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Darlington New Nuclear Project - Seismically-Induced Soil Liquefaction Assessment

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1 Introduction

1.1 Background

Ontario Power Generation (OPG) is moving forward with a Small Modular Rector (SMR) new build at the proposed Darlington New Nuclear Project (DNNP) site adjacent to the existing Darlington Nuclear Generation Station (DNGS). As part of the DNNP SMR development, it is required to develop a site specific Probabilistic Seismic Hazard Assessment (PSHA) and assess seismically induced liquefaction hazards for the DNNP to support the License to Construct (LTC) application.

In 2009, a site evaluation of the DNNP site was performed (reference [25]) in accordance with the Canadian Nuclear Safety Commission (CNSC) Regulatory Document RD-346 – "Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants – Characterization Stage (Verification)". The evaluation concluded that the site is suitable for the development of the OPG DNNP project. This study recommended further geotechnical investigation and analysis, including the detailed assessment of liquefaction potential of foundations, for detailed design (Section 7.4 in reference [25]). After the site evaluation in 2009, OPG carried out two major geotechnical investigation programs at the DNNP site in 2012 and 2021 (references [15] and [27]).

Following the previous work, OPG plans to move to the implementation stage by conducting site specific PSHA and a detailed assessment of seismically induced liquefaction hazards.

1.2 Objectives

The objective of this report is to evaluate seismically induced liquefaction hazards for both Design Basis Earthquake (DBE) and Beyond Design Basis Earthquake (BDBE) using the results from the site specific PSHA study, supporting the License to Construct (LTC) application for the DNNP project. The considered BDBE corresponds to the Checking Level Earthquake (CLE), which is defined as 1.5 times of the DBE motion. Seismically induced liquefaction hazards were assessed for the Reactor Building (Structure No.1), Turbine Building (Structure No.2), Radwaste Building (Structure No.3), Control Building (Structure No.4), Reactor Auxiliary Bay (Structure No.5), Independent Spent Fuel Storage Installation (ISFSI, (Structure No.6), and Emergency Mitigating Equipment (EME) Access Routes. The proposed locations of the structures No.1 to No.6 are shown in Figure 4-1 (see Section 4 for details).

In the event that any of the foundation soil for the identified facilities are shown to be susceptible to liquefaction hazard, the extent of the liquefaction will be stated including seismically induced settlement and lateral spreading where applicable. The liquefaction hazard at the site, if any, may impact the near-surface mounted power block foundations affecting the safety of the Seismic Category A Reactor Building.

1.3 Quality Assurance Program

As per the requirements of the Project Analysis Plan, all assessment work was completed in compliance with the requirements specified by the Kinectrics Quality Management System (QMS).

1.3.1 Software

Most of the data compilation, processing and calculation was performed using Microsoft Excel. The Ground Response Analyses were performed using pyStrata (version 0.5.0), which is an implementation of Equivalent Linear (EQL) site response, similar to the computer program SHAKE [28].

To meet Kinectrics' quality requirements, a re-run of the original SHAKE16 commercial software test case was completed for pyStrata on the dedicated project computer. A qualified analyst reviewed the test case output and validated that any difference from the test runs was within an acceptable range. This software validation was documented in Software Validation Report Program: pyStrata Version 0.5.0 Revision 0, dated October 7, 2022 [37].

1.4 Document Structure

The background information, methodology, results and conclusions of the liquefaction assessment is provided as follows:

Section 1 – Introduction

Information on the project, objectives and report structure.

Section 2 – General Site Description

Description of site location, geology, and groundwater conditions.

Section 3 – Data Collection and Review

Summary of the sources of geotechnical data.

Section 4 – Site Construction Plan

Description of excavations and grading, fill plans at DNNP.

Section 5 – Foundation Descriptions

Critical buildings and facilities.

Descriptions of specific structure foundations and references to the sources of design information.

Section 6 – Material Properties

Description of how geotechnical data was processed and how material properties were estimated.

Section 7 – Liquefaction Susceptibility and Screening Assessment

Descriptions of how the screening assessment was conducted to determine which borehole data would continue to the detailed assessment phase.

Section 8 – Ground Motions

Description of the selection of input ground motions.

Section 9 – Detailed Liquefaction Assessment

Description of the methodology and structure specific results of the detailed assessment of liquefaction and other seismically induced geotechnical hazards such as seismically induced settlement and lateral spreading displacement where applicable.

Section 10 – Conclusions and Recommendations

Conclusions and recommendations from the study are discussed.

Section 11 – References

List of references used in the assessment.

2 General Site Description

The following sections provide a general site overview with respect to the DNNP site layout and describe the current understanding of the geological/geotechnical conditions.

2.1 Site Location and Description

The DNNP site is located on the north shore of Lake Ontario, about 65 km east of the City of Toronto, in the Municipality of Clarington, Region of Durham in Ontario, Canada.

The site is at latitude 43° 52’ north and longitude 78° 42' west. The proposed DNNP site comprises a land parcel of about 600 m long and 300 m wide. The Power Block at the site is about 140 m long and 70 m wide (references [10] and [9]). A map showing the DNNP site with the neighboring area is provided as Figure 2-1 and Figure 2-2.

Figure 2-3 presents a general layout of the DNNP site. As shown, the site is bounded by the 2nd Line West road to the north and Lake Ontario to the south. To the west, the site is bounded by the existing access road.

The site is situated in an undulating to moderately rolling limestone till plain. The terrain is to be graded in the proposed site area to the elevation of about 88 m[1] within the Power Block and nearby areas (reference [9]). Further details of the proposed construction can be found in Section 4.1.1.1.

The site is easily accessible by car and rail. The multi-lane Macdonald-Cartier Freeway (Highway 401) runs east/west, immediately north of the site. There are three controlled exits to the Macdonald-Cartier Freeway, directly through Holt Road and two others less than 3 km on either side of the DNNP.

Figure 2-3 shows the major site access locations and an aerial view of the Darlington site.

2.2 Site Geology

The previous investigation reports (references [15], [8] and [25]) described the geology of the DNPP site. The local surficial geology (see Figure 2-4) can be briefly described as follows:

For the surficial geology, there are three general physiographic regions:

- The Oak Ridges Moraine on the north side of the regional study area.
- The South Slope and the Iroquois Plain; and
- A wide belt along Lake Ontario in the south.

[1] The elevation represents 88 meter above seal level (masl) in reference to Canadian Geodetic Datum CGVD28.

The Oak Ridges Moraine is a major geologic/hydrogeologic feature in Southern Ontario. The moraine is a major source of groundwater recharge, and a large number of creeks and rivers are derived from groundwater discharge from the moraine. It was formed by regional glaciation, the advance and recession of several ice sheets and the subsequent melting of the glaciers. The moraine marks the boundary between the Lake Simcoe ice lobe advancing from the north and the Lake Ontario ice lobe advancing from the south. It is a ridge of high land separating drainage to the north to Lake Simcoe and drainage to the south to Lake Ontario.

The moraine consists of interbedded layers of glacial till and sand and gravel. The moraine has a distinctive hummocky terrain with knobs and kettles. The southern flank of the moraine is covered by the Halton Till, a silty to silty clay till.

The South Slope fills the area between the moraine and the Iroquois Plain and consists of gentle to steep slopes but is more uniform as compared to the irregular terrain of the moraine. It contains a number of drumlins which point to the southwest in general indicating a general direction of glacier movement.

The Iroquois Plain, an 8 to 12 km wide plain, lies between the former shoreline of Lake Iroquois and present-day Lake Ontario. Shoreline deposits and glaciolacustrine sediments are found in this area overlying the glacial tills. The shoreline deposits include sand and gravel bars and beach terraces as well as some deltas from former rivers and creeks flowing into Lake Iroquois. The lacustrine deposits, consisting of silts and clays overlying till are found further from the former shoreline. In the area of the site, the Iroquois Plain contains drumlins with a southeast orientation indicating the northwest glacial advance.

2.3 Subsurface Soils

As summarized in References [15], [8], and [25], the geology of the DNNP site is characterized by Pleistocene and Holocene surficial deposits (“overburden”) overlying lower Paleozoic rocks of the Blue Mountain Formation and Simcoe Group. The 2022 investigation program (see Reference [15]) provides the most updated and comprehensive information regarding the in-situ properties of the subsurface deposits.

The overburden deposits (excluding fill and topsoil) at the DNNP site consist primarily of a surficial glaciolacustrine layer overlying glacial tills (upper and lower) with a layer of interglacial deposits situated between the till layers. Site investigations data indicates that the overburden deposit at the DNNP site is about 20 to 35 m thick.

The study for the OPG DNNP site at Darlington includes the following description of the surficial glaciolacustrine, upper till, interglacial and lower till deposits that cover the DNNP site: The surficial glaciolacustrine is identified as Halton Till, referred as Unit 2 in recent OPG documents (see References [15] and [27]). The till below this is identified as Newmarket Till, a silty sand with gravel to sandy lean clay with gravel till also referred to as Upper Till or Unit 3 in recent OPG documents. A dense, silt with sand to lean clay till (identified as Sunnybrook Till and referred to as the Lower Till or Unit 5) overlies the bedrock. Bounded between the Unit 3 and Unit 5 Tills are deposits of water-bearing intermediate glaciolacustrine deposits referred to

Thorncliffe Formation or Unit 4 in OPG documents. Unit 2 is a surficial glaciolacustrine deposited about 12,500 years ago and Units 3, 4, and 5 were deposited about 18,000 to 50,000 years ago (see reference [32]).

Available borehole data indicate that the stratigraphy conforms to the geologic descriptions in previous reports. The composition and thickness of stratigraphic units encountered in boreholes is summarized in sequence below as per [15]:

- Topsoil /Fill (Unit 1) described as poorly graded sand with gravel to sandy lean clay, typically 1.6 m thick ranging from 0.5 to 3.5 m. Rootlets and organic staining were commonly observed within this deposit.
- Surficial Glaciolacustrine Deposits (Unit 2) consisting of two sublayers: Unit 2a and underlying Unit 2b.
  - Unit 2a described as sandy lean clay to lean clay between 0.2 m and 6.1 m thick with an average thickness of 2.2 m. This unit extended to depths between about 1.2 m and 8.1 m below the existing ground surface(begs).
  - Unit 2b described as silty clayey sand to silty sand/sandy silt between 0.3 and 3.8 m thick with an average thickness of 1.6 m. This unit extended to depths between about 1.4 m and 9.4 m below the existing ground surface(begs).
- Upper Till (Unit 3) described as a till layer of heterogeneous mixture of gravel, boulders, and cobbles in a matrix of silty sand, typically very dense, occasionally very loose to compact. This unit is widespread and has a thickness from 0.9 m to 13.5 m, extending to depths between 3.0 m to 18.6 m (begs).
- Intermediate Glaciolacustrine deposit (Unit 4) consisting of two interbedded sublayers: Unit 4a and Unit 4b.
  - Unit 4a described as silty sand to sandy silt; typically, dense to very dense. Widespread and varying in thickness from 0.1 m to 10.7 m, extending to depths from 4.3 m to 29.2 m (begs).
  - Unit 4b described as sandy lean clay to lean clay; typically, very stiff to hard. Widespread and varying in thickness from 0.1 m to 5.2 m, extending to depths from 16.8 m to 29.2 m (begs).
- Lower Till (Unit 5) described as silt with sand to lean clay; typically, dense to very dense or hard. This unit is widespread, and has thickness typically from 0.5 to 6.3 m, extending to depths between about 19.2 m and 33.6 m (begs).
- Bedrock described as shale with interbedded limestone to shaley limestone.

The DNNP site construction plan (excavations, fill operations and fill materials) is discussed in Section 4.

2.4 Groundwater Conditions

Based on the 2022 Report by WSP Golder (reference [15]), four groundwater flow patterns have been mentioned, (1) the water table (shallow groundwater) in the upper till (Unit 3) as shown in Figure 2-5, (2) the groundwater in the interglacial deposits (Unit 4a) as shown in Figure 2-6, (3) the groundwater in the lower till deposits (Unit 5) as shown in Figure 2-7, and (4) the groundwater in shallow bedrock as shown in Figure 2-8. As shown on the figures, the groundwater flow direction in the upper and lower till (Units 3 and 5, respectively) is inferred to be toward the southwest, and in the intermediate glaciolacustrine deposits (Unit 4a) and shallow bedrock (Units 6a and 6b) to be toward the south-southeast. The general direction of the groundwater flow is toward Lake Ontario. Actual long-term groundwater level and flow pattern may change.

Furthermore, the well network is limited to within site boundaries and therefore the interpretation of groundwater flow at the site boundaries is based on a general understanding of groundwater in a local context.

The overall mean water level in the lake (1918 – 2019) is about EL. 75.17 m (reference [15]).

During the geotechnical site investigation in 2021 to 2022 (reference [15]), depths to water table generally varies between 1.8 and 3.4 m, with an average depth of 2.5 m below the ground surface in the shallow overburden of the upper till (Unit 3), as summarized in Table 2-1 using the monitoring data from the monitoring wells installed within the DNNP site.

As per the preliminary site excavation plan [9], the existing overburden within the Power Block will be excavated down to EL. 81 m and replaced with compacted fill back to the finished grade of EL. 88 m. Further details of the proposed excavation can be found in Section 4.1.1.1. During operation, the maximum groundwater level will not exceed the limit of 0.6 m (2 ft) below the plant finished grade, i.e., EL. 87.4 m, as per the design requirement from GE-H (see Reference [23]). As such, in the site response analyses, the groundwater level of EL. 87.4 m was conservatively selected for the structures listed in this report in the post-construction condition.

3 Data Collection and Review

3.1 Data Collection

Data collection started with high level review of the reference documents provided by OPG. This high level review also identified other reference documents that may have useful / relevant documents and those documents were requested through Request For Information (RFI). These additional documents / reports were then reviewed, and useful / relevant documents were identified together with more references. This cyclic data collection continued until all sources were exhausted. In total, over 50 were identified with useful / relevant data for this project.

3.2 Data Review

Documents and reports identified as having useful / relevant information were further reviewed and useful data and information were extracted. This involved the following steps:

1) Reviewed and compiled the available site investigation data relevant to the DNNP site. Identified native soil and fill units and compiled relevant data with location reference. This involved review of the following:

    a. Site investigations performed at the DNNP site.

    b. Relevant geotechnical laboratory testing.

    c. Geologic descriptions of the site.

    d. Literature about past liquefaction in similar geologic units.

2) Drawings, and reports relevant to the DNNP site development were reviewed. This involved but was not limited to relevant design information and data at major structures such as Reactor Building, Turbine Building, Radwaste Building, Control Building, Reactor Auxiliary Bay, Independent Spent Fuel Storage Installation (ISFSI), and Emergency Mitigating Equipment (EME) Access Routes were also reviewed and compiled.

3) The properties of engineered fill units were estimated as per the design information. This data included unit weight, Poisson's Ratio, and shear modulus. The properties of the fill should be verified/confirmed upon the completion of construction (see Section 4.1.2 for further details).

4) Using compiled site investigation data, excavation and backfill information, subsurface soil profiles were developed for each critical structure showing native soil units and engineered fill units. These subsurface profiles are presented later in Section 6 together with material properties.

4 Geotechnical Construction Plan

An overview of the proposed geotechnical construction at the DNNP site is presented in the following sections. The locations of the primary DNNP structures are shown on Figure 4-1.

4.1 Earth Works

The existing ground grades ranged between about EL. 80 and EL. 102 m within the proposed DNNP site and varies from about EL. 86 to EL. 88 m in the Power Block area, as shown in Figure 4-1.

Earthwork is required to achieve the final plant grade of EL. 88 m, and to construct the structure foundations.

4.1.1 Excavation Operations

The preliminary excavation plan at the DNNP site is shown in Reference [9]. Excavation operations include permanent cut slopes and temporary construction cut slopes.

The excavation plan includes over-excavation of the weaker surficial soil within the Power Block area to about EL. 81 m (reference [22]). Fill material will be backfilled and compacted to bring the site grade back to EL. 88 m. The remaining native soil consists of the lower portion of Upper Till deposit, Intermediate Glaciolacustrine, and Lower Till.

The Reactor Building structure will be constructed in a vertical right cylinder shaft that extends into bedrock at about EL. 52.9 m with a 1.2-meter-thick base slab (references [14] and [22]). At this elevation, the bottom of the vertical right cylinder shaft for the Reactor Building is expected to extend through the compacted fill and in-situ soils and into the bedrock at the DNNP site.

4.1.1.1 Soil Excavations

The preliminary excavation plan (references [9], [14] and [22]) shows soil over-excavations in the power block area will be down to EL. 81 m as per the control points listed in the reference [22]. The excavated soil includes the topsoil/fill (Unit 1), Surficial Glaciolacustrine (Unit 2a and 2b), and upper portions of Upper Till (Unit 3). The remaining native soil consists of the lower portion of Upper Till (Unit 3), Intermediate Glaciolacustrine deposit (Unit 4a and 4b), and Lower Till (Unit 5). Temporary cut slopes are at an inclination about 3H:1V (horizontal to vertical). The over-excavation will be backfilled with engineered fill which are not expected to liquefy (see Section 4.1.2).

Permanent cut slopes are proposed at the north side and east side to the power block area at an inclination about 3H:1V, as inferred from the excavation plan drawing (No. 006N6034 see Reference [9]). The permanent cut slopes are kept over 200 m away from the power block area.

It is understood that the excavation plan from the references [9], [14] and [22]) is preliminary at this stage and needs to be verified/updated by the design team based on the complete DNNP site data and construction plan.

4.1.1.2 Rock Excavations

Rock excavations are proposed below the Reactor Building, as shown in Reference [9]. Anticipated bedrock elevation at the Reactor Building generally ranges from about EL. 64.0 m to 64.7 m [15]. The rock excavations extend down to about EL. 52.9 m (references [14] and [22]). The rock excavation is expected to be carried out within a vertical right cylinder shaft as the shoring support system.

4.1.2 Fill Operations

Fill operations included backfills needed to achieve the final plant grade at EL. 88 m (references [9], [14] and [22]) after the over-excavation in the Power Block area and the construction of the various site structures and facilities.

4.1.2.1 Fill Materials

The expected properties of the fill materials are provided in the Section of 3.4 in Reference [13], including the unit weight, dynamic Poisson's Ratio and shear wave velocity.

4.1.2.2 Fill Placement and Compaction

Requirements for fill placement and compaction are expected to be developed in the detailed design phase to achieve the design parameters listed in References [12] and [13].

All fill materials and fill placement and compaction operations are expected to be approved by the Engineer or Geotechnical Quality Control Staff.

5 Foundation and Structure Descriptions

The structures considered in this study are listed below:

- Reactor Building (No. 1);
- Turbine Building (No. 2);
- Radwaste Building (No. 3);
- Control Building (No. 4);
- Reactor Auxiliary Bay (No. 5); and
- Independent Spent Fuel Storage Installation (ISFSI, No. 6).

Figure 4-1 shows the proposed layout of the listed structures at the site.

The five structures (No.1 to No. 5) are located in the rectangle Power Block area. This area is in a cut and fill zone as discussed in Section 4, where the topsoil/fill, surficial Glacio-lacustrine deposit is expected to be completely excavated and replaced with fill to match the finished grade as per the current over-excavation plan ([9] and [10]).

The structure of No. 6 (ISFSI) is located east to the Power Block area as per the Rev.0 of the preliminary site plan (reference [10]). Figure 4-1 shows the proposed location with the label of ”6a”. This structure was relocated from an earlier revision (Rev.H) of the preliminary site plan (reference [11]), where it was located north to the Power Block, as shown in Figure 4-1 with the label of ”6b”.

Table 5-1 summarizes the expected foundation conditions for these structures. The reactor building (Structure No. 1) is to be founded on rock. The structures from No. 2 to No. 6 are expected to have lightly embedded shallow foundations close the final plant grade of El. 88 m and be founded on engineered fill and in-situ soil materials.

5.1 EME Access Routes

The Emergency Mitigation Equipment (EME) routes are expected to be constructed on the finished grade as shown in Table 5-1. WSP understands that the alignment of the EME routes and the corresponding hookup locations have not yet been established as per the communication with OPG and GE-H (see the RFI-035, July 2022, reference [24]). In this study, a liquefaction screening assessment was carried out for all boreholes within the project site. The results of this screening assessment may be used to support the selection of the EME route in design in the next phase.

6 Material Properties

Information and data compiled from the data collection and review were processed and the required material properties were derived.

6.1 SPT Data and Soil Profiles

Standard Penetration Test Blow Count (SPT-N) data obtained from the review of available borehole logs (see Appendix A for the SPT data details and sources) were compiled together with corresponding soil unit information. Correction factors were then applied to obtain corrected equivalent clean sand SPT blow count data referred as $(N_1)_{60\text{-}cs}$. The SPT data corrections involves:

- Energy correction;
- Correction for Rod length;
- Overburden correction; and
- Correction for fines content.

SPT correction factors were estimated using the methods recommended in references [18], [7], [39], and [4]. The details of the SPT correction factors relationships along with the calculations are included in Appendix C.

6.1.1 Correction for Hammer Energy, Borehole Diameter, and Sampler Liners

The Standard Penetration Test Blow count (SPT-N) needs correction factors C_E, C_B, and C_S. A description of each of these factors is below:

- Energy factor, C_E: Standard SPT "N_{60}" considers 60% of theoretical maximum energy delivered by the SPT hammer. Reference [18] suggests C_E of 0.8 to 1.3 and the more recent reference [7] suggest C_E of 0.8 to 1.4 for automatic hammers. In the absence of energy measurements in the available investigation reports, C_E = 1.0 was assumed representing an average value. For the recent 2012 and 2021 investigation programs (see [15] and [27]) where the energy transfer ratio was measured for the SPT hammer at site, the specific energy factor of C_E was used accordingly for the hammer energy correction, as summarized in Table 6-1.
- Borehole diameter factor, C_B: Varies from 1.0 to 1.15 depending on borehole diameter [18]. Borehole diameters are often not reported on the available borehole logs or investigation reports. C_B = 1.0 was conservatively assumed.
- Sampler factor, C_S: Typically, C_S = 1.0 is used for spilt spoon samplers without room for liners and C_S > 1.0 is used for lined spilt spoon samplers without the liners present during sampling [18]. Specific details of the samplers are not provided in the borehole logs. However, typically non-lined spilt spoon samplers are used. Therefore, C_S = 1.0 was conservatively assumed.

6.1.2 Correction for Rod length

SPT Rod length correction factor C_R was estimated using the recommended method in the most recent SPT case history database summary by Cetin et al. (2016) [7]. Many methods are available and provide a similar range of correction factors for rod length. This method provides a gradual variation of C_R with rod length as an update to the step-wise function recommended by Idriss and Boulanger (2008) [18] and Youd et al (2001) [39]. The above-ground rod stick-up was not specified in the referenced investigation reports, stick-up was assumed to be 1.2 m based on standard drilling practice. The total rod length was calculated assuming a stick-up length of 1.2 m and corresponding correction factor C_R was calculated using the method proposed by Cetin et al. (2016) [7].

6.1.3 Overburden Correction

SPT blow counts increase with increasing confining stress. For liquefaction triggering calculations, SPT N_{60} is corrected to the equivalent value that would have been obtained at a vertical effective stress of one (1) atmosphere pressure (about 1,013 kPa), $(N_1)_{60}$, by applying an overburden correction factor C_N. Many methods are available and provide similar range of correction factors for overburden correction. C_N was estimated using three industry standard methods for liquefaction triggering described in the references [18], [39], and [4].

6.1.4 Correction for Fines Content

Case histories of liquefaction triggering have shown that liquefaction resistance increases with increasing fines content. Several procedures exist for adjusting the $(N_1)_{60}$ to a clean sand equivalent corrected blow count $(N_1)_{60\text{-cs}}$. These procedures are empirically derived from liquefaction case history data. Fines content adjustment was estimated using three industry standard methods for liquefaction triggering described in the references [18], [39] and [4]. The correction for fines content was estimated based on the fines content data from the particle size distribution laboratory tests for the specific soil samples. The average fines content of each soil units was used only where the specific soil samples do not have laboratory fines content test data (see Table 6-2 for fines content of each soil unit).

6.1.5 Corrected SPT Data Profiles

The locations of boreholes with SPT data are shown in Figure 4-1. The corrected SPT data, $(N_1)_{60\text{-cs}}$, profile plots for the soil around each structure (No. 1 to No. 6) are shown in Figures 6-1 to Figure 6-6. For the EME route, Figure 6-7 presents the corrected SPT data of each borehole within the project site, except for those within the Power Block area which are covered in Figure 6-1 to Figure 6-5 instead. These $(N_1)_{60\text{-cs}}$ profiles were developed using the procedures described in literature reference [4] and are used in the screening assessment described in Section 7.

Sensitivity analyses of the impact of the SPT data correction factors on the liquefaction assessment was also carried out and the results are discussed later in Section 9.8.4. The sensitivity analyses were performed by varying one correction factor at a time and assessing its effect on the variation of seismically induced deformations.

6.2 Summary of Laboratory Tests Data

Available laboratory test data includes routine test data such as moisture content, unit weight, grain size distribution, Atterberg Limits Tests, and Hydrometer Analyses. These laboratory test results are included in Appendix B (Table B-2).

Available advanced geotechnical test data includes strain-controlled cyclic triaxial, stress-controlled cyclic triaxial, strain-controlled cyclic direct simple shear and stress-controlled cyclic direct simple shear. These results are also summarized in Appendix B (Table B-4).

6.3 Shear Wave Velocity (V_s) Data Summary

Three sets of crosshole shear wave velocity tests were completed at boreholes BH15, BH28, and BH66 ([15] and [16]). Seventeen (17) sets of Vertical Seismic Profiling (VSP) tests were completed at the selected boreholes using downhole geophysics ([15] and [16]). The data profiles from the crosshole tests are plotted in Figure 6-8. Appendix B (Table B-3) summarizes the V_s data from the VSP tests. The SPT blow counts measured in boreholes at these locations were used to calibrate empirical correlations for Maximum Shear Moduli (G_{max}) in the following sections.

6.4 Estimation of Maximum Shear Modulus (G_{max}) using $(N_1)_{60}$ data

Available Vs data presented in Section 6.3 were used to calculate the maximum shear moduli profiles at these locations using the equation:

$$G_{max} = \rho {V_s}^2$$

Where:

G_{max} – Maximum shear modulus (kPa)

ρ – Soil Density (kg/m^3)

V_s – Shear wave velocity (m/sec)

The measured Gmax profiles were used to calibrate an empirical relationship relating $(N_1)_{60}$ to Gmax. The empirical relationship is based on Seed et al. (1986) [30] and is given below:

$$G_{max} = C * Pa(N_1)_{60}^{0.333}(\frac{\sigma'_m}{Pa})^{0.5}$$

Where:

Pa – Atmospheric pressure (kPa)

$(N_1)_{60}$ – Corrected SPT blow count without the fine content correction

σ'_m – Effective mean normal stress (kPa)

The coefficient “C” is an empirical coefficient calibrated to match the shear wave velocity measurements and typically ranges from 300 to 2000. A unique “C” was assigned to each soil type based on a calibration process fitting to the field measurement of V_s (Crosshole and VSP test data, see Section 6.3) using the correlation formula with the corresponding SPT data. Table 6-3 lists the “C” coefficients assigned to each soil type based on the calibration.

6.5 Unit Weight Summary

Table 6-2 summarizes the unit weight of backfill and native soil units as per References ([15], [16],[27] and [12]).

7 Liquefaction Susceptibility and Screening Assessments

Liquefaction susceptibility and screening assessments of native and fill materials were performed using the data presented in Section 6.

7.1 Liquefaction Susceptibility Assessment

Liquefaction susceptibility assessment was carried out using index properties (grain size, fines content, plasticity, saturation, water content) of native soil and fill to identify liquefiable and non-liquefiable units.

The liquefaction susceptibility assessment of fine grained soils (silts and clays) was performed using the following methods: Chinese Criteria (1982)[2] [34], Andrews and Martin (2002) [2] and Bray et al. (2006) [5]. These methods use water content, liquid limit, plasticity index and fines content to determine liquefaction susceptibility of fine-grained soils.

Liquefaction susceptibility of coarse grain / sandy soils was assessed using SPT blow count $(N_1)_{60\text{-}cs}$ and the saturation of the layer (i.e., above or below the water table). Based on historical data, the geotechnical profession (Youd et al, [2001] [39], Andrus and Stoke, [2000] [3], among others) accepts that sandy soils with a clean-sand corrected standard penetration resistance $(N_1)_{60\text{-}cs}$ value less than about 33 blows/ft and located below the water table can be considered susceptible to liquefaction. Based on published case history databases and suggested triggering curves shown in Figure 7-1(a), site soils with $(N_1)_{60\text{-}cs}$ values less than about 30 blows/ft are assumed to be susceptible to liquefaction. It is noted that the literature data shown in Figure 7-1(a) corresponds to the reference magnitude of 7.5 (Idriss and Boulanger, 2008 [18], Boulanger and Idriss, 2014 [4]) whereas the DNNP site is expected to have a relatively lower magnitude of 6.4 for both DBE and BDBE (see Section 8 for details) and the Cyclic Stress Ratio (CSR) at the site typically ranges from 0.2 to 0.4 (see Section 9 and Table 9-3 for details). As shown in Figures 7-1(b) and 7-1(c), the results from the detailed liquefaction assessment confirmed that the soil with $(N_1)_{60\text{-}cs}$ over 30 blows/ft is not expected to liquefy with a factor of safety above 1.1 for both DBE and BDBE events for the boreholes evaluated at the DNNP site. In addition, the two precedent liquefaction studies at the adjacent DNGS site ([35], [36]) in 2018 and 2020 adopted the same cut-off value of 30 for $(N_1)_{60\text{-}cs}$ in the screening analyses. Given the literature data and site-specific condition described above, the liquefaction susceptibility cut-off value of 30 blows/ft was conservatively chosen for the DNNP site.

Both the fine grained and coarse-grained soils data that are identified as not susceptible to liquefaction (based on the susceptibility assessments discussed above) are removed from the database requiring liquefaction screening and further assessment. The liquefaction screening assessment of the remaining data is discussed in the following Section 7.2.

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[2] The "Chinese Criteria" [34] was referred in the document of "technical base for regulatory guide for soil liquefaction" by U.S. Nuclear Regulatory Commission ([33]) and the results were provided accordingly in this report. .

7.2 Liquefaction Screening Assessment

7.2.1 Structures No. 1 to No. 6

The soil units with data indicating liquefaction susceptibility are subjected to the liquefaction screening assessment. This involved qualitatively determining if the concerned liquefiable soils could adversely impact the structures. The following steps were involved in the liquefaction screening assessment:

- The locations where there is material (or combinations of material) with potential to experience liquefaction were compiled and mapped out with respect to the structures No. 1 to No. 6. That is, locations of potentially liquefiable materials were identified in the overall site layout and borehole location plan (see Figure 4-1 for borehole locations).

- The structures No. 1 to No. 6 were screened considering locations of liquefaction susceptible materials relative to the respective structure, and possible direct and indirect impacts. This screening was generally performed considering relative distance, extent of liquefaction susceptible zone, depth and number of data points with $(N1)_{60\text{-}cs}$ value less than about 30 blows/ft, type of structure and foundation, and expected impact on the structure. Any borehole that had no data point with potential to experience liquefaction (i.e., $(N1)_{60\text{-}cs}$ value less than about 30 blows/ft) were screened out.

7.2.2 EME Access Routes

The liquefaction screening assessment of the EME Access Routes was performed using a modified cut-off criterion instead of general criterion noted above in Section 7.1. As detailed liquefaction assessment for the EME Access Routes is beyond the current scope of work, a modified cut-off criterion was developed to minimize conservatism, as discussed below, based on DNNP site specific detailed liquefaction assessment completed for the structures listed above.

The following steps were involved in the modified screening criterion used for the potential EME Access Routes:

- The calculated factors of safety (for the DBE event) against liquefaction from the detailed liquefaction assessment (see Section 9.6) were plotted (Figure 7-1b) against their corresponding $(N_1)_{60\text{-}cs}$ values. The calculated factors of safety using Boulanger and Idriss (2014) method were used in this plot as it provides the most conservative results. Figure 7-1b shows that the factor of safety against liquefaction is equal to or greater than 1.1 where the $(N_1)_{60\text{-}cs}$ value is equal to or greater than 25. Based on this summary plot, $(N_1)_{60\text{-}cs}$ value of 25 was conservatively selected as the screening cut-off value for the potential EME Access Routes for the DBE event.

- The $(N_1)_{60\text{-}cs}$ value of 30 was selected as the screening cut-off value for the potential EME Access Routes for the BDBE event.

7.3 Results of Liquefaction Susceptibility and Screening Assessment and Soil Profiles

7.3.1 General Discussion

The results of the liquefaction susceptibility and screening assessments are provided in Figure 7-2 through to Figure 7-8 corresponding to each of the listed structures, Reactor Building, Turbine Building, Radwaste Building, Control Building, Reactor Auxiliary Bay, ISFSI Building, and EME route. The borehole logs referenced in the sections below are presented in Appendix A and are summarized in Table A-1.

For the structures No. 1 to No. 5 within the Power Block area, the existing overburden above EL. 81 m will be over-excavated and replaced with fill as per the current excavation plan (reference [9]), as discussed in Section 4. The fill material will be selected and compacted in a way to ensure it is not liquefiable. As such, the screening assessment for these structures was carried out only for the overburden below EL.81 m.

For the boreholes identified as susceptible for liquefaction from the screening assessment, a representative soil profile was prepared to represent the soil condition for each borehole in the detailed liquefaction assessment, as further discussed in Section 9.

7.3.2 Reactor Building (Structure No. 1)

There are five (5) boreholes (BH9, BH10, BH11, BH12-3, and BH14) at and around the Reactor Building with SPT data. Figure 7-2 summarizes of the $(N_1)_{60\text{-}cs}$ data from those boreholes. Given that Reactor Building will be founded directly on bedrock, soil liquefaction is not a concern for the foundation of the building.

As such, the Reactor Building is screened out for further detailed liquefaction assessment. It is noted, however, that the liquefaction of soil, if any, adjacent to Reactor Building may negatively impact its performance considering (1) the structural connection of the Reactor Building and adjacent buildings, and (2) the down-drag force acting on the cylinder structure of the Reactor Building. Section 9 provides further discussions for the Reactor Building.

7.3.3 Turbine Building (Structure No. 2)

There are ten (10) boreholes (BH2, BH5, BH7, BH8, BH9, BH66, BH67, BH68, BH71 and BH73) at and around the Turbine Building with SPT data. Figure 7-3 presents the $(N_1)_{60\text{-}cs}$ data from these boreholes. It is to be noted that the existing overburden above EL. 81 m will be over-excavated and replaced with compacted fill. The engineered fill material is considered non-liquefiable as discussed in Section 7.3.1. As such, the screening assessment was carried out only for the overburden below EL.81 m. As shown in Figure 7-3, the $(N_1)_{60\text{-}cs}$ data are greater than 30 for the boreholes BH2, BH5, BH7, BH8, BH9, BH67, BH68, and BH73. The two remaining boreholes are BH66 and BH71, each of which has one data point with a low blow count approximately in a depth range from EL. 68 m to EL. 70 m. This indicates a potential presence of a discontinuous weaker layer at this depth range.

As such, the data from BH66 and BH71 is used for further detailed liquefaction assessment for this structure.

7.3.4 Radwaste Building (Structure No. 3)

There are four (4) boreholes (BH12-3, BH13, BH17, and BH73) at the Radwaste Building location with SPT data. Figure 7-4 summarizes the $(N_1)_{60\text{-}cs}$ data from these three boreholes. The lower blow counts less than 30 for boreholes BH12-3, BH13 and BH73 above the over-excavation depth and thus can be ignored. Thereby, BH12-3 and BH73 are screened out. BH13 has one data point less than 30 which is further screened out based on the plasticity criteria, as shown in Figure 7-9.

As such, the Radwaste Building does not require further detailed liquefaction assessment and is screened out.

7.3.5 Control Building (Structure No. 4)

There are seven (7) boreholes (BH14, BH15, BH18, BH19, BH20, BH78, and BO-16) at and around the control building location with SPT data. Figure 7-5 presents the $(N_1)_{60\text{-}cs}$ data from these boreholes. As shown in Figure 7-5, the five boreholes of BH15, BH19, BH20, BH78, and BO-16 are screened out as the they have blow counts over than 30 below over-excavation depth. BH14 and BH18 have low blow counts less than 30 at about EL. 70 m indicating liquefaction susceptibility.

As such, a further detailed liquefaction assessment is conducted for the Control Building considering these two boreholes (BH14 and BH18).

7.3.6 Reactor Auxiliary Bay (Structure No. 5)

There are ten (10) boreholes (BH1, BH2, BH4, BH5, BH10, BH15, BH16, BH77, B-113 and B-116) at and around the Reactor Auxiliary Bay building location with SPT data. Figure 7-6 presents the $(N_1)_{60\text{-}cs}$ data from these boreholes. As shown, the five boreholes of BH2, BH5, BH15, BH16, and B-116 are screened out as the they have blow counts all over than 30 below over-excavation depth. The boreholes BH1, BH4, BH10, BH77, and B-113 has blow counts below 30 at about EL. 70 m indicating liquefaction susceptibility. Among these five boreholes, BH4 has one data point less than 30 which is further screened out based on the plasticity criteria, as shown in Figure 7-10. The rest four boreholes (BH1, BH10, BH77, and B-113) require further detailed liquefaction potential analyses.

As such, the Reactor Auxiliary Bay building is assessed for further detailed liquefaction potential analyses considering the four boreholes of BH1, BH10, BH77, and B-113.

7.3.7 Independent Spent Fuel Storage Installation (Structure No. 6)

The independent spent fuel storage installation (ISFSI) building is located outside of the Power Block area. There is no plan for significant over-excavation of native soil below this building.

Figure 4-1 shows the proposed location of this building with the label of “6a”. It is noted that there is no borehole available within the footprint of this building. As such the boreholes further

away are included in the screening assessment, including six (6) boreholes BH1, BH3, B-104, B-113, BO-2 and AME-03alt.

Figure 7-7 presents the $(N_1)_{60\text{-}cs}$ data from these seven boreholes. The two boreholes of BO-2 and AME-03alt are screened out as the they all have blow counts over 30. The four boreholes of BH1, BH3, B-104, and B-113 have blow counts below 30 and are retained for detailed liquefaction assessment. The low blow counts are mainly encountered at depths above EL.81 m or near EL. 70 m, as shown in Figure 7-7. None of these boreholes can be further screened out using the plasticity criteria.

As such, a further detailed liquefaction assessment is conducted for the ISFSI building considering these four boreholes (BH1, BH3, B-104, and B-113).

7.3.8 EME Routes (Structure No. 11)

For the EME access routes, the liquefaction screening was performed for all boreholes, except for those within the Power Block area, to provide an understanding of potentially liquefiable soil zones. Figure 7-8 presents the $(N_1)_{60\text{-}cs}$ data from these boreholes. There are fifty-five boreholes considered in the screening assessment.

Below is a summary of the liquefaction screening results for the BDBE event using the screening cutoff value of 30 for $(N_1)_{60\text{-}cs}$:

- Twenty-nine (29) boreholes (BH3, BH7, BH8, BH16, BH17, BH29, BH50-3, BH53, BH57, BH58, BH59, BH60, BH61, BH62, BH65, BH66, BH69, BH75, BH77, B-104, B-113, B-116, B-118, BO-14, BO-21, BO-23, BO-24, BO-47 and DN60) have blow counts less than 30 indicating liquefaction susceptibility. As shown in Figure 7-8a, the low blow counts are mainly encountered at three depth ranges, (1) above EL.81 m, (2) near EL. 77 m, and (3) near EL. 70 m ranging typically from EL. 68 m to EL. 71 m. The twenty-nine boreholes remain after the liquefaction screening assessment.

The calculated factors of safety (for DBE events) against liquefaction from the detailed liquefaction assessment were plotted in Figure 7-1(b) against their corresponding $(N_1)_{60\text{-}cs}$ values. The figure shows that the factor of safety against liquefaction is equal to or greater than 1.1 where the $(N_1)_{60\text{-}cs}$ value is equal to or greater than 25. Based on this summary plot, an $(N_1)_{60\text{-}cs}$ value of 25 may be conservatively selected as a screening cut-off value for the EME Access Routes for the DBE event. Below is a summary of the liquefaction screening results for the DBE event using the screening cutoff value of 25 for $(N_1)_{60\text{-}cs}$:

- Twenty-six (26) boreholes (BH3, BH7, BH8, BH16, BH17, BH29, BH50-3, BH53, BH57, BH59, BH60, BH61, BH62, BH65, BH66, BH69, BH75, BH77, B-104, B-113, B-116, B-118, BO-21, BO-23, BO-24, and BO-47) have blow counts less than 25 indicating liquefaction susceptibility for the DBE event, as shown in Figure 7-8b.

Further liquefaction assessment may be required as per the specific design seismic hazard level and the dimensions of the EME routes, when the EME route is finalized and if the selected route

is near those boreholes. Figure 9-43 and Figure 9-44 show the locations of these boreholes with potential liquefiable soil for the DBE and BDBE events, respectively.

8 Ground Motions and Site Response Analyses

The current liquefaction study uses the design basis earthquake (DBE) and beyond design basis earthquake (BDBE) response spectra from the Darlington New Nuclear Project Site-Specific Probabilistic Seismic Hazard Assessment report (see the PSHA report [38]) as input into the site response analyses that will determine the demand for the liquefaction analyses. The peak ground acceleration (PGA) values at the soil/rock interface corresponding to DBE and BDBE motions are 0.25g and 0.34g based on Reference [38].

Following the requirements of CNSC REGDOC 2.5.2 (V1), DBE response spectra are to be developed as described in ASCE 43-05 for SDC 5 category nuclear structures. The formulation in ASCE 43-19 for SDC 5 category structures produces the same results as the ASCE 43-05 formulation and the ASCE 43-19 formulation is used in this study. The DBE spectra were computed by applying a scale factor to the uniform hazard response spectra (UHRS) for annual frequency of exceedance (AFE) of 10^{-5}, with the SF2 scale factors based on the ratio of the 10^{-4} and 10^{-5} UHRS for the DNNP site hazard. The AFE for the DBE motion is between $4x10^{-5}$ to $5x10^{-5}$ (see Reference [38]).

The spectra for the DBE and BDBE seismic hazard cases are shown in Figures 8-1(a) and 8-1(c) for the soil/rock interface. The input motions for the current site response analyses (i.e., the equivalent linear random vibration theory (RVT) site response conducted using Pystrata) are defined by their Fourier amplitude spectrum and duration. The duration is estimated using Boore and Thompson's (2015) [31] model for the Central and Eastern North America (CENA) region. The scenario used for calculating the duration is obtained from deaggregation of the hazard corresponding to the AFE of the DBE and BDBE PGA level. For the DBE input motion, the mean magnitude is 6.4 and the mean distance corresponding to the mean magnitude is 34.4 km. For the BDBE input motion, the mean magnitude is 6.4 and the mean distance corresponding to the mean magnitude is 24.4 km. The Fourier amplitude is derived from the DBE and BDBE response spectra using inverse random vibration theory. Figures 8-1(b) and 8-1(d) shows the Fourier amplitude of the two input motions for the soil/rock interface.

Liquefaction analyses require the input of a moment magnitude for the seismic event. Magnitudes were selected to be consistent with the hazard levels for the site and ground motion input. To be consistent with the selected ground motions, averages of the mean magnitudes as evaluated for the determination of the ground motion input for the site response analyses at PGA were used to represent the scenario hazard at the site for the purpose of deterministically evaluating the liquefaction. The mean magnitude for both the DBE and BDBE hazard levels is 6.4 using the de-aggregation data in the PSHA report (see Reference [38]).

Equivalent site response analysis requires G/G_{max} and damping curves for each soil layer. Golder (2022) [16] provides damping curves and G/G_{max} based on dynamic laboratory tests for Soil Units 2a, 2b, 3, 4a, 4b, and 5 (see Figure 8-2 and 8-3). These laboratory tests were performed on reconstituted samples of coarse-grained soils and on intact samples for fine-grained soils. It can be observed that the laboratory measured curves show strain softening behavior (see Figure 8-3).

The site response analyses to calculate the CSR profiles were performed using the dynamic material properties (see Figures 8-2 and 8-3) which were based on the site-specific laboratory test data from Golder (2022) [16]. The site response analyses were also performed using a set of modified material curves where the post-peak strain softening characteristic of the site-specific laboratory test data was removed (see Figure 8-4). Comparison of these results indicated that the modified dynamic material properties yield slightly more conservative CSR profiles (higher CSR) in comparison with the unmodified dynamic material properties.

The unmodified curves in Figure 8-3 show a strain softening behavior when shear strain exceeds the level ranging from 0.02% to 0.2%. This strain softening characteristic yields damping response and lower (less conservative) CSR within the top several meters of soil profiles in the site response analyses in comparison to the results using the modified material curves. In site response analyses, the strain softening characteristic cause higher shear strains in the low shear wave velocity layers (i.e., Unit 2B). These larger shear strains are accompanied by degradation of the dynamic shear modulus and higher damping, leading to a relatively lower CSR within the top several meters of soil profiles in the site response analyses.

As discussed above, the strain softening response as measured in the laboratory tests (Figure 8-3) yields lower (less conservative) CSR values within the top several meters of soil profiles. The modified curves (Figure 8-4) yield relatively higher CSR values (thus more conservative input to liquefaction assessment). The liquefaction assessment used the CSR values calculated using the modified curves (Figure 8-4) instead of the unmodified curves, considering that (i) the laboratory tests results may have been affected by field sampling and/or sample preparation in laboratory, and (ii) using laboratory-based strain softening curves yields lower CSR values. It is also noted that the material curves were not specifically adjusted for the assumed shear strength for each unit as the material curves were based on site specific lab testing that would already take into account the shear strength. The modified material curves still retain the same peak shear strength and so this modified set of curves also limited the stress to the shear strength.

9 Detailed Liquefaction Assessment

Detailed liquefaction assessments of the soil deposits were carried out using available applicable SPT data for the buildings that remained after liquefaction screening assessment, i.e., Turbine Building (Structure No. 2), Control Building (Structure No. 4), Reactor Auxiliary Bay (Structure No. 5), and Independent Spent Fuel Storage Installation (Structure No. 6). The detailed liquefaction assessment methodology is described below in Section 9.1 with relevant assumptions and simplifications. The soil profiles, soil properties and analyses details are presented in Section 9.2 through to Section 9.5. Results of the liquefaction assessments for the design base earthquake (DBE) and beyond design base earthquakes (BDBE) are presented in Sections 9.6 and 9.7, respectively.

9.1 Methodology

The liquefaction assessment was carried out in accordance with Seed's simplified approach as described in Idriss and Boulanger (2008). In this approach, the cyclic shear stress ratios (CSR) induced by the design earthquake are compared with the cyclic resistance ratios (CRR) derived from field observations of soils with known standard penetration test (SPT) resistances, at sites that have or have not liquefied during earthquakes. The induced CSRs can be computed from the site-specific ground response analyses using a software program or the simplified method using the empirical shear stress reduction coefficient r_d. This study adopted the site-specific ground response analyses for the CSRs considering that the overburden at the DNNP site is deeper (typically 25 to 30 m) than the depth range of 10 to 12 m covered by the simplified r_d method as recommended by Boulanger and Idriss (2014). Section 9.8.3 provides a further discussion for a verification check using the simplified r_d method. The CRRs are evaluated based on the equivalent $(N_1)_{60\text{-}CS}$ values, which were computed by applying the corrections for energy transfer, overburden stress, fine content, etc. on measured SPT blow counts.

The procedure used for assessment of the liquefaction potential is described as follows:

- The average cyclic shear stress ratios (CSR) induced by the design earthquake are computed directly using results from the ground response analyses, where CSR is 0.65 times the maximum earthquake-induced cyclic shear stress (τ_{max}) divided by the initial effective overburden pressure (σ_{vo}') at the depth of interest.

$$CSR = 0.65 \times \tau_{max} / \sigma_{vo}'$$

- CRR profiles are calculated (at all identified locations) using the following industry standard methodologies.
  - Boulanger and Idriss (2014);
  - Idriss and Boulanger (2008) and
  - Youd et al (2001).

- With the above computed CSR and CRR, the factor of safety (FOS) against liquefactions is computed (Reference [6]) as:

  FOS = CRR / CSR

- A factor of safety of 1.1 or greater is required to confirm that triggering a liquefaction event is unlikely to occur for a certain soil layer. This is based on the industry standard as documented in [19]. It is noted that the estimated probability of liquefaction occurrence associated with a factor of safety of 1.1 is 4% using the best estimates of the blow count and CSR and the Boulanger and Idriss (2014) method, while the probability increases to 16% at a factor of safety of 1.0.

- Since Seed's liquefaction chart is for a M7.5 earthquake at an overburden stress of 100 kPa (1 tsf) and correspond to level ground conditions, the above CRR is corrected as follows:

  $CRR = CRR_{M7.5} \times (MSF \times K_{\sigma} \times K_{\alpha} \times K_{DR})$

  Where:

  Magnitude Scaling Factor (MSF) is the correction factor for a design earthquake magnitude other than M7.5,

  K_{σ} is the correction factor for initial static confining stress greater than 100 kPa (1 tsf), and

  $K\alpha$ is the correction factor for initial static shear stresses.

  K_{DR} is the correction factor for age of deposit as described by Hayati and Andrus (2009) [17]. The age of the natural soil deposits used in calculating K_{DR} was based on descriptions of geologic units by TRCA (2009) [32]. The age of deposit factor does not apply to recent deposits or backfill materials.

As noted above, the detailed liquefactions assessment was carried out using the Boulanger and Idriss (2014), Idriss and Boulanger (2008), and Youd et al (2001) methods. Detailed descriptions and equations/charts of these methods and all related correction factors can be found in the corresponding references [4], [18] and [39], respectively. All three methods follow the same simplified procedure approach as outlined above.

The Youd et al. (2001) method has been the most widely used method in the past as it was developed in a workshop with the involvement of many of the leading researchers and consultants in the industry. This method was used in this study as it was referred by the regulatory guide (2003) as documented in [33]. The Idriss and Boulanger (2008) method was published as an update to the most widely used original Monograph “Ground Motions and Soil Liquefaction during Earthquake” (1983) [29]. The Idriss and Boulanger (2008) method incorporated additional data that became available through case histories and back analyses and provided updated correlations and correction factors. The Boulanger and Idriss (2014) method is an update to the Idriss and Boulanger (2008) method and incorporates additional data that became available since their 2008 version.

Considering that the Boulanger and Idriss (2014) method was developed utilizing the largest number of case histories and back analysis data, it is expected to provide the lowest level of uncertainty compared to other industry standard methodologies by Idriss and Boulager (2008) [18] and Youd et al (2001) [39]. As such, the Boulanger and Idriss (2014) method was chosen as the base-case approach for the detailed liquefaction assessment. The results from the methods by Idriss and Boulager (2008) [18] and Youd et al (2001) are presented herein to provide context with respect to the potential range in liquefaction and safety hazard.

9.1.1 Seismically Induced Settlement and Lateral Displacement

For boreholes considered in the detailed liquefaction assessment, seismically induced lateral displacements and settlements were estimated using the charts in Figure 95 and Figure 102 of Idriss and Boulanger (2008) [29], as shown in Figures D1 and D2 in Appendix D.

The seismically induced settlement assessment includes the following steps:

- For each data point where FS_{liq} is less than 2, the vertical strain for seismically induced settlement was computed for the corresponding data point.
- The seismically induced settlement at ground surface was then calculated by integrating the vertical strains over the depth interval for each liquefaction data point in the borehole.

The seismically induced lateral spreading assessment includes the following steps:

- For each data point where FS_{liq} is less than 2, the maximum shear strain for seismically induced lateral spreading was computed for the corresponding data.
- The seismically induced lateral spreading displacement index at ground surface was then calculated by integrating the maximum shear strains over the depth interval for each liquefaction data point in the borehole. The lateral spreading displacement index was adjusted to obtain the lateral spreading displacement using the correlation by Zhang et al. (2004) [40] considering the ground geometry at the site (see details in Appendix D).

Tables 9-1 and 9-2 provide a summary of the seismically induced settlement and lateral displacement for the DBE and BDBE events respectively. Appendix D presents a summary of the assessment approach, charts used in the calculations and detailed calculation tables.

The studies in literatures (Idriss and Boulanger, 2008 [29] and Zhang et al. 2004 [40]) compared the calculated and measured seismic induced displacement (settlement and lateral displacement) from the available case histories, and indicated that the actual displacements range from half to double the calculated values. The difference encountered in these studies may be attributed to the potential variations of soil properties and the level of accuracies of the analytical methods (Idriss and Boulanger, 2008 [29]).

In general, the liquefied soil with FS_{liq} less than 1.1 contributes the majority of the seismically induced deformation. However, there could be a small amount of reconsolidation settlement and

lateral spreading induced by seismic events for the soil data point(s) with FS_{liq} from 1.1 to 2.0, even though the liquefaction is not triggered for this range of FS_{liq}.

For the boreholes screened out with $(N_1)_{60\text{-}cs}$ over 30, the seismically induced deformation is expected to be minimal. As per the liquefaction assessment results summarized in Figure 7-1(c), the soil with $(N_1)_{60\text{-}cs}$ over 30 typically has a FS_{liq} over 2.0 and is consequently expected to have negligible seismically induced deformations.

9.1.2 Assumptions and Simplifications

1. The idealized soil profiles used in the assessment are based on available borehole data.
2. Correction factor for static shear stresses is taken as unity (1.0, that is no correction) assuming level ground surface around the location of liquefaction assessment as per the site plan by GE-H [10].
3. It is assumed that available borehole data at and around each structure represent the in-situ conditions at and around the specific structure. As the boreholes with higher $(N_1)_{60\text{-}CS}$ data have been screened out, the remaining boreholes used in this detailed liquefaction assessment represent conservative conditions at and around the structure considered.
4. Soil over-excavation within the Power Block area will be carried out down to EL. 81 m and be backfilled with non-liquefiable fill as per the design documents (see references [14] and [22]). The fill will be engineered and compacted to satisfy the property requirement specified in the design document (see reference [12]).
5. This study assumes negligible soil disturbance from construction activities. The available borehole data at and around each proposed structure represent the post-construction conditions at and around the specific structure except for over-excavation and backfill zones.

9.2 Soil Models and G_{max} Profiles for Ground Response Analyses

Figures 9-1 to 9-10 present the soil profiles for the boreholes (BH1, BH3, BH10, BH14, BH18, BH66, BH71, BH77, B-104 and B-113) that remained from the liquefaction screening assessment. The maximum shear modulus (G_{max}) profile for each of the boreholes BH3, BH14, BH66 and BH71 were evaluated using the shear wave velocity data measured from the field VSP tests [15]. For the rest of the boreholes where VSP test data is not available, G_{max} was assessed using the empirical correlation between G_{max} and $(N_1)_{60}$ data as discussed in Section 6.4. Figures 9-11 to 9-20 present the G_{max} profile for each of the soil profiles shown in Figures 9-1 to 9-10.

The maximum dynamic shear modulus for the fill material was evaluated using the design base-case parameters (shear wave velocity and unit weight) provided by GE-H (see Table A-2 in reference [14]). Given the uncertainty for the post-construction condition of the fill, a sensitivity study was carried out using the upper range (UR) and lower range (LR) profiles of the maximum shear modulus, representing the 90th and 10th percentile values for the fill material [14]. BH18

and BH71 were selected from the boreholes in the detailed liquefaction assessment as they are at the south and north ends of the power block, respectively. The objective is to investigate if the variation of G_{max} in fill material significantly impact the results of the liquefaction assessment. The results of the sensitivity studies are presented in Sections 9.6.7 and 9.7.7 for the DBE and BDBE events, respectively.

The site response analyses used the modified material curves where the strain softening characteristic of the site-specific laboratory test data was removed, as discussed in detail in Section 8.

9.3 Ground Response Analyses

The ground response analyses were performed using the software pyStrata (the same software used for the full Darlington New Nuclear Project Site-Specific Probabilistic Seismic Hazard Assessment [38]). These analyses were performed for the borehole soil profiles, as shown in Figures 9-1 to Figure 9-10, that were not screened out for liquefaction susceptibility.

The ground response analyses were completed for:

- Soil profiles representing liquefaction susceptible locations for unscreened boreholes (BH1, BH3, BH10, BH14, BH18, BH66, BH71, BH77, B-104 and B-113) associated with structures No. 2, No. 4, No. 5, and No. 6. Each profile had distinct material types, layer thicknesses, unit weights, and maximum shear modulus (G_{max}) values.
- The DBE hazard level, with a spectrum that represented the full design spectrum for the site at the soil/rock interface. This spectrum was converted into a Fourier amplitude spectrum using the software pyStrata as discussed in Section 8.0. Thus, time histories were not used in the DBE site response analyses.
- The BDBE hazard level, with a spectrum that represented the full design spectrum for the site at the soil/rock interface. This spectrum was converted into a Fourier amplitude spectrum using the software pyStrata as discussed in Section 8.0. Thus, time histories were not used in the BDBE site response analyses.

It is confirmed that a check was performed that spectral compatibility was maintained in the conversion between the response spectrum and the Fourier amplitude spectrum. It is also confirmed that the input response spectra for the site response did not include the adjustments for the NEI check that was done for some of the PSHA design spectrum.

The equivalent linear ground response analyses were completed using pyStrata. The equivalent linear ground response approach was taken to provide the CSR values for evaluation of liquefaction triggering as per the recommendation from the reference [20]. The analyses provide output files that summarize all the inputs, equivalent linear iterations, and output data. The computer program also provides punch files with the final iterated maximum shear stress and shear strain profiles. These maximum shear stresses and strains are computed at the center of each sublayer in the soil profiles. PGA values at the ground surface were taken from the output files and the maximum shear stresses were taken from the punch files.

9.4 Calculation of Cyclic Stress Ratio (CSR) Profiles

Each site response run resulted in the production of a single maximum shear stress profile for each borehole profile. The site response analyses used the modified material curves for the native soils and the mean G_{max} profile for fill material, except for where noted. The CSR values were then calculated using the following equation as noted earlier:

$$CSR = 0.65 \times \tau_{max} / \sigma_{vo}'$$

It is noted that the CSR was only computed for the soil portion of the profile. Table 9-3 summarizes the average CSR for each structure under study for both the DBE and BDBE hazard levels.

Individual CSR profiles for each soil profile under consideration are presented in the following sections together with the CRR profiles.

9.5 Calculation of Cyclic Resistance Ratio (CRR) Profiles

The Cyclic Resistance Ratio ($CRR_{M7.5}$) profiles were calculated for all unscreened borehole data using current industry standard methodologies Boulanger and Idriss (2014), Idriss and Boulanger (2008) and Youd et al (2001).

As noted earlier in Section 6.2, cyclic Triaxial and Direct Simple Shear tests were performed by Golder (2022) [15] [16] on samples from soil Units 2a, 2b, 3, 4 and 5. Estimated CRR values from these laboratory tests results are either close to or higher than the CRR values estimated from above noted empirical equations. As such, CRR values calculated from the empirical equations were adopted for the liquefaction analyses.

As noted earlier, these $CRR_{M7.5}$ values were then corrected for earthquake magnitude (MSF), age of deposit (K_{DR}), and overburden stress (K_{σ}) to develop the corrected CRR_M profiles. Individual CRR_M values for each borehole that were not screened out are presented in Figures 9-21 to 9-30 together with the CSR profiles for the DBE earthquake and Figures 9-31 to 9-40 for the BDBE year earthquake.

The Factor of Safety against liquefaction (FS_{liq}) was then calculated for each unscreened borehole data profile using following:

$$FS_{liq} = CRR_M / CSR$$

The calculated FS profiles are also presented in Figures 9-21 to 9-40 together with the CRR and CSR profiles. As per state of practice, liquefaction is expected to occur if the calculated FS_{liq} is less than 1.1. Zones with FS_{liq} values between 1.0 and 1.1 with corresponding liquefaction probabilities of 16% and 4%, respectively, are considered to have a low probability of liquefaction.

9.6 Results of Liquefaction Assessment – DBE Event

The liquefaction assessment was performed by calculating and comparing Factor of Safety values against liquefaction for the DBE event. Results of the liquefaction assessment at each structure are discussed in the following sections. Liquefaction assessment results for the DBE event are presented in Figures 9-21 to 9-30. Figure 9-41 presents a summary of the liquefaction assessment results (borehole locations with elevations of liquefiable soils) for the DBE event. Table 9-1 summarizes the expected seismically induced settlement and lateral displacement for the listed structures for the DBE event.

9.6.1 Reactor Building (Structure No. 1)

The Reactor Building was screened out as it will be founded directly on bedrock. Below presents an evaluation of the adjacent soil to assess the potential negative impact, if any.

There are five boreholes (BH9, BH10, BH11, BH12-3, and BH14) at and around Reactor Building. Two boreholes (BH 9 and BH 12-3) were screened out based on high blow counts. The soil deposit around BH11 will be completely removed during construction and thus requires no further assessment. For the two boreholes (BH10 and BH14) adjacent to the Reactor Building area, Figures 9-23 and 9-24 provide the plots of CRR, CSR, and factor of safety against liquefaction for the DBE seismic event for BH10 and BH14, respectively. Liquefaction is not expected for the DBE event as the minimum FS_{Liq} is greater than 1.1 for all depths below the over-excavation level of EL. 81 m. The backfill material above EL.81 m is considered as non-liquefiable as it will be engineered and compacted to satisfy the QA/QC and design requirement.

As such, no liquefaction is expected in the surrounding soils for Reactor Building for the DBE seismic event. The estimated seismically induced deformation at BH10 and BH14 are discussed in Sections 9.6.5 and 9.6.4 respectively

9.6.2 Turbine Building (Structure No. 2)

All boreholes at and around Turbine Building were screened out, except BH 66 and BH71. Figures 9-26 and 9-27 provide the plots of CRR, CSR, and factor of safety against liquefaction for the DBE seismic event for BH66 and BH71, respectively. For BH71, liquefaction is not expected for the DBE event as the minimum FS_{Liq} is greater than 1.1. BH66 is located about 25 m away north to Turbine Building and the results indicate that FS_{Liq} of less than 1.1 (approximately 0.3 to 1.0) for the three data points at EL. 83.9 m (Unit 2a), EL. 85.3 m and EL. 86.9 m (Unit 2b). It should be noted that all three data points are above the over-excavation level of EL. 81 m in the Turbine Building area and all native soil above EL.81 m will be over-excavated below the foundation of Turbine Building. As such, the liquefaction data points in BH66 at EL. 83.9 m, EL. 85.3 m and EL. 86.9 m are not expected to impact Turbine Building.

Overall, no liquefaction in the foundation soil is expected for Turbine Building during the DBE seismic event as the minimum FS_{liq} is greater than 1.1 for all data below the over-excavation level of EL. 81 m.

Table 9-1 summarizes the estimated seismically induced settlement (0 to 5 mm) and lateral spreading displacement (0 to 11 mm) near the structure for the DBE event. It is noted that only one borehole (BH66) near this structure is expected to have the seismically induced deformation and it is located outside the footprint of the structure and the Power Block area. The soil data point associated with the seismically induced deformation is located at about EL. 67.9 m (Unit 4b), or about a depth of about 20.1 m below the expected finished grade with the FS_{Liq} of 1.62 at BH66 (see Table D2 in Appendix D). Safety should be assessed considering the seismically induced settlement and displacement.

9.6.3 Radwaste Building (Structure No. 3)

Radwaste Building was screened out based on high blow counts in the four boreholes (BH12-3, BH13, BH17, and BH73) available near the building. No detailed liquefaction assessment was required for this building. No liquefaction in the foundation soils is expected for Radwaste Building for the DBE seismic event. The seismically induced deformation near this structure is expected to be minimal.

9.6.4 Control Building (Structure No. 4)

CRR and CSR curves, and factors of safety against liquefaction for the Control Building area are plotted on Figure 9-23 (i.e., for BH 10) and Figure 9-25 (i.e., for BH18) for the DBE seismic event.

No liquefaction in the foundation soil is expected for Control Building for the DBE seismic event, as the minimum FS_{liq} is greater than 1.1 for all depths below the over-excavation level of EL. 81 m.

Table 9-1 summarizes the estimated seismically induced settlement (0 to 5 mm) and lateral spreading displacement (0 to 17 mm) near the structure for the DBE event. It is noted that only one borehole (BH14) is expected to have the seismically induced deformation within a limited depth interval and not at any other borehole locations near the structure. As such, the seismically induced lateral displacement will likely be localized. The soil data point associated with the seismically induced deformation is located at about EL. 69.1 m (Unit 4b), or about 18.9 m deep below the expected finished grade with the FS_{Liq} of 1.41 at BH14 (see Table D2 in Appendix D). Safety should be assessed considering the expected seismically induced deformation.

9.6.5 Reactor Auxiliary Bay (Structure No. 5)

The four boreholes of BH1, BH10, BH77, and B-113 were used in the detailed liquefaction assessment for subsurface soils under the Reactor Auxiliary Bay structure. CRR and CSR curves and calculated factors of safety against liquefaction for these boreholes are shown in Figure 9-21 (i.e., for BH1, also used for Structure No. 6), Figure 9-23 (i.e., for BH10), Figure 9-28 (i.e., for BH77), and Figure 9-30 (i.e., for B-113 also used for Structure No. 6). These results indicate that the minimum FS_{liq} is greater than 1.1 for all depths below the over-excavation level of EL. 81 m of this structure. For the boreholes located about 25 to 50 m away to the structure, the results indicate that FS_{Liq} of less than 1.1 are for the data points in BH1 at EL. 85.7 m (Unit

2b), BH77 at EL. 86.1 m (Unit 2b), and B-113 at EL. 85.2 m (Unit 2a), EL. 84.5 m and EL. 83.7 m (Unit 2b). It should be noted that the native soil above EL. 81 m will be over-excavated and replaced with engineered fill in the Reactor Auxiliary Bay area. The soil liquefaction at BH1 (at EL. 85.7 m), BH77 (at EL. 86.1 m), and B-113 (at EL. 85.2 m, EL. 84.5 m and EL.83.7 m) is not expected to impact Reactor Auxiliary Bay.

As such, no liquefaction in the foundation soil is expected for this building for the DBE seismic event given that the foundation of this structure is designed to ensure a complete replacement of soil above EL. 81 m.

Table 9-1 summarizes the estimated seismically induced settlement (0 to 8 mm) and lateral spreading displacement (0 to 28 mm) near the structure for the DBE event. It is noted that only one borehole (BH10) within the footprint of the structure is expected to have the seismically induced deformation within a limited depth interval and not at any other borehole locations within the footprint of the structure. As such, the seismically induced lateral displacement will likely be localized. The soil data point associated with the seismically induced deformation is located at about EL. 69.9 m (Unit 4b), or about 18.1 m deep below the expected finished grade with the FS_{Liq} of 1.49 at BH10 (see Table D2 in Appendix D). Safety should be assessed considering the expected seismically induced deformation.

9.6.6 Independent Spent Fuel Storage Installation (Structure No. 6)

The independent spent fuel storage installation (ISFSI) building is located outside of the Power Block area. There is no plan for significant over-excavation of native soil below this building.

The boreholes BH1, BH3, B-104, and B-113 were used in the detailed liquefaction assessment for subsurface soils for the ISFSI building. CRR and CSR curves and the calculated factors of safety against liquefaction for these boreholes are shown in Figure 9-21 (i.e., for BH1), Figure 9-22 (i.e., for BH3), Figure 9-29 (i.e., for B-104), and Figure 9-30 (i.e., for B-113). For B-104, the calculated FS_{liq} is over 1.1 indicating the soils at this borehole are not liquefiable for DBE. These results indicate FS_{liq} of less than 1.1 (approximately 0.3 to 1.0) for the data points in BH1 at EL. 85.7 m (Unit 2b), BH3 at EL. 87.4 m, EL. 85.9 m, EL. 83.5 m, EL. 84.3 m (Unit 2a), and EL. 77.3 (Unit 4a), B-104 at EL. 85.0 m (Unit 2b), and B-113 at EL. 85.2 m (Unit 2a), EL. 84.5 m, EL. 83.7 m (Unit 2b) for the DBE event. These results indicate that nine out of ten data points of liquefiable soil are in Unit 2, while the other one data point is at about 9.7 m depth in Unit 4a.

In Unit 2, the FS_{liq} of less than 1.1 (approximately 0.3 to 1.0) was encountered in three of the four boreholes (BH1, BH3, and B-113), indicating a widespread portion of Unit 2, up to about 5 m thick, will liquefy during the DBE event.

For the soil deposit below Unit 2, the FS_{liq} of less than 1.1 (i.e., 1.00) was encountered for the one data point at EL. 77.3 m (i.e., 9.7 m depth) for BH3 (Unit 4a) based on the Boulanger and Idriss (2014) method, indicating that a zone of Unit 4a about 1.5 m thick will liquefy during the DBE event. The other two methods of Idriss and Boulanger (2008) and Youd et al. (2001) methods yield higher FS_{liq} of 1.10 and 1.31 respectively for this data point. Considering the

sources of conservatism in the analysis (e.g., deterministic methods using safety factor of 1.1 as the threshold for likely occurrence of liquefaction), the liquefaction of this isolated zone is considered to have a low probability of occurrence (i.e., FS_{liq} between 1.0 and 1.1 with corresponding liquefaction probabilities of 16% and 4%). It should also be noted that there were six boreholes BH1, BH3, B-104, B-113, BO-2 and AME-03alt) around this structure, and all the SPT blow count data indicate no liquefaction for the soil deposit below Unit 2 during the DBE event except the single data point noted above.

Table 9-1 summarizes the estimated seismically induced settlement (up to 154 mm) and lateral spreading displacement (up to about 1.67 m) for the DBE event. All four boreholes (BH1, BH3, B-104 and B-113) southwest to the structure are expected to have seismically induced deformation. The estimated seismically induced deformation is significant and likely will negatively impact the performance of the buildings if mitigation measures are not taken. Safety should be assessed to mitigate the risk of the expected seismically induced deformation and the expected liquefied zones.

9.6.7 Sensitivity Study for Fill Material Property (G_{max})

Sensitivity analyses were also completed for the potential variation of the maximum shear modulus (G_{max}) for the fill material in the post-construction condition. The sensitivity study was carried out for two selected boreholes (BH18 and BH71) using the upper range (UR) and lower range (LR) profiles of G_{max}, representing the 90th and 10th percentile values, as discussed in Section 9.2. BH18 and BH71 were selected from the boreholes in the detailed liquefaction assessment as they are at the south and north ends of the power block, respectively. Potential variation assigned for the fill materials is expected to be reasonable based on our judgement and standard geotechnical practice in Ontario.

The change of the G_{max} profile to the upper range and lower range profiles would typically result in a change in the CSR from 0% to 15% for BH18 and BH71 for the DBE event. The results of liquefaction assessment for BH18 and the sensitivity check cases for UR and LR are presented in Figures 9-25, 9-25a, and 9-25b, respectively. The results of liquefaction assessment for BH71 and the sensitivity check cases for UR and LR are presented in Figures 9-27, 9-27a, and 9-27b, respectively.

Considering this sensitivity, the expected variability or changes in the G_{max} related to the fill materials is not expected to affect the conclusions of this study.

9.7 Results of Liquefaction Assessment – BDBE Seismic Event

The liquefaction assessment was performed by calculating factor of safety against liquefaction (which is equal to CRR/CSR) for the BDBE event. Results of the liquefaction assessments are presented in Figures 9-31 through 9-40. Summary of the liquefaction assessment results (borehole locations with depths of liquefiable soils) for the BDBE event is presented in Figure 9 42. Table 9-2 summarizes the expected seismically induced deformation for the listed structures for the BDBE event.

Below is a summary of the liquefaction assessment results for the BDBE event:

9.7.1 Reactor Building (Structure No. 1)

The Reactor Building was screened out as it will be founded directly on bedrock. Below presents an evaluation of the adjacent soil to the Reactor Building for any potential negative impact considering its structural connection to adjacent structures and potential down-drag force.

CRR and CSR curves, and factor of safety against liquefaction for the two adjacent boreholes (BH10 and BH14) are shown in Figures 9-33 and 9-34 respectively. These results indicate FS_{liq} of less than 1.1 (approximately 1.0) for the two data points at EL. 69.9 m for BH10 and EL. 69.1 m for BH14 based on Boulanger and Idriss (2014) methods. Both data points are in the Unit 4b layer (see Figures 9-3 and 9-4 for soil profiles). Therefore, a limited thickness (1.5 m to 3.0 m) of Unit 4b material in a depth ranging from 20 m to 17 m (i.e., EL. 68 m to EL.71 m) is expected to liquefy during the BDBE event. Considering the sources of conservatism in the analysis (e.g., deterministic methods using safety factor of 1.1 as the threshold for likely occurrence of liquefaction), the liquefaction for this isolated zone is considered to have a low probability of occurrence (i.e., FS_{liq} between 1.0 and 1.1 with corresponding liquefaction probabilities of 16% and 4%).

For the soil adjacent to the Reactor Building structure, the estimated seismically induced deformation at BH10 and BH14 are discussed in Section 9.7.5 and 9.7.4 respectively.

9.7.2 Turbine Building (Structure No. 2)

Figures 9-36 and 9-37 provide the plots of CRR, CSR, and factor of safety against liquefaction for the BDBE seismic event for BH66 and BH71 respectively. For BH71, no liquefaction is expected for the BDBE event as the minimum FS_{Liq} is greater than 1.1. For BH66 located about 25 m away to the building, the results indicate that FS_{Liq} of less than 1.1 (approximately 0.3 to 1.0) is for the three data points at EL. 84.8 m, 85.3 m, and 86.9 m for the Boulanger and Idriss (2014) method. These three data points are within the Unit 2 layer. However, it should be noted that the liquefiable soil at BH66 is above the over-excavation level (EL. 81 m) in the Turbine Building area and is not expected to impact Turbine Building.

Overall, no liquefaction is expected for the foundation soil below Turbine Building for the BDBE seismic event as the minimum FS_{liq} is greater than 1.1 for all data below the over-excavation level of EL. 81 m.

Table 9-2 summarizes the estimated seismically induced settlement (2 to 17 mm) and lateral spreading displacement (6 to 36 mm) for BH71 and BH 66 near the structure for the BDBE event. It is noted that only one borehole (BH71) within the footprint of the structure is expected to have the seismically induced deformation within a limited interval at the depth of about 18.2 m from the expected finished grade (see Table D3 in Appendix D). As such, the seismically induced lateral displacement will likely be localized. Safety should be assessed considering the expected seismically induced deformation.

9.7.3 Radwaste Building (Structure No. 3)

Radwaste Building was screened out based on high blow counts in the four boreholes (BH12-3, BH13, BH17, and BH73) available near the building. No detailed liquefaction assessment was required for this building. No liquefaction in the foundation soils is expected for this building for the BDBE seismic event. The seismically induced deformation near this structure is expected to be minimal.

9.7.4 Control Building (Structure No. 4)

CRR and CSR curves, and factors of safety against liquefaction for the Control Building area are plotted on Figure 9-34 (i.e., for BH 14) and Figure 9-35 (i.e., for BH18) for the BDBE seismic event. These results indicate FS_{liq} of less than 1.1 (approximately 1.0) for the one data point at EL. 69.1 m for BH14 based on Boulanger and Idriss (2014) method. The data point is in the Unit 4b layer (see Figure 9-4 for soil profile). Therefore, a limited thickness (about 1.5 m) of Unit 4b material in a depth of 19 m (i.e., EL. 69 m) is expected to liquefy at BH14 during the BDBE event.

Considering the sources of conservatism in the analysis (e.g., deterministic methods using safety factor of 1.1 as the threshold for likely occurrence of liquefaction), the liquefaction for this isolated zone is considered to have a low probability of occurrence (i.e., FS_{liq} between 1.0 and 1.1 with corresponding liquefaction probabilities of 16% and 4%).

It should also be noted that there were seven boreholes (BH14, BH15, BH18, BH19, BH20, BH78, and BO-16) around this structure and all the SPT blow count data obtained from these boreholes indicate non liquefiable for the foundation soil below the over-excavation level of EL.81 m during the BDBE event except the one data point noted above.

Table 9-2 summarizes the expected seismically induced settlement (up to 14 mm) and lateral spreading (up to about 49 mm) in the Control Building area for the BDBE event. The estimated seismically induced settlement is 14 mm at BH14 and 1 mm at BH18. The estimated seismically induced lateral spreading displacement is about 0.05 m at BH14 and less than 0.01 m at BH18. The soil data points associated with the seismically induced deformation are located at elevations from about EL. 69.1 to 69.7 m (Unit 4b and Unit 5), or about a depth from about 18.9 to 18.3 m below the expected finished grade with FS_{liq} from 1.0 to 1.9 (see Table D3 in Appendix D). Safety should be assessed considering the expected seismically induced deformation.

9.7.5 Reactor Auxiliary Bay (Structure No. 5)

Results of liquefaction assessment for the Reactor Auxiliary Bay structure are plotted in Figure 9-31 (i.e., for BH1), Figure 9-33 (i.e., for BH10), Figure 9-38 (i.e. for BH77), and Figure 9-40 (i.e. for B-113). Above the over-excavation level of EL. 81 m, the results suggest FS_{liq} of less than 1.1 for the data points at BH1 (EL. 87.0 m, 85.7 m and 85.2 m), BH3 (EL. 83.4 m, EL. 85.9 m, EL. 84.3 m and EL. 83.5 m), BH77 (EL. 86.1 m), and B-113 (EL. 85.2 m, EL. 84.5 m, EL. 83.7 m). All of these data points are in the Unit 2 layer. It should be noted that the native soil above EL. 81 m will be over-excavated and replaced with engineered fill below the foundation. These

liquefaction data points are above EL. 81 m and are not expected to impact Reactor Auxiliary Bay structure as all native soil above EL. 81 m will be over-excavated and backfilled with competent fill below its foundation.

Below the over-excavation level of EL. 81 m, the results indicate FS_{liq} of less than 1.1 (approximately 1.0) encountered for the data points at EL. 69.9 m for BH10, and EL. 69.2 m for B-113 based on both Boulanger and Idriss (2014) and Idriss and Boulanger (2008) methods. Both two data points are in the Unit 4b layer (see Figures 9-3 and 9-10 for soil profiles). Therefore, a limited thickness (0.7 m to 3.0 m) of Unit 4b material in a depth ranging from 20 m to 17 m (i.e., EL. 68 m to EL. 71 m) is expected to liquefy during the BDBE event.

Considering the sources of conservatism in the analysis (e.g., deterministic methods using safety factor of 1.1 as the threshold for likely occurrence of liquefaction), the liquefaction for this isolated zone is considered to have a low probability of occurrence (i.e., FS_{liq} between 1.0 and 1.1 with corresponding liquefaction probabilities of 16% and 4%).

It should also be noted that there were ten boreholes (BH1, BH2, BH4, BH5, BH10, BH15, BH16, BH77, B-113 and B-116) around this structure and all the SPT blow count data obtained from these boreholes indicate non liquefiable below EL. 81 m during the BDBE event except the two data points noted above.

Table 9-2 summarizes the expected seismically induced settlement (up to 27 mm) and lateral spreading (up to about 91 mm) in the Reactor Auxiliary Bay area for the BDBE event. It is noted that only one borehole (BH10) is expected to have the seismically induced deformation within a limited depth interval. As such, the seismically induced lateral spreading displacement will likely be localized. The soil data point associated with the seismically induced deformation is located at about EL. 69.9 m (Unit 4b), or about a depth of 18.1 m below the expected finished grade (see Table D3 in Appendix D). Safety should be assessed considering the expected seismically induced deformation.

9.7.6 Independent Spent Fuel Storage Installation (Structure No. 6)

The independent spent fuel storage installation (ISFSI) building is located outside of the Power Block area. There is no plan for significant over-excavation of native soil below this building.

Results of liquefaction assessment for the Reactor Auxiliary Bay structure are shown in Figure 9-31 (i.e., for BH1), Figure 9-32 (i.e., for BH3), Figure 9-39 (i.e., for B-104), and Figure 9-40 (i.e., for B-113). These results indicate the liquefiable soils from these boreholes are either in Unit 2 or in Unit 4 for the BDBE event.

In Unit 2, the FS_{liq} of less than 1.1 (approximately 0.3 to 0.9) was encountered at all four boreholes, BH1 (at EL. 87.0 m and 85.7 m), BH3 (at EL. 87.4 m, EL. 85.9 m, EL. 84.3 m and EL. 83.5 m), BH-104 (at EL. 85.0 m), and B-113 (at EL. 85.2 m, EL. 84.5 m, EL. 83.7 m). The results indicate a widespread portion of Unit 2 will liquefy during the BDBE event.

In Unit 4, the FS_{liq} of less than 1.1 (approximately 0.8 to 1.0) was encountered for the data points at EL. 77.3 m for BH3 (Unit 4a), and EL. 69.2 m for B-113 (Unit 4b) based on both Boulanger and Idriss (2014) and Idriss and Boulanger (2008) methods.

Table 9-2 summarizes the expected seismically induced settlement (26 to 183 mm) and lateral spreading (0.19 to 1.76 m) for the BDBE event. Significant seismically induced deformation is estimated for all four boreholes (BH1, BH3, B-104 and B-113) located southwest to the structure. Safety should be assessed to mitigate the risk of the expected seismically induced deformation and the expected liquefied zones.

9.7.7 Sensitivity Study for Fill Material Property (G_{max})

Sensitivity analyses were also completed for the potential variation of the maximum shear modulus (G_{max}) for the fill material in the post-construction condition. The sensitivity study was carried out for two selected boreholes (BH18 and BH71) using the upper range (UR) and lower range (LR) profiles of G_{max}, representing the 90th and 10th percentile values, as discussed in Section 9.2.

The change of the G_{max} profile to the upper range and lower range profiles would typically result in a change in the CSR from 0% to 15% for BH18 and BH71 for the BDBE event. The results of liquefaction assessment for BH18 and the sensitivity check cases for UR and LR are presented in Figures 9-35, 9-35a, and 9-35b, respectively. The results of liquefaction assessment for BH71 and the sensitivity check cases for UR and LR are presented in Figures 9-37, 9-37a, and 9-37b, respectively.

Considering this sensitivity, the expected variability or changes in the assumptions related to the fill materials is not expected to affect the conclusions of this study.

9.8 Discussions

9.8.1 Liquefaction Potential for Soil Units

This section provides a discussion regarding the liquefaction potential for each soil unit. As described in Sections 9.6 and 9.7, the liquefaction data points with FS_{liq} less than 1.1 are located in either Unit 2 or Unit 4 for the DBE and BDBE events as per the liquefaction assessment in this study.

9.8.1.1 Liquefaction Potential – Units 1, 3, and 5

Unit 1 is typically thin at the DNNP site and consists of topsoil and existing fill. This unit is expected to be removed below the structure footprint and replaced by non-liquefiable engineered fill. Units 3 and 5 are not expected to liquefy for both DBE and BDBE events at the boreholes evaluated in the liquefaction assessment.

9.8.1.2 Liquefaction Potential – Unit 2

The Unit 2 soil is expected to liquefy in the BDBE event at all six profiles with the presence of Unit 2 (BH1, BH3, BH66, BH77, B-104, B-113). For the DBE event, the Unit 2 soil is expected to liquefy at all these boreholes.

The foundation design should consider the potential liquefaction risk from the Unit 2 soil. One mitigation option of foundation is to over-excavate the liquefiable foundation soil. Based on the liquefaction assessment data, it is recommended to remove the soil with $(N_1)_{60\text{-}cs}$ less than 30 (conservative cut-off value) within the foundation influence zone. As per the liquefaction assessment results summarized in Figure 7-1(c), the soil with $(N_1)_{60\text{-}cs}$ over 30 typically has a FS_{liq} over 2.0 at the DNNP site and is consequently expected to have a negligible seismically induced deformation.

9.8.1.3 Liquefaction Potential – Unit 4

Isolated and limited zones in Unit 4 are expected to liquefy at the DBE/BDBE event. For DBE event, only one liquefaction data point in Unit 4 at BH3 was encountered for all ten (10) borehole profiles with detailed liquefaction assessment (BH1, BH3, BH10, BH14, BH18, BH66, BH71, BH77, B-104, B-113). For the BDBE event, the liquefiable zone in Unit 4 was encountered in four profiles (BH3, BH10, BH14 and B-113) from a total of ten profiles.

Within the Power Block area, the liquefaction data points in Unit 4 (BH10 and BH14) were encountered in an isolated zone with a limited depth interval for the BDBE event, and no liquefaction data points for the DBE event. As shown in Figure 9-42, BH 10 and BH 14 are located in an isolated zone east to the centre of Power Block, which has a total of sixteen boreholes within its boundary. These two liquefaction data points are at the elevations of about 70 and 69 m at BH 10 and BH 14 respectively, (i.e., about 18 to 19 m depths from the expected finished grade, See Figure 9-34 and 9-35).

9.8.2 Comparison of Different Methods for CRR Calculation

The Cyclic Resistance Ratio ($CRR_{M7.5}$) profiles were calculated using three industry standard methodologies: Boulanger and Idriss (2014), Idriss and Boulanger (2008) and Youd et al (2001). The Boulanger and Idriss (2014) method was chosen as the base-case approach for the detailed liquefaction assessment. The results from the methods by Idriss and Boulanger (2008) [18] and Youd et al (2001) are presented herein to provide context with respect to the potential range in liquefaction and safety hazard.

The results from the liquefaction assessment indicate that the three methods yield reasonably consistent factors of safety, see Figures 9-21 to 9-40. The Boulanger and Idriss (2014) method yields the lowest (the most conservative) FS_{liq} when the liquefaction is expected (FS_{liq} less than 1.1). Overall, the Youd et al. (2001) method generally provides a higher FS_{liq} in comparison with the other two methods by Boulanger and Idriss (2014) and Idriss and Boulanger (2008).

9.8.3 Check using Simplified r_d Approach

The liquefaction assessment in this report computed the CSRs from the site-specific ground response analyses. This section provides a check using the alternative approach to calculate the CSRs, i.e., the simplified r_d approach using the empirical shear stress reduction coefficient r_d by Boulanger and Idriss, 2014 (see reference [4]).

The check was conducted using the simplified r_d approach (Boulanger and Idriss 2014) for the overburden soil within 10 m to 12 m depth at the DNNP site for both DBE and BDBE events. Boulanger and Idriss (2014) recommended that the simplified r_d approach is to be used for a depth of about 10 to 12 m because the uncertainty in r_d becomes large at deeper depths, which are not covered by the currently available liquefaction database. Further, the simplified r_d approach ignores the site-specific soil properties in estimating CSR and would introduce additional uncertainties in the analyses.

The results from the simplified r_d approach confirmed that the overburden soil within 12 m depth is not expected to liquefy in the Power Block area, consistent with the findings from the site response approach. Beyond the Power Block area, the simplified r_d approach yielded three additional liquefaction data points, including one data point with FS_{liq} of 1.07 at EL. 82.4 m at BH66 (Unit 3 with $(N_1)_{60\text{-}cs}$ of 24) for the DBE event, and one data point with FS_{liq} of 1.08 at EL.82.4 m at BH 66 (Unit 3 with $(N_1)_{60\text{-}cs}$ of 24) for the BDBE event for the overburden soil within 12 m depth from the expected finished grade. It should be noted that these three liquefaction data points are all located above the planned over-excavation base at EL. 81 m. Therefore, the impact of these additional liquefaction data points is negligible for the performance of the structures within the Power Block area. In addition, it is shown that the use of FS_{liq} of 1.1 as the liquefaction criteria in the study covers the potential variation of FS_{liq} from 1.0 to 1.1 for these three data points from the liquefaction assessment using simplified r_d approach.

Overall, the check in this section indicated that the liquefaction assessment results using simplified r_d approach yield consistent conclusions with those using the site-specific ground response analyses for the structures at the DNNP site.

9.8.4 Sensitivity Check for SPT Correction Factors

Sensitivity analyses were conducted on the correction factors applied for SPT correction used in the CRR calculation. To perform the sensitivity analyses, the inputs to the correction factor were varied by ±5% and the corresponding change in the seismically induced deformation was recorded. Potential variation of these correction factors is expected to be small and the 5% range is reasonable based on our judgement and standard geotechnical practice in Ontario. The overburden correction factor C_N and the correction factor for fines content were considered in the sensitivity analyses. The other correction factors are expected to have smaller variation and minimal impact for the liquefaction assessment. For example, the correction factor for Rod Length (C_R) was calculated assuming stick-up length of 1.2 m which is a standard practice value. Small variation in stick-up length will not significantly affect the calculated C_R. The correction for hammer energy was measured in the field and documented for each drilling rig used in the geotechnical investigation for the boreholes evaluated in the detailed liquefaction

assessment. Potential variation of correction factors for Borehole Diameter and sampler are also expected to be small (also based on the drilling field work).

For the structures No.2 to No.5 in the Power Block area, a 5% change in the correction factors would typically result in a change in the seismically induced settlement less than 2 mm and the lateral displacement less than 5 mm for DBE event. For BDBE event, the 5% change in the correction factors is expected to lead to a change of less than 4 mm in the seismically induced settlement and less than 10 mm in the lateral displacement.

For the structure No. 6 (ISFSI) outside of the Power Block area, a 5% change in the correction factors would typically result in a change in the maximum seismically induced settlement from 154 mm to the range from 150 to 159 mm and the maximum seismically induced lateral displacement from 1.67 m to the range from 1.66 to 1.68 m for DBE event. For BDBE event, the 5% change in the correction factors is expected to lead to a change in the maximum seismically induced settlement from 183 mm to the range from 173 to 194 mm and the maximum seismically induced lateral displacement from 1.76 m to the range from 1.73 to 1.79 m.

10 Conclusions and Recommendations

This study provides detailed assessment of seismically induced liquefaction hazards of foundation soils for the DNNP to support the License to Construct (LTC) application Darlington Liquefaction Assessment Report [21] using the latest seismic hazard values available from the 2022 DNNP Probabilistic Seismic Hazard Assessment (PSHA) [38]. The detailed liquefaction assessment of foundation soils was performed for the structures No. 1 to No. 6, namely, Reactor Building, Turbine Building, Radwaste Building, Control Building, Reactor Auxiliary Bay, and Independent Spent Fuel Storage Installation (ISFSI). Results of assessment are presented for the structures at their proposed locations. Some of these locations could be subject to change as project planning advances. Should the location of structures assessed in this report change significantly from the proposed locations identified, the liquefaction potential may need to be revisited to confirm the validity of this assessment. In addition, for the potential EME Access Routes at the site, all boreholes within the project boundary were screened for liquefaction potential.

The following summarizes the main findings derived from the results of the liquefaction assessment.

- For the DBE event, foundation soil liquefaction is not expected for the structures within the power block including the structures No. 1 to No. 5, i.e., Reactor Building, Turbine Building, Radwaste Building, Control Building, and Reactor Auxiliary Bay, based on available soil data and the plan of over-excavation and backfill for soil deposit above EL. 81 m in this area. For the foundation soil below the structures No.2 to No.5, the estimated seismically induced settlement is typically less than 5 mm with a maximum of 8 mm and the seismically induced lateral displacement is expected up to 28 mm under DBE event. The soil data points associated with the seismically induced deformation are located at a depth from about 19.1 to 20.1 m from the expected finished grade. The thick non-liquefied layer between the building foundation and these soil data points may act as a bridging layer that redistributes stresses and therefore may result in more uniform ground surface settlement.

- For the DBE event, soil in the vicinity of the ISFSI structure (Structure No. 6) is expected to experience liquefaction, particularly in the surficial glaciolacustrine deposit (Unit 2 from the expected finished grade of EL. 88 m down to about 5 m depth). The estimated seismically induced settlement is up to 154 mm and the lateral spreading displacement up to 1.67 m. Figure 9-41 shows the locations and elevations of soil zones with potential for liquefaction under DBE event.

- For the BDBE event, foundation soil liquefaction is not expected for the following structures:

  - Reactor Building (Structure No. 1) founded directly on bedrock;
  - Turbine Building (Structure No. 2); and
  - Radwaste Building (Structure No. 3).

- For the BDBE event, liquefaction is expected at only one data point (isolated and limited extent of zones) for foundation soils in the vicinity of the following structures:
  - Control Building (Structure No. 4). The liquefaction data point is at about EL. 69.1 m, i.e., about 18.9 m depth from the expected finished grade.
  - Reactor Auxiliary Bay (Structure No. 5). The liquefaction data point is at about EL. 69.9 m, i.e., about 18.1 m depth from the expected finished grade.
- For the BDBE event, the foundation soil of the structures No.2 to No.5 in the Power Block area is expected to have the seismically induced settlement typically less than 17 mm with a maximum of 27 mm and the lateral spreading displacement typically less than about 0.05 m with a maximum of about 0.09 m, as per the detailed liquefaction assessment of the available geotechnical data.
- For the BDBE event, significant liquefaction and seismically induced deformation is expected in the vicinity of the proposed location for the ISFSI structure (Structure No.6). Figure 9-42 shows the locations and elevations of soil zones with potential for liquefaction under BDBE event.
- For the EME access routes, liquefaction susceptibility and screening assessment was performed considering all boreholes (forty-eight in total) at the site except for those within the Power Block area. Figures 4-43 and 4-44 show the locations of the boreholes which are susceptible to liquefaction for the DBE and BDBE events respectively.
- The seismically induced displacements presented in this study are approximate and represent the best estimate value from a deterministic assessment approach for individual boreholes. The actual displacements may range from half to double the calculated values, as indicated in the case studies in literatures (Idriss and Boulanger, 2008 [29] and Zhang et al. 2004 [40]). For the structures within the Power Block area, the reported seismic induced displacements may be conservative considering the potential three-dimensional bridging and arching effects of the overlying thick non-liquefiable layer and the indication of localized, isolated and discontinuous potentially liquefiable zones (Idriss and Boulanger, 2008 [29]).

The following summarizes the key recommendations for design consideration.

- The current over-excavation plan in the Power Block area is to replace the existing soil above EL. 81 m with engineered fill. This plan may be further adjusted/optimized as project planning advances. It is recommended that the potential modification to the over-excavation plan in the Power Block area consider removing the soil with $(N_1)_{60\text{-}cs}$ less than 30 (as a conservative cut-off value) within the foundation influence zone.
  - In the case that the foundation of the structure is shallow embedded and/or is located close to the boundary of Power Block, the stress influence zone in surficial soil below foundation may extend beyond the lateral limit of Power Block as shown by the dash

blue line in Figures 9-41 and 9-42 (Reference [10]). As such, it is recommended to fully remove all unsuitable surficial soil within the stress influence zone below the foundation.

  - Should the over-excavation plan change significantly from the current one, the liquefaction potential may need to be revisited to confirm the validity of this assessment.

- In general, safety should be assessed considering the risk of the expected liquefaction zone(s) and the potential seismically induced deformation including settlement and lateral spreading displacement as described in Section 9.

- The Unit 2 soil with low blow counts at the DNNP site has potential to liquefy during the DBE and/or BDBE events and the liquefaction could consequently yield a significant reduction of lateral confining pressure to the adjacent engineering fills. Safety should be assessed considering the impact of this potential risk, particularly for the foundation design of structures in the Power Block area and interconnecting systems extending beyond the Power Block area.

- Given that Reactor Building will be founded directly on bedrock, soil liquefaction is not a concern for the foundation of the building. It is noted, however, that the liquefaction of soil adjacent to Reactor Building may negatively impact its performance considering (1) the structural connection of the Reactor Building and adjacent buildings, and (2) the down-drag force acting on the soil-retaining structure of the Reactor Building. Safety should be assessed considering the factors above for the Reactor Building and any interconnecting systems with the adjacent structures.

- The structures (No.1 to No.5) in Power Block are located within level finished grade and over 100 m away from the shoreline. The structures are expected to be founded on either engineered fill or competent native Unit 3 soil. Therefore, seismically induced natural slope instability for these Power Block structures is not expected to be a concern.

- The natural slope at the shoreline may be a concern for seismic stability. The shoreline slope could fail and the failure could progress in the surficial soil towards the Power Block area, leading to the reduction or loss of lateral confining pressure of the adjacent surficial soil to the foundation structure and/or engineered fill. Given that there is limited site investigation (boreholes) near the shoreline, further geotechnical investigation is recommended near the shoreline to provide inputs for seismic stability assessment for this potential risk. It is understood that the current plan is to install erosion prevention measures along the shoreline and these measures could alter the natural slope profile along the shore. These erosion prevention measures should be considered as part of the shoreline slope assessment and design.

- Further investigation is recommended in the close vicinity of the proposed location of the structure No. 6 (ISFSI) to obtain more relevant and site-specific geotechnical data. It should be noted that the currently available boreholes are over 40 m away from the proposed location of the ISFSI structure. It is also noted that the ground surface elevation increases towards the northeast direction (see the preliminary grading plan drawing in Reference [9]).

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Potential for this ground slope to fail onto the ISFSI building should be assessed and safety should be confirmed when the final grading plan becomes available near the proposed location of this structure and beyond.

- It is understood that excavated materials from the site will be stockpiled at a location away from DNNP site. Seismic stability of the stockpile (construction slope) may need to be assessed depending on its location relative to the Power Block area at the DNNP site.
- The EME access routes and configuration have not been established at the time of preparing this report. If the EME routes are to be constructed above grade embankment road (man-made slope), it is recommended to evaluate the seismically induced slope instability of the EME road embankment considering the liquefaction assessment results.
- The impact of seismically induced soil liquefaction on DNNP seismic risk may require further evaluation by conducting probabilistic liquefaction assessment and incorporated into downstream Seismic Probabilistic Safety Assessment (SPSA) tasks (e.g., fragility analysis, risk quantification, etc.). At present, seismic fragility assessment methodology for structures, system and components considering potential seismically induced ground failure is not finalized. As such, the need for these further evaluations has to be determined by plant design team.

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DNNP Liquefaction Assessment Report – Tables

Table 2-1: Summary of Water Table Depth Monitored at DNNP Site

Borehole / Monitoring Well	**BH02**		**BH12-1 (s)**		**BH17**		**BH28**		**BH50-1 (s)**		**Summary of Maximum, Minimum, and Average for All Boreholes**	
Hydro stratigraphic Unit, No.	Upper Till (Unit 3)		Upper Till (Unit 3)		Upper Till (Unit 3)		Upper Till (Unit 3)		Upper Till (Unit 3)			
Northing (m)	4860073		4859982		4859965		4860167		4860162			
Easting (m)	683880		683881		683841		683897		683799			
Ground Surface Elevation (m CGVD28)(3)	89.41		87.47		86.90		95.43		90.23			
Top of Pipe Elevation (m CGVD28)(3)	90.37		88.51		87.71		96.36		91.08			
Surveyed Stick-Up Length (m)	0.96		1.04		0.81		0.93		0.85			
Groundwater Depths and Elevations	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation	Depth	Elevation
Date(s)	(mbgs)(4)	(masl)(4)	(mbgs)(4)	(masl)(4)	(mbgs)(4)	(masl)(4)	(mbgs)(4)	(masl)(4)	(mbgs)(4)	(masl)(4)	(mbgs)(4)	(masl)(4)
16-Nov-21	2.97	86.44	2.04	85.43	2.83	84.08	2.10	93.33	2.18	88.05		
29-Nov-21	2.79	86.63	2.00	85.47	2.78	84.12	2.15	93.28	2.16	88.07		
5-Jan-22	2.61	86.80	1.76	85.72	2.66	84.24	1.99	93.44	2.01	88.22		
7-Feb-22	2.94	86.47	2.23	85.24	3.03	83.88	3.42	92.02	2.52	87.72		
17-Feb-22	2.73	86.68	2.02	85.46	2.86	84.04	3.22	92.22	2.32	87.91		
Maximum	2.97	86.80	2.23	85.72	3.03	84.24	3.42	93.44	2.52	88.22	**3.4**	**93.4**
Minimum	2.61	86.44	1.76	85.24	2.66	83.88	1.99	92.02	2.01	87.72	**1.8**	**83.9**
Average	2.81	86.60	2.01	85.46	2.83	84.07	2.58	92.86	2.24	87.99	**2.5**	**87.4**

Notes:
(1) The table includes the monitoring wells with the screen located in the Unit No. 3 (Upper Till). No monitoring well was installed in Unit 2. The monitoring well of BH76 with the screen at the interface of Unit 1 and Unit 3 (i.e., 1 m to 1.5 m depth) is not included in the summary as the Unit 1 (topsoil/fill) will be removed during site preparation.
(2) The data based on the investigation program from the report by WSP Golder (2022).
(3) The elevation is measured in reference to Canadian Geodetic Vertical Datum CGVD28.
(4) The abbreviations used are meters below ground surface (mbgs) and meters above sea level (masl).

Table 5-1: Summary of Structures and Expected Foundation Conditions

Structure No. (1)	Structure Name(1)	Expected Foundation Condition
1	Reactor Building	Deeply embedded into bedrock(2)
2	Turbine Building	Lightly embedded in fill, close to the final plant grade(2)
3	Radwaste Building	Same as above
4	Control Building	Same as above
5	Facility Annex	Same as above
6	Independent Spent Fuel Storage Installation (ISFSI)	Same as above
11	Emergency Mitigation Equipment (EME) Routes	On grade(3)

Notes:

(1) The structures and building numbers were based on the GEH site plan layout and excavation plan (Drawings No.006N4150 Rev. H and 006N6034 Rev. A, 2021).

(2) The information was based on the RB drawing 005N1730 Revision F by GEH. The existing fill and lacustrine deposit are expected to be fully removed within the power block area. The foundation description listed here were based on the input from GE-H as per the email from Ms. Tanya Kirby (GE-H) on July 29, 2022.

(3) The unit of topsoil/fill is expected to be removed prior to the construction of EME routes.

Table 6-1: Summary of Energy Correction Factor

Report No.	Rig Model (Serial Number)	Energy Transfer Ratio, Measured	Energy Transfer Ratio, used in assessment	C_E
NK054-REP-01210-00098 (EXP 2013)	CME 1050 (Serial 274860)	76.2%	76.2%	1.27
21451329 (Golder 2022)	Diedrich D50 (Serial D50-298)	78.1%	77.1%(1)	1.29
21451329 (Golder 2022)	Diedrich D50 (Serial D50-452)	77.1%	77.1%(1)	1.29
21451329 (Golder 2022)	Diedrich D120 (Serial D120-104)	82.0%	81.5%(1)	1.36
21451329 (Golder 2022)	Diedrich D120 (Serial D120-112)	81.5%	81.5%(1)	1.36
21451329 (Golder 2022)	Acker Renegade (Serial A110910506)	64.5%	64.5%	1.08

Note:

(1) For energy transfer ratio measured in the same model rigs, the lowest measured ratio is conservatively adopted.

Table 6-2: Summary of Fines Content and Unit Weight for Each Soil Unit

Soil Type	Assigned Unit Weight γ (kN/m^3)	Assigned Fines Content (%)
Unit 1	21	40
Unit 2a	20.2	78
Unit 2b	23.2	46
Unit 3	24.3	48
Unit 4a	22.1	50
Unit 4b	22.2	92
Unit 5	23.7	68

Note:
The unit weight and fines content for all units were taken as mean of the values as per Golder 2022 reports ([15], [16]) except for unit 2b whose data was taken from exp 2013 [27].

Table 6-3: Gmax Empirical Correlation: C Factors

Soil Type	Assigned C
Unit 1	1300
Unit 2a	1300
Unit 2b	1500
Unit 3	1500
Unit 4a	1300
Unit 4b	1800
Unit 5	2000
Weak Layer within Units 4a, 4b, 5	2000

Table 9-1: Estimated Seismically Induced Deformation for DBE event

Structure(s)	Relevant Borehole	Liquefaction Below Foundation / Engineered Fill?	Deformation for DBE Event		Max. Estimated Settlement [1] (mm)	Max. Estimated Lateral Disp. [1, 4] (mm)
			Settlement (mm)	Lateral Disp.[4], (mm)		
Reactor Building (Structure No. 1)	Not Applicable(N/A), as it will be founded on bedrock.					
Turbine Building (Structure No. 2)	BH66[2]	No	5	11	5	11
	BH71	No	0	0		
Radwaste Building (Structure No. 3)	N/A (all its relevant boreholes screened out)					
Control Building (Structure No. 4)	BH14	No	5	17	5	17
	BH18	No	0	0		
Reactor Auxiliary Bay (Structure No. 5)	BH1[2]	No	1	2	8	28
	BH10	No	8	28		
	BH77[2]	No	0	0		
	B-113[2]	No	2	10		
Independent Spent Fuel Storage Installation (Structure No. 6)	BH1[3]	Yes	29	89	154	1670
	BH3[3]	Yes	154	1670		
	B-104[3]	Yes	11	77		
	B-113[3]	Yes	74	1100		

Notes:

(1) Estimated maximum deformation relevant to the corresponding structure.

(2) The borehole is located near the structure but is **outside** of the footprint of the structure. For the boreholes relevant to Structure No. 1 to No. 5, only the soil deposit below the over-excavation level of EL.81 m was assessed for the seismically induced deformation.

(3) For the boreholes relevant to Structure No. 6, all native soil deposit below the expected finished grade EL. 88 m was evaluated for the seismically induced deformation assessment. The Unit 1 soil (topsoil and existing fill) is expected to be removed or replaced by non-liquefiable engineered fill.

(4) The lateral displacement was adjusted from the lateral displacement index considering the distance from the shoreline slope face, see Appendix D for details.

Table 9-2: Estimated Seismically Induced Deformation for BDBE event

Structure(s)	Relevant Borehole	Liquefaction Below Foundation / Engineered Fill?	Deformation for BDBE Event		Max. Estimated Settlement [1] (mm)	Max. Estimated Lateral Disp. [1, 4] (mm)
			Settlement (mm)	Lateral Disp.[4], (mm)		
Reactor Building (Structure No. 1)	Not Applicable(N/A), as it will be founded on bedrock.					
Turbine Building (Structure No. 2)	BH66[2]	No	17	36	17	36
	BH71	No	2	6		
Radwaste Building (Structure No. 3)	N/A (all its relevant boreholes screened out)					
Control Building (Structure No. 4)	BH14	Yes	14	49	14	49
	BH18	No	1	4		
Reactor Auxiliary Bay (Structure No. 5)	BH1[2]	No	5	16	27	91
	BH10	Yes	27	91		
	BH77[2]	No	1	4		
	B-113[2]	No	9	37		
Independent Spent Fuel Storage Installation (Structure No. 6)	BH1[3]	Yes	42	382	183	1760
	BH3[3]	Yes	183	1760		
	B-104[3]	Yes	26	192		
	B-113[3]	Yes	83	1140		

Notes:

(1) Estimated maximum deformation relevant to the corresponding structure.

(2) The borehole is located near the structure but is **outside** of the footprint of the structure. For the boreholes relevant to Structure No. 1 to No. 5, only the soil deposit below the over-excavation level of EL.81 m was assessed for the seismically induced deformation assessment.

(3) For the boreholes relevant to Structure No. 6, all native soil deposit below the expected finished grade EL. 88 m was evaluated for the seismically induced deformation assessment. The Unit 1 soil (topsoil and existing fill) is expected to be removed or replaced by non-liquefiable engineered fill.

(4) The lateral displacement was adjusted from the lateral displacement index considering the distance from the shoreline slope face, see Appendix D for details.

Table 9-3: Average CSR for DBE and BDBE Hazard Levels

Structure[1]	Borehole ID	Average CSR	
		DBE	BDBE
Turbine Building (No. 2)[2][2]	BH66	0.25	0.31
	BH71	0.26	0.34
Control Building (No. 4)[2]	BH14	0.27	0.39
	BH18	0.26	0.34
Reactor Auxiliary Bay Area (No. 5)[2]	BH1	0.27	0.40
	BH10	0.27	0.39
	BH77	0.25	0.31
	B-113[4]	0.21	0.29
ISFSI (No. 6)[3]	BH1	0.31	0.44
	BH3	0.32	0.39
	B-104	0.31	0.39
	B-113[4]	0.23	0.30

Notes:

(1) The reactor building (No. 1) and radwaste building (No. 3) were screened out and no detailed assessment required, hence not listed in the table.

(2) For structures No. 1 to No. 5 within the power block area, average CSR is calculated for the soil from EL.81 m (over-excavation level) down to the top of bedrock.

(3) For structure No. 6 outside the power block area, average CSR is calculated for the soil from EL.88 m (the finished grade) down to the top of bedrock.

(4) The average CSR of B-113 are different for Structure No. 5 and No. 6, because the foundation soil for Structure No. 5 is from EL. 81 m (over-excavation level) to bedrock whereas the foundation soil for Structure No. 6 is from EL. 88 m (the finished grade) to bedrock. It is noted that there is currently no plan for over-excavation at the Structure No. 6 area.

DNNP Liquefaction Assessment Report – Figures

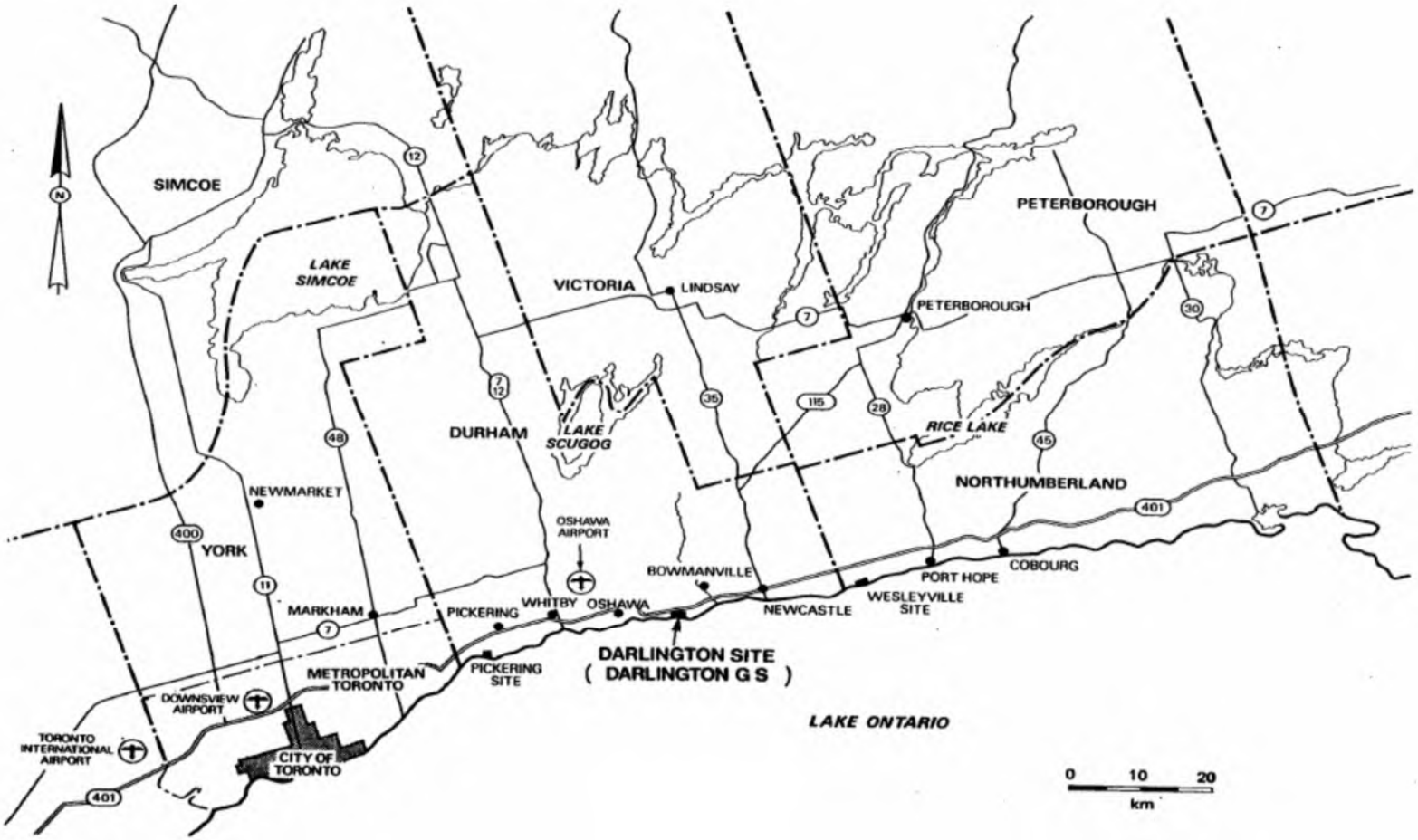

Figure 2-1: Site Location of Darlington New Nuclear Project (DNNP)

Referenced from NK054-REP-01210-00011 R001 [26], Amec No. P1093/RP/001 R06

Figure 2-2: DNNP Site with Surrounding Regions

Referenced from NK054-REP-01210-00011 R001, Amec No. P1093/RP/001 R06

LEGEND

- Highway
- Secondary Road

NOTES:
1. Background Imagery from ESRI Online Basemaps, 2020/2021.

Datum: NAD83
Projection: UTM Zone 17N

0 0.2 0.4 0.6 0.8 1 2 3 4 5 Kilometres

KINECTRICS

wsp

DARLINGTON NUCLEAR GENERATING STATION

Aerial View of Darlington Site

PROJECT N°: OMGM2102S	**FIGURE: 2-3**
SCALE: 1:18,000	DATE: November 2022

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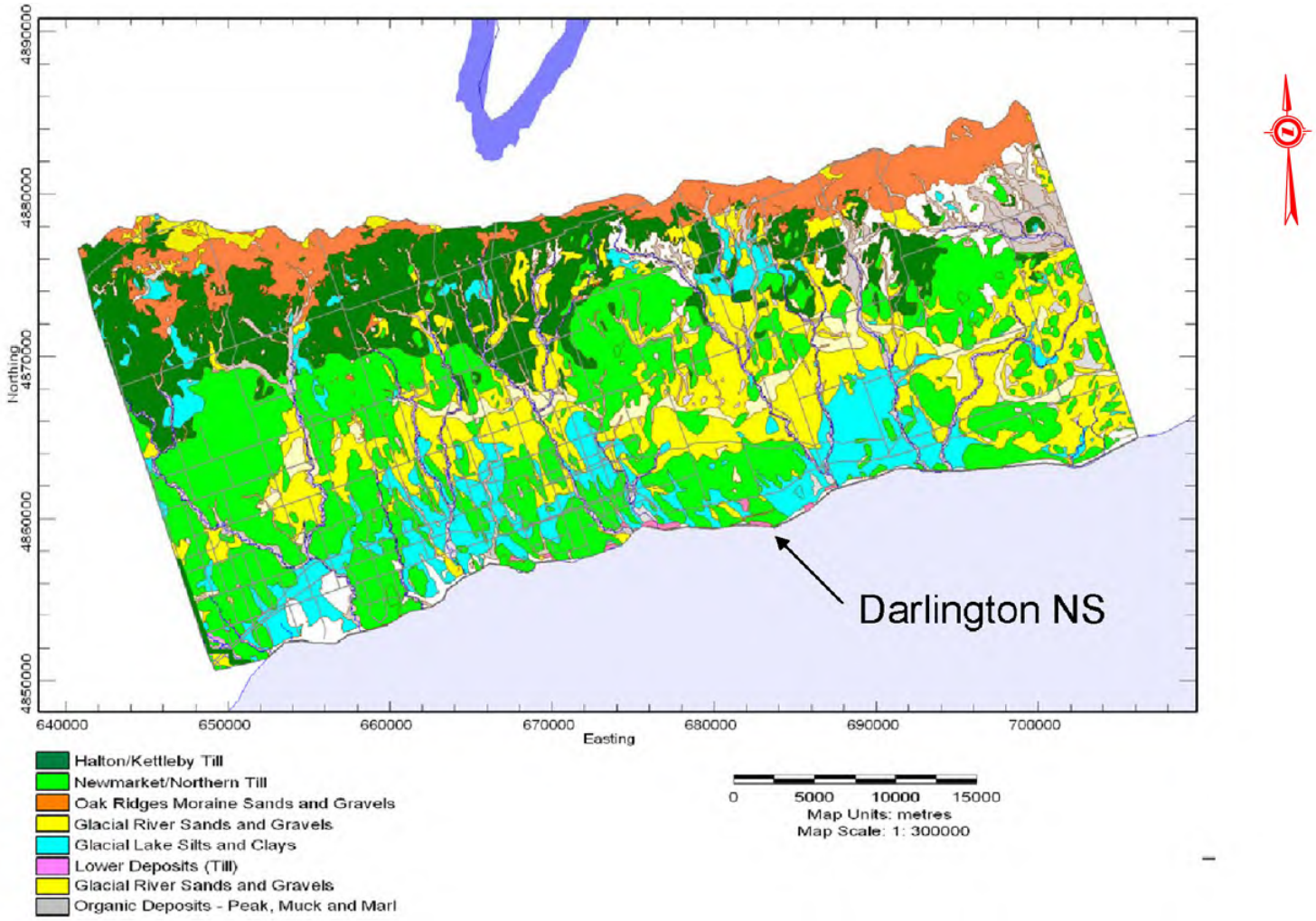


Figure 2-4: Local Surficial Geology

Referenced from NK054-REP-01210-00011 R001, Amec No. P1093/RP/001 R06

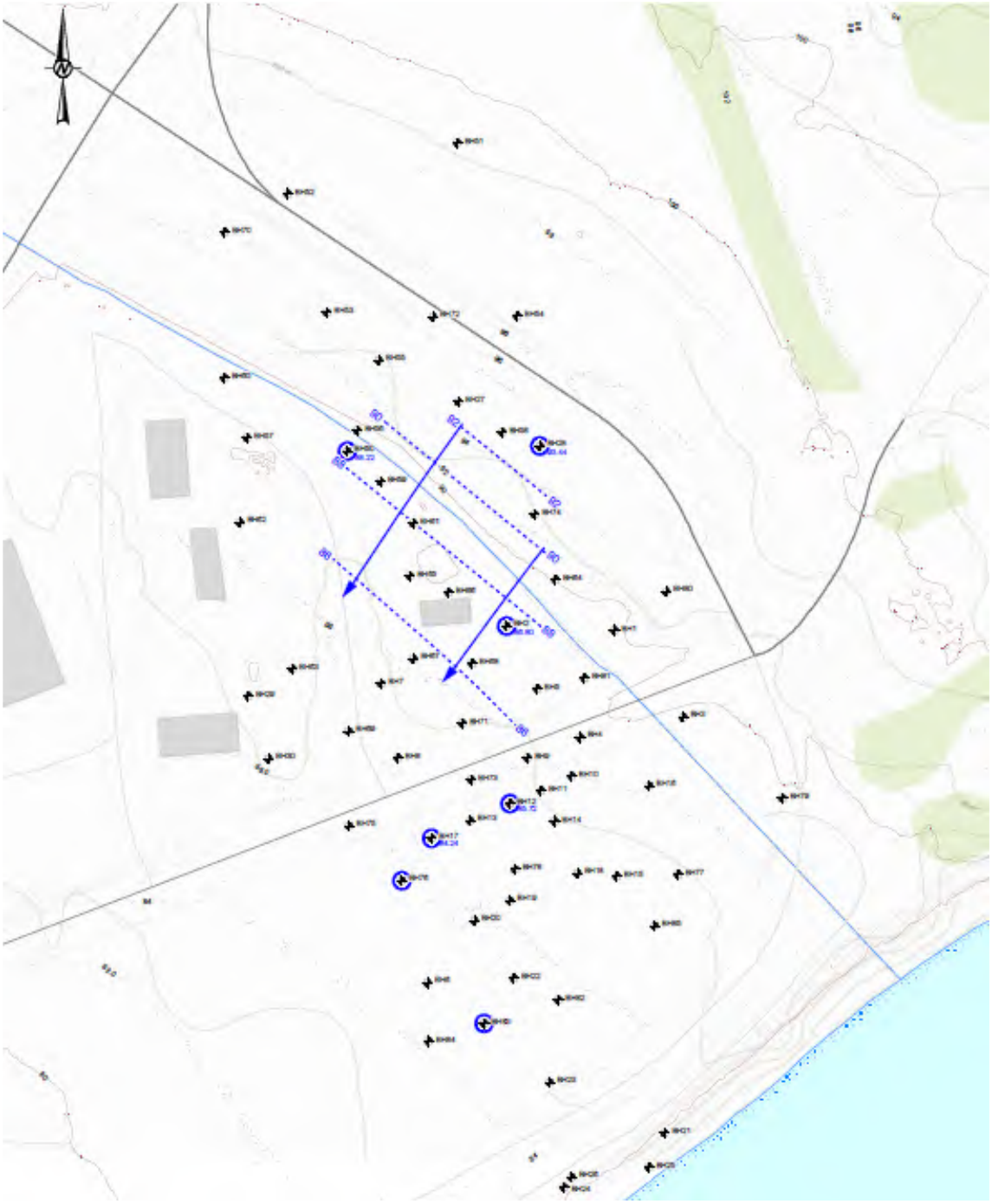


Figure 2-5: Groundwater Contours – Upper Till (Unit 3) – January 5, 2022

Referenced from 2022 WSP Golder Report

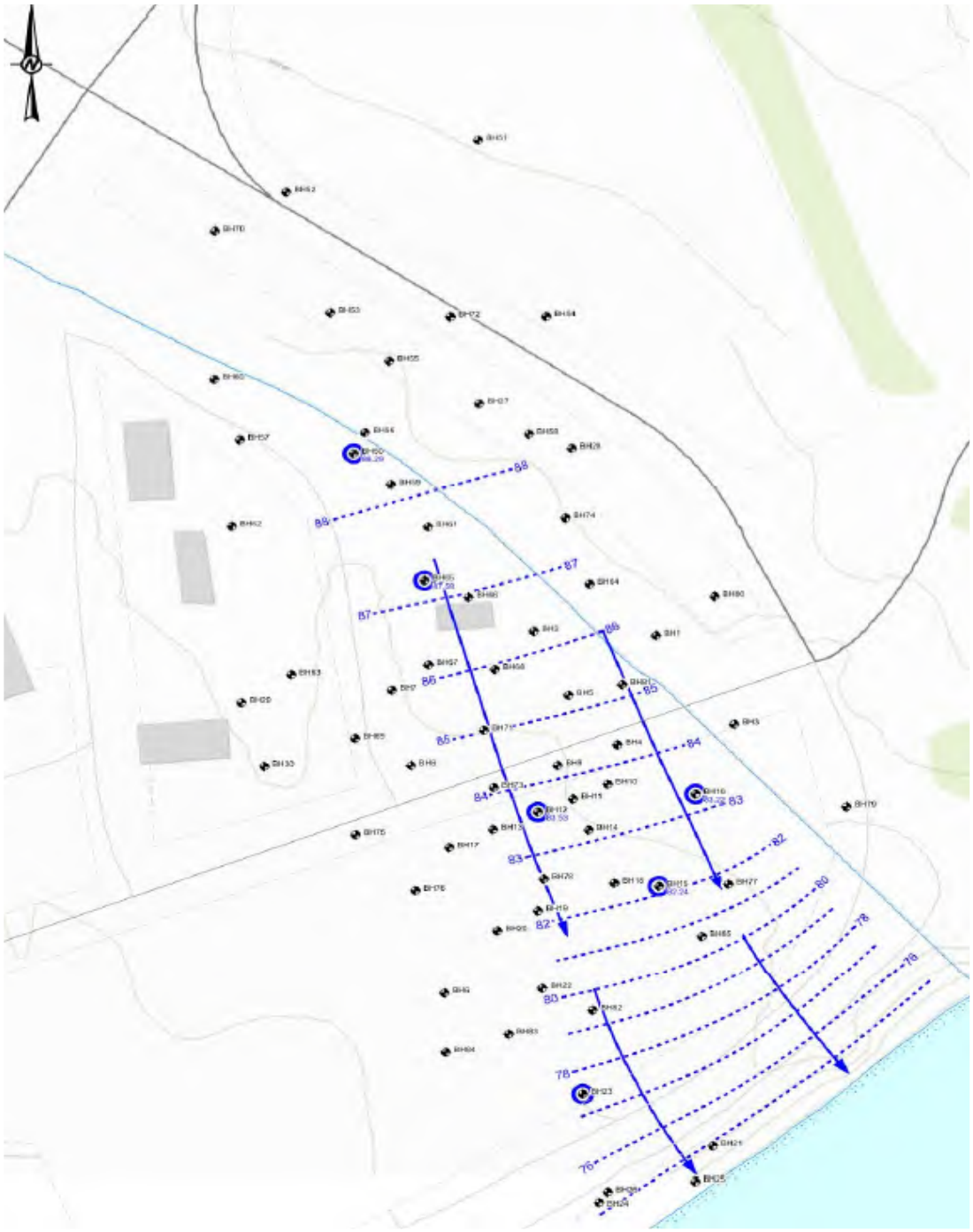


Figure 2-6: Groundwater Contours – Interglacial Unit (Unit 4a) – January 5, 2022

Referenced from 2022 WSP Golder Report

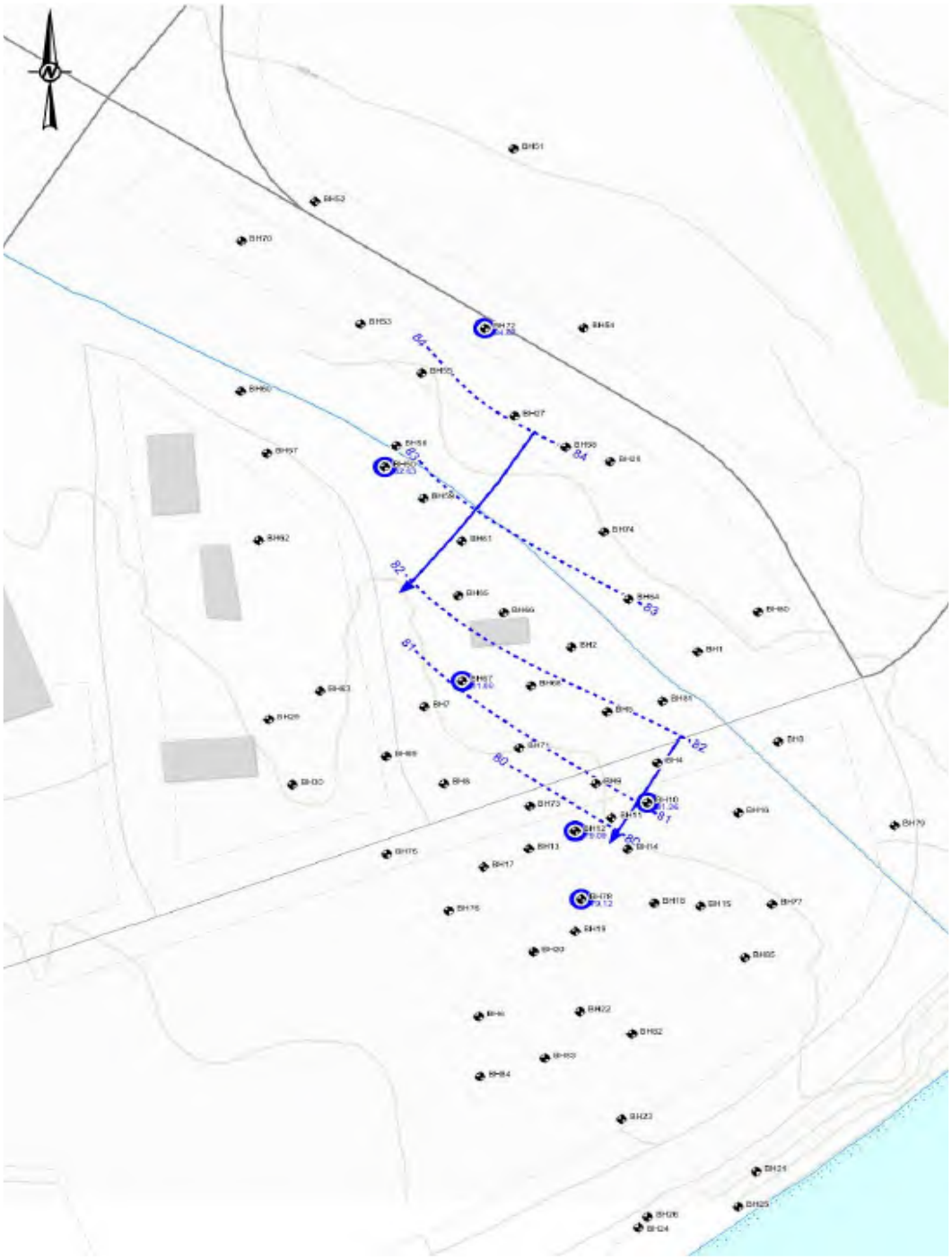


Figure 2-7: Groundwater Contours – Lower Till (Unit 5) – January 5, 2022

Referenced from 2022 WSP Golder Report

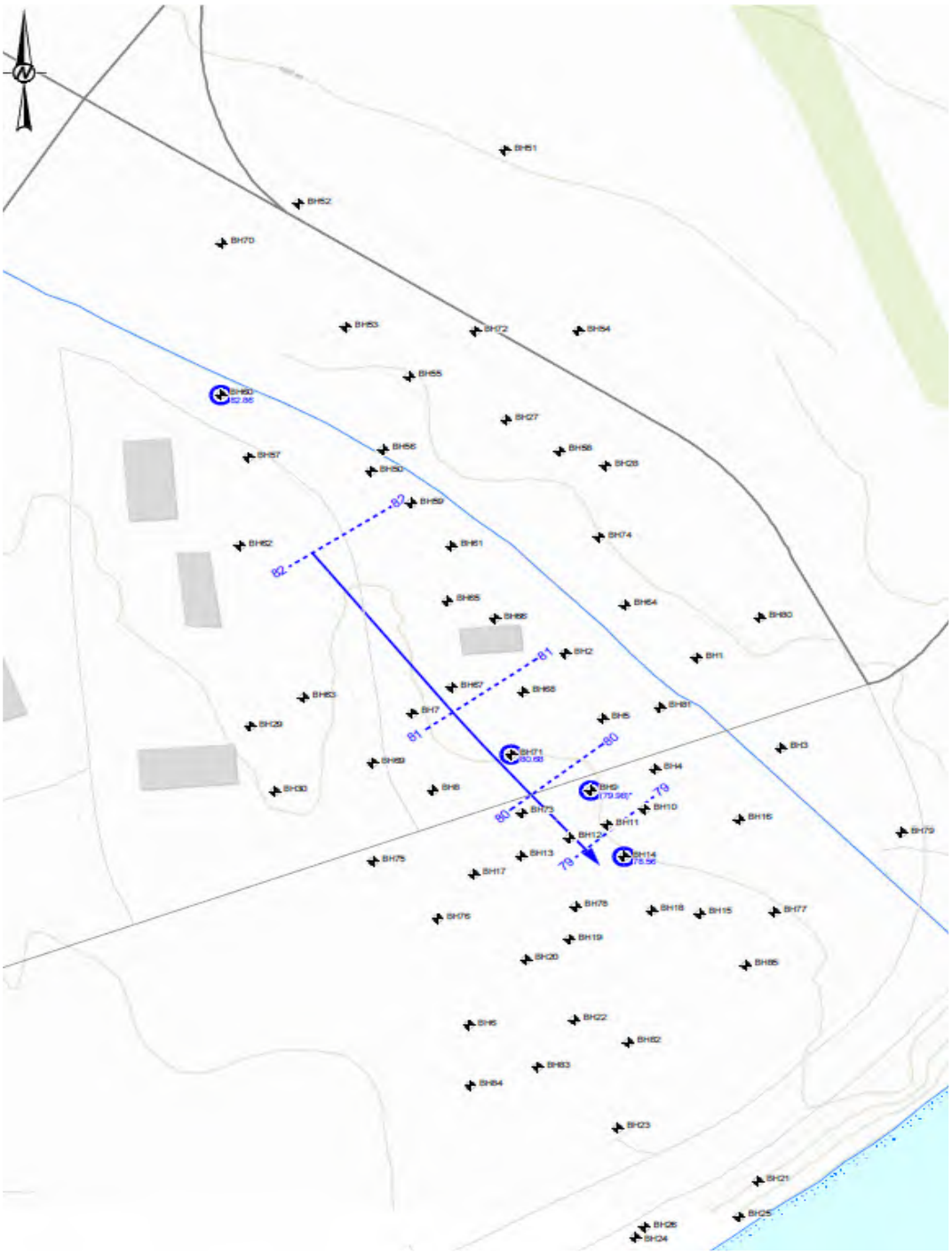
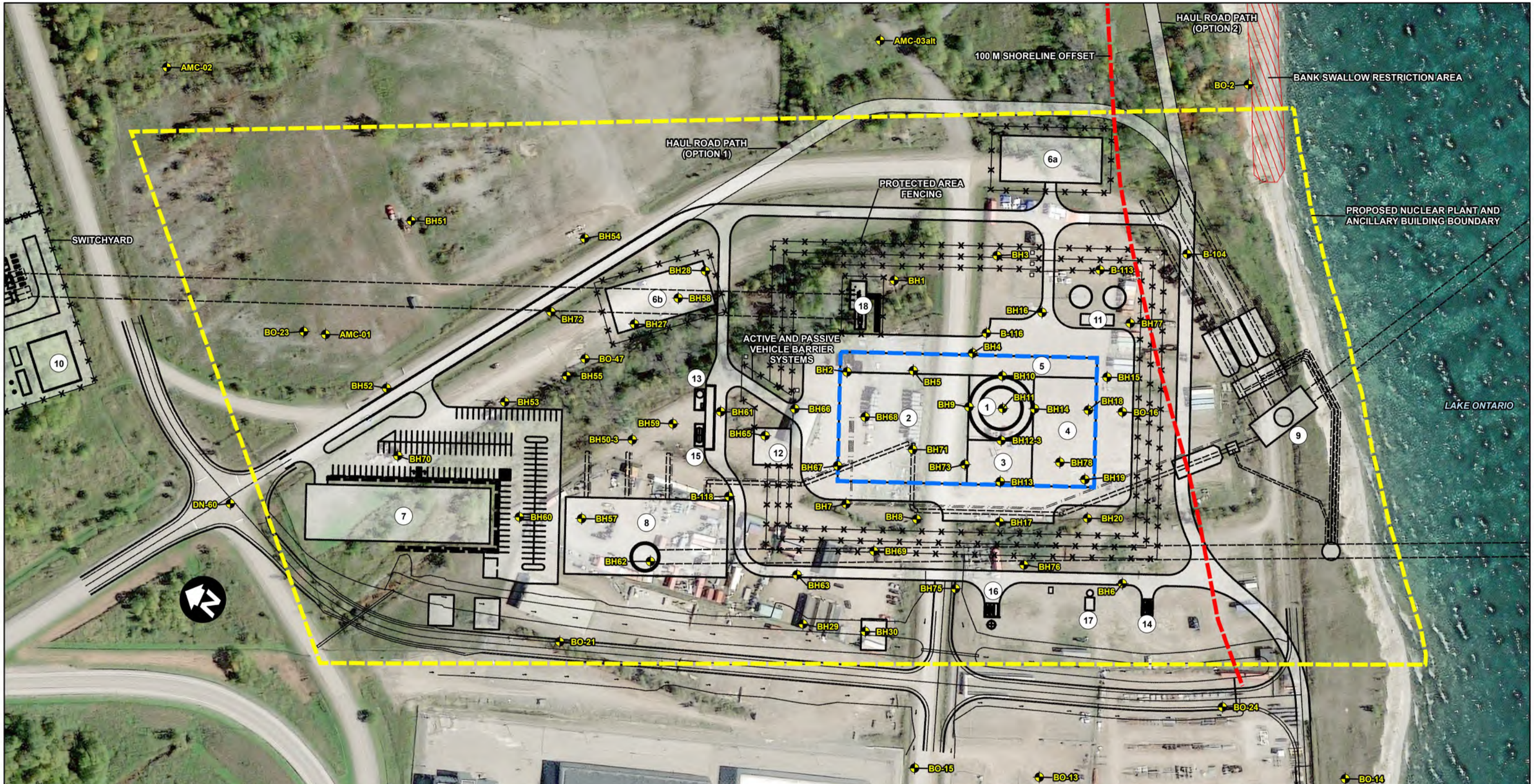


Figure 2-8: Groundwater Contours – Shallow Bedrock – January 5, 2022

Referenced from 2022 WSP Golder Report



LEGEND

- Borehole Locations
- Buildings
- Proposed Nuclear Plant and Ancillary Building Boundary
- Limit of Power Block
- Bank Swallow Restriction Area
- 100 m Shoreline Offset
- Contours (1 m interval)

Building ID	Description
1	Reactor Building
2	Turbine Building
3	Radwaste Building
4	Control Building
5	Reactor Auxiliary Bay
6a	Independent Spent Fuel Storage Installation (see Note 3)
6b	Independent Spent Fuel Storage Installation (Location as per Preliminary Design)
7	Administration/Training Building
8	Intake Structure/Forebay
9	Discharge Structure

Building ID	Description
10	Switchyard Building
11	Fire Water Storage Tanks and Pump Enclosure
12	Security Building
13	Diesel Fuel Storage Tank
14	Hydrogen Equipment
15	Turbine Lube Oil Tank
16	Demineralized Water Equipment
17	Nitrogen Equipment
18	Transformation (Preliminary)

NOTES:
1. Background Imagery from ESRI Online Basemaps, 2021.
2. Contours provided by WSP Golder, 2022.
3. Site layout plan, bank swallow restriction area extracted from GE-Hitachi Nuclear Energy Americas LLC, drawing 006N4150 Rev 0.
4. The limit of power block from the drawing of DNNP Excavation Plan Plans Single Unit by GE-H, 006N6034, Rev.A, May 24, 2021.

