(	H).				Ľ							Ĭ						
3	Pow	m Dia																	
		200 m						_											
					\$	5	SS	ĺ (											
			(SM) SILTY SAND, some gravel,	Ŵ	<u>52.05</u> 3.66														
4			inferred presence of cobbles and/or boulders; brown, (GLACIAL TILL);																
			non-cohesive, moist to wet, compact			6	SS	20					þ						
						-													
						7	SS	>50											
5																			
					50.21														
			Borehole continued on RECORD OF DRILLHOLE 13-7																
6																			
0																			
1																			
8																			
9																			
10																			
DE	PT	нs	CALE						A.	-1-1								LC	OGGED: HEC
1::	50										<del>.</del> Tatas							СН	ECKED. WIK

PR LO INC	OJEC CATIC CLINA	CT: 11-1121-0229 DN: See Site Plan TION: -90° AZIMUTH:	R	ECC	ORD		F D DRILL DRILL	RI ING RIG		HO : Ma : 75 : RAC	LE arch 1	1, 2 Do	<b>1</b> 013 wnin	<b>3-7</b> g Drilling	3						SH DA	IEET 2 OF 2 .TUM: Geodetic
DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	BOLIC LOG DEPTH (m)	RUN No.	FLUSH COLOUR RETURN	JN FLT - F SHR- S VN - \ CJ - ( RECO TOTAL XORE %	Joint Fault Shear Vein Conjug OVER SOLI	jate / R.1 ID 20 20 20 20 20 20 20 20 20 20	BD-1 FO-1 CO-1 OR-1 CL-1 Q.D. II % ( 398, 4	Beddin Foliatic Contac Drthog Cleava RACT. NDEX PER 0.3 m 0928	g in onal ge B Angle		L - Pla U- Cu N- Un T - Ste R - Irre DISCO 'w.r.t. DRE XIS 388	nar rved dulating pped gular NTINUITY TYPE AND S DESCRIF	PO- P K - S SM- S Ro - R MB- N DATA DATA	olished lickensi mooth tough lechanie Jr Ja J	ded cal Brea STRE INI n 2 2 22	BR NOT abbi of al ak sym DCK ENGTH DEX 22 22	- Brok TE: For a reviations bbreviation bbols. WEA ERIN INDE	ken Ro dditiona s refer to ons & TH- NG EX	Q AVG.	
		BEDROCK SURFACE	50.21										•	-,BD,PL	Ro	1.5 1					_	
- 6		to coarse grained non-porous strong nodular LIMESTONE, with black shale partings and interlaminates     - Broken core from 6.13 m to 6.18 m     - Broken core from 6.34 m to 6.39 m		2	100 100								•	,BD,PL ,BD,PL ,BD,PL ,BD,PL ,BD,R, ,BD,PL ,BD,PL	Ro Ro Ro Ro Ro Ro Ro	1.5 1 1.5 1 1.5 1 1.5 1 3 1 1.5 1 1.5 1 1.5 1						
7		- Broken core from 6.78 m to 6.84 m											•	,BD,PL ,BD,PL ,BD,PL	,SM ,Ro ,Ro	1 1 1.5 1 1.5 1				-		UCS = 75.9 MPa
8	Rotary Drill NQ Core			3	100								•	,BD,PL ,BD,PL ,BD,PL ,BD,PL ,BD,PL	,Ro ,Ro ,SM ,Ro ,Ro	1.5 1 1.5 1 1 1 1.5 1 1.5 1						
9				4	100								• • • • • • • • • • • • • • • • • • • •	,BD,PL ,BD,CL ,BD,PL ,BD,PL ,BD,PL ,BD,PL ,BD,PL	,Ro ,Ro ,Ro ,Ro ,Ro ,Ro ,Ro	1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1						
- - - - - - - - - -		- Mud seam and vertical fracture from 10.98 m to 11.23 m End of Drillhole	44.48 11.23	5	100 100								•	,BD,PL ,BD,PL — ,BD,PL ,BD,IR,	Ro Ro Ro	1.5 1 1.5 1 1.5 1 3 1						
- 12																						
- 13																						
- 14 - - - - 15																						
DE 1:	PTH : 50	SCALE						Go	olde	r ate	<b>S</b>										LC	IGGED: HEC ECKED: MJK

#### **RECORD OF BOREHOLE: 13-8**

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: March 5, 2013

SHEET 1 OF 2

DATUM: Geodetic

ш			SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATI RESISTANCE, BLOWS	ON \	HYDRAU		TIVITY,	.0	
DEPTH SCAL METRES		DRING METH	DESCRIPTION	RATA PLOT	ELEV. DEPTH	NUMBER	TYPE	OWS/0.30m	20 40 SHEAR STRENGTH Cu, kPa	50 80 nat V. + Q - ● rem V. ⊕ U - ○	10 <sup>-8</sup> WAT Wp H	10 <sup>-6</sup> 1 IER CONTENT	0 <sup>-4</sup> 10 <sup>-2</sup> PERCENT	ADDITIONAL	PIEZOMETER OR STANDPIPE INSTALLATION
_		Ĭ		STI	(m)	<u> </u>		B	20 40	<u>30 80</u>	20	40 6	60 80		MONINEL
— o	-		ASPHALTIC CONCRETE		55.95 0.00	; )								_	MON. WEL
- - - - - - - - -			(SP/GP) SAND and GRAVEL, crushed; (SP/GP) SAND and GRAVEL; brown, (SP/GP) SAND and GRAVEL; brown, (FILL); non-cohesive (SM) SILTY SAND, some gravel, inferred presence of cobbles and/or boulders; grey, contains asphalt fragments, (FILL); non-cohesive, moist, compact		55.75 0.20 55.57 0.38 55.19 0.76	<u>i</u> } i 1	SS	>50							-
- - - 2 -	iger	ollow Stem)			XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	2	SS	18			0				
- - - - - 3	Power A	200 mm Diam. (H			52.75	3	ss	11							
-			(CI) SILTY CLAY; grey brown; cohesive, moist, stiff to very stiff		3.20 52.14	4	SS	7			œ				- - - - - -
- 4 - 4			(SM) SILTY SAND, some gravel to gravely, inferred presence of cobbles and/or boulders; grey, (GLACIAL TILL); non-cohesive, moist, dense to very dense		3.81	5	ss	32			0			мн	Bentonite Sear
					51.01	6	ss	33							
- 6 - 6 - 7 - 7			DRILLHULE 13-0												
- 8															
- 9 - 10															
DE		Ш	CALE												DGGED: HEC
1:	50								<b>U</b> Associa	r Mes				СН	ECKED: MJK

PF	ROJEC	CT: 11-1121-0229		RE	CC	ORD	0	)F	DF	RIL	Lŀ	10	LE	:	,	13-8							S	HEET 2 OF 2
IN	CLINA	ION: See Site Plan ATION: -90° AZIMUTH:						DR DR DR	ILLIN ILL F	NG D. RIG: NG C	ate Cme Ont	: M E 75 'RAC	arch CTOF	5, 2 R: [	2013 Down	ing Drillir	g						D	ATUM: Geodetic
EPTH SCALE METRES	LING RECORD	DESCRIPTION	MBOLIC LOG	ELEV. DEPTH (m)	RUN No.	H <u>COLOUR</u>	JN FLT SHF VN CJ RE	- Joir - Fau - She - Vei - Cor	nt ult ear njugat ERY SOLID	e R.Q.	BD- E FO- F CO- ( OR- ( CL - ( D. IN	Beddir Foliati Conta Orthog Cleava RACT. NDEX	ng on ct gonal age		PL - F CU- ( UN- ( ST - S IR - I DISC	Planar Curved Jndulating Stepped rregular CONTINUITY	PO-F K -S SM-S Ro-F MB-M	Polished Slickens Smooth Rough Mechan	iided	eak	BR - I NOTE: I abbrevia of abbre symbols TH I	Broken For addit ations ref wiations  VEATH- ERING	i Rock tional fer to list & Q	
	DRII	BEDROCK SURFACE	s	51.01		FLUS	CORE 889	0 % E 8 8 8	0RE %	884	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	0.3 m ₽₽8	-986 -986	36 27 36	AXIS	DESCR	SURFACE	Jr Ja	Jn Zž (	222	2 5	W3 M3	*	MON. WEL
- 5 - - - - -		Fresh thinly to medium bedded grey fine to coarse grained non-porous strong to very strong nodular LIMESTONE, with black shale partings and interlaminates		4.94	1	0										,BD,C ,BD,C ,BD,P ,BD,P	U,SM U,Ro _,Ro _,SM	1 1 1.5 1 1.5 1 1 1						
- 6 - 6 					2	0										BD,P BD,P BD,P BD,P BD,C BD,C BD,C BD,C BD,C	_,Ro _,Ro _,Ro _,Ro J,SM _,Ro J,Ro J,Ro J,Ro	1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1						Bentonite Seal ∑
- - - - - - - - - - - - - - - -	Rotary Drill NG Core	- Mud seam from 7.11 m to 7.12 m			3	0									•	,BD,P ,BD,P ,BD,P	_,Ro _,SM	1.5 1 1 1 1.5 1						Silica Sand
- - - - - - - - - - - - - - - - - - -					4	0									•	,BD,S ,BD,P ,BD,P ,BD,P ,BD,P ,BD,P ,BD,IF ,BD,IF	T,Ro L,Ro L,Ro L,Ro L,Ro L,Ro L,Ro L,Ro	3 1 1.5 1 1.5 1 1.5 1 1.5 1 1.5 1 3 1 3.5 1						32 mm Diam. PVC #10 Slot Screen
- - - - - - - - - - 11 -		End of Drillhole		<u>44.80</u> 11.15	5	0									•	,BD,P ,BD,P	_,Ro _,Ro	1.5 1 1.5 1						Bentonite Seal
- - - - - - - - - - - - - -																								W.L. in Screen at Elev. 49.24 m on March 25, 2013
SS.GDT 06/07/13 PLG																								
111210229-1000.GPJ GAL-MI																								
MIS-RCK 004 1 DI 1 :	EPTH	SCALE					Ć			]]]] Gol 550	  de <u> oci</u> :	er ato	 25_										LI CH	DGGED: HEC ECKED: MJK

#### **RECORD OF BOREHOLE: 10-01**

BORING DATE: March 17, 2010

SHEET 1 OF 2

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

i	ł	8	SOIL PROFILE			SA	MPL	ES	Headsp	ace Org	g. Vapo	our C	Conc. [F	PPM]	HYDR	AULIC C	ONDUCT	FIVITY,	Т	.0	
RES		MEIH		PLOT		ĸ		).3m	6		12	18	2	24	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup> ⊥	TONAL	
MET		SNI2	DESCRIPTION	ATA F	DEPTH	IUMBE	TYPE	)/S/MC	Headsp ppm	ace Co	mb. Va	apou	r Conc.	[%LEL]	W W	ATER C		PERCE	NT	ADDIT AB. TI	INSTALLATION
	6	2 2		STR	(m)	z		BLO	20	) 4	40	60	8	30		10 :	20 3	30 4	10		
0			Ground Surface	222	58.26				$\left  \right $			_									
			Compact brown to dark brown silty sand, some gravel, trace clay with brick		0.15	1	50 DO	16	₽												
			and concrete (FILL)		8																
					8		50														
1					×	2	DO	210	₽												-
					×																
					8	3	50 DO	210	€												
~					×.																
2					×.	4	50 DO	19	₽												
			Very loose black sand, some gravel		55.82																
			(FILL)		55.52	5	50	2	⊕												
3			(FILL)		2.74																-
					54.91		50														
			Loose to compact grey SILTY SAND, some gravel, trace clay		3.35	0	DO	154	7												
		Stem)																			
4	uger	Hollow			•] ·:	7	DO	126	€												-
	ower A	Diam. (F																			
	6	0 mm				8	50 DO	5 (	₽												
-		20																			
5						9	50 DO	5 (	€												
					ļ	10	50	1.6													
6					52.16																-
			Compact brown fine SAND		6.10		50														
						11	DO	160	€												
			Compact grey fine SAND		6.71																
7						12	50 DO	130	€												-
			Very dense grey SILTY SAND, some	l TŤ	50.64																
8			gravel, trace clay			13	50 DO	64	€												
0																					
					49.75	14	50 DO	50	€												
			COBBLES and BOULDERS		8.51	15	NQ RC	DD													
9		b																			-
	tary Dr	V Casir					NO														
	м Ч	ź				16	RC	DD													
						4		<b>D</b> 7													
0	┢		CONTINUED NEXT PAGE		₹	Ľ′-	+-		F-+			• +			+		+		+		
				I	-	I	<u> </u>	<u> </u>			1				1	1	1	1	1		
טE 1 י	:РТ - Б	н S 0	GUALE						(#	Ģ	old	er	00							LC CH	JGGED: D.G. FCKED: KPH
• •		-								1722	500	101	CO							0.1	

## RECORD OF BOREHOLE: 10-01

BORING DATE: March 17, 2010

SHEET 2 OF 2

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	G	8	SOIL PROFILE			SA	AMPL	.ES	Head	dspa	ace Org	g. Va	pour	Conc. [F	PPM]	HYDF	RAULIC (		TIVITY,	T	.0	
RES	Ē	METH		LOT		ĸ		3m		6		12	1	8 2	24	.	10 <sup>-6</sup>	10 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	IONAL	PIEZOMETE OR
METI	0	D Z	DESCRIPTION	TA P	ELEV.	MBE	ΥPE	VS/0	Head	dspa	ace Co	mb. '	Vapo	ur Conc	. [%LEL]	V	VATER (	ONTENT	PERCE	NT	EQ.	STANDPIP INSTALLATI
_		SOR		TRA.	(m)	Ŋ	1	BLOV	ррп							W	/p —	—0 <sup>W</sup>		WI	LAE	
	-	ш		ν		-	+	ш		20	4	40	6	<u>ه</u> 0	30		10	20 3	30 4	40	+	
10			COBBLES and BOULDERS							+											+	
			(continued)	$\cdot$		17	RC	DD														
	/ Drill	asing		•																		
	totary	Š				18	NQ	סס														
	œ	z		50		10	RC															
11			Fresh grey LIMESTONE BEDROCK		47.26					_		+										
	_		with interbedded shale						-													
	y Dril	Core		Ε.	1	19	NQ	DD	≥° 10	ة 1000	⊗ n∠i 86	<u>ا</u> ر	94									
	Rotar	ğ			1		RC		T.C.		S.C.	R.O.										
	-				46.37																	
12			End of Borehole		11.89																	
3																1						
4																						
5																						
16																						
7																						
8																1						
																1						
																1						
9																1						
Ĩ																						
																1						
																1						
20																1						
																1						
				1					Â		A				1		1		1		لــــــ	
DE	PT	TH S	SCALE								G	ol	deı	•							LC	)GGED: D.G.
: 1	5	0						'	V		Ass	50	cia	tes							CH	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-02

BORING DATE: March 16, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		8	SOIL PROFILE			SA	MPL	ES	Head	space Or	g. Vapo	Ir Conc.	PPM]	HYDR	AULIC C	ONDUCT	TIVITY,	T	.0	
	RES	METH		LOT		۲		.3m	FF	6	12	18	24	1	0 <sup>-6</sup> 1	0-5 1	0 <sup>-4</sup> 1	<sub>0⁻³</sub> ⊥	ONAL	PIEZOMETER OR
ΠΕQ	METI	UNG P	DESCRIPTION	VTA P	ELEV.	IMBE	γpe	WS/0	Head	space Co	mb. Vap	our Con	. [%LEL]	W	ATER C		PERCE	NT	B. TE	STANDPIPE INSTALLATION
	2	BOR		STRA	(m)	R		BLO	ppm	20	40	60	80	W	p ┣────			WI	LAI	
	0		Ground Surface		57.54															
E	0		Black sandy silt with organic matter (TOPSOIL)		57.39	-														-
-			Compact brown silty sand, some			1	50 DO	16€	Ð											-
Ē			boulders (FILL)				50													
F						2	DO	55€	Ð											-
-	1						50													-
E						3	DO	86	7											-
F																				
Ē						4	50 DO	8 €	Ð											-
F	2																			-
F							50													-
Ē						5	DO	13€	Ð											-
F			Compact black sand, some gravel,	₩	54.80 2.74															-
F	3		trace silt (FILL)	₩	54.49 3.05	6	50 DO	22	⊕											_
F			silty sand layers (FILL)																	
Ē							50													-
F		6	-			7	DO	20€	Ð											-
E	4	v Sterr	50 0 8																	-
Ē		Auger			53.27	8	50 DO	8 €	₽											-
F		ower /	Loose grey SILTY fine SAND, trace	$\square$	4.34															-
E			gravel				-													-
F	5	200	8			9	DO	66	Ð											-
-																				-
E						10	50	4 €	Ð											-
F																				
E	6						]													-
F	-					11	DO	1 €	Ð											-
Ē																				-
Ē					50.83	12	50	36	Ð											-
F	-		Loose rusty fine SAND, trace gravel	hî	50.68 50.53		00													
Ē	1		Loose to dense brown coarse SAND		7.01															-
F						13	50 DO	1 €	Ð											-
Ē																				-
F						14	50	736	÷											-
6 -	8				49.34		DO													-
1/2//			Very dense grey SANDY SILT, some gravel, trace clay		8.20															-
ЦЦ.						15	DO	65€	Ð											
0.0			End of Borehole	<u>-41</u>	. 48.80 8.74															
BOG-	9		Auger Refusal																	
봐																				-
GPJ																				-
0044.																				
1122	10																			-
E 10									_											
HOL	DE	РТН	SCALE						Â		414								LC	DGGED: D.G.
BORE	1:	1:50 Golder CHECKE										ECKED: K.P.H.								