Datum: NAD83
Projection: UTM Zone 17N

0 20 40 60 80 100 200 300 400 500 Metres

KINECTRICS

wsp

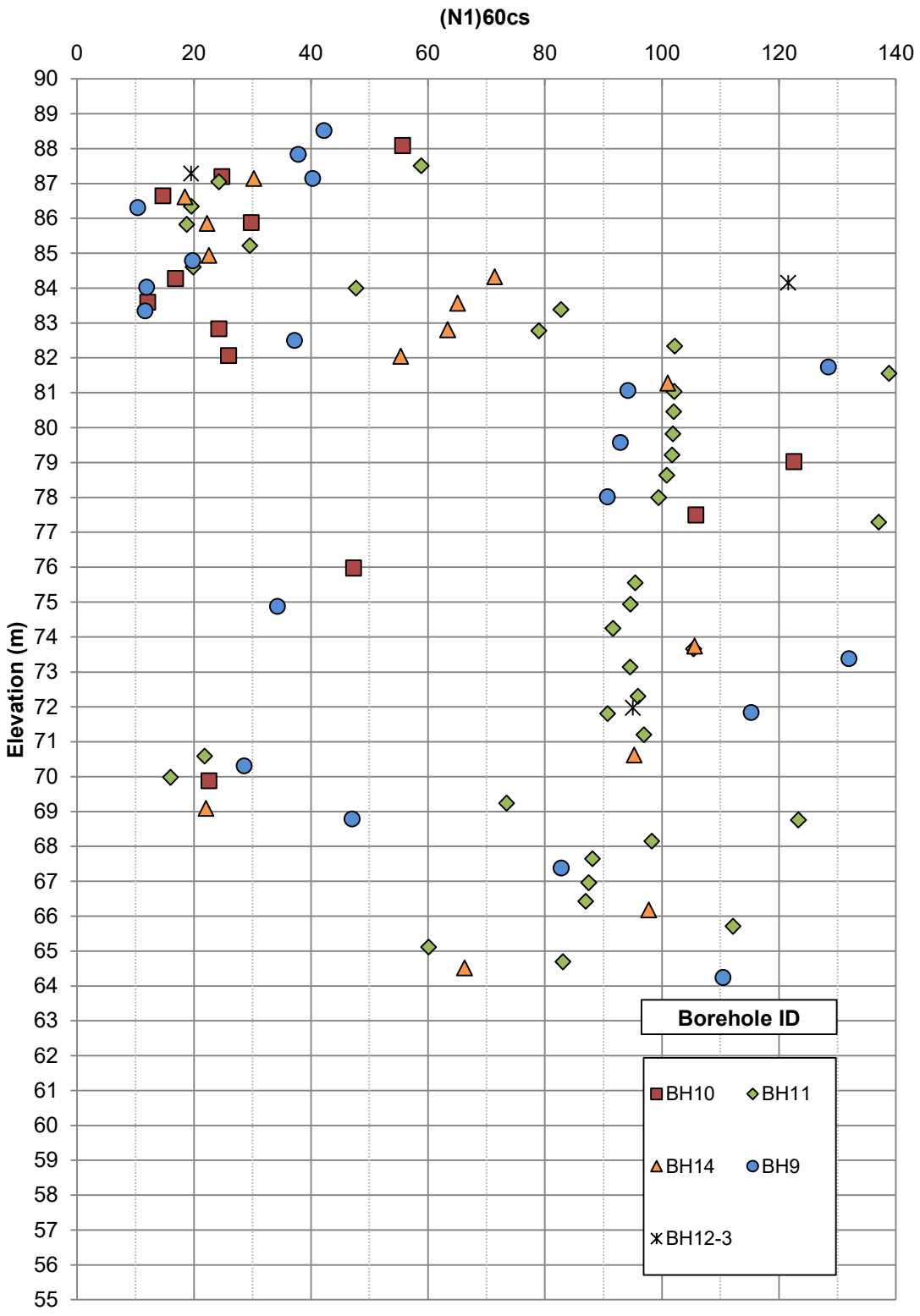
DARLINGTON NUCLEAR GENERATING STATION

Site Layout Plan and Borehole Locations

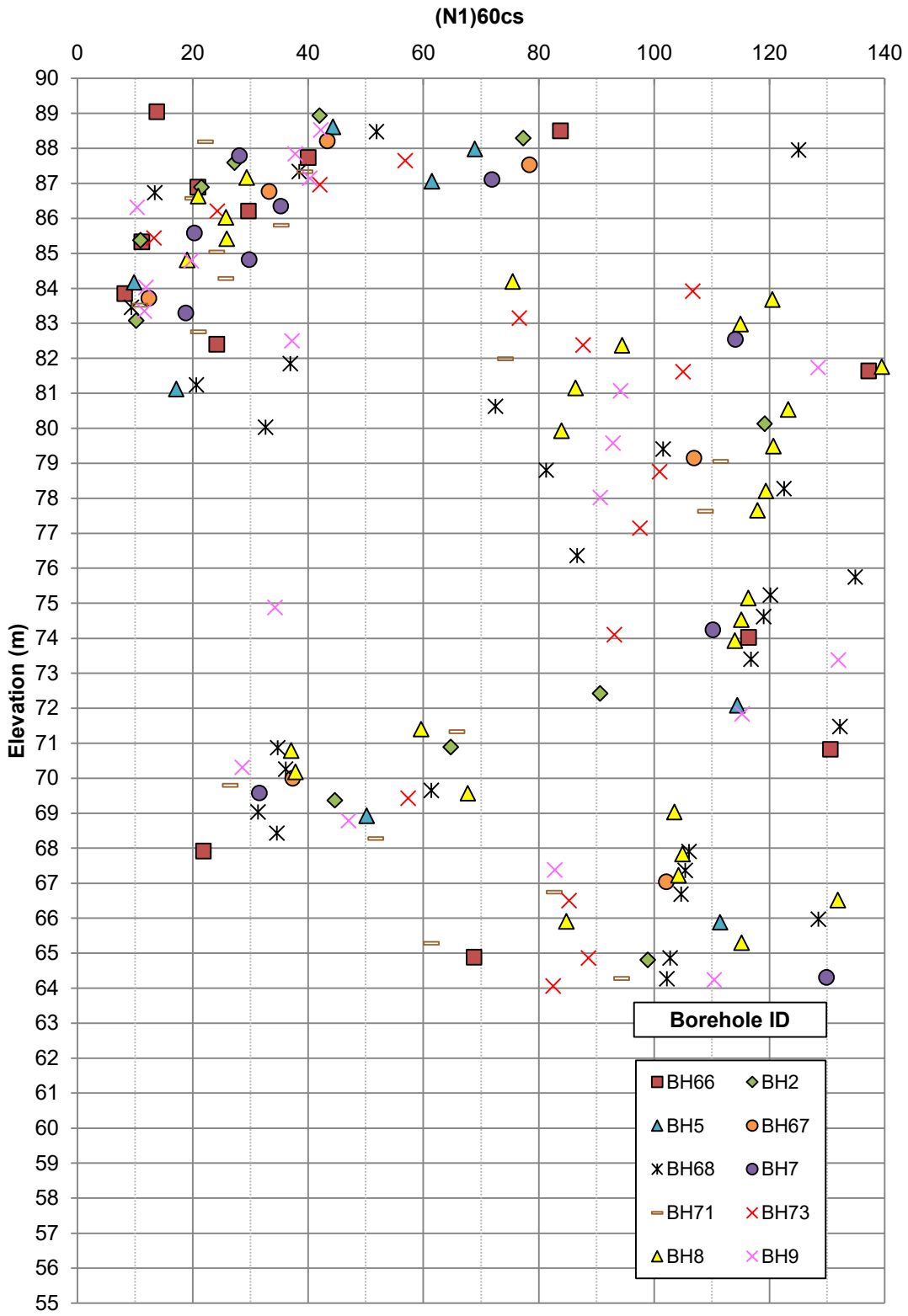
PROJECT N°: OMGM2102S | **FIGURE: 4-1**

SCALE: 1:2,000 | DATE: November 2022

Document Path: P:\2021\Projects\OMGM2102S_Kinetrics_DNNP – Geotech Review and Liquefaction Assessment\13.0_GIS\BH_Mapping_July2022\MXD\Site_Layout_and_BH_Locations_6.mxd



wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment			
		TITLE: Reactor Building Area Clean Sand Equivalent Normalized Standard Penetration Resistance $(N_1)_{60cs}$ vs Elevation			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-1 REV.



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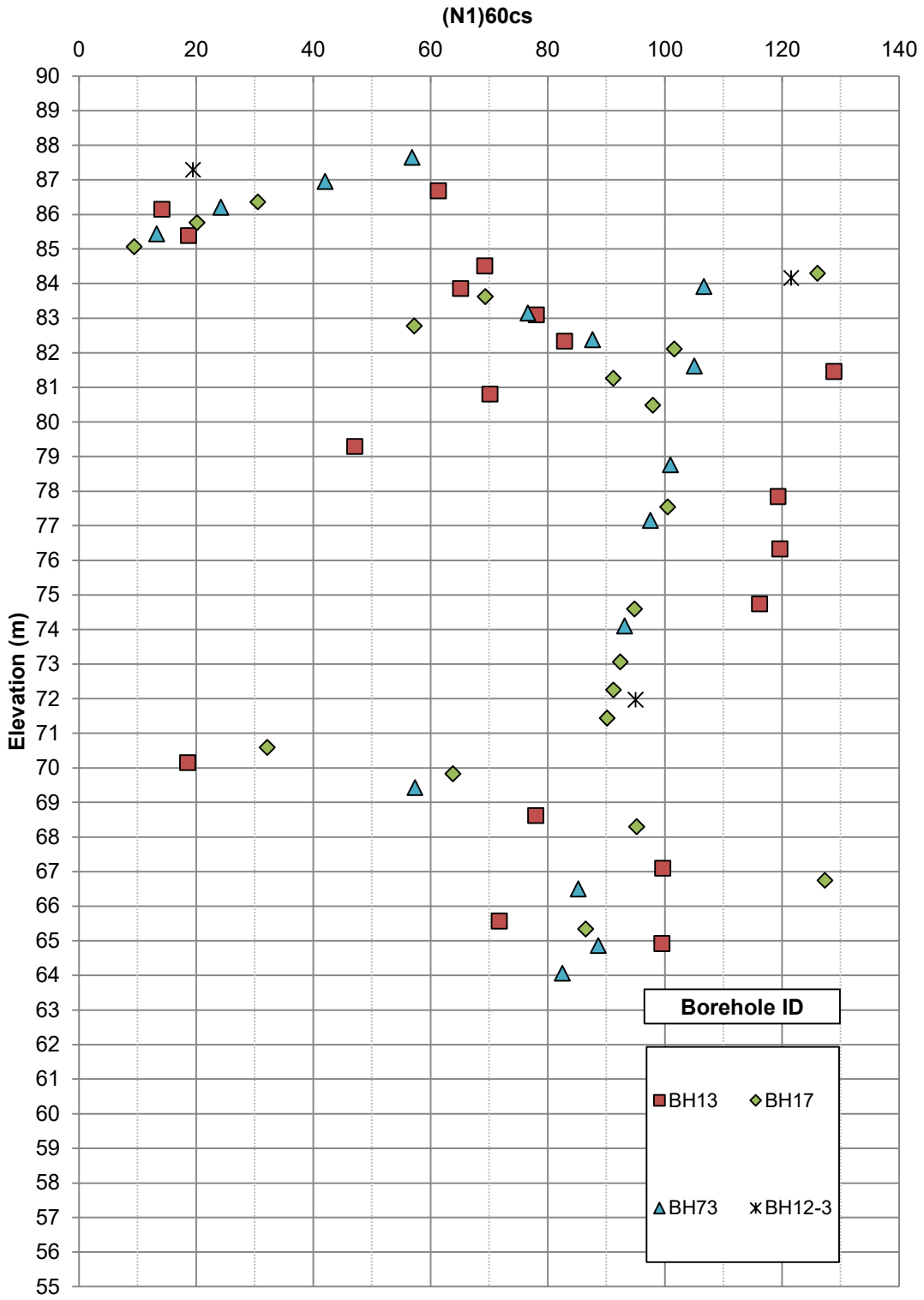
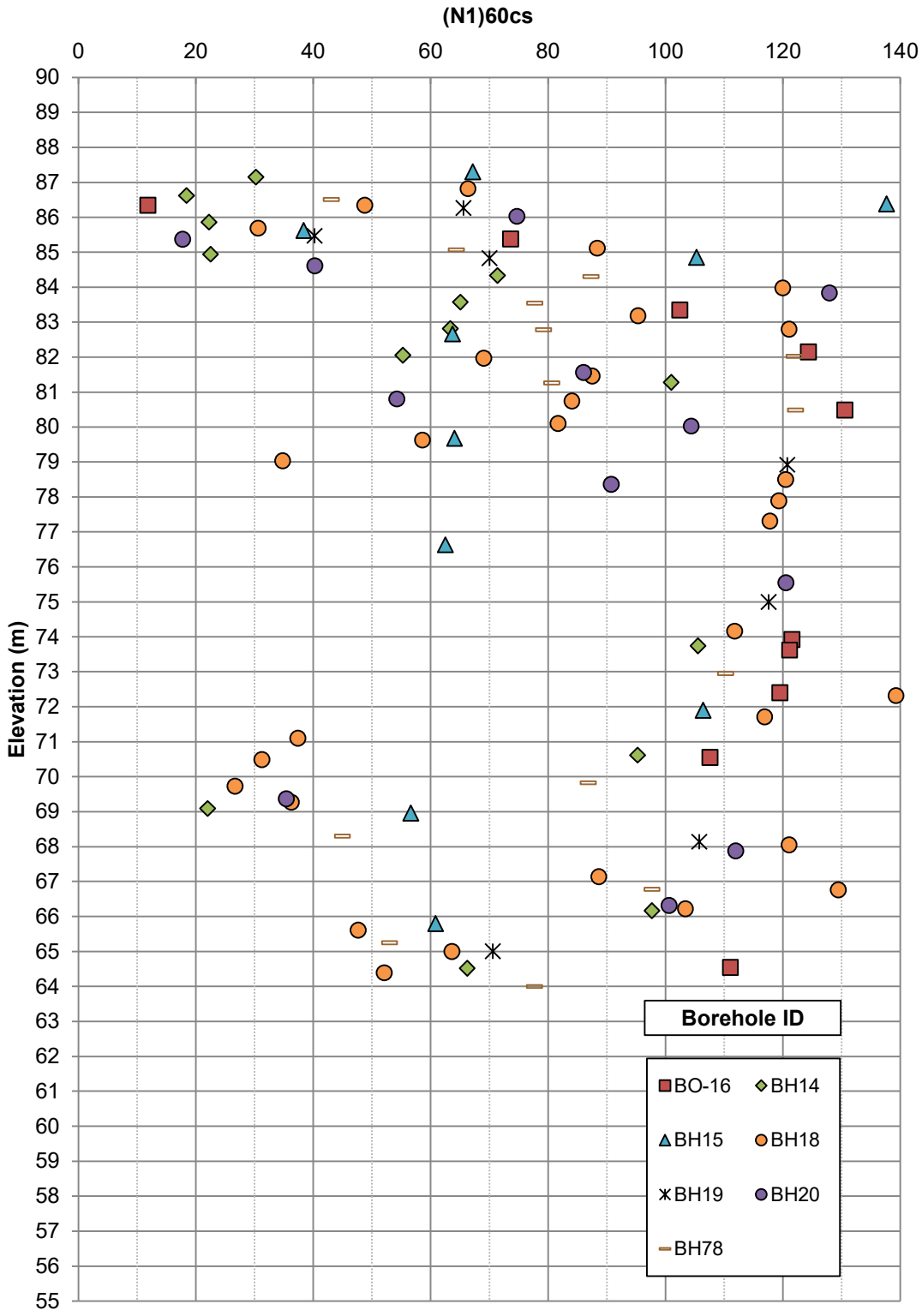
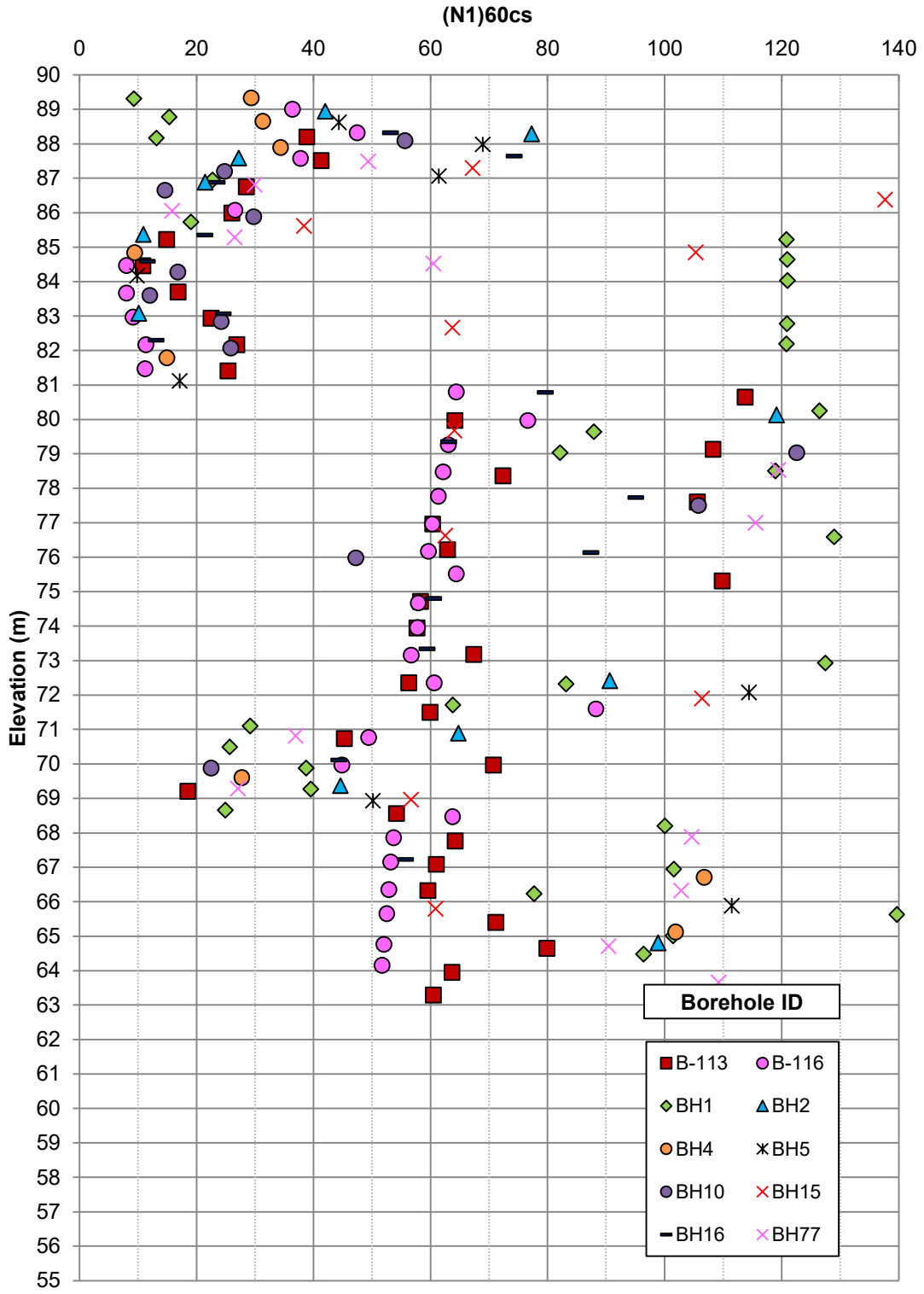
		TITLE: Turbine Building Area Clean Sand Equivalent Normalized Standard Penetration Resistance $(N_1)_{60cs}$ vs Elevation			
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-2	REV.



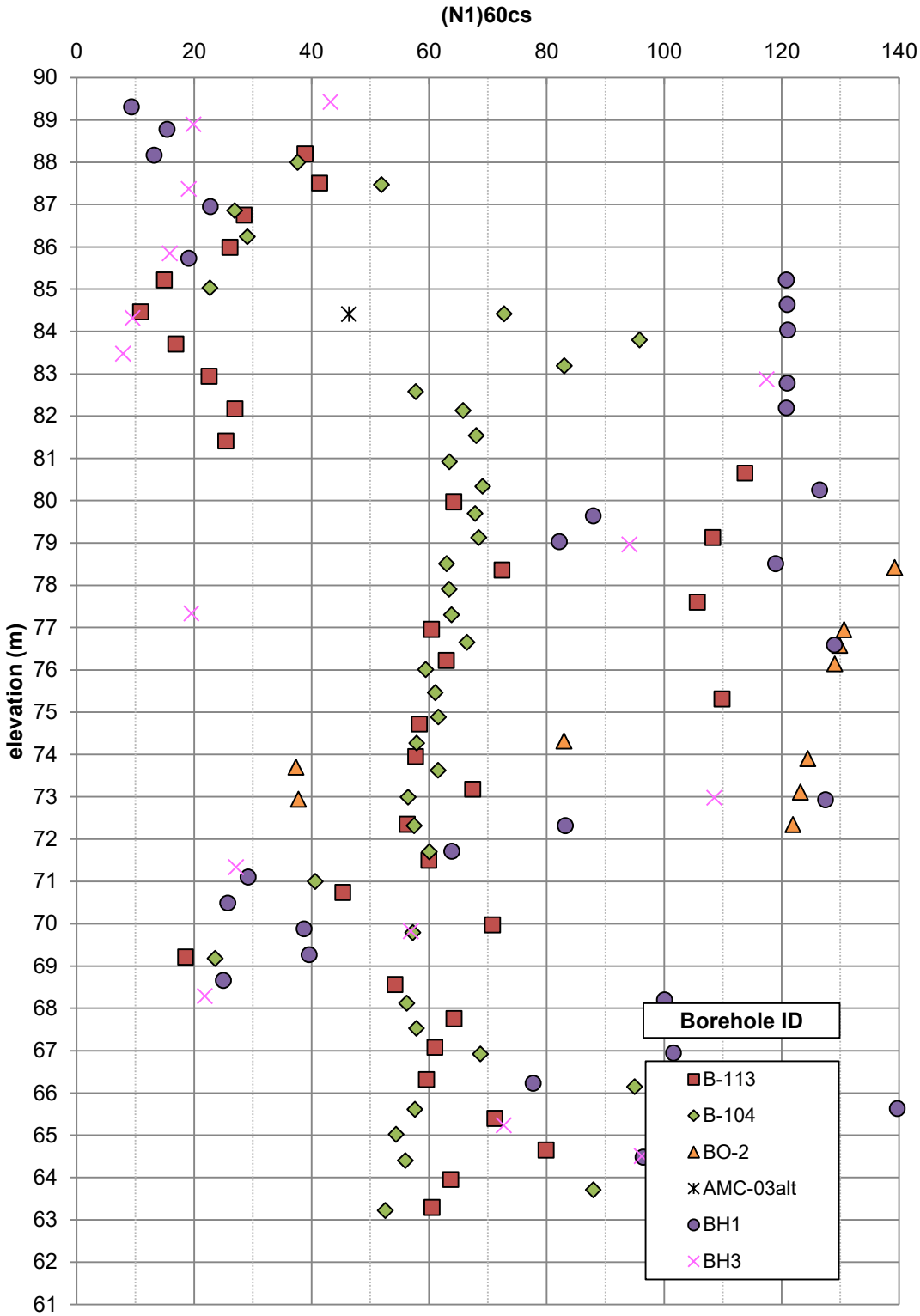
wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment				
	TITLE: Radwaste Building Area Clean Sand Equivalent Normalized Standard Penetration Resistance $(N_1)_{60cs}$ vs Elevation				
CLIENT: Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-3	REV.



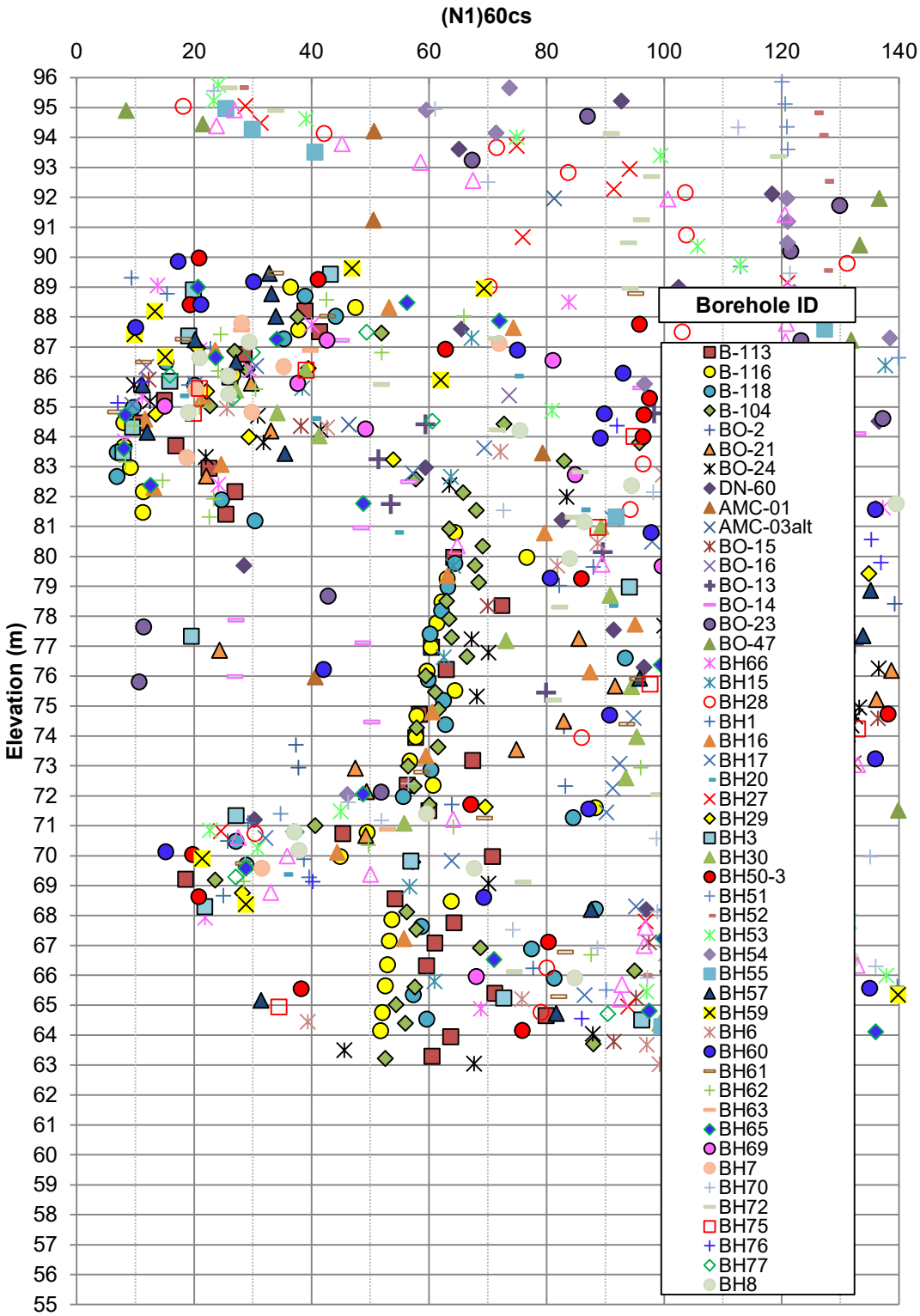
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment			
		TITLE: Control Building Area Clean Sand Equivalent Normalized Standard Penetration Resistance $(N_1)_{60cs}$ vs Elevation			
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-4	REV.



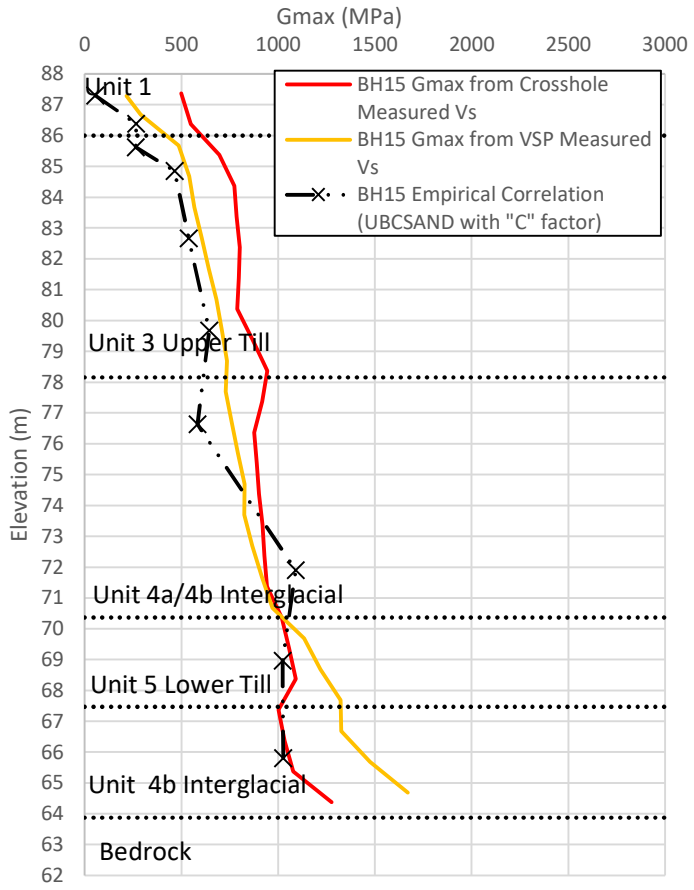
wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment				
	TITLE: Reactor Auxiliary Bay Area Clean Sand Equivalent Normalized Standard Penetration Resistance $(N_1)_{60cs}$ vs Elevation				
CLIENT: Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-5	REV.



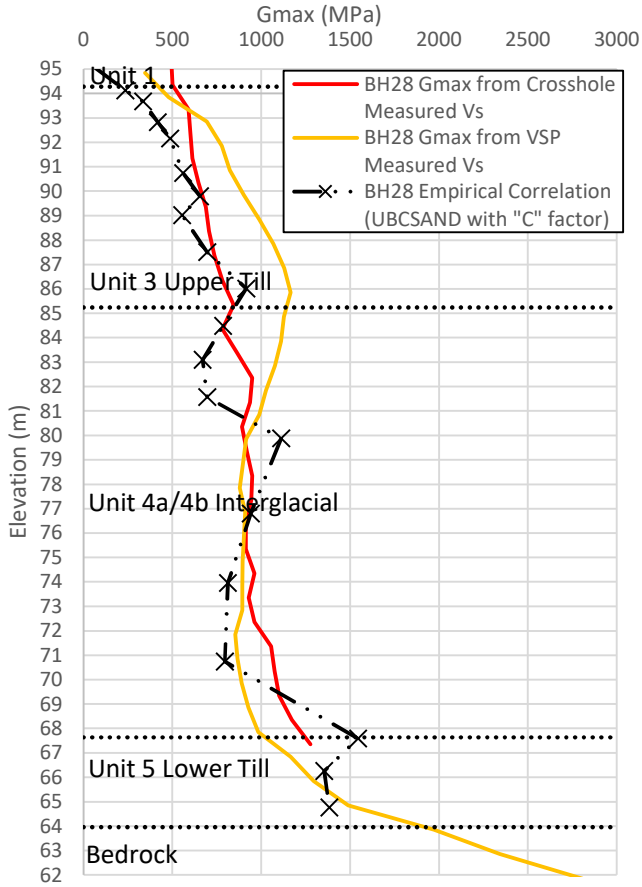
wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment				
	TITLE: Independent Spent Fuel Storage Installation Clean Sand Equivalent Normalized Standard Penetration Resistance $(N_1)_{60cs}$ vs Elevation				
CLIENT: Kinetics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-6	REV.



wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment			
		TITLE: EME Access Route Clean Sand Equivalent Normalized Standard Penetration Resistance $(N_1)_{60cs}$ vs Depth			
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-7 REV.



6.3-1 a)



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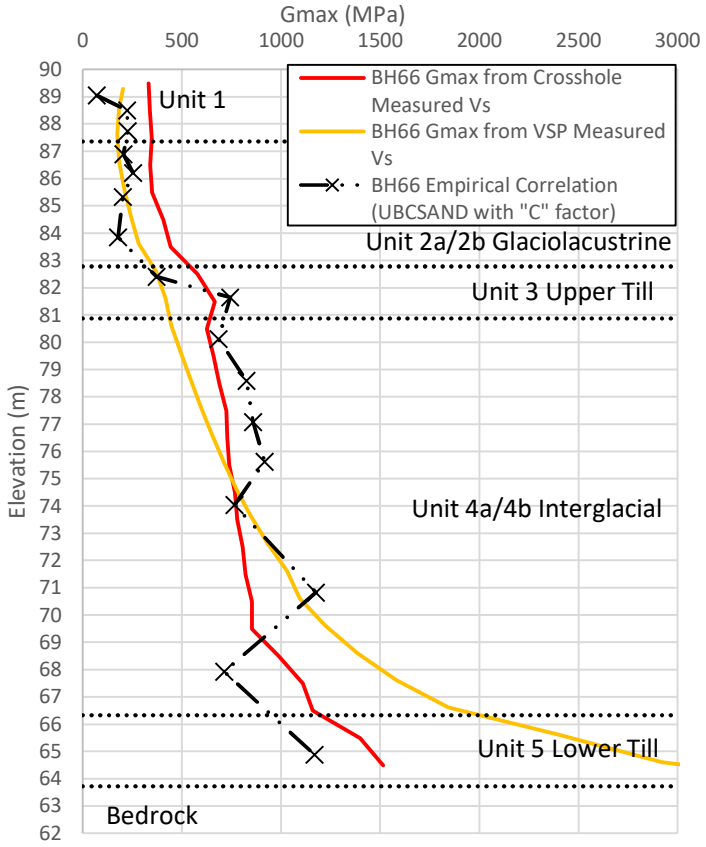
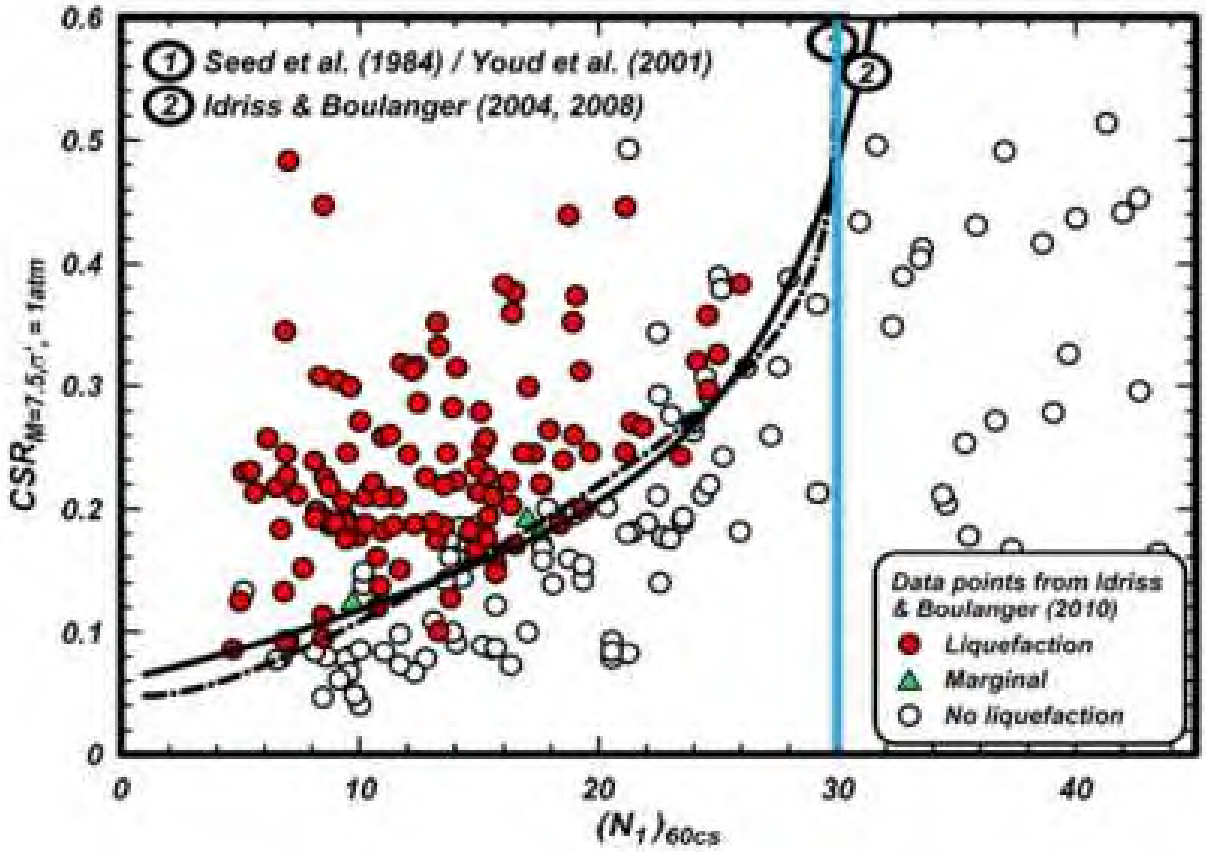
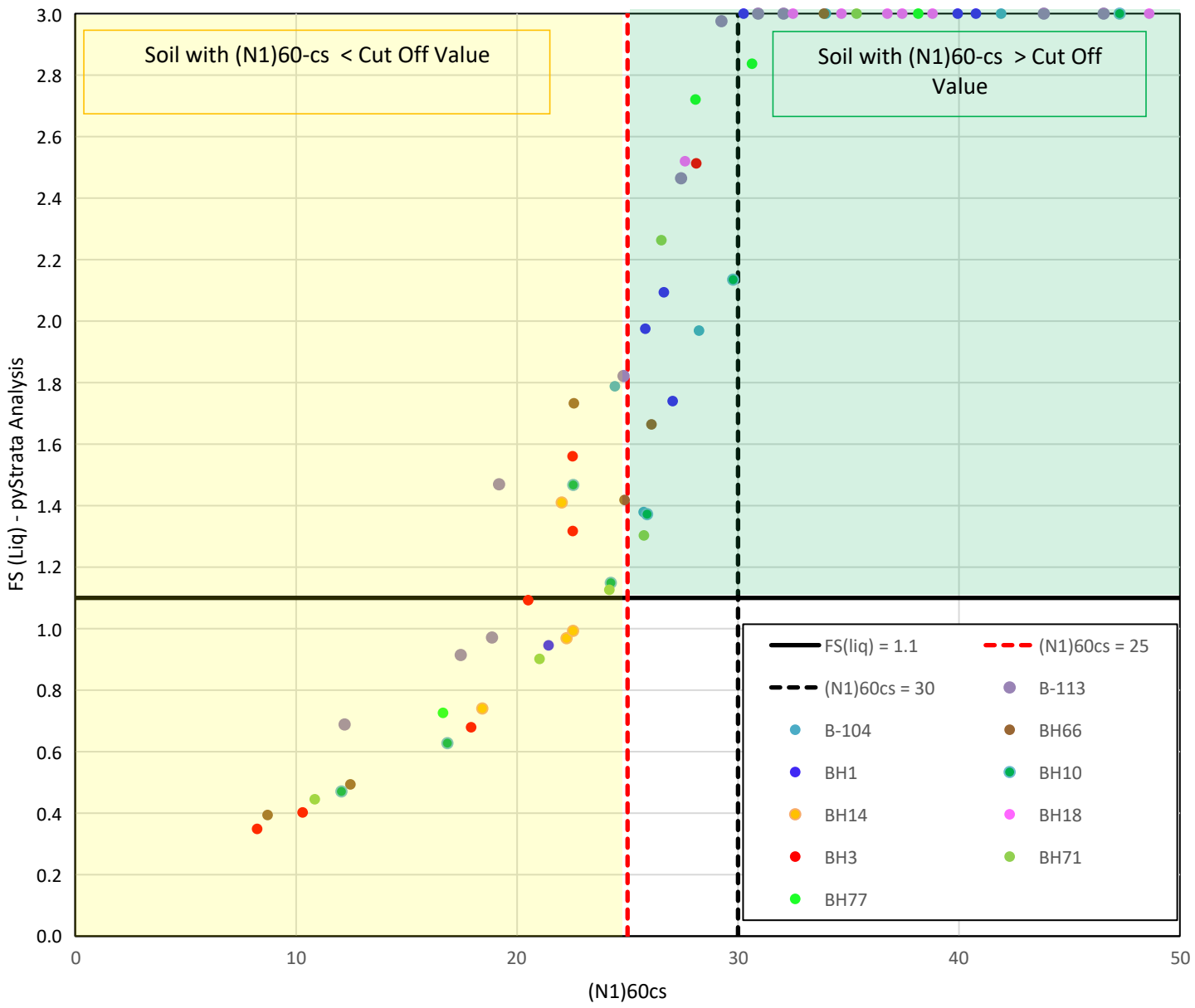


6.3-1 c)

wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Study				
	TITLE: Gmax Profiles Estimated Using Empirical Correlation and Shear Wave Velocity (V_s) Data				
CLIENT: Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 6-8	REV.



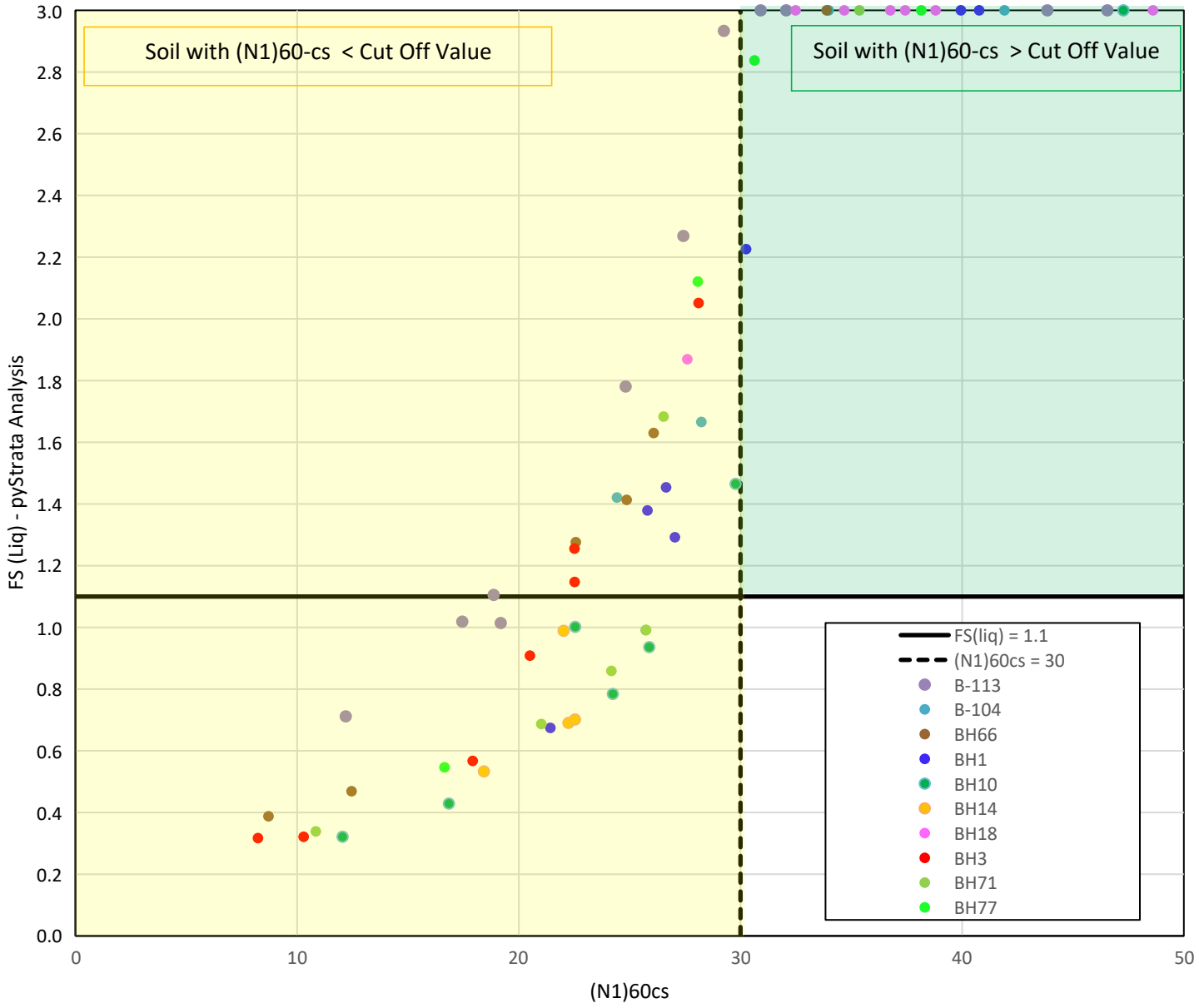
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: (N1)60-cs vs FS(liq) from DNNP liquefaction assessment Design Basis Earthquake Hazard Level			
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-1(a) REV.



Notes

1. Boulanger and Idriss (2014) Criteria was used the liquefaction assessment.
2. This figure presents the data for native soils from the detailed liquefaction assessment.

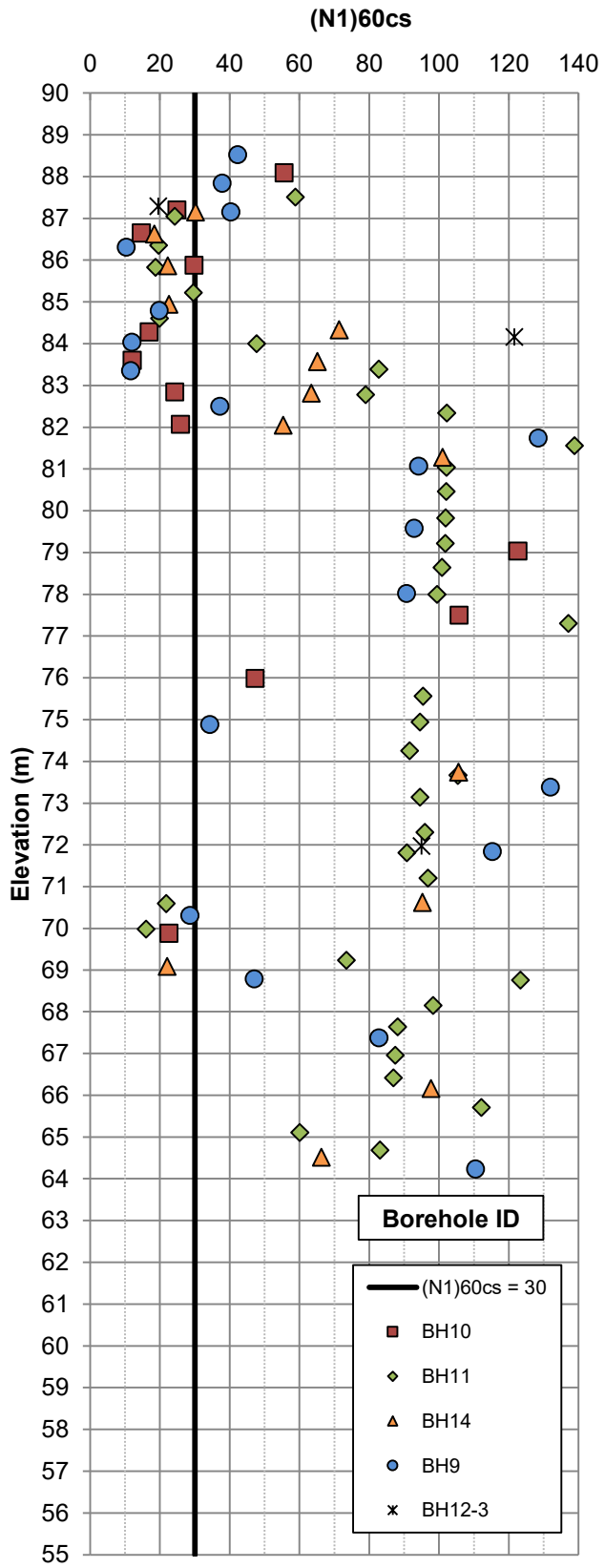
wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Study				
	TITLE: (N1)60-cs vs FS(liq) from DNNP liquefaction assessment Design Basis Earthquake Hazard Level				
CLIENT: Kinetrics	DATE:	JOB No.:	CAD FILE:	FIGURE No.: 7-1(b)	REV.

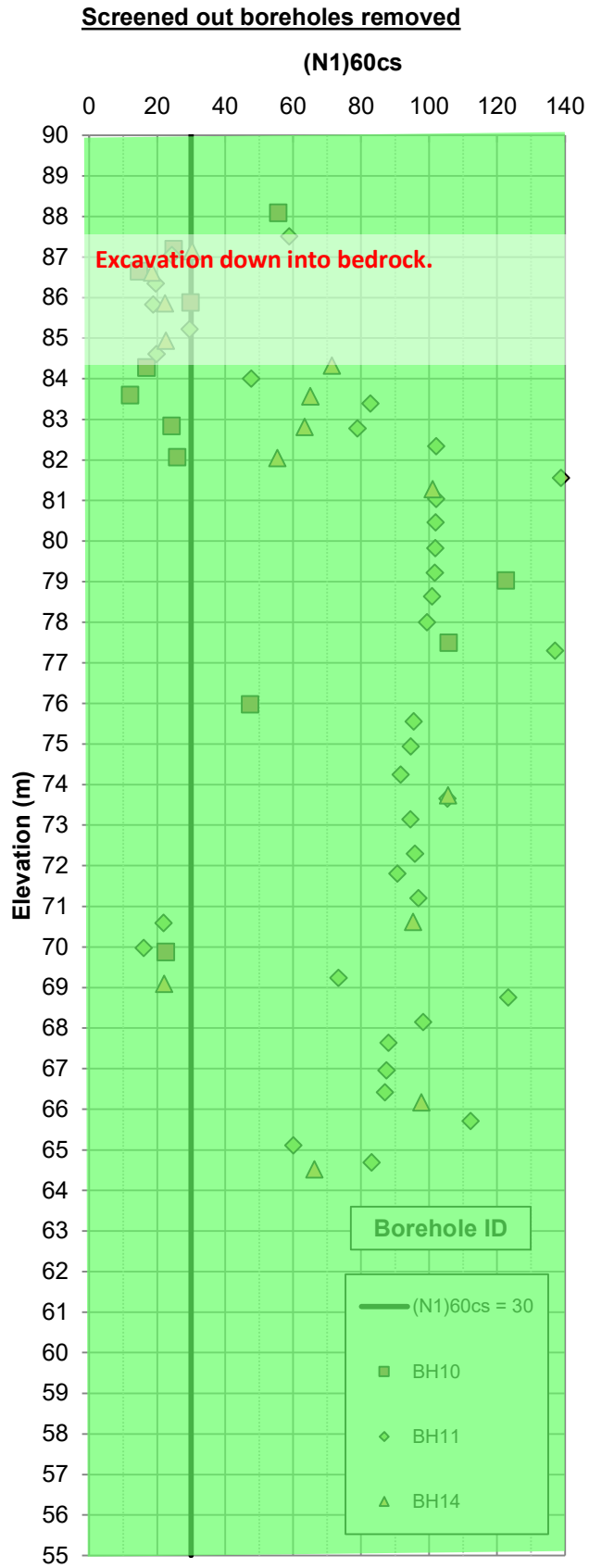


Notes

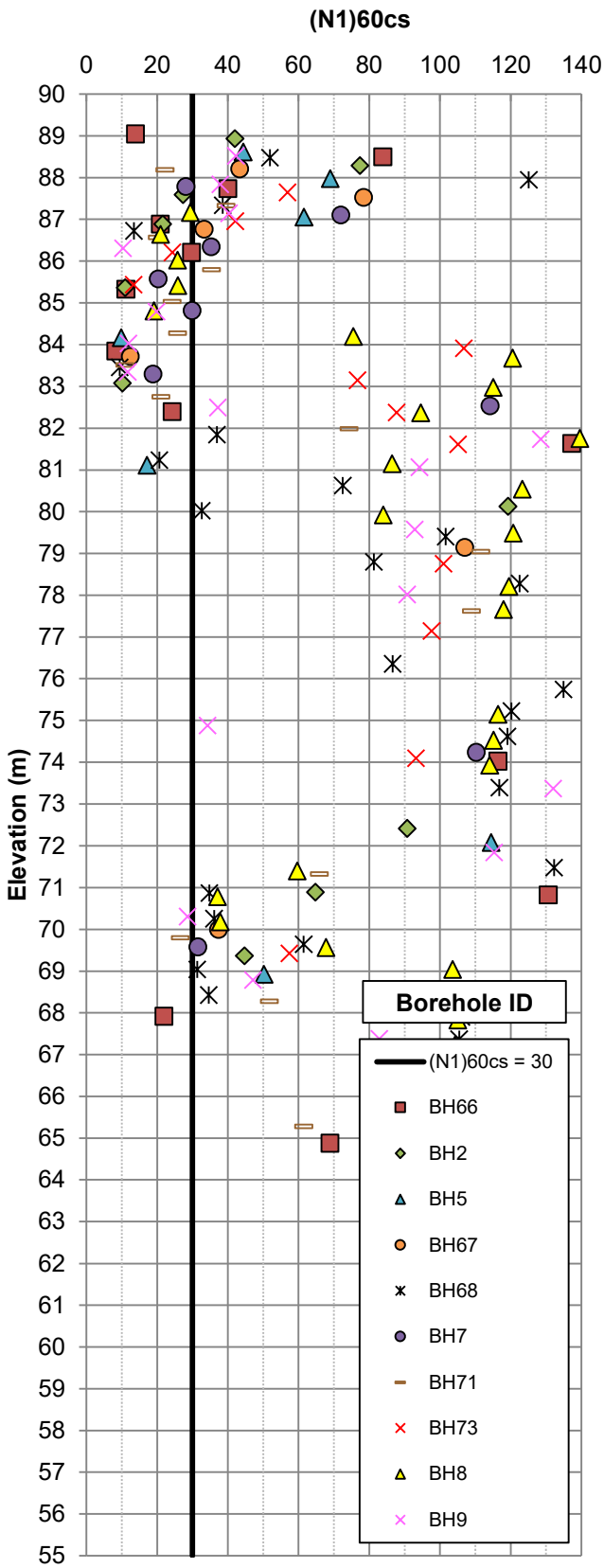
1. Boulanger and Idriss (2014) Criteria was used the liquefaction assessment.
2. This figure presents the data for native soils from the detailed liquefaction assessment.

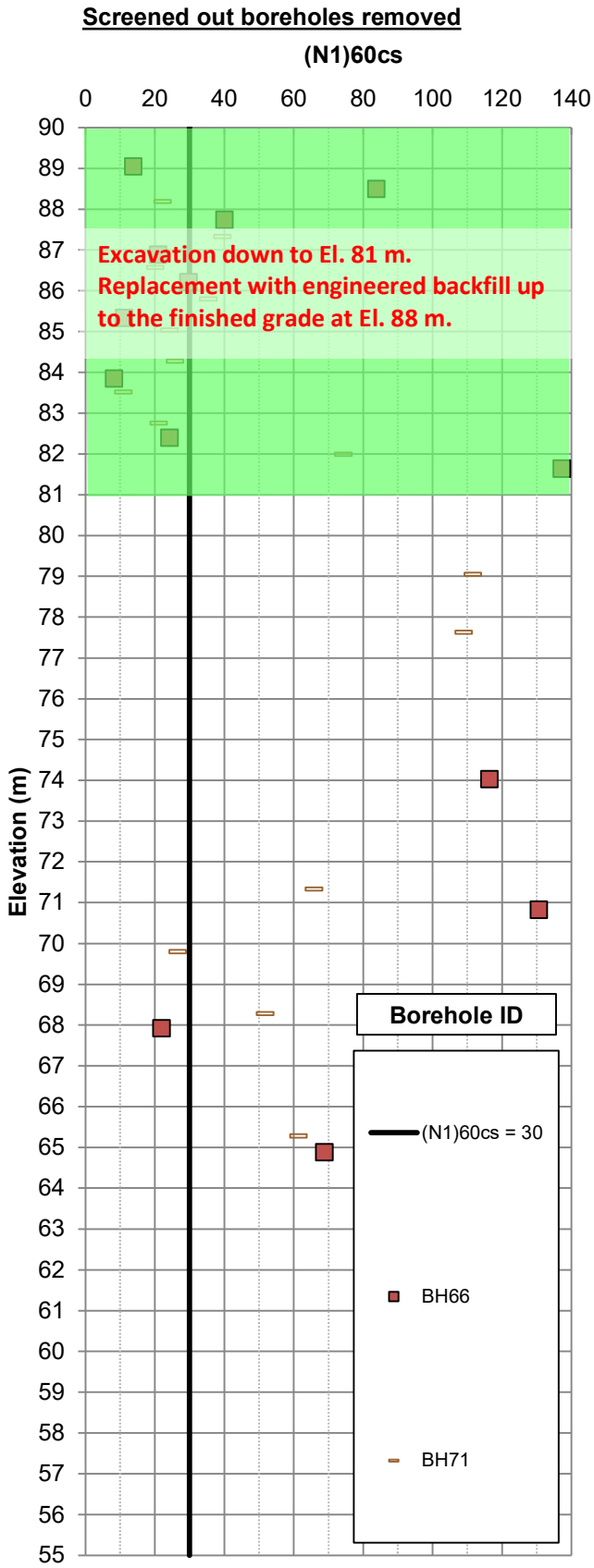
wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Study				
	TITLE: (N1)60-cs vs FS(liq) from DNNP liquefaction assessment Beyond Design Basis Earthquake Hazard Level				
CLIENT: Kinetrics	DATE:	JOB No.:	CAD FILE:	FIGURE No.: 7-1(c)	REV.



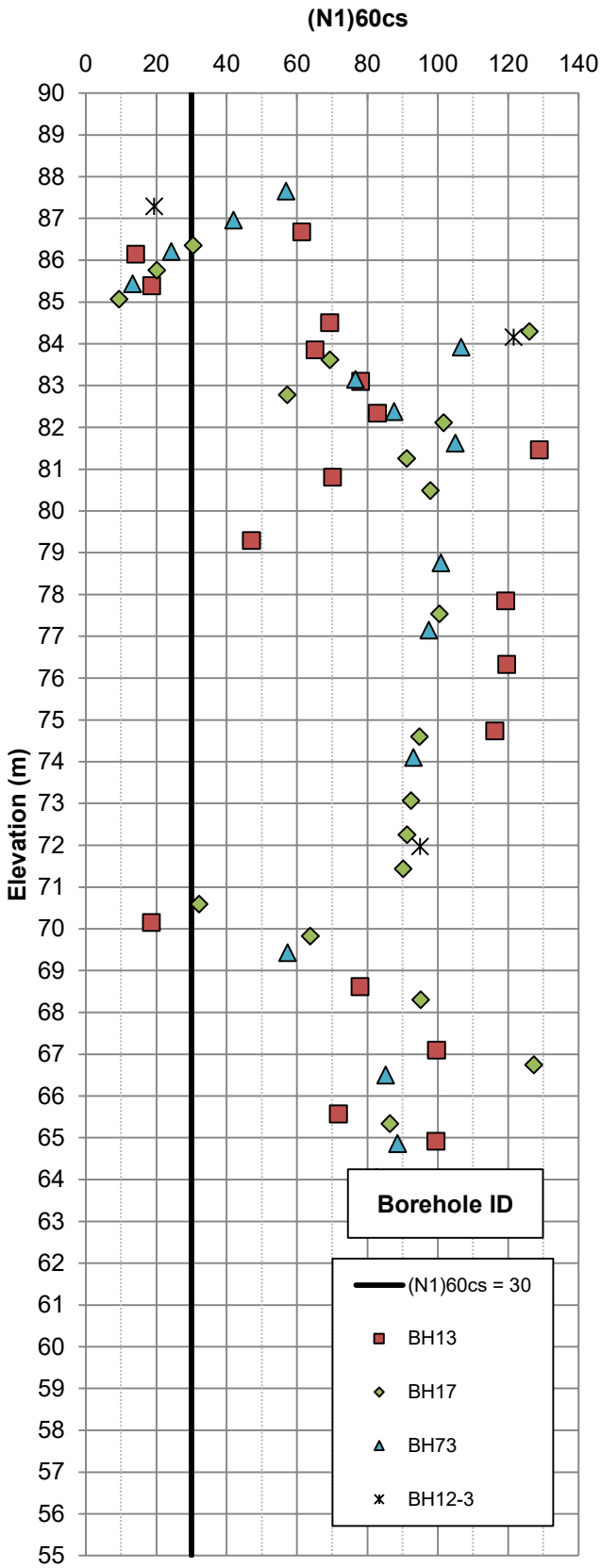


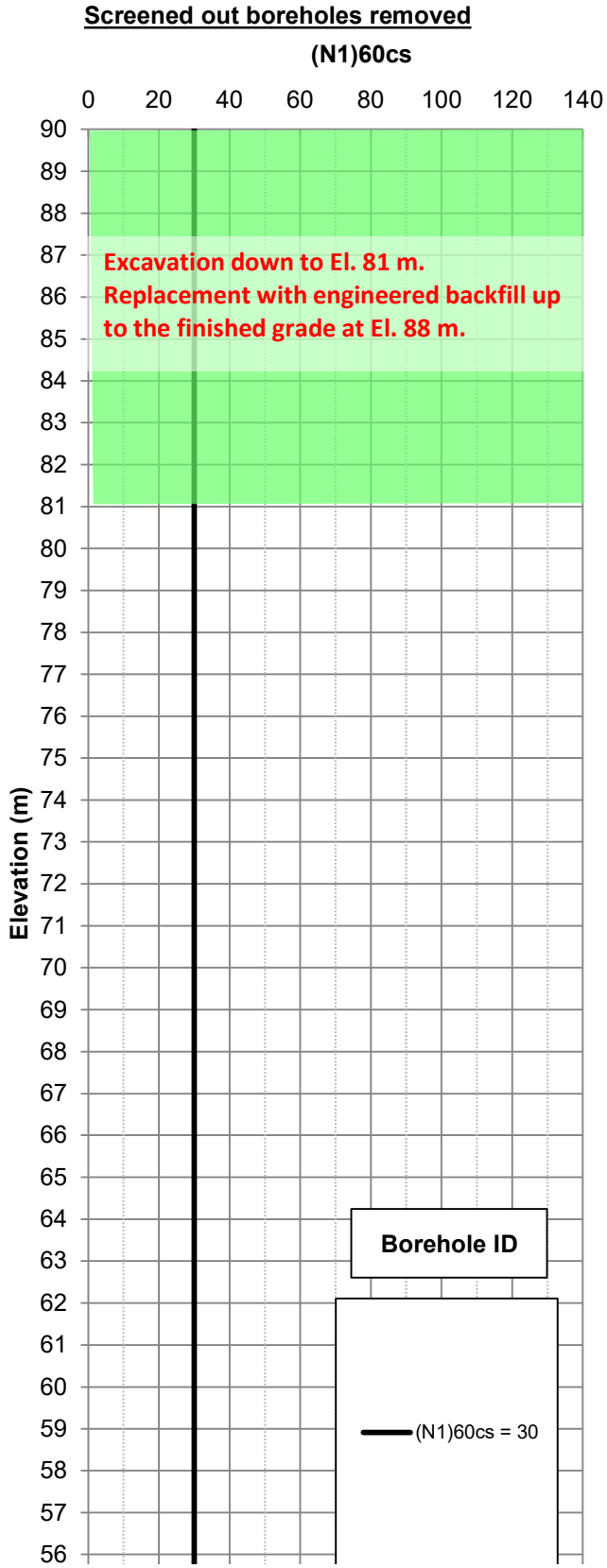
wsp	E&I Canada Limited	PROJECT:	DNNP Liquefaction Assessment		
		TITLE:	Reactor Building Area $(N_1)_{60cs}$ - Screening Assessment		
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-2 REV.





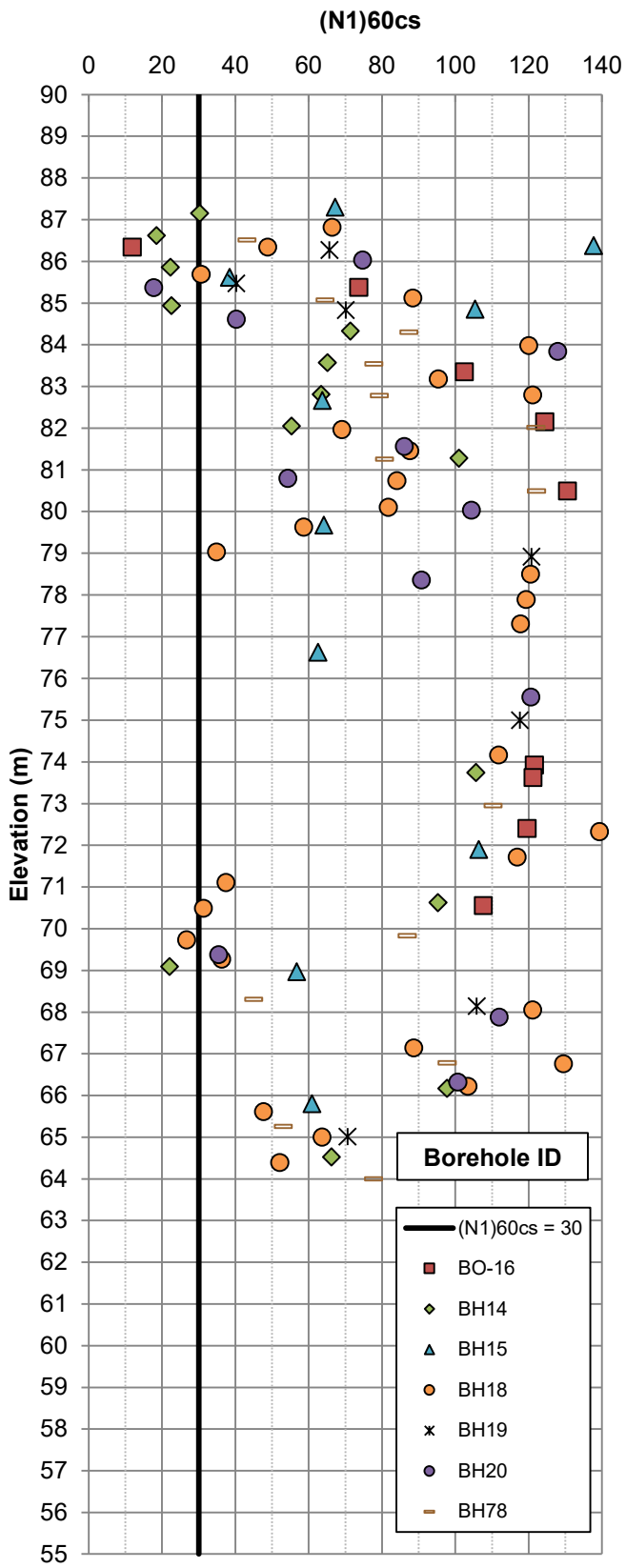
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment			
		TITLE: Turbine Building Area $(N_1)_{60cs}$ - Screening Assessment			
CLIENT: Kinetics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-3 REV.



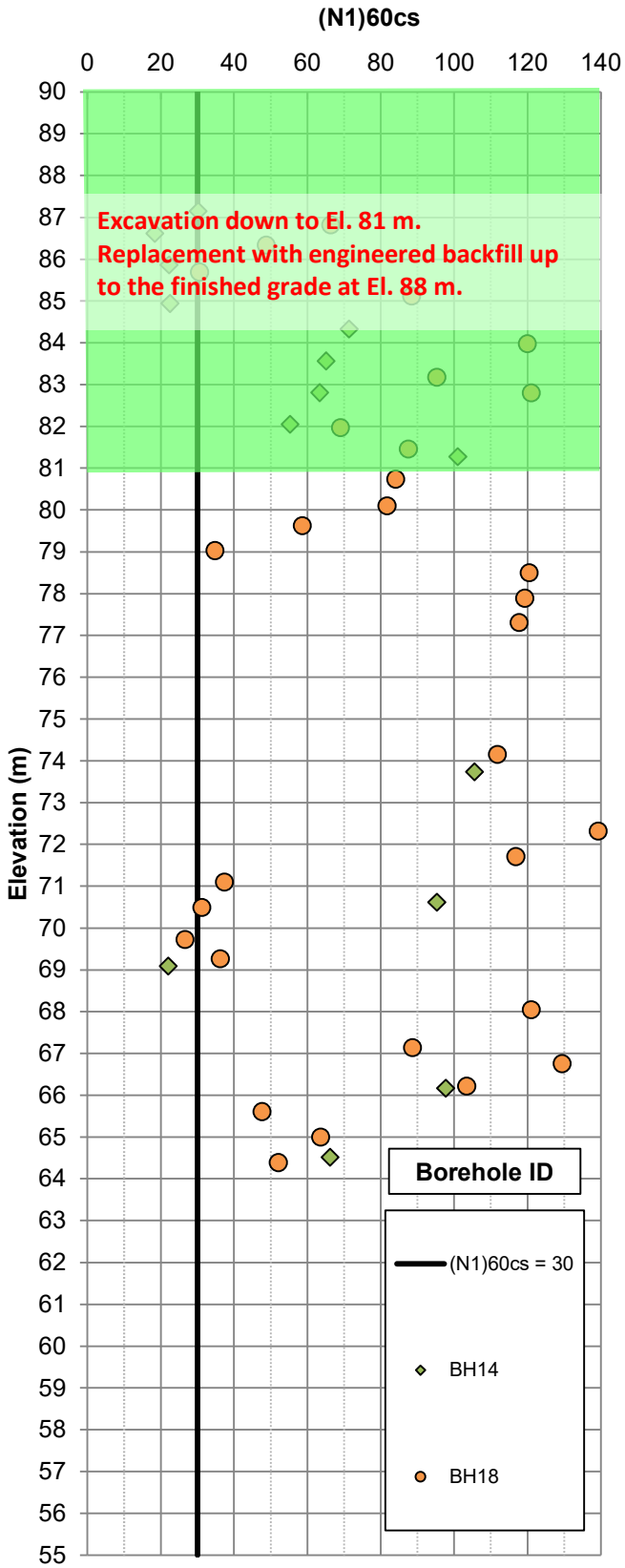


Note: BH13 was screened out based on plasticity criteria, see Figure 7-9 and main text for details

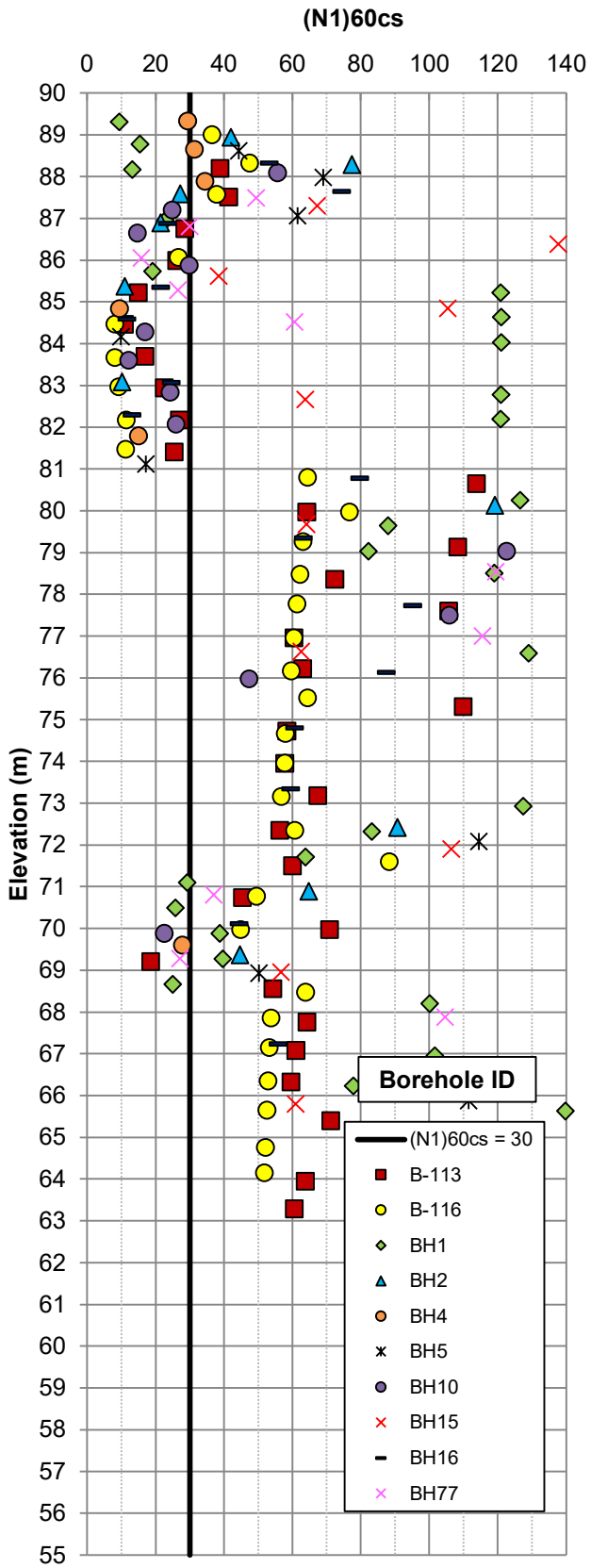
wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment				
	TITLE: Radwaste Building Area $(N_1)_{60cs}$ - Screening Assessment				
CLIENT: Kinetics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-4	REV.

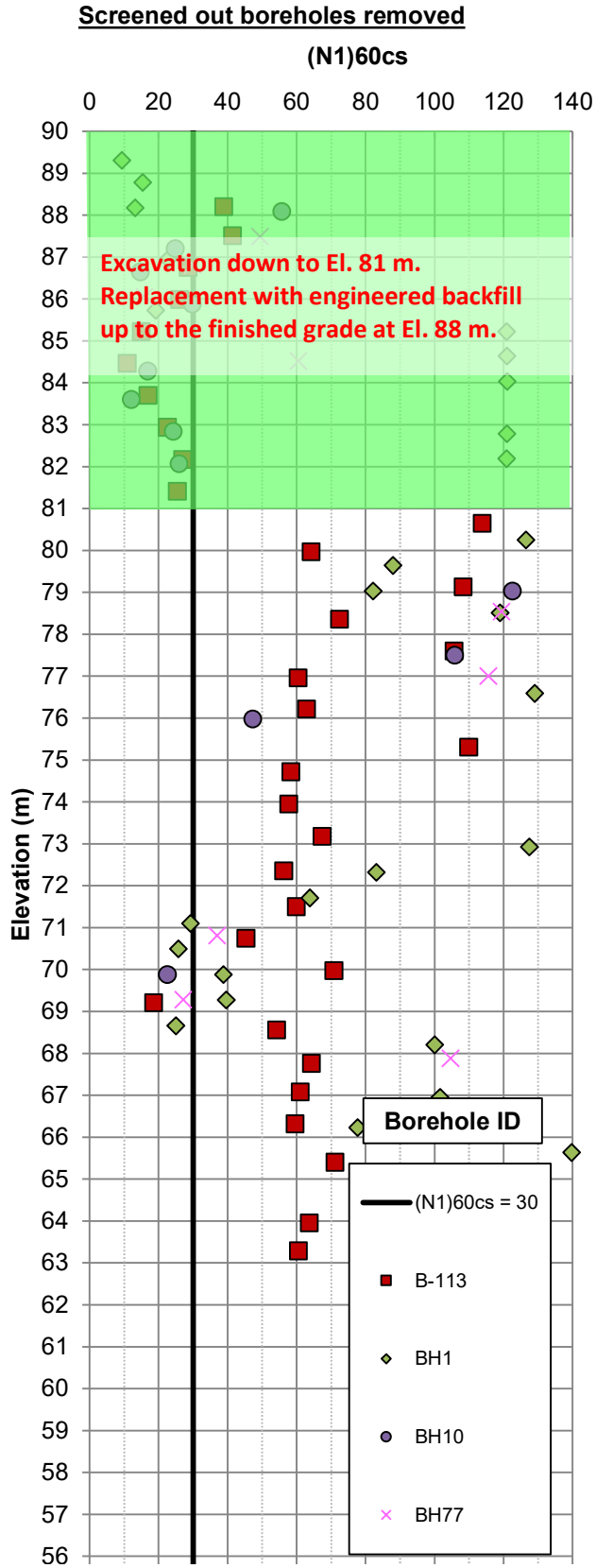


Screened out boreholes removed



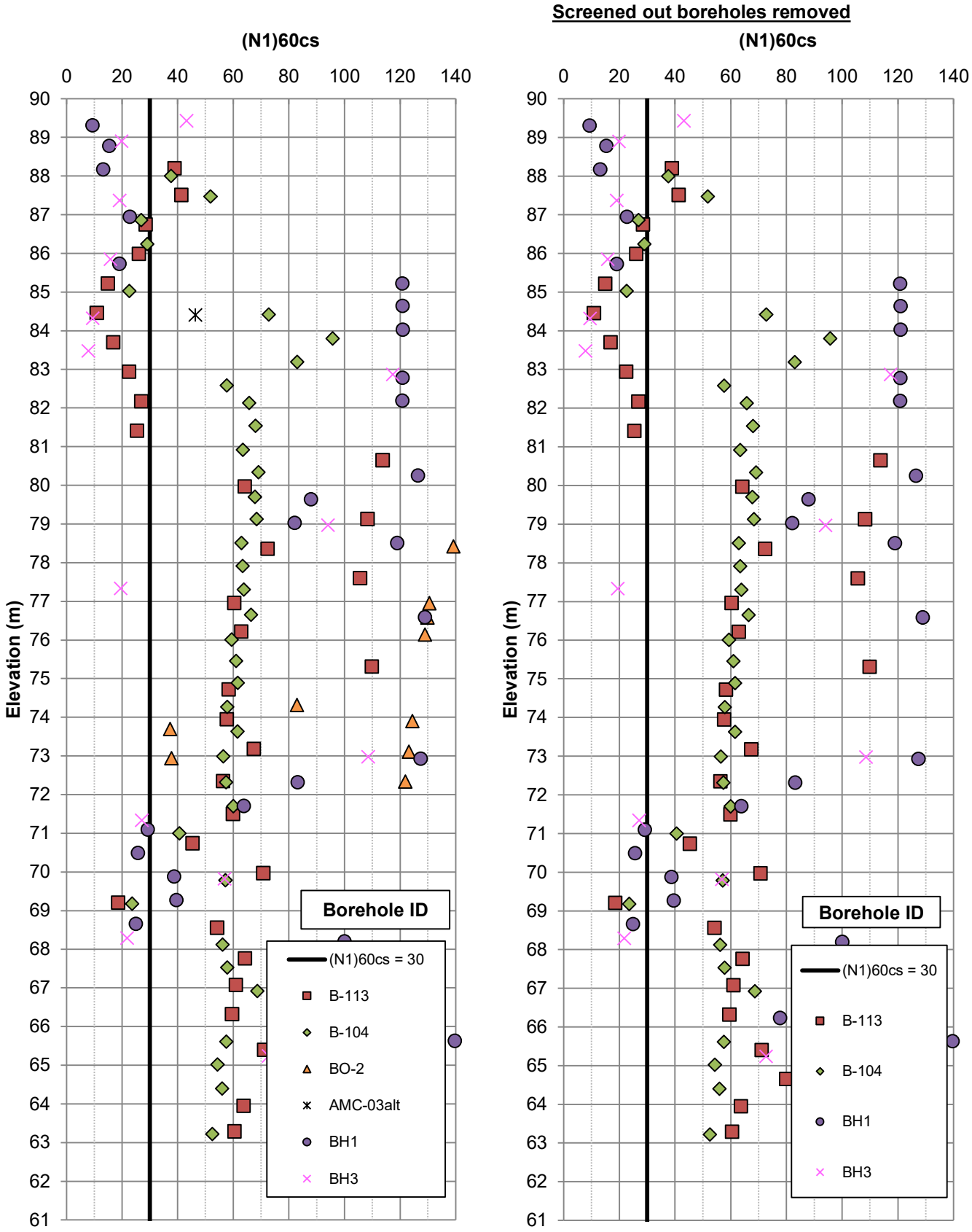
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment			
		TITLE: Control Building Area $(N_1)_{60cs}$ - Screening Assessment			
CLIENT: Kinetics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-5 REV.



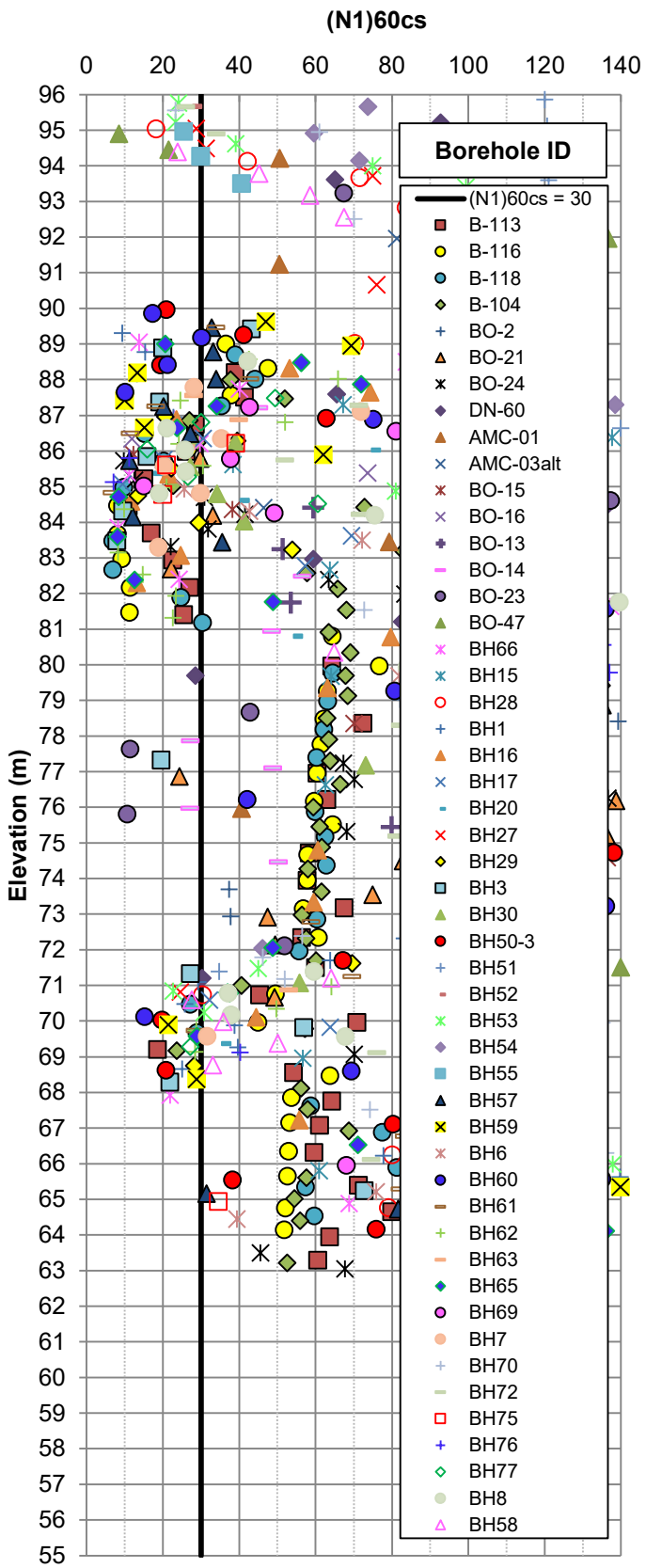


Note: BH4 was screened out based on plasticity criteria, see Figure 7-10 and main text for details

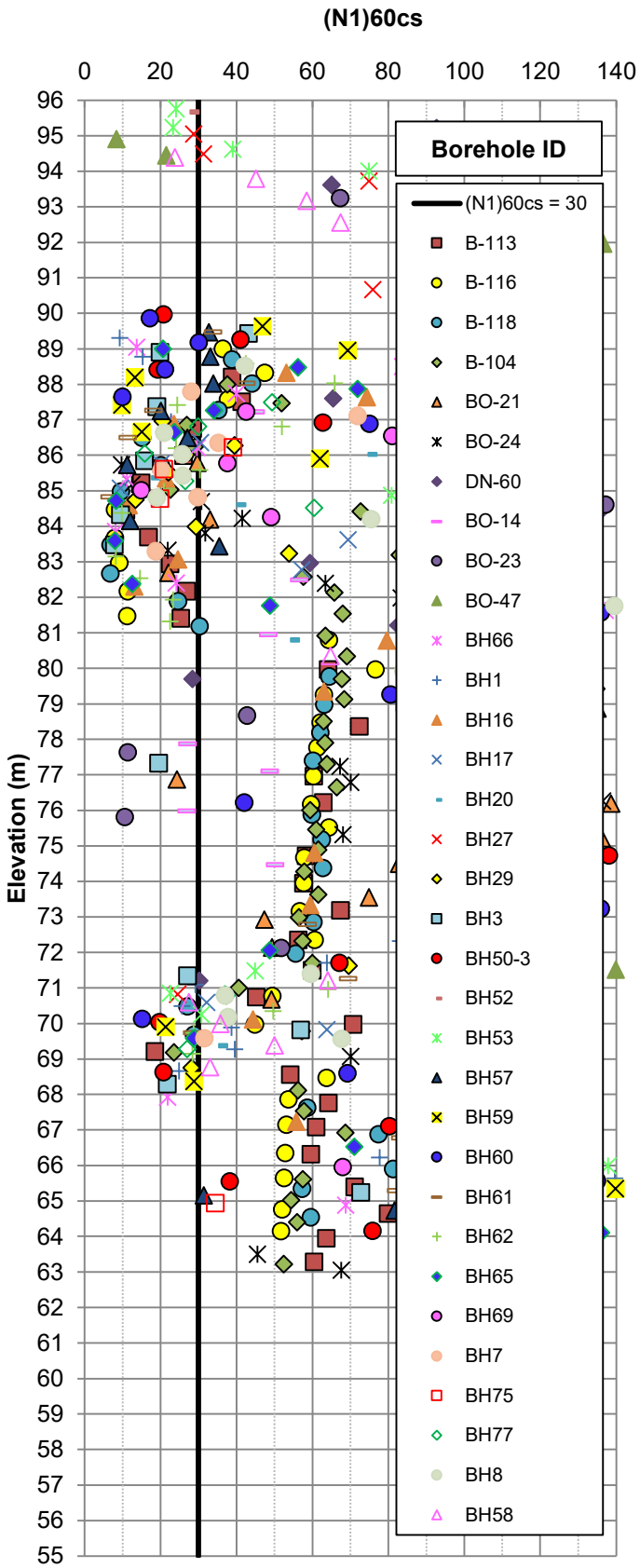
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment			
		TITLE: Reactor Auxiliary Bay Area $(N_1)_{60cs}$ - Screening Assessment			
CLIENT: Kinetics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-6 REV.



wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment			
		TITLE: Independent Spent Fuel Storage Installation $(N_1)_{60cs}$ - Screening Assessment			
CLIENT: Kinetics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-7 REV.



Screened out boreholes removed



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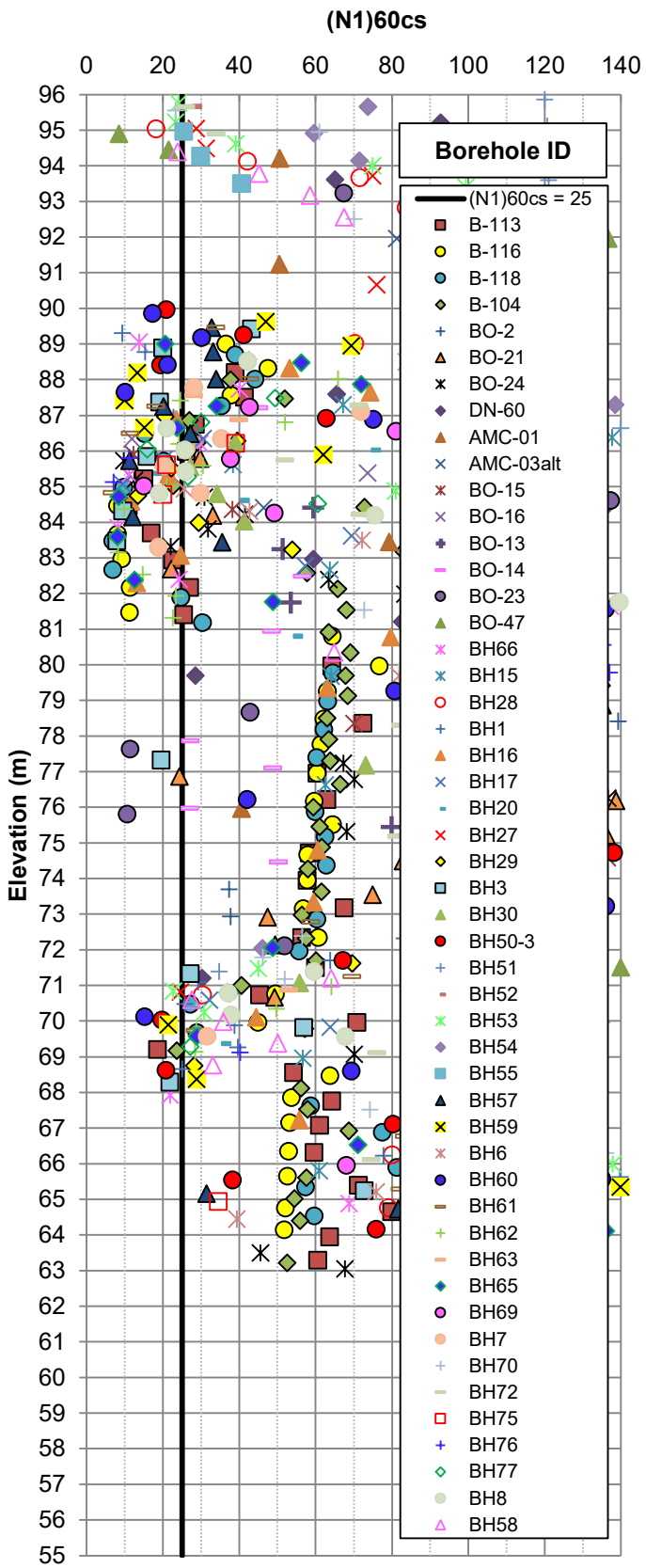
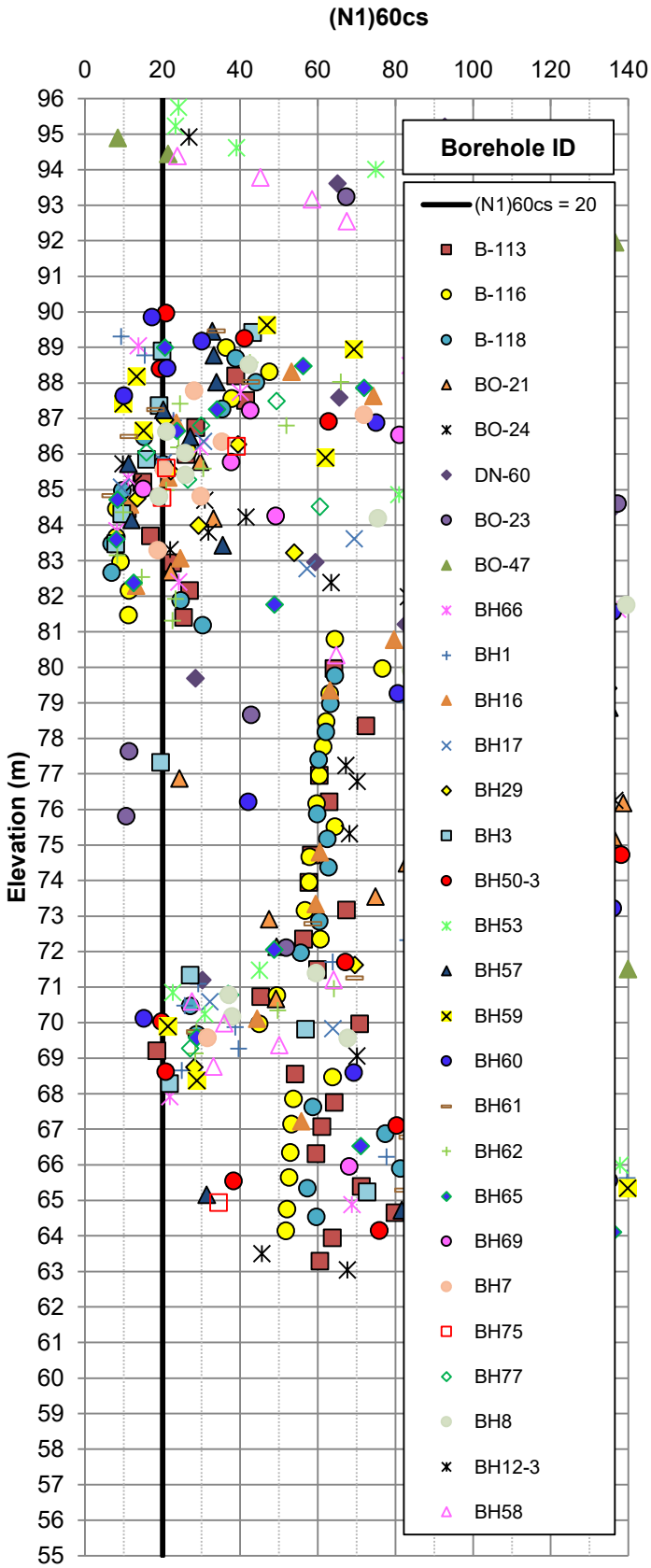
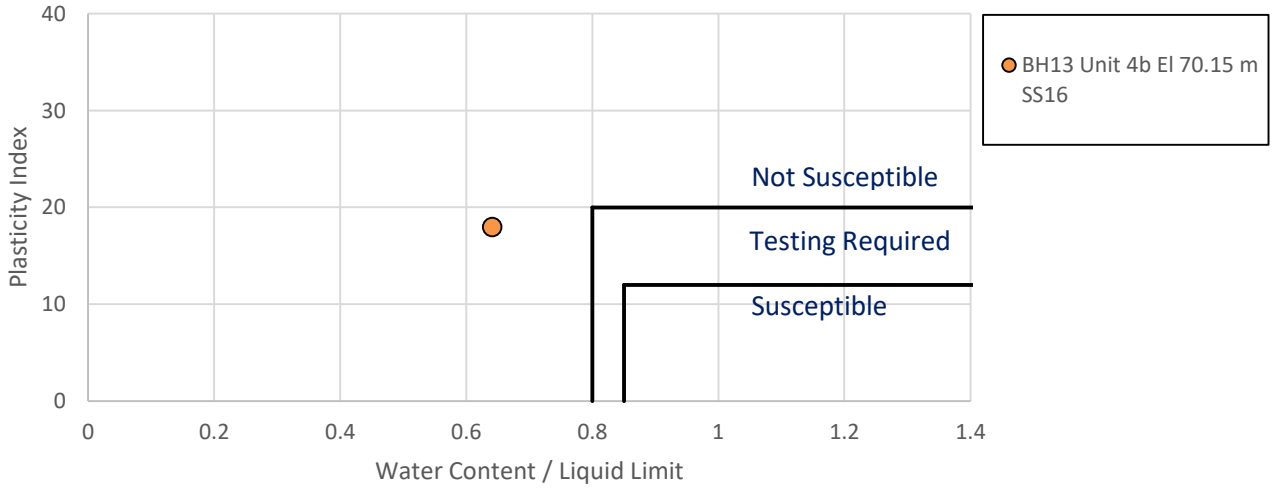
		TITLE: EME Access Route $(N_1)_{60cs}$ - Screening Assessment with cut-off at 30			
CLIENT: Kinetics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-8(a) REV.



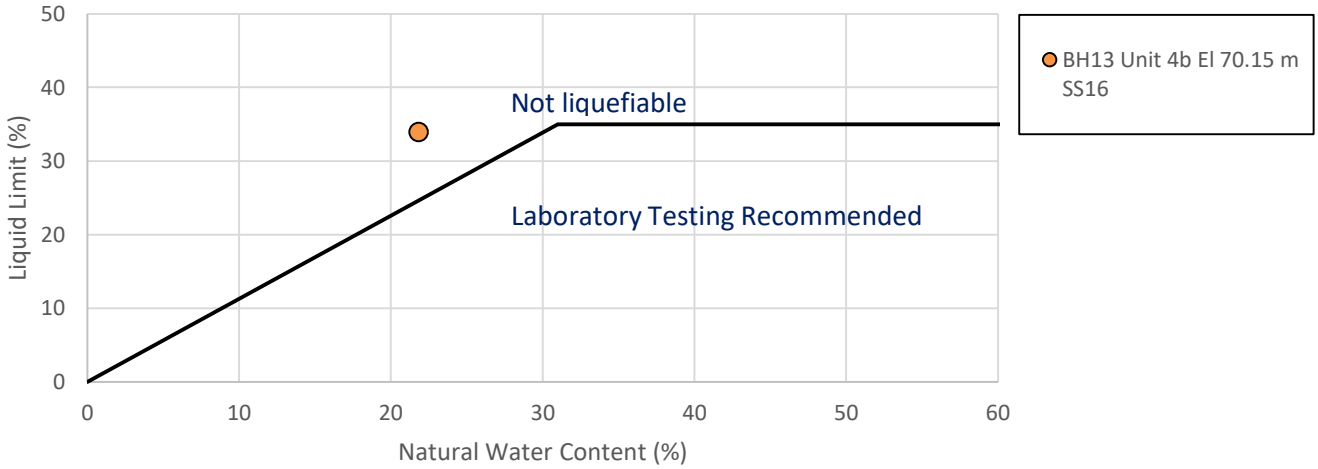
Screened out boreholes removed



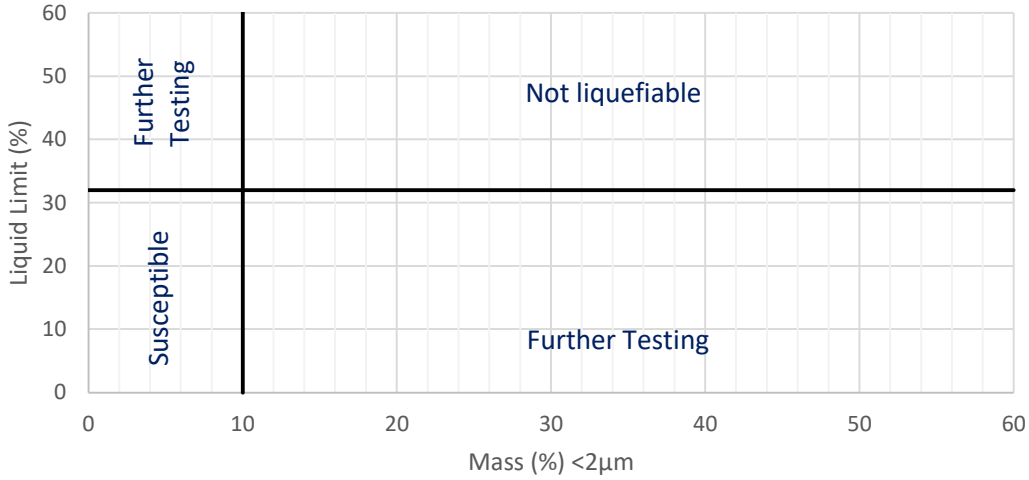
wsp	E&I Canada Limited	PROJECT: PS250-DNGS Liquefaction Study			
		TITLE: EME Access Route $(N_1)_{60cs}$ - Screening Assessment with cut-off at 25			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-8(b)	REV.



(a) Bray et al. (2006)

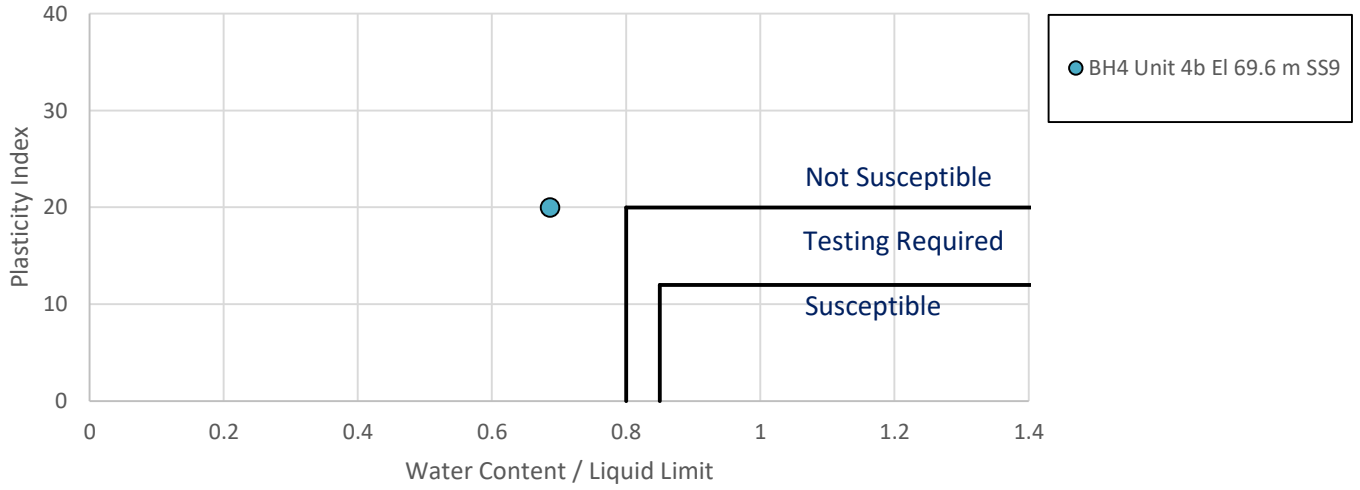


(b) Chinese Criteria

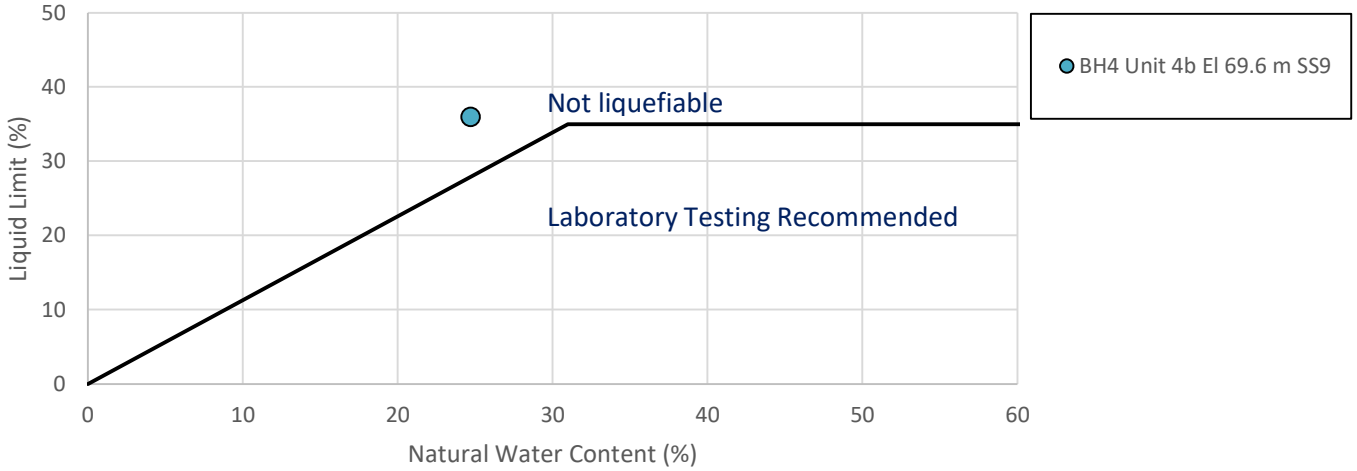


(c) Andrews and Martin (2000)

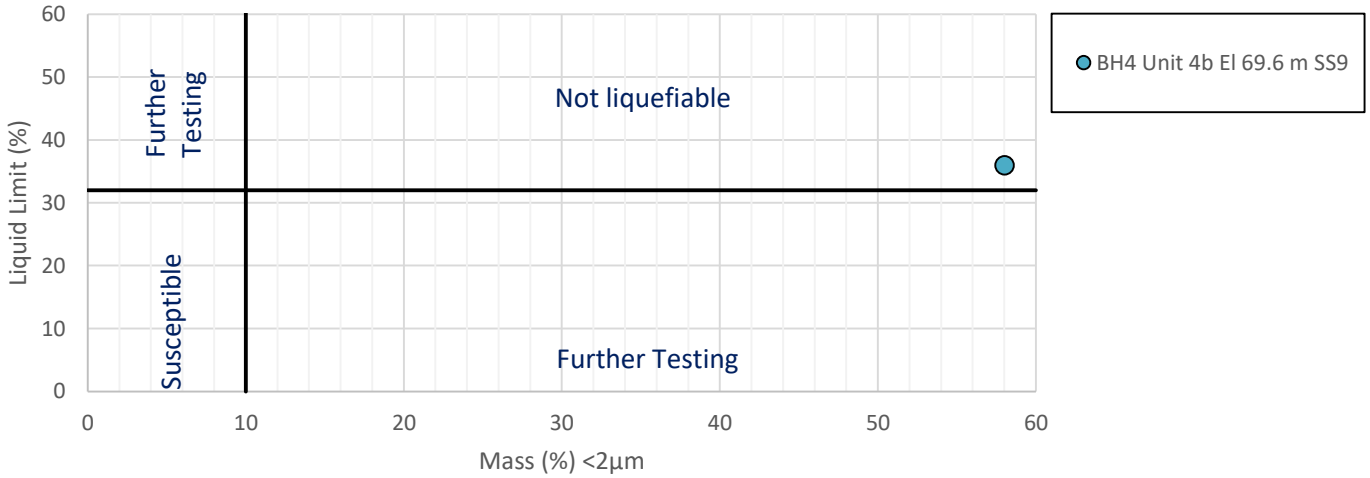
wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment				
	TITLE: Liquefaction Screening Assessment - Plasticity and Grain Size Criteria - Rad Waste Building Area (No. 3)				
CLIENT: Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-9	REV.



(a) Bray et al. (2006)



(b) Chinese Criteria



(c) Andrews and Martin (2000)

wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Assessment				
	TITLE: Liquefaction Screening Assessment - Plasticity and Grain Size Criteria - Reactor Auxiliary Bay Area (No. 5)				
CLIENT: Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 7-10	REV.

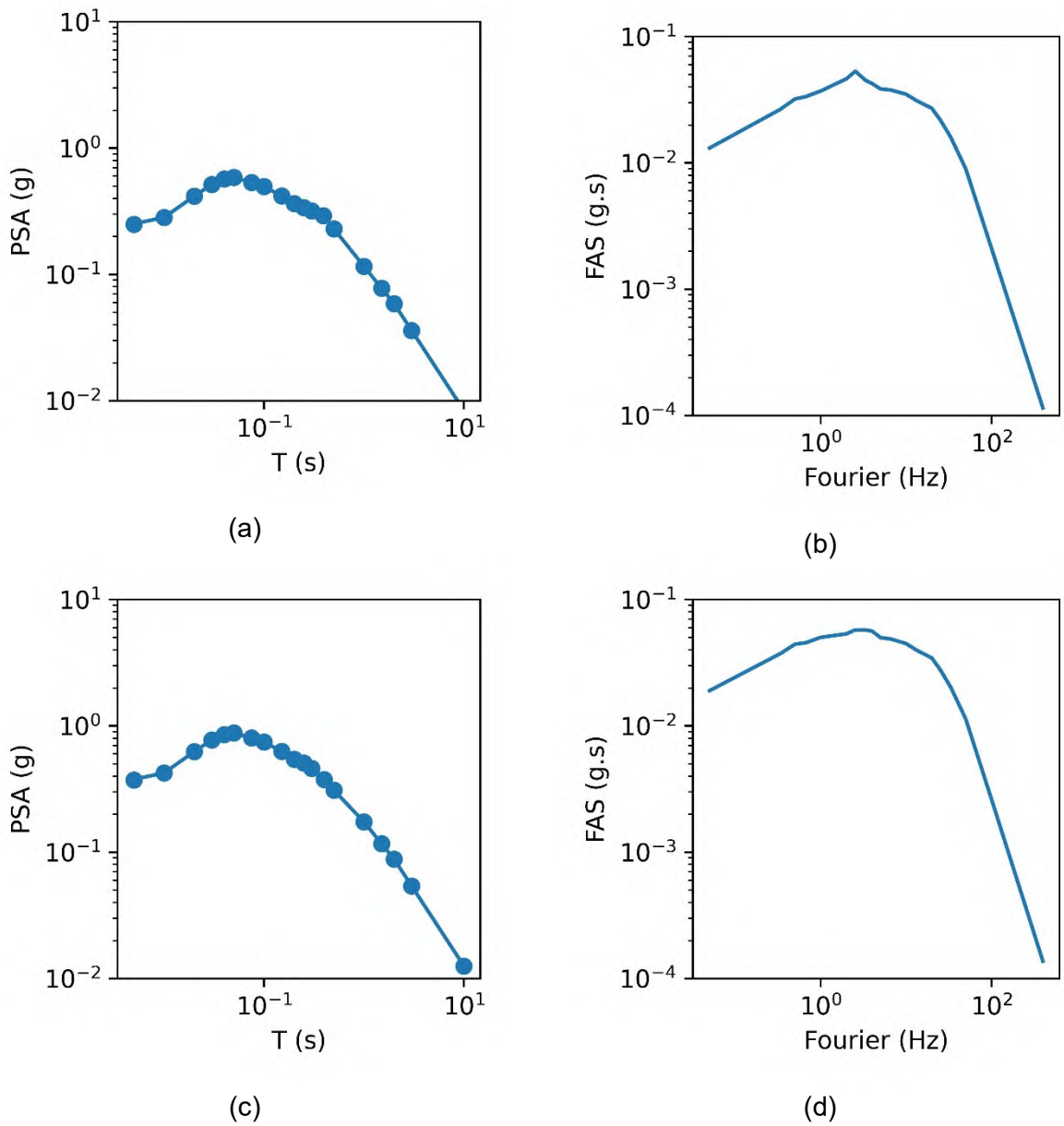
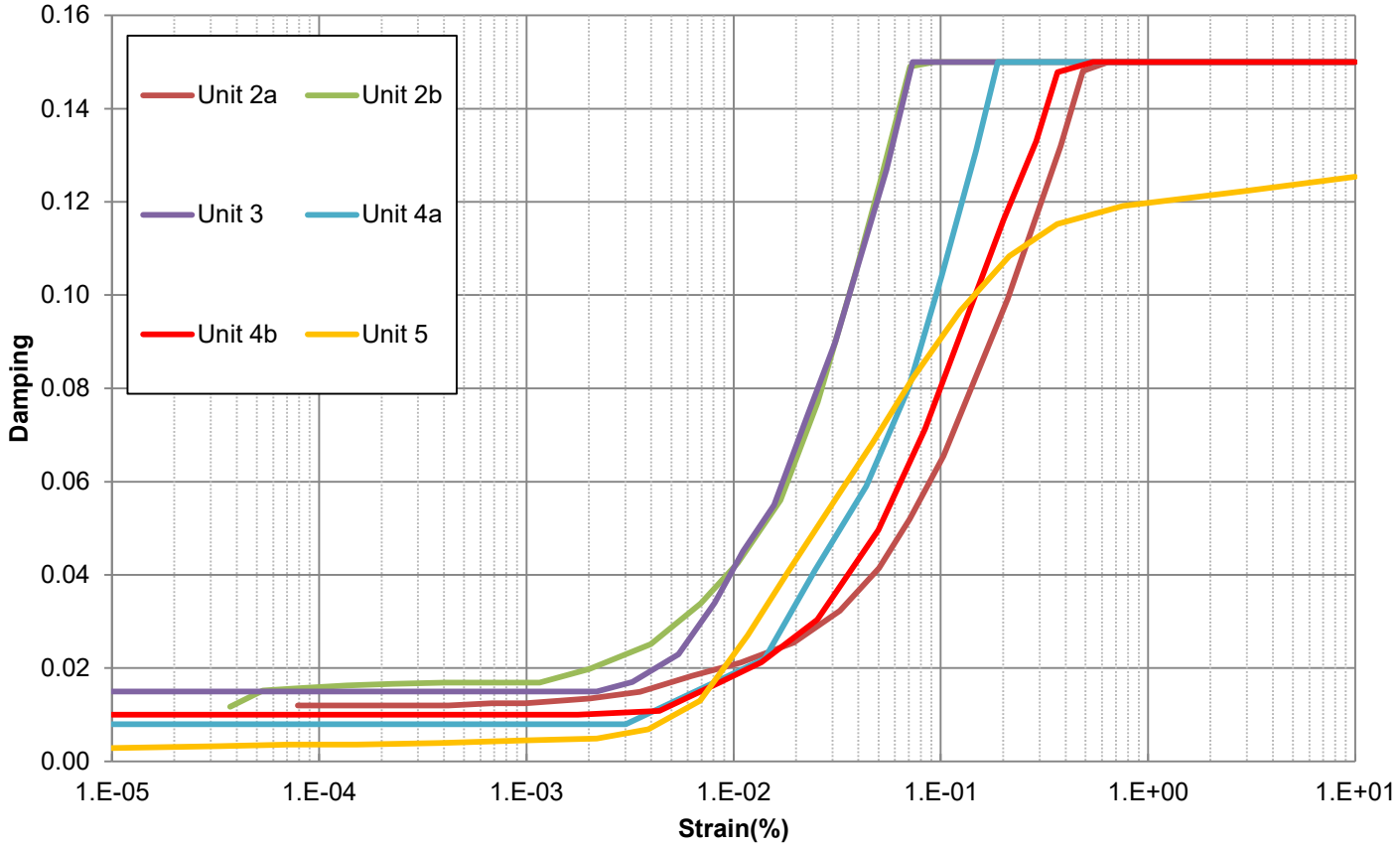
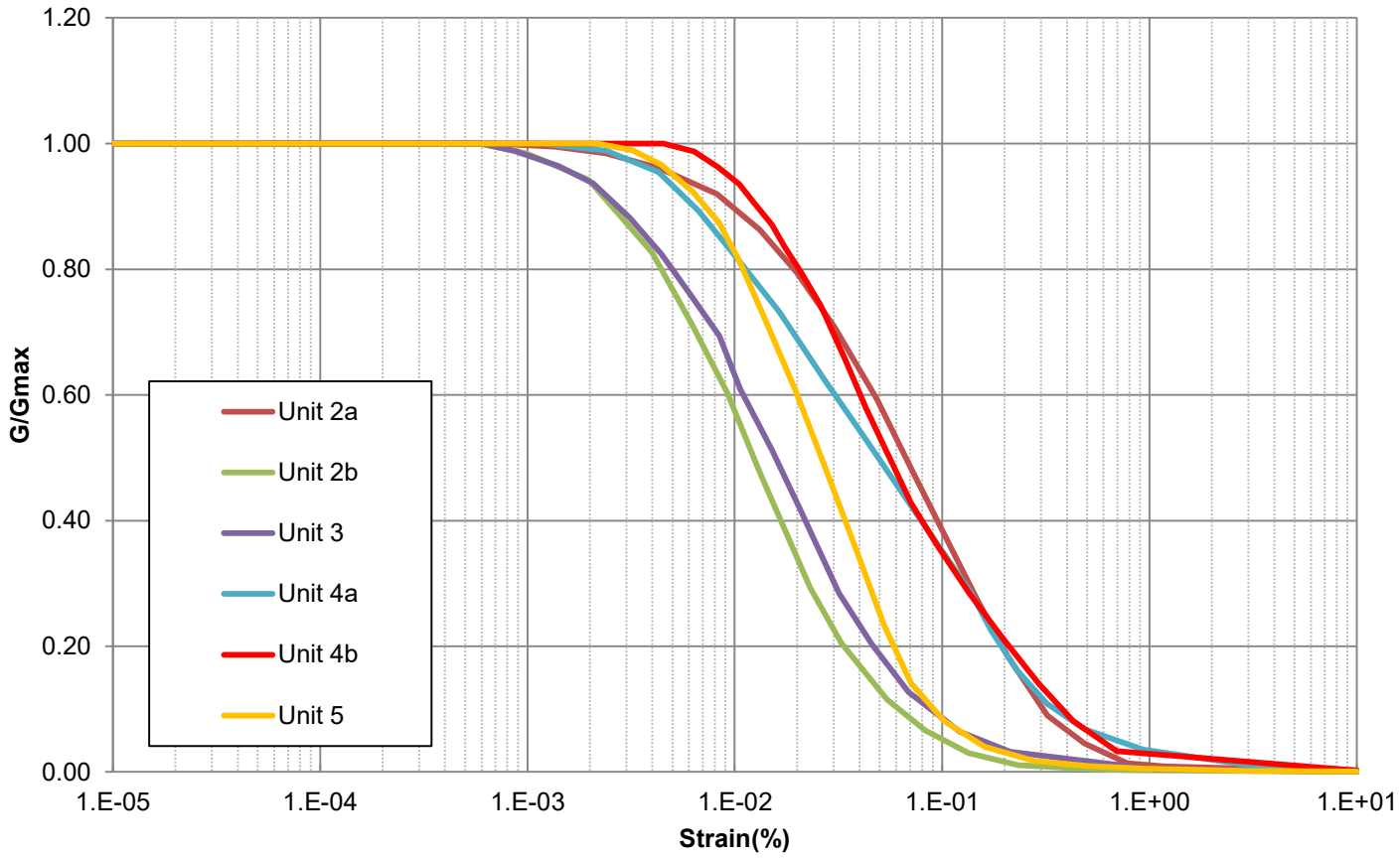
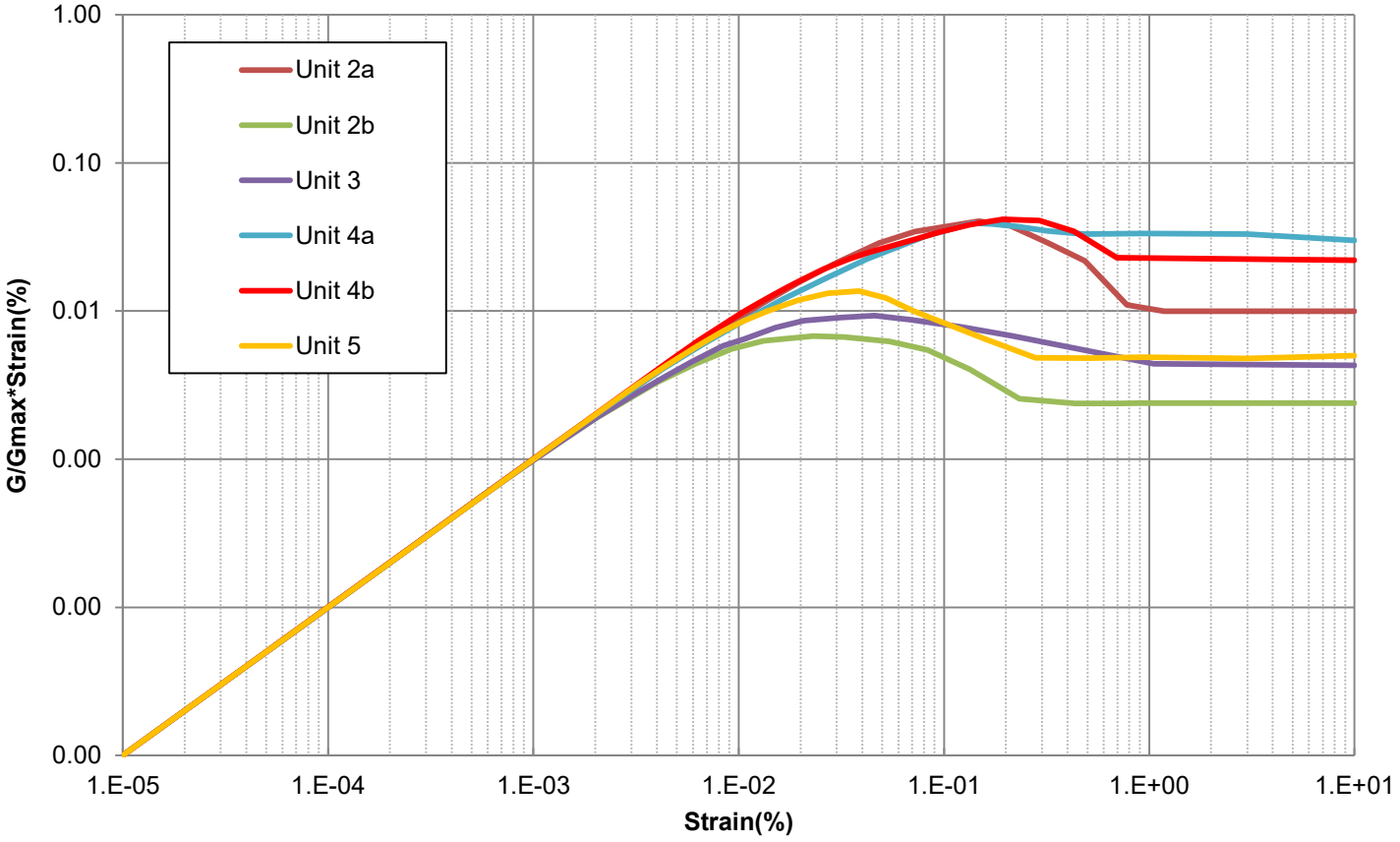


Figure 8-1. Input motion used in liquefaction assessment defined based on DBE and BDBE response spectra (a) DBE response spectra (b) Fourier amplitude spectrum compatible with DBE response spectra (c) BDBE response spectra (d) Fourier amplitude compatible with response spectra

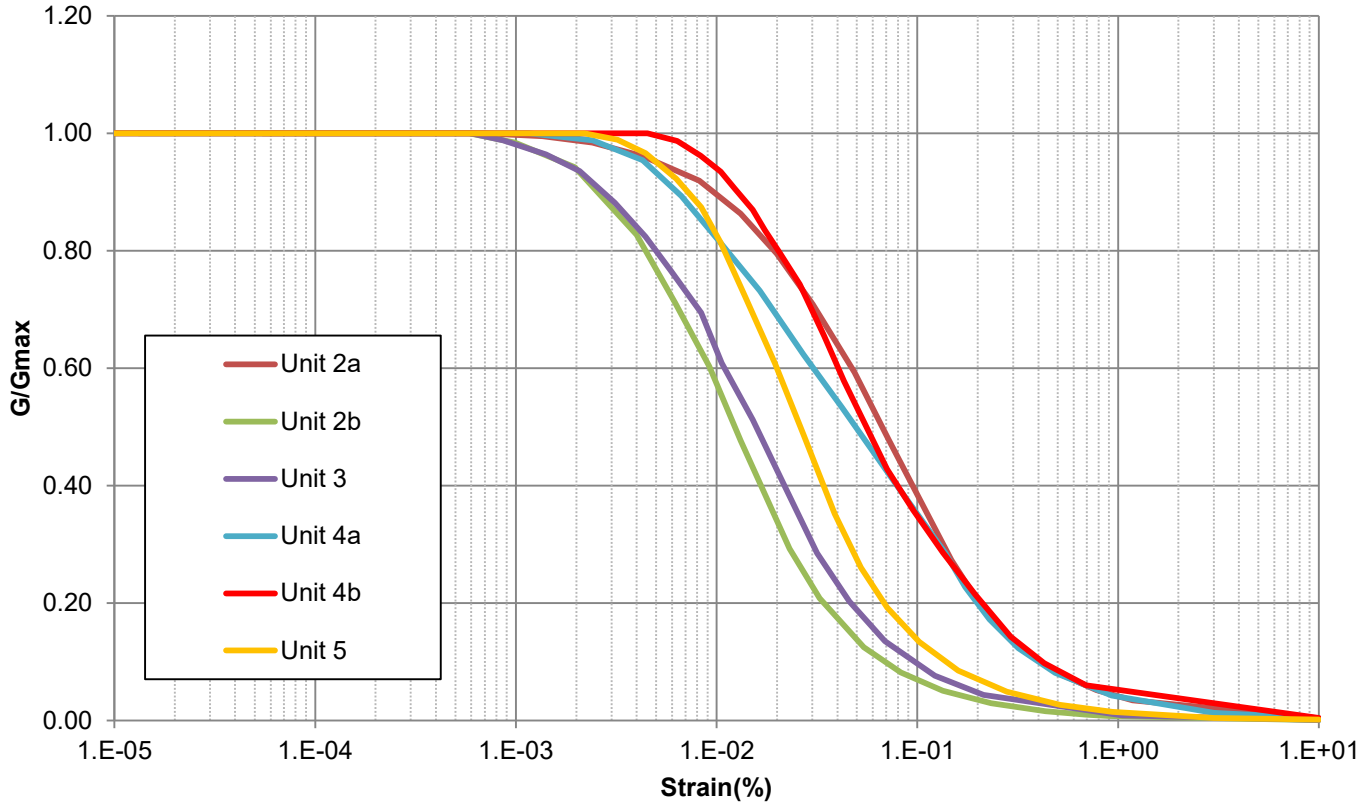


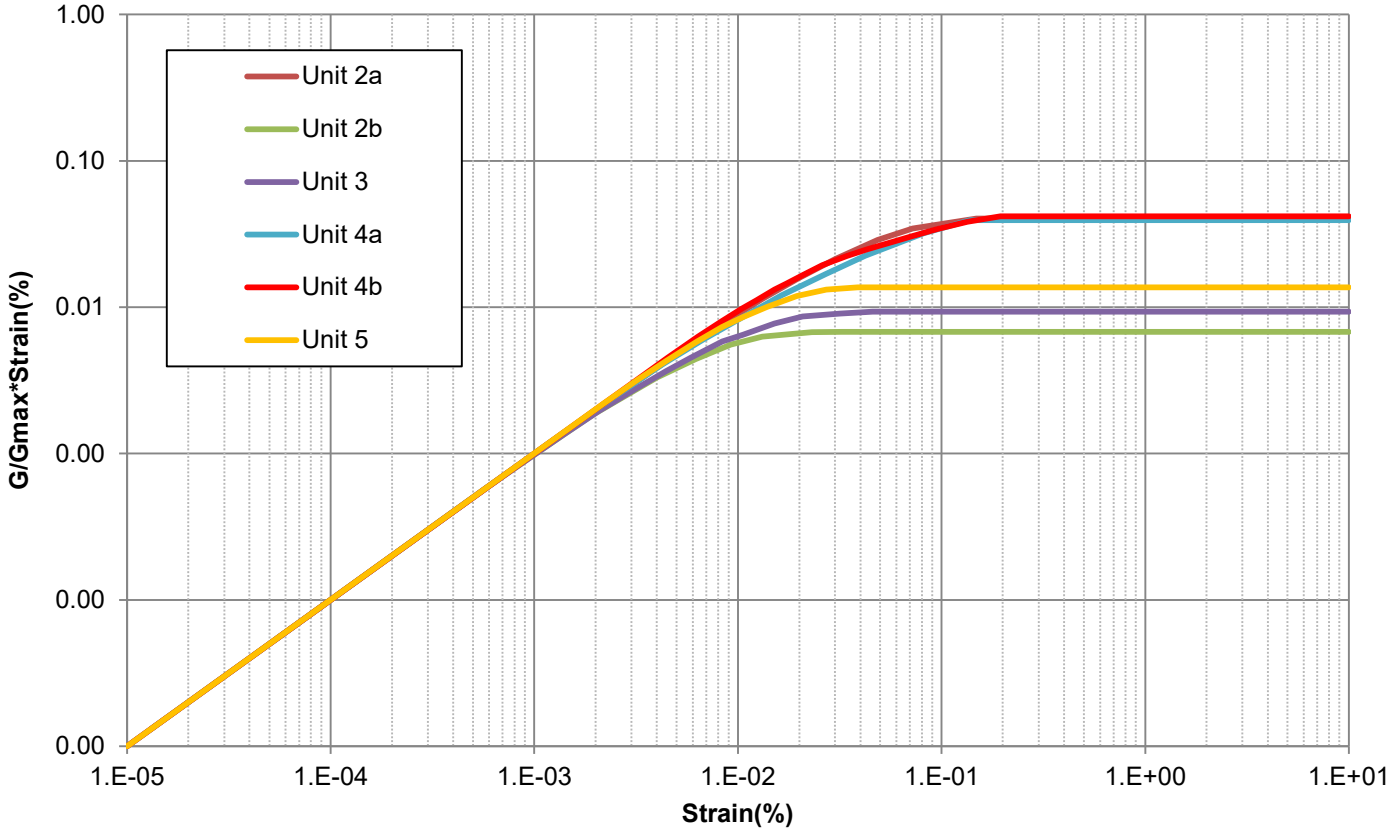
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: Damping Curves			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 8-2	REV.