## **RECORD OF BOREHOLE: 10-03**

BORING DATE: March 9, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ		8	SOIL PROFILE			SA	MPL	.ES	Heads	space (	Org.	Vapou	Conc.	[PPM]	HYDR	AULIC C	ONDUC	TIVITY,	Т	.0	
SCAL		МЕТН		LOT		ĸ		.3m		6	12	! 1	8	24	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup> ⊥	IONAL STIN	PIEZOMETER
PTH		SING P	DESCRIPTION	ATA P	ELEV.	IMBE	ΓΥΡΕ	WS/0	Heads ppm	space (	Com	b. Vapo	ur Con	c. [%LEL	] V	ATER C		PERCE	NT	E TEI	STANDPIPE INSTALLATION
DE		BOR		STR/	(m)	ľ	[	BLO		20	40	) F	0	80	- W	р —— 10	20 :		WI 40		
			Ground Surface		57.0	6											Ĭ				
F	0		Loose black silty clay with organic matter (FILL)		0.0	)	_														-
F					56.60	1	DO	13€	Þ												
E			Brick (FILL) Compact brown sand, some gravel,		56.4	5	-														-
F			trace clay with some brick and concrete (FILL)		×.	2	50	21€	Þ												-
E	1				55.84	1															-
F			Very dense to compact brown to dark grey sandy silt with cobbles and		1.2	2															-
E			organic matter (FILL)			3	DO	70€	Þ												-
F						-	-														-
F	2					4	50	14€	₽												
E					54.6	2															-
-			Compact black sand, some gravel, trace silt (FILL)		2.4	1	6														-
E			Compact, brown, medium to coarse		2.74	1 5	DO	15€	₽												-
-	3	Ê			X		-														-
Ē		w Ster	Compact black sand, some gravel		53.7	6	50 DO	13€	₽												-
Ę		Holic	trace silt (FILL)		53.4	5															-
E		Diam	Compact, brown, medium to coarse sand (FILL)		3.6	6	50														-
-	4	00 mm			×	7	DO	14€	₽												-
Ē		5	Compact grey sand and gravel (FILL)		52.79 4.2	7															-
-					52.3	8	50 DO	18€	₽												-
Ē			PEAT Compact grey SILTY CLAY		52.20	3															-
-	5		Compact grey fine SAND		4.8	3	50														
F				ि	51.7	3	DO	18€	₽												-
E			gravel, trace clay			ĺ															
F						10	50 DO	11€	Þ												-
F	6				50.9	3															
F			coarse SAND		6.10		50														-
Ē						11	DO	56	7												-
F						-															
-	7					12	50 DO	16€	Þ												
F			End of Doroholo		49.7	1															
Ē					1.0.	-															-
F																					-
	8																				
1 1																					
5																					-
9.0 -																					-
ROG	9																				
<u></u>																					-
GP																					-
247 																					-
1122(	10																				
E 10																					
EHOL	DEF	тн	SCALE						Â	Ś.	20	Jdo	<b>r</b>							LC	)GGED: D.G.
, BOR	1 : 50 CHE									ECKED: K.P.H.											

## **RECORD OF BOREHOLE: 10-04**

BORING DATE: March 8, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	Τ	8		SOIL PROFILE			SA	MPL	ES	Headspace Org. Va	apour Conc. [F	PM]	HYDRAUL		JCTIVITY,	T		
DEPTH SCALE METRES		<b>30RING METHC</b>		DESCRIPTION	TRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	3LOWS/0.3m	Headspace Comb.	18 2 Vapour Conc.	₩ 24 [%LEL]	к, 10 <sup>-6</sup> WATE Wp —	10 <sup>-5</sup> ER CONTE	10 <sup>-4</sup> 10 NT PERCEI	D <sup>-3</sup> ⊥ NT WI	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
	0			Ground Surface Black sandy silt with organic matter (TOPSOIL)		56.57 56.42 0.15				20 40	<u>60 8</u>	0	10	20	30 4	0		
				Dense grey brown silty sand, some gravel (FILL) Compact black sandy silt, some gravel (FILL)		55.99 0.58	1	50 DO	456	<b>&gt;</b>								
-	1		-	Loose brown silty sand, some gravel (FILL)		55.35 1.22	2	50 DO	216									-
	2			Loose to dense black sandy silt, some gravel (FILL)		54.82 1.75 54.44	4	50	476	÷								- - -
		ger	ollow Stem)	compact, prown, meaium to coarse sand, some gravel (FILL)		2.13	5	50 DO	136	ð								
- :	3	Power Au	00 mm Diam. (H			53.06	6	50 DO	16€	ð								
	4		2	Stiff grey silty clay (FILL)		3.51	7	50 DO	5 6	<b>&gt;</b>								
						51.77	8	50 DO	5 €	e la la la la la la la la la la la la la								-
	5			PEAT Stiff grey SILTY CLAY Compact grey SANDY SILT, some gravel		4.88 51.39 5.18	9	50 DO	13€	Ð								
-	6			Compact grey fine SAND		51.06 5.49 50.65 5.92	10	50 DO	176	>								
				Auger Refusal														
	7																	
DT 7/27/10																		
	9																	
20044.GPJ H																		
10112	0																	
D BOREHOLE	DEP :	ד⊦ 50	H S	CALE		_		_		Gold	der ciates				_	_	LC CHI	DGGED: D.G. ECKED: K.P.H.

## **RECORD OF BOREHOLE: 10-05**

BORING DATE: March 10, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш		0	SOIL PROFILE			SA	MPL	.ES	Hea	dspa	ce O	rg. ∖	/apou	Conc. [	PPM]	HYDR	AULIC C	ONDUCT	IVITY,	Т	.0	
SCAL	2	METH.		LOT		ъ		3m	pp.	6		12		8	24	1	0 <sup>-6</sup> 1	D <sup>-5</sup> 10	) <sup>-4</sup> 1(	p⁻³ ⊥	ONAL	PIEZOMETER OR
METH		ING N	DESCRIPTION	VTA P	ELEV.	IMBE	ΥPE	WS/0.	Hea	dspa	ce C	omb	. Vap	our Conc	. [%LEL]	W	ATER C		PERCE	T	DDITI B. TE	STANDPIPE INSTALLATION
DE		BOR		STRA	(m)	N		BLO	ppn	. 20		40		50	80	W	p —		\ 04	WI	LAI	
			Ground Surface		55.61							Ť							-			
E			Compact to dense black silty sand, some gravel, trace brick with cobbles		0.00																	-
F			and boulders (FILL)		Š.	1	50 DO	25€	Þ													-
F					X																	-
E					X	2	50	426														-
-	1				54.00	-	DO	720	ľ													
E			Dense grey brown sand, trace silt with		1.22																	-
F					X	3	50 DO	36€	Þ													-
F					×																	-
Ē	2				×.		50															
È		Ê			×	4	DO	426	ľ													-
F		ow Ste	Compact dark brown sandy silt, some	×	2.44																	-
Ē	0010	(Holl	gravel (FILL)		ŝ.	5	50 DO	18€	Þ													-
F	3	Diam			52.59																	-
Ē		00 mr	trace wood (FILL)		3.02		50															-
F		2			X	6	DÖ	86	₽													-
Ē			Loose dark grey fine SAND, some		51.95 3.66																	-
<u> </u>	4		gravel			7	50 DO	6 (	₽													-
E			COBBLES and BOULDERS		51.42 4.19	-	1			+	Τ	$\uparrow$		1								-
E				;			NQ															-
-						8	RC	00		69	1	"	17									-
E	5																					-
F				6		9	NQ RC	DD	(9				6									-
E				$\cdot$		10	NQ	DD	C.R.	0	2											-
Ę			Grey LIMESTONE BEDROCK with	É.	50.00				Ê	Ű	ö	0	Ê.									-
Ē	6		Interbedded Snale																			-
F		Q Cor		臣		11	NQ RC	DD	1	00	3	2	9									-
E	á	Ż		臣																		-
È				臣	48.90																	
Ē	_		End of Borenole		0.71																	-
Ę	ĺ																					-
F																						-
E																						-
Ę																						-
9	8																					-
7/27																						-
E E E																						-
ю́-																						-
E E	9															1						
ţ																1						-
- GP																						-
2004																						-
1	0															1						-
- -									ا هر		<u> </u>					1						
EHC I	DEP	тн :	SCALE					(			G	b	lde	r							LC	OGGED: D.G.
ໍ່ສີ່ 1	: :	50							V		<u>15</u>	SO	ocia	ites							СН	ECKED: K.P.H.

## **RECORD OF BOREHOLE: 10-06**

BORING DATE: March 8, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		9	SOIL PROFILE			SA	MPL	.ES	Headspace	Org. Vapo	our Conc. [	PPM]	HYDR		ONDUCT	TIVITY,	т		
SCALE		ЕТНС		Б		~		3m	6	12	18	24	1	0 <sup>-6</sup> 1	D <sup>-5</sup> 1	0 <sup>-4</sup> 10	0 <sup>-3</sup>	STING	PIEZOMETER OR
TH S		M Q N	DESCRIPTION	A PL	ELEV.	ABER	ΡE	/S/0.3	Headspace	Comb. Va	pour Cond	[%LE <u>L]</u>	w	ATER C	L ONTENT	PERCEI	NT	E E	STANDPIPE
DEP		SORIN		TRAT	DEPTH (m)	NUN	Ļ	PON	ppm				Wp	⊳ <b>⊢</b>	-0 <sup>W</sup>		WI	LAB LAB	internet
	_			S	. ,				20	40	60	80	1	0 2	0 3	60 4	10 		
F	0		Ground Surface Grey sandy silt, some gravel, trace	<b>***</b>	55.04 0.00														
F			brick (FILL)			1	50	526											-
F					54.51		DO	020	Í										-
F			Black silty sand (FILL)	諁	0.61														
-	1		coarse sand (FILL)			2	50 DO	13€	e l										-
E	1	Stem																	-
F	uder	Hollow																	-
F	wer A	am. (F			3	3	50 DO	56	•										-
Ē	P	nm Di		₩	53.21														-
-	2	200 r	(FILL)				50	20.6											-
F						4	DO	230											-
Ē						_													-
E			Grev silty clay (EILL)	×	52.30 2.74	5	DO	76€	€										-
<u>–</u>	3				51.97	6	50 DO												-
Ē			End of Borehole Auger Refusal		3.07														
F			·																
F																			-
Ē	4																		-
F	-																		
F																			-
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OLE				•	•													•	
뛰 [	DEP.	i H S	SCALE							Gold	er							LC	DGGED: D.G.
<u>ଜୁ</u> 1	: 5	0							VA	<b>SSOC</b> i	ates							CH	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-07

BORING DATE: March 8, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш	QO	SOIL PROFILE			SA	MPL	ES	Headspace Or	g. Vapou	Conc. [F	PM]	HYDR	AULIC CO	ONDUCT	IVITY,	Т	.0	
SCAL	AETH		LOT		٣		3m	6	12	18 2	4	1	D <sup>-6</sup> 10	D <sup>-5</sup> 10	) <sup>-4</sup> 10	<sub>2'³</sub> ⊥	ONAL	PIEZOMETER OR
METH	NG N	DESCRIPTION	TA PI	ELEV.	MBEI	ΥΡΕ	VS/0.	Headspace Co	mb. Vap	our Conc.	[%LEL]	W	ATER CO	ONTENT	PERCEN	NT	B. TE	STANDPIPE INSTALLATION
DEI	BORI		TRA	(m)	N	Ĺ	BLOV	ppm				Wp			I \	WI	LAE	
		Ground Surface	0	55.20				20	40 (	50 E	0	1	0 2	0 3	0 4	0		
- 0		Black sandy silt with organic matter	۲	0.05														-
Ē		Compact black sand, some gravel	′ 🗱		1	50 DO	23€	•										-
E		(FILL)		54.77														-
-		Loose to compact, brown, medium to coarse sand, some gravel (FILL)		0.61		50												-
- 1					2	DO	20€	€										-
Ē																		-
-	(moto)				3	50	126	•										-
-	ger allour 6					DO												-
	/er Au																	-
F	Pov				4	50 DO	76	€										-
-	~ 000																	-
F						50			1									-
F					5	DÓ	22		1									-
									1									-
F				51.93	6	50 DO	176											-
F		PEAT		51.82		50												-
E	$\vdash$	Dense grey GRAVEL		51.55	7	DO	50€	€										
- 4		End of Borehole Auger Refusal																-
-																		-
Ē																		-
-																		-
- 5																		-
-																		-
-																		-
E																		-
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E																		-
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-																		-
E																		-
F									1									-
10									1									
7/27/									1									-
105									1									2
1-1.C									1									-
- s																		-
																		-
GP																		-
0044																		-
1122(									1									_
10																		
TOH DE	PTH	SCALE						Â.	-1-1								LC	OGGED: D.G.
1 :	50								olde: SOCi2	r Mes							СН	ECKED: K.P.H.

## **RECORD OF BOREHOLE: 10-08**

BORING DATE: March 11, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

						1			Ц <sup>1</sup>		100	Ver	Co		LIVE		0.00		11/171/		<u> </u>	
	ç		SOIL PROFILE			SA	MPL	ES	ppm	space C	vrg.	vapou	Conc.	[PPM] €	HYDE	kauliC k, cn	, COI n/s	NDOCI	IVIIY,	T	μĥ	PIE7OMETER
RES	Ē			LoT		2		3m		6	12	! 1	8	24		10-6	10-5	10	) <sup>-4</sup> 1	0 <sup>-3</sup> ⊥	STIN	OR
E E	ç	<u>ב</u>	DESCRIPTION	Ρ	ELEV.	ABEI	ΡE	/S/0	Head	space C	om	b. Vapo	our Con	. [%LE <u>L</u>	] V	VATER	CON	NTENT	PERCE	NT	IEH.	STANDPIPE
<	ā			RAT	DEPTH (m)	NUN	F	ΓO	ppm					L	N	′p —		-0 <sup>W</sup>		WI	AD	
	<u> </u>	ñ		ST	(11)					20	40	. 6	60	80		10	20	3	0 4	40		
0			Ground Surface	×××	55.98						_											
			gravel, brick (FILL)		× 0.00		50															
					X	1	DO	8 €	₽													
					55.37																	
			Compact brown silty fine sand, some gravel with cobbles and boulders (FILL)		0.61																	
1					8	2	50 DO	696	₽													
					54.76																	
			Compact black sand, some gravel,		1.22																	
			trace slit, pieces of wood (FILL)		8	3	50	27	₽													
					X		00															
					X																	
					X	4	50	47	₽													
					8																	
		Stem	Firm grey brown SILTY CLAY, some	ĦŨ	2.44																	
	jer	Nollo	sandy gravel, organic layer from 3.66 to			5	50	6.6														
	r Auç	Н				Ŭ	DO		ľ													
	Powe	Dian																				
		E E				6	50	110														
		200				0	DO		Ĩ													
					52.25	_																
			Compact grey SANDY SILT, trace gravel		3.73	-	50															
			9.010.			<i>′</i>	DO	96	₽ 													
				14			50															
				開		8	DO	236	₽													
					4																	
						9	50	266	 													
						ľ	DO	200	ľ													
					50.49																	
			Dense grey SANDY SILT, some gravel, trace clay		5.49	10	50	35 €	₽													
	_	_	Boulders		50.16	-																
	y Dril	asinç		•		11	NQ	סס														
	Rotar	N N N			49.63		RC	00														
	-	-	Grey LIMESTONE BEDROCK with	E	6.35						+		1									
			interbedded shale	臣	-		NO															
	Ē	e		臣	1	12	RC	DD	(%) 10	8	23	(%) (%)										
7	ary D	Cor		臣	-				.R.	C.R.		D.										
	Rot	ž					1			- 0. 0			1									
				臣		13	RC	DD	10	0 2	20	0										
			End of Borehole	ᅣᅸ	48.36			-			+						_					
				1																		
в				1	1																	
										1												
				1	1																	
				1	1																	
9				1	1																	
										1												
				1	1																	
				1	1																	
										1												
)																						
						-	-						-		•							
Æ	PT	H S	SCALE					(	(4	) G	ò	lde	r,								LC	DGGED: D.G.
1 :	5	0							V	As	S	ocia	tes								СН	ECKED: K.P.H.

#### **RECORD OF BOREHOLE: 10-09**

BORING DATE: March 9, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION	TEST	HAMMER,	64kg;	DROP,	760mm

щ	Τ	QO	SOIL PROFILE			SA	MPL	ES	Headspace Org	. Vapour	Conc. [F	PPM]	HYDR	AULIC Co	ONDUCT	IVITY,	Т	.0	
SCAL		МЕТН		LOT		2		.3m	6 1	2 1	8 2	24	10	D <sup>-6</sup> 10	D <sup>-5</sup> 10	) <sup>-4</sup> 1(	0 <sup>-3</sup> ⊥	IONAL	PIEZOMETER
EPTH METI		SING I	DESCRIPTION	ATA P	ELEV.	JMBE	ΓΥΡΕ	WS/0	Headspace Cor	nb. Vapo	ur Conc.	[%LEL]	w	ATER CO		PERCE	NT	B. TE	STANDPIPE
DE		BOR		STR ∕	(m)	z		BLO	20 4	0 6	0 8	30	Wp 1	0 2	0 3	'	WI 10	LAA	
0	,	_	Ground Surface		56.97														
-			Compact to dense grey brown sandy silt, some gravel, trace clay (FILL)		0.00		50												-
Ē						1	DO	9 €	₽										-
E																			-
F.						2	50 DO	11€	₽										-
Ē																			
F							50												-
Ē						3	DO	45€	₽										-
-																			-
E <sup>2</sup>	2					4	50 DO	476	₽										-
F			Compact black sand, some gravel,	颷	2.29														-
Ē			Trace clay (FILL)		54.33		50												-
Ę			cobbles (FILL)		2.04	5	DO	36€	₽										-
3	5	Stem)	Loose grey to black SILTY CLAY, trace	Ŵ	3.02	-													-
Ę	Der	s wolic	graver with organic matter			6	50 DO	9 6	₽										-
-	ver Au	am. (H																	-
E	đ	nm Dia	Compact brown medium to coarse	<u>XX</u>	53.16 53.01		50												-
- 4	L.	200 r	SAND Compact to dense grey SANDY SILT,		3.96	1	DO	156											-
F			some gravel, trace clay																-
F						8	50 DO	20€	₽										-
E																			-
- 5	5						50	804											-
E						9	DO	090											-
F																			
E						10	50 DO	39 <del>(</del>	•										-
- 6	6																		-
E						11	50	496	•										-
F							DO												
E						10	50	20.6											-
- 7	Ĺ				49.83	12	DO	390											
Ē			End of Borehole Auger Refusal		/.14														
Ē																			:
F																			-
₽ - 19	1																		-
121																			-
																			-
EO.																			-
м М М М	'																		
Ĭ																			-
- GP																			
20044																			
10																			-
DI DI	EP	тн s	SCALE						(M) c	older	•							LC	DGGED: D.G.
<u>්</u> සි 1	: {	50							VASS	ocia	ites							СН	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-10

BORING DATE: March 18, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		0		SOIL PROFILE			SA	MPL	ES	Head	space	Org.	Vapou	Conc.	[PPM]	HYDI	RAULIC	CONDUC	FIVITY,	т		
CALE	ŝ	THC			5				Е	ppm	6	13	, <i>.</i>	8	24	₽	k, cm/	s 10 <sup>-5</sup> 1	0 <sup>-4</sup> 1	n-3 1	NAL	PIEZOMETER
L SC	ETRE	UNE ME		DECODIPTION	A PLO	ELEV.	BER	Щ	S/0.3I	Head	space	Com	h Van	ur Con	24 c [%  E		VATER (		PERCEI	й NT	TES	STANDPIPE
DEPI	Ī	NINC		DESCRIPTION	RAT/	DEPTH	MUM	Ţ	SWO.	ppm	opuoc	Com	ib. vap		0. [7022		/p	O <sup>W</sup>		wi	ADD LAB.	INSTALLATION
		ä	í		STI	(m)	_		BL		20	40	) (	50	80		10	20 3	30 4	0		
	0	_	-	Ground Surface		57.82																
F				(TOPSOIL)	1	0.05		50														
F				Compact grey brown silty sand, some gravel with brick (FILL)			1	DO	14€	Ð												
F				graver min 2000 (1 122)		×																
E						X		50	100													-
E	1					ž.	2	DO	166	Ð												-
F			┟	Compact black sand, some gravel, with	₩	56.60 1.22																-
F			em)	brick and ashes (FILL)		×.	3	50	23	Ð												-
F		-	ov St				Ű	DO	20	Ŷ												-
F		Auge	Ē	Compact brown to dark brown SAND,	$\sim$	1.83																
F	2	ower	Diam.	some gravel, trace silt			4	50	16	⊕												
E		-	Ē					00														-
E			20																			-
F							5	50 DO	10€	Ð												
F	3					54.77																-
F				Compact brown SAND and GRAVEL		3.05	6	50 DO	16€	Ð												-
E																						-
F		Dense brown coarse SAND         54.16         50         50           53.88         7         50         50																-				
F		Dense brown coarse SAND         3.66 53.88         7 50 3.94         50 50 ⊕           End of Borhole         3.94																-				
F	4			End of Borhole Auger Refusal		3.94																-
F				0																		-
E																						-
E																						-
F	5																					
F																						-
F																						-
E																						-
E																						-
F	6																					-
F																						-
E																						-
E																						-
E	7																					-
F																						-
F																						
F																						-
E																						-
	8																					-
27/1																						-
14																						-
0.GL																						-
ğЕ	9																					-
ЯĞ Г	Ĩ																					-
手																						-
Ð.																						-
0044																						-
1122	10																					_
10																						
НОГ	DEF	эт⊦	чs	CALE						Â	K.	~									LC	)GGED: D.G.
ORE	1:	50	)							V	7.5	лС 56/	DICE DCi2	r Vtee							СН	ECKED: K.P.H.
ш <u> </u>											- 4 84	الان	JUIC									