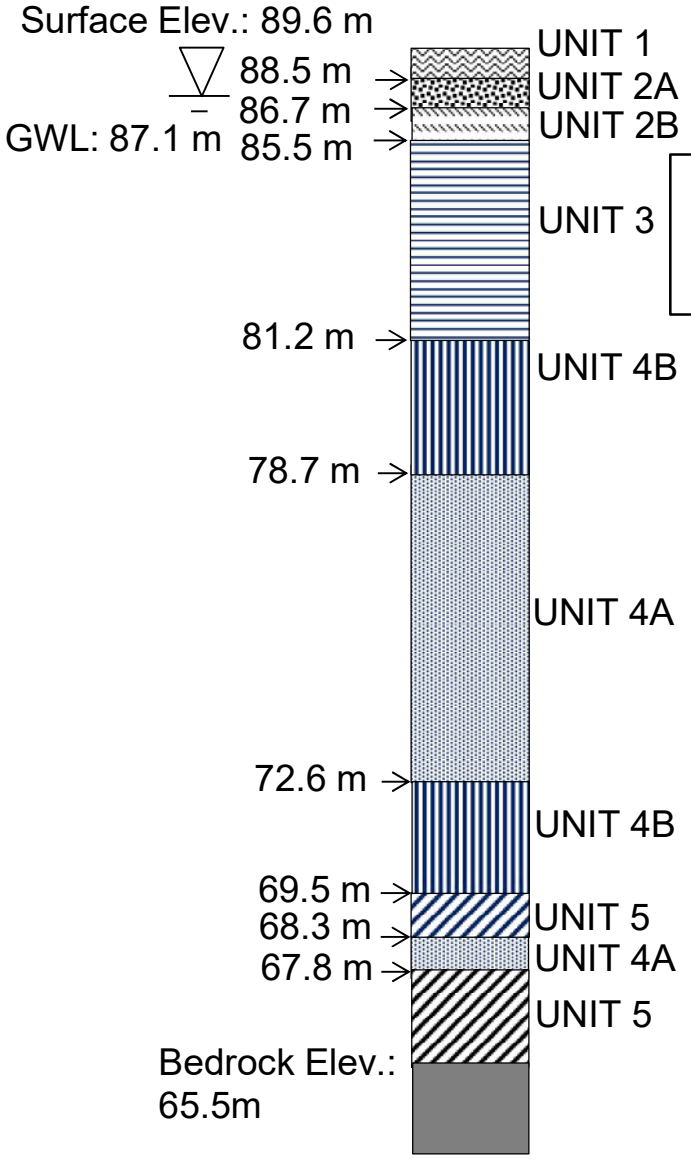


wsp E&I Canada Limited	PROJECT: DNNP Liquefaction Study				
	TITLE: Unmodified Dynamic Shear Modulus Reduction Curves				
CLIENT: Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 8-3	REV.



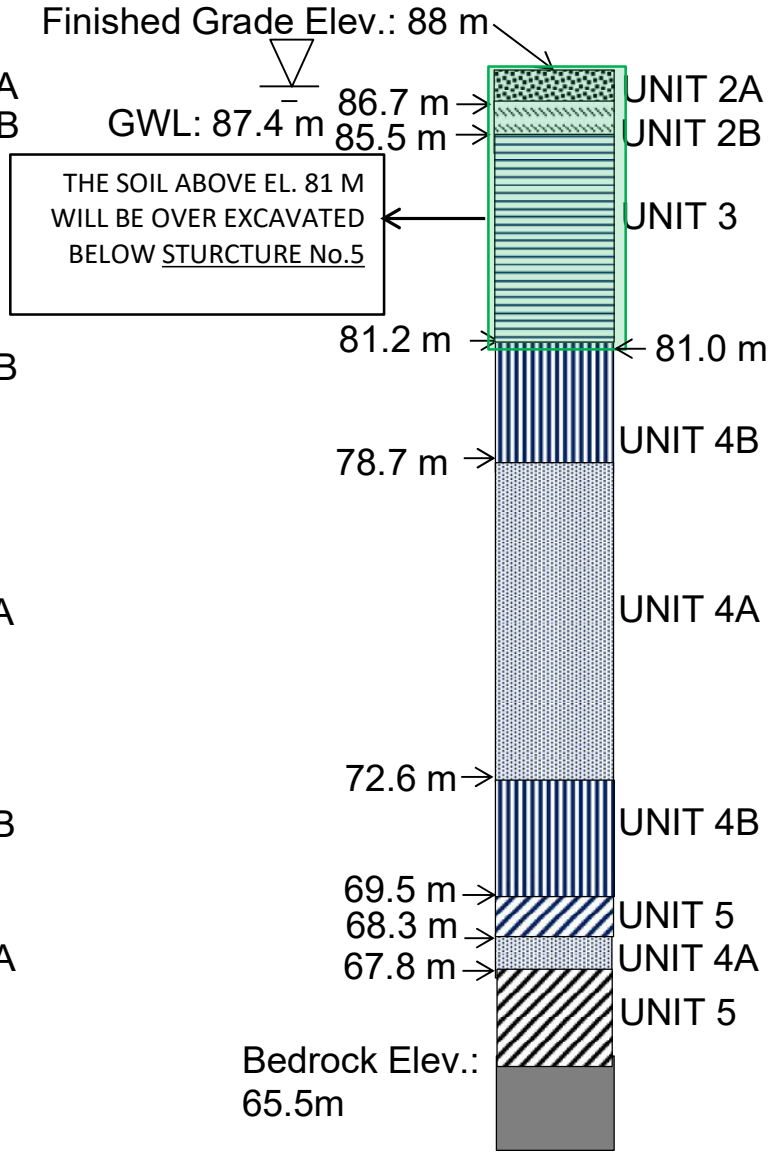


wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: Modified Dynamic Shear Modulus Reduction Curves			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 8-4 REV.



Existing soil profile

BH1



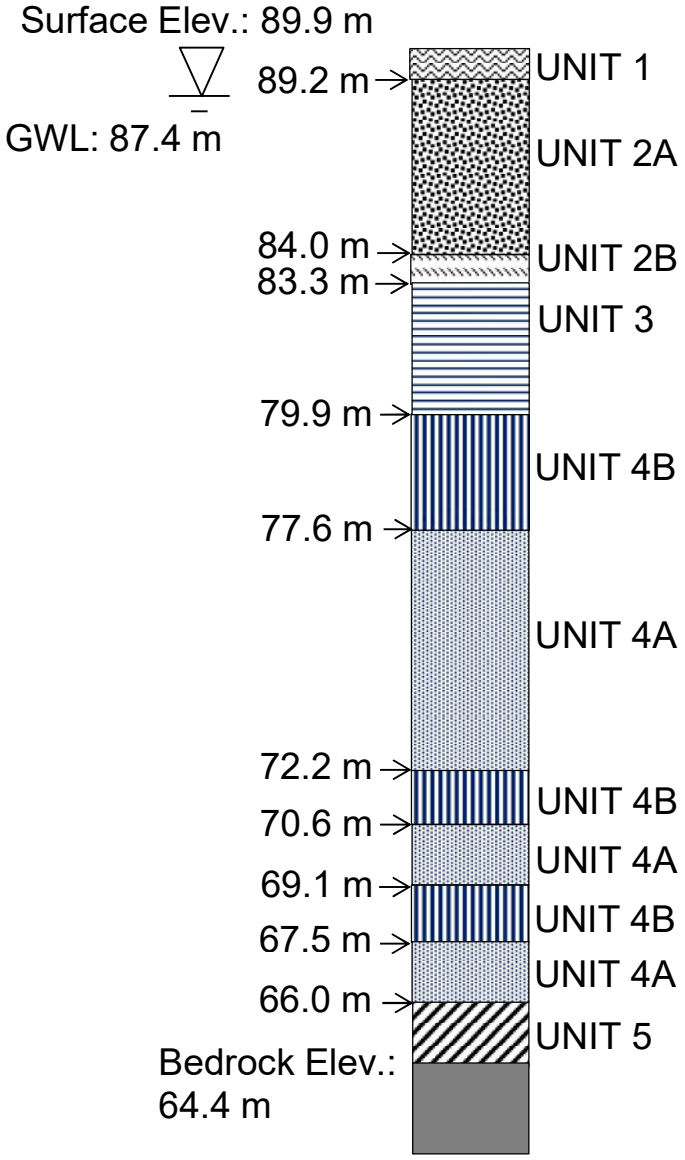
Post-construction soil profile

Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for details)

- ENGINEERED FILL
- FILL/TOPSOIL - UNIT 1
- SURFICIAL GALCIOLACUSTRINE - UNIT 2A
- SURFICIAL GLACIOLACUSTRINE - UNIT 2B
- UPPER TILL - UNIT 3
- INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
- INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
- LOWER TILL - UNIT 5
- BEDROCK

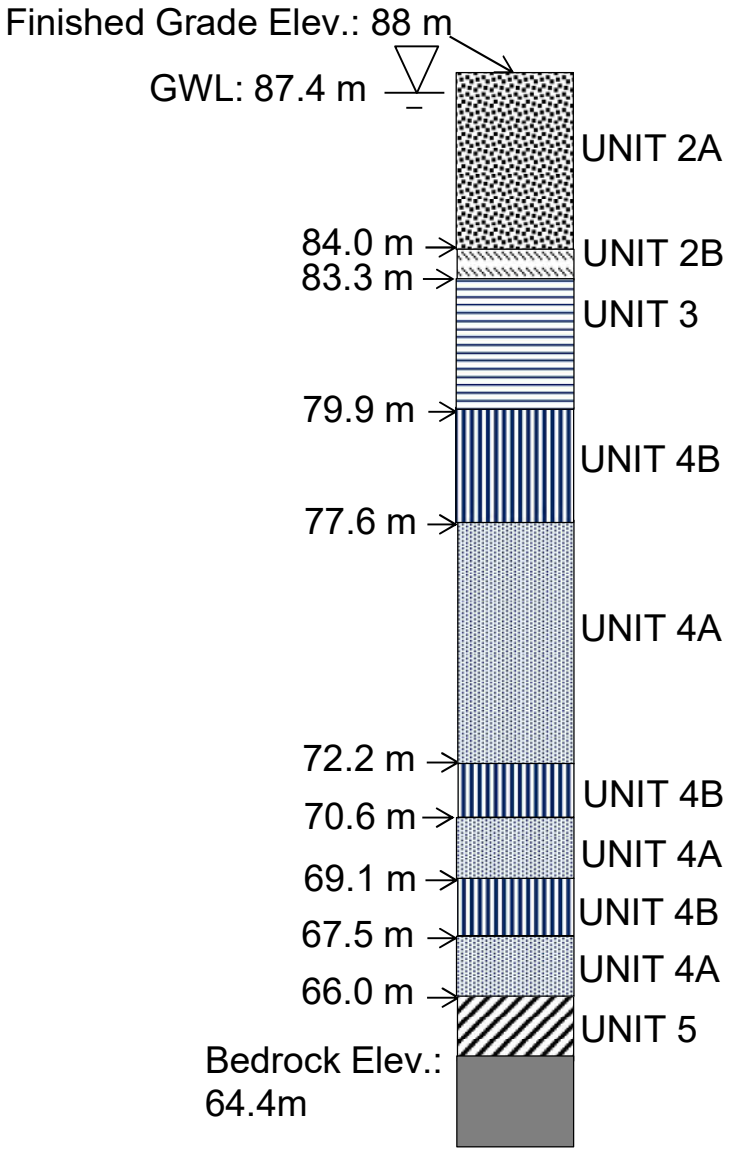
NTS

wsp	E&I Canada Limited	PROJECT: DNNP Liqurfaction study			
		TITLE: Soil Profile BH1 - Reactor Auxiliary Bay Area (No. 5) & Independent Spent Fuel Storage Installation Area (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-1 / REV.

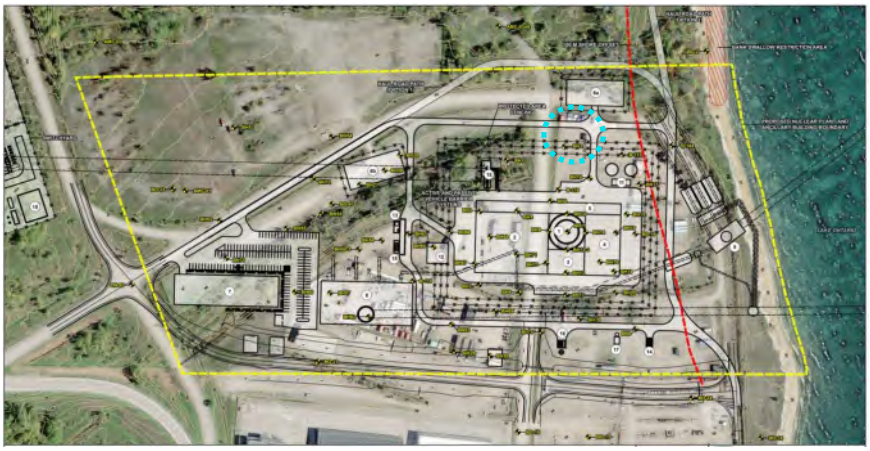


Existing soil profile

BH3



Post-construction soil profile

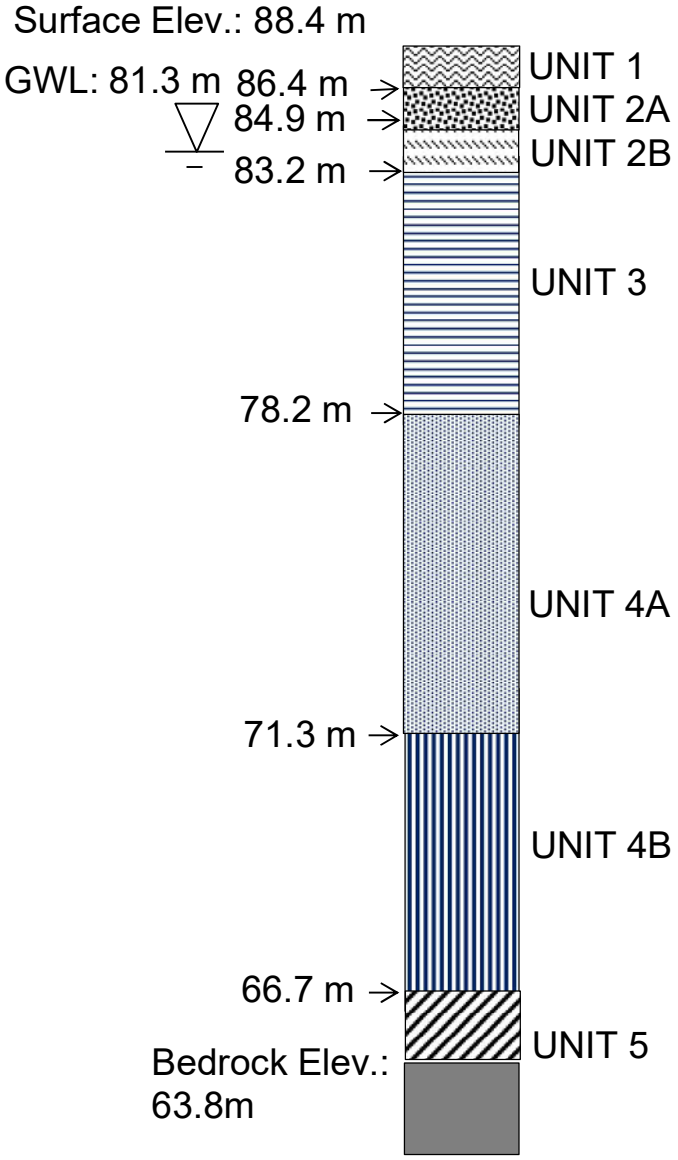


Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

ENGINEERED FILL
FILL/TOPSOIL - UNIT 1
SURFICIAL GALCIOLACUSTRINE - UNIT 2A
SURFICIAL GLACIOLACUSTRINE - UNIT 2B
UPPER TILL - UNIT 3
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
LOWER TILL - UNIT 5
BEDROCK

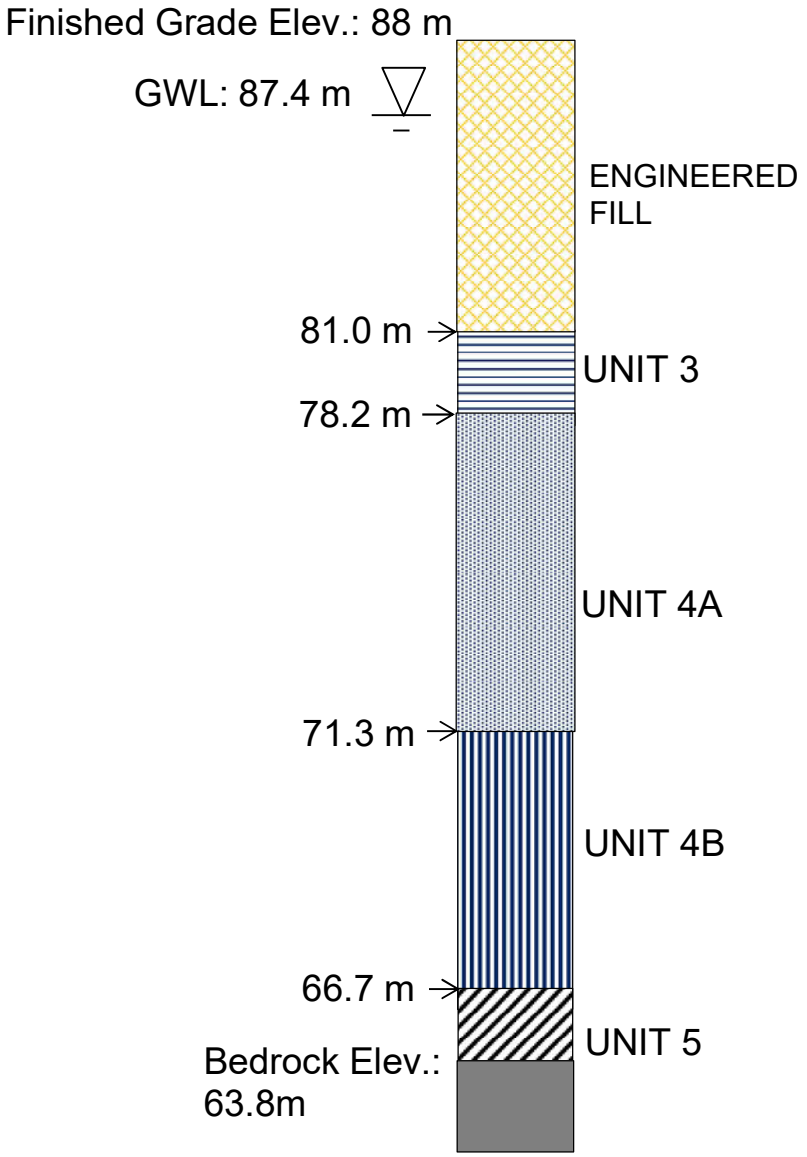
NTS

wsp	E&I Canada Limited	PROJECT: DNNP Liqurfaction study			
		TITLE: Soil Profile BH3 - Independent Spent Fuel Storage Installation Area (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-2 / REV.



Existing soil profile

BH10



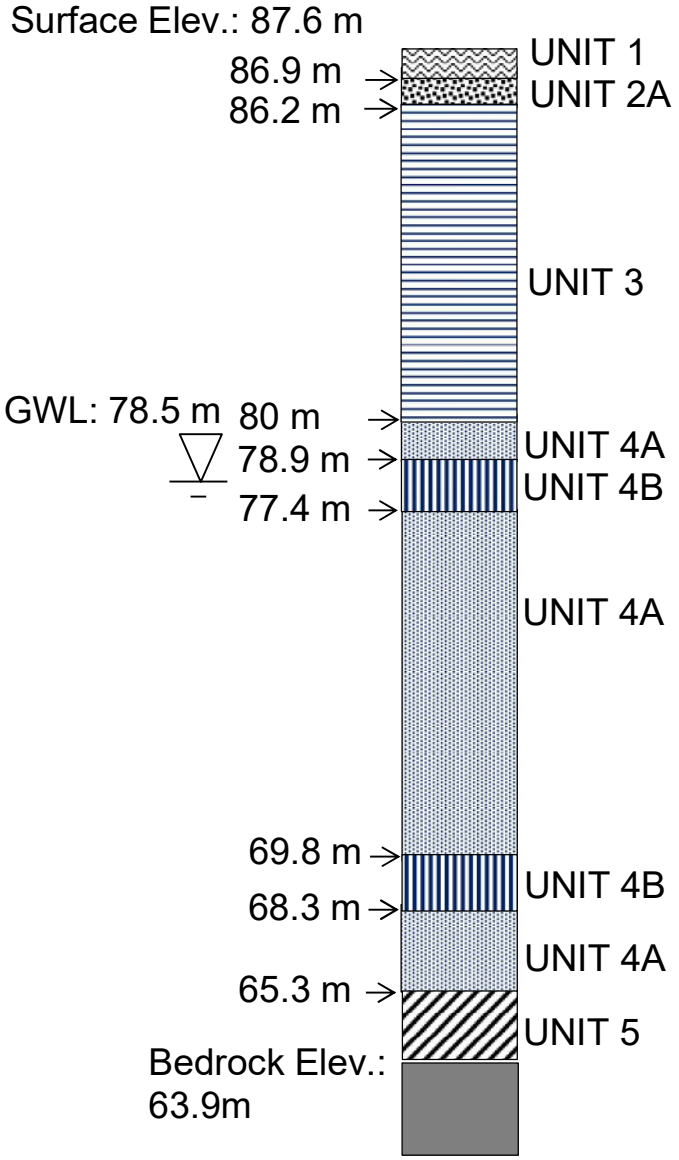
Post-construction soil profile

Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

ENGINEERED FILL
FILL/TOPSOIL - UNIT 1
SURFICIAL GALCIOLACUSTRINE - UNIT 2A
SURFICIAL GLACIOLACUSTRINE - UNIT 2B
UPPER TILL - UNIT 3
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
LOWER TILL - UNIT 5
BEDROCK

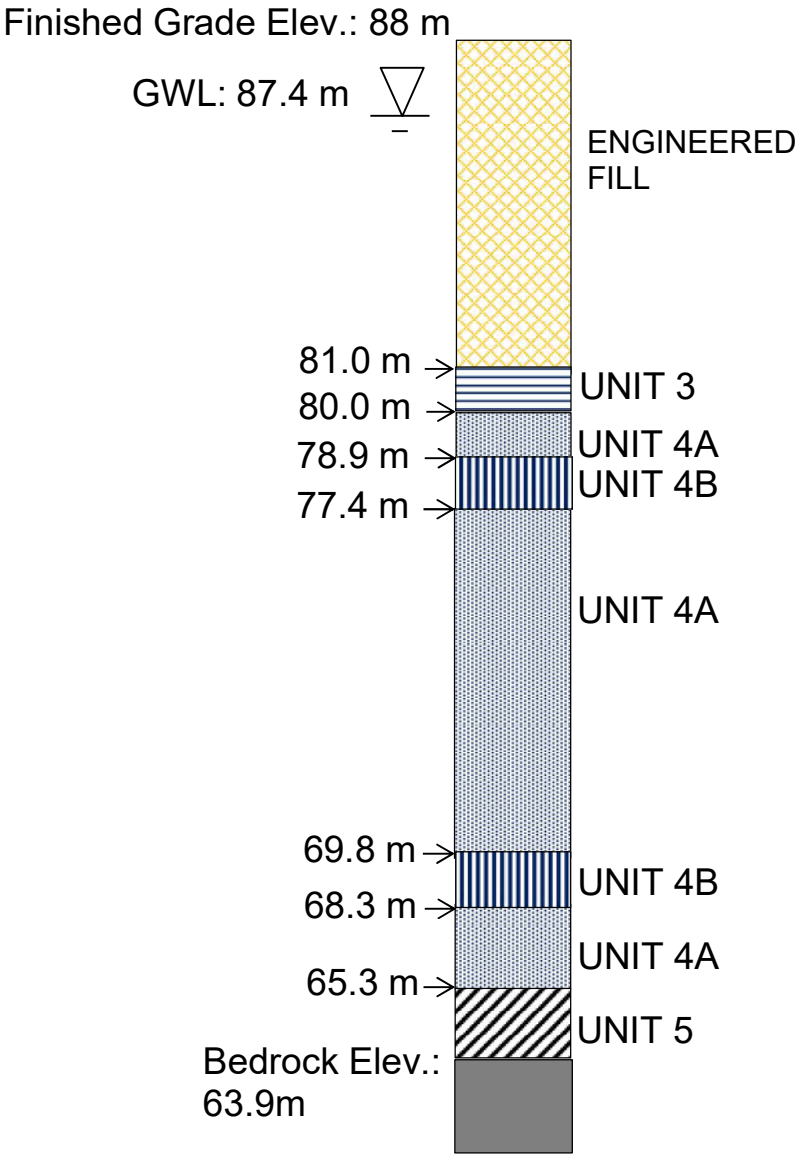
NTS

wsp	E&I Canada Limited	PROJECT:	DNNP Liqurfaction study		
		TITLE:	Soil Profile BH10 - Reactor Auxiliary Bay Area (No. 5)		
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-3 / REV.



Existing soil profile

BH14



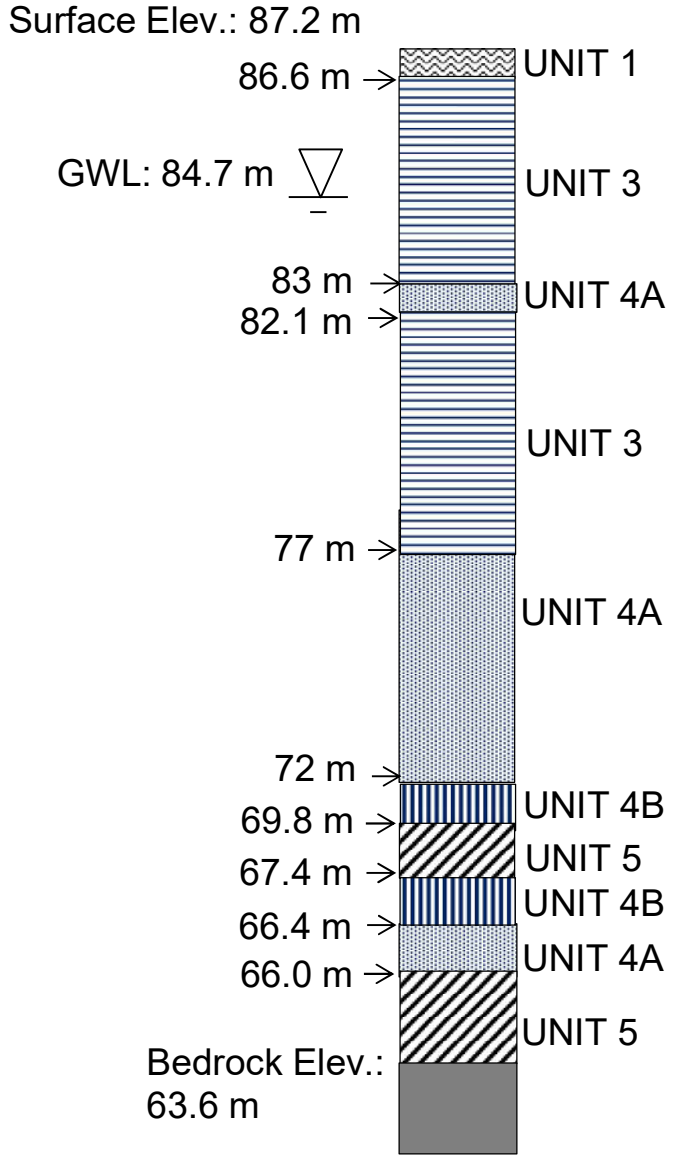
Post-construction soil profile

Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

ENGINEERED FILL
FILL/TOPSOIL - UNIT 1
SURFICIAL GALCIOLACUSTRINE - UNIT 2A
SURFICIAL GLACIOLACUSTRINE - UNIT 2B
UPPER TILL - UNIT 3
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
LOWER TILL - UNIT 5
BEDROCK

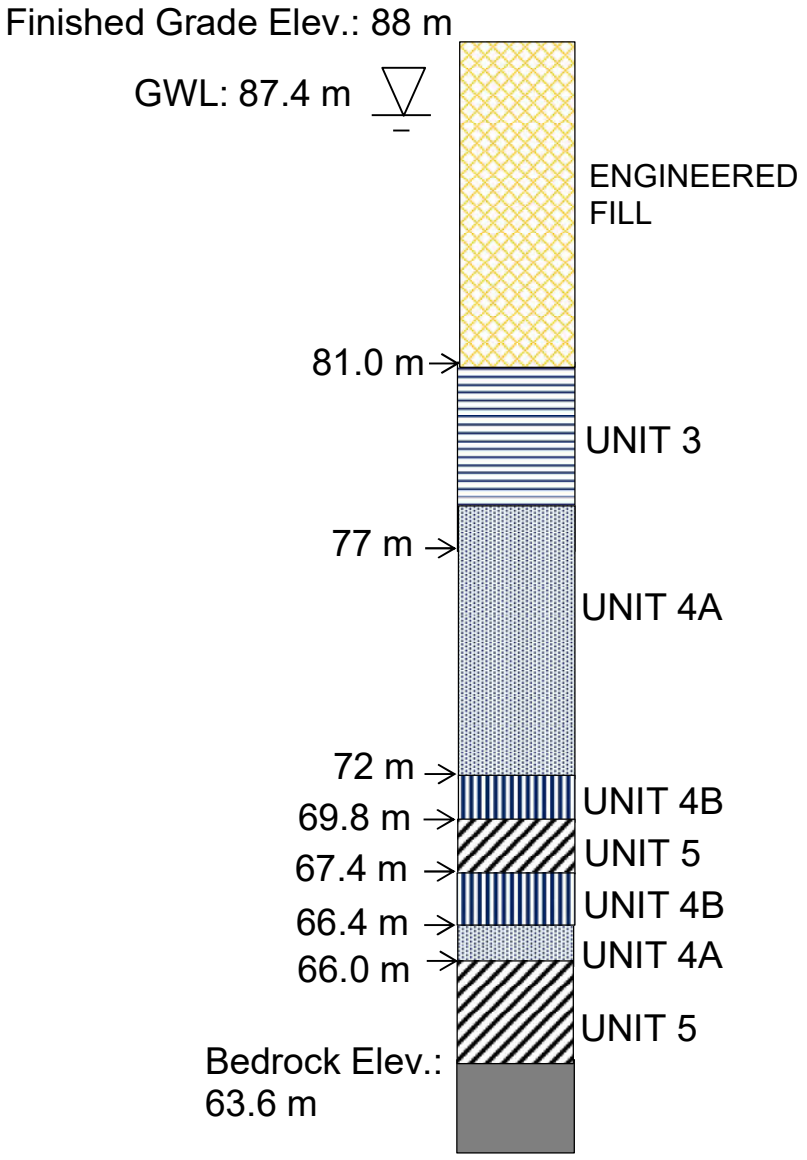
NTS

wsp **E&I Canada Limited**	PROJECT: **DNNP Liqurfaction study**				
	TITLE: Soil Profile BH14 - Control Building Area (No. 4)				
CLIENT: **Kinetrics**	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-4	REV.

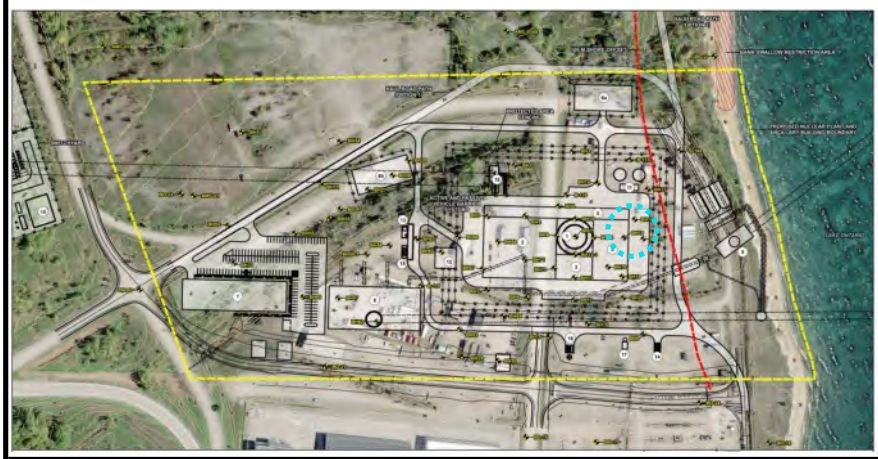


Existing soil profile

BH18



Post-construction soil profile

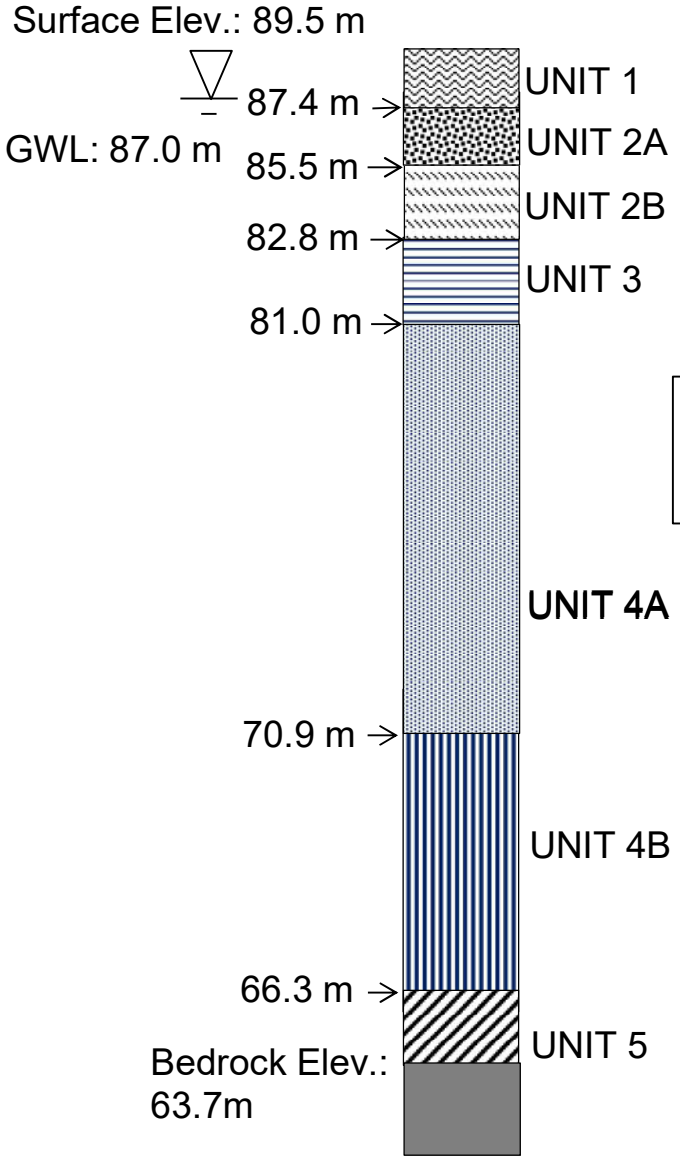


Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

ENGINEERED FILL
FILL/TOPSOIL - UNIT 1
SURFICIAL GALCIOLACUSTRINE - UNIT 2A
SURFICIAL GLACIOLACUSTRINE - UNIT 2B
UPPER TILL - UNIT 3
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
LOWER TILL - UNIT 5
BEDROCK

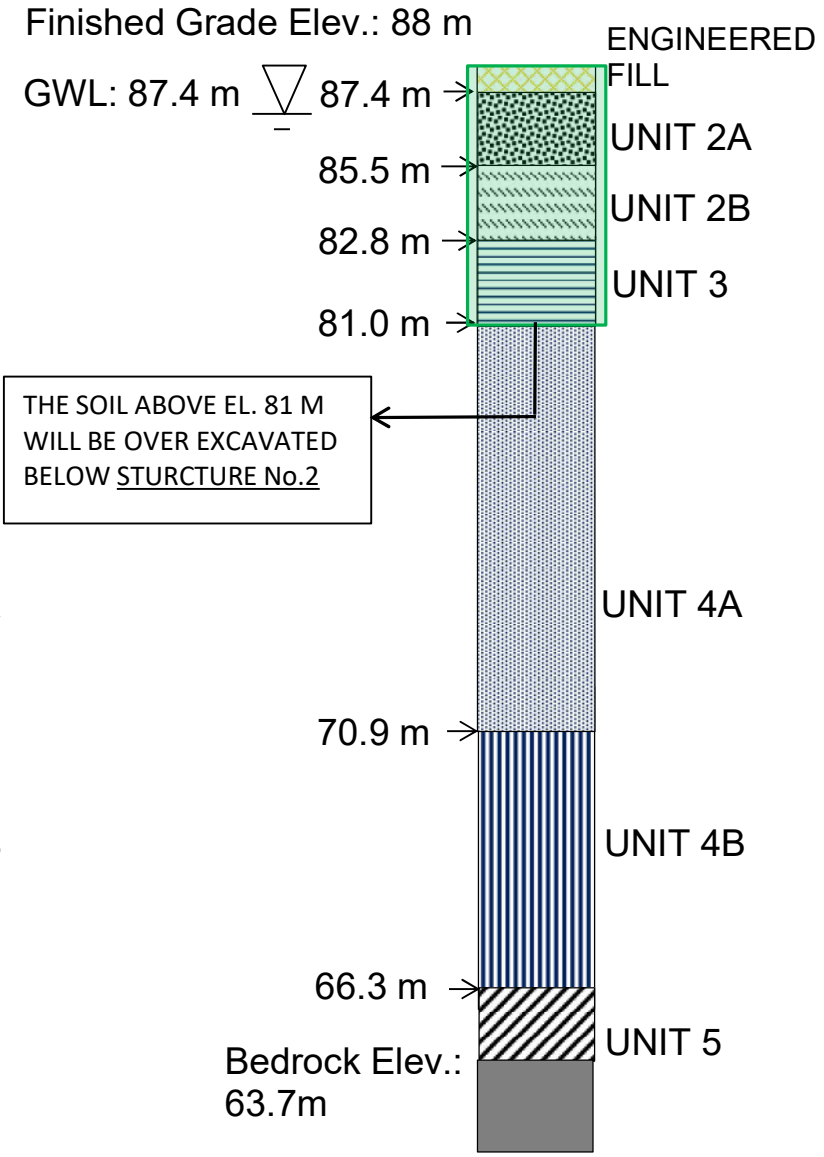
NTS

wsp	E&I Canada Limited	PROJECT:	DNNP Liqurfaction study		
		TITLE:	Soil Profile BH18 - Control Building Area (No. 4)		
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-5 / REV.

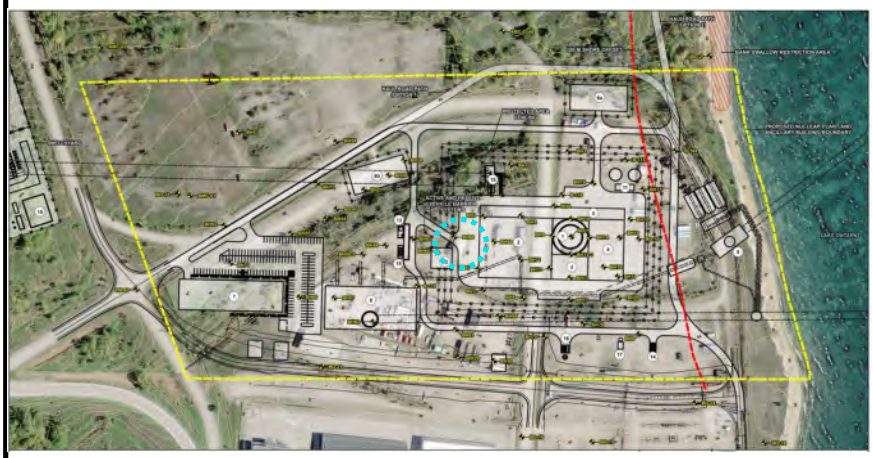


Existing soil profile

BH66



Post-construction soil profile

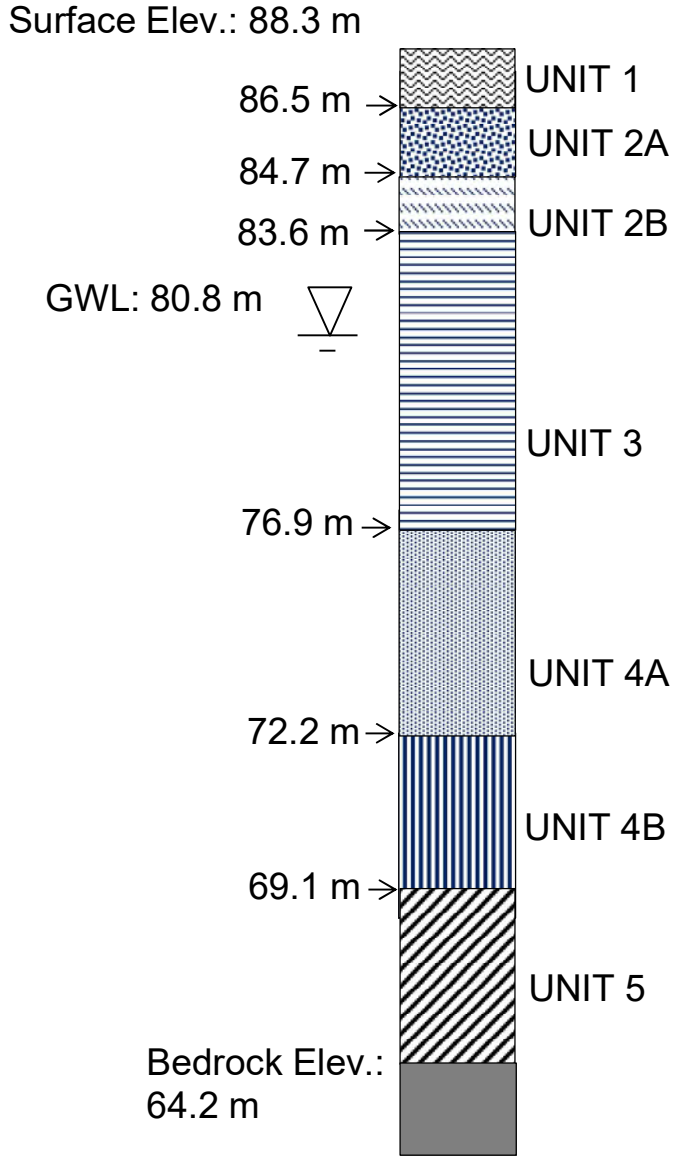


Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

- ENGINEERED FILL
- FILL/TOPSOIL - UNIT 1
- SURFICIAL GALCIOLACUSTRINE - UNIT 2A
- SURFICIAL GLACIOLACUSTRINE - UNIT 2B
- UPPER TILL - UNIT 3
- INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
- INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
- LOWER TILL - UNIT 5
- BEDROCK

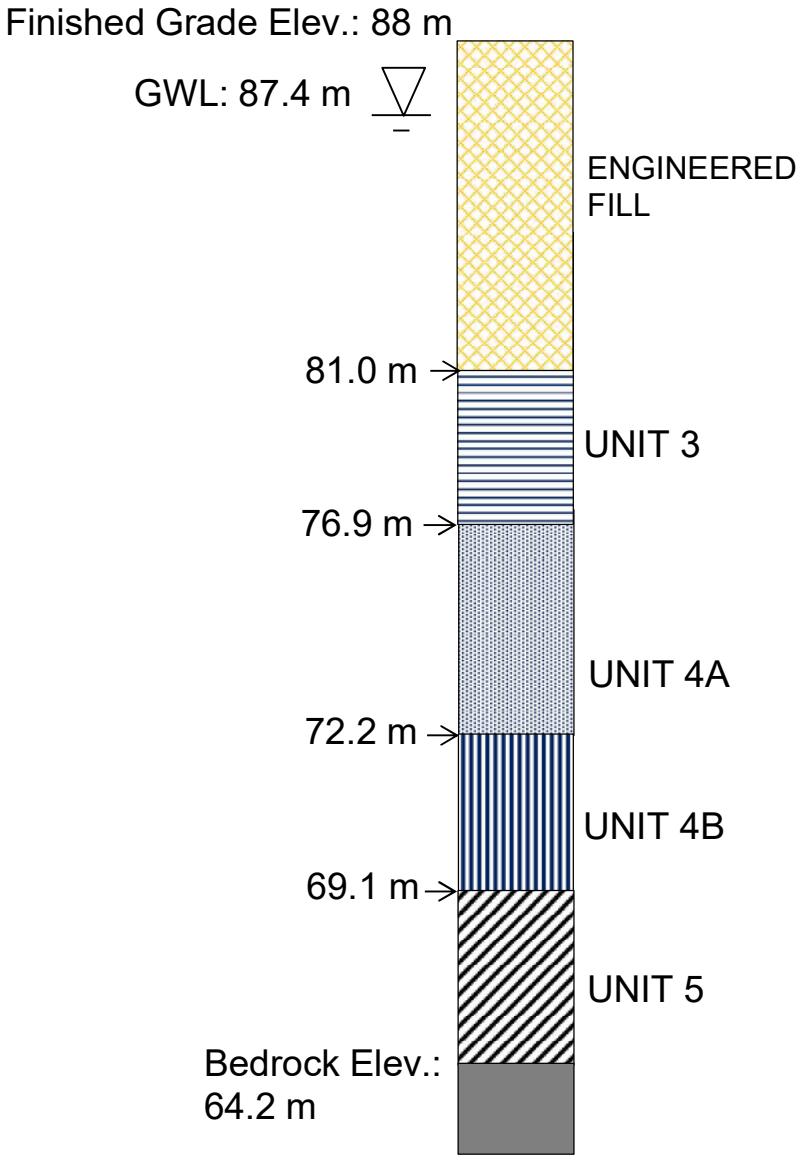
NTS

wsp **E&I Canada Limited**	PROJECT: **DNNP Liqurfaction study**				
	TITLE: Soil Profile BH66 - Turbine Building Area (No. 2)				
CLIENT: **Kinetrics**	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-6	REV.

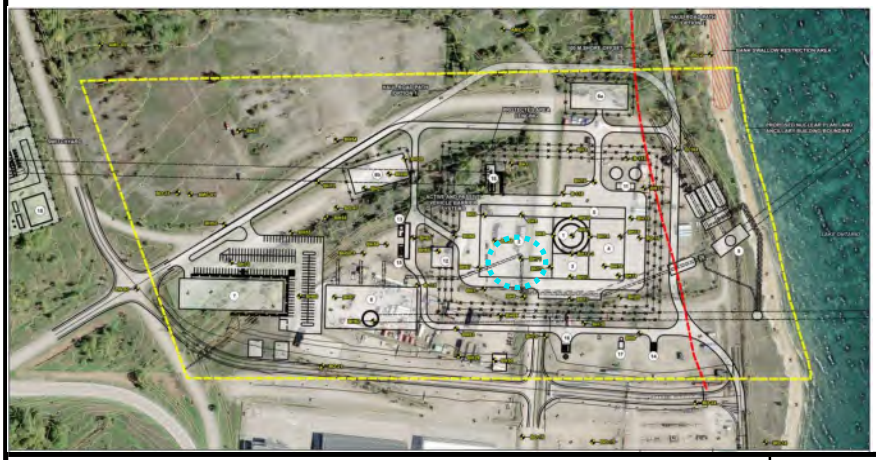


Existing soil profile

BH71



Post-construction soil profile

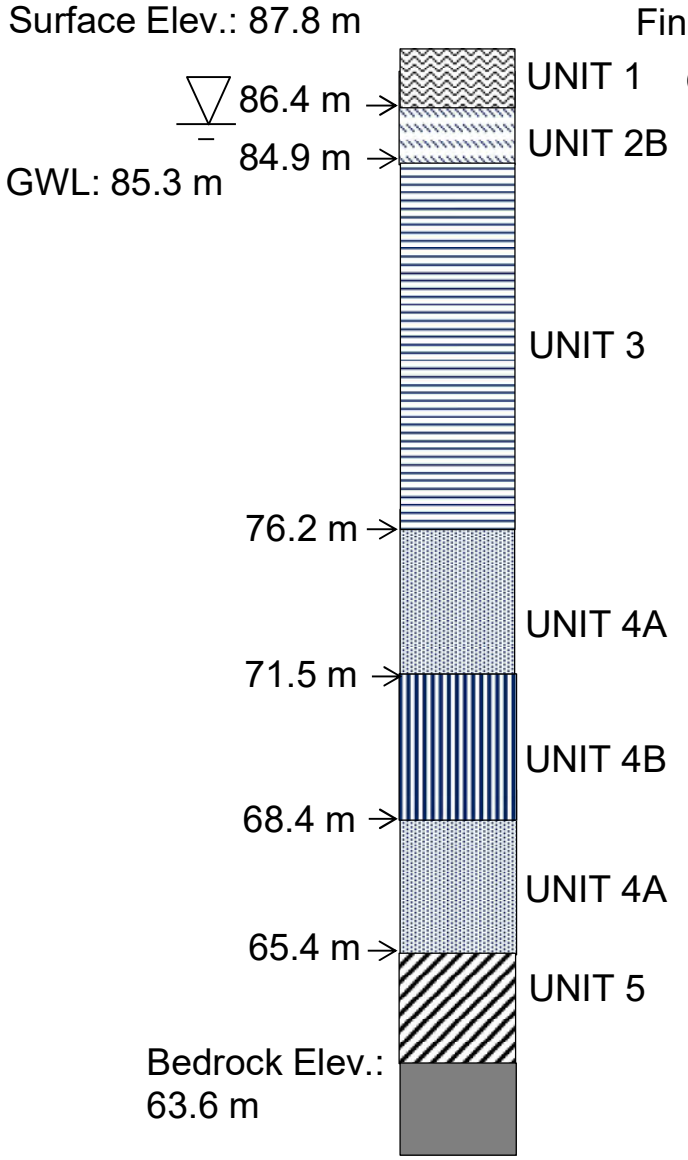


Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

ENGINEERED FILL
FILL/TOPSOIL - UNIT 1
SURFICIAL GALCIOLACUSTRINE - UNIT 2A
SURFICIAL GLACIOLACUSTRINE - UNIT 2B
UPPER TILL - UNIT 3
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
LOWER TILL - UNIT 5
BEDROCK

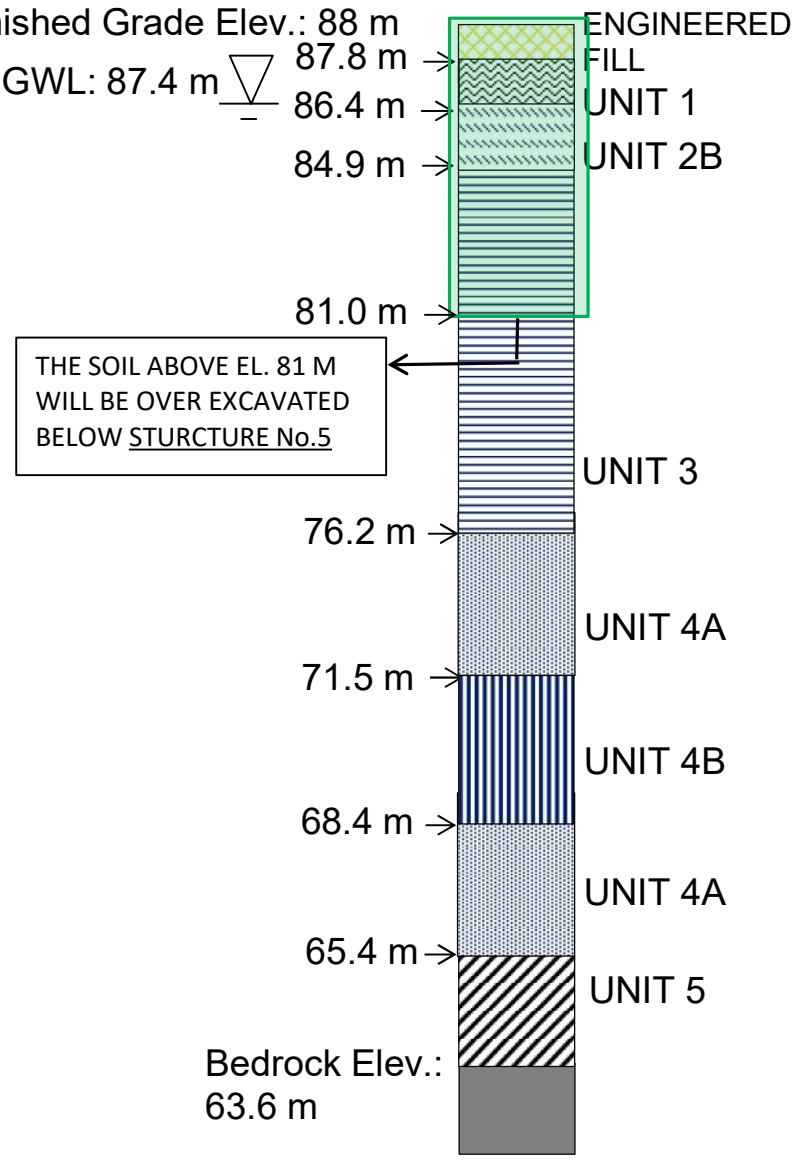
NTS

wsp	E&I Canada Limited	PROJECT:	DNNP Liqurfaction study		
		TITLE:	Soil Profile BH71 - Turbine Building Area (No. 2)		
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-7 / REV.



Existing soil profile

BH77



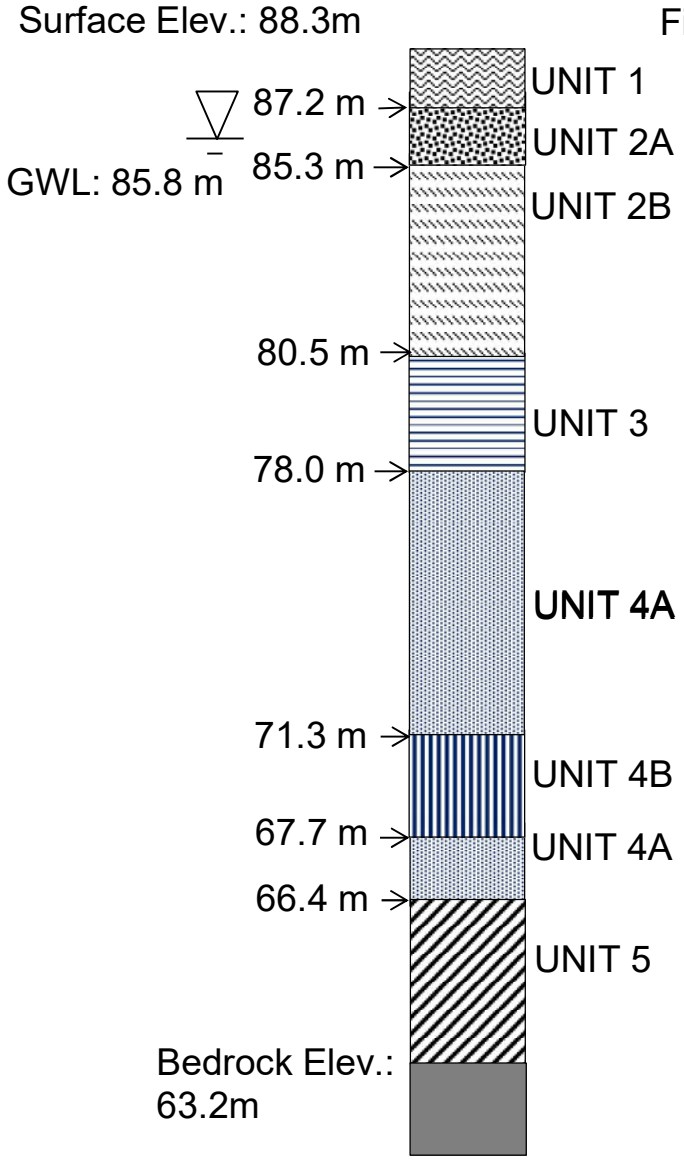
Post-construction soil profile

Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

- ENGINEERED FILL
- FILL/TOPSOIL - UNIT 1
- SURFICIAL GALCIOLACUSTRINE - UNIT 2A
- SURFICIAL GLACIOLACUSTRINE - UNIT 2B
- UPPER TILL - UNIT 3
- INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
- INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
- LOWER TILL - UNIT 5
- BEDROCK

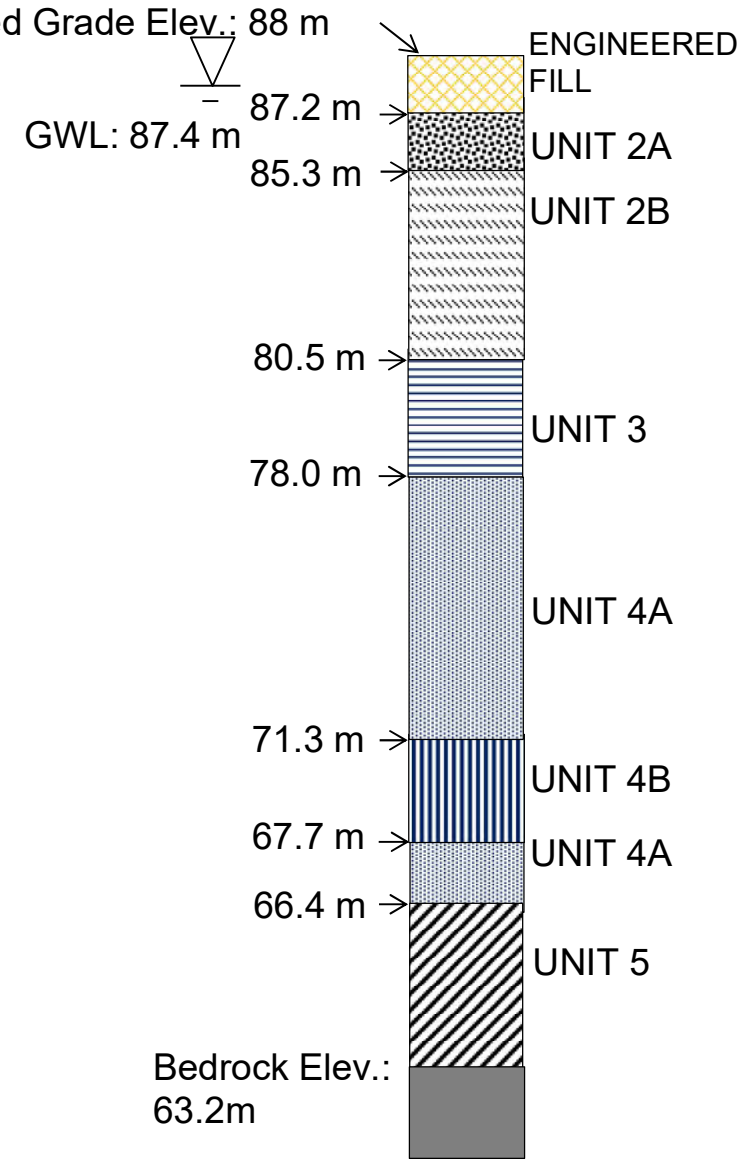
NTS

wsp E&I Canada Limited	PROJECT: DNNP Liqurfaction study				
	TITLE: Soil Profile BH77 - Reactor Auxiliary Bay Area (No. 5)				
CLIENT: Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-8	REV.

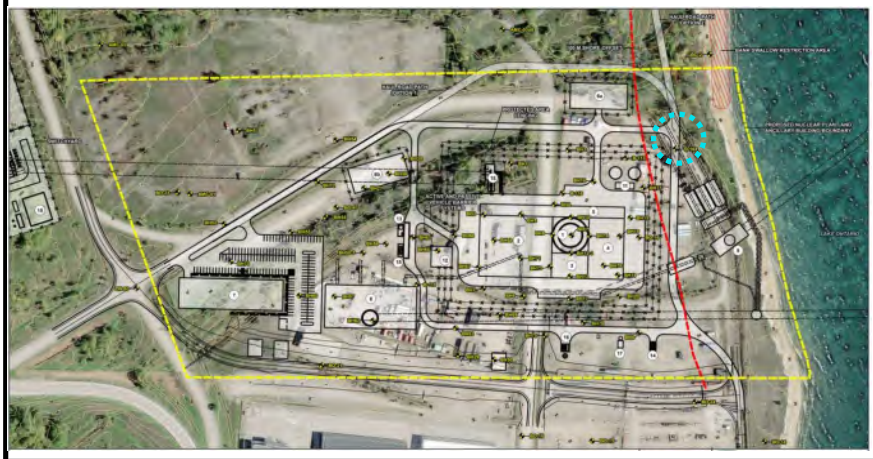


Existing soil profile

B-104



Post-construction soil profile

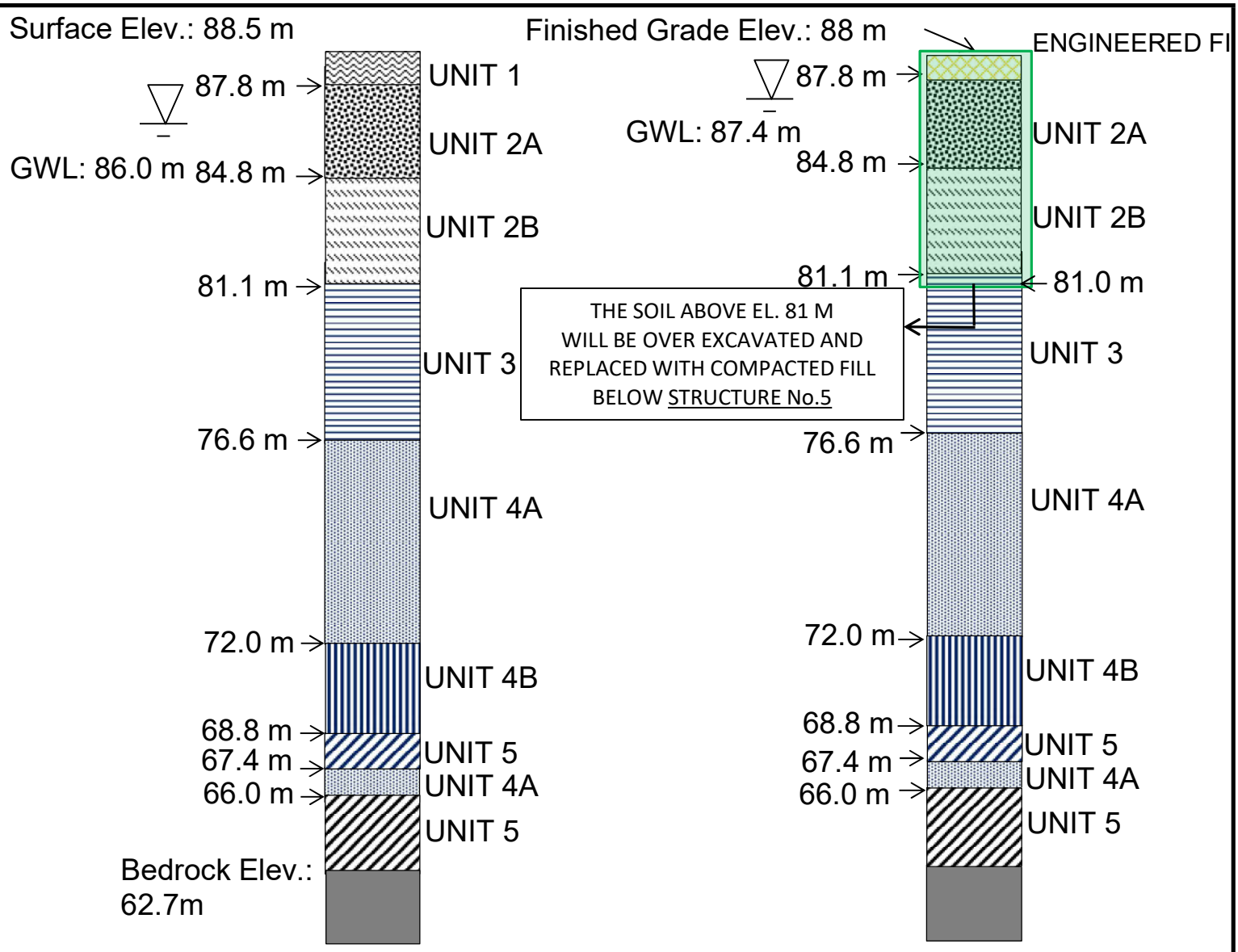


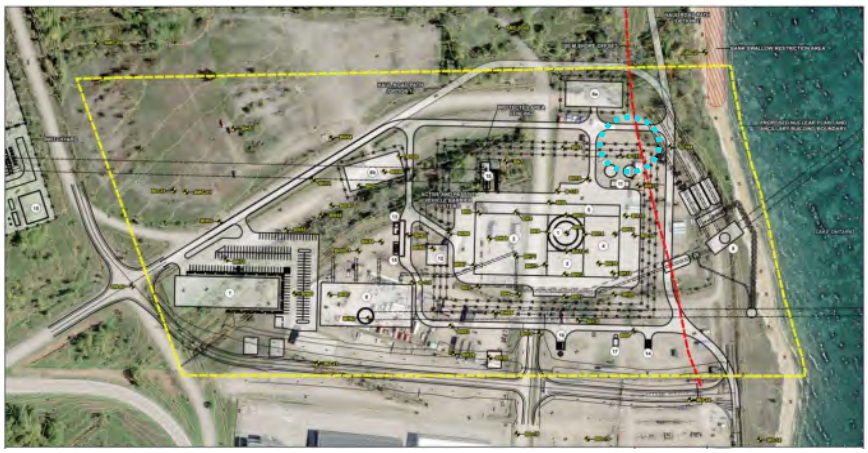
Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

ENGINEERED FILL
FILL/TOPSOIL - UNIT 1
SURFICIAL GALCIOLACUSTRINE - UNIT 2A
SURFICIAL GLACIOLACUSTRINE - UNIT 2B
UPPER TILL - UNIT 3
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
LOWER TILL - UNIT 5
BEDROCK

NTS

wsp	E&I Canada Limited	PROJECT:	DNNP Liqurfaction study		
		TITLE:	soil Profile B-104 - Independent Spent Fuel Storage Installation Area (No. 6)		
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-9 / REV.



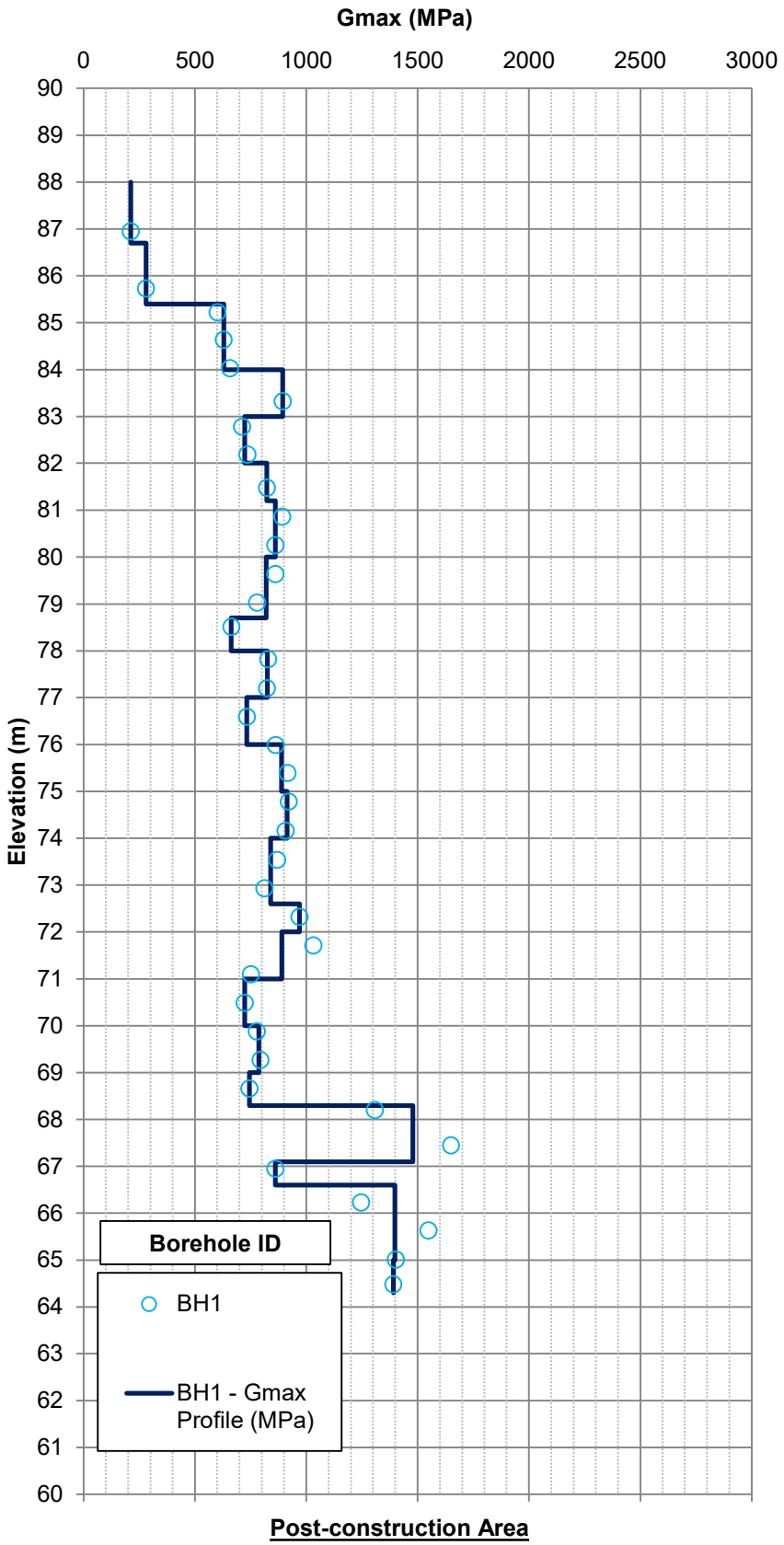


Notes:
1. Over-excavation and backfill plan as per drawing no. 006N6034.
2. The ground water table for the post-construction condition was conservatively assumed at El. 87.4 m as per the design requirement (see the main report for

ENGINEERED FILL
FILL/TOPSOIL - UNIT 1
SURFICIAL GALCIOLACUSTRINE - UNIT 2A
SURFICIAL GLACIOLACUSTRINE - UNIT 2B
UPPER TILL - UNIT 3
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4A
INTERMEDIATE GLACIOLACUSTRINE - UNIT 4B
LOWER TILL - UNIT 5
BEDROCK

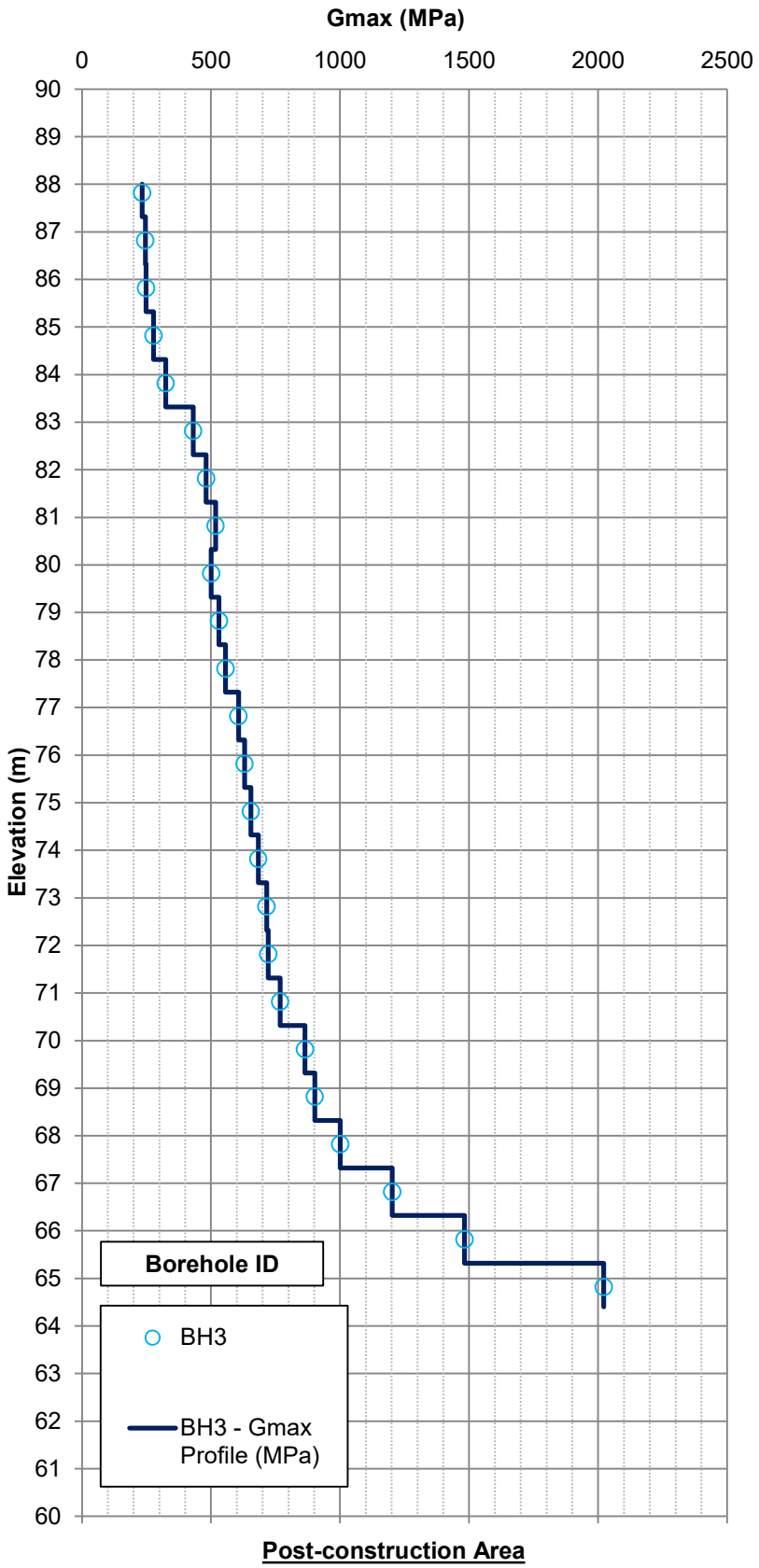
NTS

wsp	E&I Canada Limited	PROJECT:	DNNP Liqurfaction study		
		TITLE:	Soil Profile B-113 - Reactor Auxiliary Bay Area (No. 5) & Independent Spent Fuel Storage Installation Area (No. 6)		
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-10 / REV.



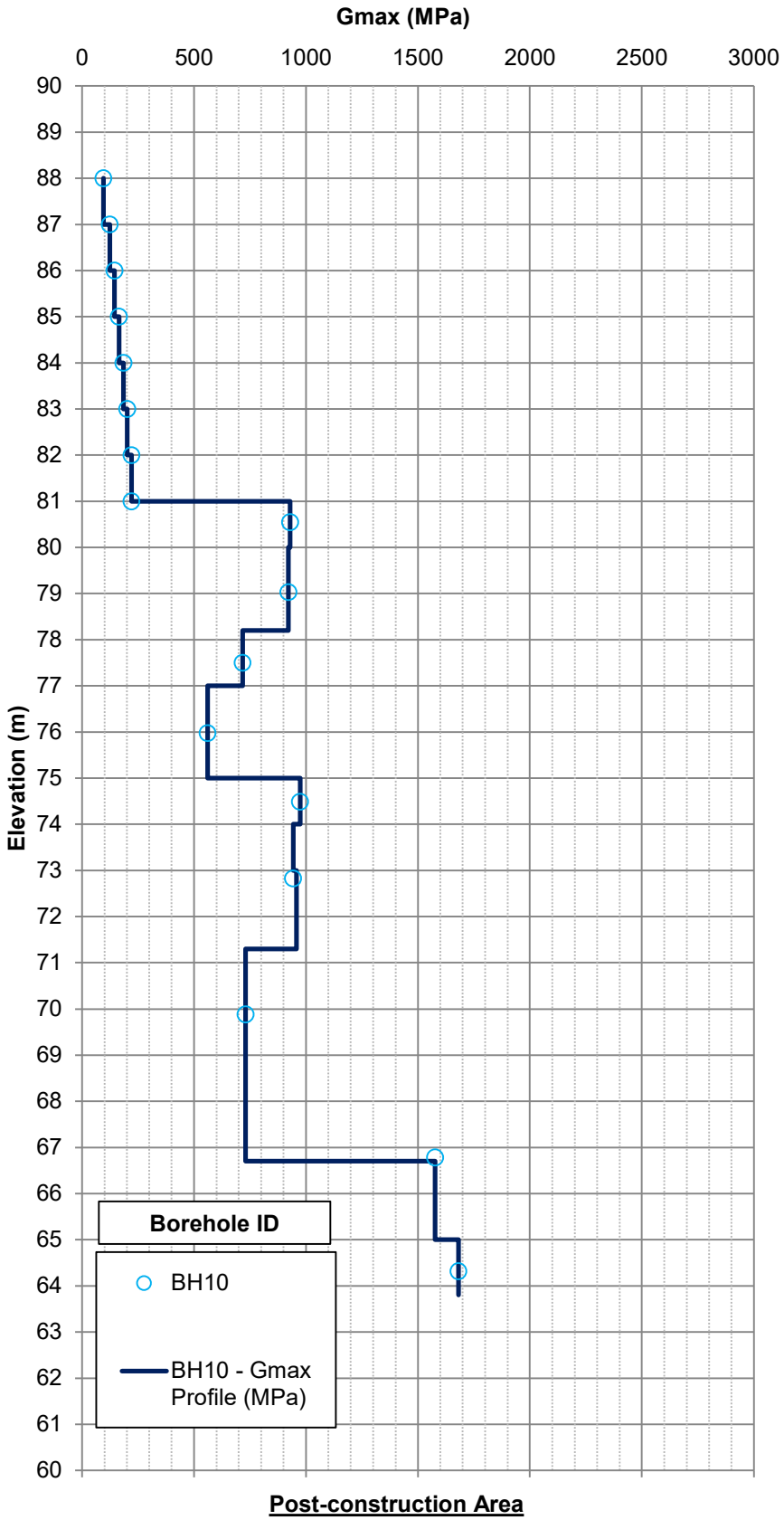
Post-construction Area

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH1 - Gmax Vs Elevation - Reactor Auxiliary Bay Area (No. 5) & ISFSI (No. 6) -			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-11	REV.



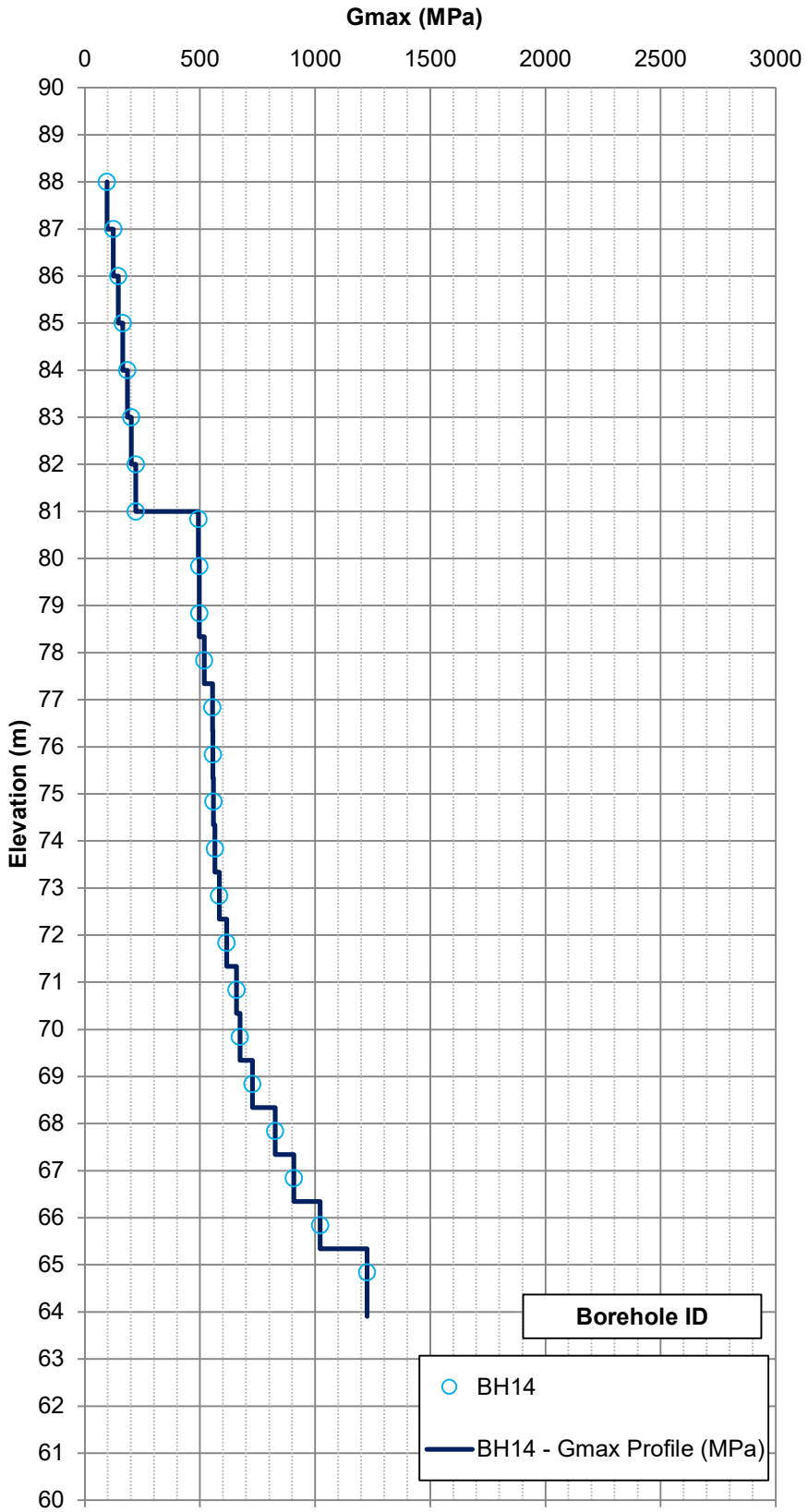
Post-construction Area

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH3 - Gmax Vs Elevation - ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-12	REV.



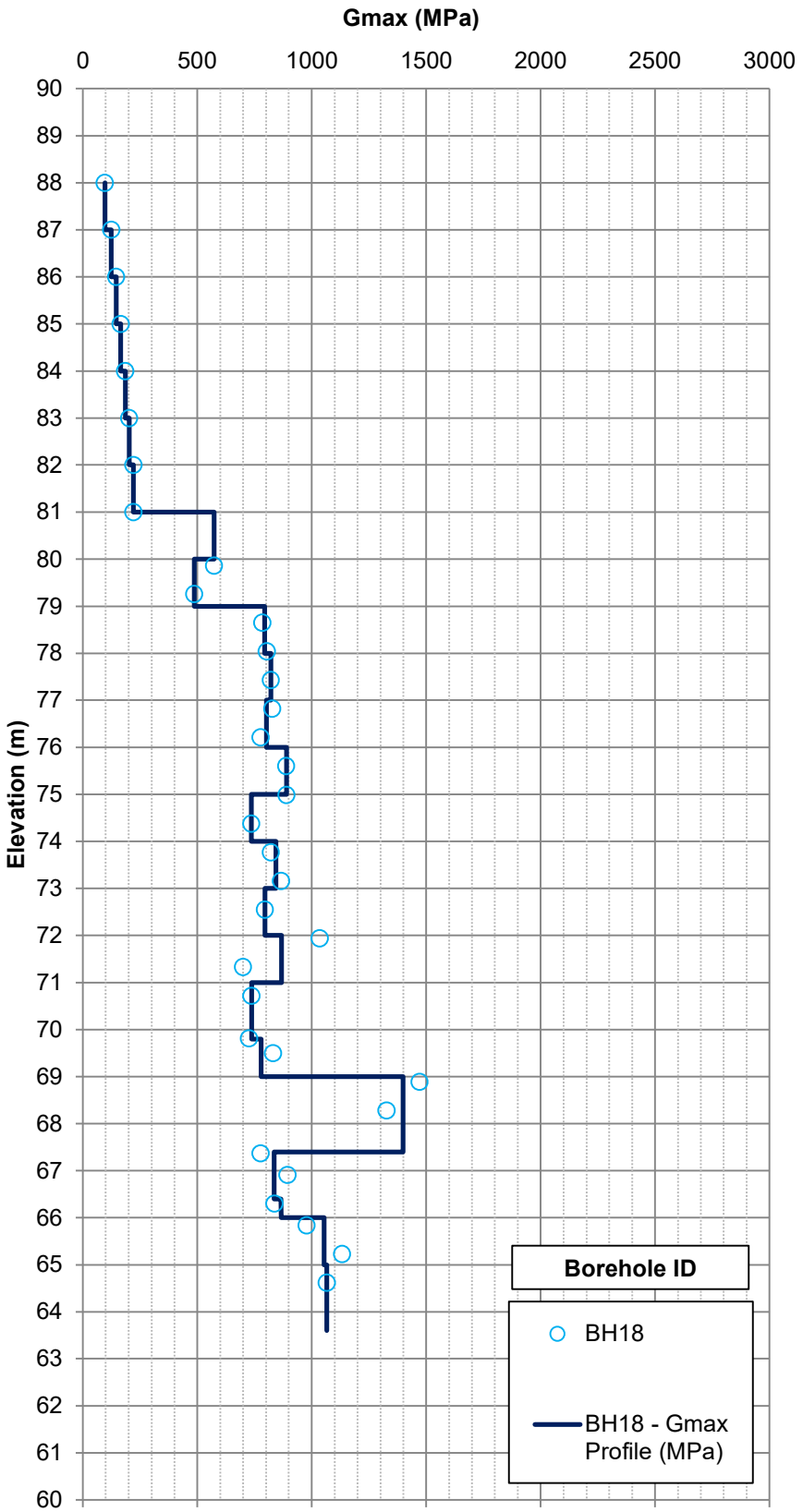
Post-construction Area

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH10 - Gmax Vs Elevation - Reactor Auxiliary Bay Area (No. 5)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-13	REV.



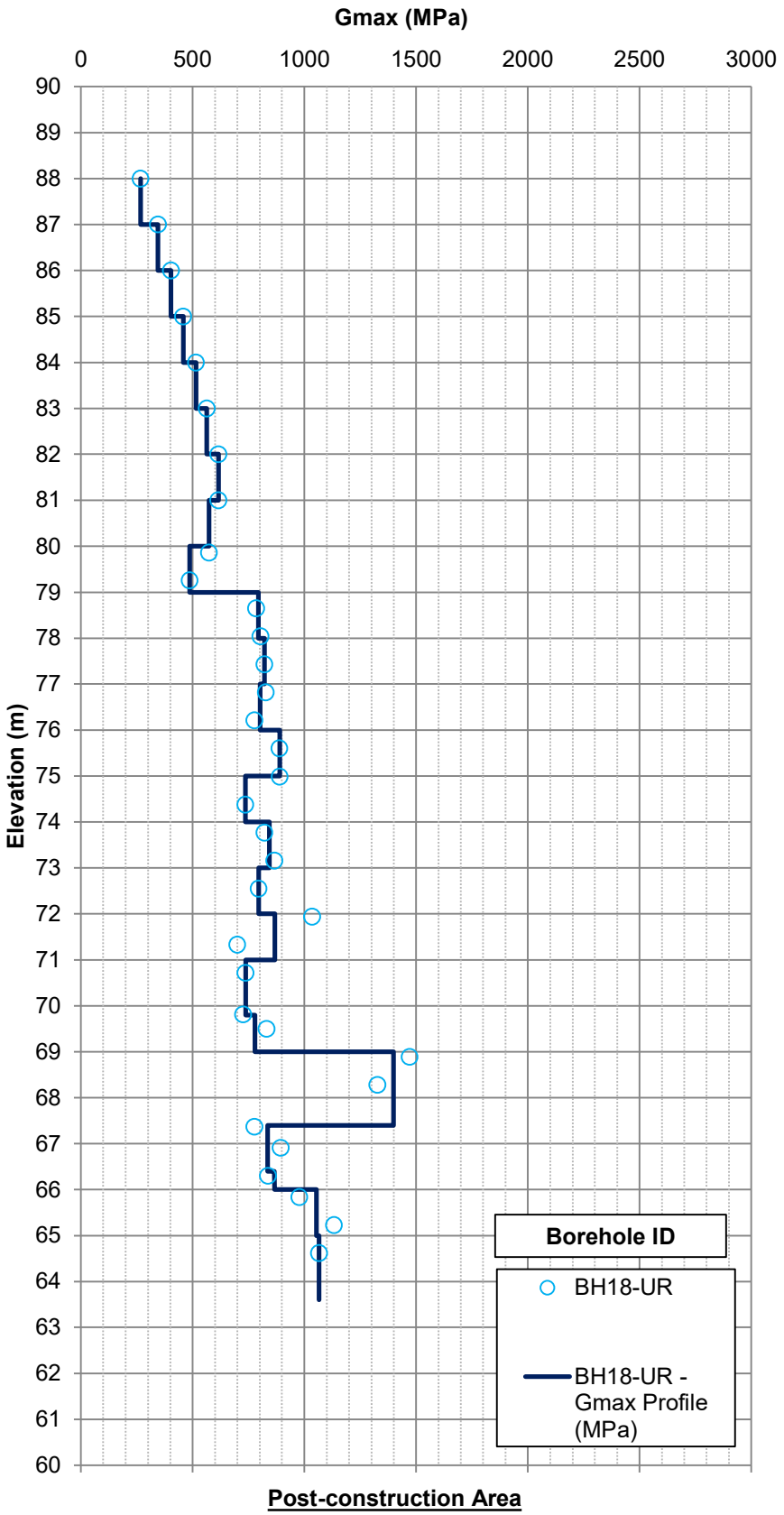
Post-construction Area

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH14 - Gmax Vs Elevation - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-14	REV.

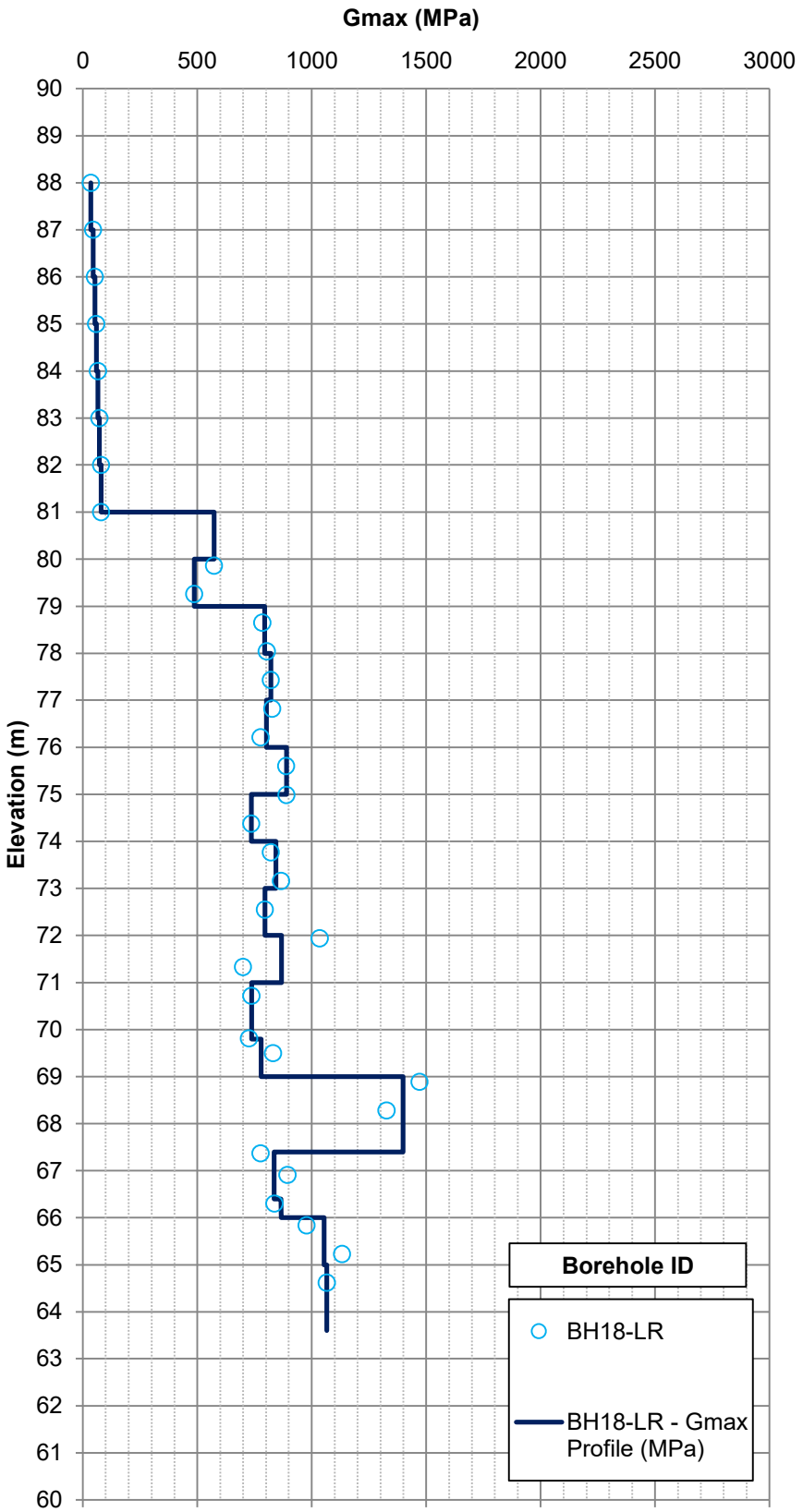


Post-construction Area

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18 - Gmax Vs Elevation - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-15	REV.

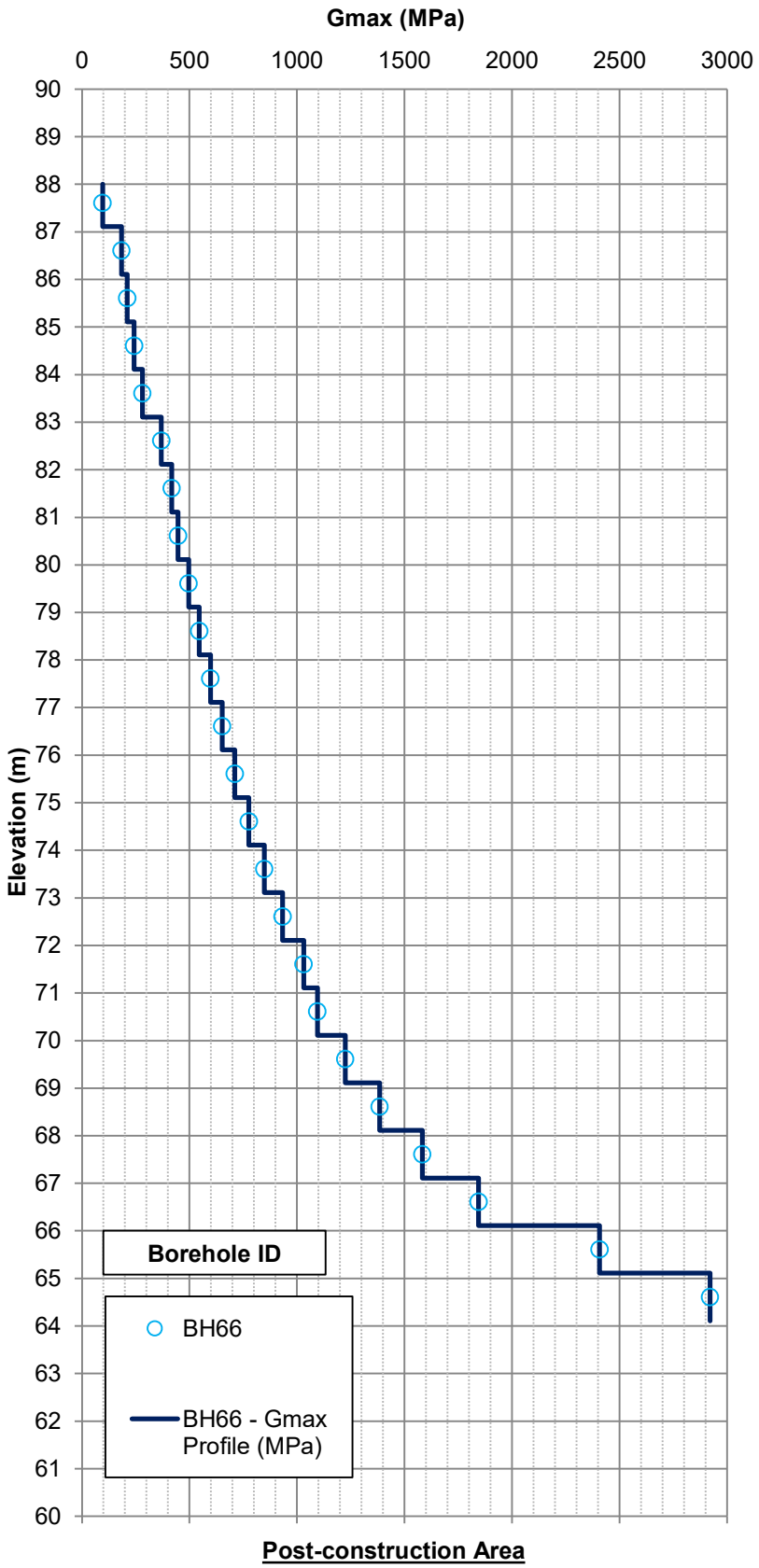


wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18-UR - Gmax Vs Elevation - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-15(a)	REV.

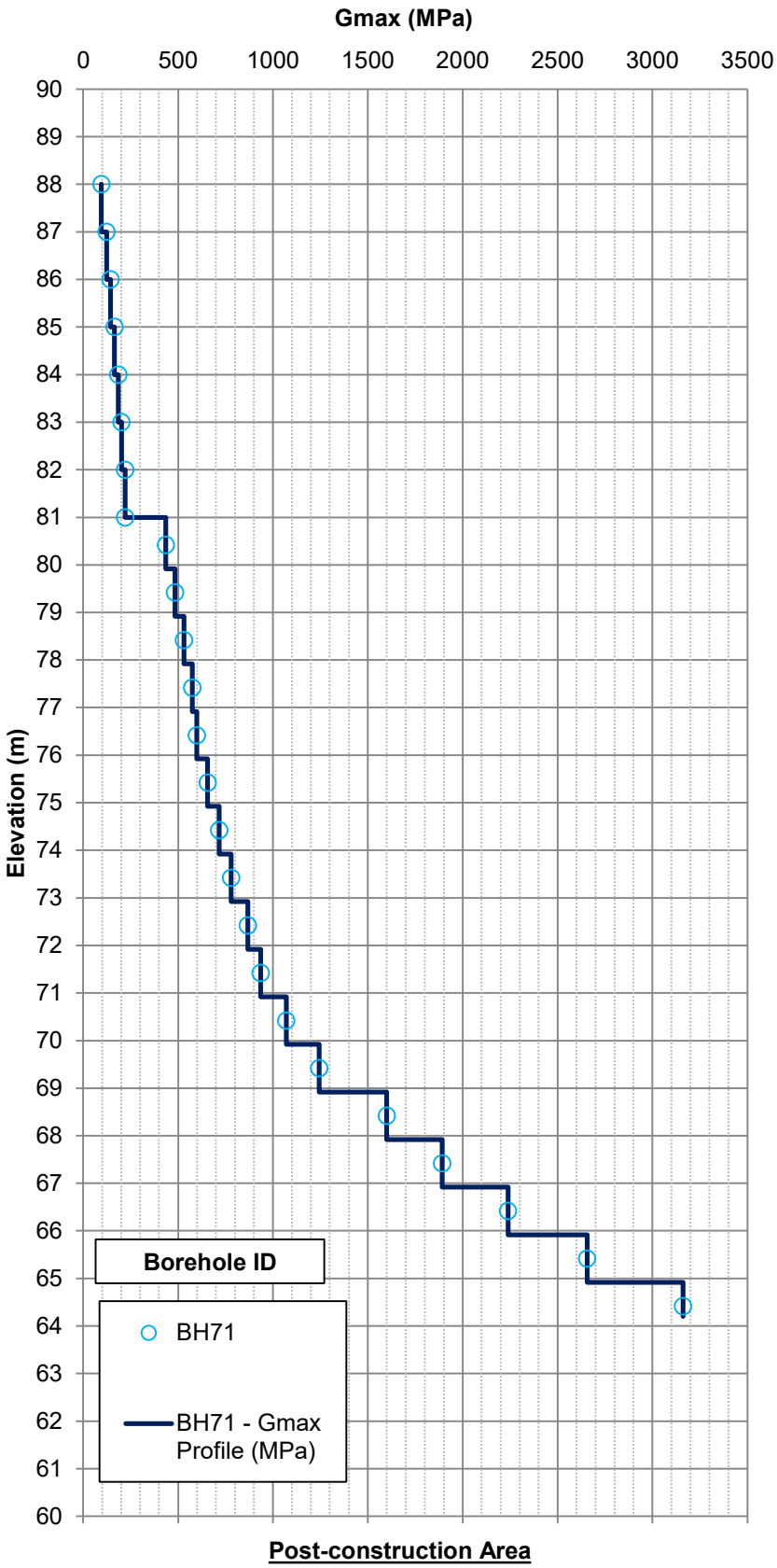


Post-construction Area

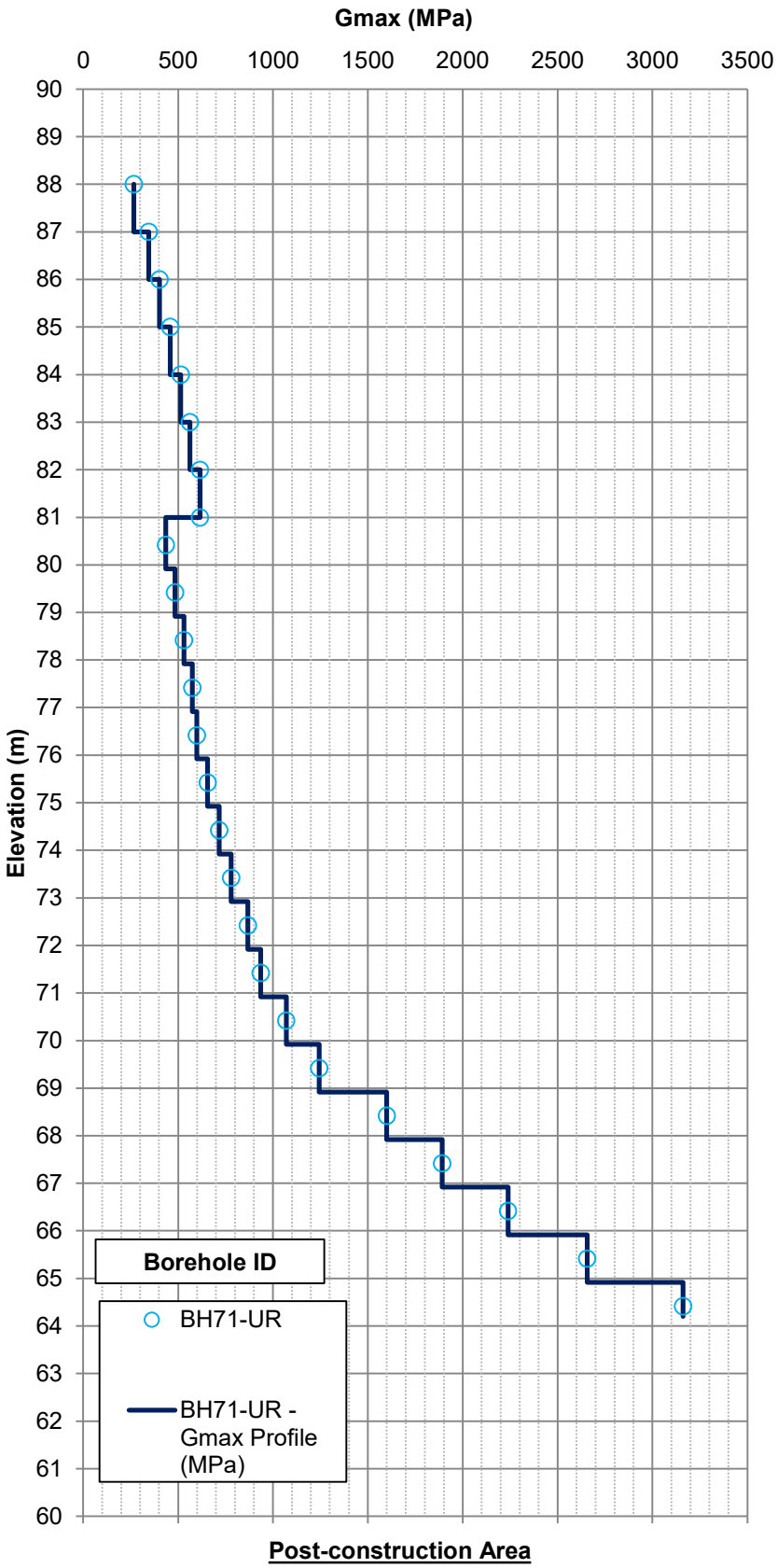
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18-LR - Gmax Vs Elevation - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-15(b)	REV.



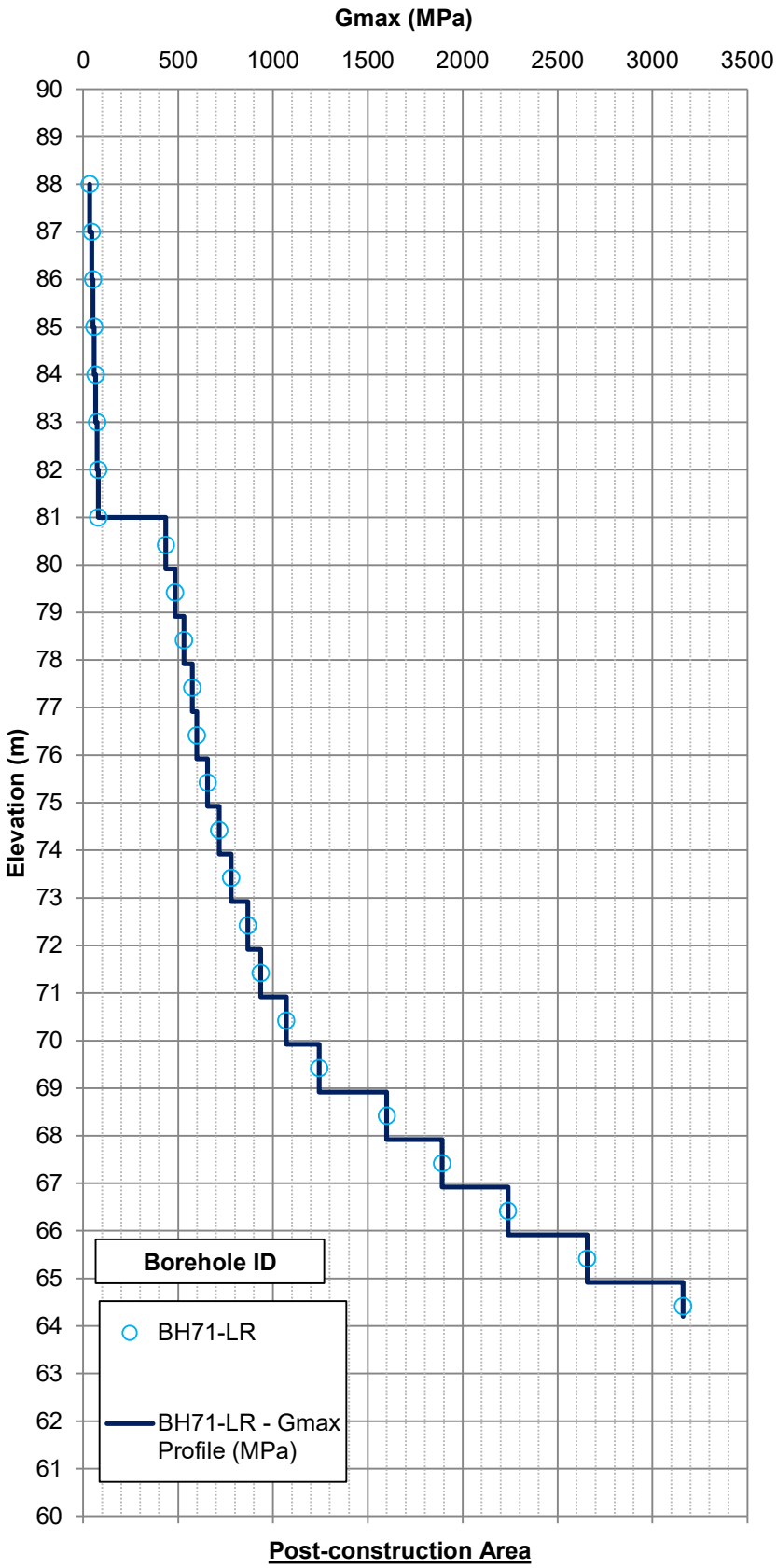
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH66 - Gmax Vs Elevation - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-16 REV.



wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71 - Gmax Vs Elevation - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-17 REV.

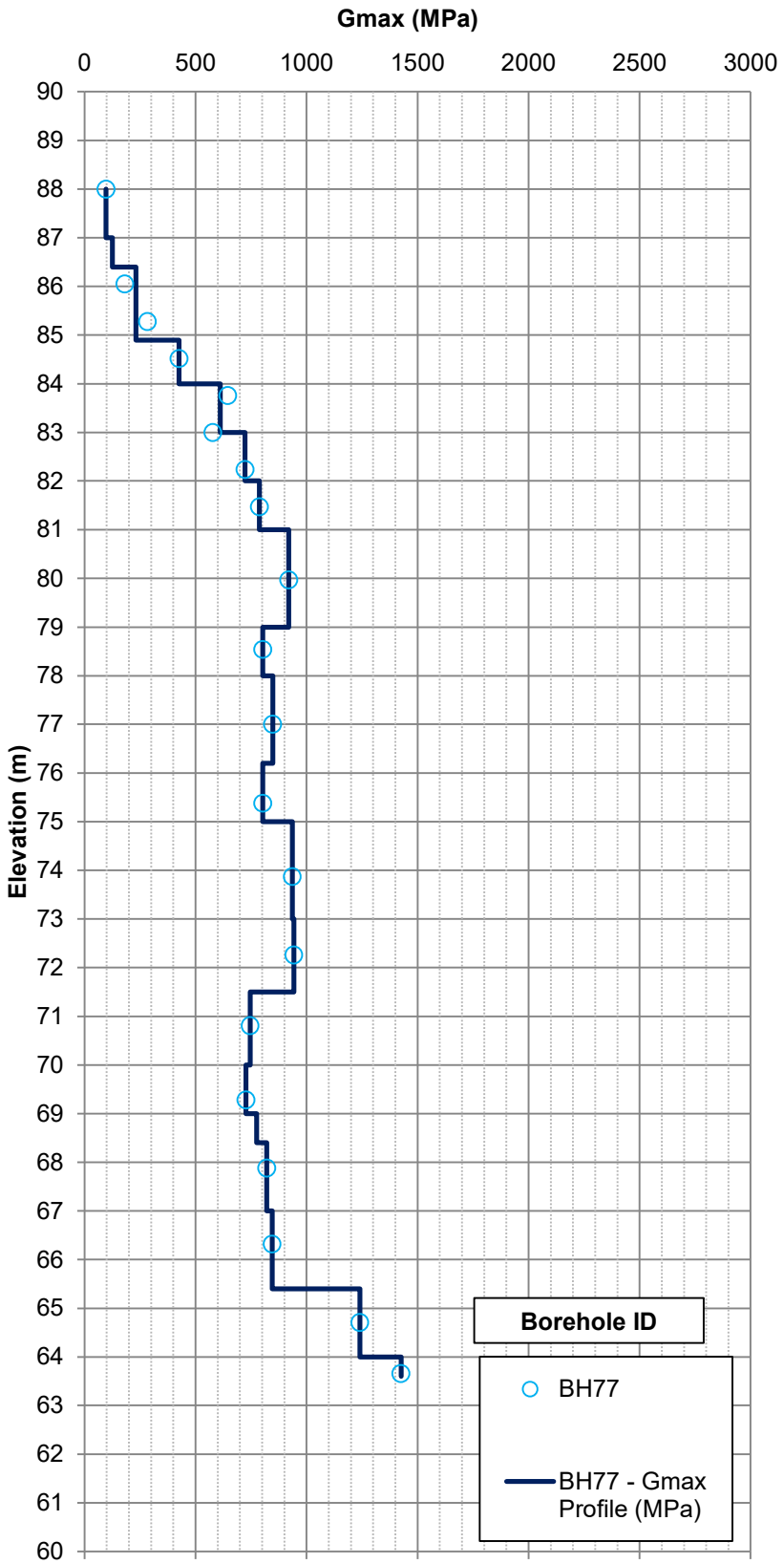


wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71-UR - Gmax Vs Elevation - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-17(a)	REV.



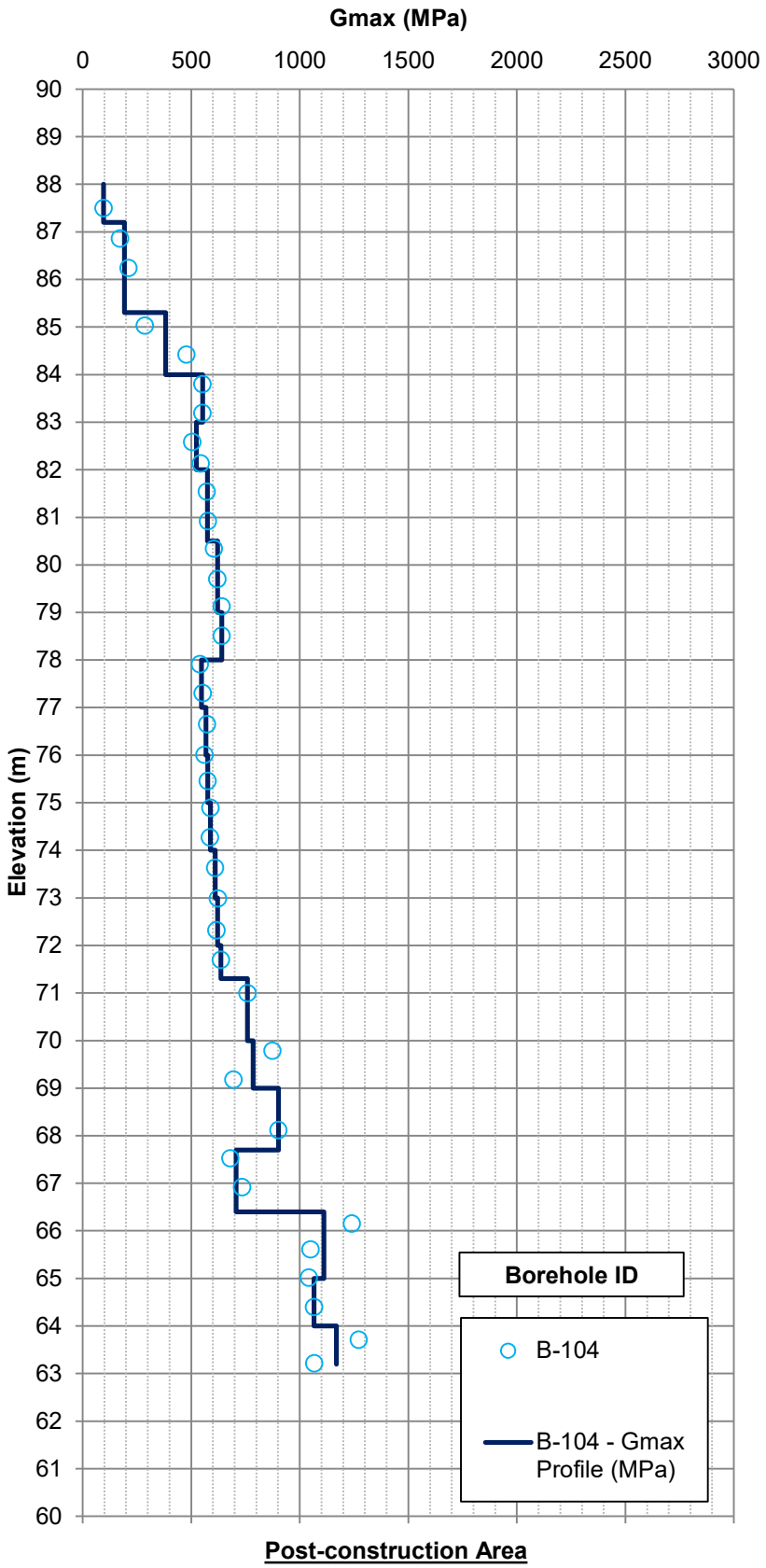
Post-construction Area

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71-LR - Gmax Vs Elevation - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-17(b)	REV.



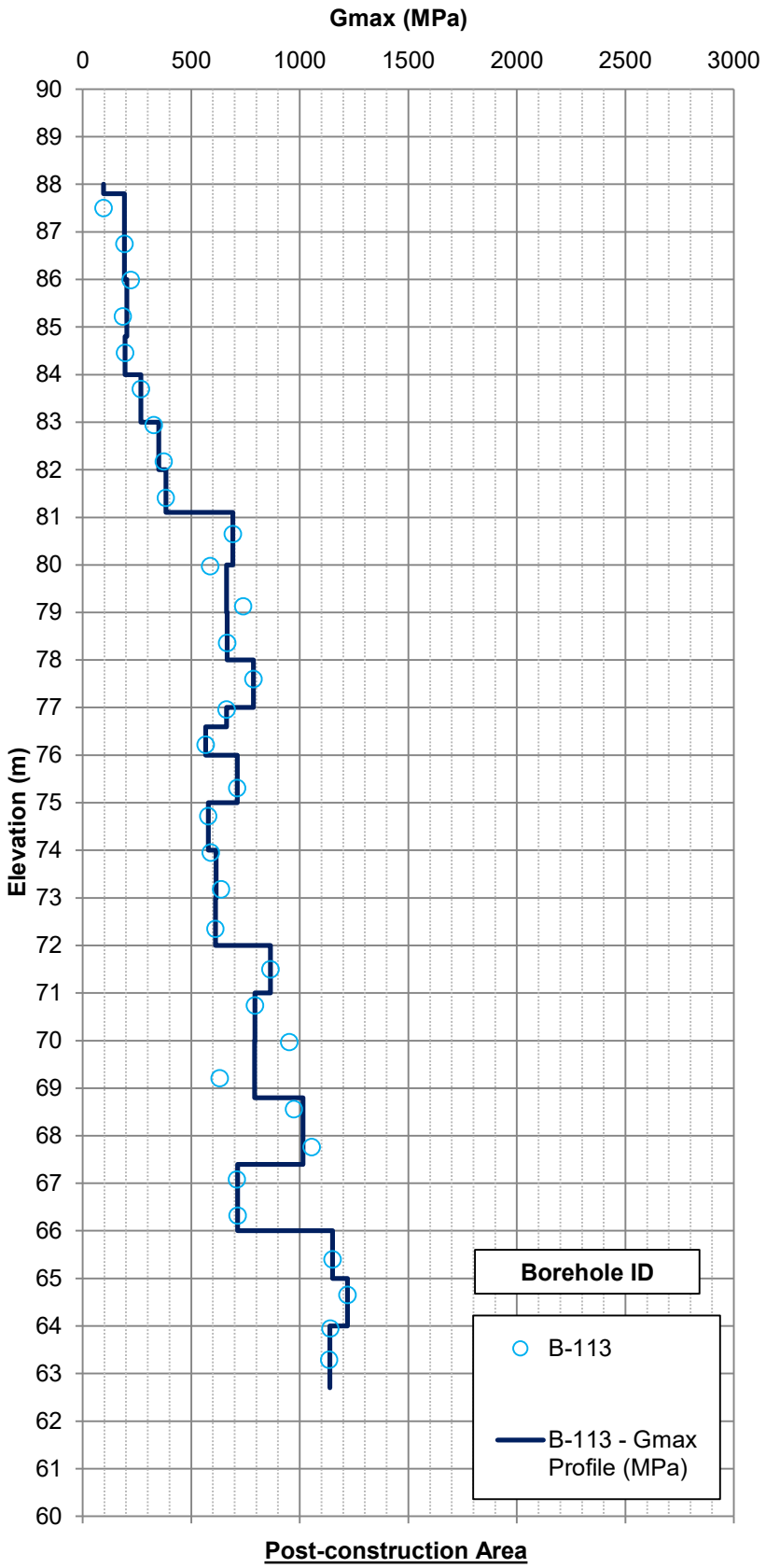
Post-construction Area

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH77 - Gmax Vs Elevation - Reactor Auxiliary Bay Area (No. 5)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-18	REV.