PROJECT: 10-1122-0044

## RECORD OF BOREHOLE: 10-11

SHEET 1 OF 1 DATUM: Geodetic

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: March 18, 2010

Т	<i>c</i>	5				SA	MPI	I FS	Hea	dspa	ce Or	rg. Va	apour	Conc. [I	PPM]	HYDR	AULIC C	ONDUC	TIVITY,			
ŝ	THO		JUL FRUFILE	۲	T				ppn	י ר		10			• •	.	k, cm/s	0-5	0.4		ING	PIEZOMETER
	ЦМ С	5		, PLO	ELEV.	3ER	щ	\$/0.3n		6	~ ~	12 1	Vana		24    0/1 = 1 1	1		ט ⁻ 1 L ריא⊐דו∧ר			TEST	OR STANDPIPE
	DINID		DESCRIPTION	RATA	DEPTH	NINE	ΤΥΡ	OWS	ppn	າ າ	CeCt	und.	vapo			w			PERCE	WI	ABD	INSTALLATION
ļ	a			STF	(m)	_		В		20		40	e	50 E	30		10 2	20 :	30 4	40		
ŀ	_		Ground Surface Black sandy silt with organic matter	222	57.86					_												
			(TOPSOIL)	1	0.08	1	50	15														
			(FILL)		8	'	DO		Ĭ													
					8	-																
					56.87	2	50 DO	38	⊕													
l			Dense to loose brown and black sand, some gravel with brick, trace concrete		0.99																	
			and wood (FILL)		8																	
					8	3	50 DO	57	⊕													
					8																	
					8		50	6														
					8	4	DO	0	₽													
I			Compact brown silty sand layers, some	▓	2.44																	
			clay, trace gravel with cobbles and boulders (FILL)		8	5	50 DO	24	╞													
					8																	
					×		50															
		em)			8	6	DO	28	₽													
	er	ow St	Very dense grey CLAYEY SILT, trace	FXX	54.20 3.66																	
	er Aug	n. (Hol	very fine sand with cobbles and boulders		1	7	50	53	₽													
	Powe	n Dian		ſIJ																		
		00 mu		И																		
		2				8	50 DO	34	₽													
				ΥII																		
				Ш	1	9	50	80	•													
									Ī													
				H																		
					1	10	50 DO	74														
				111																		
				Ш		11	50 DO	50														
l				$\ $																		
				Ш																		
l					1	12	50 DO	50														
				ſШ																		
				W																		
						13	DO	79														
ł	_		Fresh arev LIMESTONE BEDROCK	Щ	49.96 7.90							-		-								
			with interbedded shale	臣		14	NQ RC	DD		100	29	9	0									
						-																
l	y Drill	Core		臣		15	NQ RC	DD	(%) ·	100	ê 44	4 (%) .	28									
	Rotar	ğ							T.C.R		ا ز	R.O.L										
														]								
						16	RC	DD		100	50	0	36									
			End of Borehole		- 48.36 9.50					-												
					1																	
1					1																	
El	PT	нs	CALE						Â		C	പ	ሰው	r							LC	DGGED: D.G.
:	50	0							V	Z	15	<u>S0</u>	<u>Ci</u> 2	tes							СН	ECKED: K.P.H.

## **RECORD OF BOREHOLE: 10-12**

BORING DATE: March 15, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ	Τ	QO	SOIL PROFILE			SA	MPL	ES	Head ppm	spac	e Org	ı. Va	pour	Conc. [F	PM]	HYDR	AULIC C k, cm/s	ONDUCT	IVITY,	T	ں ا	
SCAL		METH		PLOT		ж		).3m		6	1	2	1	8 2	4	1	) <sup>-6</sup> 1	0 <sup>-5</sup> 10	0 <sup>-4</sup> 1	<sub>0-3</sub> ⊥	TIONAL	
MET		RING	DESCRIPTION	ATA F	DEPTH	IUMBE	ТҮРЕ	)/S/VC	Head ppm	spac	e Cor	nb. ۱	Vapo	ur Conc.	[%LEL]	W			PERCE	NT	ADDIT AB. TE	INSTALLATION
		BO		STR	(m)	z		BL(		20	4	0	6	٤ ٥	0	1	0 2	20 3	0 4	0	Ľ	
_ o	┝		Ground Surface Black sandy silt, with organic matter	EZZ	56.68					_												
F			(TOPSOIL)		0.08	1	50 DO	15€	Ð													
Ē			gravel, with cobbles and boulders, trace wood at 1.22 m depth (FILL)																			-
E						2	50	25	Ф													-
- 1 -					×.	2	DO	25	Ψ													-
Ē		Stem)			8																	-
E	uaer	Hollow				3	50 DO	16€	Ð													
÷,	ower A	Diam. (I																				
Ē		0 mm [	Very dense black sand, some gravel,		54.55 2.13	4	50 DO	60 <del>(</del>	Ð													
-		20	trace silt (FILL)		54.17																	-
			Compact light brown sandy silt (FILL)		2.59	5	50 DO	176	Ð													-
- 3	5		(FILL) Dense dark grey silty clay to dark		53.71 2.97																	-
-			brown sandy silt with organic matter (FILL)			6	50 DO	33€	Ð													
Ē			Weathered LIMESTONE BEDROCK		53.10						-											-
Ē			with interbedded shale			7	NQ RC	DD	10	0	26		17									-
- 4	╎₌											0										
F	otary Dr	IQ Core				8	NQ RC	DD	% 10 01 0	C.R. (%	30	Q.D. (%	20									-
Ę	R	2								- vi		Ľ.										-
- 5	;					9	NQ RC	DD	10	0	26		21									-
Ē	$\vdash$		End of Borehole		51.52 5.16																	
E																						-
Ē																						-
- 6	5																					-
Ē																						-
-																						-
	,																					-
E																						-
F																						
Ē																						-
↓ ↓ 8																						
1 1 1																						-
																						-
ομο Γ	'																					
																						-
14. 19.																						-
12200																						-
101										L.												
	EP <sup>-</sup>	TH S	SCALE						Â	R		1.	10-								LC	DGGED: D.G.
1 BORI	: 5	0							V	ZA	JD SS	900 10		tes							СН	ECKED: K.P.H.

## RECORD OF BOREHOLE: 10-13

BORING DATE: March 9, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	ſ	<u> </u>				.5/	MPI	ES	Head	space	Org.	Vapou	Conc.	[PPM]	HYDF		ONDUC	TIVITY,			
ES			GOLTROHLE	7				<u>د</u>	ppm	6	41	,	8	24	₽ _	k, cm/s	6 ∩⁻⁵ ⁴	0-4 4	0-3	NAL	PIEZOMETER
ETRE		≣ 2	DESCRIPTION	A PLO	ELEV.	BER	ЪЕ	S/0.3	Head	space	Com	b. Vap	our Cor	24 nc. [%LEI	_1 V	VATER C	ONTENT	PERCE	ŇT	TES	STANDPIPE
Σ				TRAT	DEPTH (m)	NUN	≿	LOW	ppm					. [	w اک	'p ┣───	—0 <sup>W</sup>		WI	ADI LAB.	INSTALLATION
	0	<u>م</u>		ST	(,		-	8	<u> </u>	20	40	) (	50	80		10	<u>20 3</u>	30 4	10 		
0		$\square$	Ground Surface Black silty clay with organic matter	<b>K</b>	56.19	)			├──	_	-										
			(TOPSOIL)	/		1	50	14€	₽												
			trace brick with cobbles (FILL)		8																
					8																
1					8	2	50 DO	20€	₽												
			Compact black sand, some gravel		54.97	2															
		Ê	trace silt (FILL)		8	3	50	266													
	-	ow Ste			54.36		DO		Í												
2	· Auge	(Hollo	Compact brown sand, some gravel	×	54.2	1															
-	Power	Diam.	Compact black sand, some gravel,	′₩	1.98	4	50 DO	24€	Þ												
	_	m U m	trace silt (FILL)		53.68																
		20	Loose brown SANDY SILT, some		2.5		50														
			gravel, have elay			5	DÖ	96	Ĵ												
3																					
						6	50 DO	3 €	Þ												
						7	50 DO	6 €	Þ												
4				%].	<u>. 52.18</u> 4.01	1								_							
5																					
6																					
7																					
8																					
9																					
																1					
																1					
																1					
0																					
ЭЕ	ΡT	ΉS	SCALE						Â	XV.	20	Jdo	r							LC	DGGED: D.G.
1 :	5	0							V	<b>Z</b> A	55(	<u>OCi</u>	<u>tes</u>	5						СН	ECKED: K.P.H.

## **RECORD OF BOREHOLE: 10-14**

BORING DATE: March 12, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		0	SOIL PROFILE			SA	MPL	ES	Hea	adspa	ace C	)rg. ∖	/apou	ur Co	nc. [Pl	PM]	HYDR	AULIC C	ONDUCT	IVITY,	т		
CALE	2	ETHC		Ь				٤	ppm	ו 6		12		18	24	4 ⊕	1	k, cm/s	0 <sup>-5</sup> 1(	) <sup>-4</sup> 1(	n-3 1	NAL	PIEZOMETER
		IG ME	DESCRIPTION	A PLO	ELEV.	BER	ЪЕ	S/0.3	Hea	udspa	ace C	omb	. Vap	our (	Zonc.	• [%LEL]		ATER C	Í ONTENT	PERCEI	ĭ NT	TES	STANDPIPE
DEP	ž	ORIN	DESCRIPTION	RAT.	DEPTH (m)	NUM	∣≿	LOW	ppm	l l						́ сі	W	p	OW		WI	ADC LAB.	INSTALLATION
		ä		ST	(,					20		40		60	80	)		10 2	:0 <u>3</u>	0 4	0		
F	0		Ground Surface Dark brown sandy silt with organic	EEE	55.85		-			_		-											
E			matter (TOPSOIL)	/	0.10	1	50	86															
Ę			gravel, trace silt and brick (FILL)		8				[														
F					8		1																
E	1				8	2	50 DO	266	Þ														-
E					54.63																		:
F			Compact, brown, medium to coarse sand, some gravel, trace silt (FILL)		1.22		50																
E		v Sten			8	3	DO	16€	₽														-
F	1000	Hollov			8	_																	:
-	2	iam. (			8	4	50	176	Þ														-
E					8																		
F		200			8																		-
-					8	5	50 DO	17€	Þ														-
F	3				8																		-
F			L		52.50	6	50	126															-
E			Compact light brown SANDY SILT		3.35	ľ	DO	120	ľ														
2			Dense coarse SAND, some gravel		3.66	7	50	50€	Þ														-
-	4		Fresh LIMESTONE BEDROCK with		51.86					_	_			_									-
E			interbedded shale	臣		8	NQ	חח		96		28	16										-
F						ľ	RC			50	1												-
-				臣			1																
E	5 3	Core							R. (%)	3	R. (%	)) [	<u>~</u>										_
-	Doto	NO NO		Ħ			NO		T.C.		S.C.		2 Y										
Ē				Ħ		9	RČ	DD	1	100	5	96	96	5									-
-				Ē																			
Ē	<u>د</u>				49.85																		-
F	Ŭ		End of Borehole		6.00																		-
Ē																							
E																							-
-																							
E	7																						-
E																							
F																							
E																							-
⊴⊢	8																						-
0. 0.																							-
	9				1																		
Ĭ					1																		
- Cal																							-
144.0																							-
1220	10				1																		-
101																							
		тн	SCALE							X												10	
	ייייי 1 : ו	50							G		G		lde	r at	26							СН	ECKED: K.P.H.
<u>ш</u>											70	JU	<u>, 1</u>	ull	5							5.1	

# RECORD OF BOREHOLE: 10-15

BORING DATE: March 12, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ	Τ	Ø	SOIL PROFILE			SA	MPL	.ES	Heads	pace C	org. '	Vapour	Conc. [	PPM]	HYDR	AULIC	CC	NDUCT	IVITY,	Т	10	
H SCAL		METH		PLOT		ER		0.3m		6	12	1	8	24	1	0 <sup>-6</sup>	10	-5 10	) <sup>-4</sup> 1	0 <sup>-3</sup> ⊥	FIONAL	
DEPTH		RING	DESCRIPTION	RATA F	DEPTH	NUMBE	TYPE	OWS/(	Heads ppm	pace C	omb	b. Vapo	ur Conc	:. [%LEL]	W W		CO		PERCE	NT	ADDIT AB. TI	INSTALLATION
		B		STF	(m)	2		Ē		20	40	6	0	80		10	20	) 3	0 4	10		
-	0		Ground Surface Dark grey silty sand with organic matter		55.34						+						+					
			(TOPSOIL) Compact grey silty sand, some gravel,	Í	0.20	1	50 DO	40 €	₽													
È			trace clay with cobbles (FILL)		54.63																	
F			Compact black sand, some gravel, trace silt (FILL)		0.81	2	50 DO	14	⊕													
-	1	em)	Loose, brown, fine to medium sand, trace gravel (FILL)																			
-		ollow St				3	50	7 6														
-		am. (Ho				-	DO															
	2						50															
		200			52.90	4	DÖ	66	P 													
			Compact dark brown to black silt, trace brick and paper (FILL)		2.44																	
						5	DO	20														
-	3		Loose coarse GRAVEL with dark	P	52.29 3.05	6	50	9														-
	$\vdash$		End of Borehole	<u>)                                    </u>	51.96 3.38						+						-					
-																						
-	4																					
-																						
	_																					
	5																					
	6																					
	_																					
	<i>'</i>																					
-	8																					
_																						
-	9																					
- 1	0																					
0	DEP	TH	SCALE					(		<b>V</b> G	ò	lde	r								LO	DGGED: D.G.
1	:	50							V	Aŝ	SC	ocia	tes								СН	ECKED: K.P.H.

## **RECORD OF BOREHOLE: 10-16**

BORING DATE: March 12, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	6	ט	SOIL PROFILE			SA	MPL	ES	Hea	dspac	e Org	g. Va	pour	Conc. [I	PPM]	HYDR	AULIC	CO	NDUCT	IVITY,	т		
SCALE		ЕН		Ь		~		ш	ppm	6		12	1	8 2		1	0 <sup>-6</sup>	10 <sup>-</sup>	<sup>5</sup> 10	) <sup>-4</sup> 1	0-3	STING	PIEZOMETER OR
AETR S		א פע	DESCRIPTION	LA PL	ELEV.	MBEF	ΡE	/S/0.3	Hea	dspac	e Co	۱ mb. ۱	Vapo	ur Conc	. [%LE <u>L]</u>	w	ATER	CO	NTENT	PERCE	NT	DITIO . TES	STANDPIPE INSTALLATION
DEP		SORII		TRAT	DEPTH (m)	NN	F	BLOW	ppm							W	p —		-0 <sup>W</sup>		WI	AD	
	<u> </u>			ŝ				-		20	4	40	6	0 8	30		10	20	) 3	0 4	10 		
- 0	-		Black sandy silt with organic matter	<b>X</b>	55.72					-													
-			(TOPSOIL) Compact dark brown to brown sand,	1	8	1	50 DO	22	₽														
-			some gravel, trace silt with pieces of concrete (FILL)		8																		
F					8																		:
- 1					8	2	50 DO	53 (	₽														-
-			Loose to compact brown fine sand	₩	54.50																		
		(me	(FILL)		8	3	50	136															
-	-	ow Ste			8		00																
- 2	r Auge	. (Holl			8		1																
_	Powe	Diam			8	4	50 DO	4 €	Þ														-
		00 mm			8																		
		20			8		50																-
					52 70	5	DO	36	ľ														-
- 3			Peat with sand and wood (FILL)		3.02	-																	-
					8	6	50 DO	2 €	Þ														
					8																		-
					51 72	7	50 DO	1 €	Þ														-
- 4			Fresh grey LIMESTONE BEDROCK	Ħ	3.99																		-
			with interbedded shale			8	NQ RC	DD	1	00	91		83										-
	Ĩ.	e		Ŧ					(%	(%	$\vdash$	(%)											-
	otary [	AQ Co							C.R. (	C.R.		O.D.											
5	æ	-				9	NQ RC	DD	1	00 00	100		100										-
																							-
	_		End of Borehole		50.21 5.51					_		-				-		_					
																							-
6																							-
7																							-
																							-
																							-
																							-
8																							-
0																							-
																							-
					1																		-
9					1																		-
					1																		-
					1																		
- 10	1																						-
					1																		
DE	EPT	'nз	SCALE					1	Ő	Ň	C	പ	10-	-								LC	OGGED: D.G.
1	: 5	0							V	ZA	lss	500	cia	ites								CH	ECKED: K.P.H.