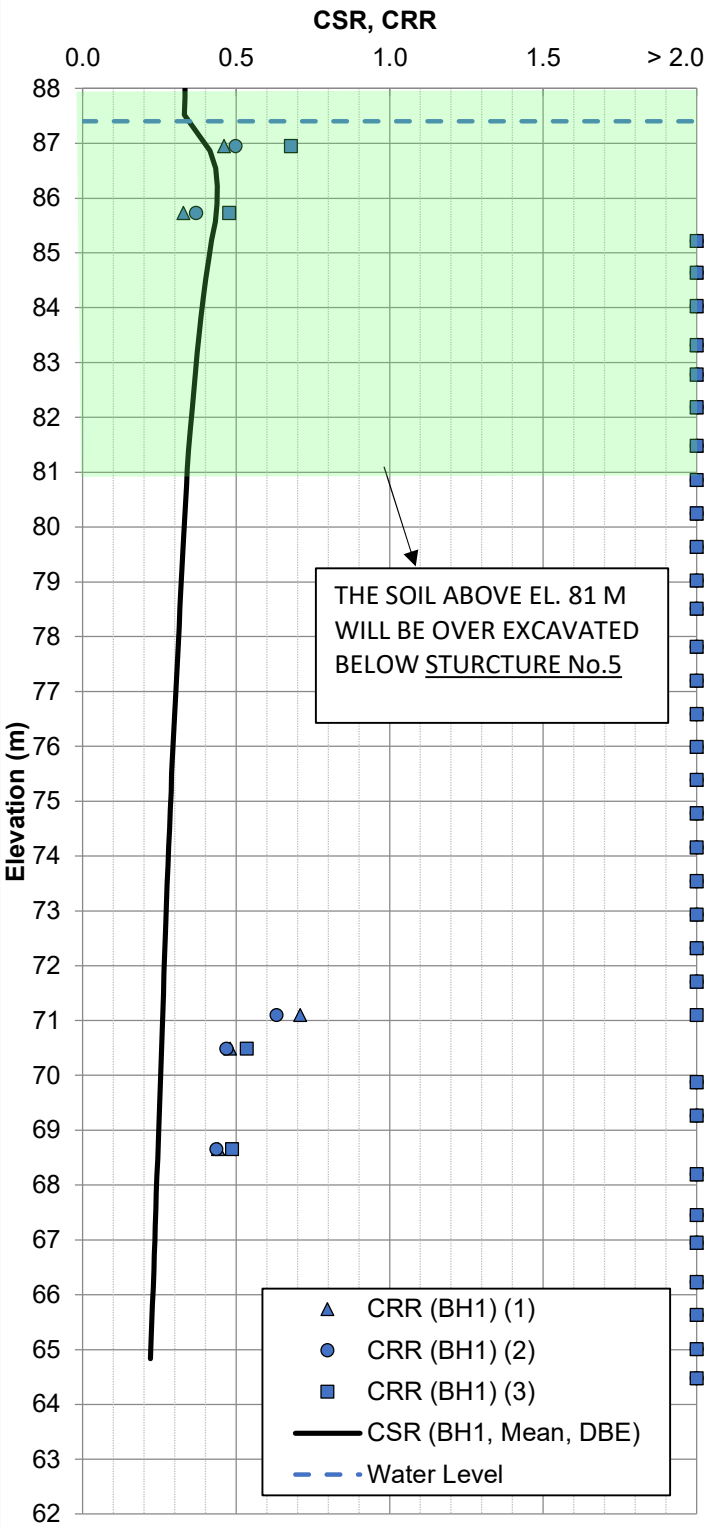
Post-construction Area

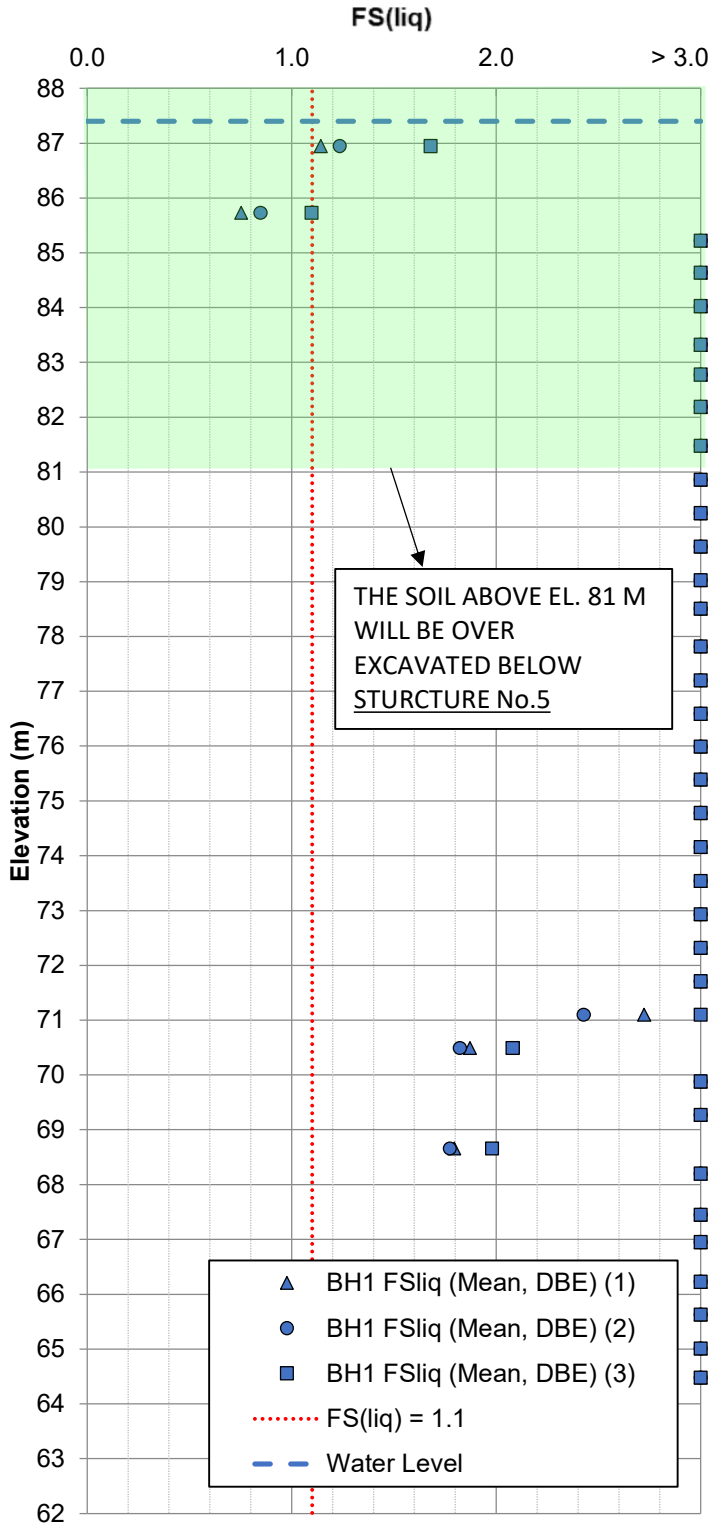
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: B-104 - Gmax Vs Elevation - ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-19	REV.



Post-construction Area

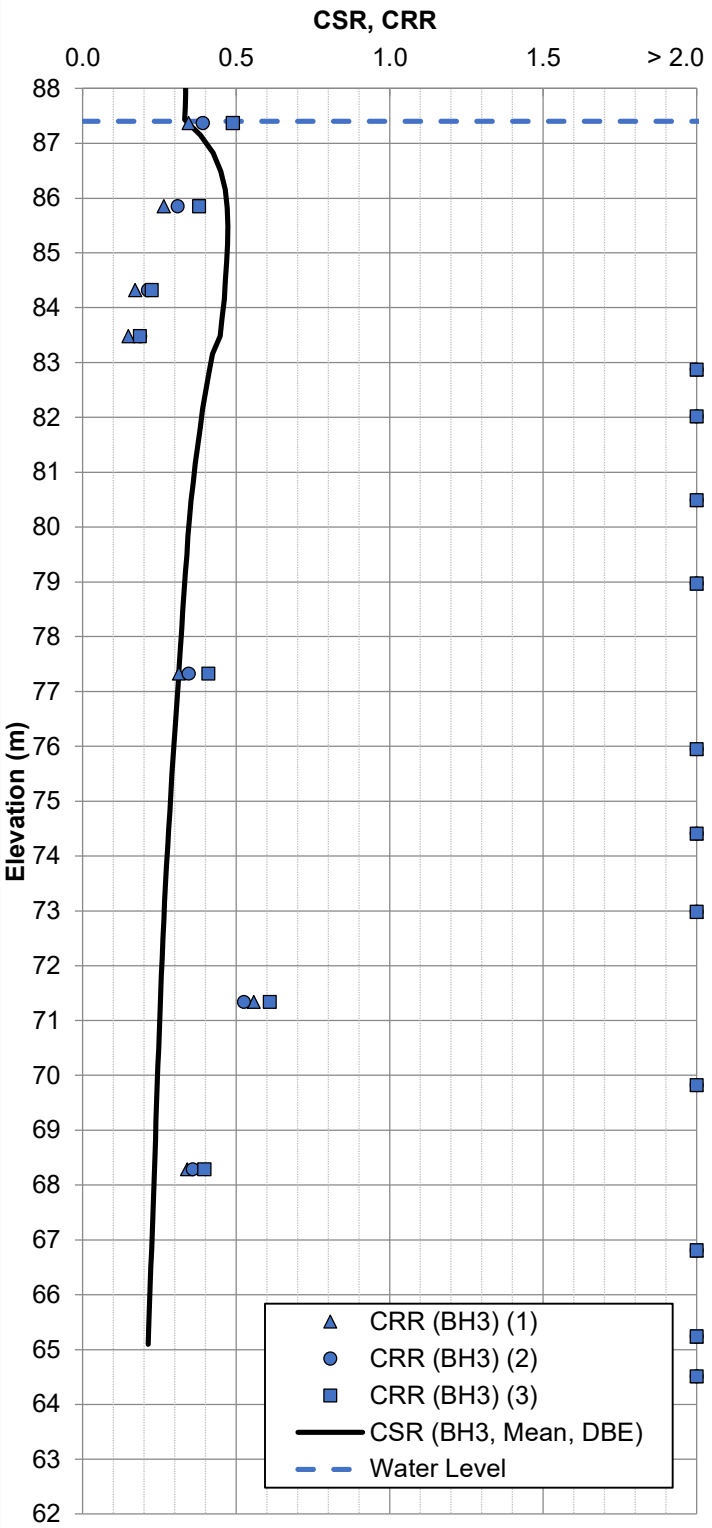
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: B-113 - Gmax Vs Elevation - Reactor Auxiliary Bay Area (No. 5) & ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-20	REV.

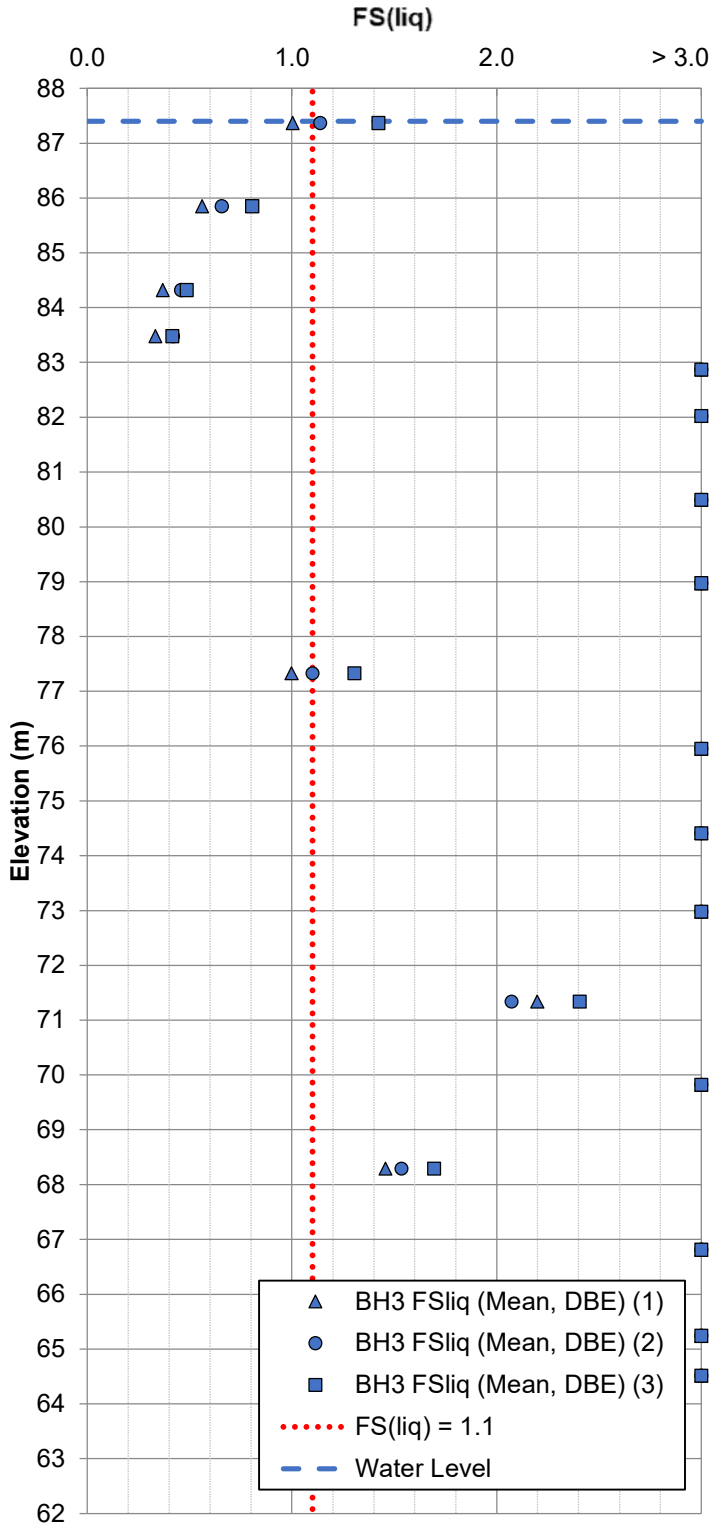




△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

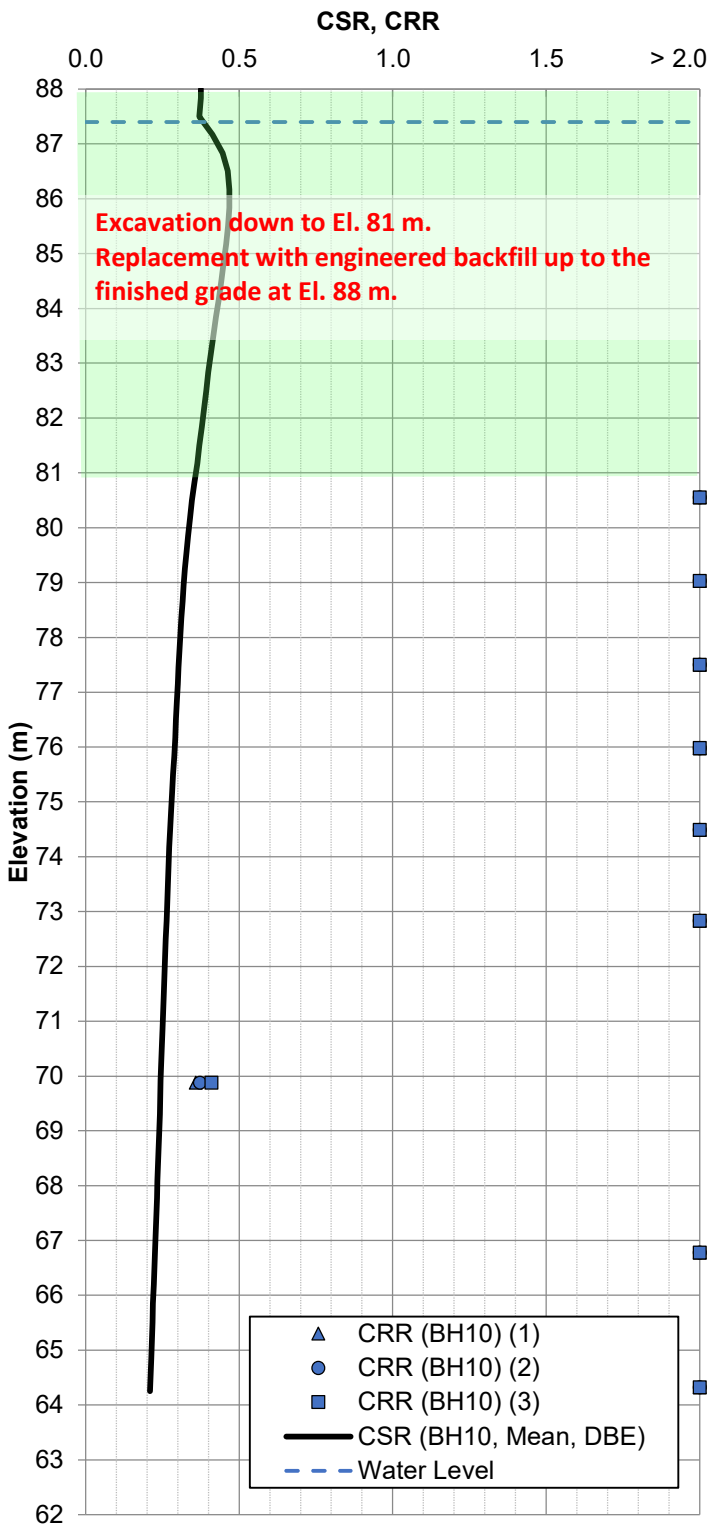
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH1 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Reactor Auxiliary Bay Area (No. 5) & ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-21	REV.

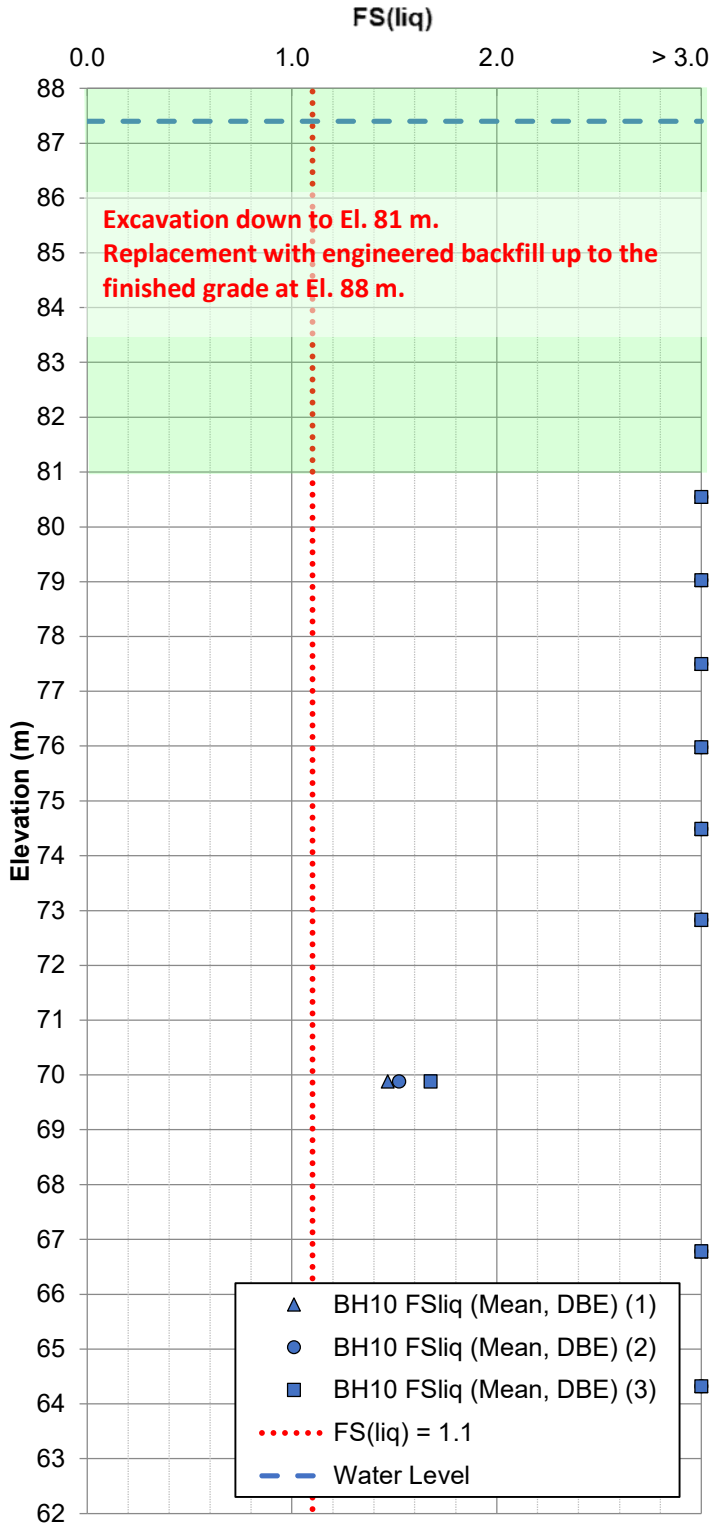




△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

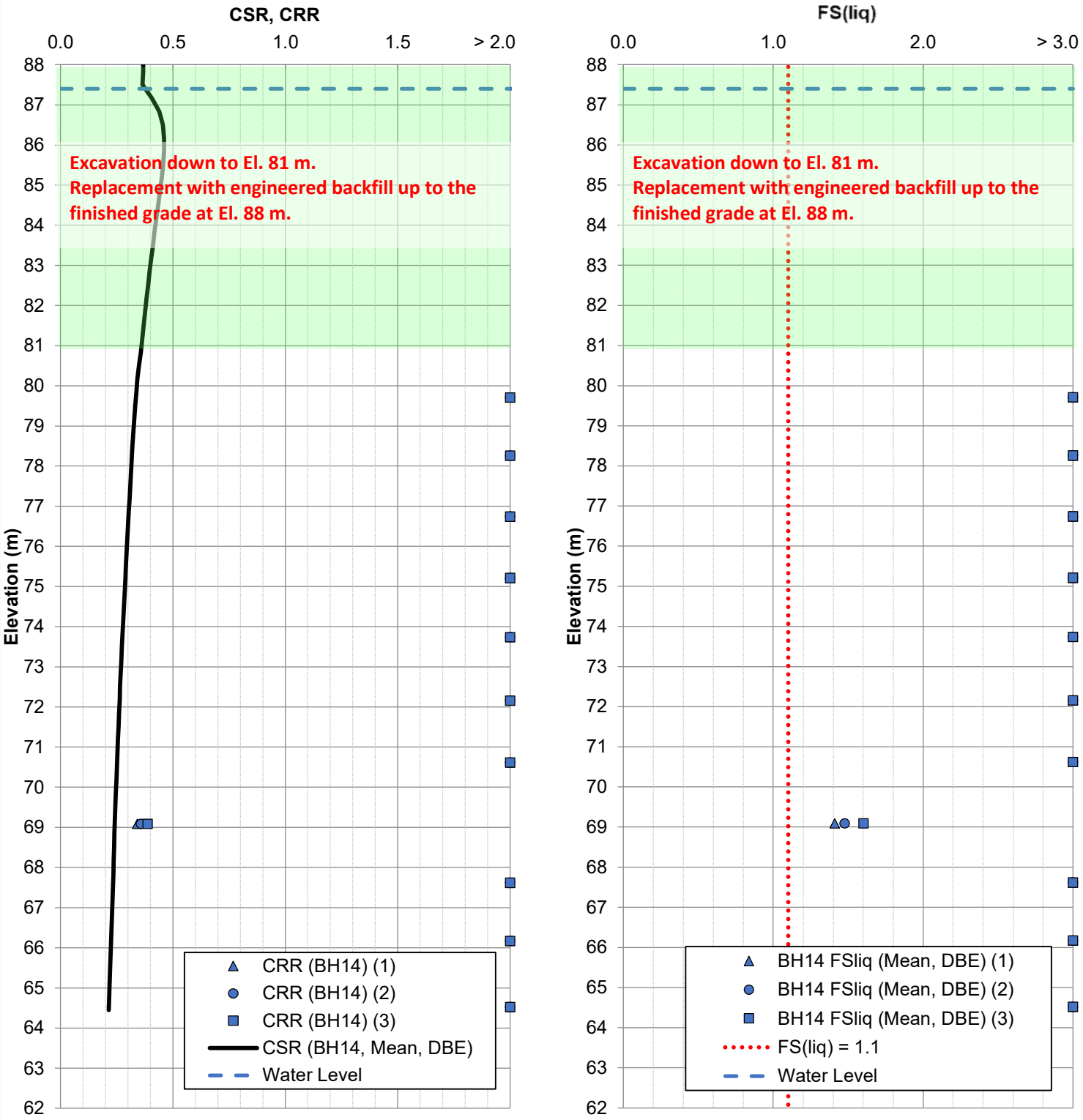
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH3 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-22 / REV.





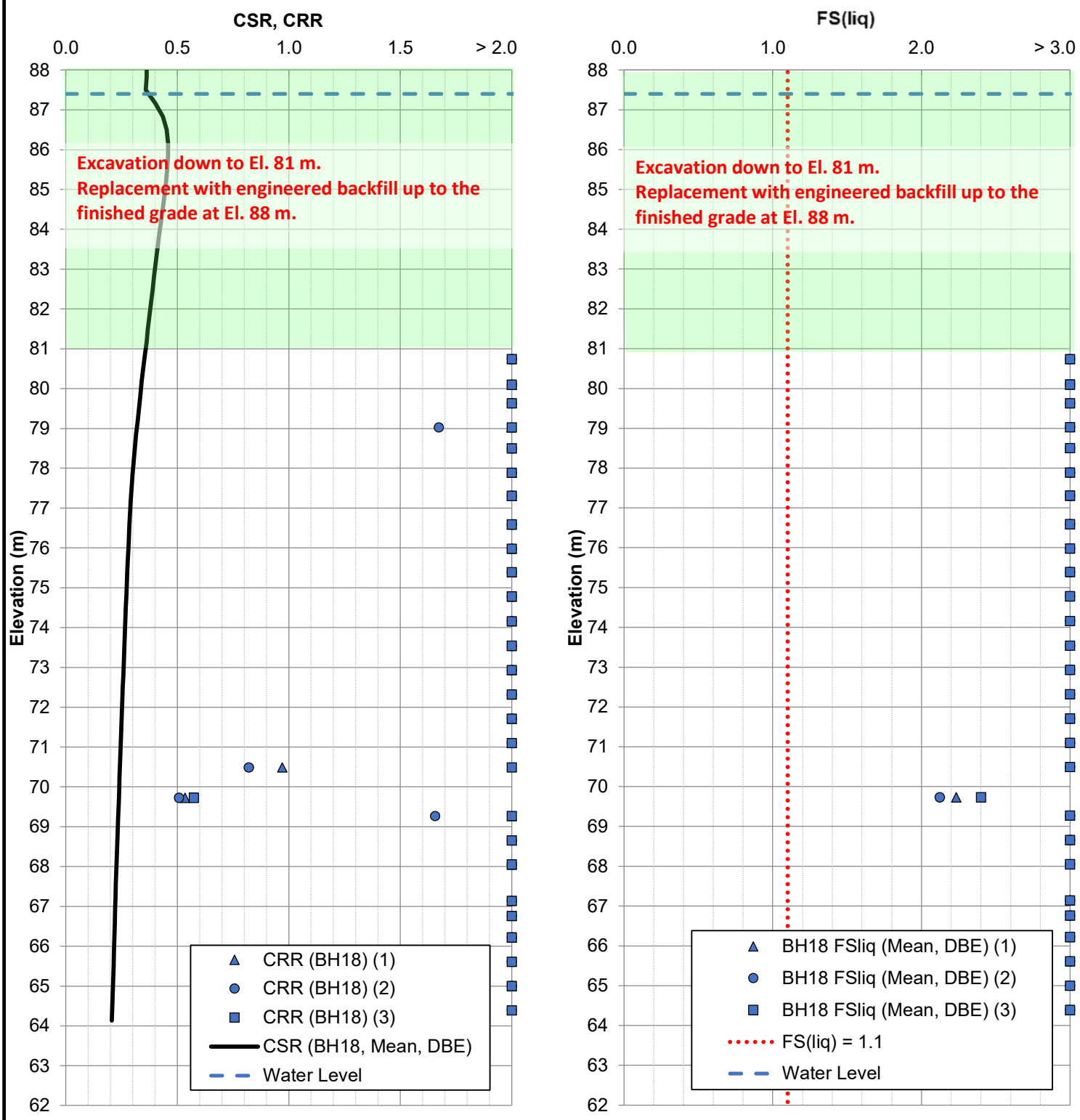
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH10 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Reactor Auxiliary Bay Area (No. 5)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-23 / REV.



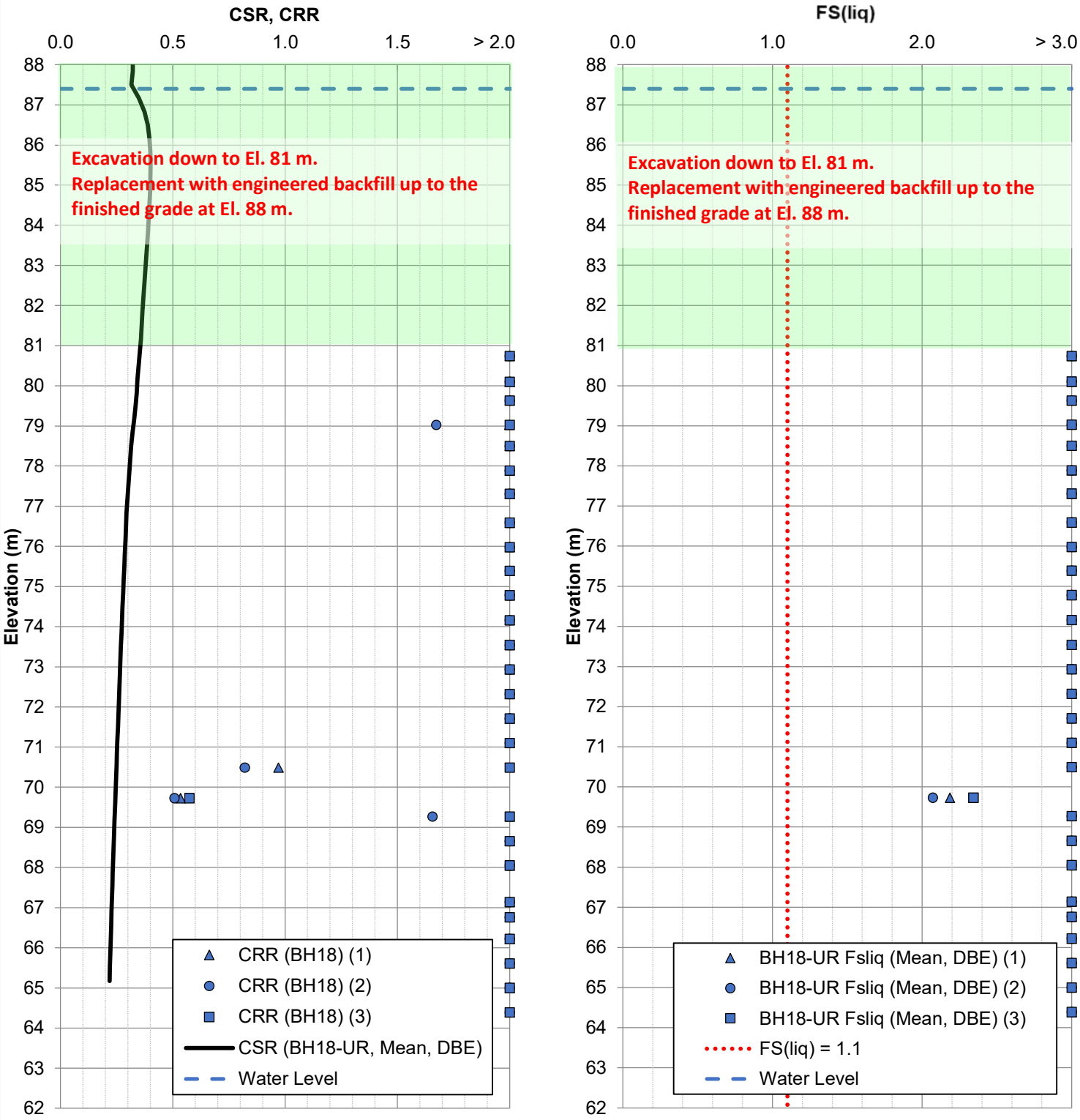
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH14 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-24 / REV.



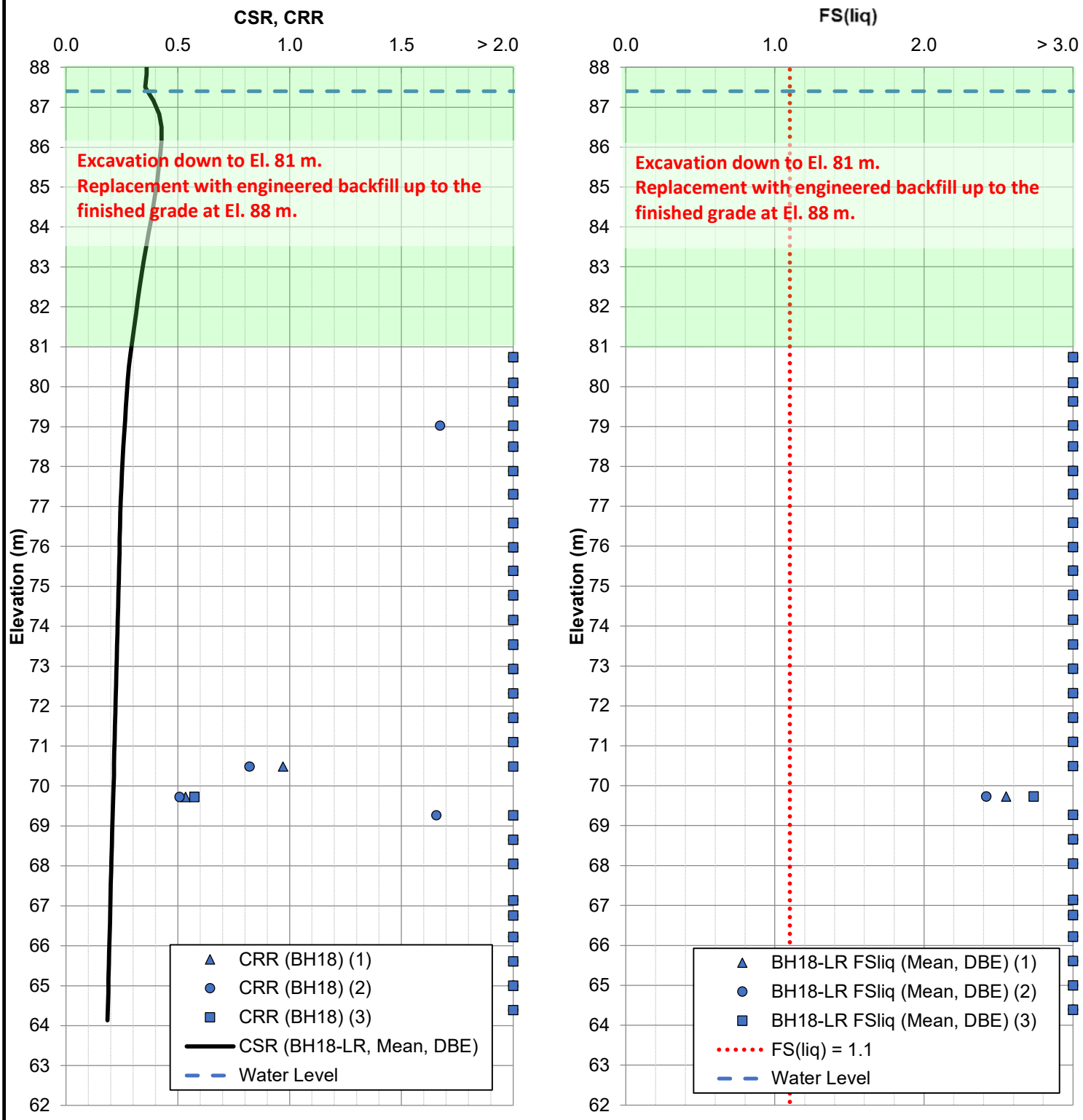
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-25 REV.



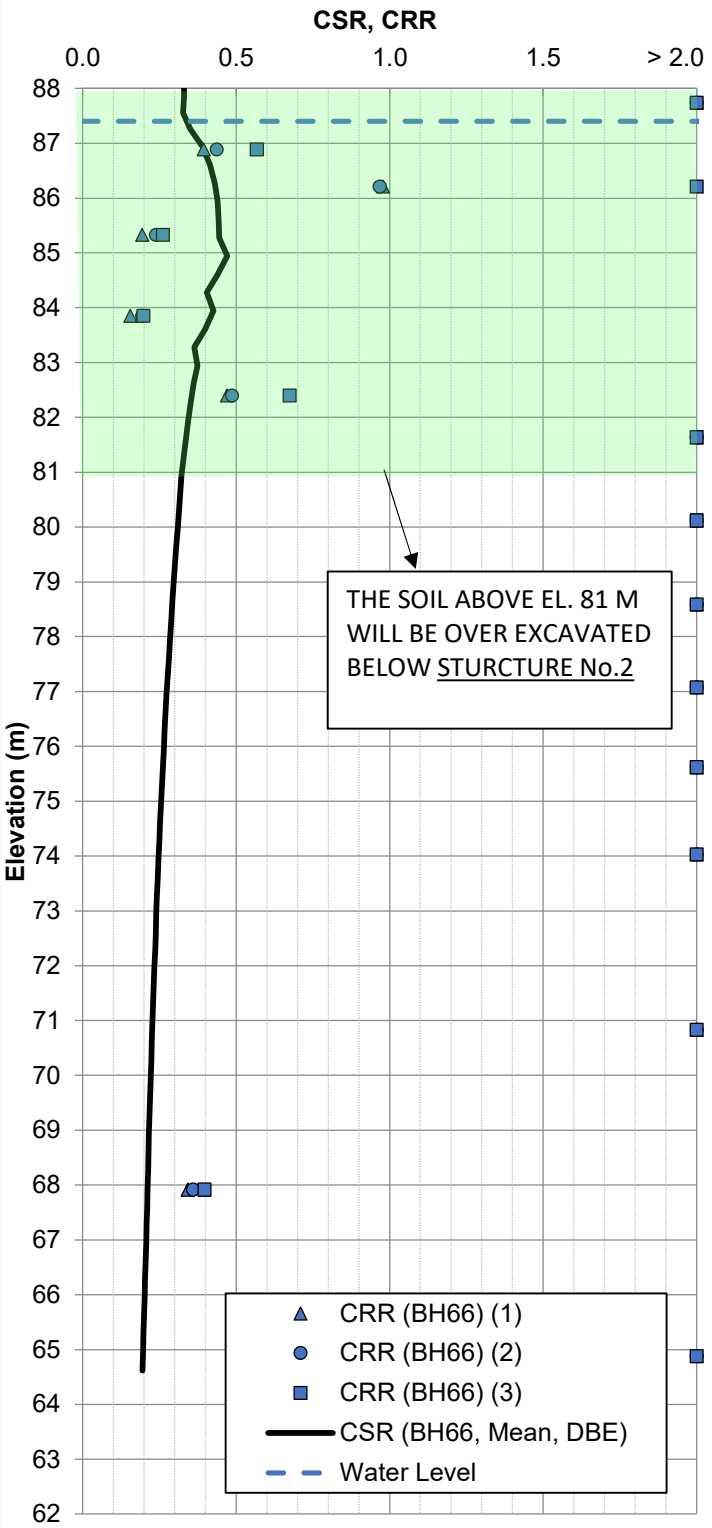
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

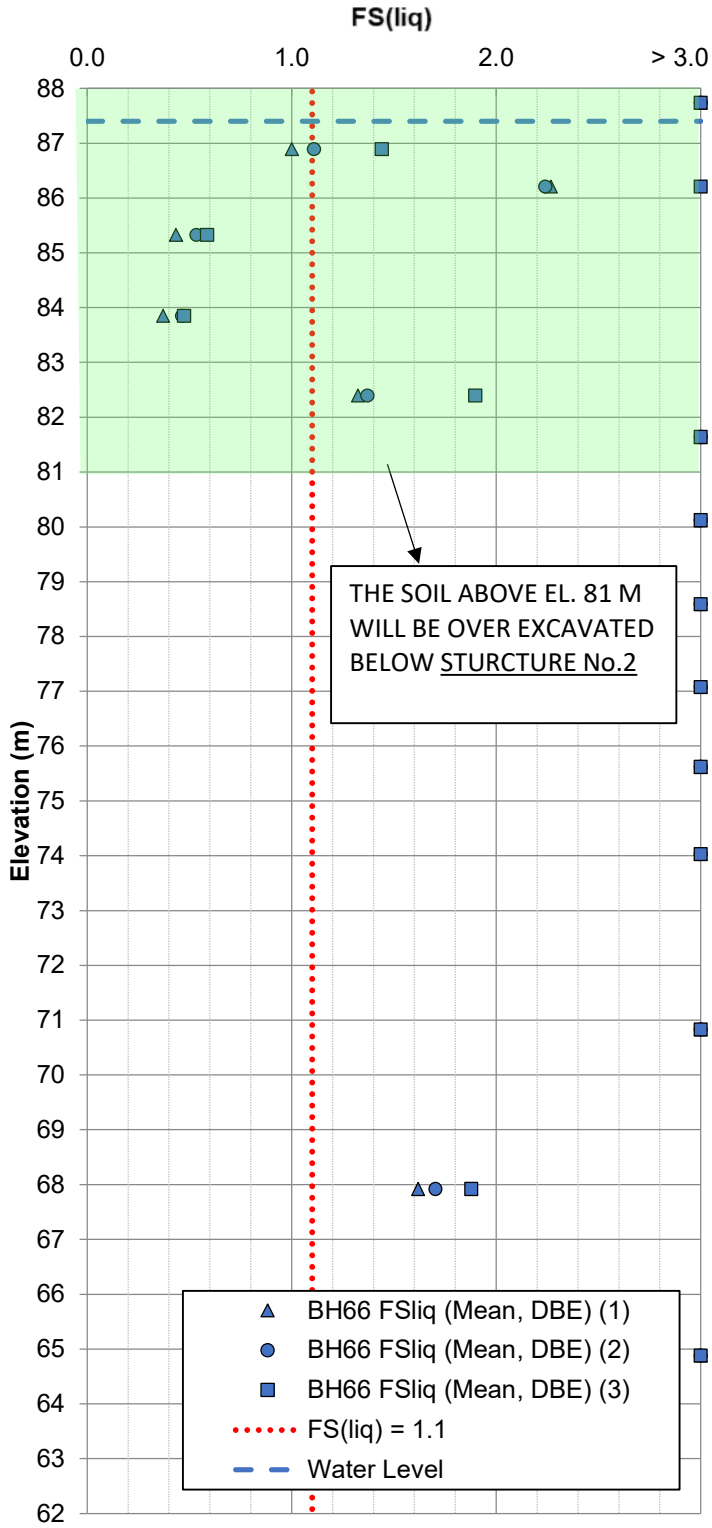
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18-UR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-25(a)	REV.



△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

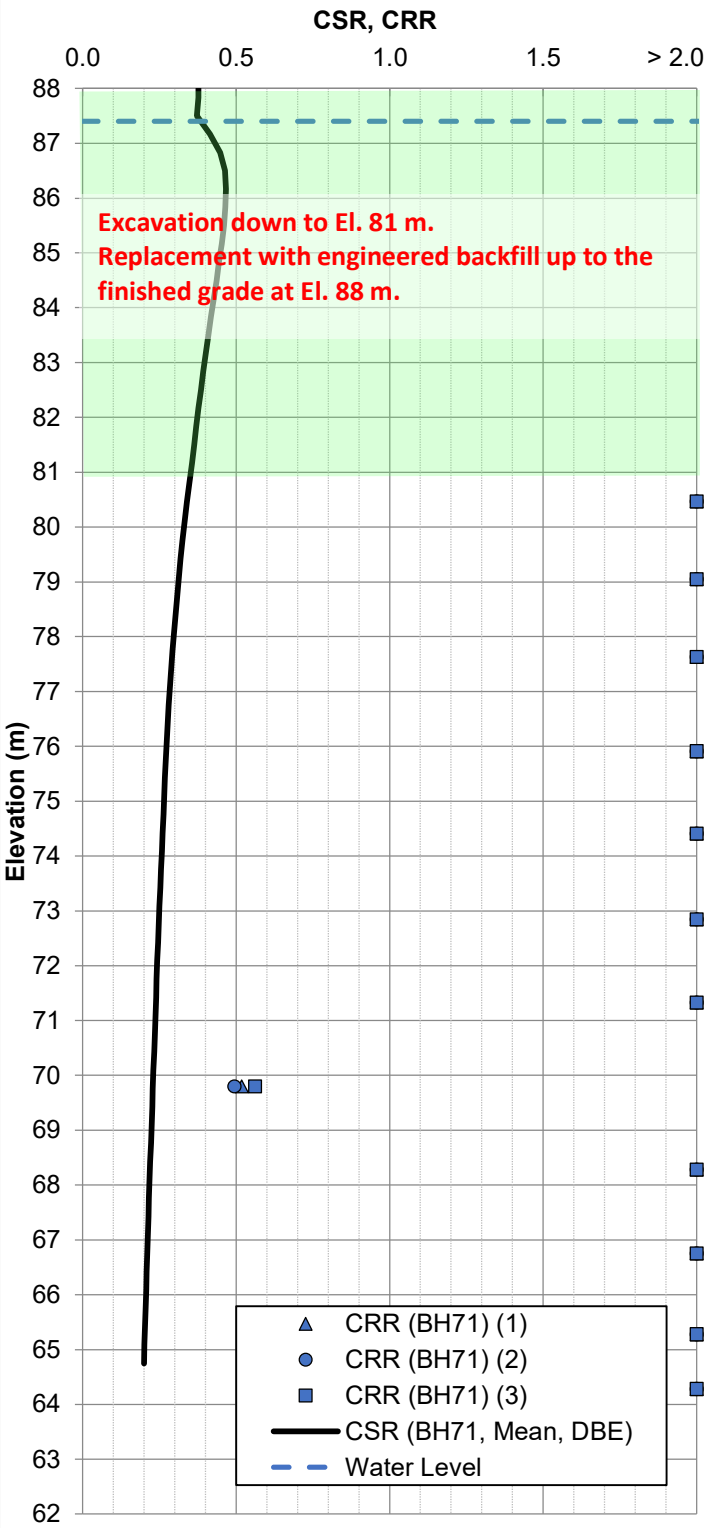
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18-LR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-25(b)	REV.

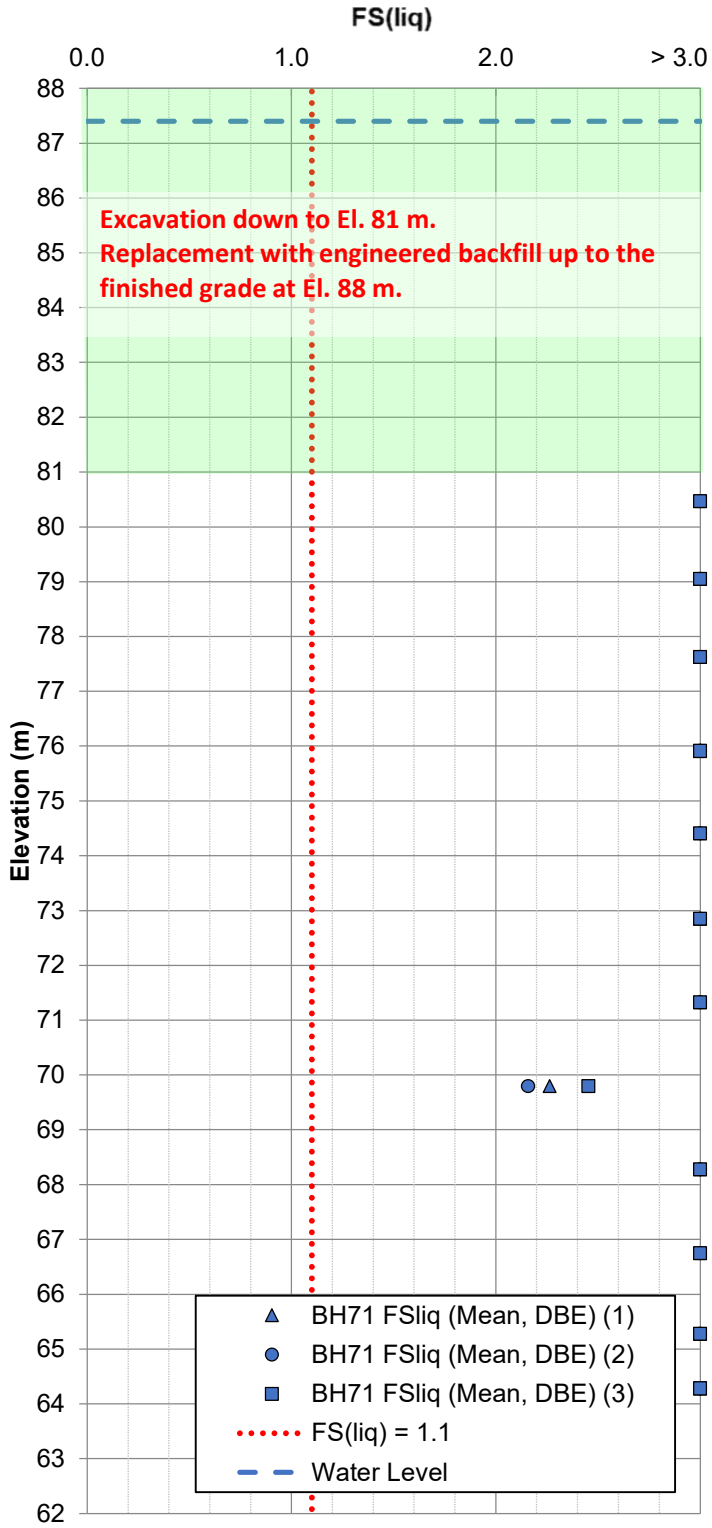




△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

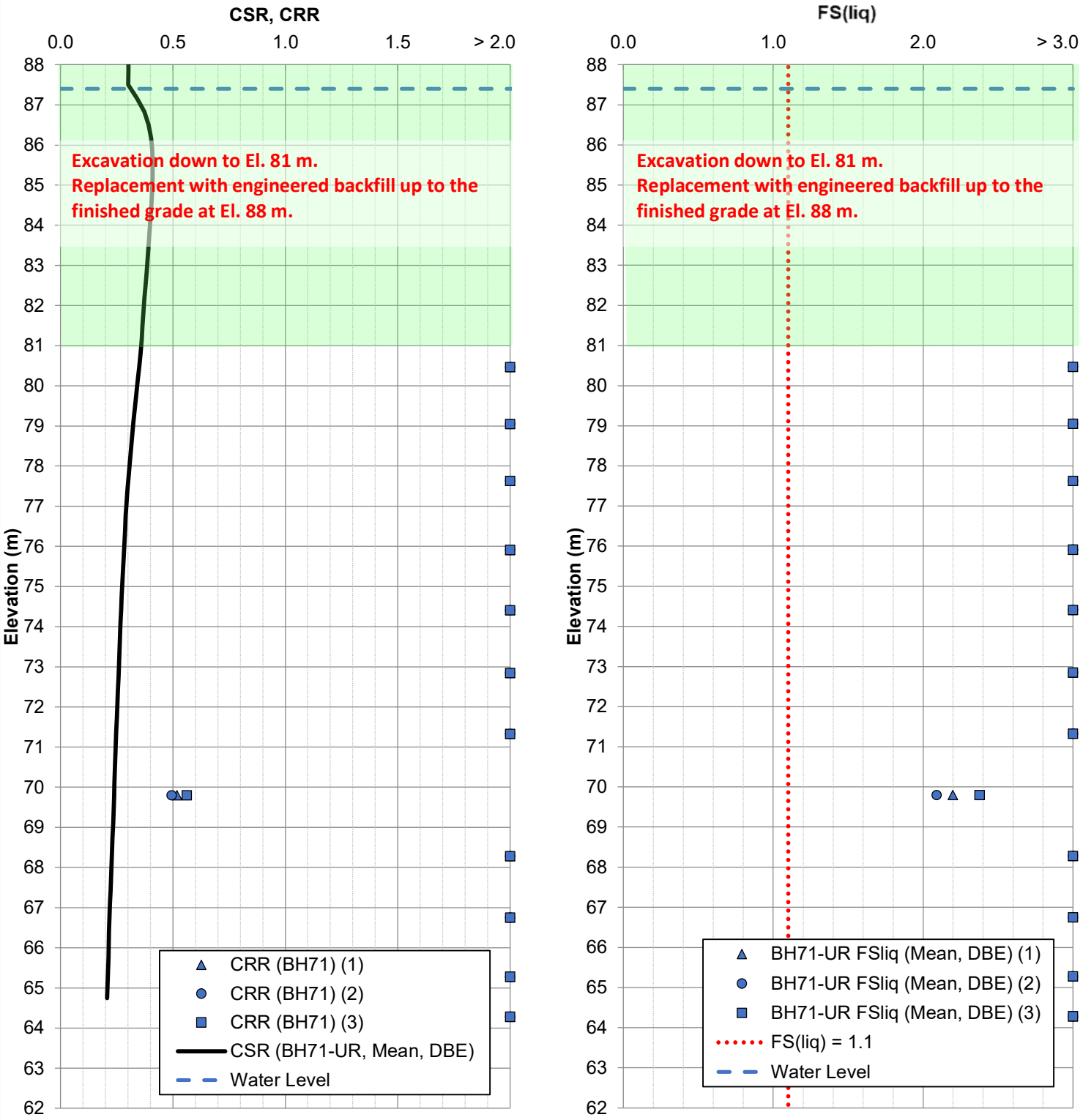
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH66 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-26 REV.





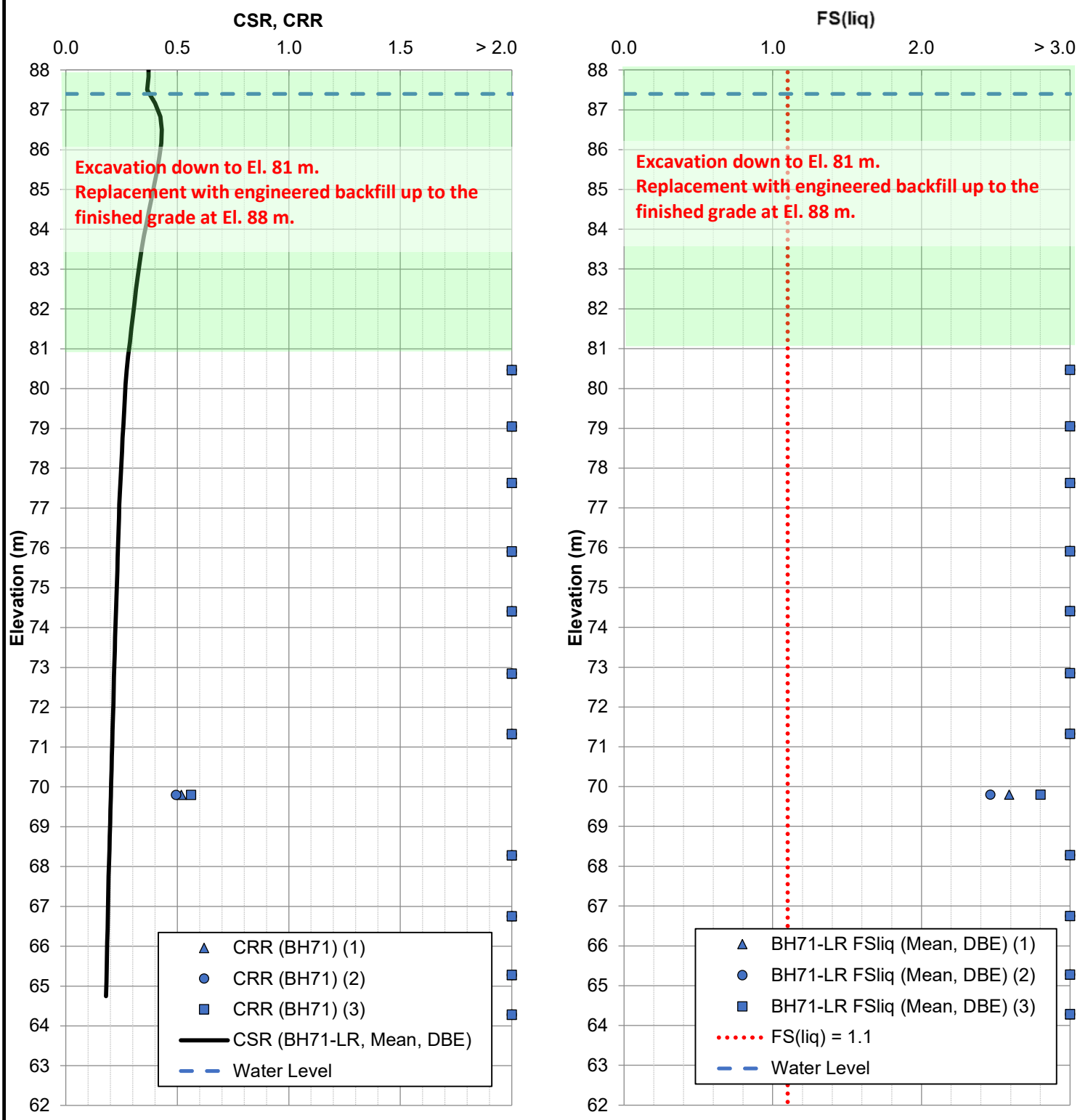
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-27 / REV.



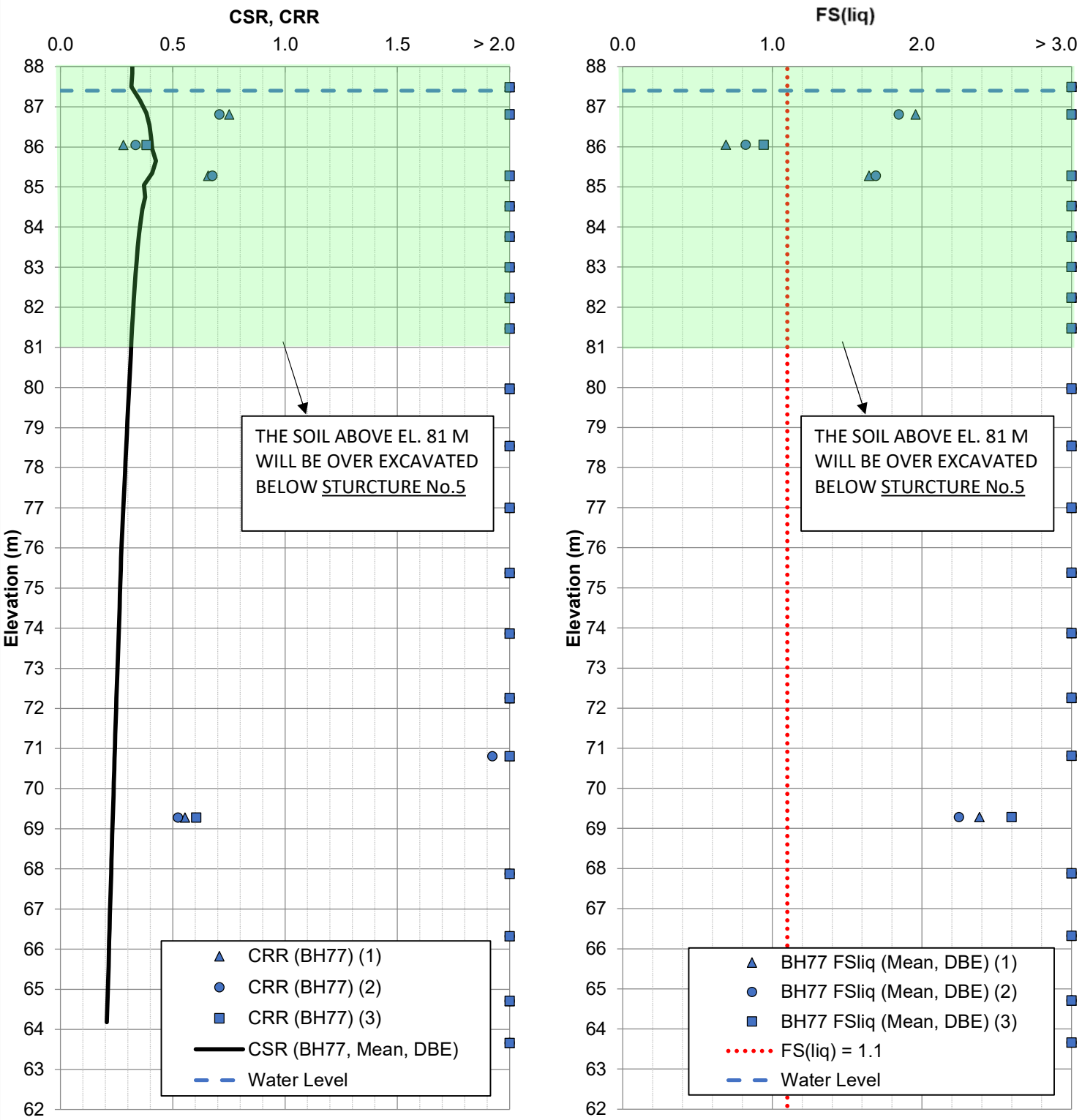
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71-UR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-27(a)	REV.



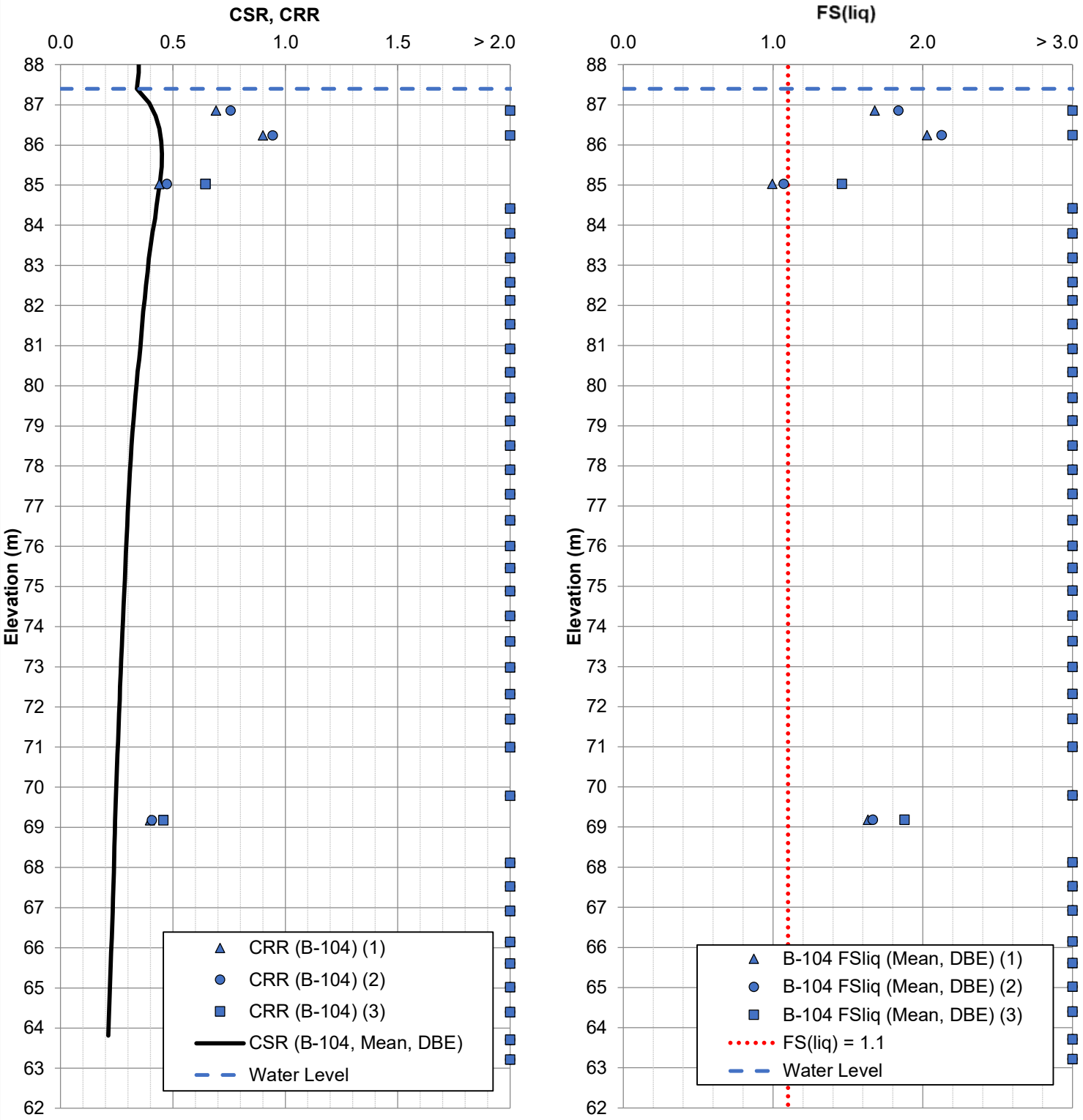
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71-LR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-27(b)	REV.



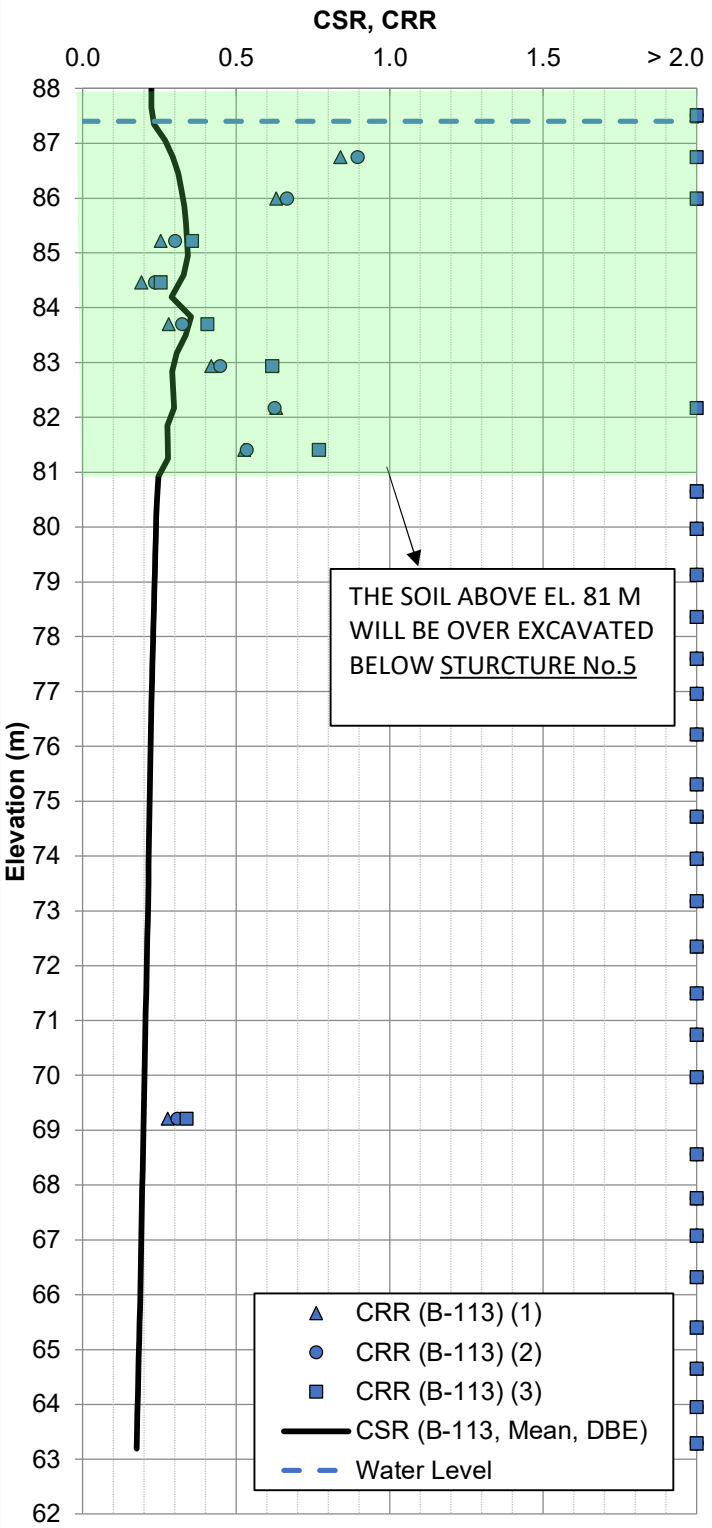
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

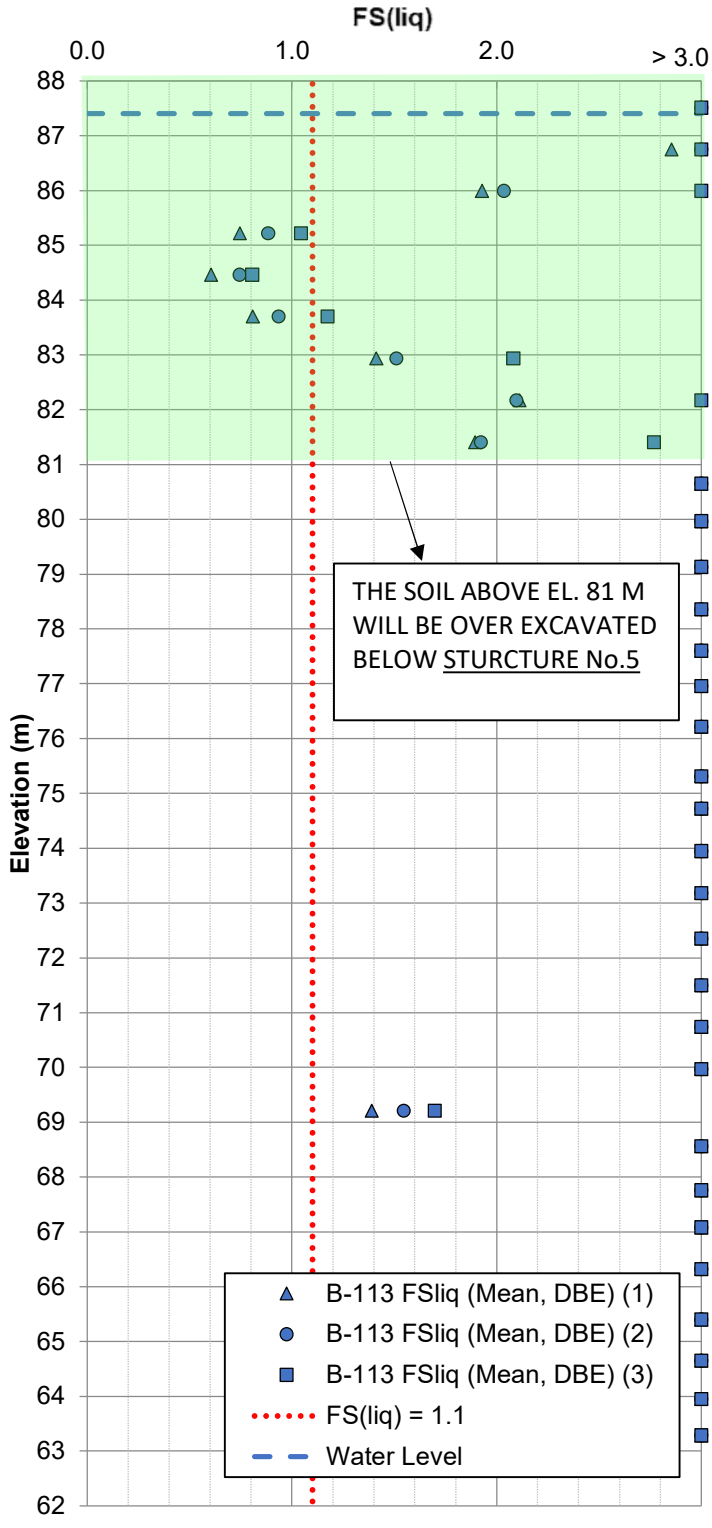
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH77 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Reactor Auxiliary Bay Area (No. 5)			
CLIENT:	Kinetrics	DATE:	JOB NO. OMGM2102S	CAD FILE:	FIGURE No. 9-28 REV.



△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

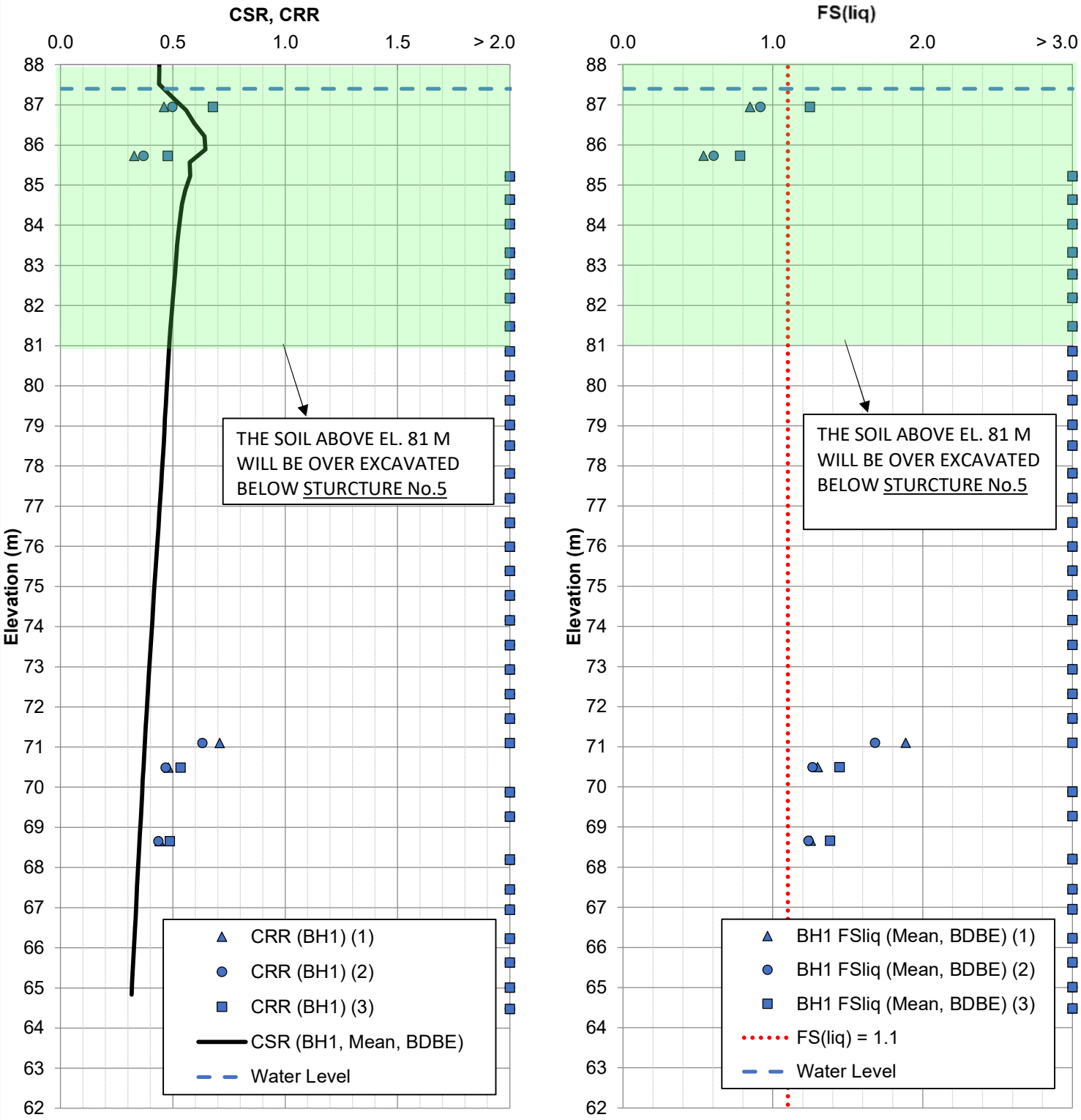
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: B-104 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-29	REV.





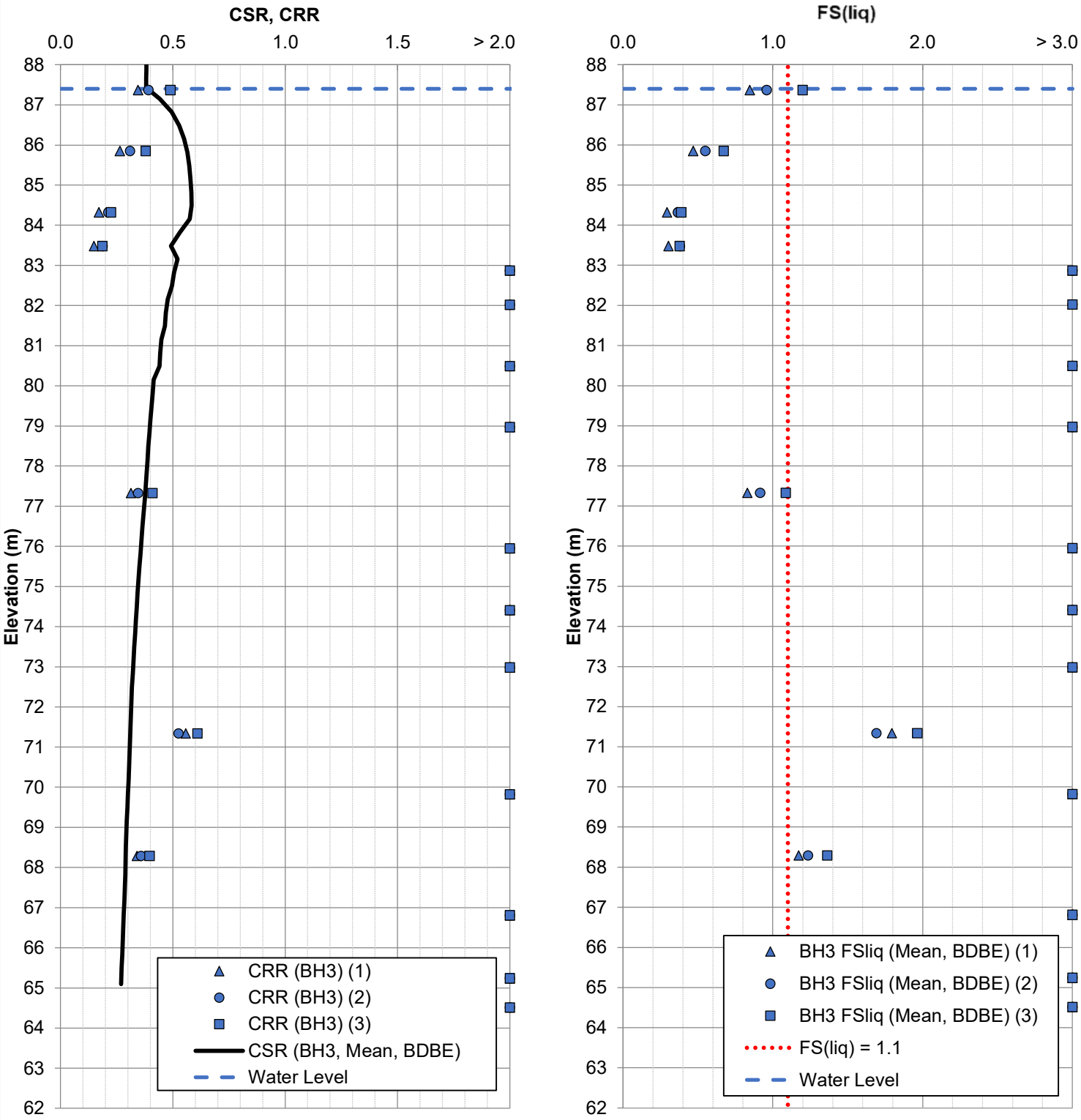
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: B-113 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, DBE case - Reactor Auxiliary Bay Area (No. 5) & ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-30	REV.



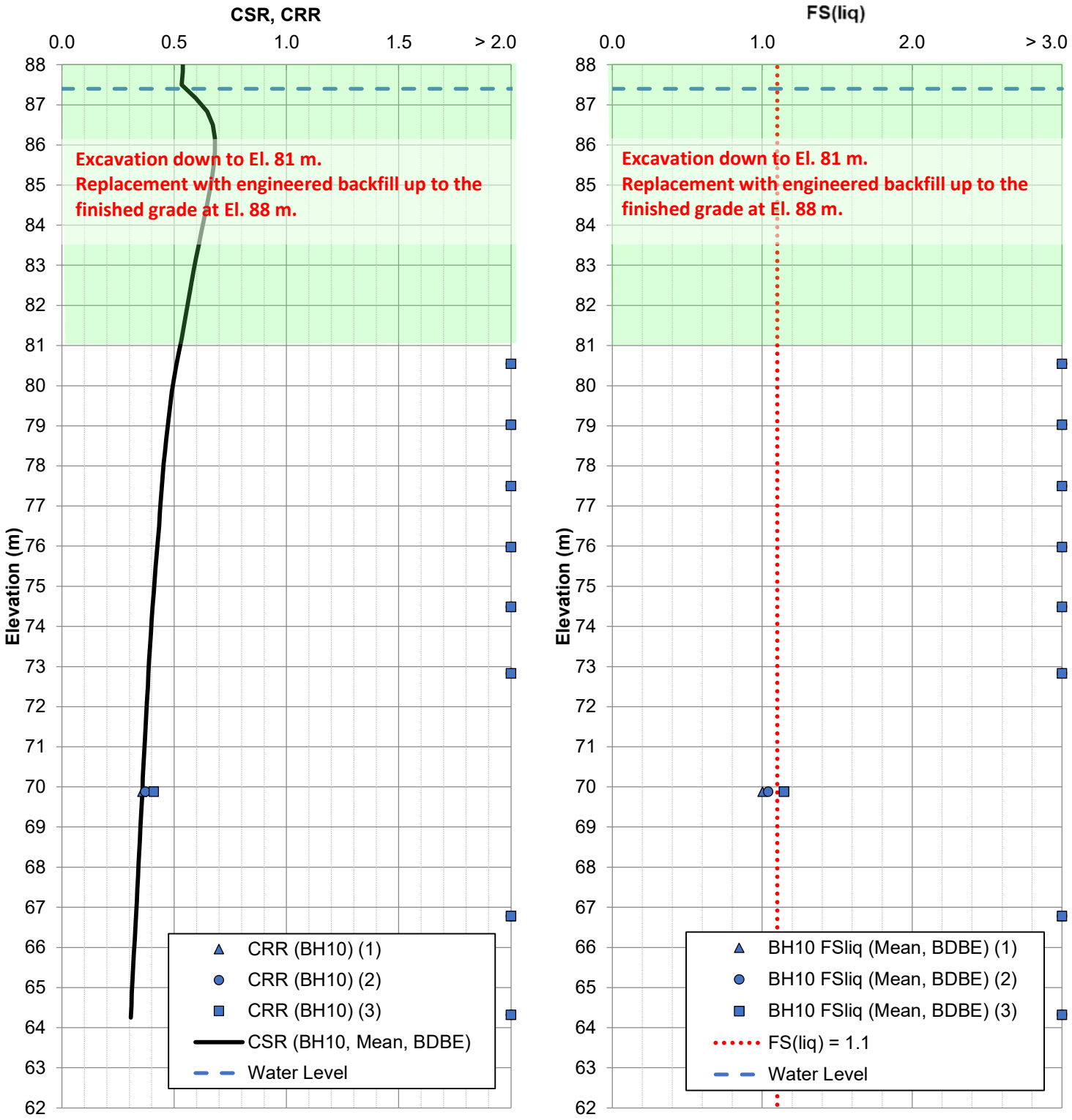
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH1 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Reactor Auxiliary Bay Area (No. 5) & ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-31	REV.



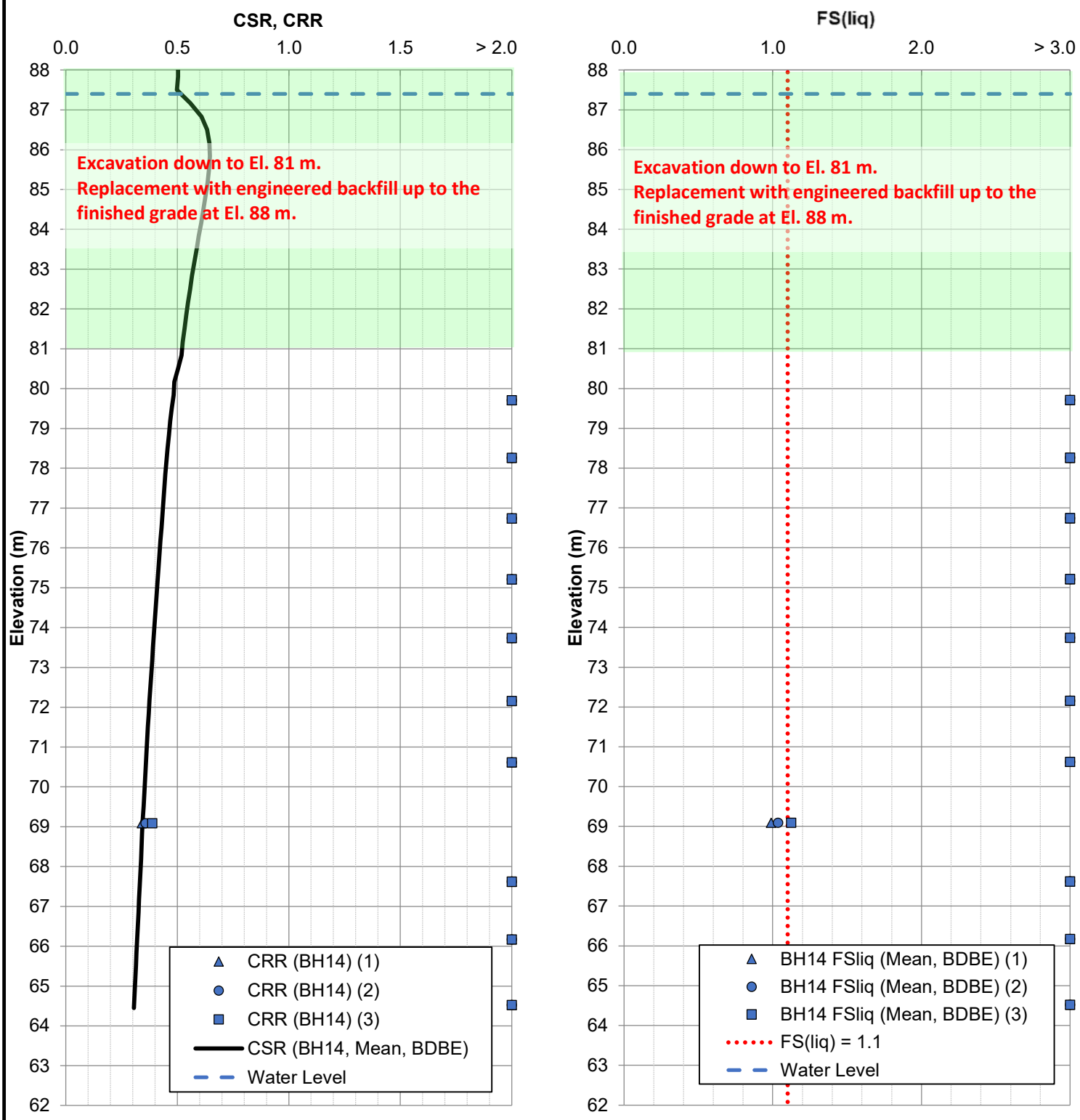
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH3 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-32 / REV.



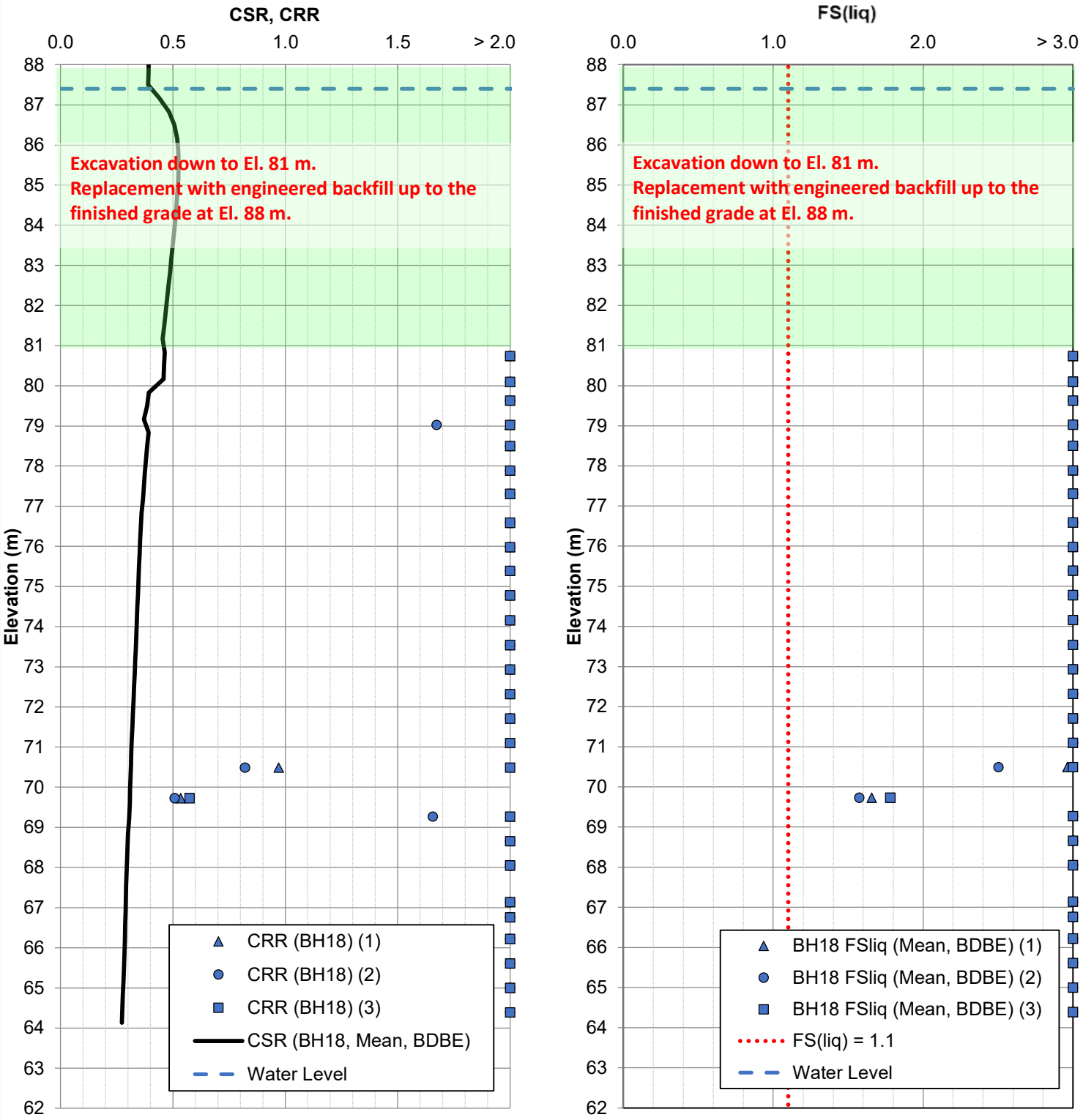
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH10 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-33 / REV.



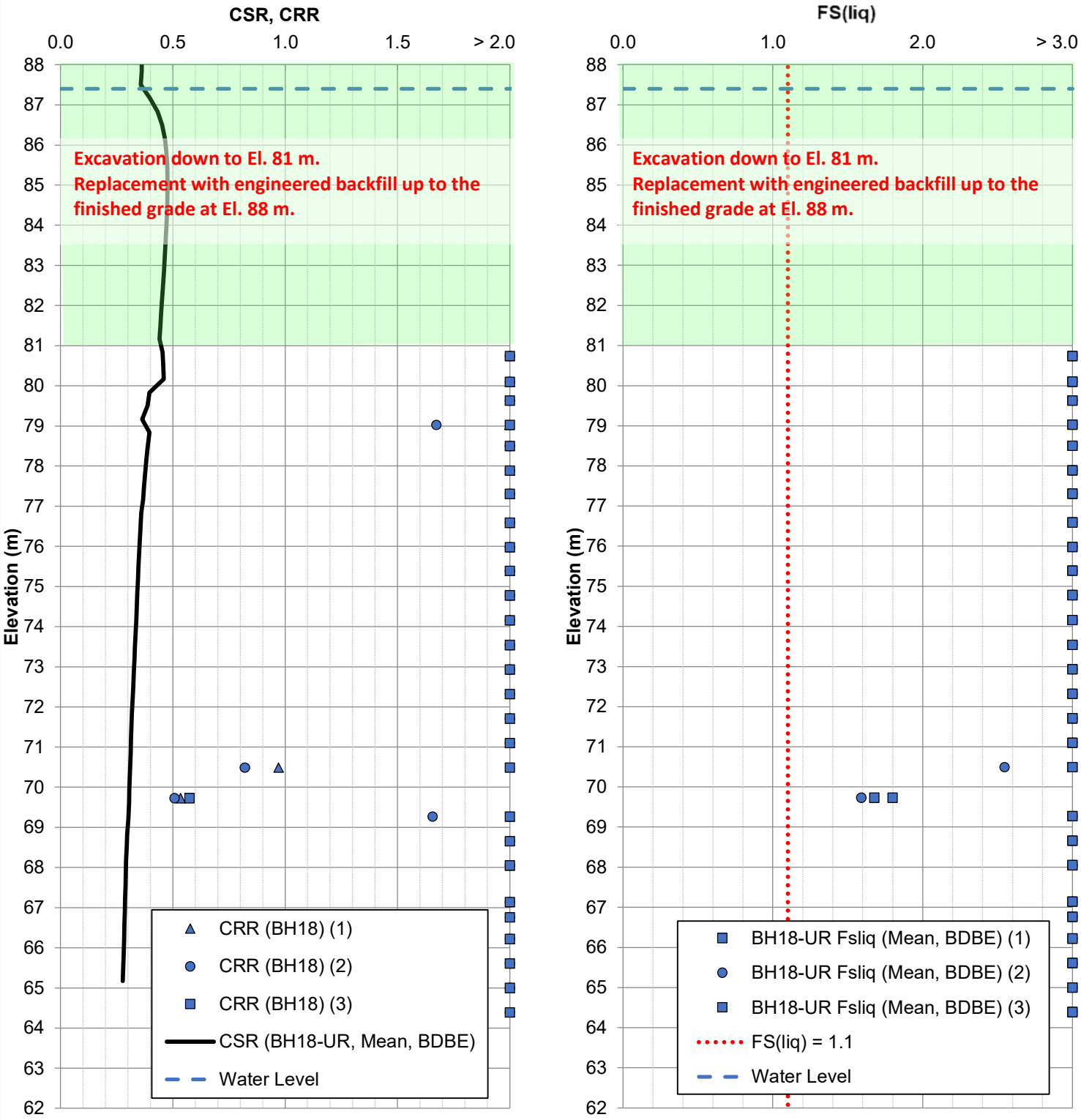
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH14 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-34 / REV.



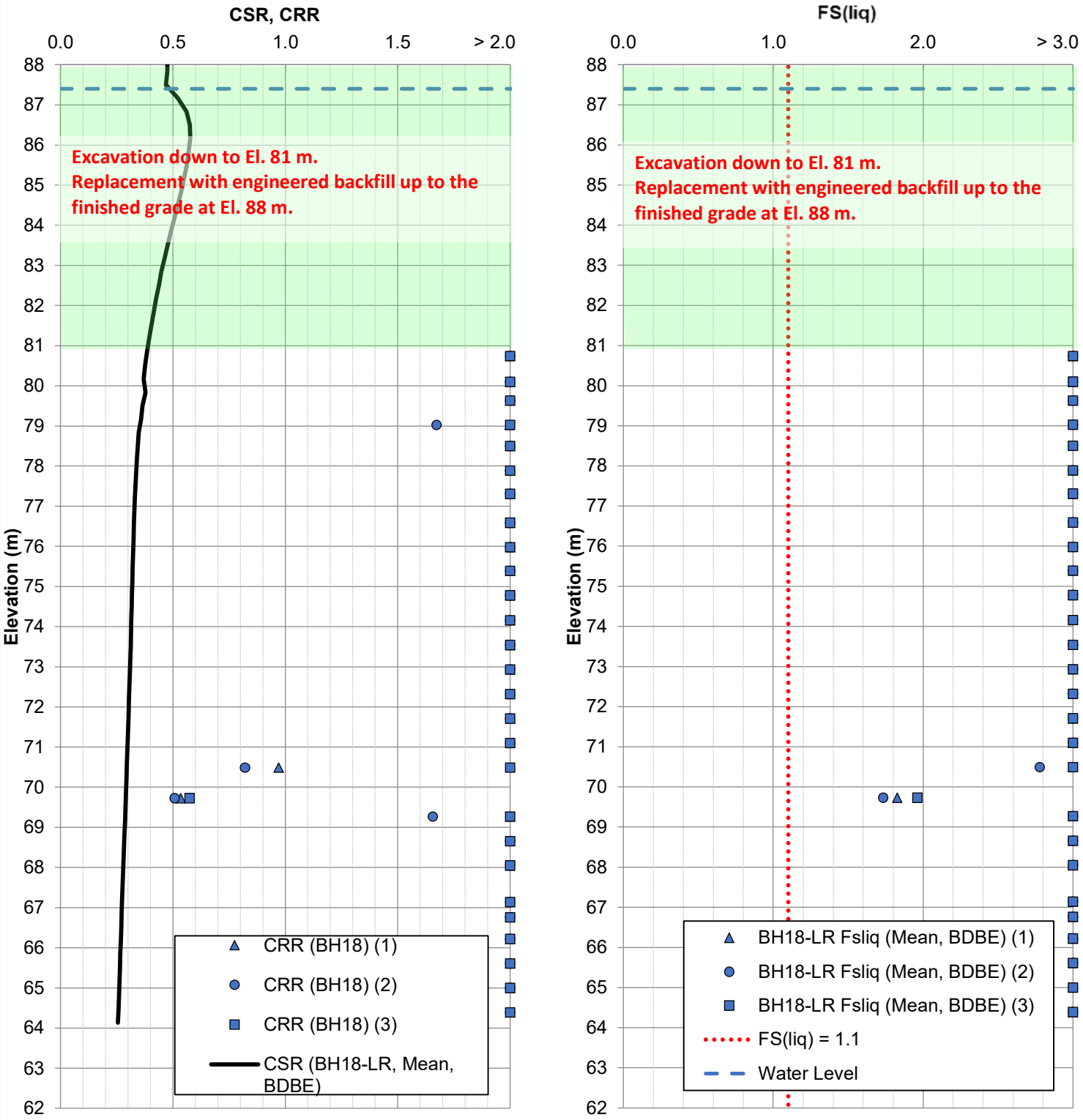
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-35 REV.



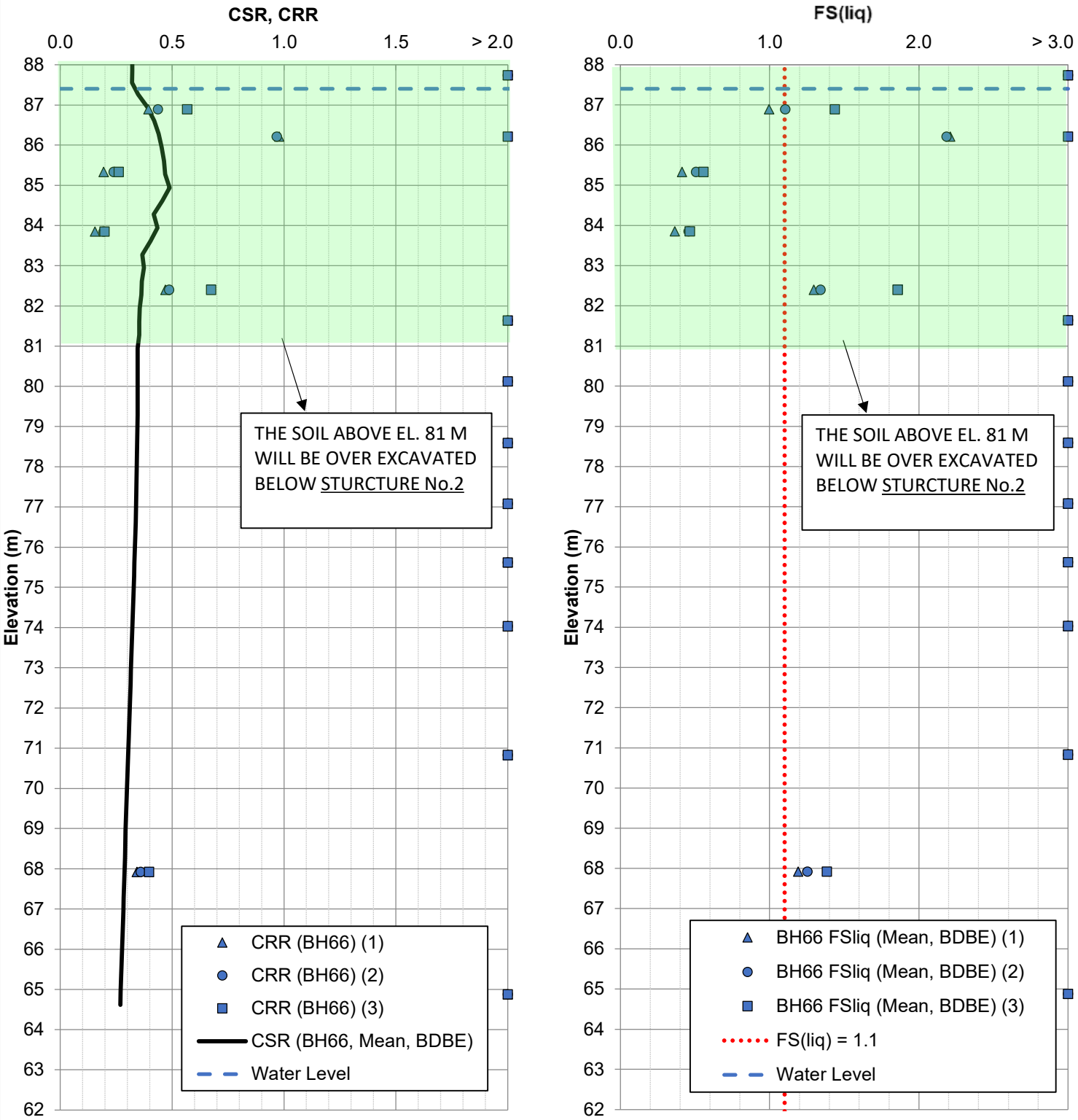
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18-UR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-35(a) REV.



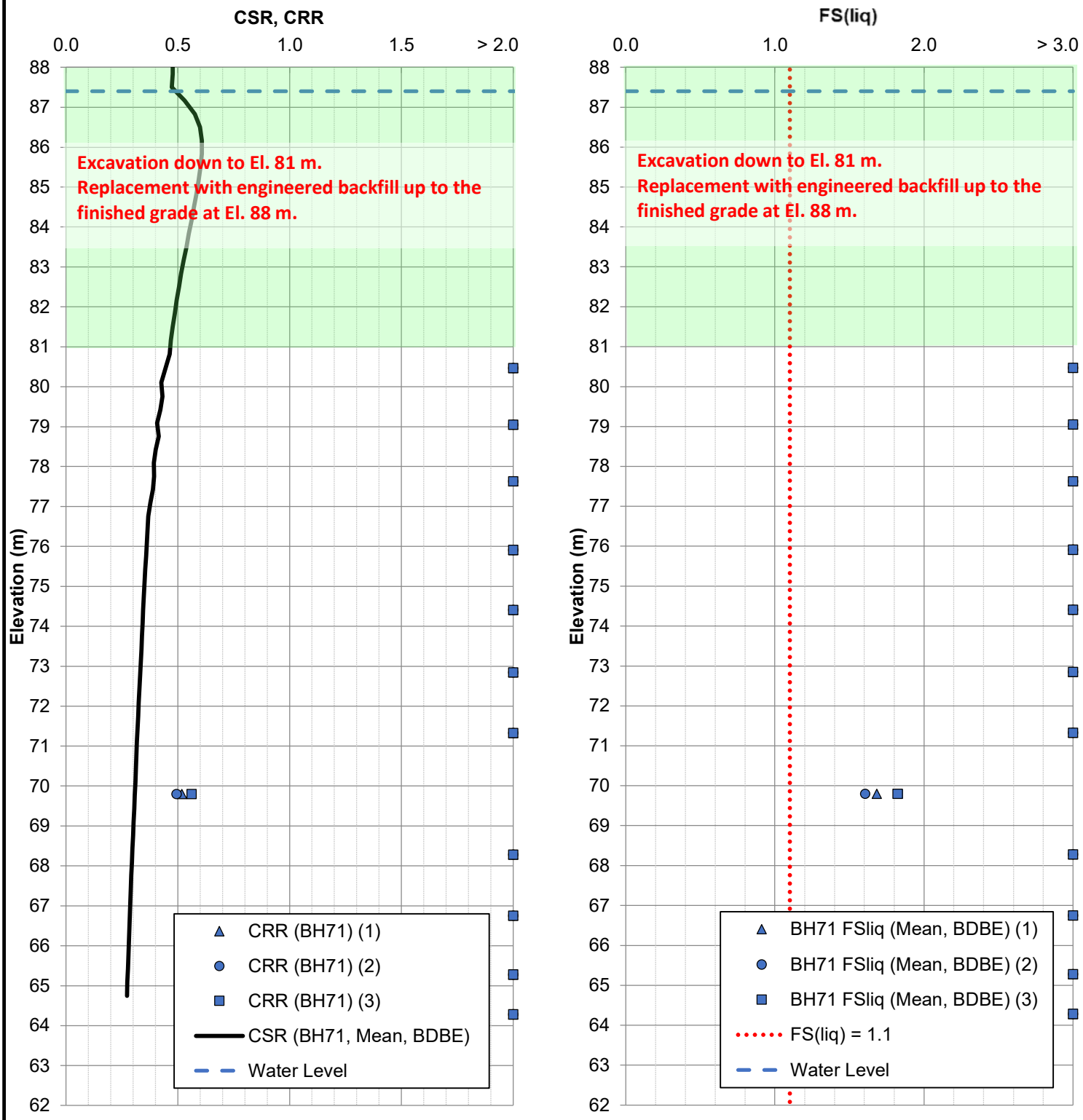
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH18-LR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Control Building Area (No. 4)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-35(b) REV.



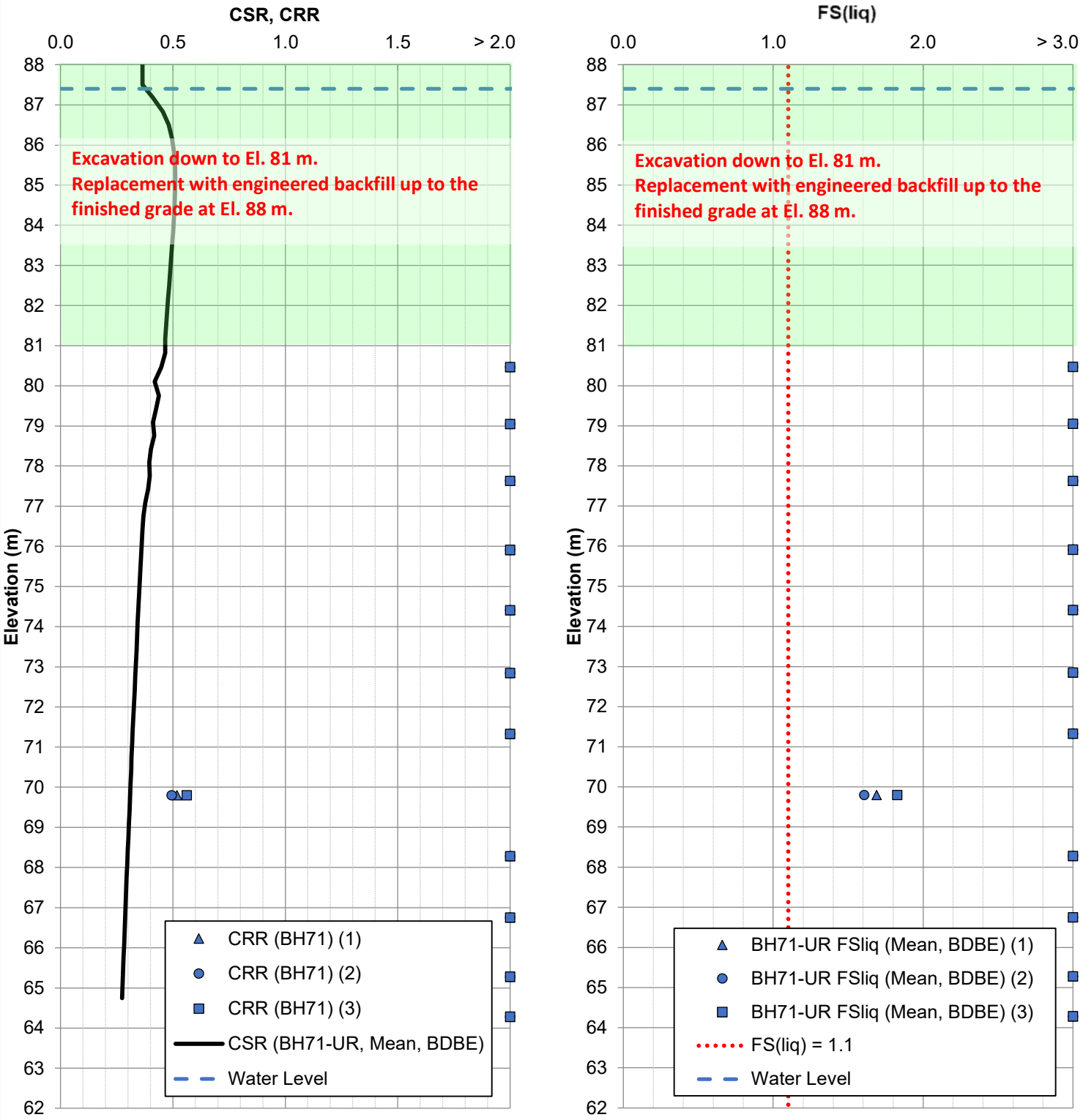
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH66 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-36 / REV.



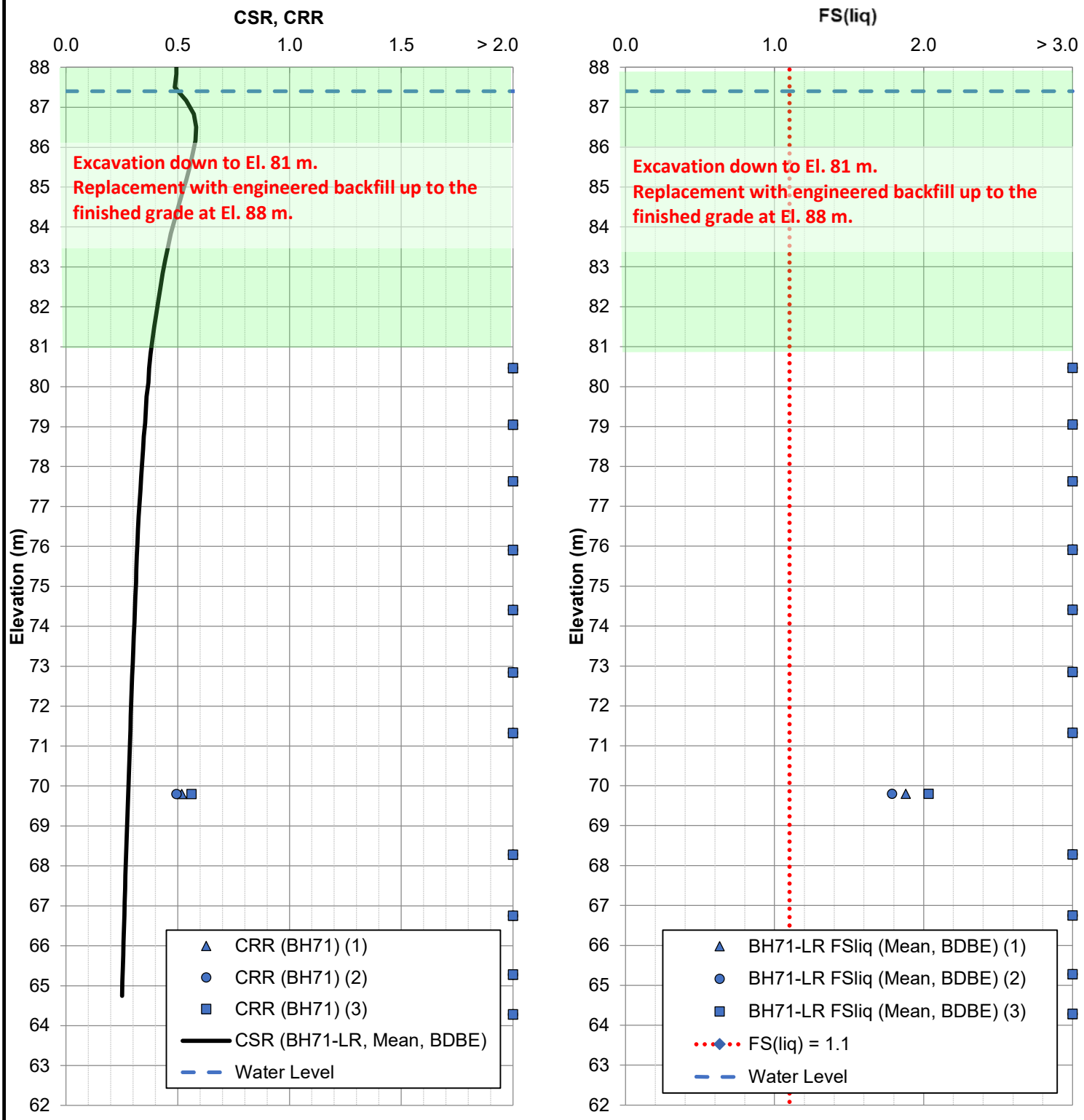
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-37 REV.



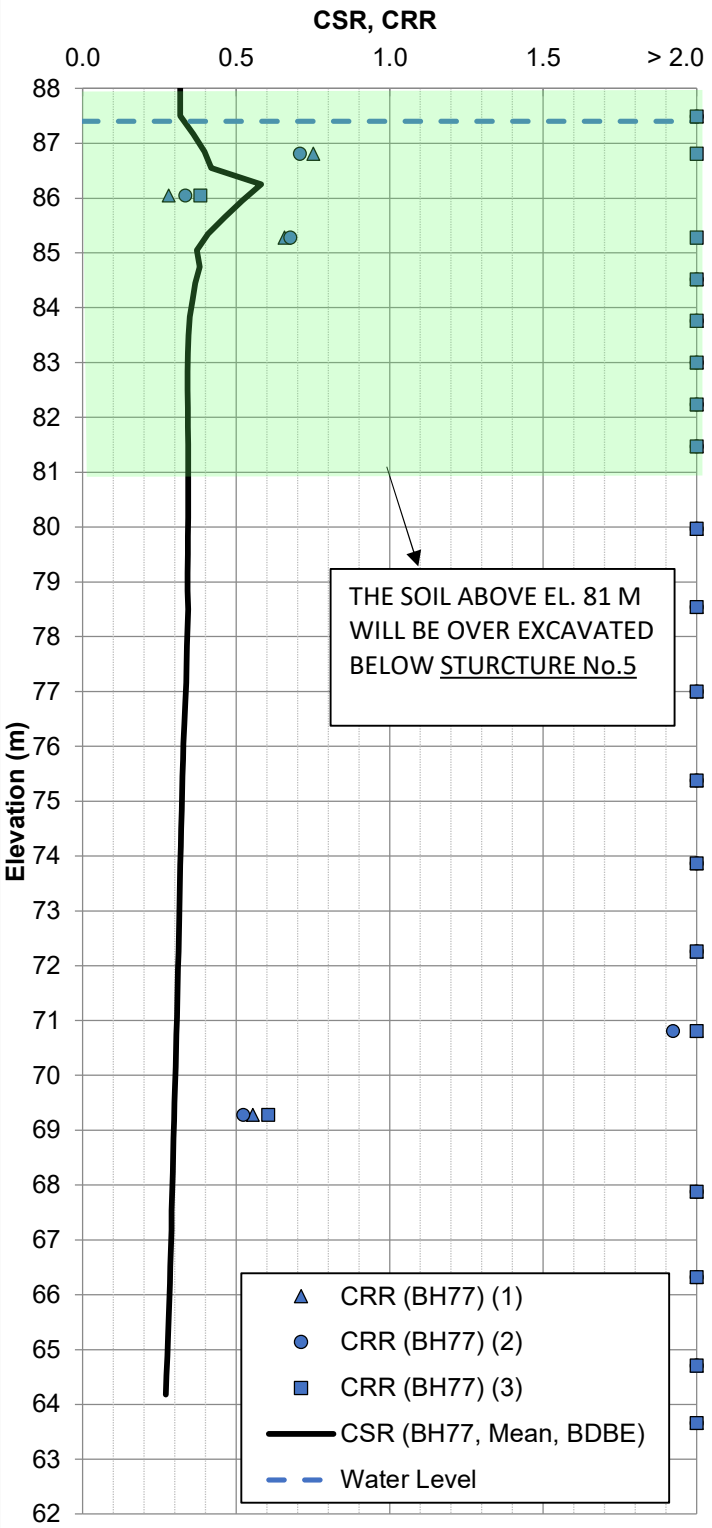
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

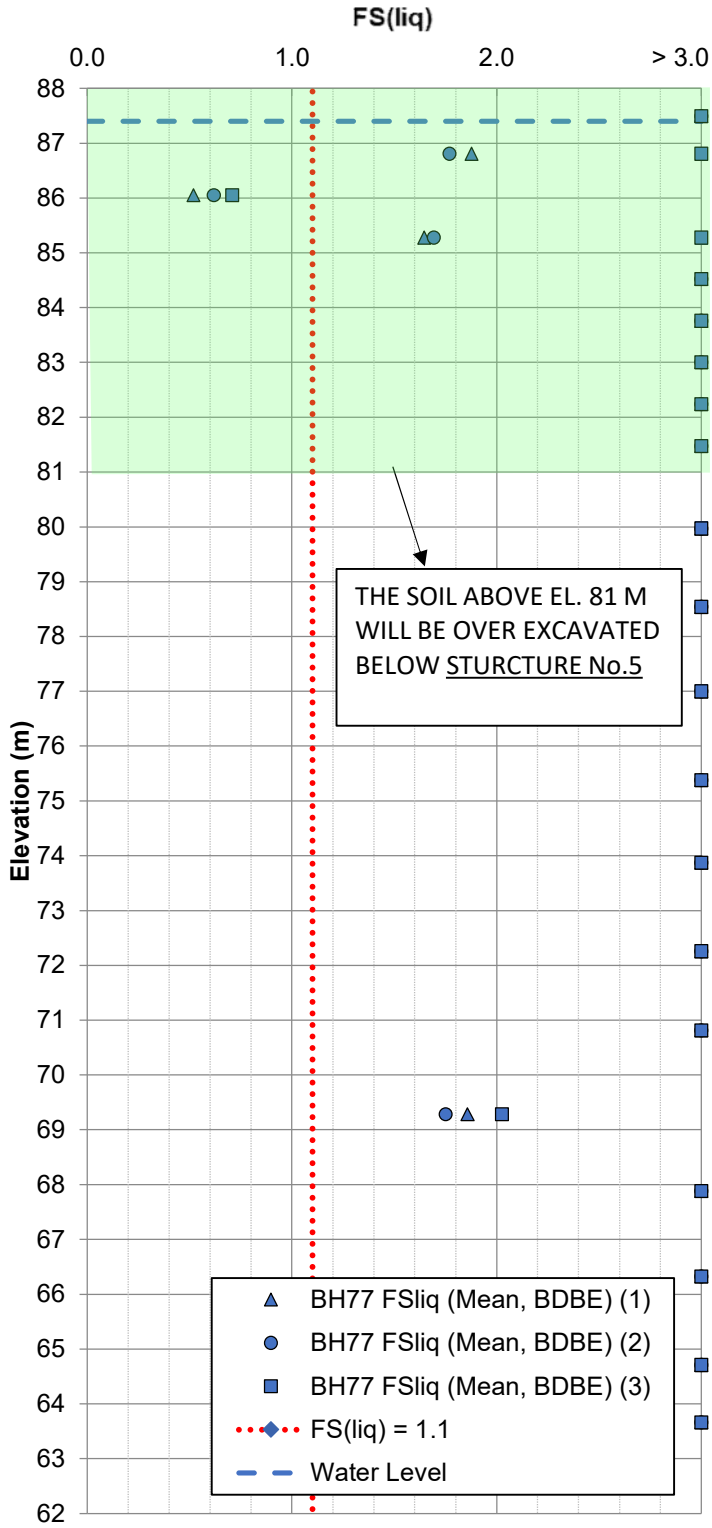
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71-UR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-37(a) REV.



△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

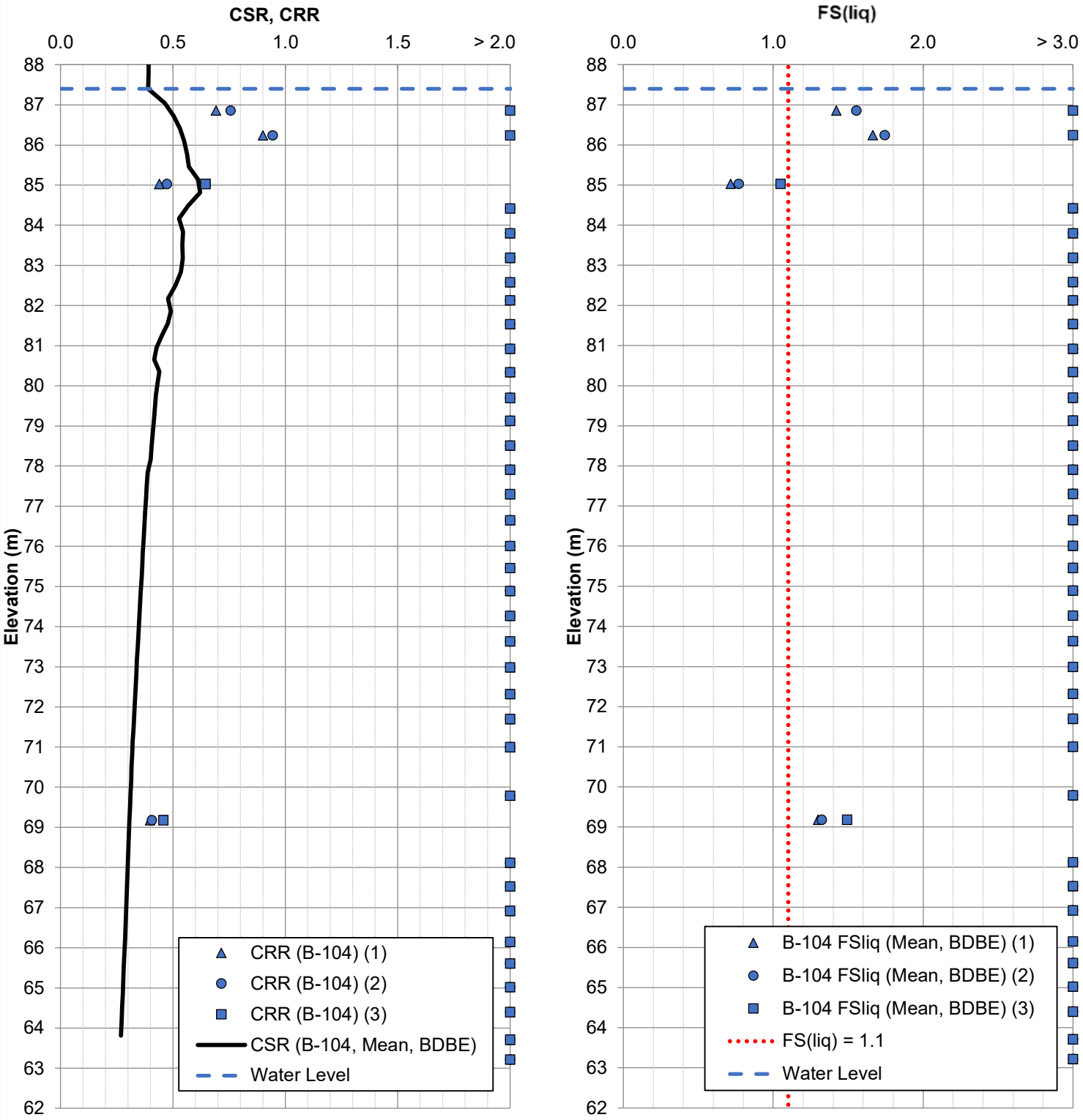
wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH71-LR - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Turbine Building Area (No. 2)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-37(b) REV.





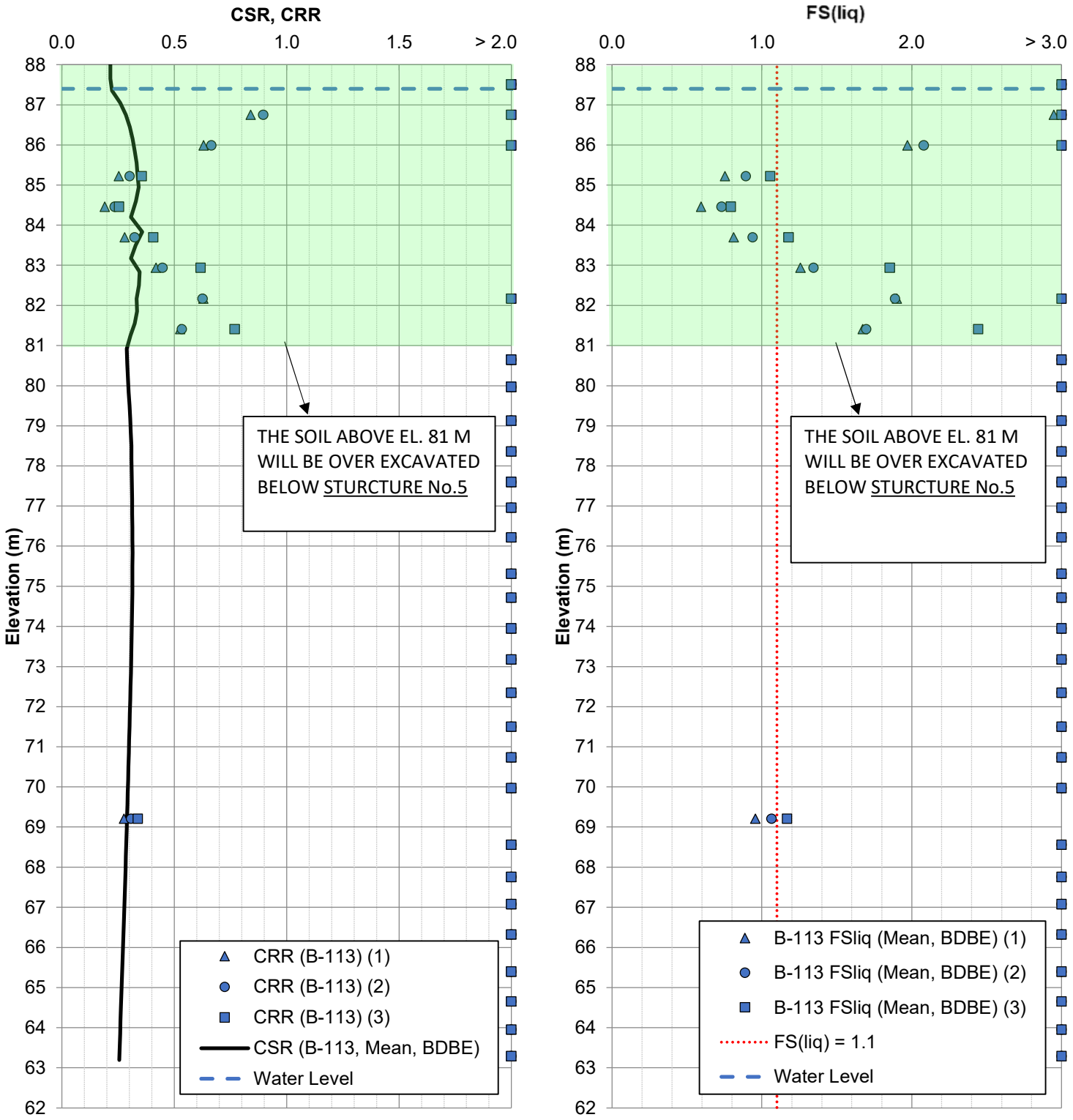
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: BH77 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Reactor Auxiliary Bay Area (No. 5)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-38 / REV.



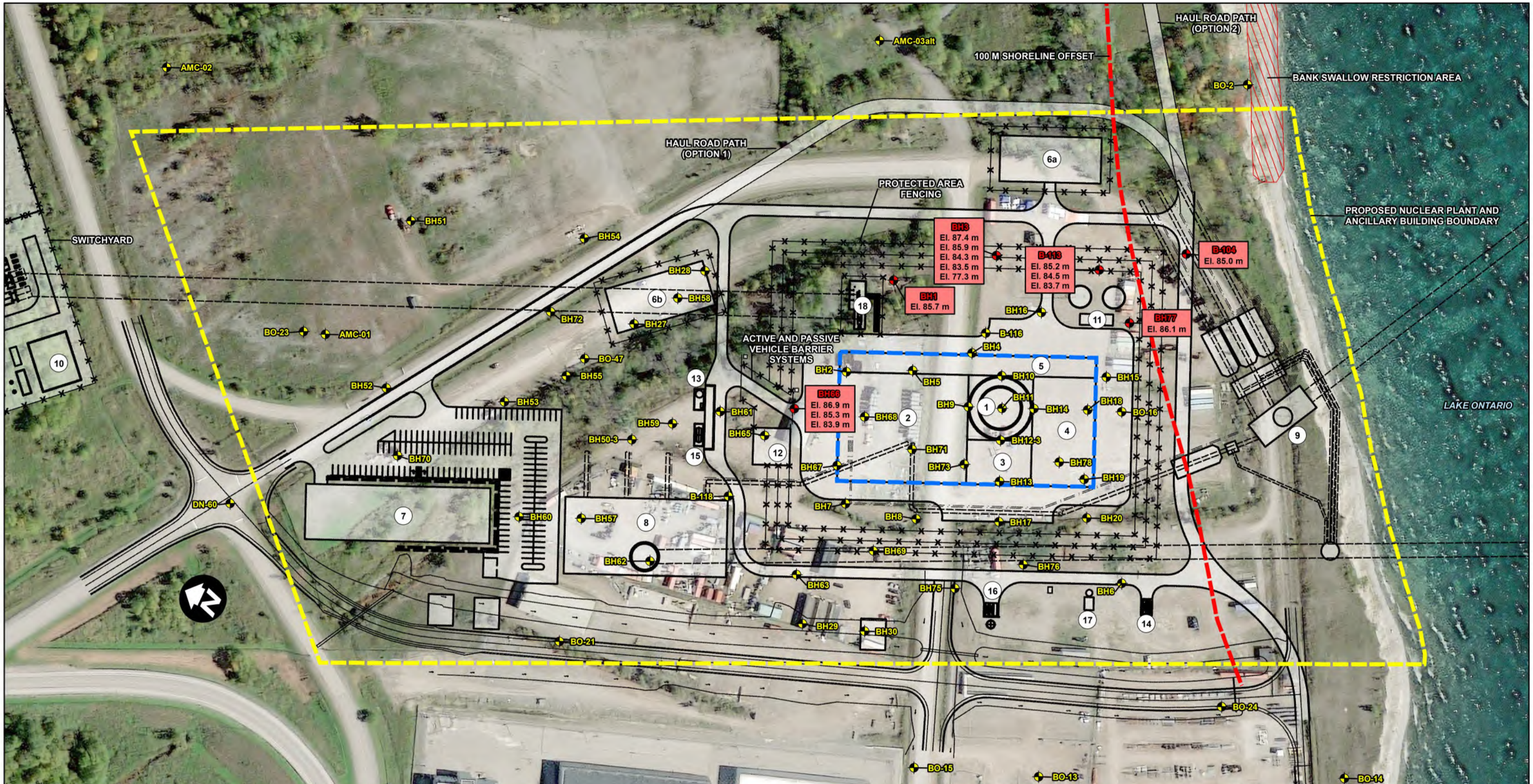
△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: B-104 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - ISFSI (No. 6)			
CLIENT: Kinetrics		DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-39	REV.



△ (1) Boulanger & Idriss 2014
○ (2) Idriss & Boulanger 2008
□ (3) Youd et al. 2001

wsp	E&I Canada Limited	PROJECT: DNNP Liquefaction Study			
		TITLE: B-113 - Cyclic Stress Ratio and Cyclic Resistance Ratio - Mean, BDBE case - Reactor Auxiliary Bay Area (No. 5) & ISFSI (No. 6)			
CLIENT:	Kinetrics	DATE:	JOB No.: OMGM2102S	CAD FILE:	FIGURE No.: 9-40	REV.



LEGEND

- Borehole Location (Labelled with ID)
- Liquefied Soil Location (Labeled with ID and Liquefied Soils Elevation)
- # Buildings
- Proposed Nuclear Plant and Ancillary Building Boundary
- Limit of Power Block
- Bank Swallow Restriction Area
- 100 m Shoreline Offset
- Contours (1 m interval)

Building ID	Description
1	Reactor Building
2	Turbine Building
3	Radwaste Building
4	Control Building
5	Reactor Auxiliary Bay
6a	Independent Spent Fuel Storage Installation (see Note 3)
6b	Independent Spent Fuel Storage Installation (Location as per Preliminary Design)
7	Administration/Training Building
8	Intake Structure/Forebay
9	Discharge Structure

Building ID	Description
10	Switchyard Building
11	Fire Water Storage Tanks and Pump Enclosure
12	Security Building
13	Diesel Fuel Storage Tank
14	Hydrogen Equipment
15	Turbine Lube Oil Tank
16	Demineralized Water Equipment
17	Nitrogen Equipment
18	Transformation (Preliminary)

NOTES:
1. Background Imagery from ESRI Online Basemaps, 2021.
2. Contours provided by WSP Golder, 2022.
3. Site layout plan, bank swallow restriction area extracted from GE-Hitachi Nuclear Energy Americas LLC, drawing 006N4150 Rev 0.
4. The limit of power block from the drawing of DNNP Excavation Plan Plans Single Unit by GE-H, 006N6034, Rev.A, May 24, 2021.

Datum: NAD83
Projection: UTM Zone 17N

0 20 40 60 80 100 200 300 400 500 Metres

KINECTRICS

wsp

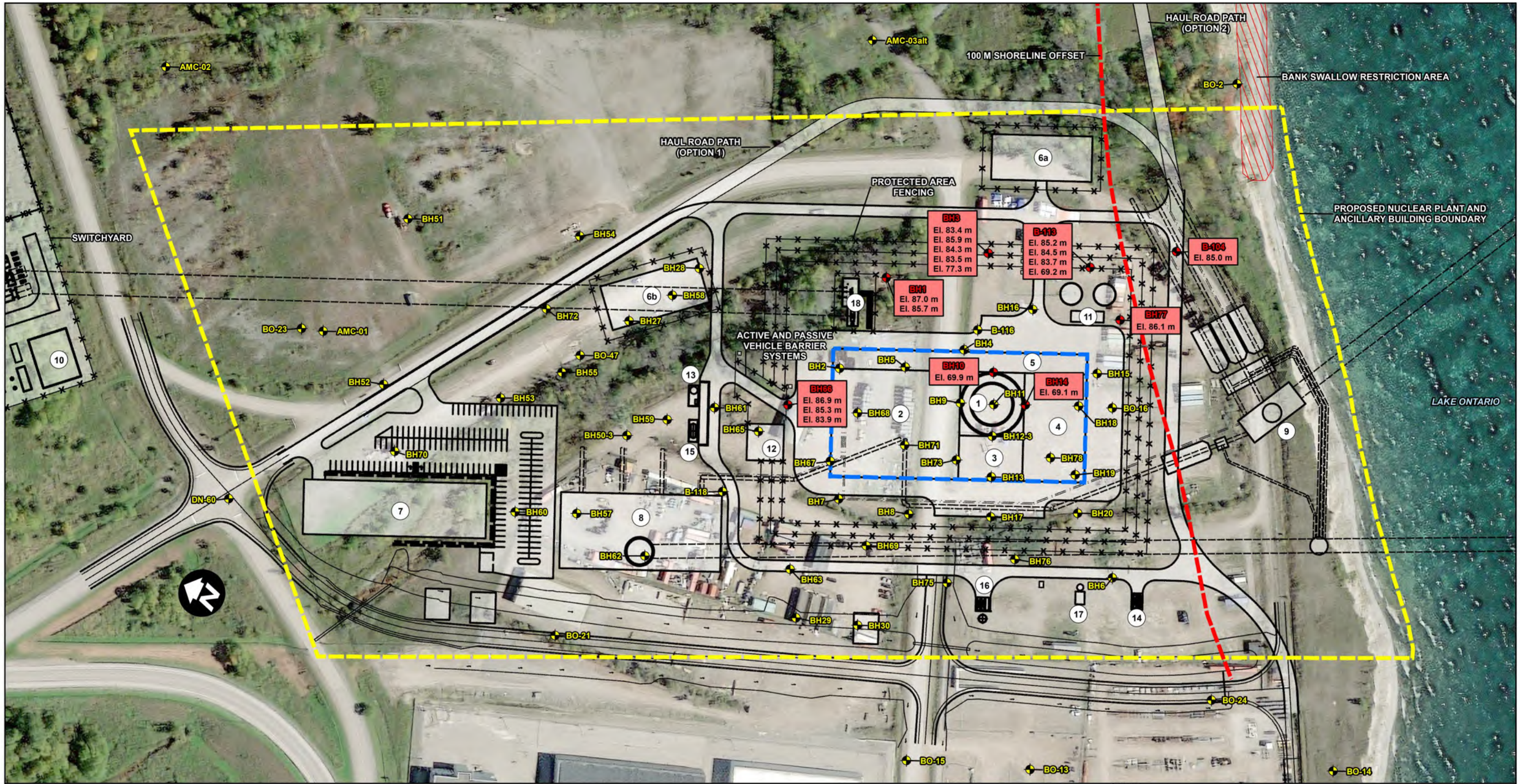
DARLINGTON NUCLEAR GENERATING STATION

Liquefaction Study
Liquefied Soils Location under the Design Base Earthquake (DBE)

PROJECT N°: OMGM2102S | **FIGURE: 9-41**

SCALE: 1:2,000 | DATE: February 2023

Document Path: P:\2021\Projects\OMGM2102S_Kinetrics_DNNP – Geotech Review and Liquefaction Assessment\13.0_GIS\BH_Mapping_July2022\MXD\Liquefied_Soils_Under_DBE_3.mxd



LEGEND

- Borehole Location (Labelled with ID)
- Liquefied Soil Location (Labeled with ID and Liquefied Soils Elevation)
- # Buildings
- Proposed Nuclear Plant and Ancillary Building Boundary
- Limit of Power Block
- Bank Swallow Restriction Area
- 100 m Shoreline Offset
- Contours (1 m interval)

Building ID	Description
1	Reactor Building
2	Turbine Building
3	Radwaste Building
4	Control Building
5	Reactor Auxiliary Bay
6a	Independent Spent Fuel Storage Installation (see Note 3)
6b	Independent Spent Fuel Storage Installation (Location as per Preliminary Design)
7	Administration/Training Building
8	Intake Structure/Forebay
9	Discharge Structure

Building ID	Description
10	Switchyard Building
11	Fire Water Storage Tanks and Pump Enclosure
12	Security Building
13	Diesel Fuel Storage Tank
14	Hydrogen Equipment
15	Turbine Lube Oil Tank
16	Demineralized Water Equipment
17	Nitrogen Equipment
18	Transformation (Preliminary)

NOTES:
1. Background Imagery from ESRI Online Basemaps, 2021.
2. Contours provided by WSP Golder, 2022.
3. Site layout plan, bank swallow restriction area extracted from GE-Hitachi Nuclear Energy Americas LLC, drawing 006N4150 Rev 0.
4. The limit of power block from the drawing of DNNP Excavation Plan Plans Single Unit by GE-H, 006N6034, Rev.A, May 24, 2021.

Datum: NAD83
Projection: UTM Zone 17N

0 20 40 60 80 100 200 300 400 500 Metres

KINECTRICS

wsp

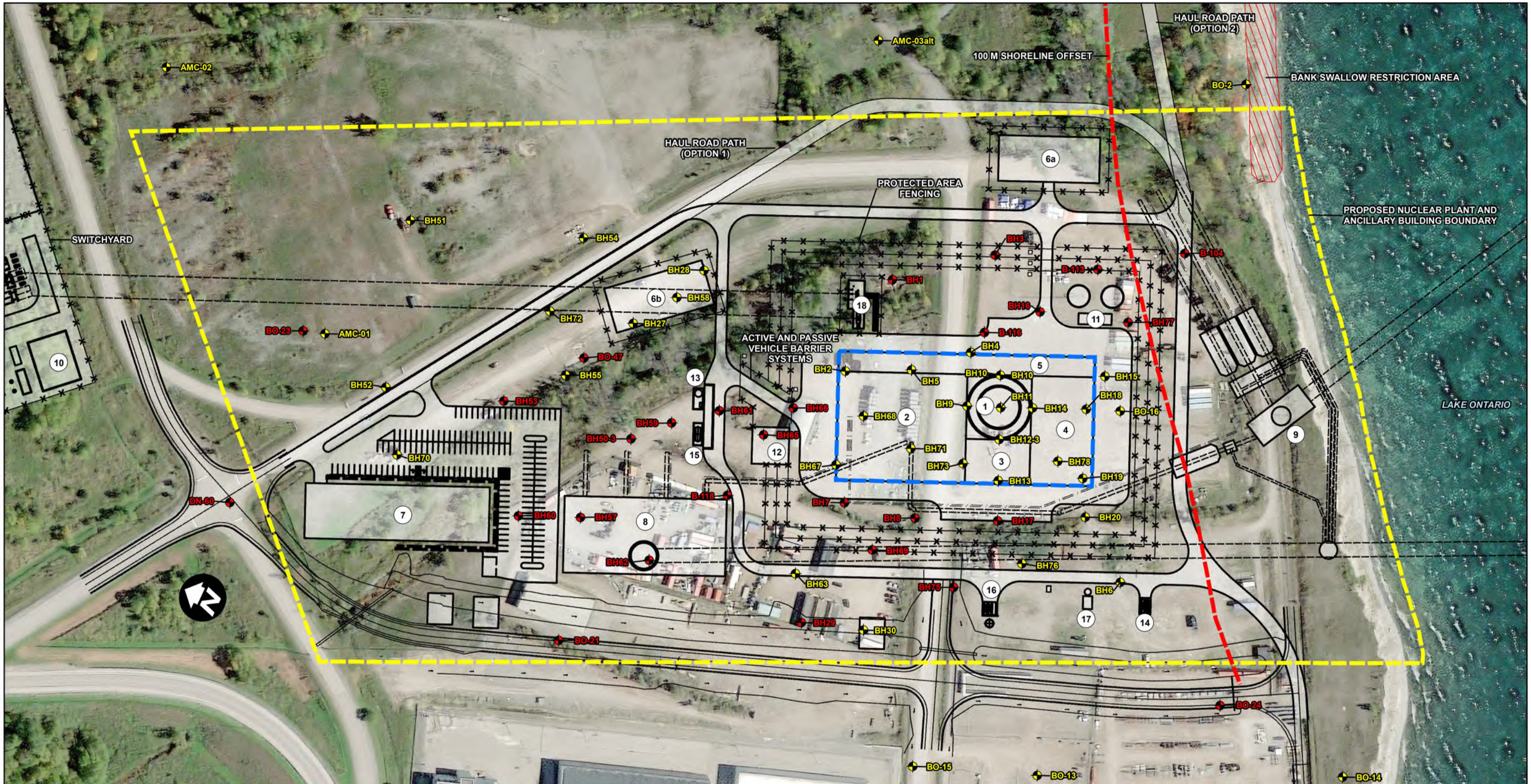
DARLINGTON NUCLEAR GENERATING STATION

Liquefaction Study
Liquefied Soils Location under the Beyond Design Base Earthquake (BDBE)

PROJECT N°: OMGM2102S | **FIGURE: 9-42**

SCALE: 1:2,000 | DATE: January 2023

Document Path: P:\2018\Projects\TC180502_PGI_Magino_Environment\02_Work_Files\GIS\ECA_Construction_WMP\MXD\Liquefied_Soils_Under_BDBE_3.mxd



LEGEND

- Borehole Location (Labelled with ID)
- Potentially Liquefiable Soil Using the SPT Cut Off Value of 25 (Labelled with ID)
- Buildings
- Proposed Nuclear Plant and Ancillary Building Boundary
- Limit of Power Block
- Bank Swallow Restriction Area
- 100 m Shoreline Offset
- Contours (1 m interval)

Building ID	Description
1	Reactor Building
2	Turbine Building
3	Radwaste Building
4	Control Building
5	Reactor Auxiliary Bay
6a	Independent Spent Fuel Storage Installation (see Note 3)
6b	Independent Spent Fuel Storage Installation (Location as per Preliminary Design)
7	Administration/Training Building
8	Intake Structure/Forebay
9	Discharge Structure

Building ID	Description
10	Switchyard Building
11	Fire Water Storage Tanks and Pump Enclosure
12	Security Building
13	Diesel Fuel Storage Tank
14	Hydrogen Equipment
15	Turbine Lube Oil Tank
16	Demineralized Water Equipment
17	Nitrogen Equipment
18	Transformation (Preliminary)

NOTES:
1. Background Imagery from ESRI Online Basemaps, 2021.
2. Contours provided by WSP Golder, 2022.
3. Site layout plan, bank swallow restriction area extracted from GE-Hitachi Nuclear Energy Americas LLC, drawing 006N4150 Rev 0.
4. The limit of power block from the drawing of DNNP Excavation Plan Plans Single Unit by GE-H, 006N6034, Rev.A, May 24, 2021.

Datum: NAD83
Projection: UTM Zone 17N

0 20 40 60 80 100 200 300 400 500 Metres

KINECTRICS

wsp

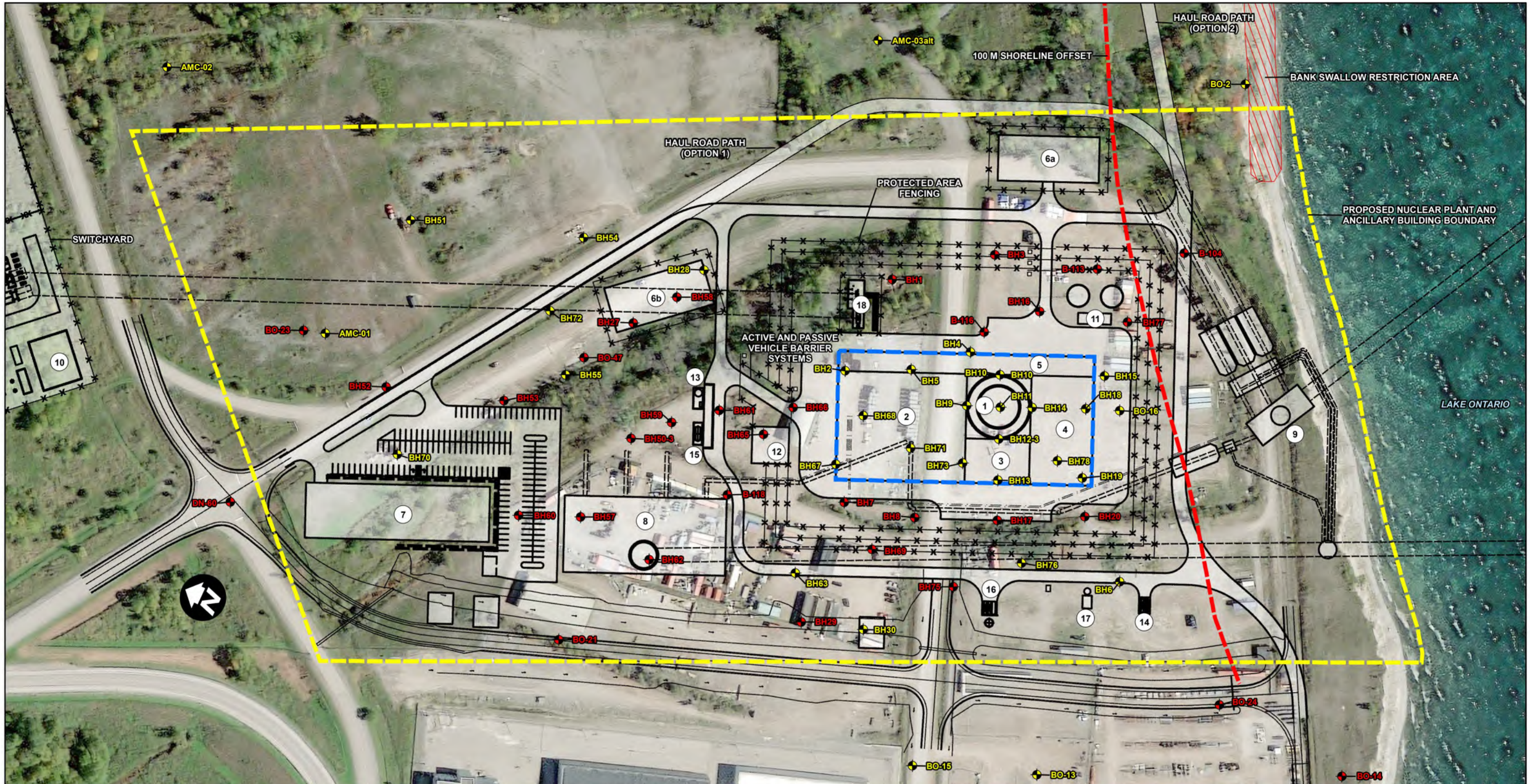
DARLINGTON NUCLEAR GENERATING STATION

Potentially Liquefiable Soil Locations for Potential EME Routes Under the Design Basis Earthquake Event

PROJECT N°: OMGM2102S | **FIGURE: 9-43**

SCALE: 1:2,000 | DATE: November 2022

Document Path: P:\2021\Projects\OMGM2102S_Kinetrics_DNNP – Geotech Review and Liquefaction Assessment\13.0_GIS\BH_Mapping_July2022\MXD\Liquefied_Soils_EME_Routes_Under_DBE_2.mxd



LEGEND

- Borehole Location (Labelled with ID)
- Potentially Liquefiable Soil Using the SPT Cut Off Value of 30 (Labelled with ID)
- Buildings
- Proposed Nuclear Plant and Ancillary Building Boundary
- Limit of Power Block
- Bank Swallow Restriction Area
- 100 m Shoreline Offset
- Contours (1 m interval)

Building ID	Description
1	Reactor Building
2	Turbine Building
3	Radwaste Building
4	Control Building
5	Reactor Auxiliary Bay
6a	Independent Spent Fuel Storage Installation (see Note 3)
6b	Independent Spent Fuel Storage Installation (Location as per Preliminary Design)
7	Administration/Training Building
8	Intake Structure/Forebay
9	Discharge Structure

Building ID	Description
10	Switchyard Building
11	Fire Water Storage Tanks and Pump Enclosure
12	Security Building
13	Diesel Fuel Storage Tank
14	Hydrogen Equipment
15	Turbine Lube Oil Tank
16	Demineralized Water Equipment
17	Nitrogen Equipment
18	Transformation (Preliminary)

NOTES:
1. Background Imagery from ESRI Online Basemaps, 2021.
2. Contours provided by WSP Golder, 2022.
3. Site layout plan, bank swallow restriction area extracted from GE-Hitachi Nuclear Energy Americas LLC, drawing 006N4150 Rev 0.
4. The limit of power block from the drawing of DNNP Excavation Plan Plans Single Unit by GE-H, 006N6034, Rev.A, May 24, 2021.

Datum: NAD83
Projection: UTM Zone 17N

0 20 40 60 80 100 200 300 400 500 Metres

KINECTRICS

wsp

DARLINGTON NUCLEAR GENERATING STATION

Potentially Liquefiable Soil Locations for Potential EME Routes Under the Beyond Design Basis Earthquake Event

PROJECT N°: OMGM2102S | **FIGURE: 9-44**

SCALE: 1:2,000 | DATE: November 2022

Document Path: P:\2021\Projects\OMGM2102S_Kinetrics_DNNP – Geotech Review and Liquefaction Assessment\13.0_GIS\BH_Mapping_July2022\MXD\Liquefied_Soils_EME_Routes_Under_BDBE_2.mxd

Appendix A Records of Boreholes

Table A-1: Borehole Summary - Lists all boreholes considered relevant to the study including information on reference report, location, date drilled, bedrock depth, and groundwater table

Compiled Borehole Logs

Table A-1: Borehole Summary

Structure	BH ID	Report No.	Borehole Location Reference	Date Completed	UTM Northing	UTM Easting	Depth of Bedrock	WL Depth	Ground Elevation	WL Elevation	Bedrock Elevation
				yyyy-mm-dd	m	m	m	m	masl		
Reactor Building (No. 1)	BH9	21451329	Figure 1 in report	2021-09-30	4860005.67	683890.63	24.7	8.9	88.8	80.0	64.1
Reactor Building (No. 1)	BH10	21451329	Figure 1 in report	2021-06-21	4859996.29	683913.47	24.4	7.1	88.4	81.3	64.0
Reactor Building (No. 1)	BH11	21451329	Figure 1 in report	2021-06-28	4859988.74	683897.63	23.2	-	87.9	-	64.7
Reactor Building (No. 1)	BH12-3	21451329	Figure 1 in report	2021-10-05	4859982.12	683881.59	23.5	1.8	87.4	85.7	64.0
Reactor Building (No. 1)	BH14	21451329	Figure 1 in report	2021-06-30	4859973.03	683904.77	23.6	9.1	87.6	78.5	64.1
Turbine Building (No. 2)	BH2	21451329	Figure 1 in report	2021-09-10	4860073.40	683879.86	24.8	2.6	89.4	86.8	64.6
Turbine Building (No. 2)	BH5	21451329	Figure 1 in report	2021-08-27	4860041.24	683895.65	25.1	-	89.0	-	63.9
Turbine Building (No. 2)	BH7	21451329	Figure 1 in report	2021-06-16	4860043.72	683814.91	24.0	-	88.1	-	64.1
Turbine Building (No. 2)	BH8	21451329	Figure 1 in report	2021-09-08	4860005.64	683823.62	23.3	-	87.5	-	64.2
Turbine Building (No. 2)	BH9	21451329	Figure 1 in report	2021-09-30	4860005.67	683890.63	24.7	8.9	88.8	80.0	64.1
Turbine Building (No. 2)	BH66	21451329	Figure 1 in report	2021-06-14	4860090.69	683849.90	25.8	-	89.5	-	63.7
Turbine Building (No. 2)	BH67	21451329	Figure 1 in report	2021-09-13	4860056.60	683831.64	24.4	7.0	88.5	81.6	64.2
Turbine Building (No. 2)	BH68	21451329	Figure 1 in report	2021-09-02	4860054.27	683861.97	24.8	-	88.8	-	64.0
Turbine Building (No. 2)	BH71	21451329	Figure 1 in report	2021-09-29	4860023.47	683856.88	24.2	7.5	88.3	80.8	64.1
Turbine Building (No. 2)	BH73	21451329	Figure 1 in report	2021-09-02	4859994.51	683861.41	24.1	-	88.0	-	63.9
Radwaste Building (No. 3)	BH12-3	21451329	Figure 1 in report	2021-10-05	4859982.12	683881.59	23.5	5.0	87.4	82.5	64.0
Radwaste Building (No. 3)	BH13	21451329	Figure 1 in report	2021-06-23	4859973.18	683861.07	22.9	-	87.1	-	64.3
Radwaste Building (No. 3)	BH17	21451329	Figure 1 in report	2021-08-05	4859964.26	683841.07	22.7	2.7	86.8	84.2	64.2
Radwaste Building (No. 3)	BH73	21451329	Figure 1 in report	2021-09-02	4859994.51	683861.41	24.1	-	88.0	-	63.9
Control Building (No. 4)	BO-16	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-06-04	4859851.72 [3]	683924.34 [3]	23.5	10.8	86.1	75.3	62.6
Control Building (No. 4)	BH14	21451329	Figure 1 in report	2021-06-30	4859973.03	683904.77	23.6	9.1	87.6	78.5	64.1
Control Building (No. 4)	BH15	21451329	Figure 1 in report	2021-06-28	4859944.69	683936.87	23.5	5.1	87.4	82.3	63.9
Control Building (No. 4)	BH18	21451329	Figure 1 in report	2021-08-12	4859946.25	683916.49	23.6	-	87.2	-	63.6
Control Building (No. 4)	BH19	21451329	Figure 1 in report	2021-08-03	4859932.14	683881.61	22.7	-	86.6	-	63.9
Control Building (No. 4)	BH20	21451329	Figure 1 in report	2021-07-15	4859922.00	683863.18	-	-	86.4	-	-
Control Building (No. 4)	BH78	21451329	Figure 1 in report	2021-10-19	4859948.25	683884.24	23.1	7.7	86.8	79.1	63.8
Reactor Auxiliary Bay (No. 5)	B-113	NK054-REP-01210-00098	Figure 3 in report	2012-12-14	4859972.70	683987.89	25.8	-	88.5	-	62.7
Reactor Auxiliary Bay (No. 5)	B-116	NK054-REP-01210-00098	Figure 3 in report	2012-12-19	4860013.90	683930.78	25.8	-	89.3	-	63.5
Reactor Auxiliary Bay (No. 5)	BH1	21451329	Figure 1 in report	2021-10-13	4860071.26	683935.66	25.3	-	89.6	-	64.3
Reactor Auxiliary Bay (No. 5)	BH2	21451329	Figure 1 in report	2021-09-10	4860073.40	683879.86	24.8	2.6	89.4	86.8	64.6
Reactor Auxiliary Bay (No. 5)	BH4	21451329	Figure 1 in report	2021-07-21	4860016.14	683917.93	25.5	-	89.6	-	64.2
Reactor Auxiliary Bay (No. 5)	BH5	21451329	Figure 1 in report	2021-08-27	4860041.24	683895.65	25.1	-	89.0	-	63.9
Reactor Auxiliary Bay (No. 5)	BH10	21451329	Figure 1 in report	2021-06-21	4859996.29	683913.47	24.4	7.1	88.4	81.3	64.0
Reactor Auxiliary Bay (No. 5)	BH15	21451329	Figure 1 in report	2021-06-28	4859944.69	683936.87	23.5	5.1	87.4	82.3	63.9
Reactor Auxiliary Bay (No. 5)	BH16	21451329	Figure 1 in report	2021-09-29	4859991.27	683953.65	24.1	5.5	88.6	83.1	64.6
Reactor Auxiliary Bay (No. 5)	BH77	21451329	Figure 1 in report	2021-08-25	4859945.63	683968.58	24.2	-	87.8	-	63.6
ISFSI (No. 6)	B-113	NK054-REP-01210-00098	Figure 3 in report	2012-12-14	4859972.70	683987.89	25.8	-	88.5	-	62.7
ISFSI (No. 6)	B-104	NK054-REP-01210-00098	Figure 3 in report	2013-02-06	4859933.56	684015.57	25.1	-	88.3	-	63.2
ISFSI (No. 6)	BH1	21451329	Figure 1 in report	2021-10-13	4860071.26	683935.66	25.3	-	89.6	-	64.3
ISFSI (No. 6)	BH3	21451329	Figure 1 in report	2021-09-28	4860026.49	683971.33	25.4	-	89.9	-	64.5
ISFSI (No. 6)	AMC-03alt	NK054-REP-01210-0418696	Figure 3a and 3b in report	2010-10-21	4860133.10	684050.06	35.6	-	99.8	-	64.2
ISFSI (No. 6)	BO-2	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-03-11	4859850.17 [3]	684112.51 [3]	25.2	-	89.1	-	63.9
EME Route	B-104	NK054-REP-01210-00098	Figure 3 in report	2013-02-06	4859933.56	684015.57	25.1	-	88.3	-	63.2
EME Route	B-113	NK054-REP-01210-00098	Figure 3 in report	2012-12-14	4859972.70	683987.89	25.8	-	88.5	-	62.7
EME Route	B-116	NK054-REP-01210-00098	Figure 3 in report	2012-12-19	4860013.90	683930.78	25.8	-	89.3	-	63.5
EME Route	B-118	NK054-REP-01210-00098	Figure 3 in report	2013-01-10	4860102.97	683791.77	24.8	-	89.0	-	64.2
EME Route	AMC-01	NK054-REP-01210-0418696	Figure 3a and 3b in report	2010-09-30	4860338.02	683779.03	34.3	-	98.9	-	64.6
EME Route	AMC-02	NK054-REP-01210-0418696	Figure 3a and 3b in report	2010-11-05	4860477.08	683873.69	35.5	-	101.5	-	66.0
EME Route	AMC-03alt	NK054-REP-01210-0418696	Figure 3a and 3b in report	2010-10-21	4860133.10	684050.06	35.6	-	99.8	-	64.2
EME Route	BO-2	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-03-11	4859850.17 [3]	684112.51 [3]	25.2	-	89.1	-	63.9
EME Route	BO-13	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-05-06	4859829.09 [3]	683725.77 [3]	23.3	-	86.3	-	63.1
EME Route	BO-14	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-05-21	4859851.43 [3]	683784.47 [3]	27.2	10.2	88.8	78.6	61.6
EME Route	BO-15	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-05-31	4859888.72 [3]	683710.3 [3]	22.1	0.1	86.1	86.0	64.0
EME Route	BO-16	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-06-04	4859851.72 [3]	683924.34 [3]	23.5	10.8	86.1	75.3	62.6
EME Route	BO-21	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-06-23	4860091.25 [3]	683703.14 [3]	-	0.0	87.8	87.8	-
EME Route	BO-23	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-07-09	4860278.12 [3]	683810.57 [3]	-	7.4	99.6	92.2	-

Table A-1: Borehole Summary

Structure	BH ID	Report No.	Borehole Location Reference	Date Completed	UTM		Depth of Bedrock	WL Depth	Ground Elevation	WL Elevation	Bedrock Elevation
					Northing	Easting					
				yyyy-mm-dd	m	m	m	m	masl		
Reactor Building (No. 1)	BH9	21451329	Figure 1 in report	2021-09-30	4860005.67	683890.63	24.7	8.9	88.8	80.0	64.1
Reactor Building (No. 1)	BH10	21451329	Figure 1 in report	2021-06-21	4859996.29	683913.47	24.4	7.1	88.4	81.3	64.0
Reactor Building (No. 1)	BH11	21451329	Figure 1 in report	2021-06-28	4859988.74	683897.63	23.2	-	87.9	-	64.7
EME Route	BO-24	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1971-07-19	4859770.15 [3]	683793.52 [3]	23.8	2.5	86.4	83.8	62.6
EME Route	BO-47	NK38-TH-12000-01-{69888} / NK054-REP-01210-0418696[2]	Figure 3a and 3b in report	1973-11-08	4860130.91 [3]	683850.01 [3]	-	6.3	95.1	88.8	-
EME Route	DN-60	NK054-REP-07730-00005	Figure 4.5-1 in report	2008-01-21	4860295.26 [3]	683679.68 [3]	31.0	15.8	98.3	82.5	67.3
EME Route	BH1	21451329	Figure 1 in report	2021-10-13	4860071.26	683935.66	25.3	-	89.6	-	64.3
EME Route	BH3	21451329	Figure 1 in report	2021-09-28	4860026.49	683971.33	25.4	-	89.9	-	64.5
EME Route	BH6	21451329	Figure 1 in report	2021-07-20	4859889.85	683838.95	22.5	-	85.3	-	62.7
EME Route	BH7	21451329	Figure 1 in report	2021-06-16	4860043.72	683814.91	24.0	-	88.1	-	64.1
EME Route	BH8	21451329	Figure 1 in report	2021-09-08	4860005.64	683823.62	23.3	-	87.5	-	64.2
EME Route	BH15	21451329	Figure 1 in report	2021-06-28	4859944.69	683936.87	23.5	5.1	87.4	82.3	63.9
EME Route	BH16	21451329	Figure 1 in report	2021-09-29	4859991.27	683953.65	24.1	5.5	88.6	83.1	64.6
EME Route	BH17	21451329	Figure 1 in report	2021-08-05	4859964.26	683841.07	22.7	2.7	86.8	84.2	64.2
EME Route	BH20	21451329	Figure 1 in report	2021-07-15	4859922.00	683863.18	-	-	86.4	-	-
EME Route	BH27	21451329	Figure 1 in report	2021-09-28	4860188.76	683854.77	-	-	95.5	-	-
EME Route	BH28	21451329	Figure 1 in report	2021-07-20	4860166.09	683897.02	31.4	2.0	95.4	93.4	64.0
EME Route	BH29	21451329	Figure 1 in report	2021-09-14	4860037.44	683746.14	23.0	-	87.3	-	64.3
EME Route	BH30	21451329	Figure 1 in report	2021-09-17	4860005.21	683756.58	22.2	-	86.6	-	64.3
EME Route	BH50-3	21451329	Figure 1 in report	2021-08-25	4860163.42	683797.42	26.2	2.0	90.2	88.2	64.0
EME Route	BH51	21451329	Figure 1 in report	2021-10-01	4860322.01	683854.32	26.2	-	99.1	-	72.9
EME Route	BH52	21451329	Figure 1 in report	2021-10-07	4860295.79	683766.61	31.7	-	97.3	-	65.5
EME Route	BH53	21451329	Figure 1 in report	2021-09-28	4860234.64	683786.79	31.1	-	96.1	-	64.9
EME Route	BH54	21451329	Figure 1 in report	2021-10-07	4860232.80	683885.34	32.7	-	96.7	-	64.0
EME Route	BH55	21451329	Figure 1 in report	2021-10-01	4860210.13	683813.68	31.0	-	95.3	-	64.3
EME Route	BH57	21451329	Figure 1 in report	2021-09-27	4860170.21	683747.19	-	-	89.8	-	-
EME Route	BH59	21451329	Figure 1 in report	2021-06-28	4860147.00	683814.54	26.1	-	89.9	-	63.8
EME Route	BH60	21451329	Figure 1 in report	2021-08-27	4860201.10	683733.71	25.3	7.4	90.2	82.8	64.9
EME Route	BH61	21451329	Figure 1 in report	2021-08-06	4860126.34	683831.47	25.6	-	89.8	-	64.2
EME Route	BH62	21451329	Figure 1 in report	2021-09-29	4860126.69	683741.81	24.4	1.3	88.9	87.6	64.5
EME Route	BH63	21451329	Figure 1 in report	2021-09-14	4860051.53	683768.83	23.7	-	87.9	-	64.2
EME Route	BH65	21451329	Figure 1 in report	2021-08-06	4860099.14	683829.81	25.6	1.8	89.3	87.5	63.8
EME Route	BH66	21451329	Figure 1 in report	2021-06-14	4860090.69	683849.90	25.8	-	89.5	-	63.7
EME Route	BH69	21451329	Figure 1 in report	2021-09-20	4860019.33	683798.09	23.3	-	87.5	-	64.2
EME Route	BH58	21451329	Figure 1 in report	2021-10-13	4860173.26	683877.49	30.8	-	95.2	-	64.4
EME Route	BH70	21451329	Figure 1 in report	2021-10-22	4860274.80	683735.99	30.6	-	96.4	-	65.8
EME Route	BH72	21451329	Figure 1 in report	2021-10-08	4860232.58	683841.65	32.2	12.0	96.7	84.7	64.5
EME Route	BH75	21451329	Figure 1 in report	2021-09-08	4859970.61	683798.32	22.5	-	86.5	-	64.0
EME Route	BH76	21451329	Figure 1 in report	2021-08-09	4859942.43	683825.68	22.4	0.4	86.1	85.8	63.8
EME Route	BH77	21451329	Figure 1 in report	2021-08-25	4859945.63	683968.58	24.2	-	87.8	-	63.6

Notes:
1. Boreholes are repeated if they are relevent to multiple structures.
2. Location of boreholes in report NK38-TH-12000-01-{69888} to be referred from report NK054-REP-01210-0418696.
3. The UTM co-ordinates are received from OPG (RFI-00003)

GEOTECHNICAL DATA - HOLE NO. BO-2 SHEET 1 OF 2

PROJECT BOWMANVILLE SITE ..... HOLE TYPE ROTARY DIAMOND
LOCATION 187+37.4 N 245 + 93.5 E DIP 90° HOLE SIZE NX
DATUM GEODETIC BEARING — DATE - Start MARCH 2 1971 Finish MARCH 11 1971
COMPILED By [signature]
CHECKED By [signature]
APPROVED By [signature]

PROFILE DESCRIPTION (ELEV. 297.4 DATUM)	STRATIGRAPHY PLOT	SAMPLES NUMBER	TYPE & DIAM	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" Δ FIELD ▲ LABORATORY ft/min; WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSERV'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION Dia mm	% PASSING 0 50 100	REMARKS
292.2 GROUND											
5.2'	NOT SAMPLED										
35.0' MOIST, VERY DENSE, GREY, VERY FINE, SAND TRACE SILT.		1	A	100/0.4					▽ (MAR. 10' 71)		
		2	AL	81/0.4	(REFUSAL)						
		3	AL	80/0.2	(REFUSAL)						
45.2' MOIST, VERY DENSE, GREY, FINE TO COARSE SAND WITH SILT, TRACE OF FINE GRAVEL, TRACE CLAY (TILL)		4	C								
		5	C								
		6	AL	100/0.4							
56.9' MOIST, VERY DENSE GR. LAYERED SILT WITH CLAY		7	A	90/0.5							
		8	A	100/0.4							
70.7 MOIST, VERY DENSE GR. FINE SAND WITH SILT SOME MED. TO COARSE SAND TRACE OF CLAY (TILL)		9	C								
		10	A	97	⊙						
		11	AL	100/0.4							
		12	A	42/1.1	⊙						
75.6 MOIST, VERY DENSE, GR., LAYERED FINE SAND TRACE OF SILT		13	A	51/0.8							
		14	A	66/1.5	⊙						
		15	A	131/0.8							
		16	C								
		17	C								
84.5' MOIST, VERY DENSE, GREY, FINE TO COARSE SAND, WITH SILT, LITTLE GRAVEL, TRACE CLAY, (TILL) 289.7							NIL/80				DENSE, FRESH AVERAGE CORE LENGTH - 5" MAXIMUM CORE LENGTH - 18"
87.7' SHALY LIMESTONE						100%-80%	1.1 / 10-25				GRADATIONAL CONTACT ZONE

CONTINUED ON SHEET 2 OF 2

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE

0.5/60 RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

— BOTTOM OF CASING
A — 2" O.D. SPLIT TUBE SAMPLE
▽ — WATER LEVEL
L — LOST SAMPLE
C — CORED SAMPLE

C.C	CORE CONDITION
C.R	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE: 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 10 0 10 20

E0565

HOLE NO. BO-2 (Sheet 1 of 2)

NK23 DBH 10180 0002 (SHEET 1 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-2 SHEET 2 OF 2

PROJECT BOWMANVILLE SITE
LOCATION 187+37.4 N 245 + 93.5 E
DIP 90°
DATUM GEODETIC
BEARING —
HOLE TYPE ROTARY DIAMOND
HOLE SIZE NX
DATE - Start MARCH 2 1971
Finish MARCH 11 1971
COMPILED By [illegible]
CHECKED By [illegible]
APPROVED By [illegible]

PROFILE DESCRIPTION	STRATIGRAPHY PLOT		SAMPLES NUMBER	TYPE & DIAM	NO. OF BLOWS per 6" or as noted	PENETRATION TEST SAMPLER CONE Converted to blows/ft	PERMEABILITY COEFFICIENT "k" Δ FIELD ▲ LABORATORY ft/min	WATER INFORMATION DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION Dia mm	% PASSING 0 50 100	REMARKS
DARK BROWN, FLAT, THIN, FOSSILIF. BEDS								100%-50%	1.1 / 10-25				GRADATIONAL CONTACT ZONE
95.8' GRAD. CONTACT- INTERBEDDED 5" DARK BR. SHALY LIMESTONE AND 6" GR., MED., FOSSILIF. LIMESTONE								YES%	LA / 40				DENSE FRESH AVG. CORE LENGTH - 10" MAX. " " - 30"
								NIL	NIL / 100-110				
101.1' LIMESTONE MEDIUM TO MASSIVE FOSSILIF. FRAGMENTAL GR., BEDS, WITH A BL., SHALY LIMESTONE MATRIX. 180.2		C.R. 99.4 %											GRAVITY GROUTED: 9 BAGS OF CEMENT
117.2' END OF HOLE													

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb.	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET
10 0 10 20

J0565 HOLE NO. BO-2 (Sheet 2 of 2)

NK23 DBH 10180 0002 (SHEET 2 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-13 SHEET 1 OF 2

PROJECT BOWMANVILLE
LOCATION 189+99.0 N
233+50.0 E
DATUM CANADIAN GEODETIC

SITE
DIP 90°
BEARING —

HOLE TYPE ROTARY DIAMOND
HOLE SIZE NX
DATE - Start APRIL 30' 71
Finish MAY 6' 71

COMPILED By M.H.
CHECKED By
APPROVED By

PROFILE: DESCRIPTION (ELEV. 286.3 DATUM)	STRATIGRAPHY PLOT	SAMPLES: NUMBER	TYPE & DIAM	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" (Δ FIELD, ▲ LABORATORY, ft/min) / WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION (Dia mm; % PASSING 0 50 100)	REMARKS
283.2 GROUND										
5.1' SILTY TOPSOIL LOOSE, WET, BROWN			X							
6.3' LAYERED SILT WITH CLAY, DENSE, MOIST, BROWN		1	A	40						
		2	A	40/0.4'						
12.1'		3	A	59						
		4	A	51						
		5	A	53						
		6	A	93						
FINE TO COARSE SAND WITH SILT, VERY DENSE, MOIST, GREY, LITTLE FINE SUBANGULAR GRAVEL, TRACE OF CLAY (TILL)		7	A	262						
		8	A	143						
		9	A	87						
		10	A	145						
		11	A	174/0.3'						
	LAYERED SILT WITH CLAY, VERY DENSE, MOIST, GREY	12	A	286						
		13	A	168/0.5'						
			C							
67.9' FINE SAND, VERY DENSE, MOIST, GREY, TRACE OF SILT		14	A	[illegible]/0.7'						
			C							
74.5' SILT WITH FINE TO COARSE SAND, VERY DENSE, MOIST, GREY, LITTLE GRAVEL, TRACE OF CLAY (TILL)	LAYERED SILT, VERY DENSE, MOIST, GREY, LITTLE CLAY	15	A	124						
		16	C							
			A	120/0.2'						
206.9 81.4' SHALY LIMESTONE, DARK BROWN, VERY THIN BEDDED, HARD FOSSILIF.						100%	NIL 80-100			ROCK - DENSE, FRESH; AVERAGE CORE LENGTH - 4"; MAXIMUM CORE LENGTH - 8"; GRADATIONAL CONTACT
80.8' LIMESTONE, FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED GREY, WITH A BLACK SHALY MATRIX										ROCK - DENSE, FRESH; AVERAGE CORE LENGTH - 7"; MAXIMUM CORE LENGTH - 12"
100.0'										CONTINUED ON SHEET 2 OF 2

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

— BOTTOM OF CASING
A — 2" O.D. SPLIT TUBE SAMPLE
C — CORED SAMPLE
L — LOST SAMPLE
X — BULK SAMPLE

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = 1 feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 10 0 10 20

C0565 HOLE NO. BO-13 (SHEET 1 OF 2)

NK23 DBH 10180 0013 (SHEET 1 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-13 SHEET 2 OF 2

PROJECT BOWMANVILLE SITE HOLE TYPE ROTARY DIAMOND COMPILED By M.H.

LOCATION 189+99.0 N 233+50.0 E DIP 90° HOLE SIZE NX CHECKED By

DATUM CANADIAN GEODETIC BEARING — DATE - Start APRIL 30' 71 Finish MAY 6' 71 APPROVED By

PROFILE DESCRIPTION			SAMPLES NUMBER	TYPE & DIAM	NO. OF BLOWS per 12" or as noted	PENETRATION TEST SAMPLER CONE ▽ Converted to blows/ft 50 100	PERMEABILITY COEFFICIENT "K" & FIELD & LABORATORY ft/min	WATER INFORMATION DRILLING WATER RETURN	PRESS TESTS	OBSERV'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION % PASSING 0 50 100	REMARKS
188.3 / 100.0' **LIMESTONE** FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED, GREY, WITH A BLACK SHALY MATRIX								100 %	NIL 80-100			
175.9 / 112.4' END OF HOLE		C.R. 100 %										GRAVITY GROUTED: 11 BAGS OF CEMENT

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
C.F. / 60 RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE: 1 inch = ± feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 10 0 10 20

C0565 HOLE NO BO-13 (SHEET 2 OF 2)

NK23 DBH 10180 0013 (SHEET 2 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-14 SHEET 1 OF 2

PROJECT BOWMANVILLE SITE
LOCATION 184+50.1 N
234+02.3 E
DATUM CANADIAN GEODETIC
DIP 90°
BEARING —
HOLE TYPE ROTARY DIAMOND
HOLE SIZE NX
DATE - Start MAY 13' 71
Finish MAY 21' 71
COMPILED By M.H.
CHECKED By
APPROVED By

PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE & DIAM	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" & FIELD & LABORATORY ft./min. / WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION: Dia mm	% PASSING 0 50 100	REMARKS
EL. 296.5										TOP OBSERVATION WELL: EL. 293.6
291.4 GROUND										
5.1' SILTY TOPSOIL LOOSE, BLACK, WET										
6.1'										
FINE TO COARSE SAND WITH SILT VERY DENSE, MOIST, GREY, LITTLE FINE SUBANGULAR GRAVEL, TRACE OF CLAY (TILL)	1	A	43							
	2	A	104							
	3	A		110/0.5'						
	4	A	61							
	5	A	52							
	6	A	143							
								▽ JAN. 12/72		
	7	A	31							
	8	A	66							
	9	A	32							
	10	A	60							
	11	A	131							
	12	A	189							
	13	A		180/0.5'						
	14	A	200/0.5'							
	15	A		200/0.3'						
		A,L	220/0.5'							
	16	A		200/0.2'						
		C,L								
		A,L		170/0.5'						
	17	A	142							
	17A	C								
	18	A	180							
		C,L								
	18A	C								
202.2										
94.3' SHALY LIMESTONE FLAT, DARK BROWN, VERY THIN BEDDED, HARD, FOSSILIF.					100%	NIL 90-110				WEATHERED SURFACE ROCK; ROCK - DENSE, FRESH; AVERAGE CORE LENGTH - 7"; MAXIMUM CORE LENGTH - 12"
100.0'										CONTINUED ON SHEET 2 OF 2

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu.ft./min / PRESSURE - psi WATER PRESS. TEST

— BOTTOM OF CASING
— OBSERVATION WELL
▽ — WATER LEVEL
A — 2" O.D. SPLIT TUBE SAMPLE
C — CORED SAMPLE
L — LOST SAMPLE

C.C	CORE CONDITION
C.R	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif.	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 10 0 10 20

HOLE NO BO-14 (SHEET 1 OF 2)

NK23 DBH 10/80 0014 (SHEET 1 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-14 SHEET 2 OF 2

PROJECT BOWMANVILLE
LOCATION 184+50.1 N
234+02.3 E
DATUM CANADIAN GEODETIC

SITE
DIP 90°
BEARING —

HOLE TYPE ROTARY DIAMOND
HOLE SIZE NX
DATE - Start MAY 13' 71
Finish MAY 21' 71

COMPILED By M.H.
CHECKED By
APPROVED By

PROFILE: DESCRIPTION	STRATIGRAPHY PROFILE	SAMPLES: NUMBER	TYPE & DIAM	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▼, Converted to blows/ft 50 100)	PERMEABILITY, COEFFICIENT "K" ▲ FIELD ▲ LABORATORY ft/min	WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSERVED WATER LEVELS	GRAIN-SIZE DISTRIBUTION: DIA mm	% PASSING (50 100)	REMARKS
196.3 / 100.0' FOR GEOLOGICAL DETAILS SEE SHEET 1												GRADATIONAL CONTACT
100.6' **LIMESTONE** FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED, GREY WITH A BLACK SHALY LIMESTONE MATRIX							100 %	BBL 50-110				ROCK - DENSE, FRESH AVERAGE CORE LENGTH - 10" MAXIMUM CORE LENGTH - 12"
171.2 / 125.3' END OF HOLE	C.R. 100 %											

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
RATE OF FLOW - cu. ft./min. / PRESSURE - psi. WATER PRESS. TEST

C.C. CORE CONDITION
C.R. CORE RECOVERY
br. BROWN
gr GREY
bit BITUMINOUS
fr's FRACTURES
fr'd FRACTURED
weath'd WEATHERED
fossil'f FOSSILIFEROUS
carb. CARBONATE
brecc'd BRECCIATED
poss. POSSIBLE
hi. HIGHLY

DEPTH SCALE: 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 10 0 10 20

C0565 HOLE NO BO-14 (SHEET 2 OF 2)

NK23 DBH 10180 0014 (SHEET 2 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-15 SHEET 1 OF 2

PROJECT BOWMANVILLE SITE HOLE TYPE ROTARY DIAMOND
LOCATION 192+01.1 N 233+51.6 E DIP 90° HOLE SIZE NX
DATUM CANADIAN GEODETIC BEARING — DATE - Start MAY 21' 71 Finish MAY 31' 71

COMPILED By M.H.
CHECKED By
APPROVED By

PROFILE DESCRIPTION (ELEV. 287.1 DATUM)	STRATIGRAPHY PLOT	SAMPLES NUMBER	TYPE & DIAM	NO OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙ CONE ▽ Converted to blows/ft 10 100)	PERMEABILITY COEFFICIENT "k" & FIELD & LABORATORY ft/min	WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSERVED WATER LEVELS	GRAIN-SIZE DISTRIBUTION (Dia mm; % PASSING 0 50 100)	REMARKS
282.6 GROUND											TOP OBSERVATION WELL: EL. 283.6
4.5' SILTY TOPSOIL LOOSE, MOIST, BROWN		1	A	7	⊙				(JAN.12/72)		PIEZOMETER INSTALLED: BO-15A 191+95.0 N 235+00.0 E TOP OF PIEZOMETER EL. 283.6
6.0' LAYERED SILT WITH CLAY, COMPACT, MOIST, BROWN		2	A	29	⊙						
13.0'		3	A		180/0.6'						
		4	A		76/0.6'						
		5	A		170/0.3'						
		6	A	68	⊙				▽ (JAN.12/72)		
					AL 75/0.2'						
		7	C								
		8	A		165/0.6'						
		9	C								
FINE TO COARSE SAND WITH SILT VERY DENSE, MOIST, GREY, LITTLE FINE, SUBANGULAR GRAVEL, TRACE OF CLAY (TILL)		10	A		200/0.6'						
		11	C								
		12	A	195							
			C,L								
		13	A	156/0.3'							
		14	C								
		15	A	156/0.3'							
		16	C								
LAYERS OF VERY DENSE, LAYERED SILT WITH CLAY		17	C		130/0.6'						
		18	A								
		19									
		20	C								
		21	A		90/0.8'						
		22	C								
		23	A		88/0.6'						
		24	C								
210.1		25	A		117/0.6'						
77.0' SHALY LIMESTONE FLAT, DARK BROWN, VERY THIN BEDDED, HARD, FOSSILIF.							100%	NIL 75-100			WEATHERED SURFACE ROCK ROCK - DENSE, FRESH AVERAGE CORE LENGTH - 4" MAXIMUM CORE LENGTH - 8"
											GRADATIONAL CONTACT
88.8' LIMESTONE FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED, GREY, WITH A BLACK SHALY LIMESTONE MATRIX											ROCK - DENSE, FRESH AVERAGE CORE LENGTH - 10" MAXIMUM CORE LENGTH - 13"
100.0'											CONTINUED ON SHEET 2 OF 2

PIEZOMETER

OBSERVATION WELL

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE

— BOTTOM OF CASING
— OBSERVATION WELL
A — 2" O.D. SPLIT TUBE SAMPLE
C — CORED SAMPLE
L — LOST SAMPLE
▽ — WATER LEVEL

0.5/60 RATE OF FLOW - cu ft/min. / PRESSURE - psi WATER PRESS. TEST

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br.	BROWN
gr.	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE: 1 inch = feet

FEET 10 0 10 20

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

HOLE NO. BO-15 (SHEET 1 OF 2)

NK23 DBH 10180 0015 (SHEET 1 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-15 SHEET 2 OF 2

PROJECT BOWMANVILLE SITE ..... HOLE TYPE ROTARY DIAMOND
LOCATION 192+01.1 N 233+51.6 E DIP 90° HOLE SIZE NX
DATUM CANADIAN GEODETIC BEARING — DATE - Start MAY 21' 71 Finish MAY 31' 71

COMPILED By M.H.
CHECKED By PJ
APPROVED By

PROFILE DESCRIPTION	STRATIGRAPHY PLOT		SAMPLES NUMBER	TYPE & DIAM.	NO. OF BLOWS per 12" or as noted	PENETRATION TEST SAMPLER ⊙ CONE ▽ Converted to blows/ft 50 100	PERMEABILITY COEFFICIENT "k" Δ FIELD ▲ LABORATORY ft/min	WATER INFORMATION DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION Dia mm	% PASSING 0 50 100	REMARKS
ELEV. 187.1 DEPTH 100.0' LIMESTONE FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED GREY, WITH A BLACK SHALY LIMESTONE MATRIX. 177.4								100%	NIL 75-100				
109.7' END OF HOLE		C.R. 100%											

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 10 0 10 20

C0565 HOLE NO. BO-15 (SHEET 2 OF 2)

NK23 DBH 10180 0015 (SHEET 2 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-16 SHEET 1 OF 2

PROJECT: BOWMANVILLE SITE: HOLE TYPE: ROTARY DIAMOND
LOCATION: 189+02.1 N, 239+98.5 E DIP: 90° HOLE SIZE: NX
DATUM: CANADIAN GEODETIC BEARING: — DATE - Start: MAY 31' 71, Finish: JUNE 4' 71
COMPILED By: M.H. PJ
CHECKED By: [signature] 74
APPROVED By: [signature]

PROFILE DESCRIPTION (ELEV. 290.0 DATUM)	SAMPLES NUMBER	TYPE & DIAM.	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" (Δ FIELD, ▲ LABORATORY, ft./min)	WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION (D.C. mm; % PASSING 0 50 100)	REMARKS
DEPTH 0.0										TOP OBSERVATION WELL EL. 286.6
285.2 GROUND										
4.8' SILTY TOPSOIL LOOSE, MOIST, BROWN	1	A	5							
5.8' LAYERED SILT COMPACT, MOIST, BROWN, LITTLE CLAY	2	A		36/0.5'						
9.4' FINE TO COARSE SAND, WITH SILT VERY DENSE, DAMP, GREY, LITTLE FINE SUBANGULAR GRAVEL, TRACE OF CLAY (TILL)	3	A	112							
	4	C								
	5	A		70/0.5'						
	6	C								
		C,L								
	7	C								
	8	A		90/0.5'						
	9	C								
	10	C								
	11	C								
	12	C								
	13	C								
45.6' LAYERED FINE SAND, VERY DENSE, DAMP, GREY, LITTLE SILT		A,L		140/0.5'						
	14	A		139/0.5'						
		C,L								
	15	A		178/0.5'						
	16	C								
54.6' LAYERED SILT WITH CLAY, VERY DENSE, DAMP, GREY	17	A	137							
	18	C								
65.5' SILT WITH SAND VERY DENSE, DAMP, GREY, LITTLE CLAY, LITTLE FINE GRAVEL (TILL)	19	C								
69.7' LAYERED SILT VERY DENSE, DAMP, GREY, LITTLE CLAY	20	C								
75.5' LAYERED FINE SAND VERY DENSE, MOIST, GREY, TRACE OF SILT	21	C								
77.0' SILT WITH SAND VERY DENSE, DAMP, GREY, LITTLE CLAY, LITTLE FINE GRAVEL (TILL)	22	A		171/0.5'						
	23	C								
208.0	24	C								
82.0' SHALY LIMESTONE FLAT, DARK BROWN, VERY THIN BEDDED, HARD, FOSSILIF.						100%	0.4/80			WEATHERED SURFACE ROCK; ROCK - DENSE, FRESH; AVERAGE CORE LENGTH - 5"; MAXIMUM CORE LENGTH - 13"
							0.5/85			GRADATIONAL CONTACT
92.1' LIMESTONE FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED, GREY, WITH A BLACK SHALY LIMESTONE MATRIX							NIL 90-100			ROCK - DENSE, FRESH; AVERAGE CORE LENGTH - 11"; MAXIMUM CORE LENGTH - 17"
100.0'										CONTINUED ON SHEET 2 OF 2

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu.ft./min / PRESSURE - psi WATER PRESS. TEST

— BOTTOM OF CASING
— OBSERVATION WELL
▽ — WATER LEVEL
A — 2" O.D. SPLIT TUBE SAMPLE
C — CORED SAMPLE
L — LOST SAMPLE

C.C	CORE CONDITION
C.R	CORE RECOVERY
br	BROWN
gr	GREY
bit.	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif.	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss.	POSSIBLE
hi	HIGHLY

DEPTH SCALE: 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 10 0 10 20

C0565 HOLE NO. BO-16 (SHEET 1 OF 2)

NK23 DBH 10180 0016 (SHEET 1 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-16 SHEET 2 OF 2

PROJECT BOWMANVILLE SITE HOLE TYPE ROTARY DIAMOND

LOCATION 189+02.1 N 239+98.5 E DIP 90° HOLE SIZE NX

DATUM CANADIAN GEODETIC BEARING DATE - Start MAY 31' 71 Finish JUNE 4' 71

COMPILED By M.H. CHECKED By APPROVED By

PROFILE: DESCRIPTION	PROFILE: STRATIGRAPHY		SAMPLES: NUMBER	SAMPLES: TYPE & DIAM	SAMPLES: NO OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽, Converted to blows/ft) 50 100	PERMEABILITY COEFFICIENT "k" & FIELD & LABORATORY ft./min	WATER INFORMATION: DRILLING WATER RETURN	WATER INFORMATION: PRESS TESTS	WATER INFORMATION: OBSERV'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION: Dia mm	% PASSING 10 50 100	REMARKS
190.0 / 100.0' **LIMESTONE** FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED GREY, WITH A BLACK SHALY LIMESTONE MATRIX								100%	NIL 50-100				
175.2 / 114.8' END OF HOLE		C.R. 100%											

ORGANICS	WATER SURFACE	C.C.	CORE CONDITION
FILL	DEPTH	C.R.	CORE RECOVERY
GRAVEL	BEDROCK SURFACE	br	BROWN
SAND	FRACTURE OR JOINT (J)	gr	GREY
SILT	LOST CORE	bit	BITUMINOUS
CLAY	RATE OF FLOW = cu ft./min / PRESSURE = psi WATER PRESS. TEST	fr'ts	FRACTURES
		fr'd	FRACTURED
		weath'd	WEATHERED
		fossilif	FOSSILIFEROUS
		carb	CARBONATE
		brecc'd	BRECCIATED
		poss	POSSIBLE
		hi	HIGHLY

DEPTH SCALE 1 inch = feet

FEET 10 0 10 20

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

GEOTECHNICAL DATA - HOLE NO. BO-21 SHEET 1 OF 2

PROJECT BOWMANVILLE SITE ..... HOLE TYPE AUGER, ROTARY DIAMOND COMPILED By M.H.

LOCATION 198+49.0 N 235+00.9 E DIP 90° HOLE SIZE 4 1/2" - NX CASING CHECKED By [illegible]

DATUM CANADIAN GEODETIC BEARING — DATE - Start JUNE 23' 71 Finish JUNE 28' 71 APPROVED By [illegible]

PROFILE DESCRIPTION (ELEV 292.4 DATUM)	STRATIGRAPHIC PLOT	SAMPLES NUMBER	TYPE & DIAM.	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" ▲ FIELD ▲ LABORATORY ft./min; WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION: Dia mm	% PASSING 0 50 100	REMARKS
DEPTH											TOP OBSERVATION WELL EL. 290.0 TOP OF PIEZOMETER BO - 21 A ELEV. 292.9
287.9 GROUND											
4.5' LOOSE, BLACK, MOIST SILTY TOPSOIL											
5.2' COMPACT, DAMP, BROWN LAYERED SILT WITH CLAY											PIEZOMETER INSTALLED: BO-21A 198+55.0N 235+00.0E
		1	A	20							
11.0'	MOIST AND COMPACT	2	A	25							
VERY DENSE, DAMP, GREY, FINE TO COARSE SAND WITH SILT, LITTLE FINE GRAVEL, TRACE CLAY (TILL)		3	A	16							
		4	A	67/0.5'							
		5	A		50/0.3'						
33.5' VERY DENSE, DAMP, GREY, LAYERED, FINE SAND, TRACE SILT		6	A	171							
36.1' VERY DENSE, DAMP, GREY, LAYERED SILT LITTLE FINE SAND		7	A	162/0.5'							
38.1' COMPACT TO VERY DENSE, DAMP, GREY LAYERED, FINE SAND LITTLE SILT		8	A	46/0.5'							
		9	A	11/0.5'							
		10	A		100/0.3'						
42.9' VERY DENSE, DAMP, GREY, LAYERED SILT, LITTLE FINE SAND		11	A	66/0.5'							
		12	A		25/0.1'						
45.0' VERY DENSE, DAMP, GREY, LAYERED SILT		13	A	67/0.5'							
48.3' VERY DENSE, DAMP, GREY, LAYERED, FINE SAND, TRACE SILT		14	A	85							
50.0'		15	A	41/0.5'							

(JUN-28/72)

21 A OBSERVATION WELL

CONTINUED ON SHEET 2 OF 2

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft./min / PRESSURE - psi WATER PRESS. TEST

- OBSERVATION WELL OR PIEZOMETER
- WATER LEVEL
- BOTTOM OF CASING
A - 2" O.D. SPLIT TUBE SAMPLE

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br.	BROWN
gr.	GREY
bit.	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif.	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss.	POSSIBLE
hi	HIGHLY

DEPTH SCALE: 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 5 0 5 10

L0565 HOLE NO BO-21 (SHEET 1 OF 2)

NK23 DBH 10180 0021 (SHEET 1 OF

GEOTECHNICAL DATA - HOLE NO. BO-21 SHEET 2 OF 2

PROJECT BOWMANVILLE SITE ..... HOLE TYPE AUGER, ROTARY DIAMOND COMPILED By M.H.

LOCATION 198+49.0 N 235+00.9 E DIP 90° HOLE SIZE 4 1/2" — NX CASING CHECKED By [illegible]

DATUM CANADIAN GEODETIC BEARING — DATE - Start JUNE 23' 71 Finish JUNE 28' 71 APPROVED By [illegible]

PROFILE DESCRIPTION	STRATIGRAPHIC LIST	SAMPLES NUMBER	TYPE & DIAM	NO. OF BLOWS per 12" or as noted	PENETRATION TEST SAMPLER ⊙ CONE ▽ Converted to blows/ft 80 100	PERMEABILITY COEFFICIENT "k" ▲ FIELD ▲ LABORATORY ft/min	WATER INFORMATION DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION Dia mm	% PASSING 0 50 100	REMARKS
242.4												
50.0' VERY DENSE, DAMP, GREY, LAYERED, FINE SAND, TRACE SILT		16	A	50								
		17	A	53								
54.2' VERY DENSE, DAMP, DARK GREY, LAYERED, SILT, LITTLE CLAY												
58.9' VERY DENSE, WET, GREY, LAYERED SILT, LITTLE FINE SAND												
233.0		18	A	27/0.5'								
59.4' END OF HOLE												

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

C C	CORE CONDITION
C R	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
bracc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

FEET 5 0 5 10

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

C0565 HOLE NO BO-21 (SHEET 2 OF 2)

NK23 DBH 10180 0021 (SHEET 2 OF

GEOTECHNICAL DATA - HOLE NO. BO-23 SHEET 1 OF 2

PROJECT BOWMANVILLE SITE
LOCATION 203+50.0 N
240+00.0 E
DATUM CANADIAN GEODETIC
DIP 90°
BEARING —
HOLE TYPE AUGER
HOLE SIZE 4 1/2"
DATE - Start JUNE 29' 71
Finish JULY 9' 71
COMPILED By M.H.
CHECKED By
APPROVED By

PROFILE DESCRIPTION (E.L. 330.7 DATUM)	STRATIGRAPHY PLOT	SAMPLES NUMBER	TYPE & DIAM.	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" (Δ FIELD, Δ LABORATORY ft/min) / WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION Dia mm	% PASSING 0 50 100	REMARKS
DEPTH 0.0'											TOP OBSERVATION WELL EL. 327.5
326.7 GROUND											
4.0' LOOSE, WET BLACK SILTY TOPSOIL											
5.0' COMPACT, DAMP, BROWN, LAYERED SILT WITH CLAY	DENSE LIGHT BROWN										
6.5'		1	A	42/0.5'	⊙						
		2	A	75	⊙						
VERY DENSE, DAMP, GREY, FINE TO COARSE, SAND WITH SILT, LITTLE FINE GRAVEL, TRACE CLAY (TILL)		3	A	46/0.5'	⊙						
		4	A	57/0.5'	⊙			OBSERVATION WELL			
								▽	(JAN 12/72)		
		5	A	110/0.5'	⊗						
34.7'		6	A	66/0.5'	⊙						
VERY DENSE, MOIST, GREY, LAYERED, FINE SAND, SOME SILT		7	A	76/0.5'	⊗						
44.5'		8	A	130/0.5'	⊗						
VERY DENSE, DAMP, GREY, SILT WITH FINE TO COARSE SAND, LITTLE FINE GRAVEL, TRACE CLAY (TILL)		9	A	111/0.5'	⊗						
50.0'											CONTINUED ON SHEET 2 OF 2

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft./min / PRESSURE - psi WATER PRESS. TEST

— BOTTOM OF CASING
— OBSERVATION WELL
▽ — WATER LEVEL
A — 2" O.D. SPLIT TUBE SAMPLE

C.C	CORE CONDITION
C.R.	CORE RECOVERY
br	BROWN
gr	GREY
bit.	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb.	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 5 0 5 10

CL565 HOLE NO BO-23 (SHEET 1 OF 2)

NK23 DBH 10180 0023 (SHEET 1 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-23 SHEET 2 OF 2

PROJECT BOWMANVILLE SITE
LOCATION 203+50.0 N 240+00.0 E
DATUM CANADIAN GEODETIC
DIP 90°
BEARING —
HOLE TYPE AUGER
HOLE SIZE 4 1/2"
DATE - Start JUNE 29' 71 Finish JULY 9' 71
COMPILED By M.H.
CHECKED By P.T. T.C.
APPROVED By [signature]

PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE & DIAM	NO OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 80 100)	PERMEABILITY COEFFICIENT "k" & FIELD ▲ LABORATORY ft/min; WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION: Dc mm	% PASSING 0 50 100	REMARKS
ELEV. 280.7 / DEPTH 50.0' VERY DENSE, DAMP, GREY SILT WITH FINE TO COARSE SAND, LITTLE FINE GRAVEL, TRACE CLAY (TILL)	10	A	174							
57.4' VERY DENSE, DAMP, GREY, LAYERED SILT WITH CLAY	11	A	221/0.7'							
	12	A		122/0.2'						
67.1' VERY DENSE, MOIST, GREY, LAYERED, FINE, SAND, TRACE SILT	13	A		100/0.2'						
	14	A	26/0.5'							
	15	A	11							
	16	A	10							
91.7' VERY DENSE, DAMP, GREY, LAYERED SILT, SOME CLAY	17	A	67							
235.2 / 95.5' END OF HOLE										

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft./min / PRESSURE - psi WATER PRESS. TEST

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br.	BROWN
gr	GREY
bit.	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss.	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 5 0 5 10

C0565 HOLE NO BO-23 (SHEET 2 OF 2)

NK23 DBH 10180 0023 (SHEET 2 OF 2)

GEOTECHNICAL DATA - HOLE NO. BO-24 SHEET 1 OF 3

PROJECT BOWMANVILLE SITE
LOCATION 187+00.0 N 235+00.0 E
DATUM CANADIAN GEODETIC
DIP 90°
BEARING —
HOLE TYPE ROTARY DIAMOND
HOLE SIZE NX
DATE - Start JULY 5' 71
Finish JULY 19' 71
COMPILED By M.H., D.F.
CHECKED By P.J. 70
APPROVED By [illegible]

PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE & DIAM	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" (▲ FIELD, ▲ LABORATORY, ft/min)	WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION (Dia mm; % PASSING 0 50 100)	REMARKS
ELEV 288.0 DATUM										
0.0'										TOP OF PIEZOMETERS BO - 24 ELEV. 284.4 BO - 24A ELEV. 284.1 BO - 24B ELEV. 286.7
283.3 GROUND										
4.7' LOOSE, MOIST, BLACK, SILTY TOPSOIL										PIEZOMETERS INSTALLED: BO-24A 186+95.0N 235+00.0E BO-24B 187+05.0N 235+00.0E
6.0' DENSE, DAMP, BROWN, LAYERED SILT WITH CLAY	1	A	4							
	2	A	8						0.001	
	3	A	25							
	4	A,L	39							SAMPLE 4 - WASH SAMPLE
	5	A,L	26						(JAN 12/72)	SAMPLE 5 - WASH SAMPLE
	6	A	17							
15.0' VERY DENSE, DAMP, GREY, FINE TO COARSE SAND WITH SILT, LITTLE FINE GRAVEL, TRACE CLAY (TILL)	7	A	107						0.001	
	8	A	64							
	9	A	26							
	10	A	136							
	11	A	225				(JAN12/72)			
	12	A	135							
	13	A	155				(JAN. 12/72			
	14	A	135						0.001	
	15	A	138							
	16	A	152							
	17	A	169							
	18	A	105							SAMPLE 18 - WASH SAMPLE
	19	A	69							SAMPLE 19 - WASH SAMPLE
	20	A	73							
	21	A	156						0.0017	
40.1' VERY DENSE, MOIST, GREY, LAYERED FINE SAND, LITTLE SILT	22	A	111							
	23	A	73							
40.7' VERY DENSE, DAMP, GREY, FINE TO COARSE SAND WITH SILT, LITTLE GRAVEL, TRACE CLAY (TILL)	24	A	160/0.5							
	25	A	171/0.5							
	26	A	220/0.5							
	27	A	300/0.5							
	28	A	300/0.4							
	29									SAMPLE 29 - WASH SAMPLE
49.8'										
50.0'										CONTINUED ON SHEET 2 OF 3

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

- BOTTOM OF CASING
- PIEZOMETER
- WATER LEVEL
A - 2" O.D. SPLIT TUBE SAMPLE
- 2 1/2" O.D. SPLIT TUBE SAMPLE
L - LOST SAMPLE

C.C	CORE CONDITION
C.R	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 5 0 5 10

C0565 HOLE NO BO-24 (SHEET 1 OF 3)

NK23 DBH 10180 0024 (SHEET 1 OF 3)

GEOTECHNICAL DATA - HOLE NO. BO-24 SHEET 2 OF 3

PROJECT BOWMANVILLE SITE
LOCATION 187+00.0 N 235+00.0 E
DATUM CANADIAN GEODETIC
DIP 90°
BEARING —
HOLE TYPE ROTARY DIAMOND
HOLE SIZE NX
DATE - Start JULY 5' 71 Finish JULY 19' 71
COMPILED By M.H., D.F
CHECKED By [illegible]
APPROVED By [illegible]

PROFILE DESCRIPTION	STRATIGRAPHY PLOT	SAMPLES NUMBER	TYPE & DIAM.	NO. OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER ⊙, CONE ▽; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" (Δ FIELD, ▲ LABORATORY, ft/min)	WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION (Dia mm; % PASSING 0 50 100)	REMARKS
238.0											
50.0' VERY DENSE, DAMP, GREY, LAYERED SILT, LITTLE FINE SAND		30	A	379							
53.3' VERY DENSE, MOIST, GREY, LAYERED FINE SAND WITH SILT		32	B		440/0.5'				24 A		
		33	B		400/0.2'						
54.2' VERY DENSE, DAMP, GREY, FINE TO COARSE SAND WITH SILT, LITTLE FINE GRAVEL, TRACE CLAY (TILL)		34	B		500/0.4'						
		35	B		303/0.4'						
		36	B		325/0.5'						
		37	B		240/0.5'						
54.7' VERY DENSE, DAMP, GREY, LAYERED FINE SAND WITH SILT		38	B		308/0.5'						
55.4' VERY DENSE, DAMP, GREY, LAYERED SILT, SOME CLAY		39	B		120/0.5'						
		40	A	81							
		41	A	141							
63.5' VERY DENSE, DAMP, GREY, FINE TO COARSE SAND WITH SILT, LITTLE FINE GRAVEL, TRACE CLAY (TILL)		42	A,L		135/0.5'						SAMPLE 42 - WASH SAMPLE
		43	A		175/0.5'						
		44	A,L		290/0.5'				24		SAMPLE 44 - WASH SAMPLE
67.5' VERY DENSE, DAMP, GREY, LAYERED SILT, LITTLE CLAY	VERY DENSE, MOIST, GREY, LAYERED, FINE SAND, LITTLE SILT	45	A		300/0.4'						
			B,L		168/0.5'						
			B,L		300/0.5'						
		46	B		400/0.3'						
		47	B		400/0.3'						
			B,L		400/0.3'						
		48	B		460/0.4'						
74.9' VERY DENSE, DAMP, GREY SILT, LITTLE FINE SAND		49	B,L		118/0.5'						SAMPLE 49 - WASH SAMPLE
		50	B	110							
78.0' VERY DENSE, DAMP, GREY SILT, WITH FINE TO COARSE SAND, LITTLE GRAVEL, LITTLE CLAY (TILL)		51	B	54							
		52	B	86							
		53	B	218							
205.3' 82.7' SHALY LIMESTONE FLAT, DARK BROWN, VERY THIN BEDDED, HARD, FOSSILIF.							100%	NIL 85-86			ROCK - DENSE, FRESH; AVERAGE CORE LENGTH - 3 - 4"; MAXIMUM CORE LENGTH - 11"
											GRADATIONAL CONTACT
91.7' LIMESTONE FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED, GREY WITH A SLACK SHALY LIMESTONE MATRIX											ROCK - DENSE, FRESH; AVERAGE CORE LENGTH - 14"; MAXIMUM CORE LENGTH - 23"
100.0'											CONTINUED ON SHEET 3 OF 3

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft/min / PRESSURE - psi WATER PRESS. TEST

C.C	CORE CONDITION
C.R	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss.	POSSIBLE
hi	HIGHLY

DEPTH SCALE 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 6 0 6 10

40565 HOLE NO BO-24 (SHEET 2 OF 3)

NK23 DBH 10180 0024 (SHEET 2 OF 3)

GEOTECHNICAL DATA - HOLE NO. BO-24 SHEET 3 OF 3

PROJECT BOWMANVILLE SITE ..... HOLE TYPE ROTARY DIAMOND COMPILED By M.H., D.F.

LOCATION 187+00,0 N 235+00,0 E DIP 90° HOLE SIZE NX CHECKED By F.J. 7.C.

DATUM CANADIAN GEODETIC BEARING — DATE - Start JULY 5' 71 Finish JULY 19' 71 APPROVED By [signature]

PROFILE: DESCRIPTION (ELEV. 188.0)	STRATIGRAPHIC PLOT		SAMPLES: NUMBER	TYPE & DIAM	No. OF BLOWS per 12" or as noted	PENETRATION TEST: SAMPLER ⊙ CONE ▽ Converted to blows/ft (60, 100)	PERMEABILITY COEFFICIENT "k" Δ FIELD ▲ LABORATORY ft/min — WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION: Dia mm	% PASSING (0, 50, 100)	REMARKS
100.0' **LIMESTONE** FRAGMENTAL, FOSSILIF., MEDIUM TO MASSIVE BEDDED, GREY WITH A BLACK SHALY LIMESTONE MATRIX 182.3'							100 %	[illegible]				
105.7' END OF HOLE		C.R. 100 %										GRAVITY GROUTED: 2 BAGS OF CEMENT

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
FRACTURE OR JOINT (J)
LOST CORE
0.5/60 RATE OF FLOW - cu ft./min / PRESSURE - psi WATER PRESS. TEST

C.C.	CORE CONDITION
C.R.	CORE RECOVERY
br	BROWN
gr	GREY
bit	BITUMINOUS
fr's	FRACTURES
fr'd	FRACTURED
weath'd	WEATHERED
fossilif.	FOSSILIFEROUS
carb	CARBONATE
brecc'd	BRECCIATED
poss	POSSIBLE
hi	HIGHLY

DEPTH SCALE: 1 inch = feet

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO
GEOTECHNICAL DEPARTMENT

FEET 5 0 5 10

NK23 DBH 10180 0024 (SHEET 3 OF

G0565 HOLE NO. BO-24 (SHEET 3 OF 3)

GEOTECHNICAL DATA - HOLE NO. BO-47

SHEET 1 OF 2 SHEETS

PROJECT BOWMANVILLE SITE ..... HOLE TYPE ROTARY DIAMOND

LOCATION 198+50 N 240+00 E DIP 90° HOLE SIZE NX

DATUM CANADIAN GEODETIC BEARING — DATE - Start 1 NOV 73 Finish 8 NOV 73

COMPILED By RJG PJ

CHECKED By MH

APPROVED By

PROFILE DESCRIPTION (ELEV 313.4 DATUM)	STRATIGRAPHY PLOT	SAMPLES NUMBER	TYPE & DIAM.	NO OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER CONE, Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" ▲ FIELD ▲ LABORATORY ft/min / WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION: Dio mm	% PASSING 0 50 100	REMARKS
DEPTH 0.0											
312.1 GROUND											DATUM PIEZOMETER ELEV 315.2
1.3' LOOSE, MOIST, BROWN, SILTY TOPSOIL		1	A	3							
		2 2A	A	15							
2.3' LOOSE TO COMPACT, DAMP, BROWN LAYERED SILT, LITTLE CLAY, TRACE FINE SAND		3	A		83/0.5'						FOR DETAILS OF POUR AND BAILING TESTS SEE INSPECTORS LOGS
		4	A		117/0.7'						
5.8' VERY DENSE, DAMP, BROWNISH GREY, FINE TO COARSE SAND, WITH SILT, SOME GRAVEL, ODD COBBLE, BOULDER (TILL)		5	A		43/0.1'						
		6	A		152/0.5'						
									▽ EL. 291.3 26 FEB 74		
	GREY	7	A		100/0.3'						
		8	A		116/0.3'						
31.0' VERY DENSE, WET, GREY, FINE SAND, TRACE SILT (PERVIOUS)		9	A		100/0.2'						
		10	A		100/0.2'						
		11	AD		115/0.2'						
		12	A		130/0.4'						
263.4 50.0'											CONTINUED ON SHEET 2 OF 2

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
WATER LEVEL
LOST CORE
0.5/60 RATE OF FLOW - cu ft./min / PRESSURE - psi WATER PRESS. TEST

— BOTTOM OF CASING
— PIEZOMETER (MENDE)
A — 2" O.D. SPLIT TUBE SAMPLE

C.C. CORE CONDITION
C.R. CORE RECOVERY

SCALE IN FEET 5 0 5 10

ontario hydro
generation projects division
geotechnical department

C0565 HOLE NO. BO-47 SHEET 1 OF 2

NK23 DBH 10180 0047 (SHEET 1 OF

GEOTECHNICAL DATA - HOLE NO. BO-47

SHEET 2 OF 2 SHEETS

PROJECT BOWMANVILLE SITE ..... HOLE TYPE ROTARY DIAMOND

LOCATION 198+ 50 N
240+ 00 E

DIP 90°

HOLE SIZE NX

DATUM CANADIAN GEODETIC

BEARING –

DATE – Start 1 NOV 73
Finish 8 NOV 73

COMPILED By RJG, PJ

CHECKED By [illegible]

APPROVED By [illegible]

PROFILE: DESCRIPTION (ELEV 263.4)	STRATIGRAPHY PLOT	SAMPLES: NUMBER	TYPE & DIAM	NO OF BLOWS per 12" or as noted	PENETRATION TEST (SAMPLER CONE; Converted to blows/ft 50 100)	PERMEABILITY COEFFICIENT "k" ▲ FIELD ▲ LABORATORY ft/min; WATER INFORMATION: DRILLING WATER RETURN	PRESS TESTS	OBSER'D WATER LEVELS	GRAIN-SIZE DISTRIBUTION: Dia mm	% PASSING 0 50 100	REMARKS
DEPTH 50.0'											
VERY DENSE, WET, GREY, FINE SAND, TRACE SILT (PERVIOUS)		13	A		77/0.3'						
		14	A		81/0.4'						
		15	A		137/0.5						
		16	A		120/0.4'						
70.0'											
VERY DENSE, DAMP, GREY, LAYERED SILT, LITTLE CLAY		17	A		124/0.4'						
234.4		18	A	187							
79.0' END OF HOLE											HOLE GRAVITY GROUTED 2 BAGS CEMENT 1/2 BAG BENTONITE FOR PIEZOMETER SEAL

ORGANICS
FILL
GRAVEL
SAND
SILT
CLAY

WATER SURFACE
DEPTH
BEDROCK SURFACE
WATER LEVEL
LOST CORE
0.5/60 RATE OF FLOW – cu ft./min / PRESSURE – psi WATER PRESS. TEST

— BOTTOM OF CASING
— PIEZOMETER (MENDE)
A — 2" O.D. SPLIT TUBE SAMPLE

C.C. CORE CONDITION
C.R. CORE RECOVERY

SCALE IN FEET 5 0 5 10

ontario hydro
generation projects division
geotechnical department

C0565 HOLE NO. BO-47 SHEET 2 OF 2

NK23 DBH 10180 0047 (SHEET 2 O

CH2MHILL

RECORD OF BOREHOLE: DN-60

LOCATION: Darlington Nuclear Station
PROJECT NUMBER: 366209
DRILLER: Lantech Soil Drilling
START DATE: January 21, 2008
BORING METHOD: HSA/HW/HQ
STICK UP: 0.775 m
LOGGED BY: DW
GROUND ELEVATION: 98.295 mASL
DATUM: Geodetic

DEPTH (mbgs)	SAMPLES RECOVERY (in.)	TYPE	BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	BOREHOLE DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 35 70 105 140
		SS1	9 6 9 16	TOPSOIL, brown, frozen.		98.15	Stick up protective casing in a cement surface seal	
				SILTY SAND TILL, fine-grained, brown, damp, compact, little to some medium to coarse sand, trace fine gravel and clay.		0.15	Silica Sand	
							Bentonite pellet seal	
1								
		SS2	12 35 52	- iron oxidation			Bentonite grout seal	
2								
3		SS3	100/1"	- some coarse gravel and cobbles				
4								
		SS4	70	- grey, trace fine gravel, iron oxidation				
5								
6		SS5	135					
7								
		SS6	175/4"					
8								
9		SS7	40 80	- trace fine to medium gravel				

BHHILL 366209_MAMSL.GPJ CG&S.GDT 11/20/08

RECORD OF BOREHOLE: DN-60

LOCATION: Darlington Nuclear Station
START DATE: January 21, 2008
LOGGED BY: DW

PROJECT NUMBER: 366209
BORING METHOD: HSA/HW/HQ
GROUND ELEVATION: 98.295 mASL

DRILLER: Lantech Soil Drilling
STICK UP: 0.775 m
DATUM: Geodetic

DEPTH (mbgs)	SAMPLES RECOVERY (in.)	TYPE	BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (masl) (mbgs)	BOREHOLE DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 35 70 105 140
		SS8	77					
11								
12		SS9	30 160/4"					
13								
		SS10	180					
14								
15		SS11	76	- laminated grey silt and clay			Waterlevel measured on July 3, 2008	
16								
		SS12	36 75	INTERLAYERED CLAY and SILT, grey, damp, very dense, trace medium gravel, clayey silt, and silty clay.		81.50 16.80		
17								
18								
		SS13	1 12 27 30	SAND, fine-grained, grey, wet, dense, trace silt, one laminate of wet silt from 18.56 to 18.62 mbgs.		80.00 18.30		
19				- little to some silt				

BHHILL 366209_MAMSL.GPJ CG&S.GDT 11/20/08

RECORD OF BOREHOLE: DN-60

LOCATION: Darlington Nuclear Station
START DATE: January 21, 2008
LOGGED BY: DW

PROJECT NUMBER: 366209
BORING METHOD: HSA/HW/HQ
GROUND ELEVATION: 98.295 mASL

DRILLER: Lantech Soil Drilling
STICK UP: 0.775 m
DATUM: Geodetic

DEPTH (mbgs)	SAMPLES RECOVERY (in.)	TYPE	BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	BOREHOLE DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 35 70 105 140
21		SS14	17 110					
						76.45		
22		SS15	52 84	INTERLAYERED CLAY, SILT, and fine SAND, grey, moist to wet, very dense.		21.85		
23						74.92		
		SS16	50 114	SAND, fine-grained, grey, wet, very dense, little silt.		23.38		
24						73.40		
25		SS17	60 120	INTERLAYERED CLAY, SILT, and fine SAND, grey, moist to wet, very dense.		24.90		
26						71.51		
27		SS18	6 15 30 44	CLAYEY SILT, grey, damp to moist, dense, laminated silt/clay from 26.82 to 26.91 mbgs, lensoidal silt, trace coarse sand and fine gravel.		26.79		
28						70.20		
		SS19	33 126	SANDY SILT TILL, grey, damp, very dense, little to some medium to coarse sand, trace fine to medium gravel and clay.		28.10		
29								
		SS20	30					

CH2MHILL

RECORD OF BOREHOLE: DN-60

LOCATION: Darlington Nuclear Station
PROJECT NUMBER: 366209
DRILLER: Lantech Soil Drilling
START DATE: January 21, 2008
BORING METHOD: HSA/HW/HQ
STICK UP: 0.775 m
LOGGED BY: DW
GROUND ELEVATION: 98.295 mASL
DATUM: Geodetic

DEPTH (mbgs)	SAMPLES RECOVERY (in.)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	BOREHOLE DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 35 70 105 140
			51 93				Bentonite pellet seal	
31		HQ1		- glacial striations on bedrock surface SHALEY LIMESTONE, Whitby Formation, black/grey. Core Recovery = 100%. RQD = 0%. Horizontal Fractures per 0.3 m (per 0.46 m run): 5,4		67.33 30.97		
		HQ2		- Core Recovery = 100%, RQD = 16.0%. Horizontal Fractures per 0.3 m (per 0.64 m run): 7,6,1			#2 silica sand pack	
32		HQ3		- Core Recovery = 100%, RQD = 35.5%. Horizontal Fractures per 0.3 m (per 1.58 m run): 3,6,4,7,5,1			2" diameter Sch. 40 No. 10 slot, flush threaded PVC well screen	
33								
34		HQ4		- Core Recovery = 100%, RQD = 66.7%. Horizontal Fractures per 0.3 m (per 0.61 m run): 3,4,1		64.04 34.26		
				End of Monitoring Well at 34.26 mbgs.				
35								
36								
37								
38								
39								

PROJECT: Darlington Site Investigation - Phase 3 Ontario, Canada		# Log of Boring No. AMC-01	
BORING LOCATION:	4860338.02N, 683779.03E (UTM)	ELEVATION AND DATUM (meters): 120.92 (Site Datum)	
DRILLING CONTRACTOR:	Atcost	DATE STARTED: 9/13/2010	DATE FINISHED: 9/30/2010
DRILLING EQUIPMENT:	CME-85	TOTAL DEPTH (m): 231.64	MEASURING POINT: Ground surface
DRILLING METHOD:	209.6mm hollow-stem auger / 96mm HQ core/rotary wash	DEPTH TO FREE WATER FIRST ENCOUNTERED: 7.16m (perched)	
SAMPLING METHOD:	See Boring Log Explanation, Figure C-1	DEPTH TO FREE WATER AT COMPLETION: N/A due to rotary wash	
HAMMER WEIGHT: 63.5 kg	HAMMER DROP: 76.2cm, auto	LOGGED BY: Kellen Shenton / Nicole McGregor	

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m³)	LABORATORY TESTS: Other
	1		37	SANDY SILT (ML) Dense, grey to brown (2.5YR 7/2 to 10YR 3/2), dry, few fine to coarse gravel, slightly petroliferous shaley gravel [FILL]			
1							
2							
3	2			Immediate sampling refusal, no recovery			Drilling brings up large pieces of asphalt. Grinding noise; possible boulder.
4				SILTY SAND (SM) Very dense, light brown (10YR 8/3), moist, trace fine to medium subangular gravel [TILL]			Grinding noise; possible boulder.
	3		50 / 13cm				
5							

GT-1 (12/03) METRIC

GEES-SOIL 12/03 METRIC SOIL_LOGS_A00318000.GPJ GES32003-7.GDT 1/25/11

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-01 cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				SILTY SAND (SM) continued			
6							
7				ATD ▽			Assumed perched water.
	4		50* / 14^{cm}	colour changes to gray (10YR 5/2), saturated to moist, trace to few fine to medium subangular gravel, trace petroleum odor (naturally occuring)			Driller had to replace 4 teeth began drilling with water.
8							
9							
10							Driller notes easier drilling.
				FAT CLAY interbedded with GRAVELLY FAT CLAY (CH) Hard, grey (10YR 5/2), moist, trace to some fine to medium subangular gravel			
11							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-01 cont.

DEPTH (m)	SAMPLES Sample No.	Sample	Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS Moisture Content (%)	Dry Density (kN/m^3)	Other
12				FAT CLAY interbedded with GRAVELLY FAT CLAY (CH) continued			
13							
14							
15							
	5		92/28^{cm}				
16							
17							
18							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-01 cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				FAT CLAY interbedded with GRAVELLY FAT CLAY (CH) continued			
19				POORLY GRADED SAND with SILT (SP-SM) Very dense, grey (10Y 5/2), moist to wet, fine grained			
20							
21							
22							
23	6		50*/14^{cm}				
24							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-01 cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				POORLY GRADED SAND with SILT (SP-SM) continued			
26							
27							
28							
29							
30							Cuttings are silty sand with minor clay.
31							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-01 cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				POORLY GRADED SAND with SILT (SP-SM) continued			
32							
33							
34				continued on rock log			switch to rotary wash and HQ coring at 33.99m set HW casing to 34.34m
35							
36							
37							
38							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3 Ontario, Canada		# Log of Boring No. AMC-02	
BORING LOCATION:	4860477.08N, 683873.69E (UTM)	ELEVATION AND DATUM (meters): 123.49 (Site Datum)	
DRILLING CONTRACTOR:	Atcost	DATE STARTED: 10/23/2010	DATE FINISHED: 11/5/2010
DRILLING EQUIPMENT:	CME-85	TOTAL DEPTH (m): 239.56	MEASURING POINT: Ground surface
DRILLING METHOD:	209.6mm hollow-stem auger / 96mm HQ core/rotary wash	DEPTH TO FREE WATER FIRST ENCOUNTERED: None	
SAMPLING METHOD:	See Boring Log Explanation, Figure C-1	DEPTH TO FREE WATER AT COMPLETION: N/A due to rotary wash	
HAMMER WEIGHT: 63.5 kg	HAMMER DROP: 76.2cm, auto	LOGGED BY: Kellen Shenton	

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				Soil			
							grinding gravelly
1							sand/silt in cuttings
2							scraping sound for 0.3m
3							becomes hard to auger silty sand with gravel cuttings
4							lots of grinding
5							

GT-1 (12/03) METRIC

GEES-SOIL 12/03 METRIC SOIL_LOGS_A00318000.GPJ GES32003-7.GDT 1/25/11

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-02 cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				Soil continued			
							excessive steaming
							lower gravel content in cuttings
6							
							becoming very difficult to drill (boulder)
							drilling becomes easier
7							
8							
							jamming badly water put in augers
9							
							drilling becomes easier
10							
11							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-02 cont.

DEPTH (m)	SAMPLES			MATERIAL DESCRIPTION	LABORATORY TESTS		
	Sample No.	Sample	Blows/ 0.30 m		Moisture Content (%)	Dry Density (kN/m^3)	Other
12				Soil continued			
13							
14							
15							
16							grinding noises for 0.15m
17							
18							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-02 cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				Soil continued			
19							boulders very hard drilling
20							
21							
22							
23							
24							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-02 cont.

DEPTH (m)	SAMPLES			MATERIAL DESCRIPTION	LABORATORY TESTS		
	Sample No.	Sample	Blows/ 0.30 m		Moisture Content (%)	Dry Density (kN/m^3)	Other
				Soil continued			
26							
27							
28							
29							
30							
31							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-02 cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				Soil continued			
32							
33							
34							
35							
				Bedrock at 35.5m			switch to rotary wash and HQ coring at 35.5m set HW casing to 36.27m
				continued on rock log			
36							
37							
38							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3 Ontario, Canada		# Log of Boring No. AMC-03alt	
BORING LOCATION:	4860133.10N, 684050.06E (UTM)	ELEVATION AND DATUM (meters): 121.79 (Site Datum)	
DRILLING CONTRACTOR:	Atcost	DATE STARTED: 9/30/2010	DATE FINISHED: 10/21/2010
DRILLING EQUIPMENT:	CME-85	TOTAL DEPTH (m): 239.56	MEASURING POINT: Ground surface
DRILLING METHOD:	209.6mm hollow-stem auger / 96mm HQ core/rotary wash	DEPTH TO FREE WATER FIRST ENCOUNTERED: 12.19m	
SAMPLING METHOD:	See Boring Log Explanation, Figure C-1	DEPTH TO FREE WATER AT COMPLETION: N/A due to rotary wash	
HAMMER WEIGHT: 63.5 kg	HAMMER DROP: 76.2cm, auto	LOGGED BY: Kellen Shenton	

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m³)	LABORATORY TESTS: Other
				SILTY SAND (SM) Loose, light brown (7.5YR 6/3) to light yellow-brown (10YR 6/6), moist, few fine gravel [FILL]			grinding noises gravel comes up
1							cuttings sandy no gravel
	1		6/15cm				
2							
				SILTY SAND with GRAVEL (SM) Very dense, grey-brown (5YR 6/2) to light brown (7.5YR 7/2), moist, gravel is subangular to subrounded and medium [FILL]			augering difficult from 2.44-2.57m
3							
	2		96				
							becomes difficult to drill; excessive grinding steam is billowing from hole
4							
							water added to bring up cuttings
5							

GT-1 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-03alt cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				SANDY SILT with Gravel (ML) Very dense, dark grey (7.5YR 6/2) to dark green grey (5Y 4/3), wet, with subrounded fine to coarse gravel [FILL]			
6							grinding/boulders
7							
	3		80				
8							
				SANDY SILT (ML) Very dense, light grey (2.5YR 6/2) to light brown (7.5YR 4/4), wet, minor subrounded to rounded fine to medium gravel			significantly easier drilling
9							
10							
11							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-03alt cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
12				SANDY SILT (ML) continued			
				ATD ▽			drilling at 1-2.5cm per second
13							
14							
15							
	4		50/13cm				
16							intermittent grinding noises
17							
							increased grinding hard to auger
18							
							significant increase in water some bubbling

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-03alt cont.

DEPTH (m)	SAMPLES			MATERIAL DESCRIPTION	LABORATORY TESTS		
	Sample No.	Sample	Blows/ 0.30 m		Moisture Content (%)	Dry Density (kN/m^3)	Other
				SANDY SILT (ML) continued			large boulder no advancement for 15 minutes at 18.29m drilling easy again at 18.72m
19							
20							
21							
22							
23							
24							

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-03alt cont.

DEPTH (m)	SAMPLES			MATERIAL DESCRIPTION	LABORATORY TESTS		
	Sample No.	Sample	Blows/ 0.30 m		Moisture Content (%)	Dry Density (kN/m^3)	Other
				SANDY SILT (ML) continued			
26							
27							
28							
29							
30							
31							boulder for 10cm

GT-2 (12/03) METRIC

PROJECT: Darlington Site Investigation - Phase 3
Ontario, Canada

Log of Boring No. AMC-03alt cont.

DEPTH (m)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 0.30 m	MATERIAL DESCRIPTION	LABORATORY TESTS: Moisture Content (%)	LABORATORY TESTS: Dry Density (kN/m^3)	LABORATORY TESTS: Other
				SANDY SILT (ML) continued			
32							
33							
34							
35							refusal at 35.61m highly petroliferous sand layer 0.15-0.3m thick on top of bedrock switch to rotary wash and HQ coring at 35.59m set HW casing to 36.27m
				continued on rock log			
36							
37							
38							

GT-2 (12/03) METRIC

exp services Inc.
1595 Clark Boulevard
Brampton, Ontario L6T 4V1

RECORD OF BOREHOLE No B-104

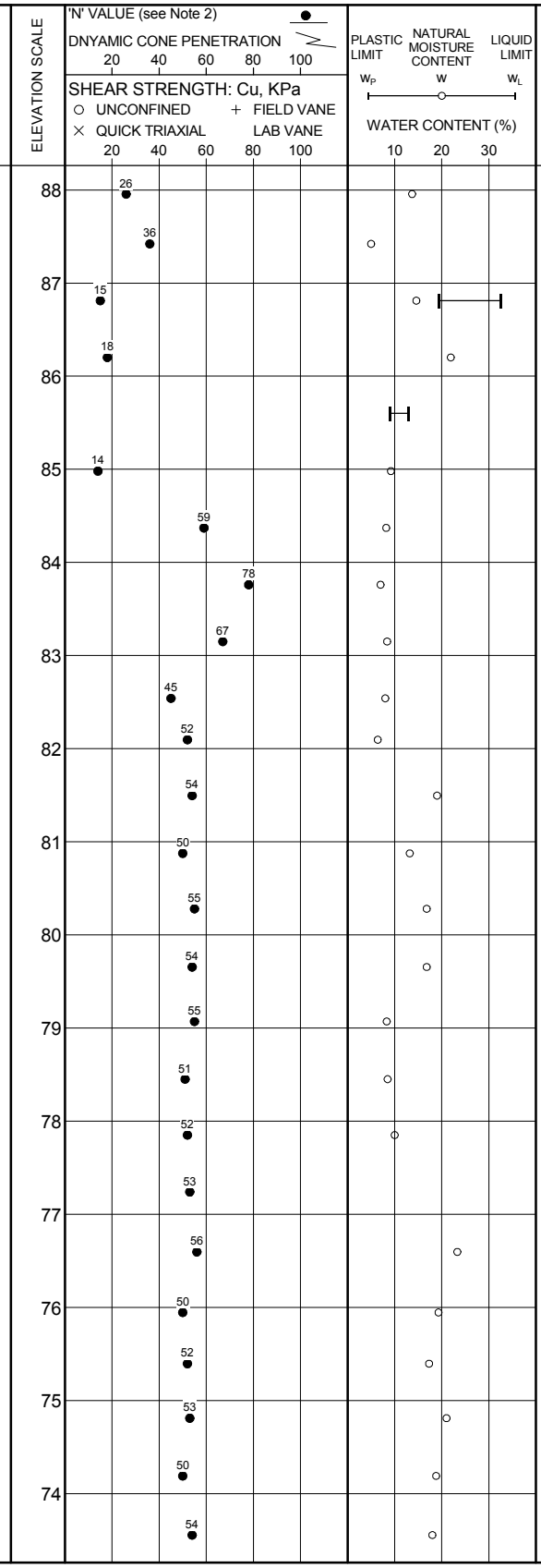
METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 684015.57E, 4859933.56N (UTM Zone 17) | ORIGINATED BY M. Clauser

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 2.2.13 - 2.6.13 | CHECKED BY S. Micic

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	SPT-VALUES (see Note 2)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
88.3 / 0.0	**Sand (SP)** medium dense, brown, frozen/moist, fine to medium sand, few subangular fine gravel sizes, and **Sandy Silt (ML)**, dense, brown, moist, trace of fine gravel and clay (Fill)	1	SS	12-12-14					
		2	SS	9-14-22					
87.2 / 1.1	**Sandy Lean Clay (CL)**, stiff to very stiff, brown, moist, weakly layered, fine to medium sand, medium plasticity (Lacustrine)	3	SS	4-6-9	19.9	0	48	26	26
		4	SS	6-9-9					
86.0 / 2.3	**Sandy Silty Clay with Gravel (CL-ML)**, stiff, grey, moist, fine to coarse sand, fine to coarse angular to subangular gravel, low plasticity (Lacustrine)	5	TW			33	34	(33)	
85.3 / 3.0	**Silty Gravel (GM)**, medium dense to very dense, grey, moist, fine to coarse sand, fine to coarse angular to subangular gravel (Lacustrine)	6	SS	4-7-7					
		7	SS	14-28-31		64	14	19	3
83.8 / 4.5	**Silty Gravel with Sand (GM)**, very dense, grey, moist, fine to coarse sand, fine to coarse subangular gravel (Lacustrine)	8	SS	19-29-49					
		9	SS	22-32-35	23.9	45	20	29	6
82.9 / 5.4	**Sandy Silt with Gravel (ML)** dense to very dense, grey, moist, fine to coarse sand, fine to coarse subangular gravel (Lacustrine)	10	SS	17-22-23					
		11	SS	52/ 0.13		24	36	35	5
81.7 / 6.6	**Silt (ML)**, very dense, grey, moist, few fine to coarse sand (Lacustrine)	12	SS	54/ 0.13		1	9	89	1
		13	SS	50/ 0.13					
80.5 / 7.8	**Sandy Silt (ML) to Sandy Silt with Gravel (ML)**, very dense, grey, moist, fine to coarse sand, fine to coarse subangular gravel (Till)	14	SS	55/ 0.1		2	41	53	4
		15	SS	54/ 0.13					
		16	SS	55/ 0.08		15	36	41	8
		17	SS	51/ 0.1					
78.0 / 10.3	**Silty Sand (SM) and Sandy Silt (ML)**, very dense, grey, moist to very moist, fine to coarse sand (Glacio-Lacustrine)	18	SS	52/ 0.08		1	54	38	7
		19	SS	53/ 0.08					
		20	SS	56/ 0.15					
		21	SS	42-50/ 0.08	19.9				
		22	SS	52/ 0.13					
		23	SS	53/ 0.08					
		24	SS	50/ 0.1					
		25	SS	54/ 0.15					



Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

OPG_EXP RECORD OF BOREHOLE DNNP_R2.GPJ ONTARIO MOT.GDT 4/25/13

RECORD OF BOREHOLE No B-104

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 684015.57E, 4859933.56N (UTM Zone 17) | ORIGINATED BY M. Clauser

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 2.2.13 - 2.6.13 | CHECKED BY S. Micic

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	SPT-VALUES (see Note 2)	'N' VALUE (see Note 2)	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
	Silty Sand (SM) and Sandy Silt (ML), very dense, grey, moist to very moist, fine to coarse sand (Glacio-Lacustrine) *(continued)*	26	SS	55/ 0.13	55				non-plastic	0	57	(43)	
		27	SS	40-51/ 0.1	51								
		28	SS	21-54/ 0.13	54				21.4	0	49	44	7
71.3													
17.0	**Sandy Lean Clay (CL) to Lean Clay (CL)**, very stiff to hard, grey, moist, fine to medium sand, low to medium plasticity (Glacio-Lacustrine)	29	SS	17-14-22	36				20.6	0	43	31	26
		30	TW						20.8	0	73	(27)	
									21.3	2	2	(96)	
	~75 mm thick wet grey Sandy Silt (ML) layer at about 18.5 m	31	SS	20-24-28	52								
		32	SS	7-10-11	21				21.9	0	40	35	26
		33	TW						21.0	3	19	(78)	
		34	SS	52/ 0.13	52					0	27	63	10
67.7													
20.6	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glacio-Lacustrine)	35	SS	54/ 0.1	54								
	No sample recovered at 20.7 m; assumed silty sand	36	SS	66/ 0.1	66					0	71	28	1
66.4													
21.9	**Silty Clayey Sand (SC-SM)**, hard, grey, moist, fine to coarse sand, few subrounded to subangular fine gravel sizes, low plasticity (Till)	37	SS	26-94/ 0.28	94								
		38	SS	46-55/ 0.15	55				23.8				
		39	SS	34-52/ 0.1	52								
		40	SS	33-54/ 0.13	54				22.4	5	48	32	15
63.5		41	SS	16-89/ 0.28	89								
24.8 / 63.2	**Sandy Silt (ML)**, very dense, grey, wet, contains angular limestone fragments (Till)	42	SS	51/ 0.05	51								
25.1 / 62.8	Bedrock encountered at 25.1 m												
25.5	Casing advance to 25.5 m												

NOTES:

1. Drilling notes: Borehole drilled with a CME 1050 drill rig using 210 mm I.D. (355 mm O.D.) hollow-stem augers to 2.7 m. A 150 mm pipe for the mud tank was installed to 2.7 m (sealed with Benseal to surface). The hole was then continued with 96 mm H casing advanced with an HW casing advancer to bedrock. The bedrock was cored with an HQ triple core barrel. The soil was sampled with 50.8 mm O.D. split barrel sampler using an automatic hammer (efficiency ranges from 71 to 76 %-see Appendix E of GDR) and 73 mm I.D. Shelby tube samplers pushed hydraulically (~1.5 kPa to 2.5 kPa).

2. For full penetration of 0.45 m (e.g. 12-13-20-see Column "SPT-Values"),

Continued Next Page

+ ³, × ³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

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1595 Clark Boulevard
Brampton, Ontario L6T 4V1

RECORD OF BOREHOLE No B-104

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 684015.57E, 4859933.56N (UTM Zone 17) | ORIGINATED BY M. Clauser

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 2.2.13 - 2.6.13 | CHECKED BY S. Micic

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	'N' VALUE (see Note 2) ● DNYAMIC CONE PENETRATION 20 40 60 80 100	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT-VALUES (see Note 2)			SHEAR STRENGTH: Cu, KPa ○ UNCONFINED + FIELD VANE × QUICK TRIAXIAL LAB VANE 20 40 60 80 100			GR SA SI CL
	SPT "N" values presented as dots show the number of blows for the final 0.3 m of the drive of a 50.8 mm OD split spoon sampler driven by a 63.5 kg hammer falling 76.2 cm. For split spoon samples where full penetration is not achieved (e.g. 50/0.08 - see Column "SPT-Values"), the number of blows is reported over the sampler penetration in metres as shown in Column "SPT-Values". 3. Upon completion of drilling groundwater level was not determined in the open hole because the borehole was full of liquid drilling mud. Since, the scope of this investigation did not involve installation of piezometers, the stabilized groundwater level could not be monitored. 4. A portable gas monitor MultiRAE Plus® used to monitor subsurface gases being released. Where encountered, gases measurements are included in this note.										

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

exp services Inc.
1595 Clark Boulevard
Brampton, Ontario L6T 4V1

RECORD OF BOREHOLE No B-113

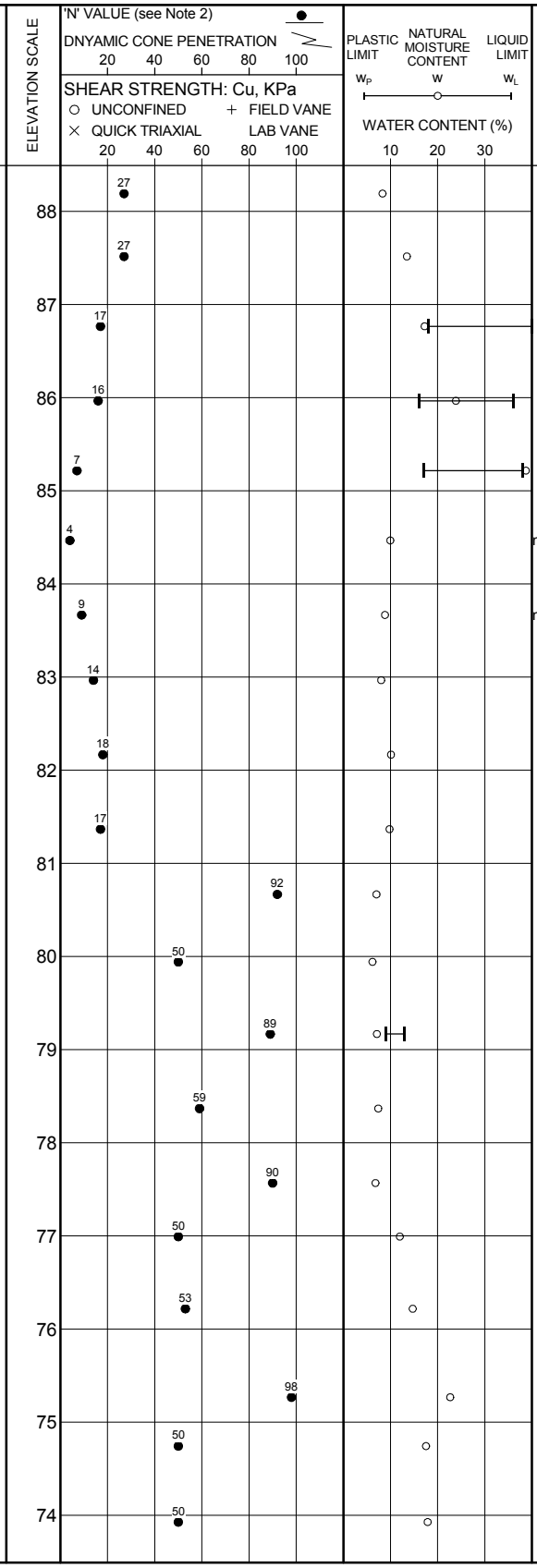
METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683987.89E, 4859972.70N (UTM Zone 17) | ORIGINATED BY G. Black

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 12.11.12 - 12.14.12 | CHECKED BY S. Micic

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	SPT-VALUES (see Note 2)	'N' VALUE (see Note 2)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
88.5 / 0.0	~150 mm **Sand and Gravel (GW)**, brown over **Crushed Rock (GW)** and **topsoil (OH)**, frozen, brown to dark brown (Fill)	1	SS	8-15-12	27					
87.8 / 0.7	**Sandy Lean Clay to Lean Clay (CL)**, very stiff to medium stiff, brown, moist, little to few fine to medium sand sizes, trace gravel sizes at 2.5 m, faintly layered at 2.5 m, medium plasticity (Lacustrine)	2	SS	6-11-16	27		0	31	48	21
		3	SS	3-7-10	17	20.1	0	8	48	44
		4	SS	5-8-8	16		1	11	45	43
		5	SS	3-3-4	7		1	8	39	52
84.8 / 3.7	**Silty Sand (SM)**, loose to medium dense, grey, wet to ~6 m, then moist, fine to coarse sand, few to little subangular gravel and clay sizes, non-plastic (Lacustrine)	6	SS	2-2-2	4	non-plastic	13	41	37	9
		7	SS	3-4-5	9	non-plastic	8	47	35	10
		8	SS	6-7-7	14	23.8	8	45	38	9
		9	SS	5-6-12	18	23.7				
81.1 / 7.4	**Silty Sand (SM) to Sandy Silt (ML)**, very dense, grey, moist, fine to medium sand, trace to little subangular fine gravel and clay sizes, low plasticity (Till)	10	SS	8-9-8	17	23.8	11	40	39	10
		11	SS	30-43-49	92	24.3				
		12	SS	36-50/ 0.13	50	24.2	18	38	34	10
		13	SS	22-89/ 0.28	89	24.3	6	41	40	13
	Cobble encountered at 7.5 m; numerous gravel sizes to about 11.9 m	14	SS	21-28-31	59	24.1	3	41	44	12
		15	SS	26-38-52	90					
76.6 / 11.9	Sampler bouncing on a stone at 11.4 m	16	SS	32-50/ 0.05	50		4	36	47	13
	Silt with Sand (ML) and Silty Sand (SM), very dense, grey, wet, fine sand (Glacio-Lacustrine)	17	SS	53/ 0.15	53					
		18	SS	37-49-49	98		0	16	83	1
		19	SS	50/ 0.1	50					
		20	SS	50/ 0.13	50					



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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No B-113

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683987.89E, 4859972.70N (UTM Zone 17) | ORIGINATED BY G. Black

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 12.11.12 - 12.14.12 | CHECKED BY S. Micic

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	SPT-VALUES (see Note 2)	'N' VALUE (see Note 2)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
	Silt with Sand (ML) and Silty Sand (SM), very dense, grey, wet, fine sand (Glacio-Lacustrine) *(continued)*	21	SS	60/ 0.13	60					
		22	SS	34-50/ 0.13	50		0	69	28	3
72.0 / 16.5	**Lean Clay (CL)**, hard, grey, contains occasional silt (ML) layers, trace to few fine sand, low to medium plasticity (Glacio-Lacustrine)	23	SS	41-20-34	54	20.1				
		24	SS	20-21-19	40	21.0	0	3	48	49
		25	SS	17-31-35	66					
	Layers of very stiff Lean Clay (CL) and Silty Clay (CL-ML) at about 19 m	26	SS	5-7-9	16	20.9	0	12	45	43
68.8 / 19.7	**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, trace of subangular gravel, low plasticity (Till)	27	SS	14-50/ 0.08	50					
	Stone fragments in tip of sampler at 19.8 m	28	SS	39-61/ 0.15	61	23.6	1	15	65	19
67.4 / 21.1	**Silty Sand (SM)**, very dense, grey moist to wet, fine sand (Glacio-Lacustrine)	29	SS	58/ 0.13	58					
		30	SS	57/ 0.13	57		0	60	39	1
66.0 / 22.5	**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, trace to few subangular gravel sizes, low plasticity (Till)	31	SS	21-27-43	70	23.7				
		32	SS	21-80/ 0.28	80	23.6	6	21	50	23
63.6 / 24.9	**Silty Sand (SM)**, very dense, grey, moist, fine to coarse sand, trace of gravel (Till)	33	SS	25-63/ 0.15	63	24.0	4	42	39	15
		34	SS	60/ 0.1	60					
62.7 / 25.8	Probable Bedrock									
62.4 / 26.1	Split barrel sampler bouncing at 25.9 m Advanced casing to 26.1 m									

NOTES:

1. Drilling notes: Borehole drilled with a CME 1050 drill rig using 210 mm I.D. (355 mm O.D.) hollow-stem augers to 2.7 m. A 150 mm pipe for the mud tank was installed to 2.7 m (sealed with Benseal to surface). The hole was then continued with 96 mm H casing advanced with an HW casing advancer to bedrock. The bedrock was cored with an HQ triple core barrel. The soil was sampled with 50.8 mm O.D. split barrel sampler using an automatic hammer (efficiency ranges from 71 to 76 %- see Appendix E of GDR).

2. For full penetration of 0.45 m (e.g. 12-13-20-see Column "SPT-Values"),

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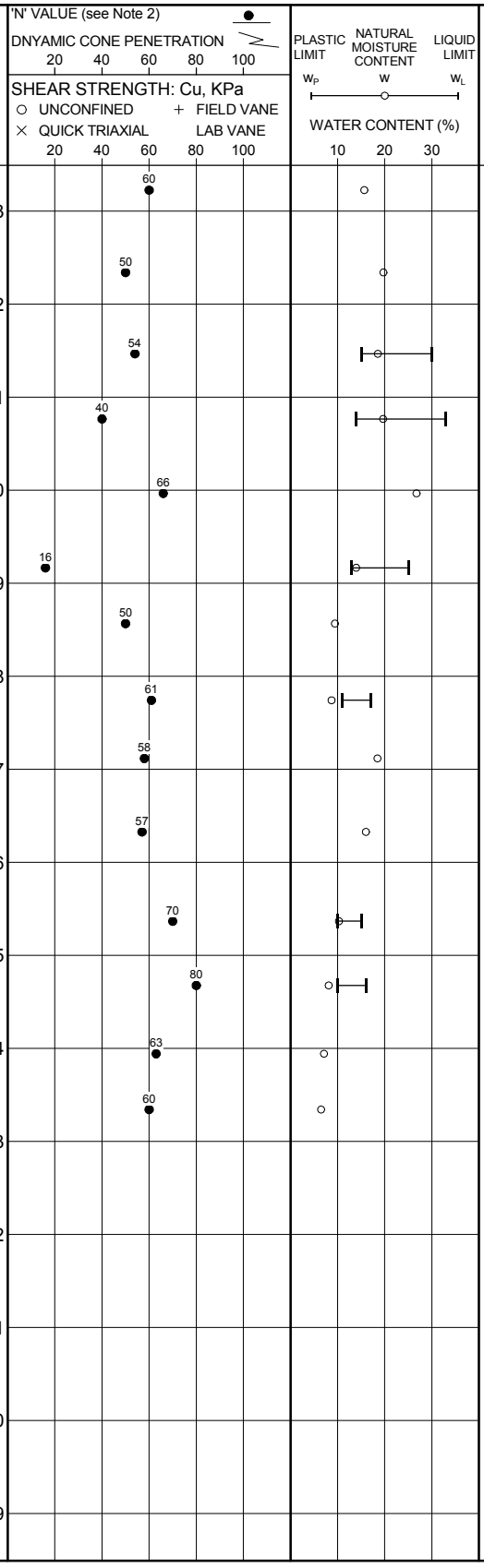

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

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RECORD OF BOREHOLE No B-113

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683987.89E, 4859972.70N (UTM Zone 17) | ORIGINATED BY G. Black

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 12.11.12 - 12.14.12 | CHECKED BY S. Micic

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	'N' VALUE (see Note 2) ● DNYAMIC CONE PENETRATION 20 40 60 80 100 ; SHEAR STRENGTH: Cu, KPa ○ UNCONFINED + FIELD VANE × QUICK TRIAXIAL LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT-VALUES (see Note 2)						
	SPT "N" values presented as dots show the number of blows for the final 0.3 m of the drive of a 50.8 mm OD split spoon sampler driven by a 63.5 kg hammer falling 76.2 cm. For split spoon samples where full penetration is not achieved (e.g. 50/0.08 - see Column "SPT-Values"), the number of blows is reported over the sampler penetration in metres as shown in Column "SPT-Values". 3. Upon completion of drilling groundwater level was not determined in the open hole because the borehole was full of liquid drilling mud. Since, the scope of this investigation did not involve installation of piezometers, the stabilized groundwater level could not be monitored. 4. A portable gas monitor MultiRAE Plus® used to monitor subsurface gases being released. Where encountered, gases measurements are included in this note.										

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

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RECORD OF BOREHOLE No B-116

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683930.78E, 4860013.90N (UTM Zone 17) | ORIGINATED BY G. Black

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 12.17.12 - 12.19.12 | CHECKED BY S. Micic

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	SPT-VALUES (see Note 2)	'N' VALUE (see Note 2)	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
89.3													
0.0	Approximately 75 mm **Sand and Gravel (GW)**, brown over approx. 200 mm **Crushed Rock (GW)** over **Silty Clay (CL-ML)**, medium dense, brown to black, moist, rootlets (Fill)	1	SS	6-6-19	25				21.5				
88.6													
0.7	**Sandy Silt (ML)**, dense to medium dense, brown and grey, some rust coloured oxidation at 1.5 m, moist, fine to medium sand, trace of gravel (Lacustrine)	2	SS	5-21-13	34				23.7				
		3	SS	15-15-11	26				20.7	0	44	49	7
87.1													
2.2	**Lean Clay to Sandy Lean Clay (CL)**, very stiff to soft, brown, turns grey at 3 m, moist, trace of subangular gravel, fine to medium sand, medium plasticity (Lacustrine)	1	TW							2	17	50	31
		4	SS	4-8-9	17				21.7	1	41	47	11
		2	TW						19.1	0	0	32	68
		5	SS	1-1-1	2			41		0	4	47	49
84.1													
5.2	**Sandy Silty (ML) toSilty Sand (SM)**, very loose to loose, grey, wet, few clay and subangular gravel sizes, fine to medium sand, non-plastic (Lacustrine)	6	SS	1-1-1	2								
		7	SS	1-1-2	3					0	44	49	7
		8	SS	2-3-2	5								
		9	SS	1-2-3	5				22.9	6	44	37	13
81.1													
8.2	**Silty Sand (SM)**, very dense, grey, moist,few subangular gravel and clay sizes, fine to coarse sand (Till)	10	SS	36-50/ 0.05	50								
80.0													
9.3	**Lean Clay (CL)**, hard, grey, moist, occasional silt pockets, medium plasticity (Glacio-Lacustrine)	11	SS	20-27-34	61					0	10	60	30
		12	SS	30-50/ 0.13	50								
78.9													
10.4	**Sandy Silt (ML) to Silty Sand (SM)**, very dense, grey, moist, fine sand, trace of clay (Glacio-Lacustrine)	13	SS	39-50/ 0.08	50								
		14	SS	38-50/ 0.1	50					0	40	59	1
		15	SS	36-50/ 0.13	50					0	67	32	1
		16	SS	46-50/ 0.1	50					0	63	36	1
		17	SS	55/ 0.15	55					0	23	76	1
		18	SS	47-50/ 0.1	50					0	75	24	1

GROUND WATER CONDITIONS

ELEVATION SCALE: 89, 88, 87, 86, 85, 84, 83, 82, 81, 80, 79, 78, 77, 76, 75

DNYAMIC CONE PENETRATION 20 40 60 80 100

SHEAR STRENGTH: Cu, KPa
○ UNCONFINED + FIELD VANE
× QUICK TRIAXIAL LAB VANE
20 40 60 80 100

WATER CONTENT (%) 10 20 30

REMARKS & GRAIN SIZE DISTRIBUTION (%)

Continued Next Page

$+^3, \times^3$: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

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RECORD OF BOREHOLE No B-116

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683930.78E, 4860013.90N (UTM Zone 17) | ORIGINATED BY G. Black

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 12.17.12 - 12.19.12 | CHECKED BY S. Micic

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	SPT-VALUES (see Note 2)	'N' VALUE (see Note 2)	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
	Sandy Silt (ML) to Silty Sand (SM), very dense, grey, moist, fine sand, trace of clay (Glacio-Lacustrine) *(continued)*	19	SS	40-50/ 0.13	50					0	60	39	1
		20	SS	38-50/ 0.13	50					0	74	25	1
		21	SS	42-54/ 0.15	54								
71.7													
17.6	**Lean Clay (CL)**, hard, grey, moist ,trace to few fine to coarse sand sizes, trace of gravel, occasional light grey pockets, medium plasticity (Glacio-Lacustrine)	22	SS	22-82/ 0.25	82				21.1				
		23	SS	16-20-24	44					1	2	45	52
		24	SS	12-17-23	40				20.2				
		3	TW						20.7	2	7	46	45
68.9													
20.4	**Silty Clay with Sand to Silty Clay (CL-ML)**, hard, grey, moist, few to little fine sand sizes, trace of subangular gravel, low plasticity (Till)	25	SS	10-20-40	60				23.6	4	22	49	25
		26	SS	36-50/ 0.13	50				23.8	1	25	60	14
		27	SS	50/ 0.1	50					0	6	75	19
66.8													
22.5	**Silt (ML)**, very dense, grey, moist, occasional Sandy Silt (ML) and Silty Sand (SM) seams, fine sand, low plasticity (Glacio-Lacustrine)	28	SS	50/ 0.1	50								
		29	SS	50/ 0.1	50								
65.3													
24.0	**Sandy Silt (ML)**, very dense, grey,moist, few subangular to angular gravel sizes, fine to coarse sand (Till)	30	SS	43-50/ 0.13	50								
64.1		31	SS	50/ 0.1	50								
25.2	Probable Bedrock Advanced casing to 25.8 m												
63.5													
25.8													

GROUND WATER CONDITIONS

ELEVATION SCALE: 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60

SHEAR STRENGTH: Cu, KPa — ○ UNCONFINED, × QUICK TRIAXIAL, + FIELD VANE, LAB VANE (20 40 60 80 100)

WATER CONTENT (%) (10 20 30)

NOTES:

1. Drilling notes: Borehole drilled with a CME 1050 drill rig using 210 mm I.D. (355 mm O.D.) hollow-stem augers to 2.7 m. A 150 mm pipe for the mud tank was installed to 2.7 m (sealed with Benseal to surface). The hole was then continued with 96 mm H casing advanced with an HW casing advancer to bedrock. The bedrock was cored with an HQ triple core barrel. The soil was sampled with 50.8 mm O.D. split barrel sampler using an automatic hammer (efficiency ranges from 71 to 76 %-see Appendix E of GDR) and 73 mm I.D. Shelby tube samplers pushed hydraulically (~1.5 kPa to 2.5 kPa).

Water circulation lost due to hole being left for three days. Partly

Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

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RECORD OF BOREHOLE No B-116

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683930.78E, 4860013.90N (UTM Zone 17) | ORIGINATED BY G. Black

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 12.17.12 - 12.19.12 | CHECKED BY S. Micic

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	'N' VALUE (see Note 2) ● / DNYAMIC CONE PENETRATION 20 40 60 80 100 / SHEAR STRENGTH: Cu, KPa ○ UNCONFINED + FIELD VANE × QUICK TRIAXIAL LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT-VALUES (see Note 2)						
	removed casing and then readvanced casing to achieve new seal. 2. For full penetration of 0.45 m (e.g. 12-13-20-see Column "SPT-Values"), SPT "N" values presented as dots show the number of blows for the final 0.3 m of the drive of a 50.8 mm OD split spoon sampler driven by a 63.5 kg hammer falling 76.2 cm. For split spoon samples where full penetration is not achieved (e.g. 50/0.08 - see Column "SPT-Values"), the number of blows is reported over the sampler penetration in metres as shown in Column "SPT-Values". 3. Upon completion of drilling groundwater level was not determined in the open hole because the borehole was full of liquid drilling mud. Since, the scope of this investigation did not involve installation of piezometers, the stabilized groundwater level could not be monitored. 4. A portable gas monitor MultiRAE Plus® used to monitor subsurface gases being released. Where encountered, gases measurements are included in this note.										