## RECORD OF BOREHOLE: 10-17

BORING DATE: March 15, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		g		SOIL PROFILE			SA	MPL	ES	Heads	space Org	g. Vapou	Conc. [F	PPM]	HYDR		ONDUC	TIVITY,	Т		
CALE	ES	ETHO	ŀ		Ь				m	ррп	6	12	8 2	₩ 24	1	к, спі/з 0 <sup>-6</sup> 1	, 0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0-3	STING	PIEZOMETER OR
THS	<b>IETR</b>	Ц С		DESCRIPTION	A PL	ELEV.	ABER	ĥ	/S/0.3	Heads	pace Co	mb. Vap	our Conc	. [%LE <u>L]</u>	w	ATER C	ONTENT	PERCE	NT	E E	STANDPIPE
DEP	2	SORIN			TRAT	DEPTH (m)	NUN	Ę	ROW	ppm					Wp	⊳ <b> </b>	—0 <sup>W</sup>		WI	LAB	INO INCLEMENT
	_	ш	+		ω'				ш	:	20 4	40 (	30 03	30	1	0 2	20 3	30 4	40 		
-	0		+	Ground Surface Dark brown silty sand with organic	EEE	56.19 56.06															
-				material (TOPSOIL)		0.13	1	50	13 (	Ð											
F				sand, some gravel with brick, cobbles		3		DO													
F				and boulders (FILL)																	
E	1						2	50 DO	9 (	₽											
-			┝	Compact black sand some gravel	₩	55.05															-
F				trace silt (FILL)		54.07															
F			(iem)	Loose to compact, brown, medium to	$\sim$	1.52	3	50 DO	18	Ð											
E		ler	No S	coarse SAND, trace gravel with cobbles and boulders																	-
E	2	er Auç	£					50	- (												_
F		Pow	n Diar				4	DO	76	7											-
F			۳ 8																		
Ē			~				5	50	20€	Ð											-
E	3					53.14		00													-
F			Γ	Compact coarse GRAVEL with dark	°.0	3.05															
F					) 0	ġ	6	50 DO	18€	Ð											-
E					。 ()																
F					0	ģ	7	50 DO	236	Ð											-
F	4		_	End of Borobolo	۰ ``	52.08															
E				Auger Refusal																	
F																					
F																					:
-	5																				-
E																					-
F																					-
F																					
E	6																				-
F	0																				-
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Ē																					
-	7																				
F																					:
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E																					-
E	8																				_
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<u>g</u> E	9																				
₹E																					
GP -																					:
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1122	10																				-
<u></u>																					
HOL	DEF	PTH	I S	CALE						Â		- 7 7								LC	DGGED: D.G.
SORE	1:	50								V		onde: Socia	r Mes							СН	ECKED: K.P.H.

## RECORD OF BOREHOLE: 10-18

BORING DATE: March 15, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

E: March 15, 2010

ш		QO	SOIL PROFILE			SA	MPL	.ES	He	eadsp m	bace	Org.	. Vap	oour	Conc. [P	PM]	HYDR	AULIC (		CTIVITY	<sup>,</sup> т		
SCAL		METH		LOT		ъ		.3m		e	6	1:	2	1	8 2	4	1	0-6	- 10 <sup>-5</sup>	10-4	10-3	ONAL	PIEZOMETER
METH		UNG I	DESCRIPTION	VTA P	ELEV.	JMBE	γPE	WS/0	He	eadsp m	bace	Con	nb. V	/apo	ur Conc.	[%LEL]	w	ATER C	ONTEN	IT PER	CENT	DDIT B. TE	STANDPIPE INSTALLATION
B		BOR		STRA	(m)	٦٢		BLO		2	0	4	n	6	0 8	0	W	⊳ <b> </b>	<del>0</del>	<u>v</u> 30	-  WI 40	[88]	
			Ground Surface		56.35						0	-	0		0 0								
Ē			Black sandy silt with organic matter		56.22 0.13																		
F			Loose black to dark brown sand, some clay, trace gravel (FILL)			1	DO	8 €	Þ														
E			Dense grey brown silty sand, some		55.74 0.61																		
F.			gravel, trace clay with cobbles and boulders (FILL)			2	50	44€	Þ														-
F		Ê			54.90																		
Ē		w Ste	Wood (FILL) Compact black sand, some gravel,		1.52	3	DO	14				⊕											-
F	- Auger	(Hollo	trace silt (FILL)		54.47	_																	-
- 2	Power	Diam.	(FILL)			4	50	29	⊕														-
Ē		0 mm	Compact black sand (FILL)	諁	2.36																		
È		2(	Compact grey brown silty sand with cobbles and boulders (FILL)				FO																-
Ę						5	DO	16 €	₽														
- 3			Compact grey brown clayey sand with		53.30 3.05																		-
E			wood (FILL)			6	50 DO	12	⊕														-
F																							
Ē					52.46	7	RC	DD€	<b>P</b>	_													-
- 4			with interbedded shale		3.89	8	NQ RC	DD		100		29		0									-
E					52.01 4.34	_																	-
F	Drill	ore	interbedded shale						(%) .		(%) .		. (%)										-
E	Rotan	N		臣		a	NQ	חח	T.C.R	100	S.C.R	98	R.Q.D	94									-
- 5				臣			RC			100		50		54									-
Ē				臣																			-
F		-	End of Borehole		50.84																		-
E																							-
- 6																							
Ē																							-
F																							-
Ē																							
- 7																							
E																							
F																							:
E																							-
≥ - 8																							-
<u>s</u> E																							-
5 																							
ĭ⊢ °																							-
																							-
10																							
											<b>A</b>											1	<u> </u>
EH DI	EPT	TH S	SCALE					(		Ĭ	Ŷ	Ga	<b>)l</b> d	ler	•							L	OGGED: D.G.
0 1	: 5	0							V	D	A	SS	00	<u>ia</u>	tes							CH	IECKED: K.P.H.

# RECORD OF BOREHOLE: 10-19

BORING DATE: March 16, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

10,2010

щ		OD	SOIL PROFILE			SA	MPL	ES	DYNAMIC RESISTAN	PENET	RATIC OWS/0	N ).3m	<u>\</u>	HYDR	AULIC C	ONDUCT	IVITY,	T	10	
SCAL		METH		PLOT		R		0.3m	20	40	6	3 C	30	1	) <sup>-6</sup> 10	) <sup>-5</sup> 1(	) <sup>-4</sup> 1(	<sub>)'³</sub> ⊥	TONAL	PIEZOMETER OR
DEPTH		RING	DESCRIPTION	RATA F	DEPTH	NMBE	ТҮРЕ	0/S/(0	SHEAR ST Cu, kPa	RENGT	FH na re	atV. + emV.⊕	Q - ● U - O	W			PERCE	NT MI	ADDIT AB. TI	INSTALLATION
		BO		STF	(m)	2		BL	20	40	6	3 (	30	1	0 2	0 3	0 4	0		
-	0		Ground Surface Black sandy silt with organic matter	<u>zz</u>	56.42															
E			(TOPSOIL) Compact to very dense grey brown silty		0.10	1	50 DO	14												-
F			sand, some gravel with brick, concrete, and asphalt (FILL)																	-
Ē						2	50	50												-
Ē	1	Stem)																		-
E	1001	Iollow S				2	50	40												-
F	A TOWO	iam. (F	Compact black sand, some gravel		54.74	3	DO	10												-
Ē	2 2	D mm C	(FILL) Compact brown silty sand, some		1.83															-
Ē		20(	gravel, trace black sand (FILL)			4	50 DO	18												-
E			Dense grey brown silty clay, trace		53.98 2.44															-
F			gravei (FILL)			5	50 DO	36												-
F	3		Dense black SANDY SILT with organic	Ê	53.45	6	50	50												-
Ē		-	Dense brown fine SAND, some silt		3.25	-	DO													
Ē			Auger Refusal																	-
E	4																			-
F	-																			-
Ē																				-
																				-
-	5																			-
-																				-
Ē																				-
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-	6																			
E																				-
F																				-
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E																				-
F																				-
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GEO.																				-
	9																			
Ή Γ																				-
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11220(	0																			-
E 101																				
EHOL	DEP	TH S	SCALE					1	Â	Gal	ሰው								LC	OGGED: D.G.
NOR 1	: :	50								<u>.550</u>	cia	tes							СН	ECKED: K.P.H.

## **RECORD OF BOREHOLE: 10-20**

BORING DATE: March 22, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш		G	3	SOIL PROFILE			SA	MPL	ES	Heads	pace Org	. Vapour	Conc. [F	PM]	HYDR		ONDUCT	IVITY,	Т	. (1)	
CAL	ES	ΠLΞ			OT		~		a B	ppm	6 1	2 1	8 2	24	1	D <sup>-6</sup> 10	D <sup>-5</sup> 1(	D <sup>-4</sup> 10	<sub>0<sup>-3</sup></sub> ⊥	STINC	PIEZOMETER OR
LH S	1ETR	N C	≥ 2	DESCRIPTION	A PL	ELEV.	ABEF	ΡĒ	/S/0:3	Heads	L pace Cor	nb. Vapo	ur Conc.	[%LE <u>L]</u>	w	ATER CO	L DNTENT	PERCEI	NT	DITIC	STANDPIPE
DEF	2				<b>TRAT</b>	DEPTH (m)	NUN	F	гом	ppm					Wp		-0 <sup>W</sup>		WI	LAB LAB	
		α	^		S	(,			8	2	0 4	ο ε	60 8	0	1	0 2	0 3	0 4	10 1		
F	0		$\dashv$	Ground Surface Black sandy silt with organic matter		57.94															
F				(TOPSOIL)		0.08	1	50	186	÷											-
È				brick (FILL)		57.00		DO													-
F				Compact sand, some gravel, trace		0.61															-
E	1			concrete and brick (FILL)			2	50 DO	39	Ð											-
E	'																				-
F																					-
F						3	3	50 DO	16	⊕											2
Ē				Loose to compact brown SILTY SAND	**	56.11															-
F	2		tem)	with cobbles and boulders			4	50	. 4	2											
È		er	low S				4	DO	00	,											-
Ē		er Aug	n. (Ho			1															-
F		Powe	n Diar	Dense grev SILTY SAND, some gravel.		55.20	5	50 DO	30 E	Ð											-
F	3		00 m.	trace clay																	-
Ē			7					50													-
Ē							6	DO	66€	÷											-
F				Very dense grev CLAYEY SILT. some		54.28 3.66															-
Ē	4			very fine sand, trace gravel	ľ	1	7	50	976	÷											-
E	4				ſ			DU													-
F					И																-
F						1	8	50 DO	86€	Ð											-
Ē					ΥII																-
-	5			End of Borehole	Ц¥	52.86 5.08															
Ē				Auger Refusal																	-
Ę																					-
F																					-
E	6																				
Ę																					-
F																					-
E																					-
È.	7																				_
F																					-
Ē																					-
È																					-
F																					-
10	8																				
7/27																					-
БĻ																					-
<u>Ö</u>																					-
PROG	9																				-
퇅																					1
GP																					-
044.0																					-
1220	10																				_
101																					
HOLE	DF	рт	НS	CALE						Â										١c	GGED: D.G.
ORE	1:	50	. <b>.</b> 0	-						Y	<b>G</b> G	oldei Ocia	r Ates							CHI	ECKED: K.P.H.
ш	-										1700	<u></u>									

## RECORD OF BOREHOLE: 10-21

BORING DATE: March 22, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	Τ	8	SOIL PROFILE			SA	MPL	.ES	Heads	space O	rg. Va	apour	Conc. [	PPM]	HYDR		ONDUC	TIVITY,	Т		
SCALE		IETHO		Б		~		۳	ppm	6	12	1	8	24	1	к, сп/s	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup>	STING	PIEZOMETER OR
NETR S		≥ ປັN	DESCRIPTION	TA PL	ELEV.	MBEF	ΥΡΕ	VS/0.3	Heads	space C	omb.	Vapo	ur Conc	[%LEL]	w	ATER C	I ONTENT	PERCE	NT	S. TES	STANDPIPE INSTALLATION
DEP		BORI		TRA	DEPTH (m)	N	ŕ	BLOW	ppm						W	p			WI	LAE	
	╈		Ground Surface	0	58.02					20	40	6	0	80	1		20 :	30 2	10		
- 0			Black sandy silt with organic matter		0.00																
Ē			(TOPSOIL)			1	50 DO	11€	Þ												
È																					
F			Compact brown silty sand, some		57.26 0.76		50														
E 1			gravel, trace clay (FILL)			2	DO	18€	₽												-
F			Compact black sand, some gravel		56.80 1.22																
F			(FILL)			3	50 DO	19	⊕												
E					56.19		00														
- 2			Compact brown to dark brown sandy silt, some gravel with cobbles and		1.83																-
F			boulders (FILL)			4	50 DO	13€	Þ												
E																					
F		Stem)	-		55.28	5	50	10	Ð												
Ē.	Uer	Hollow	Compact grey silty sand, some clay (FILL)		2.74	ľ	DO		-					1	1						
- 3	wer Al	iam. (F	Dense grey clayey silt, some very fine sand (FILL)	III	3.05									1	1						-
F	d	um Di		Ш		6	50 DO	33€	Þ												
E		200	Dense to very dense, grov SANDV		54.36																
F			SILT, some gravel, trace clay with		. 3.00	-	50	40.0													
- 4	ŀ		coddles and boulders			1	DO	426	7												-
E																					
F						8	50 DO	546	Þ												
Ē																					
- 5	;					9	50 DO	€	Þ												-
F																					
E							50														
F						10	DO	50€	₽												
E 6	5				E1 9E		50														-
F			End of Borehole		6.17	11	DO	506	,												
Ē			Auger Reiusar																		
E																					
- 7	,																				-
E																					
F																					
Ē														1	1						
F 8																					-
														1	1						
														1	1						
Ë.														1	1						
Ĩ	1																				-
E														1	1						
F														1	1						
10	"																				-
	_			L	I									1	1	<u> </u>	<u> </u>	1	<u> </u>		<u> </u>
DI	EP.	TH S	SCALE					(		G	ol	der	•							LC	DGGED: D.G.
2 1	: 5	50							V	Aš	sō	cia	tes							СН	ECKED: K.P.H.

#### PROJECT: 10-1122-0044

#### RECORD OF BOREHOLE: 10-22

LOCATION: See Site Plan

#### SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: March 16, 2010

	Τ	8	SOIL PROFILE				MPL	ES	Headspace Org. Vapour Conc. [PPM]						HYDRAULIC CONDUCTIVITY, T					
CALE		G METHO		Ь				ε	6 12 18 24				1	K, CM/S				NAL	PIEZOMETER	
DEPTH SC METRE			DESCRIPTION		ELEV. DEPTH	UMBER	핖	S/0.3	Heads	6 12 18 24 10 1 Headspace Comb. Vapour Conc. [%] ELL WATER C				PERCEI	ит	TES.	STANDPIPE			
		RIN					ТҮР	SMO	ppm							ADD -AB.	INSTALLATION			
		BO		STF	(m)	2		BL	:	20 4	0 6	0 8	0	1	0 2	0 3	0 4	0		
			Ground Surface		56.80															
- °	"		Black sandy silt with organic matter		0.10															
F			Compact grey brown silty clay, trace			1	50 DO	10€	Ð											-
F			gravel (FILL)		56.10		00													
È			Compact brown sand, some gravel,	×	0.61	2	50 DO	50 <del>(</del>	Ð											-
F			trace silt and cobbles (FILL)		<b>3</b>															
- 1					S.															
E			Compact black sand, some gravel.	₩	55.58 1.22	3	50 DO	32	⊕											
E		Ê	trace silt (FILL)																	
E		v Ste			Ś															
E	uaer	Hollov	Very dense arey coarse gravel with	₩	54.97	4	50 DO	80	⊕											
- 2	ver A	am. (f	cobbles (FILL)		54.67															-
E	Po	m Dia	Compact dark brown sand, some silt,	Ŵ	2.13															
E		00 m	(FILL)		3	5	50 DO	23€	Ð											
E		2		×	54.13															
E			PEAT Compact grey brown SILTY CLAY	1	2.74															
É 3	3			f#	53.75	6	50	17€	€											-
E			trace clay with cobbles and boulders		3.05		DO													
E					1															
F						7	50	65€	Ð											-
F							DO													-
- 4	۱H	-	End of Borehole	[sls]"	3.96															
E			Auger Refusal																	
F																				
E																				
F																				
F 5	5																			
F																				-
F																				-
F																				-
F																				
- 6	3																			-
F																				-
F																				
F																				
F																				
- 7	,																			
F																				-
F																				
F																				
F																				
- 8	3																			_
5																				-
1/2/																				
5F																				-
0.1																				-
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ét í																				
Ĩ																				-
e F																				-
8 7																				
10																				
101																				
OLE	•				•	•							•		•					
E D	EP	TH S	SCALE							G	older	r							LC	)GGED: D.G.
0g 1	: 5	50	1 : 50 Golder												CHI	ECKED: K.P.H.				
# **RECORD OF BOREHOLE: 10-23**

BORING DATE: March 16, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		0	SOIL PROFILE			SA	MPL	.ES	Heads	pace Org	j. Vapou	Conc. [F	PM]	HYDR		ONDUCT	TIVITY,	Т		
SCALI		IETH(		D TO		~		3m	ppin	6 1	12 1	8 2	4	1	0 <sup>-6</sup> 1	D <sup>-5</sup> 1	0 <sup>-4</sup> 1	<sub>0'³</sub> ⊥	STINC	PIEZOMETER OR
TH S		≥ ປັ	DESCRIPTION	LA PL	ELEV.	ABEF	ΡE	/S/0.3	Heads	ı pace Coi	nb. Vapo	ur Conc.	I [%LEL]	w	ATER C	I ONTENT	PERCE	NT	DITIO	STANDPIPE INSTALLATION
DEP		BORII		TRAT	DEPTH (m)	N	F	SLOW	ppm				Ц	W	⊳ ——	-0 <sup>W</sup>		WI	LAB	
-	-			ω.						20 4	10 E	8 0	0	1	0 2	:0 3	i0 4	10 		
F	0		Dark grey silty sand with organic	<b>**</b>	56.24 0.00															
F			matter, trace brick (FILL)		X	1	50 DO	11 €	Ð											
E					55.63															
F			Dense black crushed shale (FILL)		0.61															
F	1				×	2	DO	49 (	Ð											-
E					<sup>2</sup>															-
F		(ma)			54.72	- 3	50	166	Ð											
Ē		low S	sand, some gravel with cobbles and		1.52															
E	2	DH) .	boulders (FILL)		Š.		1													_
F		n Diar			X	4	50 DO	11 €	Ð											
E		200 mr			X															
F					X	5	50	136	2											
F					<sup>2</sup>	Ĵ	DO	150												
E	3				X															
F			Compact to dense dark grey silty clay		52.89 3.35	6	50 DO	15€	Ð											:
E			with organic matter (FILL)		X															-
F					52.30	7	50 DO	50€	•											-
Ē	4		End of Borehole Auger Refusal		3.94															
F																				-
E																				-
E																				
F	5																			-
E																				-
F																				:
E																				
-	6																			
Ē																				-
F																				
F																				
F	7																			- 
F																				
E																				
F																				
Ē	8																			-
27/10																				
5																				
0.6																				-
	9																			_
ADY F																				
4.																				
1220	0																			-
101																				
HOLE	DEP	тн 9	SCALE						Â		. 1 1								LC	OGGED: D.G.
3ORE	: :	50							V	Ass	DICE OCI7	tes							СН	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-24

BORING DATE: March 16, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш	Т	8	SOIL PROFILE			SA	MPL	.ES	Heads	space (	Org.	Vapou	r Conc	:. [PP	M] ص	HYDR	AUL	IC CC	ONDUC	TIVITY,	T		,
SCALE		METHC		LOT		¥		3m	Phili	6	1,2	2	18	24	Ψ	1	N, 1	10	<sup>-5</sup> 1	0-4	10 <sup>-3</sup>	ONAL	PIEZOMETER OR
METH		UNG N	DESCRIPTION	TA PI	ELEV.	IMBEI	ΥPE	NS/0.	Heads	space (	Com	ıb. Vap	our Co	nc. [	%LEL]	N	VATE	RCC		PERC	ENT		STANDPIPE
DE		BOR		STRA	(m)	R		BLO	ppm	20	40		60	80		W	′p ⊢ 10	2		30	40	A	Ĩ
	_		Ground Surface		56.93														0				
E	Γ		Black sandy silt with organic matter	/ 🚟	0.10																		
Ę			Compact to very dense black and brown sand, some gravel with asphalt		X	1	50 DO	18	⊕														
Ē			and brick (FILL)		×.																		
F							50																
Ē	1				55.71	2	DO	80	₽														-
Ę			Compact to very dense black sand, some gravel, with asphalt, trace brick		1.22																		:
Ē		(me	(FILL)		×.	3	50 DO	29	₽														
Ę	ľ	low St																					
Ē		n. (Hol				4	50 DO	51 6	₽														
F	Down	n Dian			54.49																		
Ē		200 mr	Dense to compact dark brown and grey brown silty clay with some sand and		2.44		50																
E			brown silty sand, some gravel layers (FILL)		×.	5	DO	38€	Ð														
Ē	3				×.																		-
È					X	6	50 DO	126	Ð														
Ē					X																		
Ę					×.	7	50	120															
E	4					ľ	DO	130	2														
-	┢	-	End of Borehole		4.29																		
Ē			Auger Refusal																				
F																							
-	5																						-
-																							:
Ē																							
F																							:
-	6																						
Ę																							:
Ē																							
F																							:
Ē	7																						-
F																							
Ē																							
F																							
<u>6</u>	8																						-
1/2/1																							
E																							-
EO.																							
	9																						
₹																							
4.GP																							:
2004																							
10112	0																						-
	_				1	I	I				1		<u> </u>			I				1		_	1
	)EP	TH S	SCALE					(		Y	Gc	olde	r									l	LOGGED: D.G.
<u>0</u> 1	: {	50							V	A	<u>55</u>	ocia	<u>ates</u>	5								С	HECKED: K.P.H.

# RECORD OF BOREHOLE: 10-25

BORING DATE: March 10, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ		G	3	SOIL PROFILE			SA	MPL	ES	Heads	pace O	rg. Vap	oour (	Conc. [P	PM]	HYDR	AULIC Co k, cm/s	ONDUCT	IVITY,	Т	10	
SCAL	RES	METH			PLOT		Ř		.3m		6	12	18	2	4	1	) <sup>-6</sup> 10	) <sup>-5</sup> 10	) <sup>-4</sup> 1	0 <sup>-3</sup> ⊥	IONAL	PIEZOMETER OR
EPTH	MET	UNIC		DESCRIPTION	ATA F	ELEV. DEPTH	UMBE	ТҮРЕ	JWS/C	Heads ppm	pace C	omb. V	/apou	r Conc.	[%LEL]	W	ATER CO		PERCE	NT	ADDIT AB. TE	INSTALLATION
		ď			STR	(m)	z		BLO	2	20	40	60	8	0	1	0 2	0 3	0 4	0	L	
-	0			Ground Surface Dark brown silty sand with organic	833	55.79						_	_									
F				matter (TOPSOIL)	<b>E</b>	0.15	1	50	296	•												-
Ē				some gravel, trace silt with cobbles and boulders, trace brick from 1.22 to 1.52				00														-
F				m depth (FILL)				50														-
E	1						2	DO	46													-
F																						-
Ē			Ê	Loose brown fine to medium sand		54.27 1.52	3	50 DO	15€	÷												
F		L.	ow Ste	(FILL)																		
F	2	er Auge	n. (Holl					50														-
-		Powe	n Dian				4	DO	30	7												
Ē			200 m																			-
F						52.89	5	50 DO	4					⊕								-
F	3			Wood (FILL)		2.90																
Ē							6	50 DO	15					⊕								
F						52.13																-
Ē				Very dense coarse GRAVEL with dark brown silt (FILL)	。 0	3.66	7	50	53	⊕												-
E	4			End of Doroholo	<i> </i>	51.65		DO														
F				Auger Refusal		4.14																-
Ē																						-
F	_																					
Ē	5																					
E																						-
E																						-
E	6																					-
F	Ŭ																					
Ē																						-
-																						:
E	7																					-
F																						-
E																						-
È																						-
F	8																					-
27/10																						-
14																						-
0.6[																						
SOGE	9																					-
ITYDE																						
GPJ																						
0044.																						-
1122	10																					-
					1																	
EHOI	DEI	PT	нs	CALE					(	Î	Ŷc	old	ler								LC	DGGED: D.G.
BOR	1:	50	)						1	V	As	SOC	ia	tes							СН	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-26

BORING DATE: March 24, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш	Τ	0	SOIL PROFILE			SA	MPL	ES	Head	spac	ce Org	g. Vap	our	Conc. [P	PM]	HYDR		ONDUC	TIVITY,	Т	.0	
SCALE		IE TH		Ŀ.		~		ш	ppin	6	1	12	1	3 2	4	1	0 <sup>-6</sup> 1	, 0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup> L	STING	PIEZOMETER OR
PTH S		≥ IJ N	DESCRIPTION	TA PI	ELEV.	MBEF	ΥPE	VS/0.:	Head	spac	ce Cor	mb. V	apo	ur Conc.	[%LEL]	w	ATER C	ONTENT	F PERCE	NT	DITIO	STANDPIPE INSTALLATION
DEI		BORI		STRA	(m)	N	<del> </del> -	BLOV	ррп	00		10				W	> —	O <sup>W</sup>		WI	LAE	
			Ground Surface	0,	55.27					20	4	10	6	) 8	0	1		20 :	30 2	10		
Ē	)		Black sandy silt with organic matter	<b>E</b>	0.08																	
E			Compact grey crushed stone, some		54.81	1	50 DO	20€	Ð													-
F			Compact black sand, some gravel	×	54.66																	-
E			Compact to dense grey crushed stone,			2	50	276	<del>)</del>													-
- ·	1		some sand (FILL)			-	DO	2.														-
E		Stem)																				
-	uder	Hollow				3	50 DO	376	Ð													-
Ē	ower A	iam. (ł	Compact brown medium to coarse		53.44																	-
	2	mm m	sand, trace crushed stone (FILL)			4	50	146	Ð													
E		200			52.83																	-
Ę			Loose grey brown silty sand, trace crushed stone (FILL)		2.44																	-
Ē			,			5	50 DO	6 €	Ð													-
÷	3		Peat, trace wood (FILL)	₩	52.22 3.05		50															
Ē			Highly weathered LIMESTONE	₩¥	51.97	6	DO	50€	Ð													-
F	2	ŇZ		Ħ	3.48																	-
E			interbedded shale																			-
F	1   =	_				7	NQ RC	DD		0 6	59	(%)	27									
	tarv Dr	Q Core							.C.R. (	C.R.		O.D.										-
F	ß	Ż									`	<u>۳</u>										-
						8	NQ RC	DD	10	0	100		100									-
	5		End of Borehole		50.22 5.05					-												
Ē																						-
F																						-
E																						-
E	5																					
Ę																						-
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E	7																					-
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E																						-
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e E	3																					-
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ŏ⊢ '	9																					-
Ĭ																						-
																						-
2004																						-
10112																						-
	_			I	1	L	L	L			<u> </u>				<u> </u>			1		1	I	1
	EP	TH S	SCALE					(		Ŋ	G	old	ler								LC	DGGED: D.G.
<u>0</u> 1	: 5	0							V	<b>I</b> A	lss	<b>60</b> C	ia	tes							СН	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-27

BORING DATE: March 24, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	Τ	g	SOIL PROFILE			SA	MPL	ES	Head	space Org	g. Vapou	Conc. [I	PPM]	HYDR	AULIC		TIVITY,	т		
SCALE		Ĭ		ŌŢ		~		۳	ррп	6	12	8 2	₩ 24	1	к, сп/ 0 <sup>-6</sup>	s 10 <sup>-5</sup> 1	10 <sup>-4</sup> 1	0-3	STING	PIEZOMETER OR
PTH S		≥ ປັ	DESCRIPTION	TA PL	ELEV.	MBEF	ΥPE	VS/0.3	Head	space Co	nb. Vapo	u Jur Conc	. [%LEL]	w	ATER (	ONTEN	T PERCE	NT	S. TES	STANDPIPE INSTALLATION
DEP		30RII		TRA	DEPTH (m)	Ñ	ŕ	BLOW	ppm					W	р —	—0 <sup>W</sup>	I	WI	LAE	
	-		Oracia d Ourfean	S				-		20 4	40 <del>(</del>	50 8 	30	1	10	20	30 4	40		
- (			Black sandy silt with organic matter		0.05	-														
F			(TOPSOIL) / Compact grev crushed stone, some			1	50 DO	17 🤅	Ð											-
Ē			sand, trace concrete (FILL)	×	55.06															
E			and brick (FILL)																	
È.						2	50 DO	6	⊕											-
F			Compact brown silty sand some clay		54.37															-
-		tem)	trace gravel (FILL)			3	50	25.6	<u>م</u>											-
F	er	low S			50.70		DO	200												
F,	er Aug	. (Н	Compact grey brown silty clay (FILL)		1.83															-
Ē	Powe	n Dian				4	50 DO	10€	Ð											
F		- m 00			53.15															
Ē			Loose brown coarse sand, trace gravel (FILL)		2.44		50													-
E					×.	5	DO	8 €	Ð											-
- :	3		Compact grey brown SILTY CLAY	諁	52.54 3.05															-
Ē						6	50 DO	12€	Ð											-
È					52.03															-
F					51.73															-
E 4	1		End of Borehole Auger Refusal		3.86															-
È			-																	
F																				-
Ē																				-
	5																			_
-																				
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4.GF																				
1 1																				
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D RHC	EP	TH S	CALE					(		<b>V</b> G	olde	r							LC	DGGED: D.G.
ີ່ 1	: 5	0							V	Ass	ocia	tes							СН	ECKED: K.P.H.

# **RECORD OF BOREHOLE: 10-28**

BORING DATE: March 22, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION '	TEST HAMMER, 64kg; DROP, 760	nm

		0	SOIL PROFILE			SAM	MPL	ES	Heads	bace Org	. Vapour	Conc. [F	PM]	HYDR.		ONDUCT	IVITY,	Т	(1)	
CAL	ES	ETH		OT				Ē	PP···	5 1	2 1	8 2	24	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 10	0 <sup>-4</sup> 1	<sub>0'3</sub> ⊥	STINC	PIEZOMETER OR
TH S	ETR	NG M	DESCRIPTION	A PL	ELEV.	<b>IBER</b>	Ы	S/0.3	Heads	Dace Cor	nb. Vapo	ur Conc.	[%LEL]	w	ATER C	ONTENT	PERCE	NT	EEE.	STANDPIPE
DEP	≥	ORIN		RAT	DEPTH	NUN	≿∣	No	ppm		-			Wp				WI	ADI	INSTALLATION
		ă		ST	(11)			B	2	0 4	0 6	<u>ع 0</u>	0	1	0 2	20 3	0 4	0		
	0		Ground Surface		56.33															
Ę			(TOPSOIL)		56.20 0.13		50													-
Ę			Compact brown coarse sand, some			1	DO DO	176	)											-
F																				-
F					55.42		50													-
F	1		Loose to compact black sand, some		0.91	2	DO	22	€											-
F			1.83 m depth (FILL)																	-
E						_	50		-											-
E		em)				3	DO	10	Ð											-
E		ow St																		-
F	2	IIOH)					50		<b>N</b>											
E		Jiam.				4	DO	4 0	0											-
È	ľ	Ē	Loose brown to grey brown SILTY		53.89 2.44															-
F		200	CLAY			5	50	9 6	÷											-
F																				-
F	3																			
F						6	50	6 €	)											-
E					50.67		00													-
E			Dense brown SILTY SAND, some	ra/r	3.66	-7	DO DO	€	•											-
Ł	4		gravel with cobbles and boulders				50	~	т											-
F					52.09	0	DO	00	Ψ											-
F			End of Borehole Auger Refusal		4.24															-
F																				-
F																				-
E	5																			
E																				-
E																				-
F																				-
F																				-
F	6																			
F																				-
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1/10																				-
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ğF	9																			
퇅																				-
<u>a</u> F																				-
4 0 1																				-
2200	10																			-
1011																				
			1						Å	<b>A</b>					I		I	1		
H	DEF	тн	SCALE					(		C.	Jder	-							LC	OGGED: D.G.
BOR	1:	50							V	Ass	ocia	ites							CHI	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-29

BORING DATE: March 22, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		8	SOIL PROFILE			SA	MPL	ES	Head	space O	rg. ۱	Vapour	Conc. [I	PPM]	HYDR	AULIC		TIVITY,	т		
CALE		ETHO		Ы				m	ррш	6	12	1	8 2	₩ 24	1	к, спі 0 <sup>-6</sup>	s 10 <sup>-5</sup>	10 <sup>-4</sup> 1	0-3	STING	PIEZOMETER OR
TH S		M Q N	DESCRIPTION	A PL	ELEV.	ABER	ĥĒ	/S/0.3	Head	space C	omb	o. Vapo	ur Conc	. [%LE <u>L]</u>	w	ATER (	CONTEN	T PERCE	INT	DITIO	STANDPIPE
DEP		SORIN		TRAT	DEPTH (m)	NUN	F	SLOW	ppm						W	p	O <sup>W</sup>		WI	AD	
	+	ш		<u>ن</u>				ш		20	40	6	<u>ه 0</u>	30		10	20	30	40		
-	∘⊢		Ground Surface Black sandy silt with organic matter	1	56.80 56.67						+				-		+				
F			(TOPSOIL) Compact brown silty clay, some sand.		0.13	1	50 DO	10€	Ð												
F			trace gravel (FILL)		56.19		00														
E			Compact brown silty sand, some		0.61																
È.	1				×.	2	50 DO	28€	Ð												-
F			Vary dance black cand, some gravel		55.58																-
E			trace brick (FILL)		1.22	0	50		•												
F		Ê			×	3	DO	22	₽												-
F		w Ste	Compact brown coarse sand (FILL)	×××	54.97																-
Ē	2	olloH)	Compact arey brown silty clay (Ell I)	×	54.67	4	50 DO	18	⊕												-
E	- Monte	Diam.					20														-
F				₩	54.21																-
F		200	organic matter (FILL)		2.00	5	50 DO	8 €	Ð												-
F	3			XX	53.75																
F			fine sand		1	6	50	286	2												-
F				111		0	DO	200													-
E				Ш	ĺ																-
<u>-</u>	4					7	50 DO	49€	Ð												-
F				ИI																	-
E			End of Borehole	₽₽₽	52.37 4.43						_										
F			Auger Refusal																		-
E	5																				_
F																					-
F																					-
E																					-
F																					-
F	6																				-
E																					-
F																					:
Ē																					-
F	7																				-
F																					-
F																					
E																					-
F	8																				-
1/10																					-
Ĩ.																					
E -																					-
DEC																					-
SE .	9																				
飰															1						-
4.GP															1						-
2004															1						-
112	0																				-
÷—									٨						1						Ĺ
믭	РЕР	тн :	SCALE					(		Ve	$\mathbf{a}$	lder	-							LC	)GGED: D.G.
۲ B	: :	50							V	As	SC	ocia	ites							СН	ECKED: K.P.H.

#### **RECORD OF BOREHOLE:** 10-30

BORING DATE: March 25, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш	Τ	8	SOIL PROFILE			SA	MPL	ES	Heads	pace Or	g. Vapoi	ır Conc.	PPM]	HYDR	AULIC C	ONDUC	FIVITY,	Т	.0	
SCAL		ЛЕТН		LOT		æ		3m		6	12	18	24	1	0 <sup>-6</sup> 1	D <sup>-5</sup> 1	0-4 10	p⁻₃ ⊥	ONAL	PIEZOMETER OR
METH		DNG N	DESCRIPTION	TAP	ELEV.	MBE	ΥPE	NS/0.	Heads	pace Co	mb. Vap	our Con	. [%LEL]	N	ATER C	ONTENT	PERCEI	NT	B. TE	STANDPIPE INSTALLATION
DE		BOR		STRA	(m)	N	-	BLO	ppin .	20	40	60	80	W	p —			WI	LAI	
			Ground Surface		57.87															
Ē	0		Black sandy silt with organic matter		57.72															
F			Loose brown silty sand, some gravel			1	50 DO	6 6	₽											-
Ē					X															
F						2	50	4 6	€											-
	1				56.65				I											-
-			Compact to dense light brown silty sand some gravel trace clay (FILL)		1.22															-
						3	50 DO	176	₽											
• :	2				×.	4	50	356	₽											-
					55.43															
		/ Stem	Dense to very dense grey SILTY SAND, some gravel, trace clay with	Π	2.44															
	Auger	Hollow	cobbles and boulders			5	50 DO	496	₽											-
;	3 3	Diam. (																		-
		- mm C				6	50 DO	496	ŧ											-
		20			.]															-
						7	50 DO	866	ŧ											-
1	4																			-
						8	50	926	€											
																				-
																				-
!	5																			-
							50													-
						9	DO	996	₽											-
						10	50 DO	50												
•	6	Ň																		-
						11	NQ RC	DD												
					51.19															
			Fresh grey LIMESTONE BEDROCK with interbedded shale	臣	6.68															-
	7	Core		臣		12	NQ RC	DD	100	10	0 10	0								-
	Rota	N		臣					. (%)	S. (%)	. (%)	4								
				臣					T.C.R	S.C.F	R.Q.E									-
				臣		13	NQ RC	DD	100	97	9	L								
1	8			臣	49.62															-
		-	End of Borehole		8.25															
9	a																			-
																				-
																				:
10	U																			_
_			·	-	1	1	I	<u> </u>	Â		1	1	1	1	1	1	I	1		
D	EP	TH S	SCALE					(	(4	G	olde	r							LC	DGGED: D.G.
1	: {	50							V	7AS	soci	ates							CH	EUNED: K.P.H.

#### RECORD OF BOREHOLE: 10-31

BORING DATE: April 15, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

-									Head	Isnace	Ora	Vanou	r Conc	PPM1	HYDR	AULIC					
ALE		DOH	SOIL PROFILE		1	SA	MPL I	.ES	ppm	iopuoo	org.	vapou	Conc.	•••••		k, cm/	s		T	ВÅ	PIEZOMETER
1 SC/	í	MET		ГОЛ		К		0.3m		6	12	2	18	24	1	0-6	10 <sup>-5</sup> ·	10 <sup>-4</sup> 1	0-3	ESTI	OR STANDPIPE
EPTH LEN		RING	DESCRIPTION	ATA I	DEPTH	IMBE	ΓΥΡΕ	WS/0	Head ppm	Ispace	Com	nb. Vapo	our Con	. [%LEL]	v	ATER (	CONTEN	T PERCE	NT	DDI	INSTALLATION
D		BOF		STR/	(m)	ž	<b>_</b>	BLO		20	40		30	80	W	p ——		30	WI 10	< ⊲	
			Ground Surface	<u> </u>	56.66					1		5	1				20	<u> </u>			
F	0		Dark brown sandy silt with organic		56.51																
F			Compact brown sand, some gravel with		0.15	1	50 DO	25€	Ð												
E			concrete and brick (FILL)		×																
E					ž																
Ł	1				Š.	2	50 DO	28€	Ð												
E					55.44																
F			Dense black sand, some gravel (FILL)		1.22																
È		Ê				3	50 DO	46	⊕												
-		w Ste			×																
F	2						50														-
E		iam. (			×	4	DO	42	⊕												
E	ć		Stiff brown SILTY CLAY, trace sand	鼮	54.22																
F		200				-	50	22													
Ę						5	DO	32													-
-	3																				-
E						6	50	7 (	Ð												
E																					-
E							1														
<u> </u>	4					7	50 DO	12€	Ð												
F					52.39																
-			End of Borehole Auger Refusal		4.27																-
E																					-
È																					
-	5																				-
F																					
F																					
E																					
E_	6																				
Ę																					
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-	7																				-
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F																					
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ξŀ															1						
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4.G															1						:
, 1200																					
101	J														1						_
<u>ا</u> ۲			I	<u>ـــــ</u>	1		L	L	A				1		1	1		1	1		ļ
Щ Г	DEP	TH	SCALE								Gr	olde	r							LC	DGGED: D.G.
<u>ل</u> ا ا	:	50							V	JA	55	<b>nci</b> z	tes							СН	ECKED: K.P.H.