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

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RECORD OF BOREHOLE No B-118

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683791.77E, 4860102.97N (UTM Zone 17) | ORIGINATED BY M. Clauser

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 1.2.13 - 1.10.13 | CHECKED BY S. Micic

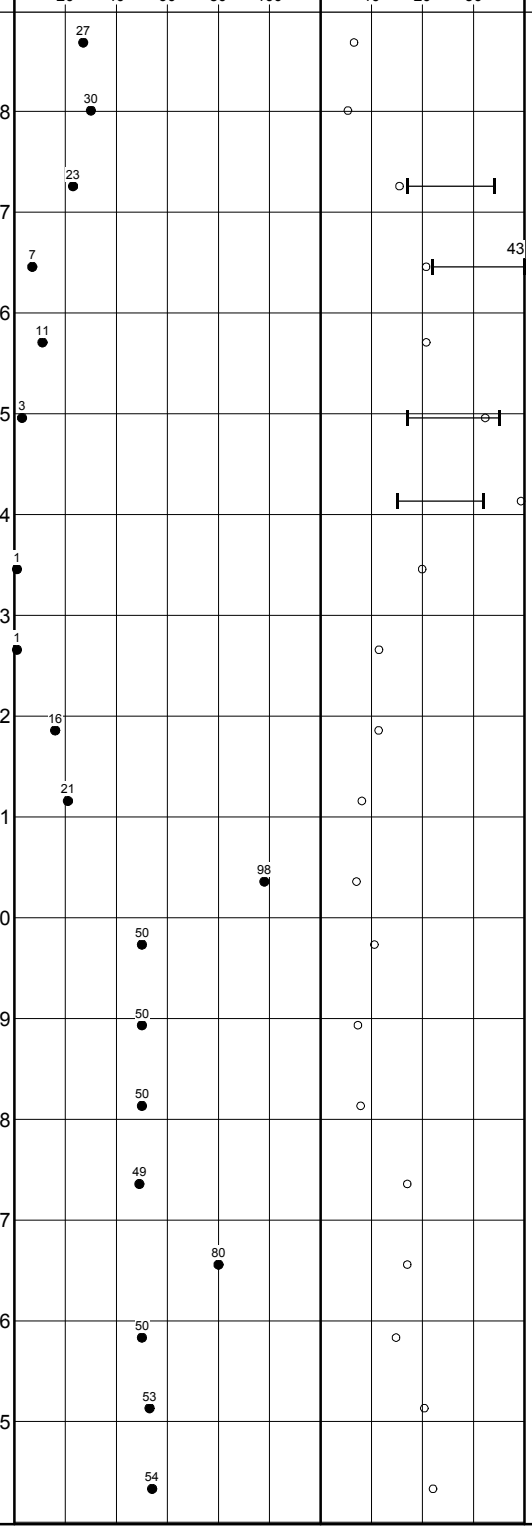
SOIL PROFILE

ELEV / DEPTH	DESCRIPTION
89.0 / 0.0	Mixture of **Silty Sand (SM) to Sandy Silt (ML)** and **Gravel (GW)**, brown to dark grey, moist, fine to coarse sand, fine angular to rounded gravel (Fill)
87.9 / 1.1	**Lean Clay with Sand (CL)**, very stiff, brown to dark brown, moist, trace of topsoil and rootlets, fine to coarse sand, medium plasticity (Fill)
86.9 / 2.1	**Lean Clay (CL)**, stiff to soft, brown, turns grey at about 3 m, moist, few fine to coarse sand, trace of gravel, medium plasticity (Lacustrine)
84.0 / 5.0	**Silty Clayey Sand (SC-SM)**, very loose, grey, wet, fine sand, few gravel (Lacustrine)
81.6 / 7.4	**Silty Sand with Gravel (SM) to Sandy Silt (ML)**, medium dense to very dense, moist, grey, fine to coarse sand sizes, fine subrounded to subangular gravel (Till)
80.0 / 9.0	**Sandy Silt (ML)**, very dense, grey, moist, fine to coarse sand sizes (Glacio-Lacustrine)
79.3 / 9.7	**Sandy Silt (ML)**, very dense, grey, moist, few rounded to subrounded fine gravel sizes, fine to coarse sand (Till)
78.4 / 10.6	**Silty Sand (SM) to Sandy Silt (ML)**, very dense, grey, moist, wet at 14.5 m, trace to few clay, trace of gravel, fine to medium sand (Glacio-Lacustrine) Layer of fine to medium sand (SP) about 100 mm thick at 10.8 m Few to little clay sizes at 11.4 m

SAMPLES

NUMBER	TYPE	SPT-VALUES (see Note 2)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
1	SS	4-14-13					
2	SS	14-15-15					
3	SS	3-8-15	19.2	1	25	48	26
4	SS	2-3-4	18.6	1	12	50	37
5	SS	3-4-7					
6	SS	2-2-1	18.3	1	6	45	48
1	TW		19.3	0	4	44	52
7	SS	0-0-1					
8	SS	0-0-1		10	44	35	12
9	SS	4-6-10					
10	SS	4-11-10	23.6	17	41	33	9
11	SS	11-98/ 0.28					
12	SS	33-50/ 0.15		1	43	52	4
13	SS	29-50/ 0.13					
14	SS	36-50/ 0.13		4	60	30	6
15	SS	17-21-28					
16	SS	23-39-41	21.9	0	36	63	1
17	SS	40-50/ 0.15	20.4				
18	SS	30-53/ 0.15	21.1	0	43	56	1
19	SS	33-54/ 0.15					

GROUND WATER CONDITIONS | ELEVATION SCALE | 'N' VALUE (see Note 2) ● | DNYAMIC CONE PENETRATION 20 40 60 80 100 | SHEAR STRENGTH: Cu, KPa ○ UNCONFINED + FIELD VANE × QUICK TRIAXIAL LAB VANE 20 40 60 80 100 | PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30 | REMARKS & GRAIN SIZE DISTRIBUTION (%)



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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

OPG_EXP RECORD OF BOREHOLE DNNP_R2.GPJ ONTARIO MOT.GDT 4/25/13

RECORD OF BOREHOLE No B-118

METRIC

PROJ. No. BRM-00025482-A0 | LOCATION 683791.77E, 4860102.97N (UTM Zone 17) | ORIGINATED BY M. Clauser

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT | BOREHOLE TYPE See Drilling Notes | COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) | DATE 1.2.13 - 1.10.13 | CHECKED BY S. Micic

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	SPT-VALUES (see Note 2)	'N' VALUE (see Note 2)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
	Silty Sand (SM) to Sandy Silt (ML), very dense, grey, moist, wet at 14.5 m, trace to few clay, trace of gravel, fine to medium sand (Glacio-Lacustrine) *(continued)*	20	SS	30-47-58	105	21.6	0	49	50	1
72.5		21	SS	30-53/ 0.13	53					
16.5	**Lean Clay (CL)**, hard, grey, moist, trace of fine sand, low to medium plasticity (Glacio-Lacustrine)	22	SS	17-21-28	49	20.5	0	2	58	40
		23	SS	22-33-41	78					
		24	SS	11-11-13	24	20.2	0	1	38	61
	stratified Silt (ML), below 19 m, light grey, 6 to 12 mm thick	25	SS	11-13-13	26					
68.6		26	TW			20.3	1	1	43	55
20.4	**Silt with Sand (ML)**, very dense, grey, moist, fine to coarse sand, little subangular gravel sizes, few clay sizes (Till)	27	SS	12-85/ 0.25	85					
67.9										
21.1	**Silt (ML)**, very dense, grey, wet, few clay, few fine sand sizes (Glacio-Lacustrine)	28	SS	55/ 0.15	55		0	8	87	5
67.2										
21.8	**Sandy Silt (ML) to Sandy Silt with Gravel (ML)**, medium dense, grey, fine to coarse sand, fine subrounded to subangular gravel (Till)	29	SS	41-32-43	75					
		30	SS	17-37-43	80					
		31	SS	55/ 0.13	55		19	30	42	9
64.2		32	SS	58/ 0.15	58					
24.8	Probable Bedrock, no split-barrel sampler penetration									
63.8										
25.2	Advanced casing to 25.1 m	33	SS	50/ 0						

Elevation scale: 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60

Shear strength: Cu, KPa — ○ UNCONFINED, × QUICK TRIAXIAL, + FIELD VANE, LAB VANE

Water content (%): PLASTIC LIMIT w_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT w_L

NOTES:

1. Drilling notes: Borehole drilled with a CME 1050 drill rig using 210 mm I.D. (355 mm O.D.) hollow-stem augers to 2.7 m. A 150 mm pipe for the mud tank was installed to 2.7 m (sealed with Benseal to surface). The hole was then continued with 96 mm H casing advanced with an HW casing advancer to bedrock. The bedrock was cored with an HQ triple core barrel. The soil was sampled with 50.8 mm O.D. split barrel sampler using an automatic hammer (efficiency ranges from 71 to 76 %-see Appendix E of GDR) and 73 mm I.D. Shelby tube samplers pushed hydraulically (~1.5 kPa to 2.5 kPa).

2. For full penetration of 0.45 m (e.g. 12-13-20-see Column "SPT-Values"), SPT "N" values presented as dots show the number of blows for the final 0.3 m of the drive of a 50.8 mm

Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

exp services Inc.
1595 Clark Boulevard
Brampton, Ontario L6T 4V1

RECORD OF BOREHOLE No B-118

METRIC

PROJ. No. BRM-00025482-A0 LOCATION 683791.77E, 4860102.97N (UTM Zone 17) ORIGINATED BY M. Clauser

PROJ. NAME DARLINGTON NEW NUCLEAR PROJECT BOREHOLE TYPE See Drilling Notes COMPILED BY H. Lohse

DATUM CANADIAN GEODETIC DATUM (CGD) DATE 1.2.13 - 1.10.13 CHECKED BY S. Micic

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	'N' VALUE (see Note 2) ● / DNYAMIC CONE PENETRATION 20 40 60 80 100 / SHEAR STRENGTH: Cu, KPa ○ UNCONFINED + FIELD VANE × QUICK TRIAXIAL LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 10 20 30	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	SPT-VALUES (see Note 2)						
	OD split spoon sampler driven by a 63.5 kg hammer falling 76.2 cm. For split spoon samples where full penetration is not achieved (e.g. 50/0.08 - see Column "SPT-Values"), the number of blows is reported over the sampler penetration in metres as shown in Column "SPT-Values". 3. Upon completion of drilling groundwater level was not determined in the open hole because the borehole was full of liquid drilling mud. Since, the scope of this investigation did not involve installation of piezometers, the stabilized groundwater level could not be monitored. 4. A portable gas monitor MultiRAE Plus® used to monitor subsurface gases being released. Where encountered, gases measurements are included in this note. 5. Methane (CH4) was detected by a portable gas monitor (MultiRAE Plus®) during drilling B-118 at approximately 44.6 m depth. Concentrations exceeded health and safety trigger levels of the on-site gas monitor. This subsequently led to stoppage of all field activities until the gas dissipated. It took approximately 18 hours to normalize the condition. Again during the drilling in B-118, gases were detected at approximately 53 m depth. The detected concentrations close to borehole were approximately 4% LEL of methane (CH4) and 5 ppm of carbon monoxide (CO), which were below the allowable limits.										

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 21451329

LOCATION: N 4860071.26; E 683935.66

RECORD OF BOREHOLE: BH1

SHEET 1 OF 5

BORING DATE: October 7 to 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		89.62							
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Sandy Silt (ML)**, very loose to loose, dark brown, rootlets, moist, fine to medium sand (Topsoil) (Unit 1)		0.00	1	SS	3				
					2	SS	7				
1		**Sandy Lean Clay (CL)**, medium stiff to stiff, brown, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)		88.48 / 1.14	3	SS	5				
2		- Pocket penetrometer 2.25 to 3.50 kg/cm² at bottom of Shelby tube sample 4			4	TO	PH				
					5	SS	13				5 26 44 24
3	Mud Rotary Wash Boring, HWT Casing	**Silty Clayey Sand with Gravel (SC-SM)**, medium dense, brown, wet, fine to coarse sand, angular to subangular, fine to coarse gravel, low plasticity (Glaciolacustrine) (Unit 2b) - No recovery in Shellby tube sample 6		86.65 / 2.97	6	TO	PH				
4					7	SS	11				17 38 35 10
		Silty Sand with Gravel (SM), very dense, grey, moist to wet, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)		85.43 / 4.19	8	SS	100/0.10				
5					9	SS	100/0.05				
					10	SS	100/0.05				
6		**Sandy Silty Clay (CL-ML)**, hard, grey, moist to wet, fine to coarse sand, angular to subangular, fine to coarse gravel, low plasticity (Till) (Unit 3)		83.73 / 5.89	11	SS	178/0.25			γ = 27.7 kN/m³	3 32 53 13
7					12	SS	100/0.10				
					13	SS	100/0.07				8 39 40 13
8					14	SS	126/0.25				
		Lean Clay (CL), hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		81.17 / 8.45	15	SS	123				
9					16	SS	103				0 3 71 26
					17	SS	75				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860071.26; E 683935.66

RECORD OF BOREHOLE: BH1

SHEET 2 OF 5

BORING DATE: October 7 to 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Lean Clay (CL)**, hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b) - Sand increases below 10.29 m			17	SS	75			γ = 25.5 kN/m³	
					18	SS	67				0 11 69 19
				78.72 / 10.90							
11		**Sandy Silt (ML) to Silty Sand (SM)**, very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			19	SS	100/ 0.13				
					20	SS	182/ 0.28			γ = 23.6 kN/m³	0 35 59 5
12					21	SS	169				
13					22	SS	113				
					23	SS	175/ 0.28			γ = 24.2 kN/m³	
14					24	SS	200/ 0.25				
					25	SS	197/ 0.25				
15					26	SS	180/ 0.28				
16					27	SS	151				0 75 24 1
					28	SS	118				
17		**Silty Clay (CL-ML)**, hard, grey, moist to wet, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b) - Thin clay layers present		72.63 / 16.99	29	SS	76				0 1 78 21
18					30	SS	62			γ = 26.7 kN/m³	
		Lean Clay (CL), very stiff to hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.41 / 18.21	31	SS	26				
19					32	SS	23				0 2 54 45
					33	SS	35				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH1

LOCATION: N 4860071.26; E 683935.66

BORING DATE: October 7 to 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Lean Clay (CL)**, very stiff to hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			34	SS	36				
21		- Trace angular fine gravel below 20.65 m		68.36	35	SS	23				
		Sandy Silt (ML), very dense, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 5)		21.26	36	SS	100/0.14			NP	1 35 56 8
22		- Pocket of sand in sample 37			37	SS	194/0.28				
		Sandy Silt (ML), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		67.14 22.48	38	SS	100/0.07				0 48 49 3
23		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, trace angular to subangular, fine to coarse gravel, low plasticity (Till) (Unit 5)		66.61 23.01	39	SS	78				
		- Rock fragments in spoon sample 42			40	SS	146/0.28				3 19 61 17
24		- Bedrock cored from 25.29 m to 41.24 m depth			41	SS	105				
		- Refer to Record of Drillhole BH1.			42	SS	100/0.07				
25		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.		64.33 25.29							
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860071.26; E 683935.66
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH1

DRILLING DATE: October 13 and 14, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.33																
26		Slightly weathered to fresh, very thinly to medium bedded, dark brownish grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds		25.29	1							BD,PL,RO SA JN,PL,RO SA	1.5 1.5	2 2	20 20					
27		- UCS with Modulus Sample			2							BD,UN,SM SA BD,UN,RO SA BD,UN,RO SA BD,UN,RO SA BD,UN,RO SA	2 3 3 3 3	2 2 2 2 2	20 22 22 22 22					
28					3							BD,UN,SM SA	2	2	20					
		Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.		61.15 28.47																
29					4							BD,UN,RO SA BD,UN,RO SA BD,UN,RO SA	3 3 3	2 2 2	22 22 22					
30					5							BD,UN,RO SA BD,UN,RO SA	3 3	2 2	22 22					
31					6							BD,UN,RO SA	3	2	22					
32					7							BD,UN,RO SA	3	2	22					
33					8															
34																				
35																				

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DEPTH SCALE
1 : 50

LOGGED: IC
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860071.26; E 683935.66
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH1

DRILLING DATE: October 13 and 14, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
36		Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.			8							BD,UN,RO	3	1	25					
37					9															
38												BD,UN,RO PC,CL	3	4	20					
39					10															
40					11															
41				48.38																
		END OF DRILLHOLE		41.24																
42																				
43																				
44																				
45																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860073.40; E 683879.86

RECORD OF BOREHOLE: BH2

SHEET 1 OF 3

BORING DATE: August 25 to 31 and September 10, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢○W⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		89.41							GR SA SI CL
0	Power Augering; 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, brown, moist, fine to coarse sand, fine subangular gravel (Fill) (Unit 1)		0.00	1A	SS	28				50 mm Dia. Monitoring Well
					1B						Concrete
				88.72							
1		**Silty Sand with Gravel (SM)**, very dense to medium dense, grey, moist, fine to coarse sand, fine subangular gravel (Fill) (Unit 1)		0.69	2A	SS	57				23 39 30 8
					2B						
				87.76	3A	SS	16				
2		**Sandy Silt (ML)**, medium dense, brown to dark brown, moist, fine to medium sand (Fill) (Unit 1)		1.65	3B						
				87.28							
		Lean Clay with Sand (CL), stiff to medium stiff, brown, moist, low plasticity (Glaciolacustrine) (Unit 2a)		2.13	4	SS	12				0 15 67 18 ▽ January 05, 2022
3	Mud Rotary Wash Boring; HWT Casing				5	TO	PH				Grout
					~~5S~~	CS					
4					6	SS	4				5 14 47 34
5					7	TO	PH				
					~~7S~~	CS					
				83.52							
6		**Silty Sand (SM)**, loose, grey, wet, fine to coarse sand, fine subrounded gravel (Glaciolacustrine) (Unit 2b)		5.89	8	SS	4				7 46 37 10 Bentonite
				82.70							
7		**Sandy Silt (ML)**, very dense, grey, moist to wet, fine to coarse sand, fine subrounded gravel (Till) (Unit 3)		6.71							Sand
8					9	SS	185/0.28				3 46 45 6
											Screen
9		- Rock fragments in top of spoon sample 10 at 9.1 m depth			10	SS	100/0.11				Sand
10											Grout

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/LT

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860073.40; E 683879.86

RECORD OF BOREHOLE: BH2

SHEET 2 OF 3

BORING DATE: August 25 to 31 and September 10, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Silt (ML) to Silty Sand (SM)**, very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		79.35 / 10.06							
11					11	SS	170				5 28 65 2
12					12	SS	142				
13					13	SS	196/0.24				
14											
15											Grout
					14	SS	198/0.27				
16											
17					15	SS	83				0 69 30 1
				71.58 / 17.83							
18		**Lean Clay (CL)**, hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)			16	SS	59				0 3 53 43
19											
20					17	SS	40				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/LT

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH2

SHEET 3 OF 3

LOCATION: N 4860073.40; E 683879.86

BORING DATE: August 25 to 31 and September 10, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Lean Clay (CL)**, hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		68.61	17	SS	40				
21		**Sandy Silty Clay (CL-ML)** with cobbles and boulders, hard, grey, moist, fine to coarse sand, fine subrounded gravel, low plasticity (Till) (Unit 5)		20.80	18	SS	176/0.28				
22											
23		- Rock fragments in spoon sample 19			19	SS	179				8 29 51 13
		- Rock fragments in spoon sample 20									
24		- Bedrock cored from 24.83 m to 41.24 m depth									
		- Refer to Record of Drillhole BH2.		64.58	20	SS	100/0.14				
25		NOTES:		24.83							
		1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary tecnique.									
26		2. Monitoring well installed on September 10, 2021.									
		3. Water level measured in the monitoring well at a depth of 2.61 m below ground surface (Elev. 86.80 m) on January 05, 2022.									
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/LT

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860073.4; E 683879.86
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH2

DRILLING DATE: September 1, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.58																
25	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds	24.83	1							BD,PL,RO	1.5	1	20					
26				2							BD,PL,RO	1.5	1	20					
		- Swell Sample									BD,UN,RO BD,PL,RO	3 1.5	1 1	25 20					
27				3							BD,PL,RO BD,PL,RO	1.5 1.5	1 1	20 20					
28											BD,PL,RO	1.5	1	20					
											BD,UN,RO PC,CL	3	4	20					
											BD,PL,RO SA	1.5	2	20					
											BD,PL,RO	1.5	1	20					
29											BD,PL,SM SO	1	1	16					
				4							BD,UN,RO SO	3	1	25					
30											BD,UN,RO BD,PL,RO SO	3 1.5	1 1	25 20					Grout
			58.75																
31		Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds	30.66	5							BD,CU,RO	3	1	25					
											BD,PL,RO BD,PL,SM	1.5 1	1 1	20 16					
32				6							BD,UN,RO SO	3	1	25					
											BD,PL,RO	1.5	1	20					
33											BD,UN,RO SA	3	2	22					
											BD,IR,RO	3	1	25					
				7							BD,UN,RO	3	1	25					
34																			

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DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860073.4; E 683879.86
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH2

DRILLING DATE: September 1, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
35	Rotary Drill HQ3 Core	Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds			7															
36					8							BD,UN,RO SA	3	2	22					
37					9															
38																				Grout
												BD,UN,RO SA	3	2	22					
39					10															
												BD,IR,VR SA	3	2	22					
40																				
												BD,UN,RO SA	3	2	22					
					11															
41												BD,PL,SM	1	1	16					
				48.14																
		END OF DRILLHOLE		41.27																
42																				
43																				
44																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

PROJECT: 21451329

LOCATION: N 4860026.49; E 683971.33

RECORD OF BOREHOLE: BH3

SHEET 1 OF 4

BORING DATE: September 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		89.89							GR SA SI CL
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, medium dense, moist, fine to coarse sand, angular to subrounded fine to coarse gravel (Fill) (Unit 1)		0.00	1A						
		Shale Rock, fragments (Fill) (Unit 1)		0.15 / 89.52	1B	SS	29				
		Silty Sand with Gravel (SM), medium dense, brown, moist, organic staining, fine to coarse sand, angular to subangular, fine to coarse gravel (Fill) (Unit 1)		0.37 / 89.20	1C						
		Lean Clay with Sand (CL), medium stiff to soft, brown, moist, fine to medium sand, subangular fine gravel, low to medium plasticity (Glaciolacustrine) (Unit 2a)		0.69	2	SS	10				
					3	TO	PB				
2					~~3S~~	CS					
					4	SS	10				9 22 55 15
3	Mud Rotary Wash Boring, HWT Casing				5	TO	PB				
					~~5S~~	CS					
4					6	SS	8			γ = 21.5 kN/m³	
		- Becoming grey below 4.57 m depth						+	>100		
5					7	SS	3				6 27 44 23
6		**Silty Sand with Gravel (SM)**, very loose, gery, wet, fine to coarse sand, subrounded fine gravel (Glaciolacustrine) (Unit 2b)		83.95 / 5.94	8	SS	2				
		Sandy Silt (ML), very dense, gery, moist, fine to coarse sand, subangular to angular, fine gravel (Till) (Unit 3)		83.26 / 6.63							
7					9	SS	97				
8					10	SS	118				2 39 47 12
9					11	SS	122				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/IC

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH3

SHEET 2 OF 4

LOCATION: N 4860026.49; E 683971.33

BORING DATE: September 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Lean Clay (CL)**, hard, grey, moist, trace fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		79.83 / 10.06							
11					12	SS	78				0 2 61 37
12				77.57	13A						
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		12.32	13B	SS	14/ 0.27				
13											
14					14	SS	167/ 0.25				
15					15	SS	164/ 0.28				0 66 32 1
16											
17					16	SS	100/ 0.15				
				72.20							
		Lean Clay (CL), very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		17.69							
18					17	SS	24				
19				70.61							
		Silt (ML), very dense, grey, wet (Glaciolacustrine) (Unit 4a)		19.28							
20					18	SS	52				0 1 85 14
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/IC

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH3

SHEET 3 OF 4

LOCATION: N 4860026.49; E 683971.33

BORING DATE: September 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Silt (ML)**, very dense, grey, wet (Glaciolacustrine) (Unit 4a)			18	SS	52		⊢○		0 1 85 14
				69.09							
21		**Lean Clay (CL)**, very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		20.80	19	SS	20		○		
22				67.54							
		Silt with Sand (ML), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		22.35							
23					20	SS	172/0.23		○	γ = 25.7 kN/m³	1 14 77 9
				66.05							
24		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine gravel, low plasticity (Till) (Unit 5)		23.84							
		- Rock Fragments in bottom spoon sample 22 at 25.44 m depth			21	SS	72		⊢○⊣		2 15 62 21
25		- Bedrock cored from 25.44 m to 41.34 m depth.									
		- Refer to Record of Drillhole BH3.		64.45	22	SS	100/0.14		○		
		NOTE:		25.44							
		1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/IC

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860026.49; E 683971.33
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH3

DRILLING DATE: September 28, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.45																
	Rotary Drill / HQ3 Core	Moderately weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with thin grey limestone interbeds		25.44	1							BD,UN,SM SA	2	2	20					
26												BD,PL,SM SA	1	2	16					
												BD,UN,SM SA	2	2	20					
												BD,PL,SM SA	1	2	16					
					2															
27												BD,PL,SM SA	1	2	16					
28					3															
												BD,UN,SM SA	2	2	20					
												BD,PL,SM	1	1	16					
				60.90								BD,UN,SM	2	1	20					
29		Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with grey shale interbeds		28.99																
					4							BD,UN,SM SA	2	2	20					
30																				
												BD,UN,SM	2	1	20					
31												BD,UN,RO PC, CL, BR	3	4	20					
					5															
32																				
33					6															
34												BD,UN,RO SA	3	2	22					
					7															
35																				
					8							BD,UN,RO PC, CL	3	4	20					

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DEPTH SCALE
1 : 50

wsp GOLDER

LOGGED: IC
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860026.49; E 683971.33
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH3

DRILLING DATE: September 28, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
36	Rotary Drill, HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with grey shale interbeds			8															
37					9							BD,UN,RO SA	3	2	22					
38																				
39					10							BD,UN,RO SA	3	2	22					
40					11															
41				48.55																
		END OF DRILLHOLE		41.34																
42																				
43																				
44																				
45																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC
CHECKED: AC

PROJECT: 21451329

LOCATION: N 4860016.14; E 683917.93

RECORD OF BOREHOLE: BH4

SHEET 1 OF 13

BORING DATE: July 19 to 21, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		89.64							GR SA SI CL
0	Power Augering, 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, medium dense, brown, moist, fine to coarse sand, subrounded to subangular, fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	18				
		Silty Sand (SM), medium dense, brown, moist, fine to coarse sand, subangular fine gravel (Fill) (Unit 1)		88.95 / 0.69	2	SS	17		○		
1											
					3	SS	21				
2		- Augers grinding from 2.1 m to 2.7 m									
3				86.36							
	Mud Rotary Wash Boring/Tri-cone, HWT Casing	**Silty Sand (SM)**, very loose to loose, grey, moist, fine to coarse sand, subangular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		3.28	1	PMT					
4											
					4	SS	3		○		
5											
6											
					2	PMT					
7											
					5	SS	8		○		7 46 37 10
8											
9				80.27							
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		9.37	3	PMT					
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: MJT

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PROJECT: 21451329

LOCATION: N 4860016.14; E 683917.93

RECORD OF BOREHOLE: BH4

SHEET 2 OF 13

BORING DATE: July 19 to 21, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring/Tri-cone, HWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			3	PMT					
11					6	SS	154		○		
12											
13					4	PMT					
14					7	SS	127		○		0 77 22 1
15											
16		- Unsucessful PMT attempt at approximate depth of 16.3 m									
17					8	SS	160		○		
18											
		Lean Clay (CL), very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.12 / 18.52							
19					5	PMT					
20					9	SS	24				0 2 40 58
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: MJT

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PROJECT: 21451329

LOCATION: N 4860016.14; E 683917.93

RECORD OF BOREHOLE: BH4

SHEET 3 OF 13

BORING DATE: July 19 to 21, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring/Tri-cone; HWT Casing	**Lean Clay (CL)**, very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)			9	SS	24				0 2 40 58
21				68.08							
		Silt (ML), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		21.56							
22					6	PMT					
23					10	SS	100/0.13				
				65.95							
		Sandy Silty Clay (CL-ML), very dense, grey, moist, fine to medium sand, angular fine gravel (Till) (Unit 5)		23.69							
24					11	SS	100/0.13			γ = 23.9 kN/m³	10 36 42 13
25		- Spoon attempted at 25.45 m depth; refusal - Bedrock cored from 25.45 m to 122.01 m depth - Refer to Record of Drillhole BH4		64.19							
		NOTES: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 2. Subsoil conditions precluded PMT at approximate depth of 16.3 m.		25.45							
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.19																
	Rotary Drill / HQ3 Core	Shale Bedrock Fragments	25.45 / 63.95																
26		Slightly weathered, thinly bedded, dark brown-grey, fine grained, faintly porous, slightly reactive to HCl, weak to strong SHALE (Blue Mountain Formation) with thin to medium, light grey, medium strong limestone interbeds. - Slake Durability Sample - Slake Durability Sample	25.69	1							BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO PC, CI	1.5	4	16					
27											BD,PL,RO SA	1.5	2	20					
											BD,PL,RO PC, CI	1.5	4	16					
				2							BD,PL,RO	1.5	1	20					
28											BD,PL,RO	1.5	1	20					
											JN,UN,RO	3	1	25					
			60.80																
29		Fresh, very thin to thinly bedded, light grey, fine to medium grained, slightly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.	28.84								BD,PL,SM	1	1	16					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
30											BD,PL,RO	1.5	1	20					
				3							BD,PL,RO	1.5	1	20					
											BD,UN,RO SA	3	2	22					
31																			
											BD,UN,RO SA	3	2	22					
32											BD,UN,RO	3	1	25					
											BD,PL,RO	1.5	1	20					
33											BD,PL,RO	1.5	1	20					
				4							BD,PL,RO	1.5	1	20					
34																			
35		R1 zone between 35.09 m and 35.13 m		5															

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
36	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, light grey, fine to medium grained, slightly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			5							BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
37												BD,PL,RO SA	1.5	2	20					
38					6							BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
39												BD,UN,SM SA	2	2	20					
												BD,PL,RO	1.5	1	20					
40												BD,PL,RO SA	1.5	2	20					
												BD,PL,RO SA	1.5	2	20					
41					7							BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
42												BD,UN,RO SA	3	2	22					
												BD,UN,RO	3	1	25					
43												BD,PL,RO SA	1.5	2	20					
												BD,PL,RO SA	1.5	2	20					
44												BD,UN,RO SA	3	2	22					
					8							BD,UN,SM	2	1	20					
45												BD,UN,SM SA	2	2	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
46	Rotary Drill / HQ3 Core	Fresh, very thin to thinly bedded, light grey, fine to medium grained, slightly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			8															
47																				
					9							BD,ST,SM	2	1	20					
48																				
												BD,PL,RO	1.5	1	20					
49																				
												BD,UN,SM	2	1	20					
50																				
					10							BD,UN,SM	2	1	20					
51												BD,UN,SM SA	2	2	20					
												BD,UN,RO PC, CI	3	4	20					
52												BD,UN,SM SA	2	2	20					
53																				
					11							BD,UN,SM	2	1	20					
54																				
												BD,UN,SM	2	1	20					
55												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, light grey, fine to medium grained, slightly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.										BD,UN,RO	3	1	25					
					11							BD,PL,SM	1	1	16					
56												BD,UN,RO	3	1	25					
57												BD,UN,RO	3	1	25					
					12							BD,UN,SM	2	1	20					
58												BD,UN,SM	2	1	20					
59												BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
60																				
												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
61					13							BD,PL,RO SA	1.5	2	20					
												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
62												BD,PL,SM	1	1	16					
63												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
64					14															
												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
65												BD,PL,RO	1.5	1	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
66	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, light grey, fine to medium grained, slightly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			14							BD,UN,RO	3	1	25					
												BD,UN,SM SA	2	2	20					
67					15							BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
												BD,PL,SM	1	1	16					
68												BD,PL,RO SA	1.5	2	20					
												BD,UN,RO	3	1	25					
69												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
70					16							BD,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
71												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
72												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
73												BD,UN,RO	3	1	25					
					17							BD,UN,SM	2	1	20					
												BD,UN,SM SA	2	2	20					
												BD,PL,SM	1	1	16					
74												BD,UN,RO	3	1	25					
75		- UCS Sample			18							BD,PL,RO	1.5	1	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
76	Rotary Drill / HQ3 Core	Fresh, very thin to thinly bedded, light grey, fine to medium grained, slightly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			18							BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,UN,RO	3	1	25					
												BD,UN,SM SA	2	2	20					
77												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,PL,SM SA	1	2	16					
78												BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,UN,RO SA	3	2	22					
												BD,PL,SM	1	1	16					
79					19							JN,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
80												BD,UN,RO	3	1	25					
												BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
81												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
82												BD,PL,RO	1.5	1	20					
					20							BD,UN,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
83												BD,UN,RO	3	1	25					
84																				
					21							BD,PL,RO	1.5	1	20					
85												BD,PL,SM	1	1	16					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
86	Rotary Drill / HQ3 Core	Fresh, very thin to thinly bedded, light grey, fine to medium grained, slightly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			21							BD,PL,RO	1.5	1	20					
												BD,UN,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
												BD,UN,RO	3	1	25					
87					22							BD,UN,SM	2	1	20					
88												BD,UN,SM	2	1	20					
												BD,UN,SM SA	2	2	20					
89												BD,UN,SM SA	2	2	20					
90		Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.		-0.34 / 89.98								BD,UN,SM	2	1	20					
91					23							BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
												BD,CU,SM	2	1	20					
92												BD,UN,RO SA	3	2	22					
												BD,ST,SM	2	1	20					
												BD,PL,SM	1	1	16					
												BD,UN,SM SA	2	2	20					
		- UCS Sample										BD,UN,SM SA	2	2	20					
93												BD,PL,SM	1	1	16					
94					24							BD,UN,RO SA	3	2	22					
												BD,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
												BD,PL,RO	1.5	1	20					
												BD,UN,SM SA	2	2	20					
95												BD,PL,RO	1.5	1	20					
												BD,UN,SM SA	2	2	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds. - Direct Shear Sample			24							BD,UN,SM SA	2	2	20					
96												BD,PL,SM	1	1	16					
												BD,UN,SM	2	1	20					
97																				
												BD,UN,SM	2	1	20					
					25							BD,PL,SM	1	1	16					
98												BD,UN,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
												BD,PL,SM	1	1	16					
99																				
												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
100		- UCS with Modulus Sample																		
												BD,PL,RO	1.5	1	20					
					26															
												BD,UN,RO	3	1	25					
101												BD,PL,RO	1.5	1	20					
102																				
												BD,UN,SM	2	1	20					
103																				
					27							BD,UN,SM	2	1	20					
104																				
												BD,PL,RO SA	1.5	2	20					
												BD,UN,SM SA	2	2	20					
												BD,PL,RO	1.5	1	20					
105																				
					28															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
106	Rotary Drill, HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			28							BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
107												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
108												BD,PL,RO	1.5	1	20					
												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
109					29							BD,UN,SM	2	1	20					
110												BD,PL,RO	1.5	1	20					
111												BD,UN,SM	2	1	20					
					30							BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
												BD,PL,SM	1	1	16					
112												BD,UN,SM	2	1	20					
												BD,UN,SM SA	2	2	20					
113												BD,PL,SM	1	1	16					
												BD,UN,SM	2	1	20					
114					31							BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
115												BD,UN,SM	2	1	20					
		- UCS Sample																		
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860016.14; E 683917.93
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH4

DRILLING DATE: July 23 to 29, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill / HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			31															
116												BD,UN,RO	3	1	25					
117					32							BD,PL,RO	1.5	1	20					
118												BD,PL,SM SA	1	2	16					
												BD,PL,SM SA	1	2	16					
119												BD,ST,SM	2	1	20					
												BD,PL,SM	1	1	16					
120					33							BD,UN,RO	3	1	25					
												BD,PL,SM	1	1	16					
121												BD,PL,SM	1	1	16					
												BD,UN,SM	2	1	20					
122				-32.37																
		END OF DRILLHOLE		122.01																
123																				
124																				
125																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860041.24; E 683895.65

RECORD OF BOREHOLE: BH5

SHEET 1 OF 5

BORING DATE: August 26 and 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		88.97							GR SA SI CL
0	Power Augering; 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Poorly Graded Gravel with Sand (GP)**, medium dense, brown to black, dry, fine to coarse sand, fine to coarse subangular to angular gravel (Fill) (Unit 1)		0.00	1A	SS	29				
				88.44	1B						
				0.53	1C						
1		**Silty Sand with Gravel (SM)**, dense, grey, moist, medium to coarse sand, subangular to angular fine to coarse grave (Fill) (Unit 1)			2	SS	47		○		
		- Metal fragments from 1.37 m to 1.83 m									
				87.14	3A	SS	44				
2		**Silty Sand with Gravel (SM)**, dense, brown, moist, fine to coarse sand (Fill) (Unit 1)		1.83	3B						
3	Mud Rotary Wash Boring; PWT Casing			85.69							
		Sandy Silty Clay (CL-ML), very loose to loose, grey, moist, fine to medium sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 2a)		3.28	1	PMT					
4					4	SS	3		⊢○⊣		13 33 37 17
5											
6					2	PMT					
7											
8					5	SS	9		○		
		- Grinding from 8.1 m to 10.7 m									
9				79.60							
		Sandy Silt (ML), very dense, grey, moist, fine to coarse sand (Till) (Unit 3)		9.37	3	PMT					
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: MJB

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PROJECT: 21451329

LOCATION: N 4860041.24; E 683895.65

RECORD OF BOREHOLE: BH5

BORING DATE: August 26 and 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4})	WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---											
10	Mud Rotary Wash Boring; PWT Casing	**Sandy Silt (ML)**, very dense, grey, moist, fine to coarse sand (Till) (Unit 3)			3	PMT							
11					6	SS	133			○			0 41 49 10
12				76.55 / 12.42									
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)											
13					4	PMT							
14					7	SS	172/0.29			○			
15													
16					5	PMT							
17					8	SS	100/0.09			○			0 58 39 3
18				70.56 / 18.41									
		Lean Clay (CL), hard, grey, moist, fine to coarse sand, trace fine subangular to angular gravel (Till) (Unit 5)											
19					6	PMT							
20					9	SS	44						1 14 48 38
		CONTINUED NEXT PAGE											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: MJB

PROJECT: 21451329

LOCATION: N 4860041.24; E 683895.65

RECORD OF BOREHOLE: BH5

BORING DATE: August 26 and 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION; GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring, PWT Casing	**Lean Clay (CL)**, hard, grey, moist, fine to coarse sand, trace fine subangular to angular gravel (Till) (Unit 5)			9	SS	44				1 14 48 38
21											
					7	PMT					
22											
23					10	SS	108				
		Silty Sand with Gravel (SM), very dense, grey, moist, fine to coarse sand, subrounded fine gravel (Till) (Unit 5) - Grinding at 23.77 m depth		65.42 / 23.55							
24					11	SS	192/ 0.28				16 42 33 9
25	Rock Core, HQ3	**Shale Bedrock Fragments** (Unit 6a)		63.93 / 25.07	12	SS	100/ 0.03				
		Bedrock cored from 25.07 m to 40.05 m depth. Refer to Record of Drillhole BH5.									
26		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: MJB

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860041.24; E 683895.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH5

DRILLING DATE: August 30 and 31, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		63.90																
	Rotary Drill / HQ3 Core	Slightly weathered, thinly to medium bedded, dark brownish grey, fine grained, moderately porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with light grey limestone interbeds		25.07								BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
												BD,PL,RO So	1.5	1	20					
26					1							BD,PL,SM	1	1	16					
												BD,UN,SM Sa	2	2	20					
27												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
												JN,PL,RO	1.5	1	20					
												BD,PL,SM	1	1	16					
28				60.94																
		Slightly weathered to fresh, medium bedded, light grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, thinly bedded shale interbeds		28.03								BD,UN,SM So	2	1	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
29					2							BD,PL,RO Sa	1.5	2	20					
												BD,UN,RO So	3	1	25					
30												BD,UN,RO Sa	3	2	22					
												BD,UN,RO PC, Sa, Br	3	3	20					
31												BD,PL,RO So	1.5	1	20					
32					3															
33																				
34					4							BD,PL,SM IN, Br	1	4	6					
												BD,UN,RO IN, Br	1	4	0					
35																				

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

wsp GOLDER

LOGGED: JS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860041.24; E 683895.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH5

DRILLING DATE: August 30 and 31, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill / HQ3 Core	Slightly weathered to fresh, medium bedded, light grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, thinly bedded shale interbeds			4															
36												BD,UN,RO	3	1	25					
37																				
38					5							BD,PL,RO	1.5	1	20					
												BD,UN,SM	2	1	20					
												BD,PL,RO	1.5	1	20					
39												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
					6															
40				48.92								BD,UN,RO	3	1	25					
		END OF DRILLHOLE		40.05																
41																				
42																				
43																				
44																				
45																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: JS
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4859889.85; E 683838.95

RECORD OF BOREHOLE: BH6

SHEET 1 OF 5

BORING DATE: July 16 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		85.25							GR SA SI CL
0	Power Augering, 210 mm O.D. /110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, compact, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	16		○		
					2A						
1		**Lean Clay (CL)**, very stiff, brown, moist, low to medium plasticity (Fill) (Unit 1)		84.26 / 0.99	2B	SS	28				
		Silty Sand (SM) to Sandy Silt (ML), with cobbles and boulders, very dense, brown to grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		83.88 / 1.37	3	SS	56		○		
2					4	SS	83		○		
3		- Becoming grey at 3.1 m depth			5	SS	92		○		14 43 36 7
		- Becoming wet at 3.8 m depth									
4	Mud Rotary Wash Boring, HWT	- Rock fragments in top of spoon sample 6 at 3.8 m depth			6	SS	102		○		
					7	SS	72		○		
5					8	SS	66		○	γ = 24.0 kN/m³	
6		- Rock fragments in top of spoon sample 9 at 6.1 m depth			9	SS	94		○ ⊢		5 42 41 11
7											
					10	SS	85		○		
8											
9		- Rock fragments in top of spoon sample 11 at 9.1 m depth			11	SS	166/0.29		○		
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859889.85; E 683838.95

RECORD OF BOREHOLE: BH6

SHEET 2 OF 5

BORING DATE: July 16 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring HWT			75.12							
		Poorly Graded Gravel with Sand (GP), with cobbles and boulders, very dense, grey, wet, coarse sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 4a)		10.13	12A	SS	100/0.14				
					12B						
11		- Rock fragments in top of spoon sample 12A at 10.7 m depth									
12											
				72.85	13A	SS	97				
		Silty Sand (SM), with cobbles and boulders, very dense, grey, wet, fine to medium sand, angular fine gravel (Till) (Unit 3)		12.40	13B						
13											
		- Rock fragments in top of spoon sample 14 at 13.7 m depth			14	SS	142				9 40 41 10
14				70.54							
		Silty Sand with Gravel (SM), very dense, grey, wet, fine to medium sand, subrounded to subangular gravel (Glaciolacustrine) (Unit 4a)		14.71							
15		- Rock fragments in top of spoon sample 15 at 15.2 m depth			15	SS	183/0.29				24 45 29 2
16				69.02							
		Sandy Silt (ML), very dense, grey, moist, fine to medium sand, subangular fine gravel (Till) (Unit 3)		16.23							
17					16	SS	181/0.25				
18											
		- Rock fragments in top of spoon sample 17A at 18.3 m depth			17A	SS	94				
				66.66							
		Silt (ML), very dense, grey, moist (Glaciolacustrine) (Unit 4a)		18.59	17B						
19											
		- No recovery in spoon sample 18			18	SS	71				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859889.85; E 683838.95

RECORD OF BOREHOLE: BH6

BORING DATE: July 16 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring, HWT	**Silt (ML)**, very dense, grey, moist (Glaciolacustrine) (Unit 4a)			18	SS	71				
				64.83 / 20.42							
		Lean Clay with Sand (CL), hard, grey, moist, fine to coarse sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			19	SS	36				2 16 53 30
21				64.07 / 21.18							
		Inferred Till (Unit 5)			20	SS	97				
		- No recovery in spoon sample 20									
22		- Rock fragments recovered in spoon sample 21			21	SS	100/ 0.08				
				62.72 / 22.53							
	Rock Core, HQ3	**Shale Bedrock Fragments** (Unit 6a)			22	SS	100/ 0.1				
		- Bedrock cored from 22.53 m to 40.35 m depth		62.41 / 22.84							RQD = 44%
23		- Refer to Record of Drillhole BH6									
24											
25											
26											
27											
28											
29											
30											

NOTES:

1. Water first encountered at a depth of 3.1 m during drilling.

2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859889.85; E 683838.95
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH6

DRILLING DATE: July 21 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		62.72																
	Rotary Drill / HQ3 Core	Shale Bedrock Fragments		22.53 / 62.41	1							BD,PL,SM	1	1	16					
23		Slightly weathered to fresh, thinly bedded, dark brownish-grey, fine grained, faintly porous, slightly reactive to HCl, weak to medium strong SHALE (Blue Mountain Formation) with very thin to thin, light grey, medium strong limestone interbeds.		22.84																
					2							BD,PL,RO SA	1.5	2	20					
												BD,PL,RO	1.5	1	20					
24		- UCS with Modulus Sample										BD,PL,SM	1	1	16					
25					3															
												BD,PL,RO SA	1.5	2	20					
26				59.06																
		Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.		26.19																
					4							BD,PL,RO	1.5	1	20					
27												BD,PL,RO SA	1.5	2	20					
28					5							BD,UN,RO	3	1	25					
												BD,PL,RO PC, CI	1.5	4	16					
29																				
30					6															
31																				
					7							BD,PL,RO PC, CI	1.5	4	16					
32																				
					8															

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DEPTH SCALE
1 : 50

wsp GOLDER

LOGGED: GS
CHECKED: SAP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859889.85; E 683838.95
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH6

DRILLING DATE: July 21 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
33	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			8															
34					9							BD,PL,RO	1.5	1	20					
35																				
36					10							BD,PL,SM	1	1	16					
37					11															
38																				
39					12															
40				44.90	13															
		END OF DRILLHOLE		40.35																
41																				
42																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: SAP

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PROJECT: 21451329

LOCATION: N 4860043.72; E 683814.91

RECORD OF BOREHOLE: BH7

SHEET 1 OF 7

BORING DATE: June 15 and 16, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		88.10							GR SA SI CL
0	Power Augering, 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, medium dense, brown, moist, medium to coarse sand, subrounded to subangular fine to coarse gravel (Fill) (Unit 1)		0.00	1A						
				87.57							
		Silty Sand with Gravel (SM), medium dense to very dense, grey, moist, fine to coarse sand, subangular fine gravel (Fill) (Unit 1) - Augers grinding from 0.6 m to 0.8 m		0.53	1B	SS	18				
1					2	SS	52		○		
				86.73							
		Lean Clay with Sand (CL), very stiff, brown, moist, fine to medium sand, low to medium plasticity (Fill) (Unit 1) - Poor recovery in spoon sample 3		1.37	3	SS	23				
2				85.97							
		Lean Clay (CL), medium to very stiff, brown, oxidation staining, wet, fine to coarse sand, trace subangular fine gravel, low to medium plasticity (Glaciolacustrine) (Unit 2a)		2.13	4	SS	11		⊢—○—⊣		4 9 49 38
3	Mud Rotary Wash Boring, HWT				5	SS	19		○		
					6	TO	PB				
4					~~83~~	CS			⊢—○—⊣		
				83.76							
		Silty Sand (SM), compact, grey, moist, fine to coarse sand, subangular fine gravel (Glaciolacustrine) (Unit 2b)		4.34	7	SS	11		○		
5				82.92							
		Silty Sand (SM), very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		5.18	8	SS	94				
6					9	SS	156		○		5 47 38 10
7											
8					10	SS	118				
9					11	SS	147		○		
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD/RV

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860043.72; E 683814.91

RECORD OF BOREHOLE: BH7

SHEET 2 OF 7

BORING DATE: June 15 and 16, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring, HWT	**Silty Sand (SM)**, very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)									
11					12	SS	181				
				76.44 / 11.66							
12		**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			13	SS	199/ 0.23		○		
13											
14		- Rock fragments in spoon sample 14 at 13.7 m depth			14	SS	100/ 0.13				
15					15	SS	179/ 0.28		○		
16											
17		**Lean Clay (CL)**, very stiff, grey, wet, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.12 / 16.98							
18					16	SS	29		⊢—⊕—⊣		0 4 47 49
19				68.29 / 19.81							
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD/RV

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860043.72; E 683814.91

RECORD OF BOREHOLE: BH7

SHEET 3 OF 7

BORING DATE: June 15 and 16, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring HWT	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular fine gravel, low plasticity (Till) (Unit 5)									
21				66.61	17A	SS	158/0.24				
		Silty Sand (SM), very dense, grey, moist, fine to coarse sand (Glaciolacustrine) (Unit 4a)		21.49 / 66.42	17B						
				21.68	17C						
22		**Sandy Silty Clay (CL-ML)**, hard, grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Till) (Unit 5)									
23		- Bedrock cored from 24.00 m to 60.40 m depth - Refer to Record of Drillhole BH7			18A	SS	135/0.28		○		
					18B				○		
24		NOTES: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 2. Carbon Monoxide (CO) was detected at surface by a portable gas monitor (GX-6000) during drilling of BH7 at a depth of approximately 25 m. Concentrations of CO exceeded health and safety levels of the on-site gas monitor. Gas pockets of CO and Volatile Organic Compounds (VOC) continued to be monitored. Concentrations were within allowable limits but led to 1 day delay due to gas pressure preventing overcoring rig from advancing between depth of approximately 42.20 m and 45.70 m.		64.10 / 24.00							RQD = 31%
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD/RV

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860043.72; E 683814.91
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH7

DRILLING DATE: June 17, July 14, 16, and 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.10																
24	Rotary Drill, HQ3 Core	Slightly weathered to fresh, thinly bedded, dark grey, fine grained, faintly porous, slightly reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin, light grey limestone interbeds.		24.00	1							BD,PL,SM	1	1	16					
					2							BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,UN,SM	2	1	20					
												BD,UN,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,PL,SM	3	1	25					
												BD,PL,SM								
25												BD,UN,VR	2	1	20					
												BD,UN,SM	1	1	16					
												BD,UN,SM	1.5	1	20					
												BD,PL,SM	3	1	25					
												BD,PL,RO								
												BD,UN,RO	3	1	25					
												BD,UN,RO								
												BD,UN,SM	2	1	20					
26					3							JN,PL,RO	1.5	1	20					
												BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
27				60.89								BD,PL,SM	1	1	16					
												BD,UN,VR	3	1	25					
		Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.		27.21	4															
28					5							BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
29					6							BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
30												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
31					7							BD,UN,RO SA	3	2	22					
												BD,PL,SM	1	1	16					
32					8							BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
33												BD,PL,RO	1.5	1	20					
					9							BD,CU,SM	2	1	20					
34																				

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

wsp GOLDER

LOGGED: TD/BD
CHECKED: SAP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860043.72; E 683814.91
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH7

DRILLING DATE: June 17, July 14, 16, and 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
34	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			9							BD,PL,RO SA	1.5	2	20					
35		- Overcore testing			10							BD,PL,RO	1.5	1	20					
36					11							BD,UN,RO	3	1	25					
37					12							BD,UN,RO	3	1	25					
38												BD,PL,RO	1.5	1	20					
		- Overcore testing			13							BD,PL,RO BD,PL,RO BD,CU,RO	1.5 1.5 3	1 1 1	20 20 25					
39					14							BD,PL,RO	1.5	1	20					
40					15							BD,UN,SM	2	1	20					
41					16							BD,PL,RO BD,PL,RO BD,PL,RO BD,PL,RO	1.5 1.5 1.5 1.5	1 1 1 1	20 20 20 20					
42					17							BD,UN,RO SA BD,UN,RO SA	3 3	2 2	22 22					
43					18															
44		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD
CHECKED: SAP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860043.72; E 683814.91
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH7

DRILLING DATE: June 17, July 14, 16, and 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
44	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			18															
					19							BD,PL,SM	1	1	16					
45																				
					20							BD,PL,RO	1.5	1	20					
46																				
					21															
47																				
					22															
48																				
49					23															
50		- Overcore testing			24															
51					25															
52					26															
					27															
53		- Overcore testing			28															
					29							BD,PL,RO	1.5	1	20					
54		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD
CHECKED: SAP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860043.72; E 683814.91
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH7

DRILLING DATE: June 17, July 14, 16, and 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
54	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds. - Overcore testing			29							BD,PL,RO	1.5	1	20					
55					30															
					31															
56																				
57					32															
58					33							BD,UN,SM	2	1	20					
59																				
60					34															
				27.70																
		END OF DRILLHOLE		60.40																
61																				
62																				
63																				
64																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD
CHECKED: SAP

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PROJECT: 21451329

LOCATION: N 4860005.64; E 683823.62

RECORD OF BOREHOLE: BH8

SHEET 1 OF 4

BORING DATE: September 2 to 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE	87.48					
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, brown, moist, fine to coarse sand, subangular fine gravel (Fill) (Unit 1)	0.00	1	SS	19		
			86.87					
1		**Sandy Lean Clay (CL)**, medium stiff, brown, moist, fine to coarse sand, subrounded fine gravel, low to medium plasticity (Fill) (Unit 1)	0.61	2	SS	11	γ = 21.1 kN/m³	
			86.18	3A	SS	14		
		Lean Clay with Sand (CL), medium stiff, brown, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)	1.30	3B				
2		- Augers grinding from 2.89 m to 3.05 m depth		4	SS	15		5 24 44 27
		- Vane attampted and refused at 2.89 m depth		5	SS	10		
			84.59					
3	Mud Rotary Wash Boring, HWT Casing	**Silty Sand with Gravel (SM)** with cobbles and boulders, very dense, brown to grey, wet to moist, fine to coarse sand, subangular fine gravel (Till) (Unit 3)	2.89	6	SS	61		
		- Rock fragments in bottom of spoon sample 6		7	SS	100/0.13		
4		- Rock fragments in spoon sample 7						
		- Rock fragments in spoon sample 8		8	SS	95		26 40 28 7
5		- Rock fragments in spoon sample 9		9	SS	77		
		- Rock fragments in spoon sample 10		10	SS	116		
6		- Rock fragments in spoon sample 11		11	SS	70		
7				12	SS	102		
				13	SS	68		12 44 35 9
8		- Rock fragments in spoon samples 12, 13, 14 and 15		14	SS	100/0.14		
				15	SS	182/0.28		
9		- No recovery in spoon sample 16		16	SS	100/0.09		
			77.80					
			9.68	17	SS	100/0.13		
10		*CONTINUED NEXT PAGE*						

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20, 40, 60, 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20, 40, 60, 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10}, 10^{-8}, 10^{-6}, 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl; 10, 20, 30, 40

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860005.64; E 683823.62

RECORD OF BOREHOLE: BH8

SHEET 2 OF 4

BORING DATE: September 2 to 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊖W WI) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Silt (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			18	SS	163				0 44 54 2
11		- Rock fragments in spoon sample 17			19	SS	168/0.27				
					20	SS	178/0.27				
12					21	SS	100/0.11				
13					22	SS	100/0.14				
					23	SS	100/0.13				
14					24	SS	197/0.28				
15					25	SS	195/0.27			NP	0 30 69 2
					26	SS	145				
		Lean Clay (CL), hard, grey, moist to wet, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.71 / 15.77							
16					27	SS	52				0 6 57 36
					28	SS	32				
17					29	SS	33				
		Silty Clay with Sand (Cl-ML), very dense, grey, moist, fine to coarse sand, subrounded fine gravel, low plasticity (Till) (Unit 5)		69.88 / 17.60							
18					30	SS	63				3 23 60 15
					31	SS	100/0.14				9 19 60 13
19					32A	SS	142/0.28				
		Sandy Silt (ML), very dense, grey, wet to moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		68.25 / 19.23	32B						
					33	SS	100/0.13				0 38 58 4
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860005.64; E 683823.62

RECORD OF BOREHOLE: BH8

SHEET 3 OF 4

BORING DATE: September 2 to 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4})	WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---											
20	Mud Rotary Wash Boring; HWT Casing	**Sandy Silt (ML)**, very dense, grey, wet to moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			34	SS	100/0.11						
				66.93									
		Silty Clay with Sand (CL-ML) with cobbles and boulders, hard, grey, moist, fine to coarse sand, low plasticity (Till) (Unit 5)		20.55									
21					35	SS	133						0 23 58 19
					36	SS	84						
22		- Rock fragments in spoon sample 37			37	SS	117						
		- Subrounded to subangular fine gravel below 22.5 m depth - Rock fragments in spoon sample 38 - Becomes siltier below 22.5 m depth - Rock fragments in spoon sample 39			38	SS	194/0.23						23 38 31 8
23				64.19									
		Shale Bedrock Fragments (Unit 6a)		23.29	39	SS	100/0.11						
				63.96									
		- Bedrock cored from 23.52 m to 25.01 m depth		23.52									
24		- Refer to Record of Drillhole BH8.											
25													
26													
27													
28													
29													
30													

NOTE:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary tecnique.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.64; E 683823.62
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH8

DRILLING DATE: September 8, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.19																
		Shale Bedrock Fragments		23.29 / 63.96																
24	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly bedded to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin grey limestone interbeds		23.52	1							BD,PL,RO SA	1.5	2	20					
												BD,UN,RO SA	3	2	22					
												BD,PL,RO SA	1.5	2	20					
												BD,UN,RO SA	3	2	22					
												BD,PL,RO PC,CL	1.5	4	16					
												BD,UN,SM SA	2	2	20					
25				62.47								BD,PL,RO SO	1.5	1	20					
		END OF DRILLHOLE		25.01																
26																				
27																				
28																				
29																				
30																				
31																				
32																				
33																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH9

SHEET 1 OF 13

LOCATION: N 4860005.67; E 683890.63

BORING DATE: August 13 to 17 and September 30, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		88.83							
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, dense, brown, moist, fine to coarse sand, subangular to angular fine gravel (Fill) (Unit 1)		0.00	1	SS	35				41 mm Dia. Monitoring Well; Concrete; Bentonite
				88.15							
1		**Lean Clay with Sand (CL)**, very stiff to hard, brown, moist, fine to coarse sand, subangular fine gravel, low to medium plasticity (Fill) (Unit 1)		0.68	2	SS	28				3 19 49 29
					3	SS	33				
2				86.70							
		Lean Clay (CL), medium stiff to stiff, brown, moist, low to medium plasticity (Glaciolacustrine) (Unit 2a)		2.13	4	SS	4				
3	Mud Rotary Wash Boring, HWT Casing	- Vane attempted at 3.2 m and refused			5	TO	PB				
		- Pitcher barrel sample 5 refused due to presence of gravel/cobbles at 3.56 m depth			6A	SS	15				
4				84.79							
		Silty Clayey Sand with Gravel (SC-SM), loose to medium dense, grey, wet, low plasticity, fine to coarse sand, subangular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		4.04	6B						
		- No recovery in spoon sample 7			7	SS	7				
5		- Low recovery in spoon sample 8			8	SS	7				Grout
				82.89							
6		**Silty Sand with Gravel (SM)** with cobbles and boulders, dense to very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		5.94	9	SS	36				
7		- Rock fragments in spoon samples 9, 10, 11			10	SS	138				21 42 31 7
					11	SS	100/0.13				
8											
9											January 05, 2022
		- Cobble encountered at 9.1 m depth. Tricone used to advance past this depth.			12	SS	100/0.05				
10											

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860005.67; E 683890.63

RECORD OF BOREHOLE: BH9

BORING DATE: August 13 to 17 and September 30, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM)** with cobbles and boulders, dense to very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)									
		- Rock fragments in spoon sample 13			13	SS	100/0.13		○		
11				77.27 / 11.56							
		Silty Sand (SM), dense to very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
12					14	SS	185/0.13		○		
13											
14					15	SS	39		○		0 79 20 1
15											Grout
					16	SS	157/0.26		○		
16				72.60 / 16.23							
		Lean Clay (CL), hard,grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
17					17	SS	136		○		
18					18	SS	33		⊢—○—⊣		0 1 49 50
19											
20				68.87	19A	SS	53		○		
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860005.67; E 683890.63

RECORD OF BOREHOLE: BH9

BORING DATE: August 13 to 17 and September 30, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)	GR	SA	SI	CL
		--- CONTINUED FROM PREVIOUS PAGE ---													
20	Mud Rotary Wash Boring; HWT Casing	**Silty Clay with Sand (CL-ML)**, hard, grey, moist to wet, fine to coarse sand, subangular fine to coarse gravel, low plasticity (Till) (Unit 5)		19.96	19B							2	25	54	19
												2	25	54	19
21				67.39	20A	SS	100/0.07								
		Silty Sand (SM), very dense, grey, moist, fine to medium grained (Glaciolacustrine) (Unit 4a)		21.44	20B										
22															
23					21	SS	183/0.25					13	52	32	4
				65.00											
		Silty Clayey Sand with Gravel (SC-SM), very dense, grey, moist, fine to coarse sand, subangular gravel (Till) (Unit 5)		23.83											
24					22	SS	143/0.25					15	36	36	13
				64.12											
		Shale Bedrock Fragments (Unit 6a)		24.71											
				24.79											
25		- Bedrock cored from 24.76 m to 120.80 m depth - Refer to Record of Drillhole BH9.													
26															
27															
28															
29															
30															

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Monitoring well installed on September 30, 2021.

3. Drilling mud leaked out of the ground during drilling BH9 at a depth of approximately 6.5 m. Drilling mud was noticed coming out of the ground at approximately 5 m east of BH9. Drilling mud stopped upon noticing the leakage.

4. Water level measured in the monitoring well at a depth of 8.87 m below ground surface (Elev. 79.96 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.12																
		Shale Bedrock fragments	24.71																
		Slightly weathered to fresh, thinly bedded to medium bedded, dark brownish grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to medium, grey limestone interbeds - Slake Durability Sample - Petrographic Analysis Sample - Slake Durability Sample	24.76																
25	Rotary Drill HQ3 Core			1							BD,PL,RO	1.5	1	20					
											BD,PL,RO BD,PL,SM	1.5 1	1 1	20 16					
26											BD,PL,SM	1	1	16					
27				2							BD,PL,SM	1	1	16					
28			60.71								BD,PL,SM	1	1	16					
		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds	28.12	3							BD,PL,RO	1.5	1	20					
29																			Grout
30		- Petrographic Analysis Sample		4															
31				5															
32																			
33				6															
34				7															

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DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
35	Rotary Drill, HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			7															Grout
36					8															Bentonite; Sand
37		- UCS Sample			9															
38																				
39					10															Screen
40					11							BD,PL,RO	1.5	1	20					Sand
41																				
42					12															Bentonite
43					13															
44												BD,PL,RO SO	1.5	1	20					
					14							BD,UN,RO	3	1	25					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
45	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			14															
46					15							BD,UN,SM	2	1	20					Bentonite
47																				
48					16															
49																				
50					17															
51					18															Grout
52																				
53					19							BD,UN,RO	3	1	25					
54					20															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
55	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			20															
					21						•	BD,UN,SM	2	1	20					
56																				
57					22						•	BD,UN,SM	2	1	20					
											•	BD,UN,SM	2	1	20					
58																				
59					23															Grout
60					24															
61																				
62					25															
63					26						•	BD,UN,SM	2	1	20					
											•	BD,PL,RO	1.5	1	20					
64					27															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
65	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			27															
66					28							BD,UN,SM	2	1	20					
67																				
68					29															
69																				
70					30															Grout
71					31															
72																				
73					32															
74					33															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
75	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			33															
76					34															
77					35															
78					36															
79																				
80					37															Grout
81																				
82					38															
83					39															
84					40															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
85	Rotary Drill	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			40															
86					41															
87																				
88					42															
89					43															
				-0.80 / 89.63																Grout
90		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds																		
91		- Petrographic Analysis Sample - UCS with Modulus Sample			44															
92																				
93					45															
94					46															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
95	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds			46															
					47															
96																				
97					48															
98		- UCS Sample																		
					49															
99																				
100					50															Grout
101		- UCS Sample																		
					51															
102																				
103					52															
104																				
					53															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
105	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds			53															
106					54															
107					55															
108																				
109					56															Grout
110																				
111					57															
112					58															
113																				
114					59															
					60															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.67; E 683890.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH9

DRILLING DATE: August 17 to 31, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
115	Rotary Drill, HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds			60															
116																				
117					61															
118					62															Grout
119																				
120					63							BD,UN,SM	2	1	20					
				-31.97																
121		END OF DRILLHOLE		120.80																
122																				
123																				
124																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329

LOCATION: N 4859996.29; E 683913.47

RECORD OF BOREHOLE: BH10

SHEET 1 OF 7

BORING DATE: June 17 to 21, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		88.40							GR SA SI CL
0	Power Augering; 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, dense, brown, moist, fine to coarse sand, subrounded to subangular gravel (Fill) (Unit 1)		0.00	1	SS	40		○		
		- Rock fragments in bottom of spoon sample 1 at 0.6 m depth		87.71 / 0.69							
1		**Lean Clay with Sand (CL)**, medium stiff to stiff, brown, rootlets, organic inclusions, moist, fine to coarse sand, low to medium plasticity (Fill) (Unit 1)			2A						
					2B	SS	13				
					3	SS	6		⊢—○—⊣		1 24 56 19
2		Lean Clay (CL), very stiff, brown, moist, low to medium plasticity (Glaciolacustrine) (Unit 2a)		86.42 / 1.98							
					4	SS	19		⊢—○—⊣		
3	Mud Rotary Wash Boring; HWT Casing	- Pocket Penetrometer (1.75 to 2.25 kg/cm²) at 3.5 m depth at bottom of Shelby Tube			5	TO	PH				
		Silty Clayey Sand with Gravel (SC-SM), loose to medium dense, grey, moist, fine to coarse sand, subangular fine gravel (Glaciolacustrine) (Unit 2b)		84.92 / 3.48	5S	CS			○	NP	
4					6	SS	10				
					7	SS	6				
5				83.22 / 5.18							Grout
		Silty Sand (SM), with cobbles and boulders, medium dense to very dense, grey, moist, fine to coarse sand, subangular fine to coarse gravel (Till) (Unit 3)			8	SS	18				
		- Rock fragments in top of spoon Sample 8 at 5.3 m depth									
6					9	SS	20		○		
		- Rock fragments in top of spoon Sample 9 at 6.6 m depth									
7											January 05, 2022
		- Rock fragments in spoon Samples 10 and 11			10	SS	133				
8											
9					11	SS	110		○		5 46 39 10
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859996.29; E 683913.47

RECORD OF BOREHOLE: BH10

SHEET 2 OF 7

BORING DATE: June 17 to 21, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM) to Sandy Silt (ML)**, dense to very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		78.27 / 10.13							
11					12	SS	94		○		
12					13	SS	40				
13											
14					14	SS	193/0.23		○		0 72 25 2
15											Grout
					15A	SS	158				
					15B						
16											
17		**Lean Clay (CL)**, very stiff to hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.41 / 16.99							
18											
					16	SS	21		⊢—○—⊣		0 4 53 43
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859996.29; E 683913.47

RECORD OF BOREHOLE: BH10

SHEET 3 OF 7

BORING DATE: June 17 to 21, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4})	WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---											GR SA SI CL
20	Mud Rotary Wash Boring / HWT Casing	**Lean Clay (CL)**, very stiff to hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)											
21				66.86	17A	SS	148/0.13			○	○		Grout
		Sandy Silty Clay (CL-ML), very dense, grey, moist, fine to coarse sand, subangular fine gravel (Till) (Unit 5)		21.54	17B						○		Bentonite
22													Sand
23													Screen
24					18	SS	161/0.18			○		NP	10 35 12 43
				63.98									Sand
	Rock Core / HQ3	**Shale Bedrock Fragments** (Unit 6a)		24.42	19	SS	100/0.13						
		Bedrock cored from 24.62 m to 60.72 m depth.		24.55									
25		NOTE:											RQD = 47%
		1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.											
26		2. Water level measured in the monitoring well at a depth of 7.10 m below ground surface (Elev. 81.30 m) on January 05, 2022.											
27													Grout
28													
29													
30													

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859996.29; E 683913.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH10

DRILLING DATE: June 21 to August 18, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	PIEZOMETER
		TOP OF BEDROCK	63.98								
		Shale Bedrock Fragments	24.42 63.78								Sand
		Slightly weathered to fresh, very thinly to medium bedded, dark brownish grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin, grey, fine to medium grained limestone interbeds	24.62								
25	Rotary Drill HQ3 Core			1		BD,UN,RO	3	1	25		
						BD,PL,SM	1	1	16		
						BD,PL,RO	1.5	1	20		
						BD,PL,RO	1.5	1	20		
						BD,PL,RO	1.5	1	20		
						BD,PL,RO	1.5	1	20		
						BD,PL,RO	1.5	1	20		
26				2		BD,PL,RO	1.5	1	20		
						BD,PL,SM	1	1	16		
						BD,PL,SM	1	1	16		
						BD,CU,SM	2	1	20		
						BD,PL,SM	1	1	16		
27						BD,CU,RO	3	1	25		
						BD,UN,RO PC, Cl	3	4	20		
				3		BD,UN,RO	3	1	25		
			60.65			BD,PL,SM	1	1	16		
		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds	27.75								
28						BD,PL,RO	1.5	1	20		
						BD,PL,RO	1.5	1	20		
						BD,CU,RO Sa	3	2	22		
						JN,CU,RO PC, Cl	3	4	20		
				4							
29				5		BD,UN,RO	3	1	25		Grout
30											
31				6		BD,PL,RO	1.5	1	20		
						BD,PL,SM Sa	1	2	16		
32		- Overcore testing		7							
33				8							
				9		BD,PL,RO	1.5	1	20		
						BD,PL,RO	1.5	1	20		
34				10							

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DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/GS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859996.29; E 683913.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH10

DRILLING DATE: June 21 to August 18, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
35	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			10							BD,PL,RO Sa	1.5	2	20					
36					11							JN,UN,RO BD,PL,RO Sa	3 1.5	1 2	25 20					
37					12															
38		- Overcore testing			13							BD,PL,RO Sa BD,PL,RO Sa	1.5 1.5	2 2	20 20					
39					14															Grout
40					15							BD,PL,RO	1.5	1	20					
41					16															
42		- Overcore testing			17															
43					18															
44		- Overcore testing			19															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/GS
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859996.29; E 683913.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH10

DRILLING DATE: June 21 to August 18, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
45	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds - Overcore testing			19 20 21															
46					22															
47					23															
48												BD,PL,RO	1.5	1	20					
49					24															Grout
50																				
51					25															
		- Overcore testing			26															
52					27															
53		- Overcore testing			28															
54					29															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/GS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859996.29; E 683913.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH10

DRILLING DATE: June 21 to August 18, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
55	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds - Overcore testing			29															Grout
					30															
56					31															
57					32															
58					33															
59																				
60				27.68	34															
		END OF DRILLHOLE		60.72																
61																				
62																				
63																				
64																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/GS
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH11

SHEET 1 OF 13

LOCATION: N 4859988.74; E 683897.63

BORING DATE: June 23 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		87.89							
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, dense, brown, shale fragments from 0.2 m to 0.6 m, (shale cobbles/boulder), moist, fine subrounded to subangular gravel (Fill) (Unit 1)		0.00	1A	SS	50				
					1B						
				87.28							
		Lean Clay with Sand (CL), very stiff to stiff, dark brown to brown, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)		0.61	2	SS	16				0 17 48 35
1					3A	SS	11				
		- Organic staining to 1.4 m depth			3B						
				86.14							
		Silty Sand with Gravel (SM), with cobbles and boulders, compact to very dense, brown to grey, moist to wet, fine to medium sand, subangular fine to coarse gravel (Till) (Unit 3)		1.75	4	SS	12				
2					5	SS	24				
3	Mud Rotary Wash Boring; HWT Casing				6	SS	14				
		- Becoming grey and wet at 3.7 m depth			7	SS	44			NP	35 35 23 7
4		- Slight plasticity to 3.7 m depth									
		- Rock fragments in spoon sample 8			8	SS	80				
5		- Rock fragments in top of spoon sample 9 from 4.9 m to 5.0 m depth			9	SS	76				
		- Rock fragments in top of spoon sample 10 at 5.5 m depth			10	SS	100/0.13				
6					11	SS	138				7 51 35 8
		- Coarser sand between 6.7 m and 7.6 m depth			12	SS	100/0.13				
7		- Rock fragments in top of spoon sample 12 at 7.0 m depth			13	SS	100/0.06				
		- Rock fragments in top of spoon sample 13 at 7.5 m depth									
8		- Casing grinding between 7.5 m and 7.6 m depth - No soil recovery in spoon sample 14 at 7.9 m depth. Spoon recovered several large rock fragments.			14	SS	100/0.13				
		- Rock fragments between 6.7 m and 8.5 m			15	SS	100/0.13				23 25 34 18
9		- Rock fragments in top of spoon sample 16 at 9.1 m depth			16	SS	100/0.05				
					17	SS	100/0.13				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859988.74; E 683897.63

RECORD OF BOREHOLE: BH11

SHEET 2 OF 13

BORING DATE: June 23 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---										
10	Mud Rotary Wash Boring; HWT Casing			77.69								
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		10.20								
					18	SS	142			○		
11					19	SS	149					
					20	SS	170/0.29			○		4 50 45 2
12					21	SS	100/0.13					
13					22	SS	100/0.14			○		
					23	SS	95			○		
14					24	SS	112/0.25					
					25	SS	100/0.08			○		4 72 23 1
15				72.42	26A	SS	103					
		Lean Clay (CL), hard, grey, moist, trace fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		15.47	26B					⊢○⊣		0 5 52 43
				72.12 / 15.77								
16		**Silty Clay (CL-ML)**, hard, grey, wet, fine sand, low plasticity (Glaciolacustrine) (Unit 4b)			27	SS	98			⊢○		0 6 74 20
					28	SS	106			○		
17		**Lean Clay (CL)**, very stiff, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		70.90 / 16.99	29	SS	22			⊢○⊣		0 2 47 51
18					30	SS	15			○		
				69.35	31A	SS	83			○		
		Silt with Sand (ML), very dense, grey, moist, fine to coarse sand (Till) (Unit 5)		18.54	31B					○		
19					32	SS	145			○	NP	0 21 63 16
					33	SS	115			○		
20		*CONTINUED NEXT PAGE*										

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH11

SHEET 3 OF 13

LOCATION: N 4859988.74; E 683897.63

BORING DATE: June 23 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM) to Sandy Silt (ML)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		67.82 / 20.04	34	SS	100/0.1		○		
21					35A, 35B	SS	100/0.13				
					36	SS	100/0.1		○		0 36 53 12
				66.12 / 21.77							
22		**Sandy Silt (ML)**, very dense, grey, moist, fine to medium sand, fine subangular gravel (Till) (Unit 5)			37	SS	136		○		14 20 47 19
					38	SS	70		○		
23		- Rock fragments in tip of spoon sample 39 at 23.3 m depth		64.65 / 23.24	39	SS	100/0.08				
		Shale Bedrock Fragments (Unit 6a)									
		- Bedrock cored from 23.77 m to 120.70 m depth		64.12 / 23.77							
24		- Refer to Record of Drillhole BH11									
25		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.65																
	Rotary Drill, HQ3 Core	Shale Bedrock Fragments		23.24 / 64.12																
24		Slightly weathered to fresh, thinly bedded, dark brownish-grey, fine grained, faintly porous, slightly reactive to HCl, weak SHALE (Blue Mountain Formation) with light grey limestone interbeds. - Swell Sample - Swell Sample - Slake Durability Sample - Swell Sample - Swell Sample		23.77	1							BD,PL,RO BD,PL,RO BD,PL,SM	1.5 1.5 1	1 1 1	20 20 16					
25					2							BD,PL,RO BD,PL,SM	1.5 1	1 1	20 16					
26					3							BD,PL,SM BD,PL,SM SA BD,PL,RO	1 1 1.5	1 2 1	16 16 20					
27				60.50								BD,PL,RO SA	1.5	2	20					
28		Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with dark grey medium strong shale interbeds.		27.39	4							BD,PL,RO	1.5	1	20					
29					5							BD,PL,RO BD,PL,SM BD,PL,RO	1.5 1 1.5	1 1 1	20 16 20					
30					6							BD,PL,RO	1.5	1	20					
31					7															
32																				
33																				

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with dark grey medium strong shale interbeds.			7							BD,UN,SM	2	1	20					
34					8							BD,PL,RO	1.5	1	20					
35		- UCS with Modulus Sample																		
36					9							BD,UN,RO	3	1	25					
37					10															
38												BD,CU,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
39					11															
40												BD,UN,SM	2	1	20					
41					12															
42					13															
43					14															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
44	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with dark grey medium strong shale interbeds.			14															
45					15															
46					16															
47																				
48					17							BD,PL,SM	1	1	16					
49					18															
50																				
51					19															
52																				
53					20															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
54	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with dark grey medium strong shale interbeds.			20															
55					21															
56					22															
57					23															
58					24															
59												BD,UN,RO	3	1	25					
60					25															
61												BD,PL,RO	1.5	1	20					
62					26															
63					27															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
64	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with dark grey medium strong shale interbeds.			27															
65					28															
66					29															
67																				
68					30															
69					31															
70																				
71					32							BD,PL,SM	1	1	16					
72					33															
73																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
74	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with dark grey medium strong shale interbeds.			33															
					34															
75					35															
76																				
77					36															
78					37															
79																				
80					38															
81																				
82					39															
83					40															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
84	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with dark grey medium strong shale interbeds.			40							BD,PL,SM	1	1	16					
85					41															
86					42															
87					43							BD,PL,RO	1.5	1	20					
88				-0.78																
89		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.		88.67	44															
90																				
91					45															
92					46							BD,PL,RO PC	1.5	4	16					
93																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
94	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			47															
95		- UCS with Modulus Sample			48															
96		- Direct Shear Sample										BD,PL,SM	1	1	16					
97					49															
98					50															
99																				
100					51															
101					52															
102																				
103					53															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
104	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds. - UCS with Modulus Sample			53															
105					54															
106					55							BD,UN,RO SA	3	2	22					
107					56															
108																				
109					57															
110					58															
111																				
112					59															
113					60															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859988.74; E 683897.63
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH11

DRILLING DATE: June 29 to July 12, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
114	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			60															
115					61															
116		- UCS Sample			62															
117																				
118					63															
119																				
120					64															
				-32.81																
		END OF DRILLHOLE		120.70																
121																				
122																				
123																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: SAP

PROJECT: 21451329

LOCATION: N 4859982.12; E 683881.59

RECORD OF BOREHOLE: BH12-1

SHEET 1 OF 1

BORING DATE: September 27 to 28 and October 12 and 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		87.44							
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	See Record of Borehole BH12-3 for soil stratigraphy		0.00							50 mm Dia. Monitoring Well; Concrete
1											
											January 05, 2022
2											Bentonite
3											
4											Sand
5											
6											Screen
7											
8											Sand
				79.03							
		NOTE: 1. Water level measured in the monitoring well at a depth of 1.76 m below ground surface (Elev, 85.68 m) on January 05, 2022.		8.41							
9											
10											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859982.12; E 683881.59

RECORD OF BOREHOLE: BH12-2

SHEET 1 OF 2

BORING DATE: September 27 to 28 and October 12 and 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		87.44							
0	Power Augering, 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	See Record of Borehole BH12-3 for soil stratigraphy		0.00							50 mm Dia. Monitoring Well Concrete
1											
2											
3											
4											January 05, 2022
5											Bentonite
6											
7											
8											
9											
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859982.12; E 683881.59

RECORD OF BOREHOLE: BH12-2

SHEET 2 OF 2

BORING DATE: September 27 to 28 and October 12 and 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Augering; 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	See Record of Borehole BH12-3 for soil stratigraphy									Bentonite
11											
12											Sand
13											Screen
				73.57							Sand
14		NOTE: 1. Water level measured in the monitoring well at a depth of 3.91 m below ground surface (Elev, 83.53 m) on January 05, 2022.		13.87							
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859982.12; E 683881.59

RECORD OF BOREHOLE: BH12-3

SHEET 1 OF 7

BORING DATE: September 27 and 28, October 12 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE	87.44							
0	Power Augering; 210 mm O.D./100 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, dark brown to black, shale fragments, moist, fine to coarse sand, angular to subangular, fine to coarse gravel (Fill) (Unit 1) - Spoon bouncing at 0.3 m depth	0.00	1	SS	11/0.15		○		50 mm Dia. Monitoring Well Concrete
		Lean Clay with Sand (CL) (Unit 2a)	86.68 / 0.76							
1										
2			85.06	1	PMT					
		Silty Sand with Gravel (SM) with cobbles and boulders, very dense, grey, moist, fine to coarse sand, subrounded, subangular to angular, fine to coarse gravel (Till) (Unit 3)	2.38							
3	Mud Rotary Wash Boring / Tri-Cone; PWT Casing Tri-cone			2	SS	93		○		
4		- Intermittent, casing grinding between 3.9 m to 7.62 m depth								
5				2	PMT					January 05, 2022 Bentonite
6				3	SS	164/0.18		○		
7		- Spoon bouncing at 6.4 m depth								
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, subangular to angular, fine to coarse gravel, low plasticity (Till) (Unit 3)	79.66 / 7.78							
8				3	PMT					
9				4	SS	190/0.20		⊢○⊣		
10		*CONTINUED NEXT PAGE*								

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859982.12; E 683881.59

RECORD OF BOREHOLE: BH12-3

SHEET 2 OF 7

BORING DATE: September 27 and 28, October 12 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring / Tri-Cone; PWT Casing Tri-cone	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular to angular, fine to coarse gravel, low plasticity (Till) (Unit 3)		76.67 / 10.77							
11		**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			4	PMT					
12					5A / 5B	SS	163/ 0.29		58.5	γ = 22.1 kN/m³	
13				73.56 / 13.88							Bentonite
14		**Silty Clay (CL-ML)**, hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b)			5	PMT					
15					6	SS	80				
16											
17		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular, fine to coarse gravel, low plasticity (Till) (Unit 5)		70.45 / 16.99	6	PMT					
18					7	SS	187/ 0.25				Sand
19											Screen
20					7	PMT					
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859982.12; E 683881.59

RECORD OF BOREHOLE: BH12-3

SHEET 3 OF 7

BORING DATE: September 27 and 28, October 12 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---							GR SA SI CL
20	Mud Rotary Wash Boring / Tri-Cone; PWT Casing Tri-cone	**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular, fine to coarse gravel, low plasticity (Till) (Unit 5)		66.89					Sand
		Sandy Silt (ML), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		20.55	7	PMT			
21		- Faint silt and clay layers in spoon sample 8			8	SS	140/ 0.28	γ = 21.7 kN/m³	
22									
23		- Rock fragments in spoon sample 9		63.97	9	SS	100/ 0.04		
		Shale Bedrock Fragments (Unit 6a) - Bedrock cored from 23.51 m to 60.41 m depth - Refer to Record of Drillhole BH12-3		23.51					
24									
25									
26									
27									
28									
29									
30									

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10} 10^{-8} 10^{-6} 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl; 10 20 30 40

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Drilling fluid leaking out at ground surface when advancing to 6.7 m depth; unable to get proper seal in rocky ground. Borehole grouted on September 28. Returned on October 12 and redrilled through grout to start PMT3 and continue borehole.

3. Monitoring wells installed on October 19 and 20, 2021.

4. Gas bubbling was observed during monitoring well development on October 29, 2021.

5. Water level measured in the monitoring well at a depth of 4.98 m below ground surface (Elev. 82.46 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859982.12; E 683881.59
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH12-3

DRILLING DATE: October 14, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	63.97																
		Shale Bedrock Fragments	23.47 / 23.51																
24	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCL, medium strong to strong SHALE (Blue Mountain Formation) with very thin to thin, grey limestone interbeds - UCS with Modulus Sample									BD,PL,SM SA	1	2	16					
											BD,UN,RO	3	1	25					
											BD,UN,RO SA	3	2	22					
											BD,UN,RO	3	1	25					
				1							BD,UN,RO SA	3	2	22					
											BD,PL,RO SA	1.5	2	20					
25											JN,UN,RO SA	3	2	22					Grout
											JN,UN,RO SA	3	2	22					
											BD,IR,RO SA	3	2	22					
											JN,UN,RO	3	1	25					
26											JN,IR,RO	3	1	25					
											JN,IR,RO	3	1	25					
											JN,UN,SM SA	2	2	20					
			60.71								JN,UN,RO SA	3	2	22					
		Fresh, very thin to medium bedded, grey fine to medium grained, faintly porous, moderately reactive to HCL, strong, LIMESTONE (Lindsay Formation) with dark grey shale interbeds	26.73																
27				2							BD,PL,RO SA	1.5	2	20					
											BD,PL,RO SA	1.5	2	20					
28																			
											BD,UN,RO SA	3	2	22					
											BD,UN,RO SA	3	2	22					
29																			
30											BD,PL,RO SA	1.5	2	20					
				3															
31																			
32																			
				4															
33											BD,UN,RO SA	3	2	22					

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859982.12; E 683881.59
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH12-3

DRILLING DATE: October 14, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
34	Rotary Drill / HQ3 Core	Fresh, very thin to medium bedded, grey fine to medium grained, faintly porous, moderately reactive to HCL, strong, LIMESTONE (Lindsay Formation) with dark grey shale interbeds			4							BD,UN,RO SA	3	2	22					
35																				
36					5							BD,CU,RO	3	1	25					
37												JN,UN,RO	3	1	25					
												BD,IR,SM SA	2	2	20					
38																				
39												BD,UN,SM	2	1	20					
					6							BD,UN,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
40												JN,UN,RO SA	3	2	22					
41																				
42					7							BD,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
43																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859982.12; E 683881.59
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH12-3

DRILLING DATE: October 14, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
44	Rotary Drill, HQ3 Core	Fresh, very thin to medium bedded, grey fine to medium grained, faintly porous, moderately reactive to HCL, strong, LIMESTONE (Lindsay Formation) with dark grey shale interbeds			7															
45					8															
46																				
47																				
48					9						•	BD,UN,RO	3	1	25					
49											•	BD,UN,RO SA	3	2	22					
50											•	BD,UN,RO SA	3	2	22					
											•	BD,UN,RO SA	3	2	22					
51																				
52					10						•	BD,UN,RO	3	1	25					
53											•	BD,UN,RO	3	1	25					
					11															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859982.12; E 683881.59
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH12-3

DRILLING DATE: October 14, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
54	Rotary Drill, HQ3 Core	Fresh, very thin to medium bedded, grey fine to medium grained, faintly porous, moderately reactive to HCL, strong, LIMESTONE (Lindsay Formation) with dark grey shale interbeds										BD,UN,RO	3	1	25					
55					11															
56												BD,UN,RO SA	3	2	22					
57																				
58					12							BD,UN,RO	3	1	25					
59												BD,UN,RO BD,UN,RO	3 3	1 1	25 25					
60				27.03	13															
		END OF DRILLHOLE		60.41																
61																				
62																				
63																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4859973.18; E 683861.07

RECORD OF BOREHOLE: BH13

SHEET 1 OF 9

BORING DATE: June 22 and 23, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		87.14							
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Poorly Graded Gravel with Sand (GP)**, dense, brown, dry, angular gravel, fine sand (Fill) (Unit 1) - Augers grinding from 0.1 m to 0.2 m		0.00 / 86.63	1A	SS	43		○		
1		**Lean Clay with Sand (CL)**, medium stiff, brown, wet, fine to medium sand (Fill) (Unit 1) - Augers grinding from 1.2 m to 1.4 m		0.51 / 85.77	1B; 2	SS	6		○		
2		**Silty Sand (SM)**, loose, grey, wet, fine to medium sand (Fill) (Unit 1)		1.37 / 85.01	3	SS	9				
3		**Silty Sand with Gravel (SM)**, with cobbles and boulders, very dense, grey, moist, fine to medium sand, subangular to subrounded , fine to coarse gravel (Till) (Unit 3) - Rock fragments in top of spoon sample 4B at 2.3 m depth		2.13	4A; 4B	SS	56				
	Mud Rotary Wash Boring; HWT Casing				5	SS	52				
4		- Rock fragments in top of spoon sample 6 at 3.8 m depth			6	SS	63		○		
5		- Rock fragments in top of spoon sample 7 at 4.6 m depth			7	SS	67				
		- A 50 mm thick layer of wet sand at 5.3 m depth			8A; 8B	SS	107		○		30 41 23 7
6					9	SS	56		○		16 47 30 7
7											
8					10	SS	36				
9					11	SS	100/0.13				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859973.18; E 683861.07

RECORD OF BOREHOLE: BH13

SHEET 2 OF 9

BORING DATE: June 22 and 23, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM) to Sandy Silt (ML)**, with cobbles and boulders, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		77.09 / 10.05							
		- Rock fragments in top of spoon sample 12 at 10.7 m depth			12	SS	100/0.13				
11											
12		- Rock fragments in top of spoon sample 13 at 12.2 m depth			13	SS	100/0.25				
13											
		- Rock fragments in top of spoon sample 14 at 13.7 m depth			14	SS	157/0.28				0 32 65 4
14											
15					15	SS	134				
16				70.99 / 16.15							
		Lean Clay (CL), very stiff, grey, wet, medium plasticity (Glaciolacustrine) (Unit 4b)									
17					16	SS	15				
					17	TO	PH				
		- Shelby Tube lost down hole; overcoring required for retrieval		69.16 / 17.98							
18		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low to medium plasticity (Till) (Unit 5)			18	SS	74				
19											
		- Rock fragments in top of spoon sample 19 at 19.8 m depth			19	SS	98				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859973.18; E 683861.07

RECORD OF BOREHOLE: BH13

SHEET 3 OF 9

BORING DATE: June 22 and 23, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low to medium plasticity (Till) (Unit 5)		66.26	19	SS	98				
21		**Sandy Silt (ML)**, very dense, grey, wet, fine to coarse sand (Glaciolacustrine) (Unit 4a) - Thin layers of clay present - Rock fragments in top of spoon sample 20 at 21.3 m depth		20.88	20	SS	70		○		
22				64.81	21	SS	100/0.08		○		
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine to coarse sand, low plasticity (Till) (Unit 5)		22.33 64.27							
23	Rock Core; HQ3	**Shale Bedrock Fragments** (Unit 6a) Bedrock cored from 23.16 m to 81.01 m depth.		22.87 64.07 23.07	22	SS	100/0.2				RQD = 86%
24											
25											
26											
27											
28											
29											
30											

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Borehole caved to about 10.1 m below ground surface upon removal of casing to retrieve Shelby tube.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.18; E 683861.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH13

DRILLING DATE: June 24 and August 18, 23 to 25 and 27, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.27									
23	Rotary Drill / HQ3 Core	Shale Bedrock Fragments	22.87 / 63.98									
		Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, weak to medium strong SHALE (Blue Mountain Formation) with very thin to thin, grey limestone interbeds	23.16	1		BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
24						BD,PL,SM	1	1	16			
				2		BD,PL,RO	1.5	1	20			
25						BD,UN,RO	3	1	25			
		- UCS Sample				BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
						BD,PL,SM	1	1	16			
						BD,PL,SM	1	1	16			
						BD,PL,SM	3	1	25			
						JN,UN,RO						
26				3		BD,PL,SM	1	1	16			
						BD,PL,SM	1	1	16			
						BD,PL,SM	1	1	16			
						BD,PL,SM	1	1	16			
						BD,PL,SM	1.5	1	20			
						BD,PL,RO	1.5	1	20			
						BD,PL,RO	1	1	16			
						BD,PL,SM						
27			59.83			BD,UN,SM	2	1	20			
			27.31			BD,UN,RO	3	1	25			
		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds		4		BD,PL,SM	1	1	16			
28						BD,UN,SM	2	1	20			
						BD,UN,RO	3	1	25			
						BD,UN,RO	3	1	25			
						BD,PL,RO	1.5	1	20			
29				5								
30				6								
31				7								
		- UCS Sample										
32				8								

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

LOGGED: TD/BD/LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.18; E 683861.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH13

DRILLING DATE: June 24 and August 18, 23 to 25 and 27, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
33	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			8							BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
34					9															
35		- Overcore testing			10															
36					11							BD,PL,RO	1.5	1	20					
37					12															
		- Direct Shear Sample										BD,PL,RO Sa	1.5	2	20					
38		- Overcore testing			13															
39					14															
40					15															
41																				
42					16															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.18; E 683861.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH13

DRILLING DATE: June 24 and August 18, 23 to 25 and 27, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
43	Rotary Drill / HQ3 Core	- Overcore testing Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			17 17															
					18															
44																				
45					19															
46					20															
47		- Overcore testing																		
					21															
48					22															
49					23															
50																				
51					24															
52		- Overcore testing			25															
					26															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/LT
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.18; E 683861.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH13

DRILLING DATE: June 24 and August 18, 23 to 25 and 27, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling
DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
53	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			26															
54					27															
55		- UCS with Modulus Sample			28															
56																				
57					29															
58																				
59					30															
60					31															
61					32															
		- Overcore testing			33															
62					34															
					35															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.18; E 683861.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH13

DRILLING DATE: June 24 and August 18, 23 to 25 and 27, 2021
DRILL RIG: Diedrich 50 Track Mounted
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LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
63	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			35															
64																				
65					36															
66					37															
67																				
68					38															
69					39															
70																				
71					40															
72					41															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.18; E 683861.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH13

DRILLING DATE: June 24 and August 18, 23 to 25 and 27, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
73	Rotary Drill / HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			41															
74					42															
75					43							BD,UN,SM BD,PL,RO	2 1.5	1 1	20 20					
76																				
77					44															
78																				
79					45															
80					46															
81		END OF DRILLHOLE		6.13 81.01																
82																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD/BD/LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4859973.03; E 683904.77

RECORD OF BOREHOLE: BH14

SHEET 1 OF 13

BORING DATE: June 29 to 30, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)	GR SA SI CL
		GROUND SURFACE		87.61								
0	Power Augering / PT Casing	**Poorly Graded Sand with Gravel (SP)**, compact, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1A						50 mm Dia. Monitoring Well	
				87.31		SS	19					
				0.30	1B							
		Sandy Lean Clay (CL), very stiff, dark brown, organic staining, moist, fine sand (Fill) (Unit 1)		86.92								
				0.69								
1		**Lean Clay with Sand (CL)**, stiff, brown to dark brown, rootlets, organic staining, moist, fine to medium sand (Glaciolacustrine) (Unit 2a)			2	SS	9					0 13 55 33
				86.24								
		Silty Sand (SM), with cobbles and boulders, medium dense to very dense, brown to grey, moist to wet, fine to coarse sand, subrounded to subangular fine to coarse gravel (Till) (Unit 3)		1.37	3	SS	12					
2		- Auger grinding between 2.1 m and 2.6 m depth										
		- Rock fragments in top of spoon sample 4 at 2.6 m depth			4	SS	14			NP		10 43 37 10
3	Mud Rotary Wash Boring / HWT Casing				5	SS	59					
4		- Becoming grey and wet below 3.8 m depth			6	SS	54					
					7	SS	53					
5											Grout	
					8	SS	46					
6					9	SS	89					
7				79.89	10A	SS	139					
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		7.72	10B							3 60 34 4
8				79.00								
		Sandy Lean Clay (CL), hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		8.61								
9											January 05, 2022	
					11	SS	188/ 0.27					
10		*CONTINUED NEXT PAGE*										

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859973.03; E 683904.77

RECORD OF BOREHOLE: BH14

SHEET 2 OF 13

BORING DATE: June 29 to 30, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		77.49 / 10.12							
		- Rock fragments in top of spoon sample 12 at 10.7 m depth			12	SS	154/0.25				
11											
12					13	SS	184/0.25				
		- Lean clay seam at 12.6 m depth									
13											
					14	SS	100/0.14				
14											
15											Grout
					15	SS	185/0.25				0 55 42 2
16				71.40 / 16.21							
		Silt with Sand (ML), very dense, grey, wet, fine sand (Glaciolacustrine) (Unit 4a)									
17					16	SS	93				
				69.86 / 17.75							
18		**Sandy Lean Clay (CL)**, very stiff, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
					17	SS	21				
19				68.33 / 19.28							
		Silt with Sand (ML), very dense, grey, moist, fine to medium sand, non-plastic (Glaciolacustrine) (Unit 4a)									
					18	SS	181/0.2				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859973.03; E 683904.77

RECORD OF BOREHOLE: BH14

SHEET 3 OF 13

BORING DATE: June 29 to 30, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring, HWT Casing	**Silt with Sand (ML)**, very dense, grey, moist, fine to medium sand, non-plastic (Glaciolacustrine) (Unit 4a)		66.85	18	SS					
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		20.76							
21					19	SS	100/0.05				
22				65.41							Grout
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine to medium sand, subangular fine gravel, low plasticity (Till) (Unit 5)		22.20							
23					20	SS	67				5 20 53 22
				64.05							
		Shale Bedrock Fragments (Unit 6a)		23.56	21	SS	100/0.14				
				23.70							
24	Rock Core, HQ3	- Bedrock cored from 23.56 m to 120.47 m depth - Refer to Record of Drillhole BH14									RQD = 56% Bentonite
25		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 2. Well installed on August 4, 2021. 3. Water level measured in the monitoring well at a depth of 9.11 m below ground surface (Elev. 78.50 m) on January 05, 2022.									
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.05									
		Shale Bedrock Fragments	23.56									
		Slightly weathered to fresh, thinly bedded, dark grey, fine grained, faintly porous, slightly reactive to HCl, weak to medium strong SHALE (Blue Mountain Formation) with very thin to thin, light grey limestone interbeds. - Slake Durability Sample - Petrographic Analysis Sample - Slake Durability Sample	23.70									
24	Rotary Drill, HQ3 Core			1		BD,PL,RO	1.5	1	20			Grout
						BD,PL,VR	1.5	1	22			
						BD,PL,SM	1	1	16			Bentonite
						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
						BD,UN,SM	2	1	20			
						BD,PL,RO	1.5	1	20			Sand
						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
25				2		BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
						BD,PL,SM	1	1	16			
						BD,PL,SM	1	1	16			Screen and Sand
26												
				3		BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
												Sand
27						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
			60.38									
		Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.	27.23									
28						BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
				4		BD,PL,RO	1.5	1	20			
						BD,CU,RO	3	1	25			Bentonite
29						BD,PL,RO	1.5	1	20			
						BD,UN,RO	3	1	25			
				5		BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
30												
						BD,UN,RO	3	1	25			
						BD,PL,SM	1	1	16			
						BD,PL,RO	1.5	1	20			
31				6		BD,UN,RO	3	1	25			
32												Grout
				7		BD,UN,RO	3	1	25			
33						BD,PL,RO	1.5	1	20			
						BD,ST,SM	2	1	20			
						BD,PL,SM	1	1	16			

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DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
34	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			8							BD,UN,RO	3	1	25					Grout
												BD,PL,RO	1.5	1	20					
												BD,UN,RO SA	3	2	22					
35																				
					9															
36																				
37												BD,PL,RO	1.5	1	20					
					10							BD,PL,RO	1.5	1	20					
												BD,UN,RO SA	3	2	22					
38												BD,UN,RO SA	3	2	22					
												BD,PL,RO	1.5	1	20					
39					11															
40					12															
41																				
42					13															
43					14							BD,UN,RO	3	1	25					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
44	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			14							BD,PL,RO	1.5	1	20					Grout
45					15															
46					16															
47																				
48					17															
49					18							BD,PL,SM	1	1	16					
50																				
51					19							BD,PL,SM	1	1	16					
52					20							BD,PL,RO	1.5	1	20					
53												BD,PL,RO	1.5	1	20					
					21															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
54	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			21							BD,UN,RO	3	1	25					Grout
												BD,PL,RO SA	1.5	2	20					
55					22															
56												BD,UN,RO	3	1	25					
57					23															
58																				
59					24															
		- Petrographic Analysis Sample																		
60					25							BD,UN,SM	2	1	20					
61																				
62					26							BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO SA	1.5	2	20					
63		- UCS Sample			27															
												BD,UN,RO SA	3	2	22					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
64	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			27															
					28							BD,PL,RO	1.5	1	20					
65												BD,PL,RO	1.5	1	20					
66					29							BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
67					30							BD,PL,SM	1	1	16					
68												BD,UN,RO SA	3	2	22					Grout
69					31															
70																				
71					32							BD,PL,VR PC, CI	1.5	4	20					
72					33															
73					34															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
74	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			34															
75					35															
76											•	BD,PL,RO	1.5	1	20					
77					36						•	BD,PL,VR SA	1.5	2	22					
78					37						•	BD,PL,SM	1	1	16					Grout
79																				
80					38															
81					39															
82																				
83					40						•	JN,CU,RO	3	1	25					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
84	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to very strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			40															
85					41															
86					42															
87					43															
88											•	BD,PL,RO	1.5	1	20					
											•	BD,PL,SM	1	1	16					Grout
				-1.09 / 88.70																
89		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			44															
90					45															
91																				
92		- Direct Shear Sample			46						•	BD,UN,RO SA	3	2	22					
											•	BD,PL,SM	1	1	16					
93					47															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
94	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			47							BD,UN,SM SA	2	2	20					
												BD,PL,RO SA	1.5	2	20					
95					48															
96																				
97					49															
98		- UCS Sample			50															Grout
99																				
100					51															
												BD,PL,RO SA	1.5	2	20					
101					52															
102																				
103					53															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
104	Rotary Drill HQ3 Core	- UCS Sample Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			53															
105					54															
106					55							JN,UN,RO SA	3	2	22					
107					56															
108																				
109					57															Grout
110					58															
111		- UCS with Modulus Sample																		
112					59															
113					60															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859973.03; E 683904.77
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH14

DRILLING DATE: July 29 to 30, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
114	Rotary Drill, HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds. - Petrographic Analysis Sample			60															
115					61															
116					62							BD,UN,RO SA	3	2	22					Grout
117																				
118					63															
119					64															
120				-32.86																
		END OF DRILLHOLE		120.47																
121																				
122																				
123																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329

LOCATION: N 4859944.69; E 683936.87

RECORD OF BOREHOLE: BH15

SHEET 1 OF 9

BORING DATE: June 25 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		87.37							GR SA SI CL
0	Power Augering, 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Pooly Graded Sand with Gravel (SP)**, very dense, brown, moist, fine to coarse sand, subrounded to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	50/ 0.13				50 mm Dia. Monitoring Well
1					2	SS	98		○		
				86.00							
		Silty Sand (SM), medium to very dense, brown to grey, moist to wet, fine to coarse sand, subangular to subrounded fine to coarse gravel (Till) (Unit 3)		1.37	3	SS	25		○		
2		- Becoming grey at 2.3 m depth			4	SS	82		○	NP	7 47 37 10
3	Mud Rotary Wash Boring/Tri-Cone, PWT Casing				1	PMT					
4		- Becoming grey at 4.6 m depth			5	SS	50/ 0.13		○		Bentonite
5											January 05, 2022
6					2	PMT					
7					6	SS	50/ 0.13				
8											
9				78.15							Sand
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		9.22	3	PMT					Screen
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859944.69; E 683936.87

RECORD OF BOREHOLE: BH15

SHEET 2 OF 9

BORING DATE: June 25 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring/Tri-Cone; PWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			3	PMT					Screen
					7	SS	50/0.13		○		
11											
12											Sand
13				74.34 / 13.03	4	PMT					
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
14					5	PMT					
15		- 30 mm thick sand seam at 15.4 m depth			8	SS	95		⊢—○⊣		0 5 68 28
16											
17		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular to subrounded fine gravel, low plasticity (Till) (Unit 5)		70.38 / 16.99	6	PMT					
18					9	SS	50/0.08		○		
19											
20				67.43	7	PMT					
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859944.69; E 683936.87

RECORD OF BOREHOLE: BH15

BORING DATE: June 25 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring/Tri-Cone; PWT Casing	**Silty Clay (CL-ML)**, hard, grey, moist, low plasticity (Glaciolacustrine) (Unit 4b)		19.94							
					7	PMT					
21											
					10	SS	56				
22											
23				63.90	8	PMT					
	Tri-Cone	**Shale Bedrock Fragments** (from drill cuttings) (Unit 6a)		23.47							
24		- Advance tricone to 23.95 m; becoming harder at 23.47 m depth - Bedrock cored from 23.95 m to 80.90 m depth - Refer to Record of Drillhole BH15		63.42 23.95							
25		NOTES: 1. Water encountered at a depth of 4.6 m during drilling.									
26		2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 3. Gas bubbling observed during monitoring well development on October 25, 2021.									
27		4. PWT casing was used upon reaching bedrock to facilitate PMT testing in bedrock. 5. Water level measured in the monitoring well at a depth of 5.12 m below ground surface (Elev. 82.25 m) on January 05, 2022.									
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859944.69; E 683936.87
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH15

DRILLING DATE: June 29 to July 21, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES
		TOP OF BEDROCK	63.90								
	Rotary Drill, HQ3 Core	Shale Bedrock Fragments (from drill cuttings)	23.47 / 63.42								
24		Slightly weathered to fresh, thinly bedded, dark brownish-grey, fine grained, faintly porous, slightly reactive to HCl, medium strong SHALE (Blue Mountain Formation) with laminated to thin, light grey limestone interbeds.	23.95								
25				1		BD,PL,RO	1.5	1	20		
						BD,ST,SM	2	1	20		
		- UCS with Modulus Sample				BD,PL,SM	1	1	16		
26						BD,UN,SM	2	1	20		
27			60.36			BD,UN,SM SA	2	2	20		
		Fresh, thinly bedded, light grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.	27.01			BD,UN,SM	2	1	20		
				2		BD,UN,SM	2	1	20		
28						BD,PL,SM	1	1	16		
29						BD,UN,SM	2	1	20		
						BD,UN,SM	2	1	20		
30						BD,PL,SM	1	1	16		
				3		BD,UN,SM	2	1	20		
						BD,PL,SM SA	1	2	16		
31						BD,PL,RO	1.5	1	20		
						BD,UN,RO	3	1	25		
32				4							
33						BD,UN,SM SA	2	2	20		
						BD,UN,SM	2	1	20		

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SP
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859944.69; E 683936.87
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH15

DRILLING DATE: June 29 to July 21, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
34	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			4							BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
35												BD,UN,RO	3	1	25					
36					5							BD,UN,RO	3	1	25					
												JN,UN,RO	3	1	25					
37												BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
38												BD,UN,SM	2	1	20					
39					6							BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
40												BD,UN,SM	2	1	20					
41																				
42					7							BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
												BD,PL,SM	1	1	16					
43												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
												BD,UN,SM	2	1	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SP
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859944.69; E 683936.87
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH15

DRILLING DATE: June 29 to July 21, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
44	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			7															
45					8							BD,UN,SM	2	1	20					
46												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
47																				
48					9							BD,UN,SM	2	1	20					
49												BD,PL,RO	1.5	1	20					
												BD,UN,SM	2	1	20					
50																				
51					10							BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
52												BD,UN,RO	3	1	25					
53																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SP
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859944.69; E 683936.87
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH15

DRILLING DATE: June 29 to July 21, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	RUN No.	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon
		--- CONTINUED FROM PREVIOUS PAGE ---					
54	Rotary Drill / HQ3 Core	- UCS Sample Fresh, thinly bedded, light grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.		BD,PL,RO	1.5	1	20
55			11				
56							
57				BD,ST,SM SA	2	2	20
				BD,PL,SM	1	1	16
58			12	BD,UN,SM	2	1	20
59				BD,PL,SM	1	1	16
60				BD,PL,RO	1.5	1	20
				BD,PL,RO	1.5	1	20
				BD,PL,RO	1.5	1	20
61			13				
62				BD,PL,RO	1.5	1	20
63			14	BD,UN,SM	2	1	20
		CONTINUED NEXT PAGE					

Columns: SYMBOLIC LOG; ELEV. / DEPTH (m); FLUSH RETURN; RECOVERY (TOTAL CORE %, SOLID CORE %); R.Q.D. %; FRACT. INDEX PER 0.25 m; DIP w.r.t. CORE AXIS; HYDRAULIC CONDUCTIVITY K, cm/sec; WEATHERING INDEX; FEATURES; R0/R1 ZONES; PIEZOMETER

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SP
CHECKED: MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859944.69; E 683936.87
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH15

DRILLING DATE: June 29 to July 21, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
64	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			14							BD,PL,SM	1	1	16					
65												BD,PL,RO BD,UN,SM	1.5 2	1 1	20 20					
66					15							BD,PL,SM	1	1	16					
67																				
68												BD,UN,SM	2	1	20					
69					16															
70																				
71												JN,UN,RO SA	3	2	22					
												BD,PL,SM	1	1	16					
72					17							BD,PL,SM	1	1	16					
73																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SP
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859944.69; E 683936.87
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH15

DRILLING DATE: June 29 to July 21, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
74	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			17							BD,PL,SM SA	1	2	16					
75												BD,UN,SM	2	1	20					
76					18							BD,UN,RO SA BD,UN,RO SA	3 3	2 2	22 22					
												BD,UN,SM SA	2	2	20					
77																				
78																				
79					19							BD,UN,SM	2	1	20					
80				6.47																
81		END OF DRILLHOLE		80.90																
82																				
83																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SP
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4859991.27; E 683953.65

RECORD OF BOREHOLE: BH16

SHEET 1 OF 11

BORING DATE: July 6 to 8, September 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		88.63					GR SA SI CL
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Poorly graded Sand with Gravel (SP)**, dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	36		50 mm Dia. Monitoring Well Bentonite
		Silty Sand with Gravel (SM), very dense, brown, moist, fine to medium sand, subangular to angular fine gravel (Fill) (Unit 1)		87.94 / 0.69	2	SS	51		
1		**Lean Clay with Sand (CL)**, stiff, grey, oxidation staining; fine to coarse sand, subrounded to subangular gravel, medium plasticity (Glaciolacustrine) (Unit 2a)		87.26 / 1.37	3	SS	12	γ = 19.7 kN/m³	
2		- Shelby tube sampling attempt failed at 2.3 m; retrieved tube was damaged.			4	TO	PH		
					4S	CS			
3	Mud Rotary Wash Boring; PWT Casing				5	SS	12		
		Silty Sand (SM), loose to medium dense, grey, moist to wet, fine to coarse sand, subangular fine to coarse gravel, low plasticity (Glaciolacustrine) (Unit 2b)		84.97 / 3.66	6	SS	5		
4									
5		- Vane attempted at 5.0 m depth and refused			7	SS	17		Grout; January 05, 2022
6					8	SS	7		12 43 36 10
7		**Silty Sand with Gravel (SM)**, very dense, grey, moist, fine to coarse sand, subangular fine gravel (Till) (Unit 3)		81.54 / 7.09	9	SS	64		27 40 27 6
8									
9					10	SS	50/0.13		
10		*CONTINUED NEXT PAGE*							

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10} 10^{-8} 10^{-6} 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○—⊣ W ⊢ Wl; 10 20 30 40

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859991.27; E 683953.65

RECORD OF BOREHOLE: BH16

SHEET 2 OF 11

BORING DATE: July 6 to 8, September 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊖W WI; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; PWT Casing	**Lean Clay (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		78.57 / 10.06							
11					11	SS	78				Grout
12											Bentonite
				76.29 / 12.34	12A / 12B	SS	73				
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									Sand
13					13	SS	50/0.08				
14											
15											Screen
					14	SS	50/0.13				
16											Sand
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.79 / 16.84							
17											
18											Grout
					15	SS	38				
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859991.27; E 683953.65

RECORD OF BOREHOLE: BH16

BORING DATE: July 6 to 8, September 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; PWT Casing			68.55							
		Sandy Silt (ML), very dense, grey, wet, fine to medium sand, subangular to angular, fine to coarse gravel (Glaciolacustrine) (Unit 4a)		20.08							
21		- Rock fragments in spoon sample 16			16	SS	50/ 0.13				
22											
23		- Bedrock cored from 24.08 m to 100.66 m depth - Refer to Record of Drillhole BH16.									
24				64.55 / 24.08							
25											
26											
27											
28											
29											
30											

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Monitoring well installed on September 29, 2021.

3. PWT casing utilized after encountering bedrock to facilitate PMT testing in bedrock.

4. Water level measured in the monitoring well at a depth of 5.52 m below ground surface (Elev. 83.11 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: YS

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.55																
	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin, grey, limestone interbeds	24.08																
25				1							BD,UN,SM SA	2	2	20					
											BD,PL,SM SA	1	2	16					
											BD,UN,RO	3	1	25					
26											BD,UN,RO CC,CL	3	4	20					
											BD,PL,RO SA	1.5	2	20					
27																			
				2							BD,UN,SM	2	1	20					
			60.77								BD,UN,SM SA	2	2	20					
28		Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds	27.86																
											BD,UN,RO	3	1	25					
29																			Grout
				3							BD,UN,RO	3	1	25					
30		- Drillhole stopped at 30 m depth on July 7, 2021. Drillhole extended below 30 m after September 2, 2021.																	
31																			
32				4															
33											BD,UN,RO	3	1	25					
				5															
34																			

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds			5							BD,UN,RO IN,Cl	1	10	0					
35																				
36												BD,UN,RO	3	1	25					
37																				
					6															
38												BD,UN,RO SA	3	2	22					
39																				Grout
40												BD,UN,SM	2	1	20					
41					7															
42																				
43					8															
44																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
45	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds			8							BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
46												BD,UN,RO	3	1	25					
47					9															
48																				
49																				Grout
50												BD,UN,RO	3	1	25					
					10															
51												BD,UN,RO	3	1	25					
52												BD,UN,RO	3	1	25					
53					11															
54																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds			11							BD,UN,RO	3	1	25					
55												BD,UN,RO	3	1	25					
56					12							BD,UN,RO	3	1	25					
57												BD,PL,RO	1.5	1	20					
58					13															
59																				Grout
60																				
61					14							BD,UN,RO	3	1	25					
62																				
63					15															
64		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds			15							BD,PL,SM	1	1	16					
												BD,UN,SM	2	1	20					
65																				
66					16															
67																				
68																				
69					17															Grout
70																				
71																				
72					18															
73																				
74																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds			18															
75																				
76					19															
77												BD,PL,SM IN,BR	1	4	0					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
78																				
79					20															Grout
80																				
81																				
82					21															
												BD,UN,RO	3	1	25					
83																				
84					22															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
85	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Lindsay Formation) with dark grey Shale Interbeds		22															
86											BD,UN,RO	3	1	25					
											BD,UN,RO	3	1	25					
87																			
88			0.16 / 88.47	23															
		Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Verulam Formation) with dark grey Shale Interbeds																	
89																			Grout
90																			
91				24							BD,UN,SM	2	1	20					
92																			
93																			
				25							BD,UN,SM SA	2	2	20					
											BD,UN,SM SA	2	2	20					
94																			
		CONTINUED NEXT PAGE																	

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859991.27; E 683953.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH16

DRILLING DATE: July 7 and September 2 to 8, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, LIMESTONE (Verulam Formation) with dark grey Shale Interbeds			25							BD,PL,SM IN,CL BD,PL,SM IN,CL BD,PL,SM SA,CL	1 1 1	10 10 2	0 0 16					Grout
95												BD,UN,SM	2	1	20					
96					26							BD,PL,RO BD,UN,SM BD,UN,SM	1.5 2 2	1 1 1	20 20 20					
97												BD,UN,SM	2	1	20					
98																				
99					27															
100				-12.03																
		END OF DRILLHOLE		100.66																
101																				
102																				
103																				
104																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/JS
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4859964.26; E 683841.07

RECORD OF BOREHOLE: BH17

SHEET 1 OF 9

BORING DATE: July 14 to 16 and August 5, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegrade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		86.82							
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, compact, brown; rootlets, organics staining, fine to coarse sand, subrounded fine to subangular coarse gravel (Fill) (Unit 1) - Shale fragments from 0.2 m to 0.5 m		0.00	1A, 1B	SS	23				50 mm Dia. Monitoring Well
				85.93	2A	SS	12				
1		**Silty Sand with Gravel (SM)**, medium dense to very loose, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		0.89	2B						
					3	SS	3				21 40 31 8
2				84.69							Grout
		Silty Sand with Gravel (SM), with cobbles and boulders, very dense, grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3) - Rock fragments in spoon sample 4 from 2.5 m to 2.6 m depth		2.13	4	SS	125			▼ = 22.9 kN/m³	January 05, 2022
3	Mud Rotary Wash Boring; HWT Casing	- Rock fragments in spoon sample 5 from 3.2 m depth			5	SS	67				
		- Becoming grey at 3.7 m depth									
4					6	SS	54				26 40 26 8
					7	SS	100/0.13				
5		- Rock fragments in spoon sample 7 at 4.8 m depth									Bentonite
					8	SS	89				
6					9	SS	96				Sand
7											
					10	SS	158/0.23				13 43 36 8
8											Screen and Sand
9					11	SS	100/0.13				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH17

LOCATION: N 4859964.26; E 683841.07

BORING DATE: July 14 to 16 and August 5, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegrade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION; GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM)**, with cobbles and boulders, very dense, grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)									
11					12	SS	155/ 0.28		○		
		- Rock fragments in spoon sample 12 at 11.6 m depth									
12		- Spoon bouncing/refusal from sample 13 to sample 16			13	SS	100/ 0.05				
		- No recovery in spoon samples 13 to 16									
13											
					14	SS	100/ 0.05				
14											
		- Granite fragments in wash return at 14.5 m depth			15	SS	100/ 0.03				
15		- No recovery in spoon sample 16									Grout
					16	SS	100/ 0.13				
		Lean Clay with Sand (CL), hard, grey, moist, fine sand, medium plasticity (Glaciolacustrine) (Unit 4b)		71.20 15.62							
16					17	SS	33		○		
17					18	SS	68		⊢○⊣		2 23 48 27
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine to coarse sand, subangular fine gravel, low plasticity (Till) (Unit 5)		69.07 17.75							
18		- Rock fragments in spoon sample 19 at 18.3 m depth			19	SS	107		○⊢⊣		12 13 57 19
19											
				66.96 19.86	20A 20B	SS	148		○		
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH17

LOCATION: N 4859964.26; E 683841.07

BORING DATE: July 14 to 16 and August 5, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegrade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Silt with Sand (ML)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			20B				○		
21					21	SS	100/0.13		○		0 17 81 2
22		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular fine gravel (Till) (Unit 5)		64.66 / 22.16							
		Shale Bedrock Fragments (Unit 6a)		64.16 / 22.72	22A / 22B	SS	100/0.1		○		
23	Rock Core HQ3	- Bedrock cored from 22.66 m to 81.18 m depth - Refer to Record of Drillhole BH17									RQD = 51%

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Well installed on August 5, 2021.

3. During rock coring at BH17, starting at an approximate depth of 75 m and below, it was observed that water was coming out of the open borehole at BH13. Saturation of the surrounding ground area in the vicinity of BH13 was observed. The drill crew waited 10 minutes before each run to allow for dissipation of water/drilling fluid from BH13 prior to starting each following run, which led to a total of 1 hour delay.