#### RECORD OF BOREHOLE: 10-32

BORING DATE: April 15, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

... April 15, 2010

щ		8		SOIL PROFILE			SA	MPL	.ES	Heads	space Or	g. Vapo	ur Con	c. [PP	'M] ⊕	HYDR	AULIC	CONDU	CTIVITY,	Т	.0	
SCAL	N L L L L	METH			LOT		R		.3m		6	12	18	24		1	0 <sup>-6</sup>	10 <sup>-5</sup>	10 <sup>-4</sup>	10 <sup>-3</sup>	IONAL	PIEZOMETER OR
EPTH	ME	RING		DESCRIPTION	ATA F	ELEV. DEPTH	UMBE	TYPE	D/S//C	Heads ppm	space Co	mb. Va	oour C	onc. [9	%LEL]	W N	ATER (		IT PERCI		ADDIT AB. TE	INSTALLATION
		BO			STR	(m)	z		BLO		20	40	60	80		vv	р 10	20	30	40	<u>د ۲</u>	
-	0		Gro	ound Surface ark brown sandy silt with organic		56.32							_	_					_			
Ē				atter (TOPSOIL)		0.05	1	50	126	•												-
Ē			gra	avel, trace brick (FILL)																		-
Ē																						-
-	1						2	DO	40€	₽												-
F			Co	ompact black sand, some gravel,		55.10 1.22																-
Ē			tra	ice brick (FILL)			3	50 DO	18	⊕												-
F				fine and (FUL)		54.49																-
F	2	iger		ense brown fine sand (FILL)		1.05	4	50	25	A												_
F		wer Au	ш. Ш			53.88	4	DO	20	Ψ												
Ē		e i	Fir	m grey brown to grey SILTY CLAY		2.44																-
Ē			2002				5	50 DO	12 🤅	Ð												-
-	3																					-
Ē							6	50 DO	5 (	₽												-
Ē																						-
F							7	50	6	۵												-
Ē	4					52.05	'	DO		Ψ												
E			We	eathered SHALE BEDROCK		4.27 51.82	8	50 DO	12	⊕												-
F			En Au	nd of Borehole Iger Refusal		4.50																-
E	5																					_
Ē																						-
F																						-
Ē																						-
-	6																					-
F																						-
Ē																						-
F																						
-	7																					-
Ē																						-
F																						
Ē																						-
₽ -	8																					-
1121																						-
GDT																						
GE0																						
	я																					
Ξ																						-
14.G																						-
12200	10																					-
101																						
HOLE	DEI	PTH	I SCA	LE						Â		. 1.1									LC	DGGED: D.G.
BORE	1:	50								Ś	As	010( 50Ci	r ate	S							СН	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-33

BORING DATE: April 15, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

щ	Τ	OD	SOIL PROFILE			SA	MPL	.ES	Head: ppm	space	Org.	Vapou	Conc.	[PPM] €	HYDR	AULIC C	ONDUC	TIVITY,	T	.0	
DEPTH SCAL METRES		ORING METH	DESCRIPTION	FRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	LOWS/0.3m	Head	6 I space	1: Corr	2 ź	8 J our Con	24 c. [%LEL	1 ] V ] W	0 <sup>-6</sup> 1 /ATER C p	0 <sup>-5</sup> 1 ONTENT	0 <sup>-4</sup> 1 PERCE	0 <sup>-3</sup> ⊥ NT WI	ADDITIONAI LAB. TESTIN	PIEZOMETER OR STANDPIPE INSTALLATION
	-	ā	Ground Surface	ST	56.22			B		20	4	<u>)</u>	50 	80		10 :	20 3	80 4	0		
			Black sandy silt with organic matter (TOPSOIL) Compact brown silty sand to sandy silt, some gravel with concrete (FILL)		56.23 56.08 0.15	1	50 DO	24 €	Ð												
- - - - -			Compact black and brown sand (FILL)		55.16 1.07	2	50 DO	38	⊕												
	2	Hollow Stem)	Compact brown coarse sand, some gravel with cobbles (FILL)		54.40 1.83	3	50 DO	28 14€	⊕												
	Dower	200 mm Diam. (h				5	50 DO	30€	Ð												
- - - -						6	50 DO	12€	•												
- 4	ı		PEAT		52.27 3.96	7	50 DO	22	Ð												-
			Weathered SHALE BEDROCK		51.96 4.27	8	50 DO	26€	€												
E	-		End of Borehole		51.56 4.67					-											
	5																				-
- - - - - - - - - - - - - - - - - - -	,																				
- - - - - - - -	3																				
- 9 - 9        	)																				
D 1	EP	тн s 50	SCALE						Ĵ		Go ss	olde: oci7	r Mes							LC CH	)GGED: D.G. ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-34

BORING DATE: April 15, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш		Ð	SOIL PROFILE			SA	MPL	.ES	Head	space	Org.	Vapou	Conc. [	PPM]	HYDR	AULIC (		TIVITY,	T	.0	
4 SCAL		METH.		PLOT	FI FV	ER	ш	ʻ0.3m		6	12	2 /	8	24	1	0-6	10 <sup>-5</sup> 1	0-4 1	0 <sup>-3</sup> ⊥	TIONAL TESTINC	PIEZOMETER OR STANDPIPE
DEPTH	M	ORING	DESCRIPTION	TRATA	DEPTH (m)	NUMB	ТҮР	ROWS/	Head: ppm	space	Com	ib. Vapo	our Cond	:. [%LEL]	w W	/ATER C p			NT WI	ADDI LAB. T	INSTALLATION
	_	ш	Ground Surface	°.	55.90			ш		20	40	) (	0	80	,	10	20 :	30 4	40		
-			Black sandy silt with organic matter		0.05		50	400													-
Ē			Compact to dense brown sand, some gravel with brick, concrete and asphalt (FILL)			1	DO	186	7												
E							50	20	•												
E	1				54.68	2	DO	39	₽												-
È			Compact brown sand, some gravel (FILL)		1.22		50	10	τ.												-
E		w Stem				5	DO	12	Ð												-
-	2	er Auge n. (Holic				4	50	10.6	Ð												-
Ē	c	mm Diar				4	DO														
Ē		200				5	50	15€	÷												-
Ē	3				52.85		DO														-
Ē			compact sand, some gravel with cobbles and boulders (FILL)		3.05	6	50	16€	Ð												
E																					-
Ē	4		PEAT		3.81	7	50 DO	5 €	Ð												-
Ē			End of Borehole Auger Refusal		4.14																
Ē																					-
E	5																				-
È	-																				
F																					-
Ē																					-
Ē	0																				_
È																					-
È																					-
Ē	7																				
Ē																					-
Ē																					-
<u>e</u>	8																				_
7/27																					-
0.GD																					
ROGE	9																				-
																					-
144.GP																					-
112200	0																				
LE 10									A												
DREHO	DEF	тн	SCALE					(		ý	Go	olde	r_							LC	DGGED: D.G.
	1:	50							V	7A	550	DCia	tes							CH	EUKED: K.P.H.

# **RECORD OF BOREHOLE: 10-35**

BORING DATE: April 16, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш		8	SOIL PROFILE			SA	MPL	ES	Headspa	ce Org	. Vapour	Conc. [I	PPM]	HYDR		ONDUC	TIVITY,	Т	. (1)	
SCALE		ETH		Ŀ.		~		ш	é é	1	2 1	8	24	1	0 <sup>-6</sup> 1	, 0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	<sub>0⁻³</sub> ⊥	STING	PIEZOMETER OR
PTH (		≥ ೮ ۷	DESCRIPTION	TA PI	ELEV.	MBEF	ΥΡΕ	VS/0.:	Headspa	ce Con	nb. Vapo	ur Conc	[%LEL]	w	ATER C	ONTENT	PERCE	NT	3. TE	STANDPIPE INSTALLATION
DE		BORI		STRA	(m)	N	Т	BLOV	ppin					Wp	⊳ <b>⊢</b>	OW		WI	LAI	
			Ground Surface	0,	55.66					4	<u> </u>					20 3				
E	0	Π	Dark brown sandy silt with organic		55.51															-
E			Compact grey silty sand, some gravel,		0.15	1	50 DO	20€	•											-
F			Trace Drick (FILL)																	-
Ē						_	50													-
Ē	1					2	DO	186	*											
F			Loose to compact brown medium sand,		54.44 1.22															-
E		Stem)	some gravel (FILL)			3	50 DO	8 €	•											-
F	Jaer	lollow																		-
	2 A	an. (F					50													-
E	Po	Ш Ш Ш				4	DO	11€	•											-
F		200	Loose dark brown sand, some gravel	₩	53.22 2.44															-
Ē			with wood (FILL)			5	50	10€	•											-
È.	3				52.61		50													-
E			Firm grey silty clay (FILL)		3.05		50													-
F				×	52.15	6	DO	5 €	•											-
-			PEAT		3.51	7	50	4 €	•											-
E.	4	-	End of Borehole	833	51.77 3.89		DO													
E			Auger Refusal																	-
E																				-
F																				-
E,	5																			-
F																				-
E																				-
F																				-
Ē,																				-
È																				-
E																				-
F																				-
F.																				-
E	<i>(</i>																			-
F																				-
E																				-
F																				-
9E	В																			
1212																				-
100																				-
Sie l																				-
NAC 4	9																			-
ΞĒ																				-
GP																				-
20044																				
1 10	D																			-
т Ц																				
	EP	TH S	SCALE					(		G	Jde	r							LC	OGGED: D.G.
ජ් <u>ල</u> 1	: 5	0						1	D	lšs	ocia	ites							CH	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-36

BORING DATE: April 16, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

ш		OD	SOIL PROFILE			SA	MPL	ES	Heads	spac	ce Org	j. Vapo	our C	onc. [F	PPM]	HYDR	AULIC C	ONDUC	TIVITY,	Т	.0	
SCAL RES		METH		PLOT		ER		).3m		6	1	2	18	2	24	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0 <sup>-3</sup> ⊥	TONAL	
EPTH		RING	DESCRIPTION	ATA F	DEPTH	IUMBE	ТҮРЕ	)/S//C	Heads ppm	spa	ce Cor	mb. Va	pour	Conc.	[%LEL]	W			PERCE	NT	ADDIT AB. TI	INSTALLATION
		Bo		STR	(m)	2		BL(		20	4	10	60	8	30		10 2	20 3	i0 4	40	L,	
- 0	,  -		Ground Surface Dark brown sandy silt with organic	222	55.96																	
Ē			matter (TOPSOIL)	1	0.08	1	50	216	÷													
Ē			some gravely shale, trace brick (FILL)																			
-							50															
F 1	1					2	DO	21€	)													-
E			Compact brown sand, some gravel		54.74																	
-					54.04	3	50 DO	20	Ð													
-			Compact brown fine to medium sand	躑	1.75																	
- 2	2					4	50 DO	16€	÷													
		em)			53.52																	
	, P	ollow St	wood (FILL)		2.44	5	50	4 6	÷													
- 3		am. (Ho				-	DO															
	Č	mm Dia			52.61		50															
		200	PEAT		3.35	6	DO	56	)													
-			Firm grey SILTY CLAY		3.66																	
- 4	ı					7	50 DO	76	÷													
			Compact black SILTY CLAY, trace		51.69 4.27																	
			gravel			8	50 DO	11	$\oplus$													
			Compact grou SILTY SAND, some		51.08																	
- 5	5		gravel, trace clay with cobbles and boulders		4.00	9	50	156	•													-
							00															
						10	50 DO	6														
6	5	-	End of Borehole Auger Refusal	1.127	5.84																	-
- 7	,																					
- 8	3																					
-																						
- - 9	,																					
- 10																						-
				<u> </u>					à													<u> </u>
D	ΕP	TH S	SCALE					(		5	G	olde	er								LC	)GGED: D.G.
1	: {	50							V		lss	oci	iat	es							CH	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-37

BORING DATE: April 19, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		0	SOIL PROFILE			SA	MPL	ES	Head	space (	Org.	Vapou	r Conc. [	PPM]	HYDR	AULIC Ç	ONDUCT	TIVITY,	т		
CALE		ЕТНС		5				E	ppm	6	12	, <i>.</i>	18	⊕ 24	1	k, cm/s	0 <sup>-5</sup> 1	0 <sup>-4</sup> 1	0-3	NAL	PIEZOMETER
ETRI		G MI	DESCRIPTION	A PL(	ELEV.	BER	Ы	S/0.3	Head	space (	<sup>1</sup> Com	- ib. Vapo	our Cond	-1 . [%LEL]		ĂTER C	ONTENT	PERCE	ĭ NT	TES	STANDPIPE
M EP		ORIN	DESCRIPTION	RAT.	DEPTH	NUM	Ţ	LOW:	ppm					Ġ	w	p ——	-O <sup>W</sup>		WI	ADI LAB.	INSTALLATION
		ā		ST	(11)			BI		20	40	) (	50	80	1	10 2	20 3	<u>م</u>	40		
-	┝		Ground Surface Black sandy silt with organic matter	===	55.69						_										
F			(TOPSOIL)		0.10		50														
E			Compact dark brown silty sand, some gravel (FILL)			1	DO	166	7												
E																					
E					3	2	50	260	<b>`</b>												
<u> </u>	1				\$	2	DO	200	,												-
F			Compact brown medium sand, some	₩	54.47 1.22																
F			gravel with cobbles (FILL)		3	3	50 DO	8 €	Ð												
F		tem)	Dense black sand, some gravel (FILL)	₩	54.01																
F		ow S				4	50 DO	80	⊕												
F	Allow	(Holl	Compact brown silty cond. come group		53.56																-
E	AWO	Diam	(FILL)		2.13		50														
E		mm				5	DO	12 (	Ð												
E		200																			
È :	3					e	50	100							1						
F				×	52.49	0	DO	106	7												
F			Compact grey SILTY SAND, some	Ш	52.34 3.35																
F			gravel, trace clay with cobbles and boulders			7	50	186	Ð												
E							DO		-												
	1						50														-
F					51.35	8	DO	76	Ð												
-			End of Borehole Auger Refusal		4.34																
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ີ່ 🗋 1	: {	50							V	A	550	ocia	ites							CHI	ECKED: K.P.H.

# RECORD OF BOREHOLE: 10-38

BORING DATE: April 19, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

		8	SOIL PROFILE			SA	MPL	.ES	Heads	space O	rg. Vapo	ur Conc.	PPM]	HYDR		ONDUC	TIVITY,	Т	(1)	
SCALI		AETH		LOT		e contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra contra		Зm	ppm	6	12	18	24	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0-4 1	o-₃ ⊥	STINC	PIEZOMETER OR
PTH (		⊿ U N	DESCRIPTION	TA PI	ELEV.	MBEF	ΥPE	VS/0.	Heads	space C	omb. Vap	our Con	. [%LEL]	w	ATER C	ONTENT	PERCE	NT	B. TE	STANDPIPE INSTALLATION
DE		BORI		STRA	(m)	R	-	BLOV	ppm	20	40	60	ы 10	W		O		WI	LAI	
			Ground Surface	0,	56.00					1	40	00	0			20 3				
	"		Black sandy silt with organic matter		0.10															
-			Compact dark brown silty sand, some		×.	1	50 DO	13€	Ð											-
F			graver with block and concrete (FILL)				50													-
Ē					×	2	DO	76	Ð											-
	1																			
F		Ê	Compact black sand, some gravel		1.22															-
E		w Ster	(FILL)		54.32	3	50 DO	23	Φ											-
F	Auger	(Hollo	Compact brown medium sand, some	颷	1.68															-
- 2	ower	Diam.	graver (FILL)				50													-
E	1	mm				4	DO	23	⊕											-
F		20(	Loose brown silty sand, some clay	颷	53.56 2.44															
-			(FILL)		X	5	50 DO	7 6	Þ											-
- 3	3				52.95															-
F			Loose dark brown gravel (FILL)		3.05															-
Ē						6	DO	7	⊕											-
Ę			Wood		52.34	7	50 DO	6	⊕											
- 4	1		End of Borehole Auger Refusal		3.76															-
F			U U																	
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a EHOL	EP	гн s	SCALE						Â		مام	114							LC	OGGED: D.G.
1 gg	: 5	50							V	As	soci	<u>ates</u>							СН	ECKED: K.P.H.

# **RECORD OF BOREHOLE: 10-39**

BORING DATE: April 19, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

	PENETRATION TEST HAN	/MER,	64kg; DROP, 760mm
M]	HYDRAULIC CONDUCTIVITY, T		

ш		8	SOIL PROFILE			SA	MPL	ES	Headspace Org. Vapour Cor	nc. [PPM]	HYDR	AULIC C	ONDUCTIVITY	<sup>,</sup> т	.0	
CAL	li	Ē		ОТ				ε	6 12 18	24	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 10 <sup>-4</sup>	10 <sup>-3</sup>	NAL	PIEZOMETER
H SI		2		PLO	ELEV.	BER	щ	\$/0.3			14				E	STANDPIPE
EP1 MB		Ž I	DESCRIPTION	ATA	DEPTH	IUME	Τ	SMC	ppm						ABD AB.	INSTALLATION
		2 2		STR	(m)	z		BLC	20 40 60	80		р 10 э	0 30	40	L_1	
	+		Cround Surface		57.00									-+0		
- o	-		Black sandy silt with organic matter	EEE	57.30											
F			(TOPSOIL)	Ŵ	0.15		50									-
F			Compact dark brown silty sand, some gravel (FILL)			1	DO	116								-
F			glavel (LEE)													-
E																-
Ł.						2	50 DO	14	Ð							-
F'			2		56.16											-
F			Compact black sand, some gravel (FILL) /		1.22											-
F			Compact brown medium sand, some			3	50	29.6								-
E			gravel (FILL)			Ŭ	DO									-
-		╞		₩	55.47											-
- 2			layers (FILL)				50									
F						4	DO	17€	>							-
F																-
È		(m)		×												-
F	-	S NO		×		5	50 DO	8 €	>							-
F .	Auge	ШЧ			E 4 00		<sup></sup>									-
F <sup>3</sup>	wer /	am.	Firm grey SILT, some very fine sand	rm?	54.25 3.05											
F	Po	ы ш					50									-
F		n S				ø	DÖ	196	7							-
E		5														-
-																-
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Ł						8	50	20€	>							-
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- 5							50									
F						9	DŐ	286	·							-
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-																-
F						10	50 DO	81€	)							-
- 6					51.26											
F			End of Borehole Auger Refusal		6.04											-
F																-
E																-
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F 7																
F																-
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	EPT	ъ	CALE												LC	DGGED: D.G.
		0							Golder							
мГ	. ၁	U							V ASSOCIATE	:5					СH	LONED. N.F.H.