4. Water level measured in the monitoring well at a depth of 2.66 m below ground surface (Elev. 84.16 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859964.26; E 683841.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH17

DRILLING DATE: July 26, 2021
DRILL RIG: Acker Renegrade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.16																
		Slightly weathered to fresh, thinly bedded, dark grey, fine grained, faintly porous, slightly reactive to HCl, weak to medium strong SHALE (Blue Mountain Formation) with very thin to thin, light grey, medium strong limestone interbeds.	22.66	1							BD,PL,SM	1	1	16					
23											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,SM	1	1	16					
											BD,PL,SM	1	1	16					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
		- UCS Sample		2															
24																			
				3							JN,PL,RO	1.5	1	20					
25																			
											JN,PL,RO	1.5	1	20					
26																			
			60.41																
		Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.	26.41	4															
27	Rotary Drill / HQ3 Core																		Grout
											BD,UN,SM	2	1	20					
28				5							BD,CU,RO IN, Br	1	4	0					
29																			
											BD,PL,RO SA	1.5	2	20					
30				6															
31				7															
32																			
				8							BD,PL,RO	1.5	1	20					

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859964.26; E 683841.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH17

DRILLING DATE: July 26, 2021
DRILL RIG: Acker Renegrade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
33	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			8							BD,CU,RO	3	1	25					
												BD,PL,SM	1	1	16					
												BD,PL,RO	1.5	1	20					
34					9															
35																				
36					10															
37					11							BD,PL,RO	1.5	1	20					Grout
38																				
39					12															
40																				
41					13															
42					14															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859964.26; E 683841.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH17

DRILLING DATE: July 26, 2021
DRILL RIG: Acker Renegrade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
43	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			14															
44					15							BD,PL,RO	1.5	1	20					
45					16															
46																				
47					17															
48					18															Grout
49																				
50					19															
51					20															
52		- UCS with Modulus Sample																		
					21															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859964.26; E 683841.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH17

DRILLING DATE: July 26, 2021
DRILL RIG: Acker Renegrade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
53	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			21															
54					22															
55																				
56					23															
57					24															Grout
58																				
59					25															
60																				
61					26															
62					27															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859964.26; E 683841.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH17

DRILLING DATE: July 26, 2021
DRILL RIG: Acker Renegrade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
63	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			27															
64					28															
65					29															
66					30															
67																				
68					31															Grout
69																				
70					32															
71					33															
72					34															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859964.26; E 683841.07
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH17

DRILLING DATE: July 26, 2021
DRILL RIG: Acker Renegrade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
73	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			34															
74					35															
75																				
76					36							BD,PL,RO	1.5	1	20					
77					37															Grout
78																				
79					38															
80					39															
81				5.64																
		END OF DRILLHOLE		81.18																
82																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MT

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PROJECT: 21451329

LOCATION: N 4859946.25; E 683916.49

RECORD OF BOREHOLE: BH18

SHEET 1 OF 9

BORING DATE: August 9 to 12, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 55 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		87.18							
0	Power Augering, 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, with shale fragments, very dense, brown, dry, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1A	SS	48				
				86.77 / 0.41	1B						
		Sandy Silty Clay (CL-ML), hard, brown, organic staining, fine to coarse sand, trace angular fine to coarse gravel, low plasticity (Fill) (Unit 1)		86.57 / 0.61	2	SS	34				
1		**Silty Sand (SM)**, with cobbles and boulders, very dense, brown to grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)			3A	SS	19				
					3B						
2					4	SS	72				
					5	SS	141				9 45 37 9
3	Mud Rotary Wash Boring, HWT Casing				6	SS	100/0.12				
		- Rock fragments in spoon sample 7A - Becoming grey and wet below 3.7 m depth			7A						
4					7B	SS	78				
		Well Graded Sand (SW), very dense, grey, wet, medium to coarse sand, trace angular fine gravel (Glaciolacustrine) (Unit 4a)		82.99 / 4.19	8	SS	100/0.06				
5				82.10	9A	SS	55				9 86 5 0
		Silty Sand with Gravel (SM), with cobbles and boulders, very dense, grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3) - Rock fragments in spoon sample 10		5.08	9B						
					10	SS	71				
6		- Rock fragments in spoon sample 12A			11A	SS	68				
					11B						
					12A	SS	66				
7					12B						
		Sandy Silty Clay (CL-ML), medium dense to dense, grey, moist, fine to coarse sand, subangular fine to coarse gravel, low plasticity (Till) (Unit 3)		79.94 / 7.24	13	SS	46				
8					14	SS	26				14 30 40 16
		Sandy Silt (ML), with gravel, cobbles and boulders, very dense, grey, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Till) (Unit 3)		78.72 / 8.46	15	SS	100/0.15				
9					16	SS	100/0.13				1 42 51 6
					17	SS	100/0.09				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/YS

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4859946.25; E 683916.49

RECORD OF BOREHOLE: BH18

SHEET 2 OF 9

BORING DATE: August 9 to 12, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 55 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊖W WI) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		77.00 / 10.18							
					18	SS	174				
11					19	SS	136				
					20	SS	195/0.11				
12		- Becoming wet below 12.2 m depth			21	SS	187/0.25				0 70 29 1
13					22	SS	100/0.13				
					23	SS	153				
14					24	SS	171				
					25	SS	126				
15		**Lean Clay (CL)**, very stiff to hard, grey, moist, trace fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		72.02 / 15.16							
					26	SS	106				
16					27	SS	32				0 3 52 46
					28	SS	27				
17					29A	SS	24				
		Silty Clay (CL-ML), very stiff to hard, grey, moist, fine to coarse sand, trace subangular fine to coarse gravel, low plasticity (Till) (Unit 5)		69.81 / 17.37	29B						
18					30	SS	33				
					31	SS	169				1 8 71 20
19					32	SS	119				
					33A	SS	84				
				67.37 / 19.81	33B						
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/YS

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH18

SHEET 3 OF 9

LOCATION: N 4859946.25; E 683916.49

BORING DATE: August 9 to 12, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 55 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring, HWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		67.14 / 20.04	33B						
				66.91	34A	SS	126				
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		20.27	34B						0 67 31 2
				66.53							
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		20.65							
				66.30	35A	SS	100/0.15				
21				20.88	35B						
		Silty Clay (CL-ML), hard, grey, moist, low plasticity (Glaciolacustrine) (Unit 4b)		66.00 / 21.18							
		Silty Sand (SM), very dense, grey, wet, fine sand (Glaciolacustrine) (Unit 4a)			36	SS	44			γ = 22.9 kN/m³	
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, subrounded to subangular fine gravel, low plasticity (Till) (Unit 5)									
22		- Shale fragments in spoon sample 39			37	SS	62				7 23 53 17
					38	SS	50				
23				63.57							
	Rock Core, HQ3	**Shale Bedrock Fragments** (Unit 6a)		23.66	39	SS	100/0.05				
24		- Bedrock cored from 23.61 m to 90.95 m depth - Refer to Record of Drillhole BH18									
25											
26											
27											
28											
29											
30											

NOTES:

1. Water encountered at a depth of 3.7 m during drilling.

2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

3.Methane (CH4) and Carbon Monoxide (CO) were detected at surface by a portable gas monitor (GX-6000) during drilling of BH18 at approximately 64.19m depth. Concentrations of CH4 and CO exceeded health and safety trigger levels which led to stoppage of all field activities for minimum 3.5 hours until the gas dissipated below action levels.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/YS

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859946.25; E 683916.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH18

DRILLING DATE: August 12 to 18, 2021
DRILL RIG: Diedrich 55 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		63.57																
		Slightly weathered to fresh, thinly to medium bedded, dark brownish-grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin, grey limestone interbeds.		23.61	1							BD,UN,SM BD,PL,RO JN,PL,RO Sa BD,PL,RO	2 1.5 1.5 1.5	1 1 2 1	20 20 20 20					
24																				
25					2															
		- Direct Shear Sample										BD,PL,RO	1.5	1	20					
26				61.09																
		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.		26.09																
					3							BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
27												BD,PL,RO IN, Br	1	4	6					
28					4							BD,PL,SM	1	1	16					
29																				
30					5							BD,PL,RO	1.5	1	20					
31					6															
32																				
33		R1 Zone: 32.94 m to 32.99 m			7															
		R0 Zone: 33.32 m to 33.33 m										BD,PL,RO PC, Cl	1.5	4	16					

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859946.25; E 683916.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH18

DRILLING DATE: August 12 to 18, 2021
DRILL RIG: Diedrich 55 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
34		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.			8															
35																				
36					9															
37					10															
38																				
39		R1 Zone: 39.01 m to 39.03 m			11							BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,SM PC, Cl	1	4	12					
40					12															
41																				
42					13															
43					14															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859946.25; E 683916.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH18

DRILLING DATE: August 12 to 18, 2021
DRILL RIG: Diedrich 55 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
44		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.			14															
45					15															
46												BD,PL,RO	1.5	1	20					
47					16															
48					17															
49																				
50					18															
51					19															
52																				
53					20															
					21															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859946.25; E 683916.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH18

DRILLING DATE: August 12 to 18, 2021
DRILL RIG: Diedrich 55 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
54		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.			21							BD,UN,RO	3	1	25					
55					22															
56																				
57					23							BD,PL,RO	1.5	1	20					
58																				
59					24															
60					25							BD,PL,RO	1.5	1	20					
61																				
62					26							BD,PL,RO	1.5	1	20					
63					27															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859946.25; E 683916.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH18

DRILLING DATE: August 12 to 18, 2021
DRILL RIG: Diedrich 55 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
64		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.			27															
65					28															
66					29															
67																				
68					30															
69					31															
70																				
71					32															
72					33															
73																				
					34															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859946.25; E 683916.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH18

DRILLING DATE: August 12 to 18, 2021
DRILL RIG: Diedrich 55 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
74		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.			34															
75					35															
76																				
77					36															
78																				
79					37															
80					38															
				6.23																
81		END OF DRILLHOLE		80.95																
82																				
83																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS/YS
CHECKED: MJT

PROJECT: 21451329

RECORD OF BOREHOLE: BH19

SHEET 1 OF 7

LOCATION: N 4859932.14; E 683881.61

BORING DATE: July 28 to August 3, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 52 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		86.58							
0	Power Augering, 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, with shale fragments, dense, brown, dry, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	48		○		51 40 8 2
				85.89							
		Sandy Silty Clay (CL-ML), very stiff, brown, moist, fine to medium sand, trace subangular gravel, low plasticity (Fill) (Unit 1)		0.69	2A				○		
1				85.59		SS	27				
		Silty Sand with Gravel (SM), with cobbles and boulders, medium dense to very dense, brown to grey, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Till) (Unit 3)		0.99	2B				○		
					3	SS	55		○		
2		- Rock fragments in spoon sample 2B									
		- Auger grinding from 1.2 m to 1.5 m depth									
		- Heavy auger grinding from 2.4 m to 2.7 m depth			4	SS	150		○	NP	19 40 32 9
		- Auger refusal at 2.7 m depth									
3	Mud Rotary Wash Boring/Tri-Cone, HWT Casing										
4		- PMT attempts between 3.8 m and 6.1 m depth and refused									
5		- Becoming grey below 5.2 m depth									
6											
		- Very coarse material at PMT 1 which required a lot of pressure			1	PMT					
7											
					5	SS	100/0.08		○		
8											
9		- Cored through cobbles/boulder between 8.8 m and 9.6 m depth									
				76.92 / 9.66							
10					2	PMT					

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/GS/TD/KC

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859932.14; E 683881.61

RECORD OF BOREHOLE: BH19

SHEET 2 OF 7

BORING DATE: July 28 to August 3, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 52 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring/Tri-Cone; HWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
					2	PMT					
11											
					6	SS	100/0.14		○		0 73 24 4
12											
13											
14											
		- PMT probe appeared to be destroyed after unsuccessful test			3	PMT					
15											
					7A	SS	156		○		
				70.98 / 15.60	7B				○		
		Lean Clay (CL), hard, grey, moist, fine sand (Glaciolacustrine) (Unit 4b)									
16											
17				69.56 / 17.02							
		Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, subangular fine gravel, low plasticity (Till) (Unit 5)									
					4	PMT					
18											
					8	SS	100/0.14		○		
19											
					5	PMT					
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/GS/TD/KC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859932.14; E 683881.61

RECORD OF BOREHOLE: BH19

SHEET 3 OF 7

BORING DATE: July 28 to August 3, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 52 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring/Tri-Cone, HWT Casing	**Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular fine gravel, low plasticity (Till) (Unit 5)			5	PMT					
21					9	SS	69				2 13 59 26
22	Rock Core, HQ3	**Shale Bedrock Fragments** (Unit 6a) - Bedrock cored from 22.71 m to 61.51 m depth - Refer to Record of Drillhole BH19		63.87 22.73	10	SS	100/0.03				
23											
24											
25											
26											
27											
28											
29											
30											

NOTE:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/GS/TD/KC

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859932.14; E 683881.61
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH19

DRILLING DATE: August 13 and 16, 2021
DRILL RIG: Diedrich 52 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	63.87																
23	Rotary Drill HQ3 Core	Slightly weathered to fresh, very thinly to medium bedded, very dark grey, fine grained, medium porous, moderately reactive to HCl, weak to medium strong SHALE (Blue Mountain Formation) with thin to medium, grey limestone interbeds.	22.71	1							BD,UN,RO	3	1	25					
											BD,PL,RO	1.5	1	20					
											BD,UN,RO Sa	3	2	22					
											BD,PL,RO	1.5	1	20					
											BD,IR,SM Sa	2	2	20					
24											BD,PL,SM	1	1	16					
											BD,PL,SM Sa	1	2	16					
				2							BD,IR,SM	2	1	20					
											BD,PL,SM Sa	1	2	16					
25											BD,UN,SM	2	1	20					
											BD,UN,SM	2	1	20					
											BD,PL,SM	1	1	16					
26			60.52								BD,PL,SM Sa	1	2	16					
		Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.	26.06								BD,PL,RO Sa	1.5	2	20					
											BD,PL,SM Sa	1	2	16					
27											BD,UN,SM Sa	2	2	20					
				3							BD,PL,RO	1.5	1	20					
28											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
29											BD,UN,RO	3	1	25					
											BD,PL,RO	1.5	1	20					
30											BD,UN,SM Sa	2	2	20					
31				4							BD,UN,SM Sa	2	2	20					
32											BD,PL,RO	1.5	1	20					

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: YS/JS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859932.14; E 683881.61
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH19

DRILLING DATE: August 13 and 16, 2021
DRILL RIG: Diedrich 52 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
33	Rotary Drill HQ3 Core	Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			4							BD,PL,SM	1	1	16					
34												BD,PL,SM	1	1	16					
35					5							BD,UN,RO	3	1	25					
36																				
37												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
38					6							BD,UN,SM	2	1	20					
												BD,PL,RO	1.5	1	20					
39																				
												BD,PL,SM	1	1	16					
40												BD,UN,SM	2	1	20					
												BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
41					7															
												BD,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
42																				
					8															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: YS/JS
CHECKED: MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859932.14; E 683881.61
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH19

DRILLING DATE: August 13 and 16, 2021
DRILL RIG: Diedrich 52 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
43	Rotary Drill HQ3 Core	Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.										BD,UN,RO	3	1	25					
44					8							BD,PL,RO Sa	1.5	2	20					
45												BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
46												BD,UN,SM	2	1	20					
												BD,UN,SM Sa	2	2	20					
												BD,PL,RO	1.5	1	20					
47												BD,PL,SM	1	1	16					
					9							BD,PL,SM	1	1	16					
48												BD,PL,SM	1	1	16					
												BD,PL,SM SO	1	1	16					
49												BD,UN,SM SO	2	1	20					
												BD,PL,SM	1	1	16					
50					10															
51												BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
												BD,UN,SM	2	1	20					
52					11							BD,UN,RO SO	3	1	25					
												BD,PL,RO	1.5	1	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: YS/JS
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859932.14; E 683881.61
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH19

DRILLING DATE: August 13 and 16, 2021
DRILL RIG: Diedrich 52 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
53	Rotary Drill, HQ3 Core	Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			11							BD,UN,RO Sa	3	2	22					
54																				
55					12							BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
												BD,UN,RO	3	1	25					
56																				
57												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
58					13							BD,PL,RO	1.5	1	20					
59																				
												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
60												BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
61					14							BD,PL,SM	1	1	16					
				25.07 / 61.51																
		END OF DRILLHOLE																		
62																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: YS/JS
CHECKED: MJT

PROJECT: 21451329

RECORD OF BOREHOLE: BH20

SHEET 1 OF 3

LOCATION: N 4859922.00; E 683863.18

BORING DATE: July 14 and 15, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		86.36							
0	Power Augering; 210 mm O.D. /110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, very dense, brown, shale fragments from 0.1 m to 0.3 m, wet, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1A, 1B, 1C	SS	52		○		
				85.67							
		Silty Clayey Sand with Gravel (SC-SM), loose, brown, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		0.69							
1					2	SS	8		○—⊢		16 37 35 12
				84.99							
		Silty Sand with Gravel (SM), medium to very dense, brown to grey, moist to wet, fine to coarse sand, subangular to subrounded fine to coarse gravel (Till) (Unit 3)		1.37							
					3	SS	27		○		
2											
					4	SS	102		○		15 44 33 9
3		- Rock fragments from depths of 3.1 m to 3.3 m			5	SS	121		○		
		- Becoming grey and wet below 3.7 m									
4					6	SS	111		○		
	Mud Rotary Wash Boring; HWT				7	SS	66		○		
5											
					8	SS	40		○—⊢		30 37 28 6
6											
					9	SS	81		○		
7				79.30							
		Poorly Graded Gravel with Sand (GP), very dense, grey, wet, medium to coarse sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 4a)		7.06							
					10A	SS	70		○		
				78.44							
8		**Silty Sand with Gravel (SM)**, very dense, grey, wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		7.92	10B				○		
9					11	SS	115		○		
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859922.00; E 683863.18

RECORD OF BOREHOLE: BH20

SHEET 2 OF 3

BORING DATE: July 14 and 15, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring, HWT	**Well Graded Gravel with Sand (GW)**, very dense, grey, wet, medium to coarse sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 4a)		76.15 / 10.21							
11					12	SS	100/0.13		○		67 30 3 1
12					13	SS	135		○		
13		**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		73.23 / 13.13							
14					14	SS	162/0.29		○		
15					15	SS	127		○		0 61 36 3
16		**Lean Clay (CL)**, very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		70.05 / 16.31							
17					16	SS	29		⊢—○—⊣	γ = 21.1 kN/m³	0 2 48 50
18		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to medium sand, subangular fine gravel (Till) (Unit 5)		67.94 / 18.42	17A / 17B	SS	100/0.1		○		2 17 63 19
19		**Silty Sand (SM) to Sandy SILT (ML)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		67.08 / 19.28							
20					18	SS	91				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH20

SHEET 3 OF 3

LOCATION: N 4859922.00; E 683863.18

BORING DATE: July 14 and 15, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	HWT			66.09	18	SS	91		○		
		END OF BOREHOLE		20.27							
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

NOTES:

1. Water first encountered at a depth of 3.1 m during drilling.

2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH27

SHEET 1 OF 4

LOCATION: N 4860188.76; E 683854.77

BORING DATE: September 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		95.47							GR SA SI CL
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, brown, rootlets, organic staining, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Fill) (Unit 1)		0.00	1A	SS	18				
		Sandy Lean Clay (CL), very stiff, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low to medium plasticity (Till) (Unit 3)		94.94 / 0.53	1B						
1					2	SS	18				13 29 40 17
		Gravelly Silt (ML) to Silty Sand with Gravel (SM) with cobbles and boulders, very dense, brown, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)		94.10 / 1.37	3	SS	59				
2		- Augers grinding from 2.3 m to 3.0 m depth - Rock fragments in bottom of spoon sample 4			4	SS	78				
3		- Casing grainding from 3.0 m to 11.5 m depth			5	SS	75				
4	Mud Rotary Wash Boring, HWT Casing				6	SS	184			γ = 25.4 kN/m³	
5		- Rock fragments in bottom of spoon sample 7			7	SS	61				34 7 52 6
					8	SS	154/0.28				
6		- Becoming grey below 5.94 m depth			9	SS	100/0.10				
7											
8					10	SS	186/0.28				
9		- Rock fragments in bottom of spoon sample 11			11	SS	192/0.19				23 32 38 7
10											

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH27

SHEET 2 OF 4

LOCATION: N 4860188.76; E 683854.77

BORING DATE: September 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Gravelly Silt (ML) to Silty Sand with Gravel (SM)** with cobbles and boulders, very dense, brown, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)									
					12	SS	100/0.48		○		
11				83.98 / 11.49							
		Lean Clay (CL), hard, grey, moist, fine to medium sand, subrounded to subangular fine gravel, low to medium plasticity (Glaciolacustrine) (Unit 4b) - Casing grinding between 11.5 m and 14.7 m depth									
12					13	SS	133		⊕—⊣		6 6 67 22
13											
14					14	SS	123		○	▼ = 20.6 kN/m³	
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		80.77 / 14.70							
15					15	SS	100/0.13		○		
16											
17											
18					16	SS	149		○	▼ = 21.5 kN/m³	
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860188.76; E 683854.77

RECORD OF BOREHOLE: BH27

SHEET 3 OF 4

BORING DATE: September 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊖W WI; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)									
21					17	SS	100/0.14		○		0 56 43 1
22											
23				72.10 / 23.37							
		Lean Clay (CL), very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
24					18	SS	24		⊖		0 2 44 54
25											
26				69.29 / 26.18							
		Silty Clay (CL-ML), hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b)									
27				67.83 / 27.64	19A 19B	SS	100/0.12		◐ ○		1 11 70 18
		Silt with Sand (ML), very dense, grey, moist to wet, fine sand (Glaciolacustrine) (Unit 4a)									
28											
29				66.26 / 29.21							
		Sandy Silty Clay with Gravel (CL-ML), hard, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Till) (Unit 5)									
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH27

SHEET 4 OF 4

LOCATION: N 4860188.76; E 683854.77

BORING DATE: September 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○—⊣ W ⊢ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	HWT Casing	**Sandy Silty Clay with Gravel (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Till) (Unit 5) - Rock fragments in bottom of spoon sample 20		64.85	20	SS	100/0.14		○⊢		41 34 19 6
		END OF BOREHOLE		30.62							
31		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
32											
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860166.09; E 683897.02

RECORD OF BOREHOLE: BH28

SHEET 1 OF 6

BORING DATE: June 14 and 16, and July 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)	GR SA SI CL
		GROUND SURFACE		95.35								
0	Power Augering; 210 mm O.D. /110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, medium dense, grey, moist, medium to coarse sand, angular to subangular fine gravel (Fill) (Unit 1)		0.00	1	SS	12				Concrete; 50 mm Dia. Monitoring Well	
				94.66								
1		**Lean Clay with Sand (CL)**, hard, brown, moist, fine to medium sand, low to medium plasticity (Fill) (Unit 1)		0.69	2A				○			
				94.28								
		Silty Sand (SM), with cobbles and boulders, dense to very dense, brown to grey, moist to wet, fine to coarse sand, angular to subangular gravel (Till) (Unit 3)		1.07	2B	SS	35					
					3	SS	67					
2											January 05, 2022; Grout	
					4	SS	80		○	NP		12 42 40 6
3		- Rock fragments in bottom of spoon sample 5 - Oxidation staining above 3.3 m depth			5	SS	100/0.13					
4		- Spoon attempted at 3.8 m depth and refused; rock stuck in casing (i.e. bouncing); no sample recovery;			~~5A~~	SS	-					
	Mud Rotary Wash Boring; HWT	- Spoon, sample 6 refusal/bouncing at 4.6 m depth; no sample recovery;			6	SS	100/0.06				Bentonite	
5		- Becoming grey and wet at 5.3 m depth - Rock fragments at top of spoon sample 7			7	SS	128				Sand	
6					8	SS	66		○			7 47 39 8
7											Screen and Sand	
8					9	SS	100					
9											Sand	
					10	SS	185/0.23		○		Bentonite	
10		*CONTINUED NEXT PAGE*										

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD/ML

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860166.09; E 683897.02

RECORD OF BOREHOLE: BH28

SHEET 2 OF 6

BORING DATE: June 14 and 16, and July 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT	**Silty Sand (SM)**, very dense, brown to grey, moist, fine to medium sand, subrounded to subangular gravel (Glaciolacustrine) (Unit 4a)		85.24 / 10.11							
		- Rock fragments in spoon sample 11 at 10.7 m depth			11	SS	183/0.23		○		10 53 34 2
11											Bentonite
12					12	SS	100/0.14				
13		**Poorly Graded Gravel with Sand (GP)**, very dense, grey, moist, fine to medium sand, fine to coarse subrounded to subangular gravel (Glaciolacustrine) (Unit 4a)		82.32 / 13.03							
					13	SS	100/0.13				
14		**Lean Clay (CL)**, hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		80.80 / 14.55							
15					14	SS	145		⊢—○—⊣		0 10 60 30
16											Grout
17											
18				76.91 / 18.44	15A / 15B	SS	183/0.22		○		
		Silty Sand (SM), very dense, grey, wet, fine to medium sand, subrounded fine gravel (Glaciolacustrine) (Unit 4a)									
19		- Rock fragments in spoon sample 15B at 18.4 m depth									
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD/ML

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860166.09; E 683897.02

RECORD OF BOREHOLE: BH28

SHEET 3 OF 6

BORING DATE: June 14 and 16, and July 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring HWT	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand, subrounded fine gravel (Glaciolacustrine) (Unit 4a)									
21					16	SS	100/0.13				
22											
23		**Lean Clay (CL)**, hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		72.43 / 22.92							
24					17	SS	36				
25		- Pocket Penetrometer refusal (>5 kg/cm²) at 25.1 m depth at bottom of Shelby tube			18 / ~~18S~~	TO / CS	PH				Grout
26											
27					19A						1 6 43 51
		Sandy Silt (ML), very dense, grey, moist, fine to coarse sand, subangular to angular gravel (Till) (Unit 5)		67.64 / 27.71	19B	SS	158/0.22				
28											
29					20	SS	100/0.13				
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD/ML

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH28

SHEET 4 OF 6

LOCATION: N 4860166.09; E 683897.02

BORING DATE: June 14 and 16, and July 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
30	Mud Rotary Wash Boring HWT	**Sandy Silt (ML)**, very dense, grey, moist, fine to coarse sand, subangular to angular gravel (Till) (Unit 5)			21	SS	100/0.05		○		Grout
31				63.96							
	Rock Core HQ3	**Shale Bedrock Fragments** (Unit 6a)		31.39	22	SS	100/0.14				
				31.51							
32		- Bedrock cored from 31.51 m to 50.52 m depth - Refer to Record of Drillhole BH28									
33		NOTES: 1. Water first encountered at a depth of 5.3 m during drilling. 2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 3. Well installed on July 20, 2021. 4. Water level measured in the monitoring well at a depth of 1.99 m below ground surface (Elev. 93.36 m) on January 05, 2022.									
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD/ML

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860166.09; E 683897.02
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH28

DRILLING DATE: June 21 and 22, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	63.96									
		Shale Bedrock Fragments	31.39									Grout
		Fresh, thinly bedded, dark grey, fine grained, non-porous, slightly reactive to HCl, weak SHALE (Blue Mountain Formation) with medium strong limestone interbeds.	31.51	1		BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
						BD,UN,RO	3	1	25			
32				2		BD,PL,SM	1	1	16			
		- UCS Sample				BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
33				3								
			61.62			BD,PL,RO SA, Cl	1.5	2	20			
		Fresh, thinly bedded, grey, fine grained, slightly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with medium strong shale interbeds.	33.73									
34												
				4		BD,UN,SM	2	1	20			
35												
						BD,UN,SM	2	1	20			
						BD,UN,RO	3	1	25			
36				5								
37												
				6		BD,UN,RO	3	1	25			
38												
39				7								
						BD,UN,SM	2	1	20			
						BD,UN,SM SA	2	2	20			
40												
						BD,UN,RO	3	1	25			
				8								
41												

Drilling record: Rotary Drill; HQ3 Core

Symbolic log: 31.51–61.62 Shale Bedrock Fragments; 61.62–41 Limestone

Recovery: Total Core % / Solid Core % 80 60 40 20; R.Q.D. % 80 60 40 20; Fract. Index per 0.25 m 5 10 15 20; Dip w.r.t. Core Axis 0 30 60 90; Hydraulic Conductivity K, cm/sec 10^{-8} 10^{-6} 10^{-4} 10^{-2}; Weathering Index W1 W2 W3 W4 W5 W6

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD/ML
CHECKED: SAP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860166.09; E 683897.02
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH28

DRILLING DATE: June 21 and 22, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
42	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine grained, slightly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with medium strong shale interbeds.			9															
43					10															
44												BD,UN,RO SA BD,PL,RO SA	3 1.5	2 2	22 20					
45					11															
46					12															
47												BD,UN,RO	3	1	25					
48					13															
49					14															
50				44.83								BD,PL,RO SA	1.5	2	20					
		END OF DRILLHOLE		50.52																
51																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD/ML
CHECKED: SAP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH29

SHEET 1 OF 4

LOCATION: N 4860037.44; E 683746.14

BORING DATE: September 13 and 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		87.27							
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	12		○		
1					2	SS	25		○		
		Silty Sand with Gravel (SM),medium dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		86.05 / 1.22	3	SS	12		○	γ = 24.0 kN/m³	22 43 29 6
2		**Silty Clayey Sand (SC-SM)**, loose, brown, wet, fine to coarse sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		85.14 / 2.13	4	SS	6		⊖		6 46 38 10
3	Mud Rotary Wash Boring, HWT Casing	**Silty Sand with Gravel (SM)** with cobbles and boulders, medium dense to very dense, brown to grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		84.37 / 2.90	5	SS	20		○	γ = 27.2 kN/m³	
		- Becoming grey below 3.66 m depth									
4					6	SS	42		○		19 42 32 8
		- Rock fragments in spoon sample 7A			7A	SS	86				
5					7B				○		
		- Rock fragments in spoon sample 8			8	SS	105		○		
6		- Rock fragments in spoon sample 9			9	SS	180		○		16 41 35 8
7											
8					10	SS	115		○	γ = 26.0 kN/m³	
9		- Rock fragments in spoon sample 11			11	SS	100/0.24		○		
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH29

LOCATION: N 4860037.44; E 683746.14

BORING DATE: September 13 and 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring, HWT Casing	**Silty Sand with Gravel (SM)** with cobbles and boulders, medium dense to very dense, brown to grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)									
		- Rock fragments in spoon sample 12			12	SS	175/0.23		○	▼ = 25.1 kN/m³	
11				75.68							
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		11.59							
12					13	SS	129		○		
13											
14					14	SS	163		○		6 49 44 1
				72.56							
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		14.71							
15					15A				⊢—○—⊣		6 8 47 40
				71.69							
		Silty Sand (SM) to Sandy Silt (ML), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		15.58	15B	SS	61		○		
16											
				70.28							
17		**Lean Clay (CL)**, very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		16.99							
18											
					16	SS	25		○		
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH29

SHEET 3 OF 4

LOCATION: N 4860037.44; E 683746.14

BORING DATE: September 13 and 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Till) (Unit 5)		67.23 / 20.04							
		- Rock fragments in spoon sample 17									
21											
		- Rock fragments in spoon sample 18			17	SS	157		○ ⊢—⊣		7 36 43 14
22											
				64.31							
23		**Shale Bedrock Fragments** (Unit 6a)		22.96	18	SS	151/0.19		○		
				64.08 / 23.19							
		- Bedrock cored from 23.19 m to 30.51 m depth									
		- Refer to Record of Drillhole BH29.									
24		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860037.44; E 683746.14
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH29

DRILLING DATE: September 15, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.31																
23		Shale Bedrock fragments		22.96 / 64.08																
	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with thin grey limestone interbeds		23.19	1							BD,PL,RO SA	1.5	2	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,UN,RO SA	3	2	22					
24												BD,PL,SM CC,CL	1	4	12					
					2							BD,PL,SM	1	1	16					
25												BD,PL,SM	1	1	16					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
26												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
												BD,PL,SM	1	1	16					
				60.64 / 26.63	3															
27		Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.										BD,UN,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
28					4							BD,UN,RO IN,CL	1	8	6					
29												BD,UN,RO SO	3	1	25					
					5															
30												BD,PL,RO	1.5	1	20					
												BD,UN,RO	3	1	25					
				56.76																
		END OF DRILLHOLE		30.51																
31																				
32																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH30

SHEET 1 OF 4

LOCATION: N 4860005.21; E 683756.58

BORING DATE: September 16 and 17, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		86.55							
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, grey and black, moist, fine to coarse sand, subangular to angular fine gravel (Fill) (Unit 1)		0.00	1	SS	27		○		22 51 21 6
1					2	SS	15				
					3	SS	22		○		
2		**Silty Sand with Gravel (SM)** with cobbles and boulders, dense to very dense, grey, moist, fine to coarse sand, subangular fine to coarse gravel (Till) (Unit 3) - Auger grinding between 2.7 m and 3.0 m depth		84.42 2.13	4	SS	31		○		
3		- Granite rock fragments in spoon sample 5			5	SS	177		○		
	Mud Rotary Wash Boring, HWT Casing	- Auger grinding between 3.5 m and 3.8 m depth - Rock fragments in spoon samples 6, 7 , 8, 9 , 10 , 11, 12 and 13A - Casing grinding intermittently throughout			6	SS	170		○ ⊢⊣		25 39 29 8
4					7	SS	123		○		
5					8	SS	73		○	γ = 24.8 kN/m³	
6					9	SS	138		○		
7											
8					10	SS	74		○		
9					11	SS	59		○	γ = 23.8 kN/m³	16 46 32 7
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH30

SHEET 2 OF 4

LOCATION: N 4860005.21; E 683756.58

BORING DATE: September 16 and 17, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring, HWT Casing	**Silty Sand with Gravel (SM)** with cobbles and boulders, dense to very dense, grey, moist, fine to coarse sand, subangular fine to coarse gravel (Till) (Unit 3)									
11		- Casing grinding intermittently throughout			12	SS	81		○		
12					13A				○		
		Silty Sand (SM), very dense, grey, wet, fine to coarse sand, subangular fine gravel (Glaciolacustrine) (Unit 4a)		74.05 / 12.50	13B	SS	83		○		13 70 15 2
13		**Silty Sand with Gravel (SM)** with cobbles and boulders, very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		73.37 / 13.18							
14		- Casing grinding - Rock fragments in spoon sample 14			14	SS	82		○ H		22 43 30 6
15		**Lean Clay (CL)**, hard, grey, moist, trace fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.84 / 14.71	15	SS	48		⊢○⊣	▼ = 22.3 kN/m³	1 6 51 42
16											
17		**Silt with Sand (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		69.56 / 16.99							
18					16A	SS	143/0.29		⊢D⊣		3 17 65 15
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		67.96 / 18.59	16B				○	▼ = 20.9 kN/m³	
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH30

SHEET 3 OF 4

LOCATION: N 4860005.21; E 683756.58

BORING DATE: September 16 and 17, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)** with cobbles and boulders, hard, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 5)		66.51 / 20.04							
21		- Rock fragments in spoon sample 17 - Casing grinding			17	SS	120		○⊢		13 38 38 11
22		**Shale Bedrock fragments** (Unit 6a) - Bedrock cored from 22.33 m to 30.67 m depth - Refer to Record of Drillhole BH30.		64.34 / 22.21 / 22.33	18	SS	100/ 0.13		○		
23		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
24											
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860005.21; E 683756.58
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH30

DRILLING DATE: September 20, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.34																
		Shale Bedrock fragments		22.21																
		Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin grey limestone interbeds		22.33																
					1							BD,PL,RO SA	1.5	2	20					
												BD,UN,RO SA	3	2	22					
23												BD,UN,RO SA	3	2	22					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
					2							BD,PL,RO SA	1.5	2	20					
24												BD,PL,RO	1.5	1	20					
												BD,UN,RO SO	3	1	25					
												BD,PL,RO	1.5	1	20					
25					3							BD,UN,RO	3	1	25					
26																				
					4															
27												BD,PL,RO SA	1.5	2	20					
												BD,UN,RO CC,CL	3	4	20					
28				58.47								BD,UN,RO IN,CL	1	6	6					
		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.		28.08	5															
29												BD,UN,RO SA	3	2	22					
					6															
30												BD,UN,RO SA	3	2	22					
				55.88																
				30.67																
31																				
32																				

Rotary Drill
HQ3 Core

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH50-1

SHEET 1 OF 1

LOCATION: N 4860163.42; E 683797.42

BORING DATE: July 27 to 28 and August 23 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		90.20							GR SA SI CL
0		See Record of Borehole BH50-3 for soil stratigraphy		0.00							Concrete Casing 50 mm Dia. Monitoring Well
1											Bentonite Seal
											Grout
2											January 05, 2022
3											Bentonite Seal
4											
5											Silica Sand Filter
6											
7				83.19							
		NOTES: 1. Methane (CH4) and Carbon Monoxide (CO) were detected at surface by a portable gas monitor (GX-6000) during drilling of BH50-1 at a depth of approximately 7.3 m. Concentrations exceeded health and safety trigger levels of the on-site gas monitor which led to stoppage of all field activities for approximately 15 minutes until the gas dissipated below action levels. 2. Gas bubbling was observed during monitoring well development on October 27 and 28, 2021. 3. Water level measured in the monitoring well at a depth of 2.01 m below ground surface (Elev. 88.19 m) on January 05, 2022.		7.01							
8											
9											
10											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH50-2

SHEET 1 OF 2

LOCATION: N 4860163.42; E 683797.42

BORING DATE: July 27 to 28 and August 23 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		90.20							
0		See Record of Borehole BH50-3 for soil stratigraphy		0.00							Concrete Casing 50 mm Dia. Monitoring Well; Bentonite Seal
1											
2											January 05, 2022
3											
4											
5											Grout
6											
7											
8											
9											
10											Bentonite Seal

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH50-2

SHEET 2 OF 2

LOCATION: N 4860163.42; E 683797.42

BORING DATE: July 27 to 28 and August 23 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10		See Record of Borehole BH50-3 for soil stratigraphy									Bentonite Seal
11											
12											
13											
14											Silica Sand Filter
15											
16											
17				73.13							
		NOTE: 1. Water level measured in the monitoring well at a depth of 1.92 m below ground surface (Elev. 88.28 m) on January 05, 2022.		17.07							
18											
19											
20											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860163.42; E 683797.42

RECORD OF BOREHOLE: BH50-3

SHEET 1 OF 13

BORING DATE: July 27 to 28 and August 23 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		90.20							
0	Power Augering; 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense to dense, brown, moist, fine to coarse sand, subrounded to angular fine gravel (Fill) (Unit 1)		0.00	1A	SS	16				Concrete 50 mm Dia. Monitoring Well Bentonite Seal
					1B						
1		- Organic inlusions between 1.1 m and 2.9 m			2A	SS	34				
					2B						
		Lean Clay with Sand (CL), stiff, brown, oxidation staining, moist, fine to coarse sand, subangular fine gravel (Glaciolacustrine) (Unit 2a)		88.60 / 1.60	3A	SS	12				
					3B						7 30 44 20
2		**Sandy Silt (ML)**, with cobbles and boulders, very dense, brown to grey, moist to wet, fine to coarse sand, subrounded to subangular fine gravel (Till) (Unit 3)		88.07 / 2.13	4	SS	100/ 0.14				
		- Cored through granite cobble between 2.6 m and 2.74 m depth									
3		- Wet between 2.9 m and 4.6 m depth			5	SS	63			NP	
4	Mud Rotary Wash Boring; HWT Casing				6	SS	116				
		- Becoming grey below 4.4 m depth			7A	SS	101				
5		- Wet silty sand layer from 4.4 m to 4.8 m depth			7B						
					8	SS	100/ 0.13				Grout 5 39 48 9
6					9	SS	100/ 0.05				
7		- Spoon sample 10 refusal/bouncing at 7.6 m depth			10A	SS					January 05, 2022
8		- Cored between 7.62 m and 9.14 m depth to advance past obstruction									
		- Granite and limestone cobbles between 7.62 m and 7.75 m depth									
		- Clay recovered from bottom of core run		81.21							
9		**Lean Clay with Sand (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		8.99	10B	SS					
					11	SS	163/ 0.23				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH50-3

SHEET 2 OF 13

LOCATION: N 4860163.42; E 683797.42

BORING DATE: July 27 to 28 and August 23 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Lean Clay with Sand (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		79.46	12A	SS	90				
		Silty Sand (SM) to Sandy Silt (ML), very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		10.74	12B						
11											
12											
					13	SS	183				
13											
14					14	SS	123			NP	0 36 63 0
15											Grout
					15	SS	161				
16											
17					16	SS	188/0.23				
				72.48							
18		**Lean Clay with Sand (CL)**, hard, grey, moist, fine sand, low to medium plasticty (Glaciolacustrine) (Unit 4b)		17.72							
					17A	SS	78				
		Sandy Silt (ML),, very dense, grey, wet, fine sand (Glaciolacustrine) (Unit 4a)		71.63 / 18.57	17B						
				18.69	17C						
19		**Lean Clay (CL)**, very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
				70.24	18A						
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH50-3

LOCATION: N 4860163.42; E 683797.42

BORING DATE: July 27 to 28 and August 23 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

BORING METHOD: Mud Rotary Wash Boring, HWT Casing

DEPTH SCALE METRES	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLE NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
	--- CONTINUED FROM PREVIOUS PAGE ---						GR SA SI CL
20	**Silt (ML)**, medium dense, grey, wet (Glaciolacustrine) (Unit 4a)	19.96	18B	SS	22		
	Lean Clay with Sand (CL), hard, grey, moist, fine sand, medium plasticity (Glaciolacustrine) (Unit 4b)	20.04	18C				
21							
			19	SS	24	▼ = 20.7 kN/m³	Grout
22							
23			20A				
	Silt with Sand (ML), grey, dense, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)	67.14 23.06	20B	SS	100/ 0.1		
	Lean Clay with Sand (CL), hard, grey, moist to wet, fine to coarse sand (Glaciolacustrine) (Unit 4b)	66.45 23.75					
24							Bentonite Seal
	Silty Sand with Gravel (SM), dense to very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 5)	65.71 24.49	21A				
			21B	SS	47		
25							Silica Sand Filter
	- Shale rock fragments in tip of spoon sample 22						
26	- Bedrock cored from 26.17 m to 120.80 m depth		22	SS	100/ 0.1		25 40 29 7
	- Refer to Record of Drillhole BH50-3	64.03 26.17					
27							Bentonite Seal
28							
29							
30							

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Tri-level well installed on August 23 and 25, 2021.

3. Methane (CH4), Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs) were detected at surface by a portable gas monitor (GX-6000) during drilling of BH50-1 between depths of approximately 39.90 m and 49.10 m. Gas concentrations exceeded health and safety trigger levels of the on-site gas monitor. This subsequently led to 1 hour stoppage of all field activities until the gas dissipated below action levels.

4. Gas bubbling was observed during monitoring well development on October 28, 2021.

5. Water level measured in the monitoring well at a depth of 7.68 m below ground surface (Elev. 82.52 m) on January 05, 2022.

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10} 10^{-8} 10^{-6} 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl 10 20 30 40

DEPTH SCALE 1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.03																
27	Rotary Drill / HQ3 Core	Slightly weathered, thinly to medium bedded, dark grey, fine grained, faintly porous, slightly reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin, grey limestone interbeds. - Slake Durability Sample - Petrographic Analysis Sample		26.17	1							BD,UN,SM SA	2	2	20					
												BD,PL,SM SA	1	2	16					
												BD,PL,RO SA	1.5	2	20					
												BD,PL,SM SA	1	2	16					
												BD,PL,RO SA	1.5	2	20					
												JN,CU,SM	2	1	20					Bentonite Seal
												BD,PL,RO SA	1.5	2	20					
		- Slake Durability Sample			2															
28												BD,PL,SM	1	1	16					
				61.58																
		Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with thin to thin, dark grey, shale interbeds.		28.62								BD,PL,RO	1.5	1	20					
29																				
					3							BD,PL,RO	1.5	1	20					
30												BD,PL,RO	1.5	1	20					
												BD,UN,SM	2	1	20					
												BD,UN,RO IN, Br	1	5	0					
31					4															
												BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
32												BD,PL,RO	1.5	1	20					
					5															Grout
33												BD,UN,RO	3	1	25					
34												BD,UN,RO	3	1	25					
					6							BD,PL,RO SA	1.5	2	20					
												BD,UN,RO SA	3	2	22					
35																				
					7							BD,PL,RO	1.5	1	20					
36																				

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
37	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with thin to thin, dark grey, shale interbeds.			7						90	BD,PL,RO	1.5	1	20					Grout
38					8						90	BD,PL,RO	1.5	1	20					
39					9						90	BD,PL,RO	1.5	1	20					
40					10						90	BD,PL,RO	1.5	1	20					
41											90	BD,PL,SM	1	1	16					
42					11						90	BD,UN,SM	2	1	20					
43					12						90	BD,UN,SM	2	1	20					
44					13						90	BD,UN,SM	2	1	20					
45					14						90	BD,UN,SM	2	1	20					
46		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
47	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with thin to thin, dark grey, shale interbeds.			14															
48					15															
49					16							BD,PL,RO	1.5	1	20					
50																				
51					17							BD,PL,RO	1.5	1	20					Grout
												BD,UN,RO	3	1	25					
52					18															
53												BD,UN,RO BD,PL,RO	3 1.5	1 1	25 20					
54					19							BD,UN,SM	2	1	20					
55																				
					20															
56		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
57	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with thin to thin, dark grey, shale interbeds.			20															
58					21															
59					22							BD,PL,SM	1	1	16					
60					23															
61																				Grout
62		- UCS with Modulus Sample			24							BD,UN,SM	2	1	20					
63					25															
64																				
65					26							BD,PL,RO	1.5	1	20					
66					27															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
67	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with thin to thin, dark grey, shale interbeds.			27															
68					28							BD,UN,SM	2	1	20					
69					29															
70												BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
71					30															Grout
72					31							BD,UN,SM	2	1	20					
73		- Petrographic Analysis Sample																		
74					32															
75					33															
76																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
77	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with thin to thin, dark grey, shale interbeds.			33															
					34							JN,UN,RO	3	1	25					
												BD,UN,SM PC, Cl	2	4	16					
78					35															
79																				
80					36															
81																				Grout
82					37															
83					38															
84																				
85					39															
86					40							BD,CU,SM SA	2	2	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
87	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with thin to thin, dark grey, shale interbeds.			40															
88					41							BD,UN,RO	3	1	25					
89					42							BD,PL,RO	1.5	1	20					
90				-0.02																
91		Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds. - UCS with Modulus Sample		90.22	43							BD,UN,SM	2	1	20					Grout
92					44							BD,PL,RO SA	1.5	2	20					
93																				
94					45							BD,PL,RO SA	1.5	2	20					
95					46															
96		- Direct Shear Sample										BD,UN,RO	3	1	25					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
97	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds.			46															
					47							BD,UN,SM	2	1	20					
98					48															
99																				
100					49															
101		- Petrographic Analysis Sample			50															Grout
102																				
103					51															
104					52															
105																				
106					53															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds.			53															
107					54							BD,UN,SM	2	1	20					
108																				
109					55															
110		- UCS Sample																		
					56															
111												BD,UN,RO	3	1	25					Grout
112					57															
113																				
					58															
114																				
115					59							BD,PL,RO	1.5	1	20					
116																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860163.42; E 683797.42
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH50-3

DRILLING DATE: July 29 to August 10, 23 and 25, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
117	Rotary Drill / HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, medium strong shale interbeds.			60															
118					61							BD,UN,SM	2	1	20					Grout
119																				
120		- UCS with Modulus Sample		-30.60	62															
121		END OF DRILLHOLE		120.80																
122																				
123																				
124																				
125																				
126																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: MJT

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PROJECT: 21451329

RECORD OF BOREHOLE: BH51

SHEET 1 OF 5

LOCATION: N 4860322.01; E 683854.32

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE	99.06							
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, dark brown to black, moist, rootlets, organic inclusions, fine to coarse sand, angular to subangular fine to coarse gravel, shale fragments (Fill) (Unit 1)	0.00	1	SS	24		○		
		Lean Clay with Sand (CL), very stiff, brown, moist, fine to coarse sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)	98.36 / 0.70	2	SS	26		⊕⊣		2 24 51 24
1		**Silty Sand (SM)**, with cobbles and boulders, very dense, brown, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)	97.66 / 1.40	3	SS	69		○		
2				4	SS	159/0.27		○⊣		9 43 38 10
3		- Rock fragments in spoon samples 5, 6, 7, 8		5	SS	100/0.14		○		
4	Mud Rotary Wash Boring, HWT Casing	- Becoming grey below 4.32 m depth.		6	SS	100/0.10		○		
				7	SS	100/0.10		○		
5				8	SS	100/0.10		○		
6		**Silty Clayey Sand (SC-SM)**, very dense, grey, moist, fine to coarse sand, angular to subangular gravel, low plasticity (Till) (Unit 3)	93.21 / 5.85	9	SS	179/0.22		○⊣		12 40 36 13
7				10	SS	183		○		
8		-Rock fragments in spoon samples 9 and 10								
		Sandy Silt to Silt with Sand (ML), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)	90.44 / 8.62							
9				11	SS	82		○	▼ = 17.1 kN/m³	0 28 68 4
10		*CONTINUED NEXT PAGE*								

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860322.01; E 683854.32

RECORD OF BOREHOLE: BH51

SHEET 2 OF 5

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Silt to Silt with Sand (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)									
				88.16	12A	SS	167/0.29				
11		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b)		10.90	12B						
12											
					13	SS	122			γ = 23.1 kN/m³	1 14 66 18
13				85.87							
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, subangular to angular, fine to coarse gravel (Till) (Unit 3)		13.19							
14					14	SS	158			γ = 24.6 kN/m³	10 35 42 14
15					15	SS	100/0.05				
16											
17				82.00							
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		17.06							
18		- Trace rock fragments in spoon sample 16			16	SS	136/0.29				17 49 31 3
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860322.01; E 683854.32

RECORD OF BOREHOLE: BH51

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊖W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)									
21					17	SS	98		○	γ = 17.5 kN/m³	
22											
23											
24					18	SS	100/0.11		○		0 59 39 2
25											
26		**Lean Clay (CL)**, hard, grey, moist, trace fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		73.00 / 26.06							
27					19	SS	35		⊖		0 4 48 48
28											
29		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5)		69.83 / 29.23							
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH51

LOCATION: N 4860322.01; E 683854.32

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}); WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION; GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
30	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5)									
					20	SS	121		○⊢⊣		7 30 46 17
31											
32											
33		- Rock fragments in bottom of spoon sample 21. - Bedrock cored from 33.64 m to 41.30 m depth. - Refer to record of drillhole BH51		65.42 33.64	21	SS	100/0.03				
34		NOTES: 1. Water encountered at a depth of 3.66 m during drilling. 2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: LT

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860322.01; E 683854.32
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH51

DRILLING DATE: October 1, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DIP w.r.t. CORE AXIS (0 30 60 90)	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		65.42																
34	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with very thin to thin, grey, limestone interbeds. - UCS Sample - UCS with Modulus Sample at 33.64 m - Direct Shear Sample		33.64	1							BD,PL,RO SA	1.5	2	20					
					2							BD,PL,RO SA	1.5	2	20					
												BD,UN,RO SO	3	1	25					
												BD,UN,RO SO	3	1	25					
												BD,UN,RO SA	3	2	22					
35												BD,UN,RO SA	3	2	22					
												BD,UN,RO SO	3	1	25					
				63.81																
		Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.		35.25																
36					3							BD,UN,RO SA	3	2	22					
37					4							BD,UN,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
38																				
39					5							BD,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
40		- Direct Shear Sample			6															
41				57.76																
		END OF DRILLHOLE		41.30																
42																				
43																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

PROJECT: 21451329

LOCATION: N 4860295.79; E 683766.61

RECORD OF BOREHOLE: BH52

SHEET 1 OF 5

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		97.26							
0	Power Augering; 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, medium dense, brown, moist, fine to coarse sand, subangular to rounded fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	17		○		
1					2	SS	19		○		
		Sandy Lean Clay (CL-ML) hard, brown, moist, fine to coarse sand, low plasticity (Glaciolacustrine) (Unit 2a) - Spoon refused at 1.61 m depth		95.89 1.37	3	SS	15/ 0.14		○⊢—⊣		11 39 37 14
2		- Auger grinding at 1.61 m depth		95.31 1.95							
		Sandy Silt (ML) with cobbles and boulders, very dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)			4	SS	100/ 0.14		○		
3	Mud Rotary Wash Boring/Tri-cone; HWT Casing				5	SS	100/ 0.13		○		
4		- Becoming grey below 3.96 m depth			6	SS	100/ 0.13		⊢○⊣		8 38 46 8
5											
6		- Casing grinding between 5.78 m and 5.95 m depth			7	SS	188		○		
7		- Casing grinding between 7.32 m and 7.47 m depth			8	SS	100/ 0.14		○		
8											
9					9	SS	100/ 0.12		○		
10				87.29							

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860295.79; E 683766.61

RECORD OF BOREHOLE: BH52

SHEET 2 OF 5

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring/Tri-cone; HWT Casing	**Sandy Lean Clay (CL)**, very dense, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 3)		9.97	10	SS	100/0.11		W		7 36 43 14
11				85.76							
		Silt (ML), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		11.50							
12					11	SS	168/0.25				
13											
14					12	SS	100/0.10				0 9 76 15
15		- Increases in plasticity below 15.2 m depth.			13	SS	136			γ = 21.7 kN/m³	
16											
17											
18				78.93	~~14A~~						
		Silt (ML), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		18.33	14B	SS	100/0.07				
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH52

SHEET 3 OF 5

LOCATION: N 4860295.79; E 683766.61

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring/Tri-cone; HWT Casing	**Silt (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)									
21					15	SS	100/0.07		○	▼ = 21.9 kN/m³	0 13 84 3
22											
23											
24					16	SS	100/0.14		○		
25											
26		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5)		71.28 / 25.98							
27					17	SS	160		○⊢⊣		1 26 59 15
28											
29											
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH52

SHEET 4 OF 5

LOCATION: N 4860295.79; E 683766.61

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	Mud Rotary Wash Boring/Tri-cone; HWT Casing	**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5)			18	SS	195/0.24		○		
31				65.97 / 31.29	19	SS	100/0.01				
		Granite Boulder cored between 31.27 m and 31.73 m - Bedrock cored from 31.73 m to 40.23 m depth		65.53 / 31.73							
32		- Refer to Record of Drillhole BH52 NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860295.79; E 683766.61
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH52

DRILLING DATE: October 7, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		65.53																
32	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly bedded to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds.		31.73	1							BD,PL,SM SA BD,PL,SM SA BD,UN,RO PC,CL BD,UN,RO PC,CL	1 1 3 3	2 2 4 4	16 16 20 20					
33		- UCS Sample										BD,UN,RO SA BD,UN,RO SA BD,UN,RO SA BD,UN,RO SA	3 3 3 3	2 2 2 2	22 22 22 22					
				63.38																
34		Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.		33.88								BD,PL,RO SA BD,UN,RO SA	1.5 3	2 2	20 22					
35					2							BD,UN,RO PC,CL BD,UN,RO PC,CL BD,UN,RO SA BD,UN,RO BD,UN,RO	3 3 3 3 3	4 4 2 1 1	20 20 22 25 25					
36																				
37																				
38					3							BD,UN,RO	3	1	25					
39												BD,UN,RO SA	3	2	22					
40					4															
				57.03																
		END OF DRILLHOLE		40.23																
41																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH53

SHEET 1 OF 9

LOCATION: N 4860234.64; E 683786.79

BORING DATE: September 21 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		96.07							GR SA SI CL
0	Power Auger, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Sandy Silty Clay (CL-ML)**, medium stiff, dark brown, rootlets, organics, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Fill) (Unit 1)		0.00	1	SS	14				
		Sandy Lean Clay (CL), medium stiff, brown, organic staining, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low to medium plasticity (Fill) (Unit 1)		95.46 / 0.61	2	SS	12				
1		**Silty Clayey Sand with Gravel (SC-SM)** with cobbles and boulders, medium dense to very dense, brown, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		94.93 / 1.14	3	SS	25				
2		- Rock fragments in spoon sample 4			4	SS	57				
		- Rock fragments recovered in samples 5			5	SS	78				
3	Mud Rotary Wash Boring, HWT Casing				6	SS	151/0.23				
4					7	SS	161				18 39 34 9
					8	SS	137				
5					9	SS	149/0.23				
		- Becoming grey below 5.5 m depth			10	SS	82				
6		- Rock fragments recovered in samples 10			11	SS	88				
		- Casing grinding between 5.8 m and 6.1 m depth			12	SS	119				
7		**Sandy Silty Clay (CL-ML)** with cobbles and boulders, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 3)		88.83 / 7.24	13	SS	100/0.13				10 31 46 13
8					14	SS	100/0.13				
					15	SS	160/0.23				
9		- Rock fragments in spoon samples 16 and 17			16	SS	100/0.05				
					17	SS	100/0.13				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

RECORD OF BOREHOLE: BH53

SHEET 2 OF 9

LOCATION: N 4860234.64; E 683786.79

BORING DATE: September 21 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)** with cobbles and boulders, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 3)			18	SS	158/0.25			γ = 19.0 kN/m³	
				85.17 / 10.90							
11		**Lean Clay with Gravel (CL)**, hard, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low to medium plasticity (Till) (Unit 3)			19	SS	65				
					20	SS	94				12 10 49 29
12					21	SS	131/0.25				
13					22	SS	126				
					23	SS	90				
14				81.82 / 14.25	24	SS	188/0.25				
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		81.52 / 14.55							
		Lean Clay with Sand (CL), hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			25	SS	93				
15					26	SS	135				1 11 60 29
16					27A	SS	112				
				79.89 / 16.18	27B						
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			28	SS	191/0.28			γ = 23.2 kN/m³	
17					29	SS	179/0.28				
18					30	SS	170/0.28				
					31	SS	100/0.13				
19					32	SS	100/0.13				0 53 47 1
					33	SS	100/0.10				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH53

SHEET 3 OF 9

LOCATION: N 4860234.64; E 683786.79

BORING DATE: September 21 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			34	SS	100/0.13				
					35	SS	100/0.13				
21					36	SS	100/0.13				
22					37	SS	167				
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		73.59 / 22.48	38A	SS	180/0.28				
		Silt with Sand (ML), very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		73.26 / 22.81	38B						
23					39	SS	100/0.13			NP	0 26 72 3
24					40	SS	139				
		Lean Clay (CL), very stiff to hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		71.76 / 24.31	41	SS	40				6 5 46 43
25					42	SS	21				
					43	SS	29				
26		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5)		69.93 / 26.14	44	SS	186				2 20 62 16
27				68.97	45A	SS	157/0.25				
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		27.10 / 68.74 / 27.33	45B						
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5)			46	SS	171/0.25				
28					47	SS	135				
29					48	SS	111			γ = 24.5 kN/m³	7 36 43 14
					49	SS	157				
30					50	SS	144/				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH53

LOCATION: N 4860234.64; E 683786.79

BORING DATE: September 21 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5) - Rock fragments recovered in sample 51			50	SS	0.25 144/ 0.25		○		
					51	SS	100/ 0.13		○		
31		**Shale Bedrock Fragments** (Unit 6a) - Bedrock cored from 31.65 m to 80.99 m depth		64.93 / 31.14	52	SS	100/ 0.13				
		- Refer to Record of Drillhole BH53.		64.42 / 31.65							
32		NOTES: 1. Water first encountered at 3.60 m during drilling. 2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 3. Carbon Monoxide (CO) was detected at surface by a portable gas monitor (GX-6000) during drilling of BH53 at a depth of 22.5 m. Concentrations exceeded health and safety trigger levels of the on-site gas monitor which led to stoppage of all field activities for approximately 15 minutes until the gas dissipated below action levels.									
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860234.64; E 683786.79
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH53

DRILLING DATE: September 29 and 30, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.93									
	Rotary Drill, HQ3 Core	Shale Bedrock fragments	31.14 – 64.42									
32		Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds.	31.65	1		BD,PL,SM PC,CL	1	4	12			
				2		BD,UN,SM SA	2	2	20			
						BD,PL,RO SA	1.5	2	20			
						BD,PL,RO PC,CL	1.5	4	16			
33						BD,PL,RO PC,CL	1.5	4	16			
						BD,PL,RO PC,CL	1.5	4	16			
						BD,PL,RO SA	1.5	2	20			
						BD,UN,RO SA	3	2	22			
			62.42			BD,PL,RO SA	1.5	2	20			
		Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.	33.65									
34				3		BD,PL,RO SA	1.5	2	20			
						BD,PL,RO SA	1.5	2	20			
						BD,PL,RO SA	1.5	2	20			
						BD,PL,RO SA	1.5	2	20			
35						BD,PL,RO SA	1.5	2	20			
				4		BD,PL,RO SA	1.5	2	20			
36						BD,CU,RO SA	3	2	22			
						BD,CU,RO SA	3	2	22			
						BD,CU,RO	3	1	25			
37				5		BD,PL,RO SA	1.5	2	20			
38						BD,PL,RO SA	1.5	2	20			
						BD,UN,RO SA	3	2	22			
				6		BD,UN,RO	3	1	25			
39						BD,UN,RO	3	1	25			
						BD,CU,RO	3	1	25			
						BD,UN,RO SA	3	2	22			
40				7		BD,UN,RO	3	1	25			
						BD,UN,RO	3	1	25			
						BD,UN,RO	3	1	25			
41						BD,UN,RO SA	3	2	22			

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860234.64; E 683786.79
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH53

DRILLING DATE: September 29 and 30, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill / HQ3 Core	Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.			7															
42					8							BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
43					9							JN,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
44					10							BD,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
45					11							BD,UN,RO	3	1	25					
46												BD,UN,RO	3	1	25					
47					12															
48					13															
49					14															
50												BD,CU,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
51												BD,UN,RO SA	3	2	22					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860234.64; E 683786.79
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH53

DRILLING DATE: September 29 and 30, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.			14															
52																				
					15															
53																				
54					16															
											•	BD,UN,RO SA	3	2	22					
55																				
					17															
56																				
57					18															
58																				
					19															
59		- UCS Sample																		
60					20															
61																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860234.64; E 683786.79
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH53

DRILLING DATE: September 29 and 30, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
62	Rotary Drill HQ3 Core	Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.			21															
63					22							BD,UN,RO	3	1	25					
64												BD,UN,RO	3	1	25					
												BD,UN,RO CC,CL	3	4	20					
65					23							BD,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
66					24															
67																				
68					25															
69												BD,UN,RO SA	3	2	22					
					26															
70																				
					27															
71													3	1	25					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860234.64; E 683786.79
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH53

DRILLING DATE: September 29 and 30, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.										BD,UN,RO								
					27							BD,UN,RO SA	3	2	22					
72					28															
73												BD,UN,RO SA	3	2	22					
74					29															
75												BD,UN,RO	3	1	25					
		- UCS with Modulus Sample			30															
76												BD,UN,RO SA	3	2	22					
77					31							BD,IR,RO SA	3	2	22					
78																				
					32							BD,CU,RO	3	1	25					
												BD,UN,RO SA	3	2	22					
79																				
80					33							BD,UN,RO SA	3	2	22					
81		END OF DRILLHOLE		15.08 80.99																

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860232.80; E 683885.34

RECORD OF BOREHOLE: BH54

SHEET 1 OF 5

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 55 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		96.67							GR SA SI CL
0	Power Augering, 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, brown, organic staining, rootlets, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	29		○		
		- Rock fragments in spoon sample 1		95.97 / 0.70							
1		**Silty Sand with Gravel (SM)** with cobbles and boulders, dense to very dense, brown, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)			2	SS	55		○		
					3	SS	46		○		
2					4	SS	58		○		15 40 36 8
3	Mud Rotary Wash Boring, HWT Casing	- Rock fragments in spoon samples 3 and 5			5	SS	137		○		
		- Becoming grey below 3.66 m depth									
4		- Faint oxidation, staining to 3.66 m depth			6	SS	173/ 0.22		○	γ = 24.2 kN/m³	
					7	SS	100/ 0.13		○		
5					8	SS	100/ 0.11		○		
6					9	SS	100/ 0.04		○		
7		**Lean Clay (CL)**, hard, grey, moist, fine to coarse sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		89.67 / 7.00	10A	SS	98		⊢○⊣		2 9 65 24
8		**Silty Sand with Gravel (SM)**, very dense, grey, moist to wet, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)		88.68 / 7.99	10B				○		
9					11	SS	117		○		
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860232.80; E 683885.34

RECORD OF BOREHOLE: BH54

SHEET 2 OF 5

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 55 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM)**, very dense, grey, moist to wet, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)									
11					12	SS	83		○		
12		- Rock fragments in spoon sample 13, spoon bouncing			13	SS	100/0.13				
13		**Sandy Silt (ML)**, very dense, grey, wet, fine to coarse sand, trace angular to subangular fine gravel (Glaciolacustrine) (Unit 4a)		83.58 / 13.09							
14					14	SS	190/0.25		○		4 34 58 4
15		**Silty Clay (CL-ML) and Sandy Silt (ML)** layered, hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b)		81.98 / 14.69	15	SS	195/0.23		⊢○⊣	▼ = 22.5 kN/m³	0 11 72 17
16											
17											
18		**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		79.14 / 17.53	16	SS	100/0.14		○	▼ = 21.8 kN/m³	
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860232.80; E 683885.34

RECORD OF BOREHOLE: BH54

SHEET 3 OF 5

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 55 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
21					17	SS	185/ 0.24		○	γ = 21.9 kN/m³	
22											
23				73.54							
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		23.13							
24					18	SS	43		⊢—○—⊣		0 2 64 33
25											
26											
27					19A	SS	125/ 0.29		○		
		Sandy Silty Clay (CL-ML), hard, grey, wet, fine to coarse sand, subangular to angular fine gravel, low plasticity (Till) (Unit 5)		68.93 / 27.74	19B				○		
28											
29											
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860232.80; E 683885.34

RECORD OF BOREHOLE: BH54

SHEET 4 OF 5

BORING DATE: October 5 to 7, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 55 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)**, hard, grey, wet, fine to coarse sand, subangular to angular fine gravel, low plasticity (Till) (Unit 5)			20	SS	198/ 0.24		W		7 25 58 10
31											
32				64.11							
		Granite Cobble		32.56							
		- Bedrock cored from 32.72 m to 40.99 m depth.		32.72							
33		- Refer to Drillhole BH54									
		NOTES:									
		1. Water encountered at a depth of 3.38 m during drilling									
34		2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860232.8; E 683885.34
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH54

DRILLING DATE: October 8, 2021
DRILL RIG: Diedrich 55 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		63.95																
33	Rotary Drill HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with thin grey limestone interbeds. - UCS Sample		32.72	1							BD,UN,SM SA BD,UN,SM SA	2 2	2 2	20 20					
34		- UCS with Modulus Sample			2							BD,UN,RO SA	3	2	22					
				61.92																
35		Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.		34.75								BD,UN,RO SA	3	2	22					
36		- UCS Sample			3							BD,UN,RO SA BD,UN,RO SA BD,UN,RO CC, CL	3 3 3	2 2 4	22 22 20					
37					4							BD,UN,RO SA	3	2	22					
38																				
39					5							BD,UN,RO SA	3	2	22					
40					6							BD,UN,RO SA	3	2	22					
41				55.68								BD,UN,RO SA	3	2	22					
		END OF DRILLHOLE		40.99																
42																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860210.13; E 683813.68

RECORD OF BOREHOLE: BH55

SHEET 1 OF 5

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		95.28							GR SA SI CL
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, grey to dark brown, trace of rootlets and organics, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1A	SS	15				
				94.76							
		Sandy Lean Clay with Gravel (CL), very stiff, dark brown, organic staining, rootlets, fine to coarse sand, angular to rounded fine to coarse gravel, low to medium plasticity (Fill) (Unit 1)		0.52	1B				○		
1					2	SS	16				
				93.88							
		Silty Sand (SM) to Sandy Silt (ML), medium dense to very dense, brown, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)		1.40	3	SS	27		○		
2		- Intermittent casing grinding between 2.01 m and 3.04 m									
3	Mud Rotary Wash Boring; PWT Casing	- Becoming grey below 3.32 m depth - Subrounded coarse gravel at 3.32 m			1	PMT					
4					4	SS	175/ 0.26		○		14 40 37 10
5											
6											
7					2	PMT					
					5	SS	100/ 0.11		⊢⊕		7 39 42 13
		- Spoon bouncing at 7.75 m depth									
8											
9				86.07							
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		9.21	3	PMT					
10											
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860210.13; E 683813.68

RECORD OF BOREHOLE: BH55

SHEET 2 OF 5

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; PWT Casing	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			3	PMT					
					6	SS	100/0.12		○	γ = 22.8 kN/m³	7 56 33 5
11											
12				82.93 / 12.35							
		Silty Clay (CL-ML), hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b)									
13					4	PMT					
14					7	SS	76		⊢○⊣		1 11 68 20
15											
16					5	PMT					
				78.49 / 16.79	8A				○		
17		**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			8B	SS	146		○	γ = 22.4 kN/m³	
18											
				76.72 / 18.56							
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
19					6	PMT					
					9	SS	100/0.11		○		
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860210.13; E 683813.68

RECORD OF BOREHOLE: BH55

SHEET 3 OF 5

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; PWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
21				73.88							
		Silt with Sand (ML), very dense, grey, wet, fine sand (Glaciolacustrine) (Unit 4a)		21.40							
22					7	PMT					
23					10	SS	181		○		0 24 66 10
24											
				70.63							
		Silty Clay with Sand (CL-ML), very desne, grey, moist, fine to coarse sand, subrounded to angular fine to coarse gravel, low plasticity (Till) (Unit 5)		24.65							
25					8	PMT					
26					11	SS	180		○⊣		4 21 56 19
27											
28					9	PMT					
29					12	SS	173		○		
				65.38							
30				29.90							
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH55

LOCATION: N 4860210.13; E 683813.68

BORING DATE: September 29 to October 1, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	Mud Rotary Wash Boring; PWT Casing	**Silty Sand with Gravel (SM)**, very dense, gravel, moist, fine to coarse sand, subangular to angular fine to coarse sand (Unit 4a)			13	SS	113		○		34 43 19 5
		- Spoon sample 14 bouncing - Bedrock cored from 31.00 m to 40.11 m depth - Refer to Record of Drillhole BH55		64.28	14	SS	100/0.02				
31				31.00							
32											
33											
34											
35											
36											
37											
38											
39											
40											

NOTES:

1. Water encountered at 4.27 m depth during drilling.

2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860210.13; E 683813.68
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH55

DRILLING DATE: October 1, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.28																
31	Rotary Drill, HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds.		31.00								BD,PL,SM SA	1	2	16					
												BD,UN,RO SA	3	2	22					
32					1							BD,PL,RO SA	1.5	2	20					
33				62.03								BD,UN,RO	3	1	25					
		Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.		33.25																
34												BD,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
35					2															
36																				
												BD,UN,RO	3	1	25					
37																				
38					3															
39												BD,UN,RO SA	3	2	22					
												BD,UN,RO PC, CL	3	4	20					
40				55.17	4															
		END OF DRILLHOLE		40.11																
41																				

DEPTH SCALE
1 : 50

LOGGED: KL
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860170.21; E 683747.19

RECORD OF BOREHOLE: BH57

SHEET 1 OF 3

BORING DATE: September 21 to 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		89.77							GR SA SI CL
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	26		○		
				89.09							
1		**Sandy Lean Clay (CL)**, very stiff, brown to dark brown, organic staining, rootlets, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low to medium plasticity (Fill) (Unit 1)		0.68	2	SS	23		○		
		- Topsoil inclusions between 1.5 m and 1.65 m depth			3	SS	26		○		
2				87.64							
		Lean Clay (CL), very stiff to medium stiff, brown, moist, fine to coarse sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)		2.13	4	SS	13		○		
3	Mud Rotary Wash Boring, HWT Casing	- Trace of subangular fine gravel to 3.66 m - Trace of fine to medium sand below 3.66 m - Becoming grey and wet below 3.66 m depth			5	SS	20		○		
4					6	SS	5		⊢—○—⊣		0 9 48 43
5		- Attempted Shelby tube at 5.03 m and refused at 5.05 m depth						⊕ ⊕ + +			
					7	SS	6		○		
				83.83							
6		**Silty Clayey Sand (SC-SM)**, medium dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Glaciolacustrine) (Unit 2b)		5.94	8A	SS	29		○		
				83.55							
		Silty Sand (SM), medium dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		6.22	8B				○		13 43 34 10
7				82.68							
		Silty Sand (SM), very dense, grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 4a) - Rock fragments in spoon sample 9		7.09	9	SS	150		○	γ = 24.5 kN/m³	
8											
9					10	SS	165		○		4 51 41 5
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS/SC

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860170.21; E 683747.19

RECORD OF BOREHOLE: BH57

SHEET 2 OF 3

BORING DATE: September 21 to 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing			79.64							
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		10.13							
				78.90	11A	SS	136/0.29		○		
11		**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		10.87	11B				○		
12											
				77.25	12A				○		
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine sand, low plasticity (Glaciolacustrine) (Unit 4b)		12.52	12B	SS	139		○		
13				76.59							
		Silty Sand (SM) to Sandy Silt (ML), very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		13.18							
					13	SS	100/0.10		○		
14											
15											
					14A	SS	124		○		
					14B				○		
16											
17											
18		- Transitioning into silt with sand below 17.75 m									
		- Intermittent layers of lean clay and silt in samples 5, 14 and 15			15	SS	192/0.29		○		
19				70.49							
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine to coarse sand, angular fine gravel, low plasticity (Till) (Unit 5)		19.28							
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS/SC

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

RECORD OF BOREHOLE: BH57

SHEET 3 OF 3

LOCATION: N 4860170.21; E 683747.19

BORING DATE: September 21 to 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular fine gravel, low plasticity (Till) (Unit 5)									
21					16	SS	104				1 21 57 21
22											
23				66.78	17A						
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		22.99 / 66.55	17B						
				23.22	17C	SS	134				
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		65.92							
24		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Till) (Unit 5)		23.85							
					18	SS	38				6 24 50 21
25				64.72	19A	SS	100/0.10				
		Shale Fragments (Unit 6a)		25.09	19B						
		END OF BOREHOLE									
26		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS/SC

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH58

SHEET 1 OF 6

LOCATION: N 4860173.26; E 683877.49

BORING DATE: September 29 to October 5, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE	95.23					
0	Power Augering; 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand (SM)**, medium dense, brown, rootlets, organic staining, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Fill) (Unit 1)	0.00	1	SS	17		
		Silty Sand (SM), medium dense to very dense, brown, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)	94.62 / 0.61	2	SS	13		
1				3	SS	33		
2				4	SS	46		
				5	SS	54	γ = 23.7 kN/m³	
3	Mud Rotary Wash Boring; HWT Casing			6	SS	83		8 45 38 8
				7	SS	100/0.13		
4		- Oxidation staining to 4.26 m		8	SS	171/0.27		
5				9	SS	143/0.25		
		- Becoming grey below 5.48 m depth		10	SS	175/0.25		
6				11	SS	100/0.11		
7				12	SS	100/0.07		
				13	SS	100/0.10		
8				14	SS	100/0.10		
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)	86.85 / 8.38	15	SS	98		5 27 55 14
9				16	SS	141/0.25	γ = 27.2 kN/m³	
			85.58 / 9.65	17	SS	200/0.20		
10		*CONTINUED NEXT PAGE*						

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10} 10^{-8} 10^{-6} 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl; 10 20 30 40

DEPTH SCALE 1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH58

SHEET 2 OF 6

LOCATION: N 4860173.26; E 683877.49

BORING DATE: September 29 to October 5, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM)**, very dense, grey, moist to wet, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)			17	SS					
					18	SS	100/0.15				
				84.41 / 10.82							
11		**Silty Sand (SM) to Sandy Silt (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			19	SS	100/0.14				
					20	SS	100/0.12				0 56 43 1
12					21	SS	100/0.10				
13					22	SS	100/0.02			γ = 25.7 kN/m³	
				82.04 / 13.19							
		Lean Clay (CL), hard, grey, moist, fine to coarse sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			23	SS	148/0.29				
14					24	SS	143				0 2 70 28
15					25	SS	56				
					26	SS	80				
16					27	SS	101				
					28	SS	172/0.10				
17					29A	SS	100/0.12				
				77.95 / 17.28	29B						
		Silty Sand (SM) to Sandy Silt (ML), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
				77.36 / 17.87	30A	SS	100/0.11				
18		**Lean Clay (CL)**, hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			30B						
				77.10 / 18.13							
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			31	SS	200/0.25				
19					32	SS	171/0.3				
					33	SS	100/0.07				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860173.26; E 683877.49

RECORD OF BOREHOLE: BH58

SHEET 3 OF 6

BORING DATE: September 29 to October 5, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring, HWT Casing	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			34	SS	168			NP	0 78 20 2
21					35	SS	164				
					36	SS	146				
22					37	SS	132				
				72.71							
		Silt (ML), hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4a)		22.52	38	SS	163/0.25				0 6 74 19
23				72.07							
		Sandy Silt (ML), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		23.16	39A	SS	155				
					39B						
				71.49							
		Lean Clay with Sand (CL), very stiff to hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		23.74							
24					40	SS	62				
					41	SS	27				
25					42	SS	35				
		- Angular fine to coarse gravel below 25.60 m			43	SS	48				
26					44	SS	33				
				68.44							
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b)		26.79	45	SS	162/0.22				3 20 61 16
27					46	SS	100/0.11				
				67.29							
28		**Silty Sand (SM)** , very dense, grey, moist, fine to coarse sand, trace subangular fine gravel (Glaciolacustrine) (Unit 4a)		27.94	47	SS	100/0.12				
				66.70							
		Silt with Sand (ML), very dense, hard, grey, moist, fine to coarse sand, angular to subangular, fine to coarse gravel (Till) (Unit 5)		28.53	48	SS	145				
29					49	SS	100/0.11				5 21 61 13
		- Rock fragments in spoon sample 50			50	SS	100/				
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH58

LOCATION: N 4860173.26; E 683877.49

BORING DATE: September 29 to October 5, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	HWT Casing	**Silt with Sand (ML)**, very dense, hard, grey, moist, fine to coarse sand, angular to subangular, fine to coarse gravel (Till) (Unit 5) - Shale rock fragments in bottom of spoon sample 51			50	SS	0.11		○		
					51	SS	182/ 0.25		○		
				64.40							
31		- Bedrock core from 30.83 m to 41.05 m - Refer to record of Drillhole BH58		30.83							
32		NOTES: 1. Water encountered at 4.27 m depth during drilling. 2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860173.26; E 683877.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH58

DRILLING DATE: October 5, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	TOTAL CORE %	SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.40																
31	Rotary Drill, HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds. - UCS with Modulus Sample	30.83	1							BD,UN,RO SA	3	2	22					
											BD,UN,RO SA	3	2	22					
											BD,UN,RO SA	3	2	22					
											BD,UN,RO SA	3	2	22					
32				2							BD,UN,RO SA	3	2	22					
33											BD,UN,RO SA	3	2	22					
			61.93								BD,UN,RO IN, CL	1	15	0					
		Fresh, very thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds.	33.30																
34				3							BD,UN,RO SA	3	2	22					
35											BD,UN,RO SA	3	2	22					
36				4							BD,UN,RO	3	1	25					
37				5							BD,UN,RO	3	1	25					
											BD,UN,RO	3	1	25					
38											BD,UN,RO SA	3	2	22					
39				6							BD,UN,RO	3	1	25					
											BD,UN,RO PC, CL	3	4	20					
40				7							BD,UN,RO SA	3	2	22					

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860173.26; E 683877.49
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH58

DRILLING DATE: October 5, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
41				54.18	7															
		END OF DRILLHOLE		41.05																
42																				
43																				
44																				
45																				
46																				
47																				
48																				
49																				
50																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860147.00; E 683814.54

RECORD OF BOREHOLE: BH59

SHEET 1 OF 9

BORING DATE: June 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		89.94							
0	Power Augering, PT Casing	**Poorly Graded Sand with Gravel (SP)**, dense, brown, moist, medium to coarse sand, subangular fine to coarse gravel (Fill) (Unit 1)		0.00	1A						
				89.58		SS	33				
		Silty Sand (SM), dense, brown, moist, fine to medium sand, subrounded to subangular fine to coarse gravel (Fill) (Unit 1)		0.36	1B				○		5 50 35 10
					2A						
1					2B						
		Topsoil (Unit 1)		88.82 / 1.12	2C	SS	50				
		Lean Clay with Sand (CL), firm to soft, brown to dark brown, moist, fine to medium sand, trace subangular fine to coarse gravel, low to medium plasticity (Glaciolacustrine) (Unit 2a)		88.37 / 1.57	3A	SS	5				
2					3B				○		
		- Root fragments to 2.1 m depth			4	SS	3		⊢—○—⊣		
3					5A				○		
	Mud Rotary Washbore, HWT Casing	**Silty Sand with Gravel (SM)**, with cobbles and boulders, loose to very dense, grey, wet, fine to medium sand, subangular to subrounded fine to coarse gravel (Till) (Unit 3)		86.69 / 3.25	5B	SS	7				
4					6	SS	49				
					7	SS	149/0.1		○		
5		- Rock fragments in top of spoon sample 8 at 5.3 m depth			8	SS	100/0.13				
6		- Rock fragments in top of spoon sample 9 at 6.1 m depth			9	SS	100/0.14		○		
7											
		- Rock fragments in top of spoon sample 10 at 7.62 m depth			10	SS	162/0.23				
8											
		Sandy Silt (ML) to Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		81.37 / 8.57							
9					11	SS	95		○		
10											

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DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860147.00; E 683814.54

RECORD OF BOREHOLE: BH59

BORING DATE: June 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Washbore; HWT Casing	**Sandy Silt (ML) to Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
					12A	SS	133				
11					12B						
12											
					13	SS	149		○		0 69 30 1
13											
14					14	SS	157/0.28				
15					15	SS	100/0.14		○		
16											
17		- Clayey sand seam between 17 m and 17.1 m depth			16	SS	157/0.23				
18					17A						
		- Silt (ML) layer between 18.4 m and 18.6 m depth			17B	SS	143				
					17C						
19				70.66 / 19.28							
		Lean Clay (CL), very stiff, grey, moist, trace fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
					18	SS	19				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH59

SHEET 3 OF 9

LOCATION: N 4860147.00; E 683814.54

BORING DATE: June 24 to 28, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Washbore, HWT Casing	**Lean Clay (CL)**, very stiff, grey, moist, trace fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			18	SS	19		○		
21					19	SS	27		○⊢—⊣		
22				67.61 / 22.33							
		Poorly Graded Sand (SP), very dense, grey, wet, fine to medium sand, non-cohesive (Glaciolacustrine) (Unit 4a)									
23					20	SS	100/0.1		○		
				66.19 / 23.75							
		Silty Sand (SM), very dense, grey, moist, fine to medium sand, subangular fine to coarse gravel (Till) (Unit 5)									
24					21	SS	147/0.25		○		
25											
26				63.84	22A	SS	167				
	Rock Core, HQ3	**Shale Bedrock Fragments** (Unit 6a)		26.10	22B						
		- Bedrock cored from 26.10 m to 82.10 m depth		63.57 / 26.37							
		- Refer to Record of Drillhole BH59									
27		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860147; E 683814.54
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH59

DRILLING DATE: June 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	W1	W2	W3	W4	W5	W6
		TOP OF BEDROCK	63.84												
	Rotary Drill, HQ3 Core	Shale Bedrock Fragments	26.10	1											
27			62.90												
		Slightly weathered, very thinly to thinly bedded, dark grey, fine grained, faintly porous, slightly reactive to HCl, medium strong SHALE (Blue Mountain Formation) with light grey, medium strong to strong limestone interbeds.	27.04			BD,PL,SM	1	1	16						
		- UCS with Modulus Sample				BD,PL,SM	1	1	16						
28		- UCS with Modulus Sample at 27.04 m		2											
			61.58			BD,PL,SM	1	1	16						
		Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.	28.36			BD,PL,SM	1	1	16						
						BD,PL,SM	1	1	16						
						BD,PL,SM	1	1	16						
						BD,PL,SM	2	1	20						
						BD,UN,SM	3	1	25						
						BD,UN,RO									
29						BD,PL,SM	1	1	16						
				3											
30						BD,UN,RO	3	1	25						
						BD,PL,RO	1.5	1	20						
31				4		BD,UN,SM	2	1	20						
						BD,PL,SM	1	1	16						
32		- Overcore testing		5		BD,PL,SM	1	1	16						
33				6											
		- Overcore testing		7											
34				8		JN,PL,RO	1.5	1	20						
35				9											
36															

CONTINUED NEXT PAGE

FEATURES | R0/R1 ZONES | PIEZOMETER

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860147; E 683814.54
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH59

DRILLING DATE: June 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			9															
37					10															
38		- Overcore testing			11							BD,PL,RO BD,PL,RO	1.5 1.5	1 1	20 20					
39					12							BD,UN,RO SA	3	2	22					
		- Overcore testing			13															
40					14							BD,PL,RO	1.5	1	20					
41					15															
42																				
43		- Overcore testing			16							BD,UN,RO	3	1	25					
					17							BD,PL,RO SA	1.5	2	20					
44		- Overcore testing			18															
45					19							BD,PL,RO SO	1.5	1	20					
46					20															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860147; E 683814.54
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH59

DRILLING DATE: June 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
47	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			20															
48					21															
49					22															
50																				
51					23							BD,PL,RO	1.5	1	20					
52					24															
53																				
54					25							BD,PL,RO	1.5	1	20					
55					26															
56																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860147; E 683814.54
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH59

DRILLING DATE: June 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
57	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			26															
					27							BD,UN,RO	3	1	25					
58					28															
59																				
60					29															
61																				
62					30															
63					31															
64		- UCS Sample																		
					32							BD,PL,RO IN, Br	1	5	0					
65																				
					33															
66		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860147; E 683814.54
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH59

DRILLING DATE: June 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
67	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			33															
68					34															
69					35							BD,PL,RO	1.5	1	20					
70					36															
71					37															
72					38															
73					39															
74																				
75																				
76																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860147; E 683814.54
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH59

DRILLING DATE: June 21, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
77	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			39															
					40							BD,UN,RO IN, Br BD,UN,RO IN, Br	1 1	5 5	0 0					
78					41															
79																				
80					42															
81					43															
82				7.84																
		END OF DRILLHOLE		82.10																
83																				
84																				
85																				
86																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: TD
CHECKED: MT

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PROJECT: 21451329

RECORD OF BOREHOLE: BH60

SHEET 1 OF 7

LOCATION: N 4860201.10; E 683733.71

BORING DATE: August 12 and 13 and 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		90.17					
0	Mud Rotary Wash Boring; HWT Casing	**TOPSOIL (Fill)** (Unit 1)		0.00	1A				50 mm Dia. Monitoring Well; Concrete; Bentonite
		Poorly Graded Sand with Silt (SP-SM), medium dense, brown, moist, fine to medium sand, subangular fine gravel (Fill) (Unit 1)		0.08 / 89.84 / 0.33	1B, 1C	SS	12		
1		**Silty Sand with Gravel (SM)**, medium dense, brown, moist, fine to coarse sand, angular fine to coarse gravel (Fill) (Unit 1)		89.26 / 0.91	2A, 2B, 2C	SS	22		
		Lean Clay with Sand (CL), very stiff, dark brown to black, organic inclusions, moist, fine to medium sand, low to medium plasticity (Fill) (Unit 1)		88.80 / 1.37	3A				
2		**Silty Clay with Sand (CL-ML)**, medium stiff, brown, moist, fine to medium sand, subangular fine gravel, low plasticity (Fill) (Unit 1)		88.42 / 1.75	3B, 3C	SS	14		
		Silty Sand with Gravel (SM), medium dense, brown, moist, fine to coarse sand, subangular fine to coarse gravel (Fill) (Unit 1)		88.04 / 2.13	4A, 4B	SS	4		2 22 43 33
3		**Lean Clay with Sand (CL)**, firm, brown, moist, fine to coarse sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)		87.27 / 2.90					
		Silty Sand with Gravel (SM), with cobbles and boulders, very dense, brown to grey, moist to wet, fine coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)			5A, 5B	SS	80		
		- Becoming grey below 3.7 m			6A				
4		- Becoming wet below 4.0 m			6B	SS	102		
		- Rock fragments in spoon sample 7			7	SS	133	NP	36 31 27 6
5					8	SS	100/0.14		Grout
6		- Rock fragments in spoon sample 9			9	SS	100/0.08		
		- Casing grinding between 6.7 m and 7.6 m depth							
7									January 05, 2022
		- Rock fragments in spoon sample 10			10	SS	119		
8		**Lean Clay (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		81.94 / 8.23	11	SS	153/0.28		
9					12	SS	109		0 13 41 46
10		*CONTINUED NEXT PAGE*							

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80)

SHEAR STRENGTH Cu, kPa — nat V. + Q - ● ; rem V. ⊕ U - ○ (20, 40, 60, 80)

HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10}, 10^{-8}, 10^{-6}, 10^{-4})

WATER CONTENT PERCENT — Wp ⊢—○W—⊣ Wl (10, 20, 30, 40)

DEPTH SCALE 1 : 50

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH60

LOCATION: N 4860201.10; E 683733.71

BORING DATE: August 12 and 13 and 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Lean Clay (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
11					13	SS	91				
				78.51 / 11.66							
12		**Silty Sand (SM)**, very dense, grey, wet to moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			14	SS	183/0.25				0 66 32 2
13				77.01 / 13.16							
		Lean Clay (CL), hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			15A						
14		**Sandy Silt (ML)**, dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		76.28 / 13.89	15B	SS	47				
				75.46 / 14.71							
15		**Sandy Lean Clay (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			16A	SS	110				Grout
				74.55 / 15.62	16B						
16		**Sandy Silt (ML)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
17					17A / 17B / 17C	SS	171/0.25				
				72.44 / 17.73							
18		**Lean Clay (CL)**, hard, grey, moist, fine sand (Glaciolacustrine) (Unit 4b)			18A						
				71.70 / 18.47	18B / 18C	SS	109				
19		**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		70.89 / 19.28							
20		**Lean Clay (CL)**, very stiff, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			19	SS	17				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860201.10; E 683733.71

RECORD OF BOREHOLE: BH60

SHEET 3 OF 7

BORING DATE: August 12 and 13 and 27, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Terramac RT6

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Lean Clay (CL)**, very stiff, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			19	SS	17				
				69.37							
21		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, angular fine gravel, low plasticity (Till) (Unit 5)		20.80							
					20A	SS	90				
					20B						
22				67.84							
		Silty Sand (SM), very dense, grey, wet, fine to medium sand, subrounded fine to coarse gravel (Glaciolacustrine) (Unit 4a)		22.33							Grout
				67.16	21A	SS	167				
23		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Till) (Unit 5)		23.01	21B						
24					22	SS	188/0.1				13 36 39 13
25											Bentonite
				64.87	23	SS	100/0.08				
		Shale Bedrock Fragments (Unit 6a)		25.37							
26		- Bedrock cored from 25.30 m to 61.22 m depth - Refer to Record of Drillhole BH60.									
27											
28											
29											
30											

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Monitoring well installed on August 27, 2021.

3. Methane (CH4), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs) were detected at surface by a portable gas monitor (GX-6000) during drilling of BH60 between depths of 55.1 m and 62.2 m. Concentrations of CH4 exceeded health and safety trigger levels of the on-site gas monitor which led to stoppage of all field activities for 24 hours until the gases dissipated below action levels.

3. Gas bubbling was observed during monitoring well development on November 1, 2021.

4. Water level measured in the monitoring well at a depth of 7.37 m below ground surface (Elev. 82.80 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860201.1; E 683733.71
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH60

DRILLING DATE: August 13 to 17, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.87																
		Slightly weathered to fresh, very thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin, grey, limestone interbeds.		25.30																Bentonite
					1							BD,PL,RO	1.5	1	20					Sand
26																				
		- UCS Sample																		
												BD,PL,SM	1	1	16					
												JN,PL,RO	1.5	1	20					
												BD,PL,SM	1	1	16					
					2															
27																				
				62.85																
		Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.		27.32																Screen
28																				
					3							BD,PL,SM	1	1	16					
29																				Sand
												BD,UN,RO SA	3	2	22					
												BD,PL,RO	1.5	1	20					
30					4															
												BD,PL,RO	1.5	1	20					
31												BD,UN,RO	3	1	25					
					5							BD,UN,RO	3	1	25					
32																				Grout
												BD,PL,RO	1.5	1	20					
33					6															
		- Direct Shear Sample										BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
34																				
					7							BD,UN,RO	3	1	25					
35																				

Rotary Drill
HQ3 Core

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860201.1; E 683733.71
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH60

DRILLING DATE: August 13 to 17, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
36	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.			8							BD,PL,RO	1.5	1	20					
37					9							BD,PL,RO	1.5	1	20					
38												BD,UN,SM	2	1	20					
												BD,PL,RO BD,PL,RO	1.5 1.5	1 1	20 20					
39					10							BD,UN,SM	2	1	20					
40												BD,PL,RO	1.5	1	20					Grout
		- UCS with Modulus Sample			11															
41												BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
42					12							BD,UN,RO	3	1	25					
43												BD,UN,RO	3	1	25					
					13															
44																				
45					14															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860201.1; E 683733.71
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH60

DRILLING DATE: August 13 to 17, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
46	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.			14							BD,PL,RO	1.5	1	20					
												BD,UN,RO	3	1	25					
47					15							BD,PL,RO	1.5	1	20					
48					16							BD,UN,SM	2	1	20					
49					17							BD,PL,SM	1	1	16					
50												BD,PL,RO SA	1.5	2	20					Grout
51					18							BD,PL,RO	1.5	1	20					
52					19							BD,UN,SM	2	1	20					
												BD,PL,RO	1.5	1	20					
53																				
54					20							BD,PL,RO	1.5	1	20					
55					21															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860201.1; E 683733.71
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH60

DRILLING DATE: August 13 to 17, 2021
DRILL RIG: Terramac RT6
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
56	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, shale interbeds.			21							BD,PL,RO	1.5	1	20					
												BD,UN,RO	3	1	25					
												BD,PL,SM	1	1	16					
57					22							BD,PL,RO	1.5	1	20					
58																				Grout
					23							BD,UN,RO	3	1	25					
59																				
60					24							BD,PL,RO	1.5	1	20					
61				28.95																
		END OF DRILLHOLE		61.22																
62																				
63																				
64																				
65																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: ML
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860126.34; E 683831.47

RECORD OF BOREHOLE: BH61

SHEET 1 OF 7

BORING DATE: August 4 to 6, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		89.78							
0	Power Augering; 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Silt (SP-SM)**, and gravel, medium dense, brown, moist, fine to coarse sand, subangular fine to coarse gravel (Fill) (Unit 1)		0.00 / 89.27	1A	SS	27				
1		**Silty Sand with Gravel (SM)**, with cobbles, very dense to dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1) - Rock fragments in spoon sample 2 at 1.1 m depth - Organic staining below 1.5 m depth		0.51 / 87.65	1B, 2, 3	SS	84, 36				
2		**Lean Clay with Sand (CL)**, firm to medium stiff, brown, moist to wet, fine to coarse sand, angular to subangular fine gravel, low to medium plasticity (Glaciolacustrine) (Unit 2a)		2.13	4	SS	11			γ = 20.0 kN/m³	1 22 53 25
3	Mud Rotary Wash Boring; HWT Casing	- Becoming wet below 3.1 m depth		86.05	5A, 5B	SS	5				
4		**Silty Sand (SM) to Sandy Silt (ML)**, very loose, grey, wet, fine to coarse sand, subrounded to subangular gravel (Glaciolacustrine) (Unit 2b)		3.73	6, 7, 7S	CS, TO, CS	PH				
5					8	SS	1				8 42 39 11
		Silty Sand to Sandy Silt (ML), very dense, grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3) - Becoming wet below 5.9 m depth		84.29 / 5.49	9A, 9B	SS	142				
6					10	SS	100/0.13				7 43 42 8
7				81.91	11A	SS	125				
8		**Sandy Lean Clay with Gravel (CL)**, hard, grey, moist, fine to coarse sand, angular fine gravel, low to medium plasticity (Till) (Unit 3)		7.87	11B						
9					12	SS	106				20 26 32 22
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/GS

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH61

LOCATION: N 4860126.34; E 683831.47

BORING DATE: August 4 to 6, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Lean Clay with Gravel (CL)**, hard, grey, moist, fine to coarse sand, angular fine gravel, low to medium plasticity (Till) (Unit 3)		78.96	13A						
11		**Silt with Sand (ML)**, very dense, grey, moist, fine to coarse sand (Glaciolacustrine) (Unit 4a)		10.82 / 78.12	13B	SS	131				
		Sandy Lean Clay (CL), hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		11.66 / 77.51	14A						
12		**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		12.27	14B	SS	121				
13											
14					15	SS	100/0.14				5 67 28 1
15					16	SS	100/0.11				
16		**Lean Clay (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		73.55 / 16.23							
17					17	SS	62				
18		- 50 mm thick silt with sand (ML) layers at 18.3 m and 18.6 m			18A / 18B	SS	76				
19											
20					19	SS	31				1 5 46 48
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/GS

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860126.34; E 683831.47

RECORD OF BOREHOLE: BH61

SHEET 3 OF 7

BORING DATE: August 4 to 6, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring, HWT Casing	**Lean Clay (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			19	SS	31				1 5 46 48
				68.37	20A						
		Silt (ML), very dense, grey, moist, fine to coarse sand, angular fine to coarse gravel, low plasticity (Till) (Unit 5)		21.41	20B	SS	152/ 0.28				
22											
23					21	SS	100/ 0.13				1 12 74 14
24					22	SS	100/ 0.06				
25				64.18							
	Rock Core, HQ3	**Shale Bedrock Fragments** (Unit 6a)		25.60	23	SS	100/ 0.13				
				25.73							
26		- Bedrock cored from 25.73 m to 61.18 m depth - Refer to Record of Drillhole BH61									
27		NOTES: 1. Water encountered at a depth of 3.1 m during drilling. 2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC/GS

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860126.34; E 683831.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH61

DRILLING DATE: August 9 to 11, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.18																
		Shale Bedrock Fragments	25.60																
	Rotary Drill, HQ3 Core	Slightly weathered to fresh, very thinly to medium bedded, dark brownish-grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey limestone interbeds.	25.73	1							BD,PL,SM BD,PL,SM	1 1	1 1	16 16					
26											BD,PL,SM	1	1	16					
				2							BD,PL,RO	1.5	1	20					
27											BD,PL,SM Sa	1	2	16					
											BD,PL,SM	1	1	16					
28			61.43																
		Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.	28.35	3							BD,PL,SM	1	1	16					
29																			
30				4															
31				5															
32																			
33				6															
34				7							BD,UN,RO Sa	3	2	22					
35																			
				8															

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DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860126.34; E 683831.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH61

DRILLING DATE: August 9 to 11, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
36	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			8															
37					9															
38																				
39					10															
40					11															
41																				
42					12															
43					13															
44																				
45					14															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860126.34; E 683831.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH61

DRILLING DATE: August 9 to 11, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
46	Rotary Drill HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			14															
47					15															
48					16															
49					17															
50																				
51					18															
52																				
53					19															
54					20															
55					21															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860126.34; E 683831.47
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH61

DRILLING DATE: August 9 to 11, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
56	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to very strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.			21															
57					22															
58											•	BD,UN,SM	2	1	20					
											•	BD,UN,RO	3	1	25					
59					23															
60					24															
61				28.60																
		END OF DRILLHOLE		61.18																
62																				
63																				
64																				
65																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860126.69; E 683741.81

RECORD OF BOREHOLE: BH62

SHEET 1 OF 4

BORING DATE: September 21 to 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		88.88							GR SA SI CL
0	Power Augering, 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense to dense, brown, moist, fine to coarse sand, subangular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	28				50 mm Dia. Monitoring Well Bentonite Seal
1		- Rock fragments in spoon sample 2			2	SS	44				Sand
		Sandy Silt with Gravel (ML), medium dense, brown, organic stains, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Fill) (Unit 1)		87.70 / 1.18	3	SS	12				January 05, 2022; Screen
2					4	SS	35			▼ = 21.4 kN/m³	Sand
		Lean Clay with Sand (CL), medium stiff to very stiff, brown, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)		86.48 / 2.40	5	SS	12				
3	Mud Rotary Wash Boring, HWT Casing				6	SS	17				
		Sandy Silt (ML), medium dense to very loose, grey, moist to wet, fine to coarse sand, angular to subangular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		85.07 / 3.81	7A						
4					7B	SS	11				
					8	SS	3				
5					9	SS	WH				6 38 41 15
					10	SS	2				
6					11	SS	7				Grout
7					12	SS	14				
		Silty Sand (SM), medium dense to very dense, grey, fine to coarse gravel, subangular to angular fine to coarse gravel (Till) (Unit 3)		81.60 / 7.28	13	SS	14				
8					14	SS	126				
9					15	SS	136				11 41 39 9
					16	SS	159				
10					17	SS	180				

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860126.69; E 683741.81

RECORD OF BOREHOLE: BH62

SHEET 2 OF 4

BORING DATE: September 21 to 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing				17	SS	180				
				78.55							
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		10.33	18	SS	169				
11					19	SS	180				0 60 39 1
					20	SS	126			▼ = 21.7 kN/m³	
12					21	SS	100/ 0.139				
13					22	SS	100/ 0.127				
					23	SS	100/ 0.139				
				74.94							
14		**Lean Clay with Sand (CL)**, hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		13.94	24A						
		Sandy Silt (ML) to Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		14.11	24B	SS	180/ 0.25				
					25	SS	100/ 0.127				
15											Grout
					26	SS	171/ 0.241				
				73.13							
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		15.75	27	SS	81				0 3 68 29
16				72.33	28A	SS	164				
		Silty Sand (SM), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		16.55	28B						
17				71.85							
		Silt (ML), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		17.03 / 71.66	29A						
		Lean Clay (CL), hard to very stiff, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		17.22	29B	SS	173				
					29C						
18					30	SS	54				
					31	SS	41				
19					32	SS	24				
					33A						
					33B	SS	24				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

RECORD OF BOREHOLE: BH62

SHEET 3 OF 4

LOCATION: N 4860126.69; E 683741.81

BORING DATE: September 21 to 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4})	WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---											
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		68.80 / 20.08	34	SS	165					γ = 22.1 kN/m³	
					35A	SS	195/ 0.29						
21		**Silt with Sand (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		67.90 / 20.98	35B								
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 5)		67.63 / 21.25	36	SS	118						
22					37	SS	82						4 33 45 18
					38	SS	144						
23					39	SS	100/ 0.14						Grout
24					40	SS	183						
		Shale Bedrock Fragments (Unit 6a)		64.50 / 24.45	41	SS	100/ 0.06						
25		- Bedrock cored from 24.45 m to 25.88 m depth.											
		- Refer to record of drillhole BH62											
26													
27													
28													
29													
30													

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Monitoring well installed on September 29, 2021.

3. Water level measured in the monitoring well at a depth of 1.25 m below ground surface (Elev. 87.63 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860126.69; E 683741.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH62

DRILLING DATE: September 27, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.50																
		Shale Bedrock Fragments		24.38																
25	Rotary Drill / HQ3 Core	Slightly weathered thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin grey limestone interbeds. - Direct Shear Sample		24.45	1							BD,UN,RO SA BD,UN,RO	3 3	2 1	22 25					Grout
				63.00								BD,UN,RO SA BD,UN,RO SA	3 3	2 2	22 22					
26		END OF DRILLHOLE		25.88																
27																				
28																				
29																				
30																				
31																				
32																				
33																				
34																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH63

SHEET 1 OF 5

LOCATION: N 4860051.53; E 683768.83

BORING DATE: September 13 and 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		87.87							GR SA SI CL
0	Power Augering, 210 mm O.D. /110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, medium dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	17		○		
				87.19 / 0.68							
1		**Silty Sand with Gravel (SM)**, medium dense, brown with dark brown to brown topsoil, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)			2	SS	24		○		19 47 28 7
					3	SS	14		○		
2											
3	Mud Rotary Wash Boring, PWT Casing			84.59 / 3.28							
		Silty Sand with Gravel (SM), very dense, grey, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)			1	PMT					
4											
5					4	SS	166		○	γ = 24.3 kN/m³	21 41 30 7
6											
7					2	PMT					
8					5	SS	115		○	γ = 24.2 kN/m³	
9				78.50 / 9.37							
		Sandy Silt (ML), very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			3	PMT					
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS/KL

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH63

SHEET 2 OF 5

LOCATION: N 4860051.53; E 683768.83

BORING DATE: September 13 and 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; PWT Casing	**Sandy Silt (ML)**, very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			3	PMT					
11					6	SS	201		○	▼ = 20.3 kN/m³	0 32 57 11
12											
13		- Unsucessful PMT attempt at approximate depth of 13.2 m									
14					7	SS	279		○		
15											
16					4	PMT					
				70.97	8A	SS	43		○		
17		**Lean Clay (CL)**, hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		16.90	8B				⊢—○—⊣	▼ = 21.2 kN/m³	0 3 45 52
18				69.58							
		Silty Sand with Gravel (SM), very dense, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 5)		18.29							
19					5	PMT					
20					9	SS	110/0.15		○		
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS/KL

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH63

SHEET 3 OF 5

LOCATION: N 4860051.53; E 683768.83

BORING DATE: September 13 and 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; PWT Casing	**Silty Sand with Gravel (SM)**, very dense, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 5)									
21											
22		- Casing grinding heavily below 22.9 m depth - Spoon Sample 11 bouncing			6	PMT					
23		- Bedrock cored from 23.67 m to 41.15 m depth. - Refer to record of drillhole BH63			10	SS	100/ 0.19		○	γ = 25.6 kN/m³	
				64.20 / 23.67	11	SS	100/ 0.02				
24		NOTES: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 2. Subsoil conditions precluded PMT at approximate depth of 13.2 m.									
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS/KL

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860051.53; E 683768.83
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH63

DRILLING DATE: September 15, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.20																
24	Rotary Drill / HQ3 Core	Slightly weathered to fresh, very thinly to medium bedded, dark brownish-grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with grey limestone interbeds.	23.67	1							BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO SA	1.5	2	20					
25																			
26		- UCS Sample		2															
											BD,PL,RO	1.5	1	20					
											BD,PL,SM PC,CL	1	4	12					
27			60.77								BD,PL,SM SA	1	2	16					
		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.	27.10																
28																			
29																			
30				3							BD,UN,RO	3	1	25					
											BD,PL,RO	1.5	1	20					
31																			
32				4															
33											BD,UN,SM SA	2	2	20					
											BD,CU,SM SA	2	2	20					

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DEPTH SCALE
1 : 50

LOGGED: KL
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860051.53; E 683768.83
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH63

DRILLING DATE: September 15, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
34	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.			4							BD,UN,RO SA	3	2	22					
35																				
36					5															
37																				
38																				
39					6							BD,UN,RO	3	1	25					
												BD,UN,SM	2	1	20					
												BD,UN,RO	3	1	25					
40																				
41				46.72																
		END OF DRILLHOLE		41.15																
42																				
43																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860099.14; E 683829.81

RECORD OF BOREHOLE: BH65

SHEET 1 OF 13

BORING DATE: June 18 to 23 and August 6, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		89.32					
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**TOPSOIL** (Unit 1)		0.88					50 mm Dia. Monitoring Well
		Poorly Graded Sand with Gravel (SP), medium dense, brown, medium to coarse sand, subrounded coarse gravel (Fill) (Unit 1)		88.71	1	SS	12		
		Silty Sand with Gravel (SM), dense to very dense, grey, fine to medium sand, subrounded fine to coarse gravel (Fill) (Unit 1)		0.61	2	SS	39		
1					3	SS	54		
									January 05, 2022
2					4	SS	22		
		Lean Clay with Sand (CL) to Lean Clay (CL), very stiff to very soft, brown to grey, wet, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)		86.96 2.36	5	SS	13		1 17 60 22
3	Mud Rotary Wash boring; HWT Casing				6	TO CS	PH		
		- Pocket Penetrometer refusal (>5 kg/cm²) at 3.3 m depth at bottom of Shelby tube sample 6 - Oxidation staining to 3.5 m depth							
4		- Becoming grey below 3.5 m depth			7	TO	PB		Grout
		- Pocket Penetrometer (1.25 to 0.75 kg/cm²) at 4.4 m depth at bottom of Shelby tube sample 7			8	SS	2		0 4 45 51
		- No recovery in Shelby tube sample 9		84.29					
5		**Silty Clayey Sand with Gravel (SC-SM)**, very loose to loose, grey, fine to medium sand, fine to coarse subrounded to subangular gravel (Glaciolacustrine) (Unit 2b)		5.03	9	TO	PH		
					10	SS	2		
6					11	SS	WH		19 39 33 10
7					12	SS	6		
		Silty Sand with Gravel(SM), with cobbles and boulders, dense to very dense, grey, moist, fine to coarse sand, subangular fine gravel (Till) (Unit 3) - Rock fragments in spoon sample 13		82.05 7.27	13	SS	37		
8					14	SS	198	γ = 23.3 kN/m³	
		- Rock fragments in spoon sample 15			15	SS	135		Bentonite 20 32 39 9
9		**Silty Sand (SM)**, grey, very dense, wet, fine to medium sand, trace subrounded gravel (Glaciolacustrine) (Unit 4a)		80.25 9.07	16	SS	134		Sand
10					17	SS	179/0.25		5 73 21 0

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10} 10^{-8} 10^{-6} 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl; 10 20 30 40

CONTINUED NEXT PAGE

DEPTH SCALE 1 : 50

WSP GOLDER

LOGGED: GS/RV

CHECKED:

PROJECT: 21451329

LOCATION: N 4860099.14; E 683829.81

RECORD OF BOREHOLE: BH65

SHEET 2 OF 13

BORING DATE: June 18 to 23 and August 6, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)	GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---										
10	Mud Rotary Wash boring; HWT Casing	**Silty Sand (SM)**, grey, very dense, wet, fine to medium sand, trace subrounded gravel (Glaciolacustrine) (Unit 4a)			17	SS						5 73 21 0
					18	SS	181/0.25					
11					19	SS	200/0.28					
											Screen and Sand	
					20	SS	159					
12					21	SS	186/0.23					
				76.52								
13		**Sandy Silty Clay (CL-ML)**, hard, grey, fine sand, intermittent silt seams, low plasticity (Glaciolaustrine) (Unit 4b)		12.80	22A							
					22B	SS	85					
											Sand	
					23	SS	99					8 26 52 14
				75.38								
14		**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		13.94	24	SS	184/0.29					2 10 87 1
15					25	SS	174/0.29					
					26	SS	184					
		- Layer of silt with sand (ML) from 15.8 m to 16.0 m			27A	SS	160					
16					27B							
				72.87								
		Silt with Sand (ML), very dense, grey, wet, fine sand (Glaciolacustrine) (Unit 4a)		16.45	28	SS	170/0.29					
											Grout	
17		- 50 mm lean clay seam at 16.5 m, 30 mm lean clay seam at 16.8 m		72.33								
		Lean Clay with Sand (CL), hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		16.99	29A	SS	42					
				71.87								
		Silt (ML), dense, grey, wet, trace fine sand (Glaciolaustrine) (Unit 4a)		17.45	29B							
				17.60								
				71.49	30A							
18		**Sandy Lean Clay (CL)**, hard, grey, wet, fine sand, cohesive, low to medium plasticity (Glaciolacustrine) (Unit 4b)		17.83	30B	SS	133					0 5 89 7
		Silt (ML), very dense, grey, wet, fine sand (Glaciolacustrine) (Unit 4a)		70.93	31A							
		Lean Clay (CL), hard to very stiff, grey, moist, trace fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		18.39	31B	SS	33					
19					32	TO	PH					
					~~32B~~	CS						
					33	SS	26					0 2 55 43
20		*CONTINUED NEXT PAGE*										

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/RV

CHECKED:

PROJECT: 21451329

RECORD OF BOREHOLE: BH65

LOCATION: N 4860099.14; E 683829.81

BORING DATE: June 18 to 23 and August 6, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash boring, HWT Casing	**Lean Clay (CL)**, hard to very stiff, grey, moist, trace fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)			34	TO	PH				
					34S	CS					
				68.44	35A	SS	166/0.26				
21		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to medium sand, subangular fine to coarse gravel, low plasticity (Till) (Unit 5)		20.88	35B						
				67.91	36A	SS	100/0.11				
		Sandy Silty Clay (CL-ML), hard, grey, moist to wet, fine sand, low plasticity (Glaciolacustrine) (Unit 4b)		21.41	36B						
				67.52							
		Lean Clay (CL), hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		21.80							
22				67.32	37A	SS	100/0.13				
				22.00	37B						
		Silty Clay with Sand (CL-ML), with cobbles and boulders, hard, grey, moist to wet at 25.0 m, fine to coarse angular sand, subangular fine gravel, low plasticity (Till) (Unit 5)			38	SS	70				
		- Rock fragments in top of spoon sample 38 at 22.6 m depth									
23					39	SS	115				3 25 58 14
24					40	SS	160/0.28				
					41A						
		- Rock fragments in spoon sample 41 at 24.4 m depth			41B	SS	100/0.1				
25					42A						Grout
		- Bedrock cored from 25.55 m to 120.61 m depth			42B	SS	143/0.28				
					42C						
	Rock Core, HQ3	- Refer to Record of Drillhole BH65		63.77 / 25.55							
26											
27											
28											
29											
30											

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Well installed on August 6, 2021.

3. Methane (CH4), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs) were detected at surface by a portable gas monitor (GX-6000) during drilling of BH65 at approximately 47.2 m depth. Concentrations of CH4 and CO exceeded health and safety trigger levels of the on-site gas monitor which led to stoppage of all field activities for about 18.5 hours until the gases dissipated below action levels.

4. Water level measured in the monitoring well at a depth of 1.80 m below ground surface (Elev. 87.52 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS/RV

CHECKED:

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	63.77									
26	Rotary Drill, HQ3 Core	Slightly weathered to fresh, thinly bedded, dark brownish-grey, fine grained, faintly porous, slightly reactive to HCl, weak to medium SHALE (Blue Mountain Formation) with light grey, medium strong limestone interbeds. - Slake Durability Sample - Swell Sample - Petrographic Analysis Sample - Swell Sample	25.55	1		BD,PL,RO	1.5	1	20			
						BD,UN,SM	2	1	20			
						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
27						BD,PL,RO	1.5	1	20			
28		- Swell Sample		2		BD,UN,RO IN, Br	1	5	0			
			61.00			BD,IR,SM	2	1	20			
		Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.	28.32			BD,PL,SM PC, Cl	1	4	12			
29				3								
30												Grout
31				4		BD,PL,RO	1.5	1	20			
32												
33				5		BD,PL,RO	1.5	1	20			
34				6		BD,PL,RO	1.5	1	20			
35				7								

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DEPTH SCALE
1 : 50

LOGGED: GS
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
36	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			7															
37					8															
38					9							JN,CU,SM	2	1	20					
39																				
40					10							BD,PL,RO PC, CI	1.5	4	16					Grout
41																				
42					11							BD,PL,RO	1.5	1	20					
43					12							BD,ST,RO IN, M	1	4	0					
44																				
45					13															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
46	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			13															
					14															
47		- UCS with Modulus Sample - Petrographic Analysis Sample																		
48					15															
											•	BD,PL,RO	1.5	1	20					
					16						•	JN,IR,RO	3	1	25					
											•	BD,PL,RO	1.5	1	20					
49											•	JN,IR,RO	3	1	25					
50																				Grout
51					17															
52					18															
53																				
54					19															
											•	BD,UN,SM	2	1	20					
55					20															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
56	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			20															
57					21															
58					22							BD,PL,RO	1.5	1	20					
59												BD,PL,RO	1.5	1	20					
60					23															Grout
61					24															
62												BD,PL,RO	1.5	1	20					
63					25							BD,PL,RO	1.5	1	20					
64					26							JN,PL,RO	1.5	1	20					
65																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
66	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			27															
					27															
67												BD,PL,SM	1	1	16					
68					28															
												BD,PL,RO	1.5	1	20					
69					29															
70																				
71					30															Grout
72																				
					31							JN,PL,RO	1.5	1	20					
73																				
74					32															
75					33															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
76	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossilliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.			33															
77					34							JN,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
78					35							BD,PL,RO	1.5	1	20					Grout
79																				
80					36															
81					37															
82																				
83					38															
84		- Lost cone possible impact of mechanical grinding due to drill process, re-drilled between 83.96 m to 83.94 m			39							BD,IR,RO	3	1	25					
												JN,IR,RO	3	1	25					
												JN,IR,RO	3	1	25					
												JN,IR,RO	3	1	25					
85												BD,IR,RO	3	1	25					
					40															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
86	Rotary Drill HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong, fossiliferous LIMESTONE (Lindsay Formation) with very thin to thin, dark grey, medium strong shale interbeds.		40															
87				41							BD,UN,SM	2	1	20					
88																			
89				42							BD,PL,SM	1	1	16					
90			-0.93 90.25																
91		Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.		43															
92		- UCS Sample		44							BD,PL,RO IN, CI	1	10	0					
											JN,PL,RO PC, CI	1.5	4	16					
93				45															
94																			
95				46							JN,PL,RO BD,PL,SM	1.5 1	1 1	20 16					
		CONTINUED NEXT PAGE																	

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
96	Rotary Drill, HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds. - Petrographic Analysis Sample			46															
97					47															
98					48							BD,PL,RO	1.5	1	20					
99					49															
100					50															
101					51															
102					52															
103		- Direct Shear Sample										BD,UN,SM	2	1	20					
104					53															
105					54															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
106	Rotary Drill, HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds. - UCS with Modulus Sample			54															
107					55															
108																				
109					56															
110																				
111					57															
112		- Vuggy intact calcite veinlets (1-2 mm thickness)			58															
113																				
114					59															
115					60						•	JN,UN,SM	2	1	20					
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860099.14; E 683829.81
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH65

DRILLING DATE: July 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
116	Rotary Drill / HQ3 Core	Fresh, thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Verulam Formation) with dark grey, weak to medium strong shale interbeds.			60															
117					61							BD,PL,RO SA	1.5	2	20					
118					62															
119					63															
120				-31.29																
		END OF DRILLHOLE		120.61																
121																				
122																				
123																				
124																				
125																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: MT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860090.69; E 683849.90

RECORD OF BOREHOLE: BH66

SHEET 1 OF 9

BORING DATE: June 11 to 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		89.49							GR SA SI CL
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Poorly Graded Gravelly Sand (SP)**, loose, brown, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Fill) (Unit 1)		0.00	1A	SS	6				
		Lean Clay with Sand (CL), medium stiff, brown grey, moist, fine to medium sand, low to medium plasticity (Fill) (Unit 1)		88.93 / 0.56	1B						
1		**Silty Sand (SM)**, medium dense to very dense, grey, moist, fine to medium sand, angualr to subangular fine to coarse gravel (Fill) (Unit 1)		0.69	2	SS	58		○		12 44 35 10
		- Rock fragments in top of spoon sample 3 at 1.5 m depth			3	SS	26				
2		**Lean Clay with Sand (CL)**, medium stiff to very stiff, brown, moist to wet, low to medium plasticity (Glaciolacustrine) (Unit 2a)		87.36 / 2.13	4	SS	11		○		
3	Mud Rotary Wash Boring; HWT Casing	- 30 mm thick sand pocket at 3.1 m depth			5	SS	18		⊢○⊣		
4		**Silty Clayey Sand with Gravel (SC-SM)**, very loose to loose, grey, wet, fine to coarse sand, subangular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		85.45 / 4.04	6A / 6B	SS	4		○		
5		- Could feel gravel during turn of vane at 5.03 m depth						⊕ +			
		- Rock fragments in spoon sample 7 from 5.33 m to 5.44 m depth			7	SS	2	⊕ +	○		
6					8	TO	PH	SPT =2 , 4			
7		**Silty Sand with Gravel (SM)**, with cobbles and boulders, medium dense to very dense, grey, moist, fine to medium sand, subangular to subrounded fine to coarse gravel (Till) (Unit 3)		82.78 / 6.71	9	SS	15				
		- Rock fragments in spoon sample 9									
8		- Rock fragments in top of spoon sample 10 at 7.62 m depth			10	SS	105		○		
9		**Sandy Silt (ML)**, very dense, brown, wet, fine to medium sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 4a)		80.87 / 8.62							
		- Rock fragments in top of spoon sample 11 at 9.1 m depth			11	SS	121				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: RV/ML

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH66

SHEET 2 OF 9

LOCATION: N 4860090.69; E 683849.90

BORING DATE: June 11 to 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Silt (ML)**, very dense, brown, wet, fine to medium sand, subangular to angular fine to coarse gravel (Glaciolacustrine) (Unit 4a)									
		- Casing grinding between depths of 10.4 m and 10.7 m			12	SS	183		○	NP	5 28 61 6
11		- Rock fragments in tip of spoon sample 12 at 11.13 m depth									
12					13	SS	180/0.28		○		
13											
14					14	SS	100/0.14				
15					15	SS	195/0.29		○		
16											
17											
18					16A						
		Lean Clay (CL), medium stiff to hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		70.92 / 18.57	16B	SS	118		○		
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: RV/ML

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860090.69; E 683849.90

RECORD OF BOREHOLE: BH66

SHEET 3 OF 9

BORING DATE: June 11 to 14, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Lean Clay (CL)**, medium stiff to hard, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
21					17	SS	19				0 7 48 45
22											
23				66.33 / 23.16							
		Lean Clay with Sand (CL), hard, grey, moist, fine to medium sand, subangular fine to coarse gravel, low to medium plasticity (Till) (Unit 5)									
24					18	SS	64				5 17 56 23
25											RQD = 0%
				63.72	19A	SS	161/0.22				
		Shale Bedrock Fragments (Unit 6a)		25.77 / 63.54	19B						
26	Rock Core; HQ3	- Bedrock cored from 25.95 m to 81.03 m depth - Refer to Record of Drillhole BH66		25.95							
27		NOTES: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
28		2. Methane (CH4) was detected at surface by a portable gas monitor (GX-6000) during drilling of BH66 at approximately 26 m depth. Concentrations of CH4 exceeded health and safety trigger levels of the on-site gas monitor which led to stoppage of all field activities for 1 hour until the gas dissipated below action levels.									
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: RV/ML

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860090.69; E 683849.9
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH66

DRILLING DATE: June 15 to July 2, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	63.72									
		Shale Bedrock Fragments	25.77 / 63.54	1		BD,PL,SM	1	1	16			
26	Rotary Drill / HQ3 Core	Fresh, thinly bedded, dark brownish-grey, fine grained, faintly porous, slightly reactive to HCl, weak to medium SHALE (Blue Mountain Formation) with light grey, medium strong limestone interbeds.	25.95			BD,PL,SM	1	1	16			
						BD,PL,RO	1.5	1	20			
						BD,PL,SM	1	1	16			
						BD,PL,RO	1.5	1	20			
				2		BD,UN,RO SA	3	2	22			
27						BD,PL,RO	1.5	1	20			
						BD,PL,RO	1.5	1	20			
28						BD,PL,RO IN, Br	1	5	0			
						BD,PL,RO	1.5	1	20			
			61.08	3		BD,PL,RO IN, Br	1	4	0			
		Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong, fossiliferous LIMESTONE (Lindsay Formation) with dark grey, shale interbeds	28.41									
29						BD,UN,RO	3	1	25			
						BD,PL,RO	1.5	1	20			
				4								
30												
31						BD,PL,VR	1.5	1	22			
				5		BD,UN,VR	3	1	25			
32												
33				6								
34				7								
						BD,PL,RO IN, Br	1	5	0			
35		- Overcore testing				BD,CU,RO IN, Cl	1	10	0			
						BD,PL,SM IN, Cl	1	10	0			
		- Run 8 - Overcore Number 1		8		BD,PL,SM	1	1	16			
				9		BD,UN,RO	3	1	25			

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

LOGGED: BD/SC
CHECKED: SAP/MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860090.69; E 683849.9
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH66

DRILLING DATE: June 15 to July 2, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
36	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong, fossiliferous LIMESTONE (Lindsay Formation) with dark grey, shale interbeds			9															
37		- Run 10 - Overcore Number 2			10							BD,PL,VR	1.5	1	22					
												BD,UN,RO PC, CI	3	4	20					
38					11							BD,UN,RO	3	1	25					
		- Run 12 - Overcore Number 3			12															
39					13							BD,PL,RO SA	1.5	2	20					
40					14							BD,UN,RO	3	1	25					
												BD,UN,RO	3	1	25					
41												BD,PL,RO	1.5	1	20					
					15							BD,UN,RO	3	1	25					
		- Run 15 - Overcore Number 4										BD,PL,RO	1.5	1	20					
42					16															
43		- Overcore testing																		
		- Run 17 - Overcore Number 5			17							BD,UN,RO	3	1	25					
												BD,PL,RO	1.5	1	20					
												BD,PL,RO	1.5	1	20					
44					18															
		- Overcore testing																		
		- Run 19 - Overcore Number 6			19							BD,PL,RO	1.5	1	20					
												BD,ST,RO SA	3	2	22					
45					20															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD/SC
CHECKED: SAP/MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860090.69; E 683849.9
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH66

DRILLING DATE: June 15 to July 2, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
46	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong, fossiliferous LIMESTONE (Lindsay Formation) with dark grey, shale interbeds			20							BD,PL,SM	1	1	16					
		- Overcore testing			21															
		- Run 21 - Overcore Number 7			22							BD,PL,RO	1.5	1	20					
47																				
		- Overcore testing			23							BD,PL,RO	1.5	1	20					
		- Run 23 - Overcore Number 8										BD,PL,RO	1.5	1	20					
48		- UCS Sample			24															
49		- Overcore testing			25							BD,PL,RO	1.5	1	20					
		- Run 25 - Overcore Number 9																		
50					26															
51					27															
52																				
53					28															
54					29															
55					30															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD/SC
CHECKED: SAP/MJT

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860090.69; E 683849.9
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH66

DRILLING DATE: June 15 to July 2, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
56	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong, fossiliferous LIMESTONE (Lindsay Formation) with dark grey, shale interbeds			30															
											90	BD,PL,RO	1.5	1	20					
											90	BD,UN,RO	3	1	25					
57					31															
58																				
59					32															
60					33															
61																				
62					34															
63																				
					35						90	BD,PL,RO	1.5	1	20					
64																				
65					36															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD/SC
CHECKED: SAP/MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860090.69; E 683849.9
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH66

DRILLING DATE: June 15 to July 2, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
66	Rotary Drill / HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong, fossiliferous LIMESTONE (Lindsay Formation) with dark grey, shale interbeds			37															
67											•	BD,UN,SM	2	1	20					
68					38															
69					39															
70		- UCS with Modulus Sample																		
71					40															
72					41															
73											•	BD,PL,RO SA	1.5	2	20					
74					42															
75					43															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD/SC
CHECKED: SAP/MJT

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860090.69; E 683849.9
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH66

DRILLING DATE: June 15 to July 2, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
76	Rotary Drill, HQ3 Core	Fresh, thinly bedded, light grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong, fossiliferous LIMESTONE (Lindsay Formation) with dark grey, shale interbeds			43															
77					44							BD,PL,RO SA	1.5	2	20					
78												BD,PL,SM	1	1	16					
												BD,PL,SM	1	1	16					
79					45															
80					46															
81				8.46																
		END OF DRILLHOLE		81.03																
82																				
83																				
84																				
85																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD/SC
CHECKED: SAP/MJT

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860056.60; E 683831.64

RECORD OF BOREHOLE: BH67

SHEET 1 OF 7

BORING DATE: August 18 to 23 and September 10-13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		88.52							
0	Power Augering, 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense to very dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	29		○		26 51 18 6
					2A						Bentonite Seal 50 mm Dia. Monitoring Well
1					2B	SS	54				
		Silty Clayey Sand with Gravel (SC-SM), very stiff, dark brown to brown, moist, fine to coarse sand, subangular to angular fine gravel, low to medium plasticity (Fill) (Unit 1)		87.15 / 1.37	3	SS	20		○		21 33 37 9
2		- Augers grinding from 1.52 m to 1.68 m									
3	Mud Rotary Wash Boring and Tri-Cone, PWT Casing			85.24							
		Silty Clayey Sand with Gravel (SC-SM), medium stiff, grey, wet, fine to coarse sand, subangular to angular fine to coarse gravel, low plasticity (Glaciolacustrine) (Unit 2b)		3.28	1	PMT					
4											
					4	SS	6		○	NP	26 36 29 9
5											
6											
7				81.43							January 05, 2022
		Silty Sand with Gravel (SM), very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3) - PMT attempt at approximate depth of 7.20 m failed due to ground conditions.		7.09							
8					2	PMT					
9					5A	SS	90		○		
					5B				○		26 29 36 9
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH67

SHEET 2 OF 7

LOCATION: N 4860056.60; E 683831.64

BORING DATE: August 18 to 23 and September 10-13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring and Tri-Cone; PWT Casing	**Silty Sand with Gravel (SM)**, very dense, grey, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)									
				77.62 / 10.90							
11		**Silty Sand (SM)**, very dense, grey, moist, firm to medium sand (Glaciolacustrine) (Unit 4a) - Tri-Cone grinding from 11.43 m to 11.58 m			3	PMT					
12					6	SS	141		○		8 54 35 4
13											
14					4	PMT					
15					7	SS	165		○		
16											
				71.53 / 16.99							
17		**Lean Clay (CL)**, hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)			5	PMT					
18					8	SS	33		⊢—○—⊣		0 1 48 50
19											
20					6	PMT					
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH67

SHEET 3 OF 7

LOCATION: N 4860056.60; E 683831.64

BORING DATE: August 18 to 23 and September 10-13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring and Tri-Cone, PWT Casing	**Sandy Silt (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		68.43 / 20.04	6	PMT					Bentonite Seal
21					9A	SS	100/0.13		○		3 44 45 8
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to medium sand, low plasticity (Till) (Unit 5)		67.01 / 21.51	9B				○		
22											
23											Silica Sand Filter
24											Sand Grout
	Rock Core, HQ3	**Shale Bedrock Fragments** (Unit 6a)		64.20 / 24.35	10	SS	100/0.03				
25		Bedrock cored from 24.35 m to 60.18 m depth. Refer to Record of Drillhole BH67.									
26											
27											
28											
29											
30											

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Well installed on September 9, 2021.