# **RECORD OF BOREHOLE: 10-40**

BORING DATE: April 19, 2010

SHEET 1 OF 1

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

13, 2010

Ð		SOIL PROFILE			SA	MPL	ES	Head: ppm	space C	کر Drg. ۱	Vapou	Conc. [	PPM] ⊕	HYDR	AULIC C k, cm/s	ONDUC	TIVITY,	T	-10	
METH 1			LOT		ĸ		.3m		6	12	1	8	24	1	0 <sup>-6</sup> 1	0 <sup>-5</sup> 1	0-4 1	0 <sup>-3</sup> ⊥	IONA STIN	OR
DN D		DESCRIPTION	TAP	ELEV.	MBE	ΥPE	VS/0	Head	space C	Comb	o. Vapo	ur Conc	. [%LEL]	W	ATER C	ONTENT	PERCE	NT	B. TE	STANDPIPI INSTALLATIO
BOR			TRA	(m)	ß	-	SLO\	ppm						w	р ——	0 <sup>W</sup>		WI	LAI	
+	-		S		-	-	H		20	40	6	0	30		10 2	20 3 	30 4	ю 		
0	+	Ground Surface Black sandy silt with organic matter	222	57.58					-	-										
		(TOPSOIL)	/	0.10	1	50	110													
		compact dark brown silty sand, some gravel (FILL)		3	l '	DO	110	9												
				Š.																
				Š.		50														
1				Š.	2	DO	10	Ð												
	┟			56.36																
		Dense black sand, some gravel (FILL)		1.22		50														
				3	3	DO	50	Φ												
	╞	Wood (Ell L)		55.78																
2																				
	ŀ	Compact grey SILTY CLAY	Ŵ	2.13	4	50 DO	11	⊕												
			Ŵ	55.14																
		Compact to very dense grey shale in brown SAND and GRAVEL		2.44																
					5	50 DO	22€	Ð												
3																				
	(ja																			
i	ž N				6	50 DO	89€	Ð												
Auge	E																			
wer	ian.																			
4	Ē	Compact grev SILTY SAND some	<u> </u>	53.62 3.96	7	50 DO	32€	Ð												
	200 n	gravel, trace clay																		
				1																
					8	50 DO	20€	Ð												
				52.70																
5	Ī	Dense grey SILT, some very fine sand		4.88		1														
					9	50 DO	36€	Þ												
						1														
					10	50 DO	266	Ð												
6																				
						1														
					11	50	39€	Ð												
7					12	50	546	Ð												
	+	End of Borehole		50.21 7.37		-				+										
		Auger Refusal																		
8																				
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DEPTH	ΗS	CALE							<b>V</b> (	66	lde	r							LC	DGGED: D.G.
: 50	)							V	As	SC	ociz	tes							СН	ECKED: K.P.H.

## Borehole Number: BH06-1/MW06-1

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366313 E, 5030755 N

MOE Well ID: A029553

Date Completed: June 19, 2006 Supervisor: ADG

Ground Surface Elevation: 54.09 mASL

	-4 <sup>-m</sup> -3 <sup>-2</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1 <sup>-1</sup> -1	DEPTH BGS
		SAMPLES
		LAB SAMPLE
	2 3 50 22 34 50 18 15 10 50 14 7 50 50	BLOW COUNT
		CGI (ppm)
		PID (ppm)
		DOG
	GROUND SURFACE         FILL         Brown sand fill with gravel and wood debris. Dry, no odour.         Brown sand with grey/black silt fill and gravel. Minor iron staining. Dry, no odour.         Gravel fill with grey sand, minor silt. Dry, no odour.         PEAT         Black peat. Moist, no odour.         BEDROCK         Grey limestone bedrock.	STRATIGRAPHIC DESCRIPTION
2	1 mm diameter PVC riser	INSTAI
	102 mm diameter drill hole Water level @ 2.2 mBGS	LATION

# Borehole Number: BH06-1/MW06-1

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366313 E, 5030755 N

MOE Well ID: A029553

Date Completed: June 19, 2006 Supervisor: ADG

Ground Surface Elevation: 54.09 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	DOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
15 16 16 17 18 19 20 10 19 20 10 10 10 10 10 10 10 10 10 1							Borehole terminated at 9.1 mBGS.	51 mm diameter PVC screen
30 31 32							BOREHOLE TERMINATED	Depth of MW06-1 = 9.1 mBGS
Page 2	2 of 2			•		•		INCERA

# Borehole Number: BH06-2/MW06-2

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366240 E, 5030732 N

MOE Well ID: A029553

Date Completed: June 19, 2006 Supervisor: ADG

Ground Surface Elevation: 54.33 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION	
tt m -3 -2 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1			15 10 8 10 7 6 4 7 6 2 25	5 0 0			GROUND SURFACE         FILI         Brown silty sand fill. Dry, no odour.         Grey/brown silt and sand fill with gravel. Dry, no odour.         Grey/brown silt and sand fill with brick and wood fragments. Slightly moist, no odour.         BEDROCK         Grey limestone bedrock.	51 mm diameter PVC riser Native soil Stick-up casing	102 mm diameter drill hole Water level @ 1.9 mBGS
Page <sup>2</sup>	l of 2							INCERA	

# Borehole Number: BH06-2/MW06-2

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366240 E, 5030732 N

MOE Well ID: A029553

Date Completed: June 19, 2006 Supervisor: ADG

Ground Surface Elevation: 54.33 mASL

15     16     17     18     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     14     <	Humph DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	STRATIGRAPHIC DESCRIPTION	INSTALLATION
	15 16 17 16 17 18 19 19 10 19 10 19 10 10 10 10 10 10 10 10 10 10						Borehole terminated at 6.7 mBGS. BOREHOLE TERMINATED	Depth of MW06-2 = 6.7 mBGS

## Borehole Number: BH06-3/MW06-3

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD 83 - 366190 E, 5030708 N

MOE Well ID: A029553

Date Completed: June 19, 2006 Supervisor: ADG

Ground Surface Elevation: 55.0 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	DOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
ft m -3 -2 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1			2 9 50 9 23 50 18 32 50	0			GROUND SURFACE         FILI         Brown silty sand fill with gravel. Dry, no odour.         Grey/brown silt and sand fill with gravel. Dry, no odour.         Dark grey sand and gravel fill. Dry, no odour.         BEDROCK         Grey limestone bedrock.	51 mm diameter PVC screen 51 mm diameter PVC riser 61 mm diameter PVC riser 7 mm diameter PVC riser 7 mm diameter PVC riser 7 mm diameter borehole 102 mm diameter drill hole 102 mm diameter drill hole 102 mm diameter drill hole
Page 1	l of 2							INCERA

# Borehole Number: BH06-3/MW06-3

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD 83 - 366190 E, 5030708 N

MOE Well ID: A029553

Date Completed: June 19, 2006 Supervisor: ADG

Ground Surface Elevation: 55.0 mASL

-

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	DOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
15 16 17 16 17 18 19 10 10 10 10 10 10 10 10 10 10							Borehole terminated at 6.1 mBGS. BOREHOLE TERMINATED	Depth of MW06-3 = 6.1 mBGS
Page 2	2 of 2							INTERA

## Borehole Number: BH06-4/MW06-4

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366116 E, 5030662 N

MOE Well ID: A029553

Date Completed: June 20, 2006 Supervisor: ADG/TLJ

Ground Surface Elevation: 54.54 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
ft m -4 -3 -2 -1 -1 0 1 2 -1 -1 0 1 2 -2 -1 0 1 2 -2 -1 0 -1 -1 -1 0 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1			4 11 10 18 14 15 14 15 25	5 n/a 0			GROUND SURFACE FIL Brown silty sand fill with trace clay and gravel, slag and wood fragments. Minor iron staining. Dry, no odour. Grey/brown silt and sand fill with gravel. Dry, no cdour. BEDROCK Grey limestone bedrock.	51 mm diameter PVC screen 51 mm diameter PVC riser 51 mm diameter PVC riser 51 mm diameter PVC riser 51 mm diameter PVC riser 51 mm diameter PVC riser 51 mm diameter PVC riser 5203 mm diameter borehole 102 mm diameter drill hole 102 mm diameter drill hole
Page 1	l of 2							INCERA

# Borehole Number: BH06-4/MW06-4

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366116 E, 5030662 N

MOE Well ID: A029553

Date Completed: June 20, 2006 Supervisor: ADG/TLJ Ground Surface Elevation: 54.54 mASL

15 DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	STRATIGRAPHIC DESCRIPTION	
19 16 17 18 19 19 20 21 21 21 21 21 21 21 21 21 21 21 21 21						Borehole terminated at 5.5 mBGS. BOREHOLE TERMINATED	Depth of MW06-4 = 5.5 mBG
		<u> </u>				•	IN.223



## Borehole Number: BH06-6/MW06-6

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366010 E, 5030649 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 20, 2006 Supervisor: ADG/TLJ

Ground Surface Elevation: 54.96 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	DOJ	STRATIGRAPHIC DESCRIPTION	INSTALLATION
-4 m -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 11 11 11 11 11 11 11 11 11 11 11			4 12 15 20 5 9 10 8 2 4 6 18 7 11 1 5 12 6 4	0 5 0 0			GROUND SURFACE FILI Topsoil near surface, underlain by dark brown silty sand fill with trace gravel. Dry, no odour. Brown silt and sand fill with brick fragments and minor iron staining. Slightly moist, no odour. Brown silt and sand fill. Dry, no odour. 9 cm of black slag fill with rock fragments at 2.1 mBGS. Moist, no odour. Dark brown silt and sand fill with trace gravel and roots. Wet, no odour.	51 mm diameter PVC screen 51 mm diameter PVC riser 51 mm diameter PVC riser 51 mm diameter PVC riser 51 mm diameter PVC riser 51 mm diameter PVC riser 5203 mm diameter borehole 53 mm diameter borehole
Page 1	l of 2							INCERA

#### Borehole Number: BH06-6/MW06-6

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366010 E, 5030649 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 20, 2006 Supervisor: ADG/TLJ Ground Surface Elevation: 54.96 mASL

**BLOW COUNT** LAB SAMPLE SAMPLES CGI (ppm) PID (ppm) STRATIGRAPHIC DESCRIPTION INSTALLATION LOG 0 1 0 1 0 Borehole terminated at 4.6 mBGS. BOREHOLE TERMINATED Depth of MW06-6 = 4.6 mBGS 5 6 - 7 8 9



#### Borehole Number: BH06-7/MW06-7

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365882 E, 5030604 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 20, 2006 Supervisor: ADG/TLJ Ground Surface Elevation: 55.24 mASL

**BLOW COUNT** LAB SAMPLE DEPTH BGS SAMPLES CGI (ppm) PID (ppm) STRATIGRAPHIC DESCRIPTION INSTALLATION LOG ft m -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 3 4Stick-up casing Native soil **GROUND SURFACE** 0 3 FILL 5 Brown topsoil. 0 10 Grey/brown silt and sand fill with trace gravel. 12 Slightly moist, no odour. Bentonite 4 @ 2.5 mBGS 10 1 0 9 7 mm diameter PVC riser 3 Water level 7 Brown silt and sand fill with black slag, brick and 10 203 mm diameter borehole gravel. Slightly moist, no odour. 13 2 9 A. H П 50 0 Dark brown silt and sand fill. Dry, no odour. mm diameter PVC screen -51 3 10 11 Dark brown silt and sand fill with black slag fragments. Wet, no odour. 10 18 ŧ 0 11 18 1 76 50 12 Silica sand Grey and black sand with rock fragments. 51-7 13 4 16 0 23 14 13 Page 1 of 2

# Borehole Number: BH06-7/MW06-7

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365882 E, 5030604 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 20, 2006 Supervisor: ADG/TLJ Ground Surface Elevation: 55.24 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	DOJ	STRATIGRAPHIC DESCRIPTION	INSTALLATION
	Π						Borehole terminated at 4.6 mBGS.	
							BOREHOLE TERMINATED	Depth of MW06-7 = 4.6 mBGS
16 - 5								
17								
18								
19								
20								
21								
22								
23 7								
24								
25								
26								
27								
28								
20								
29 + 9								
31								
327								
Page 2	2 of 2							INTERA

#### Borehole Number: BH06-9/MW06-9

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365843 E, 5030527N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG/SNG Ground Surface Elevation: 61.58 mASL

**BLOW COUNT** LAB SAMPLE DEPTH BGS SAMPLES CGI (ppm) PID (ppm) STRATIGRAPHIC DESCRIPTION INSTALLATION LOG Stick-up Casing **GROUND SURFACE** 0 FILL 9 Brown topsoil. 50 0 203 mm diameter borehole Brown silty sand fill with organic material near surface. Dry, no odour. Brown silty sand fill with some clay and trace gravel. 7 Moist, no odour. 21 0 15 11 7 Dark brown sand and gravel fill. Dry, no odour. 14 2 10 2 6 mm diameter PVC Riser Brown silty sand fill with trace gravel. Dry, no odour. 5 7 0 10 Native Soil 10 3 8 24 Grey silt fill with some clay. Moist, no odour. 3 9 5 2 Black sand fill with some silt and gravel. Wet, landfill odour. Page 1 of 3

#### Borehole Number: BH06-9/MW06-9

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365843 E, 5030527N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG/SNG Ground Surface Elevation: 61.58 mASL



# Borehole Number: BH06-9/MW06-9

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365843 E, 5030527N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG/SNG Ground Surface Elevation: 61.58 mASL

	_					_		
DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	FOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
31 32 33 34 35 36 36 36 37 36 37 36 37 36 36 36 36 37 36 36 37 36 36 36 36 36 36 36 36 36 36			2 1 1	50			Sandy fill with glass and paper debris. Wet, landfill odour. Borehole terminated at 9.8 mBGS. BOREHOLE TERMINATED	Depth of MW06-9 = 9.8 mBGS
	1	<u> </u>	L	1	1	I	1	



# Borehole Number: BH06-10/MW06-10

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: LeBreton Flats

Coordinates: MTM NAD83 - 365965 E, 5030592 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG

Ground Surface Elevation: 55.56 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
m     -4       -4     -3       -2     -1       0     1       2     3       4     5       6     7       8     9       10     11       12     3       4     5       6     7       8     9       10     11       12     13       14     14			$ \begin{array}{c} 6\\22\\30\\38\\19\\48\\41\\36\\5\\5\\12\\7\\3\\2\\3\\6\\6\\3\\3\\7\\8\\5\\8\\22\end{array} \end{array} $	0 0 0 20 0			GROUND SURFACE FILL Brown sandy topsoil underlain by brown silt and sand fill with trace gravel and brick fragments. Dry, no odour. Grey/brown silty sand fill with gravel and cobbles. Dry, no odour. Grey and black silty sand fill with gravel and wood debris. Dry, no odour. Grey/brown silty sand fill with trace wood debris. Dry, no odour. Sand fill with garbage, paper, and plastic. Dry, landfill odour. Brown/black silty sand fill with wood debris. Moist, landfill odour.	51 mm diameter PVC Screen 51 mm diameter PVC Riser 51 mm diameter PVC Riser 61 mm diameter PVC Riser 6203 mm diameter borehole Mater level @ 2.8 mBGS
Page 1	of 2							INCERA

# Borehole Number: BH06-10/MW06-10

Project Number: 05-215-20

**Client: National Capital Commission** 

Site Location: LeBreton Flats

Coordinates: MTM NAD83 - 365965 E, 5030592 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG Ground Surface Elevation: 55.56 mASL

	24 25 26 27 28 29 30 31 32	20 <sup>.</sup> 21 <sup>.</sup> 22 <sup>.</sup> 23 <sup>.</sup>	18 <sup>.</sup> 19 <sup>.</sup>	15 <sup>-</sup> 16 <sup>-</sup>	
	8 9 9	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	6.	5	DEPTH BGS
					SAMPLES
					LAB SAMPLE
			3 9 14 15	23 11 3 1	BLOW COUNT
			0	0	CGI (ppm)
					PID (ppm)
		<u></u>			LOG
		BOREHOLE TERMINATED	SAND Grey sand fill with silt seams. Wet, no odour. Borehole terminated at 6.1mBGS.	Grey clay fill with trace silt and gravel. Wet.	STRATIGRAPHIC DESCRIPTION
Inces A		Depth of MW06-10 = 6.1 mBGS	,	lica Sand	INSTALLATION



# Borehole Number: BH06-11/MW06-11

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365928 E, 5030683 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG

Ground Surface Elevation: 56.80 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	FOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
-4 m -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 4 14 14 14 14 14 14 14 14 14 14 14 1			$ \begin{array}{c} 7\\ 11\\ 50\\ 16\\ 14\\ 22\\ 27\\ 1\\ 5\\ 10\\ 6\\ 9\\ 6\\ 10\\ 4\\ 4\\ 21\\ 19\\ 20\\ 50\\ \end{array} $	0 0 0 0			GROUND SURFACE FILL Brown sand fill with gravel and brick. Dry, no odour. Brown sand fill with gravel and minor silt. 12 cm of rock fragments. Dry, no odour.	51 mm diameter PVC screen 51 mm diameter PVC riser 51 mm diameter PVC riser 520 mm diameter borehole Water level @ 4 mBGS
Page 1	of 2							INCERA
### Borehole Number: BH06-11/MW06-11

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 365928 E, 5030683 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 21, 2006 Supervisor: ADG Ground Surface Elevation: 56.80 mASL

SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	DOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
		1 9 5 50	0		25 0.05 0.05 0.05 0.05 0.05 25 0.05 0.05 0.05 2 0.05 0.05 0.05 0.05 0.05 2 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.0	Gravel fill with minor sand. Wet, no odour. Borehole terminated at 5.6 mBGS.	Silica sand
						BOREHOLE TERMINATED	Depth of MW06-11 =5.6 mBGS
	SAMPLES	2 of 2	2 of 2	2 of 2	2 of 2	2 of 2	Image: Stratigraphic Description       STRATIGRAPHIC DESCRIPTION         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratigraphic Description       Image: Stratigraphic Description         Image: Stratign Descriptic Description       Image: Strati

# Borehole Number: BH06-14/MW06-14

Project Number: 05-215-20

Client: National Capital Commission

Site Location: Municipal Lands

Coordinates: MTM NAD83 - 366033 E, 5030715 N

Drilling Method: Hollow stem auger with split spoon

MOE Well ID: A029553

Date Completed: June 22, 2006 Supervisor: ADG

Ground Surface Elevation: 53.86 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	DOG	STRATIGRAPHIC DESCRIPTION		IN	STAI	LLAT	ION	
tt m -4 -3 -2 -1 0 1 2 3 4 5 6 7 4 5 6 7 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			3 12 15 50 10 37 28 38 38 1 1 1 2 50	0 10 15 n/a			GROUND SURFACE FIL Brown sandy topsoil underlain by brown silty sand fill with gravel. Dry, no odour. Rock fragments and minor sand. Wet, no odour. SAND Brown sand and organics. Wet, no odour. Borehole terminated (bedrock) at 3.0 mBGS BOREHOLE TERMINATED	a Stick-up casing	51 mm diameter PVC riser		5-14 =	Water level @ 1 mBGS 203 mm diameter borehole	Bentonite Native soil
Page 1	of 1										Πī	ER/	1

TT	ENT	Robinson Consultants Inc.	-			_			BOREHOLE No. MW01-						
LOC	CATION _	LeBretons Flats, ABC Lines, C	ttaw	a, C	ntario	_			PROJECT No. ONO1135						
DA	TES: BOR	ING01 04 06 WA	TER I	EVE	<u>.</u>		01 04	18	DATUM Geodeti						
Τ						SA	MPLES		UNDRAINED SHEAR STRENGTH - kPa						
	(LL) Z		PLOT	EVEL			2								
	EVATIO	SOIL DESCRIPTION	TRATA	VATER L	TYPE	IUMBER	ECOVER (mm)	I-VALUE	WATER CONTENT & ATTERBERG LIMITS						
	E		0	[		2	8	20	STANDARD PENETRATION TEST, BLOWS/0.3m						
1	56.08								10 20 30 40 50 60 70 80						
Ŧ	56.0	TOPSOIL													
-		Compact, brown silt and sand,			AS	1									
-		trace gravel, trace organics, trace							11111 11111 11111 11111 11111 11111 1111						
-		Clay: FILL			SS	2	200	10							
1				X											
+	54.6	Stiff arey brown silty clay trace	₩	₽¥											
-		gravel, trace organics: FILL		8	SS	3	250	11							
2 -	54.0	During and having silty sond and		8											
-		oravel: FILL		Ř			200	27							
-		giuron i maa	$\otimes$	X	55	4	200	21							
3 -		Frequent cobbles and boulders		8_											
-				₹	SS	5	150	36							
-				8		-									
-				X	22	6	150	50/							
4 -	52.0	Grey black limestone and shale		X	55	0	150	280 mm	<b>m</b>						
		boulders	5			INO	7	100%	63%						
			5	1	SS	8	0	50/							
5 -					NO	0	100%	200 mn	$\mathbf{m}_{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} \xrightarrow{1111} $						
	50.8		5		I Ing	Ľ	10070	100%	6						
-		Void			1										
	50.1														
6 -	40.9	Compact, black silty sand and		$\overline{\otimes}$			200	10							
	49.0	gravel, trace organics (wood	F		22	10	300	19							
		chips): FILL													
7 -		silt and gravel			SS	11	510	7							
	48.9	Installed Well				$\vdash$	1	1							
	-	Instance won													
	1	End of Borehole													
8 -															
	1														
	1														
. 9	1														
-	1														
	-														
	-														
10	1	· · · · · ·				-			Field Vane Test, kPa						
	A-								Remoulded Vane Test, kPa						

CL	IENT	Robinson Consultants Inc.								BOREHOLE	No. MW					
LC	CATION	LeBretons Flats, ABC Lines, Of 01 04 06		a, C		)	01.0	4 18		DATUM	Geod					
	ATES: BUI	KINGWAI	EKI		51.	SA	MPLES		UNDRAINED S	SHEAR STRENGTH - kPa						
-	(E)		OT	/EL		SA			50 10	00 150	20					
DEPTH (m	ELEVATION	SOIL DESCRIPTION	STRATA PL	WATER LEV	TYPE	NUMBER	RECOVERY (mm)	N-VALUE OR RQD	WATER CONTENT & ATTERBE DYNAMIC PENETRATION TES STANDARD PENETRATION TE	RG LIMITS T, BLOWS/0.3m ST, BLOWS/0.3m	₩ <sub>p</sub> ₩ → ↔					
	54.65								10 20 30 40	50 60	70 80					
0	54.6	TOPSOIL														
	53.9	Loose, brown black silty sand, trace gravel, trace to some clay:		X X X X	AS	1			$\begin{array}{cccccccccccccccccccccccccccccccccccc$							
1 -		Loose, grey black silty sand, trace clay, debris (plastic): FILL		XXXXX	SS	2	330	4		1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1       1     1     1     1     1     1     1	1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1           1         1         1         1         1         1					
				₹ ¥	SS	3	400	2	• 11111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111 • 1111							
2 -	52.5	Soft black neat some silt some	THE REAL	4					$\begin{array}{cccccccccccccccccccccccccccccccccccc$							
		sand: ORGANICS	1 1 1		SS	4	260	13								
3	51.0				SS	5	270	9								
4 -		Compact, grey SILTY SAND, some clay, trace gravel			SS	6	530	10		1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1						
					SS	7	410	16								
5 -	49.2								1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1						
		Severely fractured, grey limestone: BEDROCK	T		NQ	8	100%	0%								
7 -				нннн	NQ	9	79%	36%								
	47.2		H	I					$\begin{array}{cccccccccccccccccccccccccccccccccccc$							
	-	Installed Well														
8 -	-	End of Borehole														
. 9 -	-															
-10						1										

CLI	ENT	Robinson Consultants Inc. LeBretons Flats, ABC Lines, Or	ttaw	va, C	Intario	)	01.0	4 18	BOREHOLE No. MW01 PROJECT No. ONO113 DATIM Geodet
DA	TES: BOH	KINGWAI	ERI			SA	MPLES		UNDRAINED SHEAR STRENGTH - kPa
	(W) 7		LOT	VEL	- 1				50 100 150 200
	ELEVATION	SOIL DESCRIPTION	WP W W WATER CONTENT & ATTERBERG LIMITS H H H DYNAMIC PENETRATION TEST, BLOWS/0.3m * STANDARD PENETRATION TEST, BLOWS/0.3m						
n	62.63		1.10						10 20 30 40 50 60 70 80
	62.6 61.9	TOPSOIL Firm, brown silty clay, trace gravel, trace organics, trace			AS	1			1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1
1 -		<u>debris (wood fragments): FILL</u> Firm to stiff, brown grey sandy clay, some silt, trace gravel, trace			SS	2	400	10	1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1
2		Georis (rubber, brick, wood): FILL			SS	3	520	4	
					SS	4	270	4	
3					SS	5	530	35	
4					SS	6	140	3	
5					SS	7	90	8	
	57.3	Stiff, grey silty clay, some sand, trace gravel, rock fragments, trace debris (wood, plastic) : FILL			SS	8	170	3	
0					SS	9	310	8	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1
7					SS	10	440	13	
8		Sand seam			SS	11	470	8	I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I         I
	53.6				SS	12	470	17	
9		Compact, grey silty sand, rock fragments, trace debris (glass, brick, wood): FILL		¥	SS	13	460	19	
10 -	52.7		×	×					

CLI	ENT	Robinson Consultants Inc.							BOREHOLE No. MWOI
LOC	CATION	LeBretons Flats, ABC Lines, O	taw	a, C	Intario	0	01.0	4 10	PROJECT No. ONOTIS
DAT	TES: BOI	RING01 04 06 WAT	ERI	EVE	EL		010	4 18	DATUM
	Ê		T	_		SA	MPLES		50 100 150 200
ELEVATION (		SOIL DESCRIPTION	STRATA PLC	WATER LEVI	TYPE	NUMBER	RECOVERY (mm)	N-VALUE OR RQD	WATER CONTENT & ATTERBERG LIMITS
+			-					-	10 20 30 40 50 60 70 80
0+		Decomposed paper, trace wood		¥	SS	14	540	50/	
1		fragments: FILL		XXX				330 mm	
		Few cobbles			SS	15	170	27	
1	51.5	hammered spoon, then continued	<b>M</b>	×		16	280	50/	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
+	51.1	augering	1:1:1	+	55	10	200	430 mm	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
12-		to trace gravel, trace clay Auger Refusal Inferred Bedrock at 11.55 m Installed Well							
13		End of Borehole							
13-									1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1
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									$\begin{array}{cccccccccccccccccccccccccccccccccccc$
14									1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <th1< th=""> <th1< th=""> <th1< th=""> <th1< th=""></th1<></th1<></th1<></th1<>
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-									ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT         ITTT <t< td=""></t<>
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107									
-			1						
17									
1/-									$\begin{array}{cccccccccccccccccccccccccccccccccccc$
-			0						
10									
10-								1.	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <th1< th=""> <th1< th=""> <th1< th=""> <th1< th=""></th1<></th1<></th1<></th1<>
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	-								

# **Borehole Number: MW06-5**

Project Number: 05-215-22

**Client: National Capital Commission** 

Site Location: Preston St. Extension

Date Completed: June 20, 2006

Supervisor: ADG/TLJ

Ground Surface Elevation: 54.72 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	LOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
$ \begin{array}{c} ft \\ -4 \\ -3 \\ -2 \\ -1 \\ 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 14 \\ 14 \\ 14 \\ 14 \\ 14 \\ 14$			7 10 9 21 10 14 6 13 4 50	0			GROUND SURFACE FILL Topsoil near surface, underlain by dark brown silty sand fill with trace gravel. Dry, no odour. Brown sand fill with gravel and trace clay. Minor iron staining. Dry, no odour. Dark brown and black silt and sand fill with gravel and cobble. Dry, no odour. BEDROCK	51 mm diameter PVC screen 203 mm diameter borehole Stick-up casing
Page 1	of 2							INCERA

## **Borehole Number: MW06-5**

Project Number: 05-215-22

**Client: National Capital Commission** 

Site Location: Preston St. Extension

Date Completed: June 20, 2006

Supervisor: ADG/TLJ

Ground Surface Elevation: 54.72 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	ГОС	STRATIGRAPHIC DESCRIPTION	INSTALLATION
15 16 17 18 19 20 21 23 24 23 24 25 26 26 21 24 25 26 26 21 24 25 26 26 27 24 25 26 26 29 20 20 20 20 20 20 20 20 20 20 20 20 20							Borehole terminated at 5.4 mBGS. BOREHOLE TERMINATED	Depth of MW06-5 = 5.4 mBGS
Page 2	of 2							INCERA

## **Borehole Number: MW06-8**

Project Number: 05-215-22

**Client: National Capital Commission** 

Site Location: Preston St. Extension

Date Completed: June 21, 2006

Supervisor: ADG/SNG

Ground Surface Elevation: 62.50 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	FOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
ft m     -4     -3     -2     -1     0     1     2     3     4     5     6     7     8     9     10     11     12     13     14       -1     0     1     2     3     4     5     6     7     8     9     10     11     12     13     14       -1     1     1     1     1     1     14     14     14			8 15 20 18 10 12 9 15 11 16 50 10 24 50	0			GROUND SURFACE FILL Dark brown silty sand fill with trace gravel and brick fragments. Dry, no odour. Brown sand fill. Dry, no odour. Dark brown silty sand fill with trace brick fragments. Dry, no odour. BEDROCK	51 mm diameter PVC screen 203 mm diameter borehole
Page 1	of 2							INCERA

### **Borehole Number: MW06-8**

Project Number: 05-215-22

**Client: National Capital Commission** 

Site Location: Preston St. Extension

Date Completed: June 21, 2006

Supervisor: ADG/SNG

Ground Surface Elevation: 62.50 mASL

DEPTH BGS	SAMPLES	LAB SAMPLE	BLOW COUNT	CGI (ppm)	PID (ppm)	FOG	STRATIGRAPHIC DESCRIPTION	INSTALLATION
15 16 17 18 19 10 10 10 10 10 10 10 10 10 10							Borehole terminated at 5.4 mBGS. BOREHOLE TERMINATED	Depth of MW06-8 = 5.5 mBGS
Page 2	of 2							INCERA

APPENDIX III Correspondence with Regulatory Agencies

### **Evan Westad**

From:	ERU /UAE <eru-uae@ottawa.ca></eru-uae@ottawa.ca>
Sent:	Tuesday, April 19, 2022 2:16 PM
То:	Evan Westad
Cc:	ERU /UAE
Subject:	RE: LeBreton Flats Landfill
Attachments:	OLMS Phase 1 Ur-06. Oct2004.pdf

You don't often get email from eru-uae@ottawa.ca. Learn why this is important

This Email is from an **EXTERNAL** source. Ensure you trust this sender before clicking on any links or attachments.

Hi Evan,

I have attached a summary of information for the Former Nepean Bay Landfill from the Old Landfill Management Strategy 2004 study prepared by Golder Associated for the City in 2004.

I was also able to locate some information in the Federal Contaminated Sites Inventory here: <u>Site 00000015 - LeBreton Flats - Nepean Bay (tbs-sct.gc.ca)</u>

The only information our Unit has on the unnamed landfill identified as activity ID 6124 is that it reportedly operated between 1910 and 1920.

I hope this is helpful,

Regards,

Rich Barker | Specialist, Environmental Remediation (A) Environmental Remediation Unit Corporate Real Estate Office Planning, Real Estate and Economic Development

City of Ottawa | 110 Laurier Avenue West, 5<sup>th</sup> Floor West | Ottawa ON K1P 1J1 T. 613.580.2424 x. 12567 | F. 613.580.6051 | richard.barker@ottawa.ca

From: Evan Westad <ewestad@Pinchin.com> Sent: April 14, 2022 3:23 PM To: ERU /UAE <ERU-UAE@ottawa.ca> Subject: LeBreton Flats Landfill

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

#### Good afternoon,

I'm completing a study on a property in LeBreton Flats in Ottawa and am looking for information on two waste disposal Sites. I have submitted an FOI request but don't think that will return information in time. I'm wondering if you can direct me to any publicly available information regarding the Nepean Bay Dump (Ottawa River Pkwy East of CPR Prince of Wales Bridge) activity ID 6108 and an adjacent Site with activity id 6124 (as per https://open.ottawa.ca/datasets/former-landfills/explore?location=45.412533%2C-75.720958%2C6.55). Any information available would be greatly appreciated.

Evan Westad, B.Sc., GIT Project Technologist, Environmental Due Diligence & Remediation

#### Pinchin Ltd.

662 Falconbridge Road, Unit 3, Sudbury, Ontario P3A 4S4 C: 705.207.0748 | pinchin.com

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Site ID # Ur-06	AND Record # 080	MOE Site # x 1011	Category of Owner	Government	HLUI Activity ID # 6108
Other References	Gartner Lee, 1980 excerpts 2002	(Site #6); Intera, 1988 (Lf #6); City of C	Ottawa Operations Branch, 1980	(Site 6); Dillon, 1984	4 (Site No. D-123); AMEC, April 2002 (Parcel E); AMEC,
Site Name	Nepean Bay				
Landfill Monitoring/ Remediation	Extensive groundw monitoring was rec waste was found 1 NCC files were rev	ater and soil monitoring program cond ommended NCC fax dated October to 4 m below the surface and some he iewed as part of this investigation.	ucted by AMEC (report dated Ap 1, 2002 indicates a preliminary re eavy metals, chlorides and petrol	ril 2002) for the City mediation feasibilit eum hydrocarbons t	of Ottawa at the site and at other sites to the west; further y study was conducted in 1994, domestic and industrial solid that reach significant concentrations upon spring thaw. No
Site Location	open green space	between Ottawa Parkway (N), CP railw	vay (W), Scott St. (S) and LeBret	on Flats Aqueducts	(E)
Easting (UTM NAD 2	<b>?7)</b> 443540		Northing (UTM NAI	<b>) 27)</b> 5028720	
Ward #	14				
Size of Site	area approx. 7.5 ha	3			
Waste Thickness	from approx. 3 to 1	2 m [AMEC, 2002]			
Active Time Period	March 1963 - Feb.	1964			
Current Ownership	NCC				
PIN (s)	040970100, 04097	0062, 040970059, 040970046, 040970	0101		

Area Served	City of Ottawa
Type of Waste	domestic and industrial solid waste [NCC fax, Oct. 1, 2002]; concrete, glass, paper, wood, ashes, cinders, asphalt, plastic, rubber, metal and brick observed in fill [AMEC, April 2002]
Nearby Industries	Canadian Pacific Railway Yards, West of Broad St. to Ottawa River [Intera #75]
Operator	City of Ottawa
Parameters of Concern	heavy metals (barium, beryllium, cadmium, copper, lead, nickel, molybdenum, zinc) in soil; PAHs (benzo(a)pyrene and dibenzo(a,h)anthracene) in soil and groundwater; Trace levels of DCE, VC detected in limited number of sampling locations. [AMEC, April 2002]
Concentrations	in excess of applicable remediation criteria [AMEC, April 2002]
Magnitude	heavy metals not found near surface; volume of heavy-metal impacted soil evaluated at 312,000 m3; PAH impacts occur sporadically [AMEC, April 2002]
Methane (landfill gas)	up to 81.2 % methane v/v in December 2001 [AMEC, April 2002]; methane levels varied from 0 to 88.7% v/v in October 2002 [AMEC, excerpts 2002]; site studied in landfill gas utilization feasibility study but did not make it to extraction test screening level. Low levels of gas generation rates combined with a cover permeable to the atmosphere does not lend this site to gas collection [AMEC, excerpts 2002]
Ecological Receptors	ecosystem of Nepean Bay/Ottawa River
Distance to Nearest Human Receptor	closest existing houses are approx. 160 m south of site; site is immediately adjacent to LeBreton Flats where there is proposed residential development
Adjacent Land Use and Zoning	commercial and institutional (municipal facilities) on west side and currently undeveloped in all other directions; historical landfill Ur-5 (Bayview and Slidell) is located immediately west of site; the zoning is LI (major open space) and EW Sch.225 (waterway corridor) in the general area of the site
Adjacent Land Owners	City of Ottawa
Site Access	vacant land not used for recreational purposes; site is not fenced but access to the site is limited due to its location
Water Supply	municipally supplied water
Depth to Bedrock	between approx. 6 m at periphery to over 16 m in mid-west section [AMEC, 2002] to interbedded bioclastic limestone, crystalline limestone and shale
Depth to Groundwater	within the fill deposits, from 13.77m BGL on north side to 9.31 m BGL on southeast side and 4.55 m BGL on southwest side [AMEC, Dec. 3, 2001]
Distance to Surface Water	site is adjacent to Ottawa River on south side and to LeBreton Flats Aqueducts on east side
Topography	steeply sloping on the south and west sides to moderately inclined across the central, northern and eastern portions of the site [AMEC, April 2002]
Soil Cover Thickness	considerable earth fill placed over the waste for the construction of the Ottawa Parkway [GLL, 1980]; cover thickness varies from approx. 0.05 m (topsoil only) to several metres (topsoil underlain by sand or clay fill) [AMEC, April 2002]
Type of Overburden	topsoil, fill and native clay and/or till overlying limestone bedrock; estimated K = 4.2E-6 cm/s [AMEC, April 2002]
Direction of Groundwater Flow	radially south (towards Ottawa River), west and north [AMEC, April 2002]
Physical Setting	open green space with grass cover and tree plantings
Other Information	During site operation, a dyke was built across the bay and wastes filled in behind. [Dillon, 1984]