3. Water level measured in the monitoring well at a depth of 6.97 m below ground surface (Elev. 81.55 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860056.6; E 683831.64
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH67

DRILLING DATE: August 23 and 24, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.17																
25	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, weak to medium strong SHALE (Blue Mountain Formation) with very thinly bedded to medium bedded, grey limestone interbeds	24.35	1							BD,UN,SM	2	1	20					
											BD,UN,SM	2	1	20					
											BD,UN,SM	3	1	25					
											BD,UN,RO	3	1	25					
											BD,UN,RO	1	1	16					
											BD,UN,RO	1	1	16					
											BD,PL,SM	1.5	1	20					
											BD,PL,SM	1	1	16					
											BD,PL,SM	1	1	16					
											BD,PL,RO								
											BD,PL,SM								
											BD,PL,SM	2	1	20					
											BD,UN,SM								
											BD,PL,SM	1	1	16					
											BD,PL,SM	1	1	16					
											BD,PL,SM	1	1	16					
											BD,PL,SM So	1	1	16					
											BD,UN,RO Sa	3	2	22					
26											BD,PL,SM	1	1	16					
		- Swell Sample									BD,PL,SM	1	1	16					
27											BD,PL,RO	1.5	1	20					
											BD,PL,SM	1	1	16					
				2							BD,UN,RO So	3	1	25					
			60.98																
		Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, very thinly to thinly bedded shale interbeds	27.54								BD,PL,SM	1	1	16					
28											BD,PL,RO So	1.5	1	20					
											BD,UN,RO Sa	3	2	22					
29											BD,UN,RO So	3	1	25					
											BD,UN,SM Sa	2	2	20					
											BD,UN,RO Sa	3	2	22					
30											BD,PL,RO So	1.5	1	20					Grout
				3							BD,UN,RO	3	1	25					
											BD,PL,RO Sa	1.5	2	20					
31											BD,PL,RO Sa	1.5	2	20					
											BD,UN,RO Sa	3	2	22					
32											BD,UN,RO Sa	3	2	22					
33				4															
34											BD,UN,RO Sa	3	2	22					
				5															

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

LOGGED: JS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860056.6; E 683831.64
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH67

DRILLING DATE: August 23 and 24, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
35	Rotary Drill / HQ3 Core	Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, very thinly to thinly bedded shale interbeds			5							BD,UN,SM Sa	2	2	20					
												BD,UN,RO Sa	3	2	22					
												BD,PL,RO	1.5	1	20					
												BD,PL,SM So	1	1	16					
												BD,PL,RO So	1.5	1	20					
36												BD,UN,RO	3	1	25					
37												BD,PL,SM	1	1	16					
38					6							BD,UN,RO	3	1	25					
												BD,UN,RO So	3	1	25					
												BD,PL,RO	1.5	1	20					
39																				
40												BD,UN,RO Sa	3	2	22					Grout
												BD,IR,SM	2	1	20					
												BD,PL,SM So	1	1	16					
												BD,UN,SM	2	1	20					
41					7															
42												BD,UN,SM So	2	1	20					
43												BD,UN,SM So	2	1	20					
					8							BD,UN,SM Sa	2	2	20					
44																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: JS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860056.6; E 683831.64
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH67

DRILLING DATE: August 23 and 24, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	RUN No.	FLUSH RETURN	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---									
45	Rotary Drill, HQ3 Core	Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, very thinly to thinly bedded shale interbeds	8		BD,UN,RO	3	1	25			
46			9		BD,PL,RO	1.5	1	20			
47					BD,UN,SM	2	1	20			
48											
49			10		BD,PL,SM	1	1	16			
					BD,PL,SM	1	1	16			
50											Grout
					BD,UN,SM Sa	2	2	20			
51											
52			11		BD,UN,SM So	2	1	20			
					BD,UN,SM	2	1	20			
53											
					BD,UN,RO Sa	3	2	22			
54											
		CONTINUED NEXT PAGE									

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: JS
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860056.6; E 683831.64
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH67

DRILLING DATE: August 23 and 24, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
55	Rotary Drill / HQ3 Core	Fresh, thin to medium bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, very thinly to thinly bedded shale interbeds			11							BD,UN,RO Sa	3	2	22					Grout
											•	BD,PL,SM	1	1	16					
											•	BD,PL,RO Sa	1.5	2	20					
56					12															
											•	BD,PL,SM So	1	1	16					
57											•	BD,UN,SM	2	1	20					
58																				
59					13															
											•	BD,UN,RO Sa	3	2	22					
											•	BD,UN,RO Sa	3	2	22					
60				28.34																
		END OF DRILLHOLE		60.18																
61																				
62																				
63																				
64																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: JS
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860054.27; E 683861.97

RECORD OF BOREHOLE: BH68

SHEET 1 OF 7

BORING DATE: August 30 to September 2, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊖W Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE	88.79							
0	Power Augering, 210 mm O.D/110 mm I.D Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense to very dense, dark brown to brown, moist, fine to coarse sand, subrounded angular gravel (Fill) (Unit 1)	0.00	1	SS	35				
1				2	SS	87				
				3	SS	24				
		Lean Clay with Sand (CL), medium stiff, brown, fine to coarse sand, low plasticity (Glaciolacustrine) (Unit 2a)	87.04 / 1.75	4	SS	5				0 15 63 21
2										
3	Mud Rotary Wash Boring, HWT Casing	- Pocket Penetrometer 2.5 kg/cm²		5	TO	PH				
				~~5S~~	CS					
4		**Sandy Silty Clay (CL-ML)**, very loose, grey, moist to wet, fine to coarse sand, subrounded fine gravel, low plasticity (Glaciolacustrine) (Unit 2b)	84.60 / 4.19							
5				6	SS	3				7 39 40 14
6				7	TO	PH				
		Silty Sand with Gravel (SM), medium dense to very dense, grey, moist, fine to coarse sand, subrounded to angular gravel (Till) (Unit 3)	82.16 / 6.63	8	SS	26				
7				9	SS	13				19 40 33 9
8				10	SS	55				
		- Rock fragments in spoon sample 11A		11A, 11B	SS	23				
9				12	SS	80				
10				13	SS	64				

large space between samples? why

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860054.27; E 683861.97

RECORD OF BOREHOLE: BH68

SHEET 2 OF 7

BORING DATE: August 30 to September 2, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM)**, medium dense to very dense, grey, moist, fine to coarse sand, subrounded to angular gravel (Till) (Unit 3)			13	SS	64				
					14	SS	100/0.13				
11					15	SS	173			NP	12 45 38 6
					16	SS	143				
12					17	SS	72				
				76.06 / 12.73							
		Silty Sand (SM), very dense, grey, moist, fine to coarse sand (Unit 4a)									
13					18	SS	116				1 53 45 2
					19	SS	100/0.13				
14					20	SS	100/0.13				
15					21	SS	181				
					22	SS	100/0.13				0 62 37 1
16					23	SS	180				
					24	SS	177				
17					25	SS	117				
				71.18 / 17.61							
		Lean Clay (CL), very stiff to hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
18					26	SS	29				
					27	SS	29			γ = 20.3 kN/m³	
19					28	SS	53				0 2 53 45
					29	SS	27				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860054.27; E 683861.97

RECORD OF BOREHOLE: BH68

SHEET 3 OF 7

BORING DATE: August 30 to September 2, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring, HWT Casing	**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, fine subrounded gravel, low plasticity (Till) (Unit 5)		68.74 / 20.05	30	SS	31				6 28 46 20
21					31	SS	100/0.13				
		Silt with Sand (ML), very dense, grey, moist, fine to medium sand (Till) (Unit 5)		67.59 / 21.20	32	SS	100/0.13				0 21 69 10
22					33	SS	100/0.13				
		Lean Clay with Gravel (CL), hard, grey, moist, subrounded to angular gravel (Till) (Unit 5)		66.30 / 22.49	34	SS	125				
23		**Silty Sand with Gravel (SM)**, hard grey, moist to wet, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 5)		65.69 / 23.10	35	SS	174/0.25				10 33 44 13
24					36	SS	100/0.25				
					37	SS	100/0.10				
25		**Shale Bedrock Fragments** (Unit 6a) - Bedrock cored from 24.84 m to 60.20 m depth. - Refer to Record of Drillhole BH68		63.95 / 24.84 / 63.69 / 25.10	38	SS	100/0.10				
26		NOTES: 1. Water encountered at 4.89 m depth during drilling. 2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860054.27; E 683861.97
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH68

DRILLING DATE: September 7 to 16, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	63.95																
25	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong, SHALE (Blue Mountain Formation) with thin grey limestone interbeds - Direct Shear Sample	24.84	1							BD,PL,SM	1	1	16					
											BD,PL,SM	1	1	16					
											BD,UN,RO	3	1	25					
											BD,PL,SM	1	1	16					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	2	20					
26											BD,PL,RO SA	1.5	2	20					
											BD,PL,RO SA								
				2							BD,UN,RO	3	1	25					
											BD,PL,SM SA	1	2	16					
		- UCS with Modulus Sample									BD,PL,SM SA	1	2	16					
27											BD,PL,RO PC, CL	1.5	4	16					
											BD,PL,RO SA	1.5	2	20					
											BD,PL,SM	1	1	16					
28				3							BD,PL,RO	1.5	1	20					
			60.31								BD,UN,RO	3	1	25					
		Fresh, very thin to thinly bedded, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with grey shale interbeds	28.48																
29											BD,PL,RO	1.5	1	20					
				4							BD,PL,RO SA	1.5	2	20					
30											BD,PL,RO SA	1.5	2	20					
											BD,PL,RO	1.5	1	20					
											BD,PL,RO	1.5	1	20					
31				5							BD,PL,SM	1	1	16					
											BD,PL,RO IN,CL	1	15	0					
											BD,PL,RO	1.5	1	20					
32																			
				6							BD,UN,RO	3	1	25					
33											BD,PL,RO	1.5	1	20					
34				7							BD,UN,RO SA	3	2	22					
											BD,UN,RO PC	3	3	20					
											BD,PL,SM	1	1	16					

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860054.27; E 683861.97
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH68

DRILLING DATE: September 7 to 16, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
35	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with grey shale interbeds			7															
											•	BD,PL,VR SA	1.5	2	22					
36					8						•	BD,PL,RO SA	1.5	2	20					
											•	BD,PL,VR SA	1.5	2	22					
					9						•	BD,CU,RO	3	1	25					
37											•	BD,UN,RO	3	1	25					
											•	BD,UN,RO	3	1	25					
38											•	BD,UN,RO	3	1	25					
					10						•	BD,UN,RO	3	1	25					
39											•	BD,UN,RO	3	1	25					
		- Overcore testing			11															
40											•	BD,CU,RO	3	1	25					
		- UCS Sample			12						•	BD,UN,RO	3	1	25					
41																				
42					13															
43					14															
44																				
		- Overcore testing			15															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860054.27; E 683861.97
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH68

DRILLING DATE: September 7 to 16, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
45	Rotary Drill / HQ3 Core	Fresh, very thin to thinly bedded, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with grey shale interbeds			16															
46					17															
47					18						•	BD,IR,RO SA	3	2	22					
48		- Overcore testing			19															
49					20						•	BD,UN,SM SA	2	2	20					
50											•	BD,UN,RO SA	3	2	22					
51					21						•	BD,UN,RO PC, CL	3	4	20					
52					22															
53		- Overcore testing			23															
54					24															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860054.27; E 683861.97
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH68

DRILLING DATE: September 7 to 16, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
55	Rotary Drill, HQ3 Core	Fresh, very thin to thinly bedded, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with grey shale interbeds			25							BD,UN,RO SA	3	2	22					
56		- Overcore testing			26															
57					27							BD,PL,SM PC, CL	1	4	12					
58		- Overcore testing			28															
59					29															
		- Overcore testing			30															
60				28.59	31															
		END OF DRILLHOLE		60.20																
61																				
62																				
63																				
64																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: BD
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH69

SHEET 1 OF 4

LOCATION: N 4860019.33; E 683798.09

BORING DATE: September 17 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		87.54							GR SA SI CL
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, medium dense to very dense, dark brown, moist, fine to coarse sand, subangular to subrounded fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	28				
1					2	SS	56		○		
		Sandy Lean Clay with Gravel (CL), very stiff, brown, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel, low to medium plasticity (Fill) (Unit 1)		86.17 / 1.37	3	SS	24		○	▼ = 21.8 kN/m³	
2		**Silty Sand (SM)**, with cobbles and boulders, loose to very dense, grey, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		85.40 / 2.14	4	SS	7		○		
3	Mud Rotary Wash Boring, HWT Casing				5	SS	36		○⊢		12 45 35 8
4		- Rock fragments in spoon sample 6									
5					6	SS	65		○		
6					7	SS	157		○		
7											
8					8	SS	77		○	▼ = 23.0 kN/m³	
9		- Rock fragments in spoon sample 9; spoon bouncing			9	SS	100/0.10				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH69

SHEET 2 OF 4

LOCATION: N 4860019.33; E 683798.09

BORING DATE: September 17 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, with cobbles and boulders, loose to very dense, grey, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)			10A	SS	192/0.28		○		
11		- Sand seam between 10.8 m and 11.7 m			10B				○		
				75.87 / 11.67							
		Sandy Silt (ML), very dense, grey, moist, fine to coarse sand (Glaciolacustrine) (Unit 4a)									
12					11	SS	100/0.13		○	γ = 20.8 kN/m³	
13											
14					12	SS	100/0.13		○		0 48 51 1
15					13	SS	100/0.09		○	γ = 22.2 kN/m³	
16											
				70.64 / 16.90							
17		**Lean Clay with Sand (CL)**, hard, grey, moist, fine to coarse sand, trace subrounded to subangular gravel, low to medium plasticity (Till) (Unit 5)									
18					14	SS	100/0.13		○	γ = 22.9 kN/m³	
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860019.33; E 683798.09

RECORD OF BOREHOLE: BH69

SHEET 3 OF 4

BORING DATE: September 17 to 20, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Lean Clay with Sand (CL)**, hard, grey, moist, fine to coarse sand, trace subrounded to subangular gravel, low to medium plasticity (Till) (Unit 5)									
21					15	SS	63			γ = 24.0 kN/m³	2 29 45 24
22											
23		- Bedrock cored from 23.30 m to 25.96 m depth.			16	SS	100/ 0.13				
		- Refer to Record of Drillhole BH69		64.24 / 23.30							
24		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: KL

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860019.33; E 683798.09
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH69

DRILLING DATE: September 20, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.24																
24	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong, SHALE (Blue Mountain Formation) with thin grey limestone interbeds		23.30	1							BD,UN,RO SA	3	2	22					
												BD,UN,RO CC, CL	3	4	20					
25												BD,UN,RO CC, CL	3	4	20					
												BD,PL,RO PC, CL	1.5	4	16					
				61.58																
26		END OF DRILLHOLE		25.96																
27																				
28																				
29																				
30																				
31																				
32																				
33																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: KL
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860274.80; E 683735.99

RECORD OF BOREHOLE: BH70

SHEET 1 OF 6

BORING DATE: October 4 to 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION – GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE	96.40					
0	Power Augering; 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, dense, brown, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Fill) (Unit 1) - Rock fragments in spoon sample 1	0.00 / 95.79	1	SS	35	γ = 17.9 kN/m³	
1		**Silty Clayey Sand (SC-SM)**, medium dense, brown, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Fill) (Unit 1)	0.61 / 95.26	2	SS	12		
		Silty Sand (SM) to Sandy Silt (ML), medium dense, brown, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 3)	1.14	3	SS	43		
2				4	SS	88		
				5	SS	191/0.25		5 45 42 8
3	Mud Rotary Wash Boring; HWT Casing			6	SS	132/0.28		
		- Rock fragments in spoon sample 7		7	SS	53		
4				8	SS	145/0.10	γ = 25.8 kN/m³	
5				9	SS	181		
		- Becoming grey below 5.41 m depth - Intermittent grinding at 5.5 m depth		10	SS	132		
6				11	SS	136		10 37 44 9
7				12	SS	95		
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, angular to subangular fine gravel, low plasticity (Till) (Unit 3)	89.16 / 7.24	13	SS	94		9 35 46 11
8				14	SS	166/0.25		
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, low plasticity (Glaciolacustrine) (Unit 4b)	87.97 / 8.43	15A	SS	170/0.25		
9		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine gravel, low plasticity (Till) (Unit 3)	87.61 / 8.79	15B				
				16	SS	190/0.23		11 27 46 16
10				17	SS	100/0.10		
		CONTINUED NEXT PAGE						

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80)

SHEAR STRENGTH Cu, kPa (20, 40, 60, 80) — nat V. + Q - ●; rem V. ⊕ U - ○

HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10}, 10^{-8}, 10^{-6}, 10^{-4})

WATER CONTENT PERCENT (10, 20, 30, 40) — Wp ⊢—○W—⊣ Wl

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

LOCATION: N 4860274.80; E 683735.99

RECORD OF BOREHOLE: BH70

SHEET 2 OF 6

BORING DATE: October 4 to 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp — W — Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing			86.11							
		Lean Clay with Sand (CL), hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low to medium plasticity (Till) (Unit 3) - Rock fragments recovered in sample 18		10.29	18	SS	86				10 14 41 35
				85.50 / 10.90							
11		**Silt (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)			19	SS	142/ 0.28				
					20	SS	196/ 010				
12					21	SS	164/ 0.25				0 8 79 13
13					22	SS	100/ 0.07				
					23	SS	100/ 0.10				0 4 84 11
				82.56							
14		**Lean Clay (CL)**, hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		13.84	24	SS	82				
15					25	SS	60				1 4 53 42
					26	SS	113				
				80.63							
16		**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		15.77	27	SS	100/ 0.13				
					28	SS	195/ 0.28				
17					29	SS	198/ 0.23				0 63 36 1
					30	SS	100/ 0.13				
18					31	SS	100/ 0.13				
19					32	SS	100/ 0.13				
					33	SS	100/ 0.13				
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

RECORD OF BOREHOLE: BH70

SHEET 3 OF 6

LOCATION: N 4860274.80; E 683735.99

BORING DATE: October 4 to 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		76.00	34A	SS	176/0.25				
		Lean Clay (CL), hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		20.40 / 75.75	34B						0 5 70 25
		Silty Sand (SM), very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		20.65	35	SS	100/0.10				
21					36	SS	100/0.13				
		Lean Clay (CL), hard, grey, moist, fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)		74.62 / 21.78							
22					37	SS	95				0 2 61 37
					38	SS	100/0.10				
23		**Silt with Sand (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)		73.41 / 22.99	39	SS	109/0.25			▼ = 19.3 kN/m³	
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		72.70 / 23.70	40	SS	51				
24					41	SS	41				0 2 45 53
25					42	SS	47				
		Silt with Sand (ML), very dense, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 5)		70.87 / 25.53	43	SS	95				
26					44	SS	137/0.29			▼ = 23.9 kN/m³	
27					45	SS	116/0.29				5 18 60 17
					46	SS	166/0.29				
28					47	SS	100				
					48	SS	74				
29					49	SS	90				
30					50	SS	142				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

PROJECT: 21451329

RECORD OF BOREHOLE: BH70

SHEET 4 OF 6

LOCATION: N 4860274.80; E 683735.99

BORING DATE: October 4 to 13, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 120 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	HWT Casing	**Silt with Sand (ML)**, very dense, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel (Till) (Unit 5)			50	SS	142		○		
					~~54~~	SS	100/0.03		○		
		Shale Bedrock Fragments (Unit 6a)		65.80 / 30.60	52	SS	100/0.13				
		- Bedrock cored from 30.73 m to 41.21 m depth - Refer to Record of Drillhole BH70.		65.62 / 30.78							
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											

NOTES:

1. Auger refusal at 1.5 m depth. Moved Borehole 3.0 m south and resumed sampling from ground surface.

2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: BD

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860274.8; E 683735.99
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH70

DRILLING DATE: October 13 and 14, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		65.80																
		Shale Bedrock fragments		30.60																
		Slightly weathered, very thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with grey limestone interbeds		30.73																
31					1							BD,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
												BD,UN,RO SO	3	1	25					
32					2							BD,UN,RO SO	3	1	25					
												JN,UN,RO SA	3	2	22					
				63.50								BD,UN,RO PC,CL	3	4	20					
33		Slightly weathered to fresh, thinly to medium bedded, dark grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds		32.90								JN,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
												BD,UN,RO SO	3	1	25					
34					3							BD,UN,RO SA	3	2	22					
												BD,UN,RO SA	3	2	22					
35												BD,UN,RO	3	1	25					
36					4							BD,UN,RO	3	1	25					
37					5															
38																				
												BD,UN,RO SA	3	2	22					
39					6															
												BD,UN,RO	3	1	25					
40					7															

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DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860274.8; E 683735.99
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH70

DRILLING DATE: October 13 and 14, 2021
DRILL RIG: Diedrich 120 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr Ja Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																
41					7													
				55.19														
		END OF DRILLHOLE		41.21														
42																		
43																		
44																		
45																		
46																		
47																		
48																		
49																		
50																		

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: LT
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329

RECORD OF BOREHOLE: BH71

SHEET 1 OF 13

LOCATION: N 4860023.47; E 683856.88

BORING DATE: August 26 and 27 and September 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE		88.32							
0	Power Auger, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Poorly Graded Sand with Gravel (SP)**, medium dense, brown and grey, moist, medium to coarse sand, subangular fine gravel (Fill) (Unit 1)		0.00	1A	SS	14				50 mm Dia. Monitoring Well; Concrete; Bentonite
				88.07	1B						
		Sandy Silt with Gravel (ML), medium dense, grey and brown, moist, fine to coarse sand, subangular fine gravel (Fill) (Unit 1)		0.25							
1					2A	SS	25				
					2B						
					3A						
		Lean Clay with Sand (CL), medium stiff, black, moist, fine sand, low to medium plasticity (Fill) (Unit 1)		86.57 / 1.75	3B	SS	10				
2		**Lean Clay with Sand (CL)**, very stiff, brown, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 2a)		1.83	3C						
					4	SS	24				4 11 59 26
3	Mud Rotary Wash Boring, HWT Casing				5	SS	15			γ = 19.6 kN/m³	
		Silty Clayey Sand with Gravel (SC-SM), loose to medium dense, brown, moist to wet, fine to coarse sand, subangular fine to coarse gravel, low plasticity (Glaciolacustrine) (Unit 2b)		84.66 / 3.66							
4					6	SS	18				30 35 26 9
		Sandy Silt (ML) to Silt with Sand (ML) with cobbles and boulders, very dense, grey, moist, fine to coarse sand, subangular gravel (Till) (Unit 3)		83.52 / 4.80	7	SS	5				
5											Grout
					8	SS	15				
6					9	SS	64				
7											January 05, 2022
					10	SS	173				6 43 41 10
8		- Cored trough boulder between 8.53 m and 8.84 m depth									
9		- Rock fragments in top of spoon sample 11 at 9.1 m depth			11	SS	100/0.10				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4860023.47; E 683856.88

RECORD OF BOREHOLE: BH71

SHEET 2 OF 13

BORING DATE: August 26 and 27 and September 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Silt (ML) to Silt with Sand (ML)** with cobbles and boulders, very dense, grey, moist, fine to coarse sand, subangular gravel (Till) (Unit 3)			12	SS	100/0.13		○		1 17 62 21
11				76.84 / 11.48							
		Silty Sand (SM), very dense, grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
12					13	SS	171/0.28		○		
13											
14					14	SS	186/0.23		○		0 63 36 1
15											Grout
					15A	SS	188		○		
					15B				○		
16				72.17 / 16.15							
		Lean Clay (CL), hard to very stiff, grey, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
17					16	SS	63		⊢○⊣		0 6 59 35
18					17	SS	24		○	γ = 20.3 kN/m³	
19				69.04 / 19.28							
		Sandy Silty Clay (CL-ML), hard, grey, moist, fine to coarse sand, subangular fine gravel, low plasticity (Till) (Unit 5)			18	SS	50				5 33 45 17
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329

RECORD OF BOREHOLE: BH71

SHEET 3 OF 13

LOCATION: N 4860023.47; E 683856.88

BORING DATE: August 26 and 27 and September 29, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular fine gravel, low plasticity (Till) (Unit 5)			18	SS	50				5 33 45 17
21					19	SS	83			γ = 22.3 kN/m³	Grout
22											
23		- Rock fragments in spoon samples 20 and 21 - Bedrock cored from 24.18 m to 120.34 m depth. - Refer to Record of Drillhole BH71			20	SS	61				
24				64.14	21	SS	100/0.13				Bentonite
		NOTES: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 2. Monitoring well installed on September 29, 2021. 3. Methane (CH4) was detected at surface by a portable gas monitor (GX-6000) during drilling of BH71 between depths of 53.3 m and 56.4 m. Concentrations of CH4 exceeded health and safety trigger levels of the on-site gas monitor which led to stoppage of all field activities for approximately 24 hours until the gas dissipated below action levels. 4. Water level measured in the monitoring well at a depth of 7.54 m below ground surface (Elev. 88.32 m) on January 05, 2022.		24.18							
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: ML

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	FEATURES	PIEZOMETER
		TOP OF BEDROCK	64.14							
	Rotary Drill, HQ3 Core	Slightly weathered fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with thin grey limestone interbeds - Slake Durability Sample - UCS Sample	24.18	1	BD,UN,RO SA, CL BD,UN,RO PC,CL BD,UN,SM PC,CL BD,PL,SM SA,CL BD,UN,RO SA,CL	3 3 2 1 3	2 4 4 2 2	22 20 16 16 22		Bentonite Sand
25				2	BD,UN,RO SA,CL	3	2	22		
		- Slake Durability Sample - Petrographic Analysis Sample - Swell Sample								
26				3	BD,UN,RO PC,CL BD,UN,SM SA,CL	3 2	4 2	20 20		Screen
27		- Petrographic Analysis Sample - Swell Sample								
28				4						Sand
		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey to grey shale interbeds	59.90 28.42		BD,UN,RO SA,CL	3	2	22		
29				5	BD,UN,RO SA,CL	3	2	22		
30										
31				6						Grout
32				7						
33					BD,UN,SM SA,CL BD,UN,SM PC,CL	2 2	2 4	20 16		
34				8						

Columns: RECOVERY (TOTAL CORE %, SOLID CORE %); R.Q.D. %; FRACT. INDEX PER 0.25 m; DIP w.r.t. CORE AXIS; HYDRAULIC CONDUCTIVITY K, cm/sec; WEATHERING INDEX (W1, W2, W3, W4, W5, W6); R0/R1 ZONES

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
35	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey to grey shale interbeds			8															
36					9															
37					10							BD,UN,RO SA,CL	3	2	22					
38																				
39					11							BD,UN,RO SA,CL	3	2	22					Grout
40					12							BD,UN,RO PC,CL	3	4	20					
41																				
42					13															
43					14							BD,UN,RO SA,CL	3	2	22					
44																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

wsp GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
45	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey to grey shale interbeds			15															
46					16						•	BD,UN,RO SA,CL	3	2	22					
47																				
48					17															
49					18						•	BD,UN,SM	2	1	20					Grout
50											•	BD,CU,SM PC,CL	2	4	16					
51					19															
52					20															
53																				
54					21															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
55	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey to grey shale interbeds			21															
56					22															
57					23							BD,ST,SM SA,CL	2	2	20					
58					24															
59																				Grout
60					25															
61		- Petrographic Analysis Sample																		
62					26							BD,UN,SM SA,CL	2	2	20					
63					27							BD,UN,SM SA,CL	2	2	20					
64					28															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
65	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey to grey shale interbeds			28							BD,UN,RO PC,CL	3	4	20					Grout
66		- UCS with Modulus Sample - Petrographic Analysis Sample			29															
67					30							BD,UN,RO SA,CL	3	2	22					
68																				
69					31															
70					32							BD,UN,RO SA,CL	3	2	22					
												BD,UN,RO SA,CL	3	2	22					
71																				
72					33															
73					34							BD,UN,RO	3	1	25					
74																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
75	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey to grey shale interbeds			34															
76					35							BD,UN,RO	3	1	25					
77					36															
78					37															
79																				Grout
80					38															
81					39															
82																				
83					40															
84					41															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																	
85	Rotary Drill HQ3 Core	Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey to grey shale interbeds		41															
86				42															
87				43															
88		Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, medium strong shale interbeds	0.34 / 87.98								BD,PL,RO	1.5	1	20					
89				44															Grout
90				45															
91																			
92				46							BD,UN,RO	3	1	25					
93				47							BD,PL,SM SA	1	2	16					
94																			
		CONTINUED NEXT PAGE																	

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
95	Rotary Drill / HQ3 Core	Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, medium strong shale interbeds			47							JN,UN,RO	3	1	25					
					48															
96																				
					49															
97																				
98					50															
		- UCS with Modulus Sample																		
99																				Grout
					51							BD,UN,RO	3	1	25					
100												BD,UN,RO	3	1	25					
101					52															
102																				
103					53															
104					54															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
105	Rotary Drill / HQ3 Core	Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, medium strong shale interbeds			54							JN,PL,RO SA	1.5	2	20					Grout
106		- Petrographic Analysis Sample - UCS Sample			55															
107					56															
108																				
109					57															
110					58															
111		- Petrographic Analysis Sample			59															
112		- Direct Shear Sample										BD,UN,RO	3	1	25					
113					60							BD,UN,RO	3	1	25					
114		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860023.47; E 683856.88
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH71

DRILLING DATE: August 30 to September 10, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
115	Rotary Drill / HQ3 Core	Fresh, thinly to medium bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, medium strong to strong LIMESTONE (Lindsay Formation) with dark grey, medium strong shale interbeds - UCS with Modulus Sample			60															
					61															
116																				
					62															
117																				Grout
118					63															
119																				
					64															
120				-32.02																
		END OF DRILLHOLE		120.34																
121																				
122																				
123																				
124																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC/IC
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4860232.58; E 683841.65

RECORD OF BOREHOLE: BH72

SHEET 1 OF 7

BORING DATE: October 1 to 5 and October 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		96.65							
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Poorly graded Sand with Gravel (SP-SM)**, medium dense, brown, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Fill) (Unit 1)		0.00	1	SS	26				50 mm Dia. Monitoring Well; Concrete; Bentonite
				95.84							
1		**Lean Clay (CL)**, very stiff, dark grey, organic staining and inclusions, moist, trace fine to medium sand, low to medium plasticity (Fill) (Unit 1)		0.81	2	SS	17				
				95.28							
		Silty Sand (SM), medium dense, brown, moist, fine to medium sand, trace angular to subangular fine to coarse gravel (Fill) (Unit 1)		1.37	3	SS	26				
2				94.52							
		Sandy Silt (ML), very dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3)		2.13	4	SS	90				
3	Mud Rotary Wash Boring, HWT Casing				5	SS	122				
		- Becoming grey at 3.7 m depth			6A, 6B	SS	100/0.13				
4											
					7	SS	196/0.28				3 40 49 9
5					8	SS	100/0.14				Grout
6					9	SS	100/0.14			▼ = 25.9 kN/m³	
7					10	SS	100/0.13				
				88.65							
8		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 3)		8.00							
9					11	SS	75			▼ = 23.2 kN/m³	14 36 38 11
10											

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DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4860232.58; E 683841.65

RECORD OF BOREHOLE: BH72

SHEET 2 OF 7

BORING DATE: October 1 to 5 and October 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
10	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine to coarse gravel, low plasticity (Till) (Unit 3)									
11					12	SS	55		○		
				84.99 / 11.66							
		Silty Sand (SM), very dense, brown, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
12											January 05, 2022
					13	SS	81		○		1 65 32 1
13											
14					14	SS	100/0.08		○	γ = 25.2 kN/m³	
15											Grout
					15	SS	100/0.05		○		
16											
				79.79 / 16.87							
17		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to medium sand, low plasticity (Glaciolacustrine) (Unit 4b)									
18					16	SS	100/0.13		○		
19											
				76.78 / 19.88							
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH72

SHEET 3 OF 7

LOCATION: N 4860232.58; E 683841.65

BORING DATE: October 1 to 5 and October 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, brown to grey, moist to wet, fine to medium sand (Glaciolacustrine) (Unit 4a)									
21					17	SS	100/0.08		○		
22											
23		**Lean Clay (CL)**, hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)		73.68 / 22.97							Grout
24					18A	SS	127		⊢—○—⊣		1 9 46 45
		Silt with Sand (ML), very dense, grey, moist, fine sand (Glaciolacustrine) (Unit 4a)		72.06 / 24.59	18B				○		
25											
26		**Sandy Silt (ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine gravel (Till) (Unit 5)		70.52 / 26.14							
27											Bentonite; Sand
					19	SS	100/0.05		⊢○⊣		4 32 50 15
28											
29											Screen
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH72

LOCATION: N 4860232.58; E 683841.65

BORING DATE: October 1 to 5 and October 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
30	Mud Rotary Wash Boring; HWT Casing	**Sandy Silt (ML)**, hard, grey, moist, fine to coarse sand, angular to subangular fine gravel (Till) (Unit 5)			20	SS	100/0.10		○		Screen; Sand
31											
32				64.55							
		Shale Bedrock Fragments (Unit 6a) - Bedrock cored 32.26 m to 61.05 m depth. - Refer to Record of Drillhole BH72		32.10	21	SS	100/0.08				
				32.26							
33		NOTES: 1. Water encountered at 3.94 m depth during drilling.									
34		2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique. 3. Monitoring well installed on October 8, 2021									
35		4. Gas bubbling observed during monitoring well development on October 25, 2021. 5. Water level measured in the monitoring well at a depth of 11.98 m below ground surface (Elev. 84.67 m) on January 05, 2022.									Grout
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: JS

CHECKED: SEMP

GTA-BHS 005 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MIS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860232.58; E 683841.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH72

DRILLING DATE: October 6 and 7, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK	64.48																
		Shale Bedrock Fragments	32.17																
		Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong, SHALE (Blue Mountain Formation) with thin grey limestone interbeds	32.26																
				1							BD,UN,RO SA	3	2	22					
											BD,UN,RO SA	3	2	22					
33											BD,PL,RO PC, CL	1.5	4	16					
											BD,UN,RO PC, CL	3	4	20					
											BD,UN,RO SA	3	2	22					
			62.99																
		Fresh, thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with grey shale interbeds	33.66																
34											BD,PL,RO SA	1.5	2	20					
				2							BD,UN,RO PC, CL	3	4	20					
											BD,UN,RO SA	3	2	22					
35																			
											BD,UN,RO SA	3	2	22					
				3							JN,UN,RO SA	3	2	22					
36																			
37	Rotary Drill HQ3 Core			4															Grout
38																			
											BD,UN,RO SA	3	2	22					
39				5															
											BD,UN,RO SA	3	2	22					
40																			
				6							BD,UN,RO SA	3	2	22					
41																			
				7							BD,UN,RO	3	1	25					
42																			

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

wsp GOLDER

LOGGED: JS
CHECKED: AC

GTA-RCK 048 S:\CLIENTS\OPG\DARLINGTON_GENERATING_STATION\02_DATA\GINT\DARLINGTON_GENERATING_STATION.GPJ GAL-MISS.GDT 6/14/22

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860232.58; E 683841.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH72

DRILLING DATE: October 6 and 7, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with grey shale interbeds			7															
43					8						•	BD,UN,RO SA	3	2	22					
44																				
45					9						•	BD,UN,RO	3	1	25					
46																				
47					10						•	BD,UN,RO SA	3	2	22					Grout
48					11						•	BD,UN,RO SA	3	2	22					
49					12						•	BD,UN,RO	3	1	25					
50																				
51					13															
52					14															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: JS
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4860232.58; E 683841.65
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH72

DRILLING DATE: October 6 and 7, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with grey shale interbeds			14															
53		- Direct Shear Sample									•	BD,UN,RO SA	3	2	22					
54					15															
55											•	BD,UN,RO	3	1	25					
					16						•	BD,UN,RO	3	1	25					
56																				Grout
57					17															
58																				
59					18						•	BD,UN,RO SA	3	2	22					
60					19															
61				35.60							•	BD,UN,RO	3	1	25					
		END OF DRILLHOLE		61.05																
62																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: JS
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4859994.51; E 683861.41

RECORD OF BOREHOLE: BH73

SHEET 1 OF 4

BORING DATE: September 1 and 2, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4})	WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE		87.96									GR SA SI CL
0	Power Augering; 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, dense, moist, brown, fine to medium sand, fine subrounded gravel (Fill) (Unit 1)		0.00	1	SS	49						
		Sandy Silt with Gravel (ML), dense, moist, brown, fine to coarse sand, fine subrounded gravel (Fill) (Unit 1)		87.26 / 0.70	2	SS	33						
		Sandy Lean Clay (CL), very stiff, moist, black, fine sand, low plasticity (Fill) (Unit 1)		86.35 / 1.61	3A, 3B	SS	16						
		Silty Sand (SM), medium stiff, moist, brown, fine to meduim sand (Glaciolacustrine) (Unit 2b)		85.68 / 2.28	4	SS	7		>100				11 44 36 9
	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM) to Sandy Silt (ML)**, very dense, moist, grey, fine to coarse sand, subangular to subrounded fine to coarse gravel (Till) (Unit 3)		84.67 / 3.29	5	SS	105						
					6	SS	73					γ = 23.7 kN/m³	
					7	SS	85						19 41 33 7
					8	SS	103						
					9	SS	145						
					10	SS	100/0.10						
10		*CONTINUED NEXT PAGE*											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH73

SHEET 2 OF 4

LOCATION: N 4859994.51; E 683861.41

BORING DATE: September 1 and 2, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM) to Sandy Silt (ML)**, very dense, moist, grey, fine to coarse sand, subangular to subrounded fine to coarse gravel (Till) (Unit 3)									
11					11	SS	100/0.23		○		13 36 38 12
				76.43 / 11.53							
		Silty Sand (SM), very dense, moist, grey, fine to medium sand (Glaciolacustrine) (Unit 4a)									
12					12	SS	190/0.33		○		
13					13	SS	100/0.28		○		
14											
15					14	SS	193/0.40		○		0 22 75 3
16											
				70.99 / 16.97							
17		**Lean Clay (CL)**, hard, moist, grey, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
18											
					15	SS	63		⊢○⊣		3 9 48 40
19											
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH73

SHEET 3 OF 4

LOCATION: N 4859994.51; E 683861.41

BORING DATE: September 1 and 2, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring, HWT Casing	**Silty Sand (SM)**, very dense, moist, grey, fine to medium sand (Glaciolacustrine) (Unit 4a)		67.92 / 20.04							
21				66.45 / 21.51	16A, 16B	SS	100/0.1		○ ○		0 28 71 2
		Sandy Silt (ML), very dense, grey, moist, fine to coarse sand, subrounded fine gravel (Till) (Unit 5)									
22											
23		- Intermittent grinding at 23.34 m to 23.46 m depth - Shale fragments in spoon sample 18			17	SS	107		○ ⊢		7 39 40 14
		- Bedrock cored from 24.08 m to 25.46 m depth									
	Rock Core, HQ3	- Refer to Record of Drillhole BH73			18	SS	100/0.10				
24				63.88 / 24.08	19	CS			○	γ = 20.3 kN/m³	
		NOTE: 1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.									
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859994.51; E 683861.41
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH73

DRILLING DATE: September 3, 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		63.88																
25	Rotary Drill / HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds. - Swell Sample		24.08 / 62.50	1							BD,PL,RO; JN,PL,RO; BD,PL,RO SA; JN,UN,SM	1.5; 1.5; 1.5; 2	1; 1; 2; 1	20; 20; 20; 20					
		END OF DRILLHOLE		25.46																

26 27 28 29 30 31 32 33 34

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4859970.61; E 683798.32

RECORD OF BOREHOLE: BH75

SHEET 1 OF 7

BORING DATE: September 7 and 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		86.53							
0	Power Augering, 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, dense, brown, moist, fine to coarse sand, subangular fine gravel (Fill) (Unit 1)		0.00	1	SS	32				
		Lean Clay (CL), medium, stiff, brown, moist, low to medium plasticity (Glaciolacustrine) (Unit 2a)		85.92 / 0.61	2	SS	13				0 9 53 38
					3A						
		Sandy Silt (ML), medium dense, brown, moist, fine to coarse sand, subangular fine gravel (Glaciolacustrine) (Unit 2b)		84.78 / 1.75	3B	SS	12				5 41 42 13
2		**Silty Sand (SM)**,very dense, grey, moist, fine to coarse sand, subrounded fine gravel (Till) (Unit 3)		84.40 / 2.13	4	SS	94				
		- Poor recovery in spoon sample 12									
3	Mud Rotary Wash Boring, HWT Casing				5	SS	163				12 45 34 9
4					6	SS	158				
					7	SS	110				
5					8	SS	85			γ = 23.4 kN/m³	
6					9	SS	182/ 0.22				
7											
8					10	SS	196/ 0.27				8 44 41 7
9					11	SS	191/ 0.25				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859970.61; E 683798.32

RECORD OF BOREHOLE: BH75

SHEET 2 OF 7

BORING DATE: September 7 and 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring, HWT Casing	**Silty Sand (SM)**,very dense, grey, moist, fine to coarse sand, subrounded fine gravel (Till) (Unit 3) - Poor recovery in spoon sample 12			12	SS	100/0.10		○		
11				75.22 11.31							
		Silty Sand (SM), very dense grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)									
12					13	SS	142/0.27		○		
13											
14					14	SS	142/0.27		○		8 44 47 1
				71.81 14.72							
		Silty Clay (CL-ML),hard, grey, moist, fine sand, low plasticity (Glaciolacustrine) (Unit 4b)									
15					15	SS	146/0.20		⊢○⊣		1 6 70 23
16											
				69.59 16.94							
17		**Silty Clay with Sand (CL-ML)**, hard, grey, moist, fine to coarse sand, trace angular fine gravel, low plasticity (Till) (Unit 5)									
18					16	SS	180		⊢⊖⊣	γ = 26.8 kN/m³	2 17 65 17
19											
20				66.53							
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859970.61; E 683798.32

RECORD OF BOREHOLE: BH75

SHEET 3 OF 7

BORING DATE: September 7 and 8, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Acker Renegade I

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Lean Clay with Sand (CL)**,hard, grey, moist, fine sand, low plasticity (Till) (Unit 5)		20.00							
21					17	SS	41		○	γ = 25.1 kN/m³	3 20 52 26
22				64.25							
		Shale Bedrock Fragments (Unit 6a)		22.28							
		- Bedrock cored from 22.72 m to 61.03 m depth		63.81	18	SS	100/0.02				
				22.72							
23		- Refer to Record of Drillhole BH75									
24											
25											
26											
27											
28											
29											
30											

NOTE:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: IC

CHECKED: SEMP

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859970.61; E 683798.32
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH75

DRILLING DATE: September 14 and 15 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		64.00																
		Shale bedrock fragments		22.53 / 63.81																
		Slightly weathered to fresh, thinly to medium bedded, dark brownish grey, fine grained, faintly porous, moderately reactive to HCl, medium strong to strong SHALE (Blue Mountain Formation) with very thin to thin bedded grey limestone interbeds		22.72	1															
23					2							JN,UN,RO	3	1	25					
24		- UCS Sample																		
					3							BD,PL,SM	1	1	16					
25																				
26												BD,PL,SM BD,PL,SM	1 1	1 1	16 16					
		Fresh, thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds		60.37 / 26.16	4							BD,PL,RO	1.5	1	20					
27		- UCS with Modulus Sample																		
28					5							BD,UN,SM SA	2	2	20					
29																				
30					6															
31					7															
32												BD,UN,RO	3	1	25					
					8															

Rotary Drill
HQ3 Core

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 50

wsp GOLDER

LOGGED: IC/KL
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859970.61; E 683798.32
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH75

DRILLING DATE: September 14 and 15 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
33	Rotary Drill / HQ3 Core	Fresh, thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			8															
34					9															
35																				
36					10															
37					11															
38																				
39					12							BD,UN,SM	2	1	20					
40					13															
41																				
42					14															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC/KL
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859970.61; E 683798.32
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH75

DRILLING DATE: September 14 and 15 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			14															
43					15															
44											•	BD,PL,RO	1.5	1	20					
45					16															
46					17															
47																				
48					18															
49					19															
50											•	BD,UN,RO	3	1	25					
51					20						•	BD,UN,RO	3	1	25					
52					21															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC/KL
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859970.61; E 683798.32
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH75

DRILLING DATE: September 14 and 15 2021
DRILL RIG: Acker Renegade I
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
53	Rotary Drill HQ3 Core	Fresh, thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey shale interbeds			21							BD,UN,SM SA	2	2	20					
54					22															
55					23															
56																				
57					24							BD,UN,SM	2	1	20					
58																				
59					25															
60					26							BD,UN,RO	3	1	25					
61		END OF DRILLHOLE		25.50 / 61.03																
62																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: IC/KL
CHECKED: AC

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PROJECT: 21451329

LOCATION: N 4859942.43; E 683825.68

RECORD OF BOREHOLE: BH76

SHEET 1 OF 4

BORING DATE: July 26 and 27, August 9, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4})	WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		GROUND SURFACE	86.12									
0	Power Augering; 210 mm O.D. / 110 mm I.D. Hollow Stem Augers	**Silty Sand (SM)**, loose to very loose, brown, moist, to wet below 0.7 m, fine to coarse sand, angular fine gravel (Fill) (Unit 1)	0.00	1	SS	5						21 56 17 6
		- Rock fragments in spoon samples 1 and 2		2	SS	1						
		Silty Sand (SM), with cobbles and boulders, very dense, grey, moist, fine to coarse sand, subangular to angular fine gravel (Till) (Unit 3)	84.75 / 1.37	3	SS	65						
2		- Rock fragments in bottom of spoon sample 3 at 2.0 m depth		4	SS	78						
		- Augers grinding from 2.7 m to 3.0 m depth										
3	Mud Rotary Wash Boring; HWT			5	SS	180/0.28						
		- Rock fragments in bottom of spoon sample 5 at 3.5 m depth										
4		- Rock fragments in top of spoon sample 6 at 3.8 m depth		6	SS	146						
		- Rock fragments in spoon sample 7		7	SS	94						14 42 36 8
5			80.79									
		Silt (ML), very dense, grey, wet (Glaciolacustrine) (Unit 4a)	5.33	8A	SS	106						
		Silty Sand (SM), with cobbles and boulders, very dense, grey, moist, fine to coarse sand, subangular to angular fine gravel (Till) (Unit 3)	5.49	8B								
6				9	SS	108						
7												
		- Rock fragments in top of spoon sample 10 at 7.6 m depth		10	SS	99						
8												
9				11	SS	168						
10		*CONTINUED NEXT PAGE*										

PIEZOMETER OR STANDPIPE INSTALLATION: 50 mm Dia. Monitoring Well; Concrete; Bentonite; Screen and Sand; Sand; Grout

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859942.43; E 683825.68

RECORD OF BOREHOLE: BH76

SHEET 2 OF 4

BORING DATE: July 26 and 27, August 9, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring, HWT	**Silty Sand (SM)**, with cobbles and boulders, very dense, grey, moist, fine to coarse sand, subangular to angular fine gravel (Till) (Unit 3)									
11					12	SS	89		○ H		8 46 37 9
12					13	SS	173/ 0.25		○		
13				72.96 / 13.16							
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a) - Rock fragments in top of spoon sample 14 at 13.7 m depth									
14					14	SS	100/ 0.16		○		
				71.50 / 14.62							
15		**Lean Clay (CL)**, hard, grey, moist, sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
				70.78 / 15.34	15A	SS	139				
		Silty Sand (SM), very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)			15B				○		
16				69.92 / 16.20							
		Lean Clay (CL), hard, grey, moist, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
17					16	SS	35		⊢—○—⊣		0 5 43 52
				68.37 / 17.75							
18		**Silt (ML)**, hard, grey, moist, fine sand (Glaciolacustrine) (Unit 4a)									
					17	SS	111		○	γ = 22.4 kN/m³	1 13 61 24
19											
				66.18	18	SS	100/ 0.1		○		
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH76

SHEET 3 OF 4

LOCATION: N 4859942.43; E 683825.68

BORING DATE: July 26 and 27, August 9, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, subangular fine gravel, low plasticity (Till) (Unit 5)		19.94							
21	HWT				19	SS	79		⊢—⊣	γ = 20.9 kN/m³	5 36 44 16
22	Rock Core HQ3	- Bedrock cored from 22.36 m to 26.21 m depth - Refer to Record of Drillhole BH76		63.76 / 22.36							
23											
24											
25											
26											
27											
28											
29											
30											

NOTES:

1. Water first encountered at a depth of 0.8 m during drilling.

2. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

3. Well installed on August 9, 2021.

4. Water level measured in the monitoring well at a depth of 0.37 m below ground surface (Elev. 85.75 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: TD

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859942.43; E 683825.68
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH76

DRILLING DATE: August 3 to 4, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		63.76																
23	Rotary Drill HQ3 Core	Slightly weathered to fresh, very thinly to medium bedded, dark grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to medium, grey limestone interbeds.		22.36	1							BD,UN,SM	2	1	20					
												BD,PL,SM	1	1	16					
												BD,PL,RO	1.5	1	20					
24					2							JN,PL,RO	1.5	1	20					
25					3							BD,PL,SM	1	1	16					
				60.37								BD,UN,RO	3	1	25					
												BD,PL,SM	1	1	16					
26		Fresh, very thinly to thinly bedded, grey, fine to medium grained, faintly porous, slightly reactive to HCl, medium strong LIMESTONE (Lindsay Formation) with very thin to thin, dark grey shale interbeds.		25.75																
				59.91																
		END OF DRILLHOLE		26.21																
27																				
28																				
29																				
30																				
31																				
32																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: SAP

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PROJECT: 21451329

RECORD OF BOREHOLE: BH77

SHEET 1 OF 4

LOCATION: N 4859945.63; E 683968.58

BORING DATE: August 19 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION – GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		GROUND SURFACE		87.80					
0	Power Augering, 210 mm O.D./ 110 mm I.D. Hollow Stem Augers	**Sand with Gravel (SP)**, dense, brown, moist, fine to coarse sand, angular fine to coarse gravel (Fill) (Unit 1)		0.00	1A, 1B, 1C	SS	35		
		Sandy Lean Clay (CL), very stiff, dark brown, moist, fine to medium sand, low to medium plasticity (Fill) (Unit 1)		87.44 / 0.36	1D, 2A, 2B	SS	17		
1									
		Silty Sand with Gravel (SM), loose to medium dense, brown, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Glaciolacustrine) (Unit 2b)		86.43 / 1.37	3	SS	7		17 42 31 10
2					4	SS	17		
3		**Silty Sand with Gravel (SM) to Sandy Silt (ML)**, with cobbles and boulders, dense to very dense, brown to grey, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Till) (Unit 3)		84.90 / 2.90	5	SS	48		20 43 30 8
	Mud Rotary Wash Boring, HWT Casing	- Becoming grey at 3.66 m							
4		- Rock fragments in spoon sample 6A			6A, 6B	SS	136		
		- Rock fragments in spoon sample 7			7	SS	118	γ = 19.1 kN/m³	
5		- Rock fragments in spoon sample 8A			8A, 8B	SS	134		
6					9	SS	149		16 41 34 10
7									
8					10	SS	185/ 0.25		6 40 44 10
9					11	SS	100/ 0.08		
10		*CONTINUED NEXT PAGE*							

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10} 10^{-8} 10^{-6} 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl; 10 20 30 40

DEPTH SCALE 1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859945.63; E 683968.58

RECORD OF BOREHOLE: BH77

SHEET 2 OF 4

BORING DATE: August 19 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand with Gravel (SM) to Sandy Silt (ML)**, with cobbles and boulders, dense to very dense, brown to grey, moist, fine to coarse sand, subrounded to subangular fine to coarse gravel (Till) (Unit 3)									
					12	SS	100/0.1				
11				76.24 / 11.56							
		Silty Sand with Gravel (SM), very dense, grey, moist, fine to coarse sand, fine subrounded gravel (Glaciolacustrine) (Unit 4a)									
12					13	SS	135				1 35 62 2
13											
14					14	SS	192/0.27				
15					15	SS	176/0.29				
16				71.57 / 16.23							
		Lean Clay (CL), very stiff to hard, moist, fine sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									
17					16	SS	33				
18					17	SS	24				9 5 44 42
19				68.52 / 19.28							
		Silty Sand (SM) to Sandy Silt (ML), very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)									
20					18	SS	100/0.06				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859945.63; E 683968.58

RECORD OF BOREHOLE: BH77

BORING DATE: August 19 to 25, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Mud Rotary Wash Boring, HWT Casing	**Silty Sand (SM) to Sandy Silt (ML)**, very dense, grey, moist, fine to medium sand (Glaciolacustrine) (Unit 4a)									
21					19	SS	100/0.13		○		0 50 48 2
22				65.55 / 22.25							
		Silty Clay with Sand (CL-ML), hard, grey, moist, fine to coarse sand, fine, trace subangular fine gravel, low plasticity (Till) (Unit 5)									
23					20	SS	89		⊖⊣		4 22 53 22
24				63.61	21A	SS	113/0.2		○		
		Shale Bedrock Fragments (Unit 6a)		24.19 / 24.27	21B						
25	Rock Core, HQ3	Bedrock cored from 24.27 m to 25.90 m depth. Refer to Record of Drillhole BH77									
26		NOTE: 1. Water encountered during drilling at a depth of 1.52 m below ground surface.									
27											
28											
29											
30											

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: GS

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859945.63; E 683968.58
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH77

DRILLING DATE: August 25, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		63.61																
		Shale Bedrock Fragments		24.19																
	Rotary Drill	Slightly weathered, thinly to medium bedded, dark brownish grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with very thin to thin, grey limestone interbeds		24.27								BD,PL,RO So	1.5	1	20					
	HQ3 Core											BD,PL,RO So	1.5	1	20					
25					1															
		- Swell Sample		61.90																
26		END OF DRILLHOLE		25.90																
27																				
28																				
29																				
30																				
31																				
32																				
33																				
34																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: GS
CHECKED: AC

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PROJECT: 21451329

RECORD OF BOREHOLE: BH78

SHEET 1 OF 9

LOCATION: N 4859948.25; E 683884.24

BORING DATE: September 15 and 16 and October 19, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	ELEV. DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		GROUND SURFACE	86.82					GR SA SI CL
0	Power Augering, 210 mm O.D./110 mm I.D. Hollow Stem Augers	**Silty Sand with Gravel (SM)**, dense to medium dense, brown, moist, fine to coarse sand, subangular to angular fine to coarse gravel (Fill) (Unit 1) - Shale fragments between 0.10 m and 0.30 m	0.00	1A, 1B, 1C	SS	30		50 mm Dia. Monitoring Well Concrete Bentonite
		Lean Clay with Sand (CL), medium stiff, brown to dark brown, moist, organic staining, fine to medium sand, low to medium plasticity (Fill) (Unit 1) - Spoon refusal at 1.07 m depth	86.14 0.68	2	SS		γ = 19.6 kN/m³	
1		**Silty Sand with Gravel (SM)** with cobbles and boulders, very dense, brown to grey, wet to moist, fine to coarse sand, subangular to angular fine to coarse gravel (Till) (Unit 3) - Cored through boulder between 1.07 m to 1.37 m depth - Becoming grey at 2.13 m depth - Rock fragments in spoon samples 3 and 4 - Rock fragments in spoon samples 5 to 9	85.75 1.07	3	SS	51	γ = 25.2 kN/m³	
2	Mud Rotary Wash Boring, HWT Casing			4	SS	72		
3				5	SS	63		
4				6	SS	64		
5				7	SS	101		27 40 27 6
								Grout
6				8	SS	65		
				9	SS	101		
7								
8				10	SS	189/0.23	γ = 25.1 kN/m³	16 46 31 7
9				11	SS	195		
10		*CONTINUED NEXT PAGE*						

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20 40 60 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-10} 10^{-8} 10^{-6} 10^{-4}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl; 10 20 30 40

DEPTH SCALE 1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

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PROJECT: 21451329

LOCATION: N 4859948.25; E 683884.24

RECORD OF BOREHOLE: BH78

SHEET 2 OF 9

BORING DATE: September 15 and 16 and October 19, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES – NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%) (GR SA SI CL)
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Mud Rotary Wash Boring; HWT Casing	**Silty Sand (SM)**, very dense, grey, wet, fine to medium sand (Glaciolacustrine) (Unit 4a)		76.69 / 10.13							
					12	SS	185/0.26		○		0 68 30 1
11											
12											
					13	SS	186/0.26		○	γ = 21.6 kN/m³	Grout
13											
					14	SS	100/0.15		○		
14											
15											
					15	SS	162		○		
16				70.59 / 16.23							
		Lean Clay (CL), hard, grey, moist, trace fine to medium sand, low to medium plasticity (Glaciolacustrine) (Unit 4b)									Bentonite
17					16	SS	81				
				69.07 / 17.75							
18		**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, trace angular fine gravel (Till) (Unit 5)									
					17A	SS	40		○		
		- Wet between 17.75 m and 18.46 m			17B				○	γ = 23.0 kN/m³	Sand
19											Screen
20					18	SS	96				0 30 57 13
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

PROJECT: 21451329

LOCATION: N 4859948.25; E 683884.24

RECORD OF BOREHOLE: BH78

BORING DATE: September 15 and 16 and October 19, 2021

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: Diedrich 50 Track Mounted

HAMMER TYPE: AUTOMATIC

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE – DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●; rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-10} 10^{-8} 10^{-6} 10^{-4}) / WATER CONTENT PERCENT (Wp ⊢—○W—⊣ Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION / GRAIN SIZE DISTRIBUTION (%)
		--- CONTINUED FROM PREVIOUS PAGE ---									GR SA SI CL
20	Mud Rotary Wash Boring; HWT Casing	**Sandy Silty Clay (CL-ML)**, hard, grey, moist, fine to coarse sand, trace angular fine gravel (Till) (Unit 5)			18	SS	96		○		0 30 57 13
21										γ = 25.7 kN/m³	Screen
					19	SS	52		⊢—⊣		
22											Sand
		- Bedrock cored from 23.07 m to 81.03 m depth									
		- Refer to Record of Drillhole BH78.			20	SS	80		○		
23				63.75							Grout
				23.07							
24											
25											
26											
27											
28											
29											
30											

NOTES:

1. Water level in open borehole could not be measured upon completion of soil drilling due to use of mud-rotary technique.

2. Monitoring well installed on October 19, 2021.

3. Water level measured in the monitoring well at a depth of 7.71 m below ground surface (Elev. 79.11 m) on January 05, 2022.

DEPTH SCALE

1 : 50

WSP GOLDER

LOGGED: SC

CHECKED: SEMP

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859948.25; E 683884.24
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH78

DRILLING DATE: September 16 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE:
For abbreviations, symbols and descriptions refer to
LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY TOTAL CORE %	RECOVERY SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		TOP OF BEDROCK		63.75																
	Rotary Drill HQ3 Core	Slightly weathered to fresh, thinly to medium bedded, dark browinish grey, fine grained, faintly porous, moderately reactive to HCl, medium strong SHALE (Blue Mountain Formation) with thin, grey, limestone interbeds.		23.07	1							BD,PL,SM SA	1	2	16					
24												BD,UN,RO SA	3	2	22					Grout
					2							BD,PL,RO SA	1.5	2	20					
25												BD,PL,RO SA	1.5	2	20					
												BD,PL,RO SA	1.5	2	20					
26												BD,UN,RO SA	3	2	22					
				60.35																
		Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.		26.47	3							BD,UN,RO	3	1	25					
27																				
28					4							BD,PL,RO	1.5	1	20					
												BD,PL,RO PC,CL	1.5	4	16					
29																				
					5							BD,PL,RO SA	1.5	2	20					
30																				
31					6															
32																				
					7							BD,PL,RO	1.5	1	20					
33																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859948.25; E 683884.24
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH78

DRILLING DATE: September 16 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.			7															
34					8															
35											•	BD,UN,RO CC,CL	3	4	20					
											•	BD,CU,RO SA	3	2	22					
36					9															
											•	BD,UN,RO SA	3	2	22					
37																				
											•	BD,UN,RO SA	3	2	22					
					10						•	BD,PL,RO SA	1.5	2	20					
38																				
39					11															
											•	BD,PL,RO	1.5	1	20					
40																				
41					12															
											•	BD,PL,RO	1.5	1	20					
42					13															
					14						•	BD,CU,RO	3	1	25					
43																				
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859948.25; E 683884.24
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH78

DRILLING DATE: September 16 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill / HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds. - Direct Shear Sample			14							BD,UN,RO	3	1	25					
44												BD,UN,RO	3	1	25					
45					15															
46					16															
47												BD,UN,RO	3	1	25					
48					17							BD,UN,RO	3	1	25					
49					18															
50																				
51					19							BD,UN,RO BD,UN,RO	3 3	1 1	25 25					
52																				
					20															
53		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859948.25; E 683884.24
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH78

DRILLING DATE: September 16 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
54	Rotary Drill, HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.			20															
					21							BD,UN,RO	3	1	25					
55					22							BD,UN,RO	3	1	25					
56					23							BD,UN,RO	3	1	25					
57					24							BD,UN,RO	3	1	25					
58					25															
59					26							BD,UN,RO	3	1	25					
60					27															
61																				
62																				
63		*CONTINUED NEXT PAGE*																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: AC

PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859948.25; E 683884.24
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH78

DRILLING DATE: September 16 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE % (80 60 40 20)	RECOVERY: SOLID CORE % (80 60 40 20)	R.Q.D. % (80 60 40 20)	FRACT. INDEX PER 0.25 m (5 10 15 20)	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS (0 30 60 90)	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	DISCONTINUITY DATA: Jr	DISCONTINUITY DATA: Ja	DISCONTINUITY DATA: Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec (10^{-8} 10^{-6} 10^{-4} 10^{-2})	WEATHERING INDEX (W1 W2 W3 W4 W5 W6)	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
64	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.			27															
65					28															
66					29															
67																				
68					30															
69												BD,UN,RO PC,CL	3	4	20					
70					31							BD,UN,RO PC,CL	3	4	20					
71												BD,UN,RO PC,CL	3	4	20					
72					32							BD,UN,RO SA	3	2	22					
73					33															
		CONTINUED NEXT PAGE																		

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: AC

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PROJECT: 21451329
PROJECT NAME: DNNP
LOCATION: N 4859948.25; E 683884.24
LOCATION DESCRIPTION:
INCLINATION: -90° AZIMUTH: ---

RECORD OF DRILLHOLE: BH78

DRILLING DATE: September 16 to 23, 2021
DRILL RIG: Diedrich 50 Track Mounted
DRILLING CONTRACTOR: Walker Drilling

DATUM: Geodetic

NOTE: For abbreviations, symbols and descriptions refer to LITHOLOGICAL AND GEOTECHNICAL ROCK DESCRIPTION TERMINOLOGY

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	FLUSH RETURN	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jr	Ja	Jcon	HYDRAULIC CONDUCTIVITY K, cm/sec	WEATHERING INDEX	FEATURES	R0/R1 ZONES	PIEZOMETER
		--- CONTINUED FROM PREVIOUS PAGE ---																		
	Rotary Drill HQ3 Core	Fresh, very thin to thinly bedded, grey, fine to medium grained, faintly porous, moderately reactive to HCl, strong LIMESTONE (Lindsay Formation) with dark grey, shale interbeds.			33															
74					34															
75					35															
76																				
77					36							BD,UN,RO SA	3	2	22					
78					37															
79																				
80					38															
81				5.79																
		END OF DRILLHOLE		81.03																
82																				
83																				

DEPTH SCALE
1 : 50

WSP GOLDER

LOGGED: SC
CHECKED: AC

Appendix B Borehole and Laboratory Data Summary

Table B-1: Stratigraphy Summary - Lists the depths and thickness of soil units encountered in all boreholes relevant to the study.

Table B-2: SPT and Laboratory Data Summary - lists all standard penetration testing and laboratory testing retrieved from available borehole logs

Table B-3: Shear Wave Velocity Data Summary - lists all in-situ shear wave velocity measurement data

Table B-4: Summary of Cyclic Triaxial and Simple Shear Test Results

Table B-1: Stratigraphy Summary

Structure	Borehole ID	Date Completed	Ground Elevation (m)	Bedrock Elevation (m)	Stratigraphy (m)								
					Unit 1 Fill /Topsoil	Unit 2a Lacustrine	Unit 2b Lacustrine	Unit 3 Upper Till	Unit 4a Interglacial	Unit 4b Interglacial	Unit 5 Lower Till	Bedrock	Bottom of Hole
			CGD	CGD	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top depth	Depth
Reactor Building (No. 1)	BH9	2021-09-30	88.83	64.12	0-2.13	2.13-1.91	4.04-1.9	5.94-5.62	11.56-4.67 21.44-2.39	16.23-3.73	23.83-0.88	24.71	120.8
Reactor Building (No. 1)	BH10	2021-06-21	88.40	63.98	0-1.98	1.98-1.5	3.48-1.7	5.18-4.95	10.13-6.86	16.99-4.55	21.54-2.88	24.42	60.72
Reactor Building (No. 1)	BH11	2021-06-28	87.89	64.65	0-0.61	0.65-1.14	-	1.75-8.45	10.2-5.27 20.04-1.73	15.47-3.07	18.54-1.5 21.77-1.47	23.24	120.7
Reactor Building (No. 1)	BH12-3	2021-10-03	87.44	63.97	0-0.76	0.76-1.62	-	2.38-8.39	10.77-3.11 20.55-2.92	13.88-3.11	16.99-3.56	23.47	60.41
Reactor Building (No. 1)	BH14	2021-06-30	87.61	64.05	0-0.69	0.69-0.68	-	1.37-6.35	7.72-0.89 10.12-7.63 19.28-2.92	8.61-1.51 17.75-1.53	22.2-1.36	23.56	120.47
Turbine Building (No. 2)	BH2	2021-09-10	89.41	64.58	0-2.13	2.13-3.76	5.89-0.82	6.71-3.35	10.06-7.77	17.83-2.97	20.8-4.03	24.83	41.27
Turbine Building (No. 2)	BH5	2021-08-27	88.97	63.90	0-3.28	3.28-6.09		9.37-3.05	12.42-5.99	-	18.41-6.63	25.07	40.05
Turbine Building (No. 2)	BH7	2021-06-16	88.10	64.10	0-2.13	2.13-2.21	4.34-0.84	5.18-6.48	11.66-5.32 21.49-0.19	16.98-2.83	19.81-1.68 21.68-2.32	24	60.4
Turbine Building (No. 2)	BH8	2021-09-08	87.48	64.19	0-1.3	1.3-1.59	-	2.89-6.79	9.68-6.09 19.23-1.32	15.77-1.83	17.6-1.63 20.55-2.74	23.29	25.01
Turbine Building (No. 2)	BH9	2021-09-30	88.83	64.12	0-2.13	2.13-1.91	4.04-1.9	5.94-5.62	11.56-4.67 21.44-2.39	16.23-3.73	23.83-0.88	24.71	120.8
Turbine Building (No. 2)	BH66	2021-06-14	89.49	63.72	0-2.13	2.13-1.91	4.04-2.67	6.71-1.91	8.62-9.95	18.57-4.59	23.16-2.61	25.77	81.03
Turbine Building (No. 2)	BH67	2021-09-13	88.52	64.17	0-3.28	-	3.28-3.81	7.09-3.81	10.9-6.09 20.04-1.47	16.99-3.05	21.51-2.81	24.35	60.18
Turbine Building (No. 2)	BH68	2021-09-02	88.79	63.95	0-1.75	1.75-2,44	4.19-2.44	6.63-6.1	12.73-4.88	17.61-2.44	20.05-4.79	24.84	60.2
Turbine Building (No. 2)	BH71	2021-09-29	88.32	64.14	0-1.83	1.83-1.83	3.66-1.14	4.8-6.68	11.48-4.67	16.15-3.13	19.28-4.9	24.18	120.34
Turbine Building (No. 2)	BH73	2021-09-02	87.96	63.88	0-2.28	-	2.28-1.01	3.29-8.24	11.53-5.44 20.04-1.47	16.97-3.07	21.51-2.57	24.08	25.46
Radwaste Building (No. 3)	BH12-3	2021-10-03	87.44	63.97	0-0.76	0.76-1.62	-	2.38-8.39	10.77-3.11 20.55-2.92	13.88-3.11	16.99-3.56	23.47	60.41
Radwaste Building (No. 3)	BH13	2021-06-23	87.14	64.27	0-2.13	-	-	2.13-7.92	10.05-6.1 20.88-1.45	16.15-1.83	17.98-2.9 22.33-0.54	22.87	81.01
Radwaste Building (No. 3)	BH17	2021-08-05	86.82	64.16	0-0.89	-	0.89-1.24	2.13-13.49	19.86-2.3	15.62-2.13	17.75-2.11 22.16-0.5	22.66	81.18
Radwaste Building (No. 3)	BH73	2021-09-02	87.96	63.88	0-2.28	-	2.28-1.01	3.29-8.24	11.53-5.44 20.04-1.47	16.97-3.07	21.51-2.57	24.08	25.46
Control Building (No. 4)	BO-16	1971-06-04	86.93	63.40	0-0.28	-	0.28-1.05	1.33-11.11	12.44-6.12 19.81-2.22	-	18.56-1.25 22.03-1.5	24.99	34.99
Control Building (No. 4)	BH14	2021-06-30	87.61	64.05	0-0.69	0.69-0.68	-	1.37-6.35	7.72-0.89 10.12-7.63 19.28-2.92	8.61-1.51 17.75-1.53	22.2-1.36	23.56	120.47
Control Building (No. 4)	BH15	2021-06-28	87.37	63.90	0-1.37	-	-	1.37-7.85	9.22-3.81	13.03-3.96 19.94-3.53	16.99-2.95	23.47	80.9

Structure	Borehole ID	Date Completed	Ground Elevation (m)	Bedrock Elevation (m)	Stratigraphy (m)								
					Unit 1 Fill /Topsoil	Unit 2a Lacustrine	Unit 2b Lacustrine	Unit 3 Upper Till	Unit 4a Interglacial	Unit 4b Interglacial	Unit 5 Lower Till	Bedrock	Bottom of Hole
			CGD	CGD	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top depth	Depth
Control Building (No. 4)	BH18	2021-08-12	87.18	63.57	0-0.61	-	-	0.61-3.58 5.08-5.1	4.19-0.89 10.18-4.98 19.81-0.23 20.27-0.38 20.88-0.3	15.16-2.21 20.04-0.23 20.65-0.38	17.37-2.44 21.18-2.43	23.61	80.95
Control Building (No. 4)	BH19	2021-08-03	86.58	63.87	0-0.99	-	-	0.99-8.67	9.66-5.94	15.6-1.42	17.02-5.69	22.71	61.51
Control Building (No. 4)	BH20	2021-07-15	86.36	-	0-0.69	-	0.69-0.68	1.37-5.69 7.92-2.29	7.06-0.86 13.13-3.18 19.28-0.99	16.31-2.11	18.42-0.86	-	20.27
Control Building (No. 4)	BH78	2021-10-19	86.82	63.75	0-1.07	-	-	1.07-9.06	10.13-6.1	16.23-1.52	17.75-5.32	23.07	81.03
Reactor Auxiliary Bay (No. 5)	B-113	2012-12-14	88.50	62.70	0-0.7	0.7-3	3.7-3.7	7.4-4.5	11.9-4.6 21.1-1.4	16.5-3.2	19.7-1.4 22.5-3.3	25.8	33.7
Reactor Auxiliary Bay (No. 5)	B-116	2012-12-17	89.30	64.10	0-0.7	2.2-3 9.3-2.2	0.7-1.5 5.2-3	8.2-1.1	10.4-7.2 22.5-1.5	17.6-2.8	20.4-2.1 24-1.2	25.20	35.1
Reactor Auxiliary Bay (No. 5)	BH1	2021-10-13	89.62	64.33	0-1.14	1.14-1.83	2.97-1.22	4.19-4.26	10.9-6.09 22.48-0.53	8.45-2.45 18.21-3.05	21.26-1.22	25.29	41.24
Reactor Auxiliary Bay (No. 5)	BH2	2021-09-10	89.41	64.58	0-2.13	2.13-3.76	5.89-0.82	6.71-3.35	10.06-7.77	17.83-2.97	20.8-4.03	24.83	41.27
Reactor Auxiliary Bay (No. 5)	BH4	2021-07-21	89.64	64.19	0-3.28	3.28-6.09	-	-	9.37-9.15 21.56-2.13	18.52-3.04	23.69-1.76	25.45	122.01
Reactor Auxiliary Bay (No. 5)	BH5	2021-08-27	88.97	63.90	0-3.28	3.28-6.09	-	9.37-3.05	12.42-5.99	-	18.41-6.63	25.07	40.05
Reactor Auxiliary Bay (No. 5)	BH10	2021-06-21	88.40	63.98	0-1.98	1.98-1.5	3.48-1.7	5.18-4.95	10.13-6.86	16.99-4.55	21.54-2.88	24.42	60.72
Reactor Auxiliary Bay (No. 5)	BH15	2021-06-28	87.37	63.90	0-1.37	-	-	1.37-7.85	9.22-3.81	13.03-3.96 19.94-3.53	16.99-2.95	23.47	80.9
Reactor Auxiliary Bay (No. 5)	BH16	2021-09-29	88.63	64.55	0-1.37	1.37-2.29	3.66-3.43	7.09-2.97	12.34-4.5 20.08-4	10.06-2.28 16.84-3.24	-	24.08	100.66
Reactor Auxiliary Bay (No. 5)	BH77	2021-08-25	87.80	63.61	0-1.37	-	1.37-1.53	2.9-8.66	11.56-4.67 19.28-2.97	16.23-3.05	22.25-1.94	24.19	25.9
ISFSI (No. 6)	B-104	2013-02-06	88.30	63.20	0-1.1	1.1-1.9	3-4.8	7.8-2.5	10.3-6.7 20.6-1.3	17-3.6	21.9-3.2	25.1	34.2
ISFSI (No. 6)	B-113	2012-12-14	88.50	62.70	0-0.7	0.7-3	3.7-3.7	7.4-4.5	11.9-4.6 21.1-1.4	16.5-3.2	19.7-1.4 22.5-3.3	25.8	33.7
ISFSI (No. 6)	BH1	2021-10-13	89.62	64.33	0-1.14	1.14-1.83	2.97-1.22	4.19-4.26	10.9-6.09 22.48-0.53	8.45-2.45 18.21-3.05	21.26-1.22	25.29	41.24
ISFSI (No. 6)	BH3	2021-09-28	89.89	64.45	0-0.69	0.69-5.25	5.94-0.69	6.63-3.43	12.32-5.37 19.28-1.52 22.35-1.49	10.06-2.26 17.69-1.59 20.8-1.55	23.84-1.6	25.44	41.34
ISFSI (No. 6)	AMC-03alt	2010-10-21	99.79	64.19	1-7.5	-	-	-	-	-	8.5-27.1	35.6	239.57
ISFSI (No. 6)	BO-2	1971-03-11	89.06	63.92	-	-	-	11.66-3.6	8.56-3.1 15.26-4.25 20.91-2.72	-	19.51-1.4 23.63-0.94	26.73	35.72
EME Route	B-104	2013-02-06	88.30	63.20	0-1.1	1.1-1.9	3-4.8	7.8-2.5	10.3-6.7 20.6-1.3	17-3.6	21.9-3.2	25.1	34.2
EME Route	B-113	2012-12-14	88.50	62.70	0-0.7	0.7-3	3.7-3.7	7.4-4.5	11.9-4.6 21.1-1.4	16.5-3.2	19.7-1.4 22.5-3.3	25.8	33.7

Structure	Borehole ID	Date Completed	Ground Elevation (m)	Bedrock Elevation (m)	Stratigraphy (m)								
					Unit 1 Fill /Topsoil	Unit 2a Lacustrine	Unit 2b Lacustrine	Unit 3 Upper Till	Unit 4a Interglacial	Unit 4b Interglacial	Unit 5 Lower Till	Bedrock	Bottom of Hole
			CGD	CGD	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top depth	Depth
EME Route	B-116	2012-12-17	89.30	64.10	0-0.7	2.2-3 9.3-2.2	0.7-1.5 5.2-3	8.2-1.1	10.4-7.2 22.5-1.5	17.6-2.8	20.4-2.1 24-1.2	25.20	35.1
EME Route	B-118	2013-01-02	86.35	62.58	0-2.1	2.1-2.9	5-2.4	7.4-1.6 9.7-0.9	9-0.7 10.6-5.9 21.1-0.7	16.5-3.9	20.4-0.7 21.8-3	24.8	66.7
EME Route	AMC-01	2010-09-30	98.92	64.62	0-4	-	-	4-6.65	-	10.65-8.35	19-15.3	34.3	231.64
EME Route	AMC-03alt	2010-10-21	99.79	64.19	1-7.5	-	-	-	-	-	8.5-27.1	35.6	239.57
EME Route	BO-2	1971-03-11	89.06	63.92	-	-	-	11.66-3.6	8.56-3.1 15.26-4.25 20.91-2.72	-	19.51-1.4 23.63-0.94	26.73	35.72
EME Route	BO-13	1971-05-06	99.58	63.06	0-0.44	-	0.44-1.75	2.19-17.01	19.2-2.01		21.21-2.03	24.81	34.26
EME Route	BO-14	1971-05-21	89.06	61.63	0-0.4	-	-	0.4-26.68	-	-	-	28.74	38.19
EME Route	BO-15	1971-05-31	88.82	64.04	0-0.46	-	0.46-2.17	2.61-19.58	-	-	-	23.47	33.44
Control Building (No. 4)	BO-16	1971-06-04	86.93	63.40	0-0.28	-	0.28-1.05	1.33-11.11	12.44-6.12 19.81-2.22	-	18.56-1.25 22.03-1.5	24.99	34.99
EME Route	BO-21	1971-06-23	87.75	-	0-0.22	-	0.22-1.81	2.03-7.04	9.07-7.94	-	-	-	18.11
EME Route	BO-23	1971-07-09	87.75	-	0-0.3	-	0.3-0.47	0.77-8.81 12.61-3.97	9.58-3.03 16.58-11.8	-	-	-	29.1
EME Route	BO-24	1971-07-19	86.35	62.58	0-0.42	-	0.39-2.82	2.2-7.8 10.17-2.76	10-0.17 12.93-4.19 18.39-3.28	-	17.12-1.27 21.67-1.46	23.21	32.22
EME Route	BO-47	1973-11-08	95.13	-	0-0.29	-	0.29-1.12	1.41-7.85	9.26-14.95	-	-	-	24.08
EME Route	DN-60	2008-01-21	98.30	67.33	0-0.15	-	-	0.15-16.65	18.4-3.4 23.4-1.6	16.8-1.6 21.8-1.6 25-3.1	28.1-2.9	30.97	34.26
EME Route	BH1	2021-10-13	89.62	64.33	0-1.14	1.14-1.83	2.97-1.22	4.19-4.26	10.9-6.09 22.48-0.53	8.45-2.45 18.21-3.05	21.26-1.22	25.29	41.24
EME Route	BH3	2021-09-28	89.89	64.45	0-0.69	0.69-5.25	5.94-0.69	6.63-3.43	12.32-5.37 19.28-1.52 22.35-1.49	10.06-2.26 17.69-1.59 20.8-1.55	23.84-1.6	25.44	41.34
EME Route	BH6	2021-07-20	85.25	62.72	0-1.37	-	-	1.37-8.76 12.4-2.31 16.23-2.36	10.13-2.27 14.71-1.52 18.59-1.83	20.42-0.76	21.18-1.35	22.53	40.35
EME Route	BH7	2021-06-16	88.10	64.10	0-2.13	2.13-2.21	4.34-0.84	5.18-6.48	11.66-5.32 21.49-0.19	16.98-2.83	19.81-1.68 21.68-2.32	24	60.4
EME Route	BH8	2021-09-08	87.48	64.19	0-1.3	1.3-1.59	-	2.89-6.79	9.68-6.09 19.23-1.32	15.77-1.83	17.6-1.63 20.55-2.74	23.29	25.01
EME Route	BH15	2021-06-28	87.37	63.90	0-1.37	-	-	1.37-7.85	9.22-3.81	13.03-3.96 19.94-3.53	16.99-2.95	23.47	80.9
EME Route	BH16	2021-09-29	88.63	64.55	0-1.37	1.37-2.29	3.66-3.43	7.09-2.97	12.34-4.5 20.08-4	10.06-2.28 16.84-3.24	-	24.08	100.66
EME Route	BH17	2021-08-05	86.82	64.16	0-0.89	-	0.89-1.24	2.13-13.49	19.86-2.3	15.62-2.13	17.75-2.11 22.16-0.5	22.66	81.18

Structure	Borehole ID	Date Completed	Ground Elevation (m)	Bedrock Elevation (m)	Stratigraphy (m)								
					Unit 1 Fill /Topsoil	Unit 2a Lacustrine	Unit 2b Lacustrine	Unit 3 Upper Till	Unit 4a Interglacial	Unit 4b Interglacial	Unit 5 Lower Till	Bedrock	Bottom of Hole
			CGD	CGD	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top depth	Depth
EME Route	BH20	2021-07-15	86.36	-	0-0.69	-	0.69-0.68	1.37-5.69 7.92-2.29	7.06-0.86 13.13-3.18 19.28-0.99	16.31-2.11	18.42-0.86	-	20.27
EME Route	BH27	2021-09-28	95.47	-	0-0.53	-	-	0.53-10.96	14.7-8.67 27.64-1.57	11.49-3.21 23.37-4.27	29.21-1.41	-	30.62
EME Route	BH28	2021-07-20	95.35	63.96	0-1.07	-	-	1.07-9.04	10.11-4.44 18.44-4.48	14.55-3.89 22.92-4.79	27.71-3.68	31.39	50.52
EME Route	BH29	2021-09-14	87.27	64.31	0-2.13	-	2.13-0.77	2.9-8.69	11.59-3.12 15.58-1.41	14.71-0.87 16.99-3.05	20.04-2.92	22.96	30.51
EME Route	BH30	2021-09-17	86.55	64.34	0-2.13	-	-	2.13-10.37 13.18-1.53	12.5-0.68 16.99-2.05	14.71-2.28	20.04-2.17	22.21	30.67
EME Route	BH50-3	2021-08-25	90.20	64.03	0-1.6	1.6-0.53	-	2.13-6.86	10.74-6.98 18.57-0.12 19.96-0.08 23.06-0.69	8.99-1.75 17.72-0.85 18.69-1.27 20.04-3.02 23.75-0.74	24.49-1.68	26.17	120.8
EME Route	BH51	2021-10-01	99.06	72.89	0-0.7	0.7-0.7	-	1.4-7.22 13.19-3.87	8.62-2.28 17.06-9	10.9-2.29 26.06-3.17	29.23-4.41	26.17	41.3
EME Route	BH52	2021-10-07	97.26	65.53	0-1.37	1.37-0.58	-	1.95-9.55	11.5-14.48	-	25.98-5.31	31.73	40.23
EME Route	BH53	2021-09-28	96.07	64.93	0-1.14	-	-	1.14-13.11	16.18-6.3 22.81-1.5 27.1-0.23	22.48-0.33 24.31-1.83	26.14-0.96 27.33-3.81	31.14	80.99
EME Route	BH54	2021-10-07	96.67	63.95	0-0.7	-	-	0.7-6.3 7.99-5.1	13.09-1.6 17.53-5.6	7-0.99 14.69-2.84 23.12-4.61	27.74-4.82	32.72	40.99
EME Route	BH55	2021-10-01	95.28	64.28	0-1.4	-	-	1.4-7.81	9.21-3.14 16.79-7.86 29.9-1.1	12.35-4.44	24.65-5.25	31	40.11
EME Route	BH57	2021-09-27	89.77	-	0-2.13	2.13-3.81	5.94-0.28	6.22-0.87	7.09-3.04 10.87-1.65 13.18-6.1 22.99-0.63	10.13-0.74 12.52-0.66 23.22-0.63	19.28-3.71 23.85-1.2	-	25.09
EME Route	BH58	2021-10-13	95.23	64.40	0-0.62	-	-	0.61-10.21	10.82-2.37 17.28-0.59 18.13-5.61 27.94-0.59	13.19-4.09 17.87-0.26 23.74-4.2	28.53-2.3	30.83	41.05
EME Route	BH59	2021-06-28	89.94	63.84	0-1.57	1.57-1.68	-	3.25-5.32	8.57-10.71 22.33-1.42	19.28-3.05	23.75-2.35	26.1	82.1
EME Route	BH60	2021-08-27	90.17	64.87	0-2.13	2.13-0.77	-	2.9-5.33	11.66-1.5 13.89-0.82 15.62-2.11 18.47-0.81 22.33-0.68	8.23-3.43 13.16-0.73 14.71-0.91 17.73-0.74 19.28-1.52	20.8-1.53 23.01-0.07	25.3	61.22
EME Route	BH61	2021-08-06	89.78	64.18	0-2.13	2.13-1.6	3.73-1.76	5.49-5.33	10.82-0.84 12.27-3.96	11.66-0.61 16.23-5.18	21.41-4.19	25.6	61.18
EME Route	BH62	2021-09-29	88.88	64.50	0-2.4	2.4-1.41	3.81-3.47	7.28-3.05	10.33-3.61 14.11-1.64 16.55-0.67 20.08-1.17	13.94-0.17 15.75-0.8 17.22-2.86	21.25-3.13	24.38	25.88

Structure	Borehole ID	Date Completed	Ground Elevation (m)	Bedrock Elevation (m)	Stratigraphy (m)								
					Unit 1 Fill /Topsoil	Unit 2a Lacustrine	Unit 2b Lacustrine	Unit 3 Upper Till	Unit 4a Interglacial	Unit 4b Interglacial	Unit 5 Lower Till	Bedrock	Bottom of Hole
			CGD	CGD	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top Depth - Thickness	Top depth	Depth
EME Route	BH63	2021-09-14	87.87	64.20	0-3.28	-	-	3.28-6.09	9.37-7.53	16.9-1.39	18.29-5.38	23.67	41.15
EME Route	BH65	2021-08-06	89.32	63.77	0-2.36	2.36-2.67	5.03-2.24	7.27-1.8	9.07-3.73 13.94-2.51 17.45-0.15 17.83-0.56	12.8-1.14 16.99-0.46 17.6-0.23 18.39-3.28	22-3.55	25.55	120.61
EME Route	BH66	2021-06-14	89.49	63.72	0-2.13	2.13-1.91	4.04-2.67	6.71-1.91	8.62-9.95	18.57-4.59	23.16-2.61	25.77	81.03
EME Route	BH69	2021-09-20	87.54	64.24	0-2.14	-	-	2.14-9.53	11.67-5.23	-'	16.9-6.4	23.3	25.96
EME Route	BH70	2021-10-22	96.40	65.80	0-1.14	-	-	1.14-7.29 8.79-2.11	10.9-2.94 15.77-4.63 20.65-1.13 22.99-0.71	8.43-0.36 13.84-1.93 20.4-0.25 21.78-1.21 23.7-1.83	25.53-5.07	30.6	41.21
EME Route	BH72	2021-10-08	96.65	64.48	0-2.13	-	-	2.13-9.53	11.66-5.21 19.88-3.1 24.59-1.55	16.87-3.01 22.97-1.61	26.14-5.97	32.17	61.05
EME Route	BH75	2021-09-08	86.53	64.00	0-0.61	0.61-1.14	1.75-0.38	-	11.31-3.41	14.72-2.22	16.94-5.34	22.53	61.03
EME Route	BH76	2021-08-09	86.12	63.76	0-1.37	-	-	1.37-3.96 5.49-7.67	5.33-0.16 13.16-1.46 15.34-0.86 17.75-2.19	14.62-0.72 16.2-1.55	19.94-2.42	22.36	26.21
EME Route	BH77	2021-08-25	87.80	63.61	0-1.37	-	1.37-1.53	2.9-8.66	11.56-4.67 19.28-2.97	16.23-3.05	22.25-1.94	24.19	25.9

Notes:
1. Boreholes are repeated if they are relevent to multiple structures.

Table B-2a: SPT and Laboratory Data Summary - Reactor Building Area

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH9	SS1	0	0.61	88.83	88.83	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	35	0.11								
BH9	SS2	0.76	1.22	88.83	88.07	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	28		12.7	25	13	3	19	49	29	
BH9	SS3	1.52	1.83	88.83	87.31	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	33									
BH9	SS4	2.29	2.74	88.83	86.54	Unit 2a	Lean Clay (CL)	Native	4		35.3	40	18					
BH9	SS6	3.81	4.27	88.83	85.02	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	15		28.5							
BH9	SS7	4.57	5.03	88.83	84.26	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	7									
BH9	SS8	5.18	5.78	88.83	83.65	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	7		7.3							
BH9	SS9	6.1	6.55	88.83	82.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	36		6.9							
BH9	SS10	6.86	7.32	88.83	81.97	Unit 3	Till: Silty Sand with Gravel (SM)	Native	138		6.9	12	10	21	42	31	7	
BH9	SS11	7.62	7.9	88.83	81.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	7.3							
BH9	SS12	9.14	9.35	88.83	79.69	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	9.5							
BH9	SS13	10.67	10.95	88.83	78.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	8.6							
BH9	SS14	12.19	12.53	88.83	76.64	Unit 4a	Silty Sand (SM)	Native	185	0.13	17.1							
BH9	SS15	13.72	14.17	88.83	75.11	Unit 4a	Silty Sand (SM)	Native	39		22			0	79	20	1	
BH9	SS16	15.24	15.66	88.83	73.59	Unit 4a	Silty Sand (SM)	Native	157	0.26	16.4							
BH9	SS17	16.76	17.22	88.83	72.07	Unit 4b	Lean Clay (CL)	Native	136		19.8							
BH9	SS18	18.29	18.75	88.83	70.54	Unit 4b	Lean Clay (CL)	Native	33		24.3	32	16	0	1	49	50	
BH9	SS19	19.81	20.27	88.83	69.02	Unit 4b	Lean Clay (CL)	Native	53		9.2	15	10	2	25	54	19	
BH9	SS20	21.34	21.56	88.83	67.49	Unit 4a	Silty Sand (SM)	Native	100	0.07	16.1							
BH9	SS21	22.86	23.27	88.83	65.97	Unit 4a	Silty Sand (SM)	Native	183	0.25	15.8			13	52	32	4	
BH9	SS22	24.38	24.79	88.83	64.45	Unit 5	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	143	0.25	8.3	14	10	15	36	36	13	
BH10	SS1	0	0.61	88.40	88.40	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	40									
BH10	SS2	1.17	1.22	88.40	87.23	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	13									
BH10	SS3	1.52	1.98	88.40	86.88	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	6		21.1	26	15	1	24	56	19	
BH10	SS4	2.29	2.74	88.40	86.11	Unit 2a	Lean Clay (CL)	Native	19		22.4	37	17					
BH10	SS6	3.81	4.42	88.40	84.59	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	10									
BH10	SS7	4.57	5.03	88.40	83.83	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	6									
BH10	SS8	5.33	5.79	88.40	83.07	Unit 3	Till: Silty Sand (SM)	Native	18									
BH10	SS9	6.1	6.55	88.40	82.30	Unit 3	Till: Silty Sand (SM)	Native	20		9.3							
BH10	SS10	7.62	8.08	88.40	80.78	Unit 3	Till: Silty Sand (SM)	Native	133									
BH10	SS11	9.14	9.6	88.40	79.26	Unit 3	Till: Silty Sand (SM)	Native	110		6.9			5	46	39	10	
BH10	SS12	10.67	11.13	88.40	77.73	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	94		15.6							
BH10	SS13	12.19	12.65	88.40	76.21	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	40									
BH10	SS14	13.72	14.1	88.40	74.68	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	193	0.23	13.8			0	72	25	2	
BH10	SS15	15.44	15.7	88.40	72.96	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	158									
BH10	SS16	18.29	18.75	88.40	70.11	Unit 4b	Lean Clay (CL)	Native	21		21.9	29	15	0	4	53	43	
BH10	SS17	21.54	21.69	88.40	66.86	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	148	0.13	15.4							
BH10	SS18	23.86	24.29	88.40	64.54	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	161	0.18	24.3			10	35	12	43	
BH11	SS1	0.15	0.61	87.89	87.74	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	50		1.1							
BH11	SS2	0.61	1.07	87.89	87.28	Unit 2a	Lean Clay with Sand (CL)	Native	16		17.4	38	17	0	17	48	35	
BH11	SS3	1.4	1.68	87.89	86.49	Unit 2a	Lean Clay with Sand (CL)	Native	11		23.4							
BH11	SS4	1.83	2.29	87.89	86.06	Unit 3	Till: Silty Sand with Gravel (SM)	Native	12		9.4							
BH11	SS5	2.44	2.9	87.89	85.45	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24									
BH11	SS6	3.05	3.51	87.89	84.84	Unit 3	Till: Silty Sand with Gravel (SM)	Native	14									
BH11	SS7	3.66	4.11	87.89	84.23	Unit 3	Till: Silty Sand with Gravel (SM)	Native	44		11			35	35	23	7	
BH11	SS8	4.27	4.72	87.89	83.62	Unit 3	Till: Silty Sand with Gravel (SM)	Native	80									
BH11	SS9	4.88	5.33	87.89	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	76		8.1							
BH11	SS10	5.49	5.61	87.89	82.40	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH11	SS11	6.1	6.55	87.89	81.79	Unit 3	Till: Silty Sand with Gravel (SM)	Native	138		8.6			7	51	35	8	
BH11	SS12	6.71	6.99	87.89	81.18	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	7.2							
BH11	SS13	7.32	7.53	87.89	80.57	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.06								
BH11	SS14	7.92	8.2	87.89	79.97	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH11	SS15	8.53	8.81	87.89	79.36	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	9.4			23	25	34	18	
BH11	SS16	9.14	9.35	87.89	78.75	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	7.7							
BH11	SS17	9.75	10.03	87.89	78.14	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH11	SS18	10.36	10.82	87.89	77.53	Unit 4a	Silty Sand (SM)	Native	142		16.2							
BH11	SS19	10.97	11.43	87.89	76.92	Unit 4a	Silty Sand (SM)	Native	149									

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH11	SS20	11.58	12.03	87.89	76.31	Unit 4a	Silty Sand (SM)	Native	170	0.29	17.3			4	50	45	2	
BH11	SS21	12.19	12.47	87.89	75.70	Unit 4a	Silty Sand (SM)	Native	100	0.13								
BH11	SS22	12.8	13.09	87.89	75.09	Unit 4a	Silty Sand (SM)	Native	100	0.14	21.7							
BH11	SS23	13.41	13.87	87.89	74.48	Unit 4a	Silty Sand (SM)	Native	95		15.8							
BH11	SS24	14.02	14.43	87.89	73.87	Unit 4a	Silty Sand (SM)	Native	112	0.25				4	72	23	1	
BH11	SS25	14.63	14.86	87.89	73.26	Unit 4a	Silty Sand (SM)	Native	100	0.08	15.6							
BH11	SS26	15.47	15.7	87.89	72.42	Unit 4b	Lean Clay (CL)	Native	103		18.9	29	15	0	5	52	43	
BH11	SS27	15.85	16.31	87.89	72.04	Unit 4b	Silty Clay (CL-ML)	Native	98		22.9	20	15	0	6	74	20	
BH11	SS28	16.46	16.92	87.89	71.43	Unit 4b	Silty Clay (CL-ML)	Native	106		17.3							
BH11	SS29	17.07	17.52	87.89	70.82	Unit 4b	Lean Clay (CL)	Native	22		24	33	16	0	2	47	51	
BH11	SS30	17.68	18.14	87.89	70.21	Unit 4b	Lean Clay (CL)	Native	15		21.6							
BH11	SS31	18.54	18.75	87.89	69.35	Unit 5	Till: Silt with Sand (ML)	Native	83		8.6							
BH11	SS32	18.9	19.36	87.89	68.99	Unit 5	Till: Silt with Sand (ML)	Native	145		11			0	21	63	16	
BH11	SS33	19.51	19.96	87.89	68.38	Unit 5	Till: Silt with Sand (ML)	Native	115		11.1							
BH11	SS34	20.12	20.37	87.89	67.77	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.10	19.9							
BH11	SS35	20.85	21.01	87.89	67.04	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.13								
BH11	SS36	21.34	21.59	87.89	66.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.10	18.3			0	36	53	12	
BH11	SS37	21.95	22.4	87.89	65.94	Unit 5	Till: Sandy Silt (ML)	Native	136		10.3			14	20	47	19	
BH11	SS36	22.56	23	87.89	65.33	Unit 5	Till: Sandy Silt (ML)	Native	70	0.07	6.9							
BH11	SS37	23.16	23.24	87.89	64.73	Unit 5	Till: Sandy Silt (ML)	Native	100	0.08								
BH12-3	SS1	0	0.3	87.44	87.44	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	11	0.15	2.3							
BH12-3	SS2	3.05	3.5	87.44	84.39	Unit 3	Till: Silty Sand with Gravel (SM)	Native	93		5.7							
BH12-3	SS3	6.1	6.43	87.44	81.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	164	0.18	5.4							
BH12-3	SS4	9.14	9.34	87.44	78.30	Unit 3	Till: Sand Silty Clay (CL-ML)	Native	190	0.20	10.7	15	9					
BH12-3	SS5	12.19	12.48	87.44	75.25	Unit 4a	Silty Sand (SM)	Native	163	0.29	14.5							22.1
BH12-3	SS6	15.24	15.7	87.44	72.20	Unit 4b	Silty Clay (CL-ML)	Native	80		20	19	13					
BH12-3	SS7	18.29	18.69	87.44	69.15	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	187	0.25	11.6	16	12					
BH12-3	SS8	21.34	21.62	87.44	66.10	Unit 4a	Sandy Silt (ML)	Native	140	0.28	16.6							21.7
BH14	SS1	0.31	0.61	87.61	87.30	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	19									
BH14	SS2	0.76	1.22	87.61	86.85	Unit 2a	Lean Clay with Sand (CL)	Native	9		21.3	38	17	0	13	55	33	
BH14	SS3	1.52	1.98	87.61	86.09	Unit 3	Till: Silty Sand (SM)	Native	12									
BH14	SS4	2.59	2.74	87.61	85.02	Unit 3	Till: Silty Sand (SM)	Native	14		9.1			10	43	37	10	
BH14	SS5	3.05	3.51	87.61	84.56	Unit 3	Till: Silty Sand (SM)	Native	59									
BH14	SS6	3.81	4.27	87.61	83.80	Unit 3	Till: Silty Sand (SM)	Native	54		7.7							
BH14	SS7	4.57	5.03	87.61	83.04	Unit 3	Till: Silty Sand (SM)	Native	53									
BH14	SS8	5.33	5.79	87.61	82.28	Unit 3	Till: Silty Sand (SM)	Native	46		7.2							
BH14	SS9	6.1	6.55	87.61	81.51	Unit 3	Till: Silty Sand (SM)	Native	89									
BH14	SS10	7.72	8.08	87.61	79.89	Unit 4a	Silty Sand (SM)	Native	139		13.8			3	60	34	4	
BH14	SS11	9.14	9.56	87.61	78.47	Unit 4b	Sandy Lean Clay (CL)	Native	188	0.27	10.7	19	11					
BH14	SS12	10.67	11.07	87.61	76.94	Unit 4a	Silty Sand (SM)	Native	154	0.25								
BH14	SS13	12.19	12.6	87.61	75.42	Unit 4a	Silty Sand (SM)	Native	184	0.25	15.8							
BH14	SS14	13.72	14.01	87.61	73.89	Unit 4a	Silty Sand (SM)	Native	100	0.14								
BH14	SS15	15.24	15.65	87.61	72.37	Unit 4a	Silty Sand (SM)	Native	185	0.25	15.9			0	55	42	2	
BH14	SS16	16.76	17.22	87.61	70.85	Unit 4a	Silt with Sand (ML)	Native	93		21.7							
BH14	SS17	18.29	18.75	87.61	69.32	Unit 4b	Sandy Lean Clay (CL)	Native	21		19.6	35	17					
BH14	SS18	19.81	20.17	87.61	67.80	Unit 4a	Silt with Sand (ML)	Native	181	0.20	12.9							
BH14	SS19	21.34	21.54	87.61	66.27	Unit 4a	Silty Sand (SM)	Native	100	0.05								
BH14	SS20	22.86	23.32	87.61	64.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	67		11.9	18	12	5	20	53	22	

Table B-2b: SPT and Laboratory Data Summary - Turbine Building Area

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH2	SS1	0.33	0.61	89.41	89.08	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	28									
BH2	SS2	1.02	1.22	89.41	88.39	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	57									
BH2	SS3	1.65	1.98	89.41	87.76	Unit 1	Fill: Sandy Silt (ML)	Fill	16		12.7							
BH2	SS4	2.29	2.74	89.41	87.12	Unit 2a	Lean Clay with Sand (CL)	Native	12		23.7	31	17	0	15	67	18	
BH2	SS6	3.81	4.27	89.41	85.60	Unit 2a	Lean Clay with Sand (CL)	Native	4		26.7	30	14	5	14	47	34	
BH2	SS8	6.1	6.55	89.41	83.31	Unit 2b	Silty Sand (SM)	Native	4		12.7	12	9	7	46	37	10	
BH2	SS9	7.62	8.05	89.41	81.79	Unit 3	Till: Sandy Silt (ML)	Native	185	0.28	10.1			3	46	45	6	
BH2	SS10	9.14	9.41	89.41	80.27	Unit 3	Till: Sandy Silt (ML)	Native	100	0.11	9.4							
BH2	SS11	10.67	11.13	89.41	78.74	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	170		16.1			5	28	65	2	
BH2	SS12	12.19	12.65	89.41	77.22	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	142		15.6							
BH2	SS13	13.72	14.11	89.41	75.69	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	196	0.24	14.1							
BH2	SS14	15.24	15.66	89.41	74.17	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	198	0.27	18							
BH2	SS15	16.76	17.22	89.41	72.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	83		14.5			0	69	30	1	
BH2	SS16	18.29	18.75	89.41	71.12	Unit 4b	Lean Clay (CL)	Native	59		20.5	28	14	0	3	53	43	
BH2	SS17	19.81	20.27	89.41	69.60	Unit 4b	Lean Clay (CL)	Native	40		20.7							
BH2	SS18	21.34	21.77	89.41	68.07	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	176	0.28	8.6							
BH2	SS19	22.86	23.32	89.41	66.55	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	179		10.1	15	11	8	29	51	13	
BH2	SS20	24.37	24.83	89.41	65.04	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.14	7.2							
BH5	SS1	0.31	0.38	88.97	88.66	Unit 1	Fill: Poorly Graded Gravel with Sand (GP)	Fill	29									
BH5	SS2	0.76	1.22	88.97	88.21	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	47		4.5							
BH5	SS3	1.83	1.98	88.97	87.14	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	44									
BH5	SS4	4.57	5.03	88.97	84.40	Unit 2a	Sandy Silty Clay (CL-ML)	Native	3		12.3	14	9	13	33	37	17	
BH5	SS5	7.62	8.08	88.97	81.35	Unit 2a	Sandy Silty Clay (CL-ML)	Native	9		8.8							
BH5	SS6	10.67	11.13	88.97	78.30	Unit 3	Till: Sandy Silt (ML)	Native	133		12.2			0	41	49	10	
BH5	SS7	13.72	14.16	88.97	75.25	Unit 4a	Silty Sand (SM)	Native	172	0.29	15.5							
BH5	SS8	16.76	17.01	88.97	72.21	Unit 4a	Silty Sand (SM)	Native	100	0.09	18.2			0	58	39	3	
BH5	SS9	19.81	20.27	88.97	69.16	Unit 5	Till: Lean Clay (CL)	Native	44		17.1	25	12	1	14	48	38	
BH5	SS10	22.86	23.32	88.97	66.11	Unit 5	Till: Lean Clay (CL)	Native	108		9.4							
BH5	SS11	23.77	24.31	88.97	65.20	Unit 5	Till: Silty Sand with Gravel (SM)	Native	192	0.28	5.6	13	10	16	42	33	9	
BH7	SS1	0	0.61	88.10	88.10	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	18									
BH7	SS2	0.76	1.22	88.10	87.34	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	52		3.4							
BH7	SS3	1.52	1.98	88.10	86.58	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	23									
BH7	SS4	2.29	2.74	88.10	85.81	Unit 2a	Lean Clay (CL)	Native	11		24.1	38	17	4	9	49	38	
BH7	SS5	3.05	3.51	88.10	85.05	Unit 2a	Lean Clay (CL)	Native	19		19							
BH7	SS7	4.57	5.03	88.10	83.53	Unit 2b	Silty Sand	Native	11		9.1							
BH7	SS8	5.33	5.79	88.10	82.77	Unit 3	Till: Silty Sand (SM)	Native	94									
BH7	SS9	6.1	6.55	88.10	82.00	Unit 3	Till: Silty Sand (SM)	Native	156		7.2			5	47	38	10	
BH7	SS10	7.62	8.08	88.10	80.48	Unit 3	Till: Silty Sand (SM)	Native	118									
BH7	SS11	9.14	9.6	88.10	78.96	Unit 3	Till: Silty Sand (SM)	Native	147		6.5							
BH7	SS12	10.67	11.13	88.10	77.43	Unit 3	Till: Silty Sand (SM)	Native	181									
BH7	SS13	12.19	12.57	88.10	75.91	Unit 4a	Silty Sand (SM)	Native	199	0.23	14.8							
BH7	SS14	13.72	14	88.10	74.38	Unit 4a	Silty Sand (SM)	Native	100	0.13								
BH7	SS15	15.24	15.67	88.10	72.86	Unit 4a	Silty Sand (SM)	Native	179	0.28	16.7							
BH7	SS16	18.29	18.75	88.10	69.81	Unit 4b	Lean Clay (CL)	Native	29		19.9	33	16	0	4	47	49	
BH7	SS17	21.34	21.73	88.10	66.76	Unit 4a	Silty Sand (SM)	Native	158	0.24								
BH7	SS18	23.57	24	88.10	64.53	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	135	0.28	21.2							
BH8	SS1	0	0.61	87.48	87.48	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	19		4.1							
BH8	SS2	0.61	1.07	87.48	86.87	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	11		9.5							21.1
BH8	SS3	1.22	1.68	87.48	86.26	Unit 2a	Lean Clay with Sand (CL)	Native	14		22.5							
BH8	SS4	1.83	2.29	87.48	85.65	Unit 2a	Lean Clay with Sand (CL)	Native	15		19.6	26	13	5	24	44	27	
BH8	SS5	2.44	2.9	87.48	85.04	Unit 2a	Lean Clay with Sand (CL)	Native	10		10.2							
BH8	SS6	3.05	3.51	87.48	84.43	Unit 3	Till: Silty Sand with Gravel (SM)	Native	61		8.2							
BH8	SS7	3.66	3.94	87.48	83.82	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	8.3							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH8	SS8	4.27	4.72	87.48	83.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	95		6.7	12	10	26	40	28	7	
BH8	SS9	4.88	5.33	87.48	82.60	Unit 3	Till: Silty Sand with Gravel (SM)	Native	77		5.8							
BH8	SS10	5.49	5.94	87.48	81.99	Unit 3	Till: Silty Sand with Gravel (SM)	Native	116		4.3							
BH8	SS11	6.1	6.55	87.48	81.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	70		6.5							
BH8	SS12	6.71	7.16	87.48	80.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	102		5.3							
BH8	SS13	7.32	7.77	87.48	80.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	68		7.5	12	9	12	44	35	9	
BH8	SS14	7.92	8.06	87.48	79.56	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.14	3.4							
BH8	SS15	8.53	8.97	87.48	78.95	Unit 3	Till: Silty Sand with Gravel (SM)	Native	182	0.28	6.6							
BH8	SS16	9.14	9.39	87.48	78.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.09								
BH8	SS17	9.75	9.88	87.48	77.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	1.9							
BH8	SS18	10.36	10.82	87.48	77.12	Unit 4a	Sandy Silt (ML)	Native	163		15.7			0	44	54	2	
BH8	SS19	10.97	11.39	87.48	76.51	Unit 4a	Sandy Silt (ML)	Native	168	0.27	14.1							
BH8	SS20	11.58	12	87.48	75.90	Unit 4a	Sandy Silt (ML)	Native	178	0.27	15.7							
BH8	SS21	12.19	12.46	87.48	75.29	Unit 4a	Sandy Silt (ML)	Native	100	0.11	13.1							
BH8	SS22	12.8	13.09	87.48	74.68	Unit 4a	Sandy Silt (ML)	Native	100	0.14	19.1							
BH8	SS23	13.41	13.69	87.48	74.07	Unit 4a	Sandy Silt (ML)	Native	100	0.13	12.6							
BH8	SS24	14.02	14.45	87.48	73.46	Unit 4a	Sandy Silt (ML)	Native	197	0.28	17.1							
BH8	SS25	14.63	15.05	87.48	72.85	Unit 4a	Sandy Silt (ML)	Native	195	0.27	16			0	30	69	2	
BH8	SS26	15.24	15.7	87.48	72.24	Unit 4a	Sandy Silt (ML)	Native	145		16.6							
BH8	SS27	15.85	16.31	87.48	71.63	Unit 4b	Lean Clay (CL)	Native	52		19.6	25	14	0	6	57	36	
BH8	SS28	16.46	16.92	87.48	71.02	Unit 4b	Lean Clay (CL)	Native	32		19.9							
BH8	SS29	17.07	17.53	87.48	70.41	Unit 4b	Lean Clay (CL)	Native	33		19.9							
BH8	SS30	17.68	18.14	87.48	69.80	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	63		9.5	15	11	3	23	60	15	
BH8	SS31	18.29	18.58	87.48	69.19	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.14	9.3	16	12	9	19	60	13	
BH8	SS32	18.9	19.33	87.48	68.58	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	142	0.28	17.7							
BH8	SS33	19.51	19.79	87.48	67.97	Unit 4a	Sandy Silt (ML)	Native	100	0.13	16.8			0	38	58	4	
BH8	SS34	20.12	20.38	87.48	67.36	Unit 4a	Sandy Silt (ML)	Native	100	0.11	14.5							
BH8	SS35	20.73	21.18	87.48	66.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	133		11.2	17	11	0	23	58	19	
BH8	SS36	21.34	21.79	87.48	66.14	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	84		8.5							
BH8	SS37	21.95	22.4	87.48	65.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	117		8.5							
BH8	SS38	22.56	22.94	87.48	64.92	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	194	0.23	6.6	13	10	23	38	31	8	
BH9	SS1	0	0.61	88.83	88.83	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	35	0.11								
BH9	SS2	0.76	1.22	88.83	88.07	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	28		12.7	25	13	3	19	49	29	
BH9	SS3	1.52	1.83	88.83	87.31	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	33									
BH9	SS4	2.29	2.74	88.83	86.54	Unit 2a	Lean Clay (CL)	Native	4		35.3	40	18					
BH9	SS6	3.81	4.27	88.83	85.02	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	15		28.5							
BH9	SS7	4.57	5.03	88.83	84.26	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	7									
BH9	SS8	5.18	5.78	88.83	83.65	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	7		7.3							
BH9	SS9	6.1	6.55	88.83	82.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	36		6.9							
BH9	SS10	6.86	7.32	88.83	81.97	Unit 3	Till: Silty Sand with Gravel (SM)	Native	138		6.9	12	10	21	42	31	7	
BH9	SS11	7.62	7.9	88.83	81.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	7.3							
BH9	SS12	9.14	9.35	88.83	79.69	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	9.5							
BH9	SS13	10.67	10.95	88.83	78.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	8.6							
BH9	SS14	12.19	12.53	88.83	76.64	Unit 4a	Silty Sand (SM)	Native	185	0.13	17.1							
BH9	SS15	13.72	14.17	88.83	75.11	Unit 4a	Silty Sand (SM)	Native	39		22			0	79	20	1	
BH9	SS16	15.24	15.66	88.83	73.59	Unit 4a	Silty Sand (SM)	Native	157	0.26	16.4							
BH9	SS17	16.76	17.22	88.83	72.07	Unit 4b	Lean Clay (CL)	Native	136		19.8							
BH9	SS18	18.29	18.75	88.83	70.54	Unit 4b	Lean Clay (CL)	Native	33		24.3	32	16	0	1	49	50	
BH9	SS19	19.81	20.27	88.83	69.02	Unit 4b	Lean Clay (CL)	Native	53		9.2	15	10	2	25	54	19	
BH9	SS20	21.34	21.56	88.83	67.49	Unit 4a	Silty Sand (SM)	Native	100	0.07	16.1							
BH9	SS21	22.86	23.27	88.83	65.97	Unit 4a	Silty Sand (SM)	Native	183	0.25	15.8			13	52	32	4	
BH9	SS22	24.38	24.79	88.83	64.45	Unit 5	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	143	0.25	8.3	14	10	15	36	36	13	
BH66	SS1	0.31	0.56	89.49	89.18	Unit 1	Fill: Poorly Graded Gravelly Sand (SP)	Fill	6									
BH66	SS2	0.76	1.22	89.49	88.73	Unit 1	Fill: Silty Sand (SM)	Fill	58		5.1			12	44	35	10	
BH66	SS3	1.52	1.98	89.49	87.97	Unit 1	Fill: Silty Sand (SM)	Fill	26									
BH66	SS4	2.29	2.9	89.49	87.20	Unit 2a	Lean Clay with Sand (CL)	Native	11		18.9							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH66	SS5	3.05	3.51	89.49	86.44	Unit 2a	Lean Clay with Sand (CL)	Native	18		19	32	15					
BH66	SS6	4.04	4.27	89.49	85.45	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	4		12.8							
BH66	SS7	5.33	5.94	89.49	84.16	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	2		8							
BH66	SS9	6.86	7.32	89.49	82.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	15									
BH66	SS10	7.62	8.08	89.49	81.87	Unit 3	Till: Silty Sand with Gravel (SM)	Native	105		7.7							
BH66	SS11	9.14	9.6	89.49	80.35	Unit 4a	Sandy Silt (ML)	Native	121									
BH66	SS12	10.67	11.13	89.49	78.82	Unit 4a	Sandy Silt (ML)	Native	183		13.7			5	28	61	6	
BH66	SS13	12.19	12.62	89.49	77.30	Unit 4a	Sandy Silt (ML)	Native	180	0.28	11							
BH66	SS14	13.72	14.01	89.49	75.77	Unit 4a	Sandy Silt (ML)	Native	195	0.14								
BH66	SS15	15.24	15.68	89.49	74.25	Unit 4a	Sandy Silt (ML)	Native	100	0.29	17							
BH66	SS16	18.57	18.75	89.49	70.92	Unit 4b	Lean Clay (CL)	Native	118		18.9							
BH66	SS17	21.34	21.79	89.49	68.15	Unit 4b	Lean Clay (CL)	Native	19		24.6	30	16	0	7	48	45	
BH66	SS18	24.38	24.84	89.49	65.11	Unit 5	Till: Lean Clay with Sand (CL)	Native	64		9.1	20	12	5	17	56	23	
BH67	SS1	0	0.61	88.52	88.52	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	29		2.1			26	51	18	6	
BH67	SS2	0.76	1.22	88.52	87.76	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	54		10.1							
BH67	SS3	1.52	1.98	88.52	87.00	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	20		10			21	33	37	9	
BH67	SS4	4.57	5.03	88.52	83.95	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	6		12			26	36	29	9	
BH67	SS5	9.14	9.6	88.52	79.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	90		7.7			26	29	36	9	
BH67	SS6	12.19	12.65	88.52	76.33	Unit 4a	Silty Sand (SM)	Native	141		16.6			8	54	35	4	
BH67	SS7	15.24	15.7	88.52	73.28	Unit 4a	Silty Sand (SM)	Native	165		11.6							
BH67	SS8	18.29	18.75	88.52	70.23	Unit 4b	Lean Clay (CL)	Native	33		26.2	32	16	0	1	48	50	
BH67	SS9	21.34	21.62	88.52	67.18	Unit 5	Sandy Silty Clay (CL-ML)	Native	100	0.13	13.5			3	44	45	8	
BH68	SS1	0	0.61	88.79	88.79	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	35									
BH68	SS2	0.61	1.07	88.79	88.18	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	87		3.4							
BH68	SS3	1.22	1.68	88.79	87.57	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24		6							
BH68	SS4	1.83	2.29	88.79	86.96	Unit 2a	Lean Clay with Sand (CL)	Native	5		29.3	38	21	0	15	63	21	
BH68	SS6	4.88	5.78	88.79	83.91	Unit 2b	Sandy Silty Clay (CL-ML)	Native	3		14.8	13	9	7	39	40	14	
BH68	SS8	6.71	7.17	88.79	82.08	Unit 3	Till: Silty Sand with Gravel (SM)	Native	26		8.9							
BH68	SS9	7.32	7.78	88.79	81.47	Unit 3	Till: Silty Sand with Gravel (SM)	Native	13		8.6	11	9	19	40	33	9	
BH68	SS10	7.93	8.39	88.79	80.86	Unit 3	Till: Silty Sand with Gravel (SM)	Native	55		8.3							
BH68	SS11	8.53	8.99	88.79	80.26	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23		7.3							
BH68	SS12	9.15	9.61	88.79	79.64	Unit 3	Till: Silty Sand with Gravel (SM)	Native	80		7.8							
BH68	SS13	9.76	10.22	88.79	79.03	Unit 3	Till: Silty Sand with Gravel (SM)	Native	64		6.7							
BH68	SS14	10.37	10.65	88.79	78.42	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	10.4							
BH68	SS15	10.98	11.44	88.79	77.81	Unit 3	Till: Silty Sand with Gravel (SM)	Native	173		8.5			12	45	38	6	
BH68	SS16	11.59	12.05	88.79	77.20	Unit 3	Till: Silty Sand with Gravel (SM)	Native	143		10.7							
BH68	SS17	12.2	12.66	88.79	76.59	Unit 3	Till: Silty Sand with Gravel (SM)	Native	72		8.9							
BH68	SS18	12.81	13.27	88.79	75.98	Unit 4a	Silty Sand (SM)	Native	116		14.3			1	53	45	2	
BH68	SS19	13.42	13.7	88.79	75.37	Unit 4a	Silty Sand (SM)	Native	100	0.13	16							
BH68	SS20	14.03	14.31	88.79	74.76	Unit 4a	Silty Sand (SM)	Native	100	0.13	15.5							
BH68	SS21	14.64	15.1	88.79	74.15	Unit 4a	Silty Sand (SM)	Native	181		14.6							
BH68	SS22	15.25	15.53	88.79	73.54	Unit 4a	Silty Sand (SM)	Native	100	0.13	16.9			0	62	37	1	
BH68	SS23	15.86	16.32	88.79	72.93	Unit 4a	Silty Sand (SM)	Native	180		18.8							
BH68	SS24	16.47	16.93	88.79	72.32	Unit 4a	Silty Sand (SM)	Native	177		18.6							
BH68	SS25	17.08	17.53	88.79	71.71	Unit 4a	Silty Sand (SM)	Native	117		23.4							
BH68	SS26	17.69	18.15	88.79	71.10	Unit 4b	lean Clay (CL)	Native	29		15.4							
BH68	SS27	18.3	18.76	88.79	70.49	Unit 4b	lean Clay (CL)	Native	29		21.7							20.3
BH68	SS28	18.91	19.37	88.79	69.88	Unit 4b	lean Clay (CL)	Native	53		22.6	27	15	0	2	53	45	
BH68	SS29	19.52	19.98	88.79	69.27	Unit 4b	lean Clay (CL)	Native	27		21.1							
BH68	SS30	20.13	20.59	88.79	68.66	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	31		10.9	17	10	6	28	46	20	
BH68	SS31	20.74	21.02	88.79	68.05	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.13	8.2							
BH68	SS32	21.35	21.48	88.79	67.44	Unit 5	Till: Silt with Sand (ML)	Native	100	0.13	11.5	14	12	0	21	69	10	
BH68	SS33	21.96	22.24	88.79	66.83	Unit 5	Till: Silt with Sand (ML)	Native	100	0.13	16							
BH68	SS34	22.57	23.06	88.79	66.22	Unit 5	Till: Lean Clay with Gravel (CL)	Native	125		8.7							
BH68	SS35	23.18	23.59	88.79	65.61	Unit 5	Till: Silty Sand with Gravel (SM)	Native	174	0.25	7.5	15	10	10	33	44	13	
BH68	SS36	23.79	24.07	88.79	65.00	Unit 5	Till: Silty Sand with Gravel (SM)	Native	100	0.10	5.6							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH68	SS37	24.38	24.66	88.79	64.41	Unit 5	Till: Silty Sand with Gravel (SM)	Native	100	0.10	8.4							
BH71	SS1	0	0.25	88.32	88.32	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	14									
BH71	SS2	0.76	1.22	88.32	87.56	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	25									
BH71	SS3	1.52	1.98	88.32	86.80	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	10		19.8							
BH71	SS4	2.29	2.74	88.32	86.03	Unit 2a	Lean Clay with Sand (CL)	Native	24		17.4			4	11	59	26	
BH71	SS5	3.05	3.5	88.32	85.27	Unit 2a	Lean Clay with Sand (CL)	Native	15		21.6	39	17					
BH71	SS6	3.81	4.27	88.32	84.51	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	18		8.4	14	9	30	35	26	9	
BH71	SS7	4.57	5.03	88.32	83.75	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	5									
BH71	SS8	5.33	5.78	88.32	82.99	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	15		8.6							
BH71	SS9	6.1	6.55	88.32	82.22	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	64		7.2							
BH71	SS10	7.62	8.08	88.32	80.70	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	173		7.1	12	10	6	43	41	10	
BH71	SS11	9.14	9.4	88.32	79.18	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	100	0.10	7.7							
BH71	SS12	10.67	10.71	88.32	77.65	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	100	0.13	14.4			1	17	62	21	
BH71	SS13	12.19	12.62	88.32	76.13	Unit 4a	Silty Sand (SM)	Native	171	0.28	16.3							
BH71	SS14	13.72	14.1	88.32	74.60	Unit 4a	Silty Sand (SM)	Native	186	0.23	16.9			0	63	36	1	
BH71	SS15	15.24	15.7	88.32	73.08	Unit 4a	Silty Sand (SM)	Native	188		21.6							
BH71	SS16	16.76	17.22	88.32	71.56	Unit 4b	Lean Clay (CL)	Native	63		18.9	25	14	0	6	59	35	
BH71	SS17	18.29	18.75	88.32	70.03	Unit 4b	Lean Clay (CL)	Native	24		23.4							20.3
BH71	SS18	19.81	20.27	88.32	68.51	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	50		10.3	14	10	5	33	45	17	
BH71	SS19	21.34	21.79	88.32	66.98	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	83		10.7							22.3
BH71	SS20	22.86	23.22	88.32	65.46	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	61		7.2							
BH71	SS21	23.9	24.18	88.32	64.42	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.13								
BH73	SS1	0	0.61	87.96	87.96	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	49									
BH73	SS2	0.79	1.21	87.96	87.17	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	33		7.5							
BH73	SS3	1.52	1.98	87.96	86.44	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	16		30.9							
BH73	SS4	2.29	2.74	87.96	85.67	Unit 2b	Silty Sand (SM)	Native	7		10.4	13	10	11	44	36	9	
BH73	SS5	3.81	4.27	87.96	84.15	Unit 3	l: Silty Sand with Gravel (SM) to Sandy Silt (M	Native	105		6.2							
BH73	SS6	4.57	5.05	87.96	83.39	Unit 3	l: Silty Sand with Gravel (SM) to Sandy Silt (M	Native	73		6.3							23.7
BH73	SS7	5.36	5.79	87.96	82.60	Unit 3	l: Silty Sand with Gravel (SM) to Sandy Silt (M	Native	85		5.5	12	10	19	41	33	7	
BH73	SS8	6.1	6.58	87.96	81.86	Unit 3	l: Silty Sand with Gravel (SM) to Sandy Silt (M	Native	103		7.4							
BH73	SS9	7.62	8.1	87.96	80.34	Unit 3	l: Silty Sand with Gravel (SM) to Sandy Silt (M	Native	145		7.5							
BH73	SS10	9.14	9.26	87.96	78.82	Unit 3	l: Silty Sand with Gravel (SM) to Sandy Silt (M	Native	100	0.10	10							
BH73	SS11	10.67	10.94	87.96	77.29	Unit 3	l: Silty Sand with Gravel (SM) to Sandy Silt (M	Native	100	0.23	8.2			13	36	38	12	
BH73	SS12	12.19	12.58	87.96	75.77	Unit 4a	Silty Sand (SM)	Native	190	0.33	12.8							
BH73	SS13	13.72	14	87.96	74.24	Unit 4a	Silty Sand (SM)	Native	100	0.28	16.6							
BH73	SS14	15.24	15.65	87.96	72.72	Unit 4a	Silty Sand (SM)	Native	193	0.40	17.6			0	22	75	3	
BH73	SS15	18.29	18.77	87.96	69.67	Unit 4b	Lean Clay (CL)	Native	63		17.5	31	14	3	9	48	40	
BH73	SS16	21.33	21.59	87.96	66.63	Unit 4a	Silty Sand (SM)	Native	100	0.10	19.4			0	28	71	2	
BH73	SS17	22.86	23.34	87.96	65.10	Unit 5	Sandy Silt (ML)	Native	107		7.7	13	10	7	39	40	14	
BH73	SS18	23.85	23.95	87.96	64.11	Unit 5	Sandy Silt (ML)	Native	100	0.10								

Table B-2c: SPT and Laboratory Data Summary - Radwaste Building Area

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH12-3	SS1	0	0.3	87.44	87.44	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	11	0.15	2.3							
BH12-3	SS2	3.05	3.5	87.44	84.39	Unit 3	Till: Silty Sand with Gravel (SM)	Native	93		5.7							
BH12-3	SS3	6.1	6.43	87.44	81.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	164	0.18	5.4							
BH12-3	SS4	9.14	9.34	87.44	78.30	Unit 3	Till: Sand Silty Clay (CL-ML)	Native	190	0.20	10.7	15	9					
BH12-3	SS5	12.19	12.48	87.44	75.25	Unit 4a	Silty Sand (SM)	Native	163	0.29	14.5							22.1
BH12-3	SS6	15.24	15.7	87.44	72.20	Unit 4b	Silty Clay (CL-ML)	Native	80		20	19	13					
BH12-3	SS7	18.29	18.69	87.44	69.15	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	187	0.25	11.6	16	12					
BH12-3	SS8	21.34	21.62	87.44	66.10	Unit 4a	Sandy Silt (ML)	Native	140	0.28	16.6							21.7
BH13	SS1	0.31	0.61	87.14	86.83	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	43		1.4							
BH13	SS2	0.76	1.22	87.14	86.38	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	6		33.9							
BH13	SS3	1.52	1.98	87.14	85.62	Unit 1	Fill: Silty Sand (SM)	Fill	9									
BH13	SS4	2.52	2.74	87.14	84.62	Unit 3	Till: Silty Sand with Gravel (SM)	Native	56									
BH13	SS5	3.05	3.51	87.14	84.09	Unit 3	Till: Silty Sand with Gravel (SM)	Native	52									
BH13	SS6	3.81	4.27	87.14	83.33	Unit 3	Till: Silty Sand with Gravel (SM)	Native	63		7.3							
BH13	SS7	4.57	5.03	87.14	82.57	Unit 3	Till: Silty Sand with Gravel (SM)	Native	67									
BH13	SS8	5.56	5.79	87.14	81.58	Unit 3	Till: Silty Sand with Gravel (SM)	Native	107		7.2			30	41	23	7	
BH13	SS9	6.1	6.55	87.14	81.04	Unit 3	Till: Silty Sand with Gravel (SM)	Native	56		5.8			16	47	30	7	
BH13	SS10	7.62	8.08	87.14	79.52	Unit 3	Till: Silty Sand with Gravel (SM)	Native	36									
BH13	SS11	9.14	9.44	87.14	78.00	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH13	SS12	10.67	10.95	87.14	76.47	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.13								
BH13	SS13	12.19	12.6	87.14	74.95	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.25	17.4							
BH13	SS14	13.72	14.15	87.14	73.42	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	157	0.28	18.8			0	32	65	4	
BH13	SS15	15.24	15.7	87.14	71.90	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	134									
BH13	SS16	16.76	17.22	87.14	70.38	Unit 4b	Lean Clay (CL)	Native	15		21.8	34	16					
BH13	SS18	18.29	18.75	87.14	68.85	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	74		9.2							
BH13	SS19	19.81	20.27	87.14	67.33	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	98									
BH13	SS20	21.34	21.79	87.14	65.80	Unit 4a	Sandy Silt (ML)	Native	70		22.9							
BH13	SS21	22.1	22.33	87.14	65.04	Unit 4a	Sandy Silt (ML)	Native	100	0.08	8.3							
BH17	SS1	0.31	0.61	86.82	86.51	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23									
BH17	SS2	0.89	1.22	86.82	85.93	Unit 2b	Silty Sand with Gravel (SM)	Native	12		11.1							
BH17	SS3	1.52	1.98	86.82	85.30	Unit 2b	Silty Sand with Gravel (SM)	Native	3		8.9	12	10	21	40	31	8	
BH17	SS4	2.29	2.74	86.82	84.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	125		4.7							22.9
BH17	SS5	3.05	3.35	86.82	83.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	67		5							
BH17	SS6	3.81	4.27	86.82	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	54		6.7			26	40	26	8	
BH17	SS7	4.57	4.85	86.82	82.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	5.6							
BH17	SS8	5.33	5.79	86.82	81.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	89		7.7							
BH17	SS9	6.1	6.55	86.82	80.72	Unit 3	Till: Silty Sand with Gravel (SM)	Native	96		7.6							
BH17	SS10	7.62	8.03	86.82	79.20	Unit 3	Till: Silty Sand with Gravel (SM)	Native	158	0.23	7.1	12	10	13	43	36	8	
BH17	SS11	9.14	9.42	86.82	77.68	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	5.8							
BH17	SS12	10.67	11.13	86.82	76.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	150	0.28	9.2							
BH17	SS13	12.19	12.24	86.82	74.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05								
BH17	SS14	13.72	13.77	86.82	73.10	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05								
BH17	SS15	14.48	14.66	86.82	72.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.03								
BH17	SS16	15.24	15.52	86.82	71.58	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH17	SS17	16	16.46	86.82	70.82	Unit 4b	Lean Clay with Sand (CL)	Native	33		22							
BH17	SS18	16.76	17.22	86.82	70.06	Unit 4b	Lean Clay with Sand (CL)	Native	68		12.8	19	11	2	23	48	27	
BH17	SS19	18.29	18.75	86.82	68.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	107		9.9	18	12	12	13	57	19	
BH17	SS20	19.86	20.27	86.82	66.96	Unit 4a	Silt with Sand (ML)	Native	148		17.9							
BH17	SS21	21.34	21.62	86.82	65.48	Unit 4a	Silt with Sand (ML)	Native	100	0.13	20.2			0	17	81	2	
BH73	SS1	0	0.61	87.96	87.96	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	49									
BH73	SS2	0.79	1.21	87.96	87.17	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	33		7.5							
BH73	SS3	1.52	1.98	87.96	86.44	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	16		30.9							
BH73	SS4	2.29	2.74	87.96	85.67	Unit 2b	Silty Sand (SM)	Native	7		10.4	13	10	11	44	36	9	
BH73	SS5	3.81	4.27	87.96	84.15	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	105		6.2							
BH73	SS6	4.57	5.05	87.96	83.39	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	73		6.3							23.7
BH73	SS7	5.36	5.79	87.96	82.60	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	85		5.5	12	10	19	41	33	7	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH73	SS8	6.1	6.58	87.96	81.86	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	103		7.4							
BH73	SS9	7.62	8.1	87.96	80.34	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	145		7.5							
BH73	SS10	9.14	9.26	87.96	78.82	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	100	0.10	10							
BH73	SS11	10.67	10.94	87.96	77.29	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	100	0.23	8.2			13	36	38	12	
BH73	SS12	12.19	12.58	87.96	75.77	Unit 4a	Silty Sand (SM)	Native	190	0.33	12.8							
BH73	SS13	13.72	14	87.96	74.24	Unit 4a	Silty Sand (SM)	Native	100	0.28	16.6							
BH73	SS14	15.24	15.65	87.96	72.72	Unit 4a	Silty Sand (SM)	Native	193	0.40	17.6			0	22	75	3	
BH73	SS15	18.29	18.77	87.96	69.67	Unit 4b	Lean Clay (CL)	Native	63		17.5	31	14	3	9	48	40	
BH73	SS16	21.33	21.59	87.96	66.63	Unit 4a	Silty Sand (SM)	Native	100	0.10	19.4			0	28	71	2	
BH73	SS17	22.86	23.34	87.96	65.10	Unit 5	Sandy Silt (ML)	Native	107		7.7	13	10	7	39	40	14	
BH73	SS18	23.85	23.95	87.96	64.11	Unit 5	Sandy Silt (ML)	Native	100	0.10								

Table B-2d: SPT and Laboratory Data Summary - Control Building Area

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BO-16	SS1	0.36	0.81	86.93	86.57	Unit 2b	Silt, little clay	Native	6		5.55							
BO-16	SS2	1.4	1.7	86.93	85.53	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	74		6.55							
BO-16	SS3	3.35	3.8	86.93	83.58	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	112		7.55							
BO-16	SS5	4.63	4.93	86.93	82.30	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	140		9.55							
BO-16	SS8	6.29	6.59	86.93	80.64	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150		12.55							
BO-16	SS13	12.86	13.16	86.93	74.07	Unit 4a	Sand, little Silt	Native	150		17.55							
BO-16	SS14	13.16	13.46	86.93	73.77	Unit 4a	Sand, little Silt	Native	150		19.55							
BO-16	SS15	14.38	14.68	86.93	72.55	Unit 4a	Sand, little Silt	Native	150		22.55							
BO-16	SS17	16.15	16.6	86.93	70.78	Unit 4a	Silt with Clay	Native	137		25.55							
BO-16	SS22	22.24	22.54	86.93	64.69	Unit 4a	Sand, trace Silt	Native	150		27.55							
BH14	SS1	0.31	0.61	87.61	87.30	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	19									
BH14	SS2	0.76	1.22	87.61	86.85	Unit 2a	Lean Clay with Sand (CL)	Native	9		21.3	38	17	0	13	55	33	
BH14	SS3	1.52	1.98	87.61	86.09	Unit 3	Till: Silty Sand (SM)	Native	12									
BH14	SS4	2.59	2.74	87.61	85.02	Unit 3	Till: Silty Sand (SM)	Native	14		9.1			10	43	37	10	
BH14	SS5	3.05	3.51	87.61	84.56	Unit 3	Till: Silty Sand (SM)	Native	59									
BH14	SS6	3.81	4.27	87.61	83.80	Unit 3	Till: Silty Sand (SM)	Native	54		7.7							
BH14	SS7	4.57	5.03	87.61	83.04	Unit 3	Till: Silty Sand (SM)	Native	53									
BH14	SS8	5.33	5.79	87.61	82.28	Unit 3	Till: Silty Sand (SM)	Native	46		7.2							
BH14	SS9	6.1	6.55	87.61	81.51	Unit 3	Till: Silty Sand (SM)	Native	89									
BH14	SS10	7.72	8.08	87.61	79.89	Unit 4a	Silty Sand (SM)	Native	139		13.8			3	60	34	4	
BH14	SS11	9.14	9.56	87.61	78.47	Unit 4b	Sandy Lean Clay (CL)	Native	188	0.27	10.7	19	11					
BH14	SS12	10.67	11.07	87.61	76.94	Unit 4a	Silty Sand (SM)	Native	154	0.25								
BH14	SS13	12.19	12.6	87.61	75.42	Unit 4a	Silty Sand (SM)	Native	184	0.25	15.8							
BH14	SS14	13.72	14.01	87.61	73.89	Unit 4a	Silty Sand (SM)	Native	100	0.14								
BH14	SS15	15.24	15.65	87.61	72.37	Unit 4a	Silty Sand (SM)	Native	185	0.25	15.9			0	55	42	2	
BH14	SS16	16.76	17.22	87.61	70.85	Unit 4a	Silt with Sand (ML)	Native	93		21.7							
BH14	SS17	18.29	18.75	87.61	69.32	Unit 4b	Sandy Lean Clay (CL)	Native	21		19.6	35	17					
BH14	SS18	19.81	20.17	87.61	67.80	Unit 4a	Silt with Sand (ML)	Native	181	0.20	12.9							
BH14	SS19	21.34	21.54	87.61	66.27	Unit 4a	Silty Sand (SM)	Native	100	0.05								
BH14	SS20	22.86	23.32	87.61	64.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	67		11.9	18	12	5	20	53	22	
BH15	SS1	0	0.13	87.37	87.37	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	50	0.13								
BH15	SS2	0.76	1.22	87.37	86.61	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	98		2.7							
BH15	SS3	1.52	1.98	87.37	85.85	Unit 3	Till: Silty Sand (SM)	Native	25		7.4							
BH15	SS4	2.29	2.74	87.37	85.08	Unit 3	Till: Silty Sand (SM)	Native	82		5			7	47	37	10	
BH15	SS5	4.57	4.85	87.37	82.80	Unit 3	Till: Silty Sand (SM)	Native	50	0.13	8							
BH15	SS6	7.62	7.75	87.37	79.75	Unit 3	Till: Silty Sand (SM)	Native	50	0.13								
BH15	SS7	10.67	10.8	87.37	76.70	Unit 4a	Silty Sand (SM)	Native	50	0.13	14.9							
BH15	SS8	15.24	15.7	87.37	72.13	Unit 4b	Lean Clay (CL)	Native	95		21.6	24	14	0	5	68	28	
BH15	SS9	18.29	18.52	87.37	69.08	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	50	0.08	9.1							
BH15	SS10	21.34	21.79	87.37	66.03	Unit 4b	Silty Clay (CL-ML)	Native	56		13.4	19	13					
BH18	SS1	0.31	0.41	87.18	86.87	Unit 1	lty Sand with Gravel (SM) / Sandy Silty Clay (C	Fill	48		6.4							
BH18	SS2	0.61	1.07	87.18	86.57	Unit 3	Till: Silty Sand (SM)	Native	34		3.7							
BH18	SS3	1.3	1.68	87.18	85.88	Unit 3	Till: Silty Sand (SM)	Native	19		6.7							
BH18	SS4	1.83	2.29	87.18	85.35	Unit 3	Till: Silty Sand (SM)	Native	72		5.6							
BH18	SS5	2.44	2.9	87.18	84.74	Unit 3	Till: Silty Sand (SM)	Native	141		5			9	45	37	9	
BH18	SS6	3.05	3.35	87.18	84.13	Unit 3	Till: Silty Sand (SM)	Native	100	0.12	4.4							
BH18	SS7	3.89	4.11	87.18	83.29	Unit 3	Till: Silty Sand (SM)	Native	78		5.9							
BH18	SS8	4.27	4.48	87.18	82.91	Unit 4a	Well graded Sand (SW)	Native	100	0.06	9							
BH18	SS9	5.08	5.33	87.18	82.10	Unit 3	Till: Silty Sand with Gravel (SM)	Native	55		7							
BH18	SS10	5.49	5.94	87.18	81.69	Unit 3	Till: Silty Sand with Gravel (SM)	Native	71		6.5							
BH18	SS11	6.32	6.55	87.18	80.86	Unit 3	Till: Silty Sand with Gravel (SM)	Native	68									
BH18	SS12	6.99	7.16	87.18	80.19	Unit 3	Till: Silty Sand with Gravel (SM)	Native	66									
BH18	SS13	7.32	7.77	87.18	79.86	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	46		6.4							
BH18	SS14	7.92	8.38	87.18	79.26	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	26		9.5	14	9	14	30	40	16	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH18	SS15	8.53	8.83	87.18	78.65	Unit 3	Till: Sandy Silt (ML)	Native	100	0.15	7.5							
BH18	SS16	9.14	9.43	87.18	78.04	Unit 3	Till: Sandy Silt (ML)	Native	100	0.13	9.8			1	42	51	6	
BH18	SS17	9.75	9.99	87.18	77.43	Unit 3	Till: Sandy Silt (ML)	Native	100	0.09	10.1							
BH18	SS18	10.36	10.82	87.18	76.82	Unit 4a	Silty Sand (SM)	Native	174		12.6							
BH18	SS19	10.97	11.43	87.18	76.21	Unit 4a	Silty Sand (SM)	Native	136		14.2							
BH18	SS20	11.58	12	87.18	75.60	Unit 4a	Silty Sand (SM)	Native	195	0.11	12.6							
BH18	SS21	12.19	12.6	87.18	74.99	Unit 4a	Silty Sand (SM)	Native	187	0.25	13.5			0	70	29	1	
BH18	SS22	12.8	13.23	87.18	74.38	Unit 4a	Silty Sand (SM)	Native	100	0.13	14.1							
BH18	SS23	13.41	13.87	87.18	73.77	Unit 4a	Silty Sand (SM)	Native	153		15.5							
BH18	SS24	14.02	14.48	87.18	73.16	Unit 4a	Silty Sand (SM)	Native	171		18.3							
BH18	SS25	14.63	15.09	87.18	72.55	Unit 4a	Silty Sand (SM)	Native	126		16.8							
BH18	SS26	15.24	15.7	87.18	71.94	Unit 4b	Lean Clay (CL)	Native	106		19.8							
BH18	SS27	15.85	16.31	87.18	71.33	Unit 4b	Lean Clay (CL)	Native	32		21.3	32	15	0	3	52	46	
BH18	SS28	16.46	16.92	87.18	70.72	Unit 4b	Lean Clay (CL)	Native	27		22.7							
BH18	SS29	17.37	17.53	87.18	69.81	Unit 5	Till: Silty Clay (CL-ML)	Native	24		9.6							
BH18	SS30	17.68	18.14	87.18	69.50	Unit 5	Till: Silty Clay (CL-ML)	Native	33		9.4							
BH18	SS31	18.29	18.75	87.18	68.89	Unit 5	Till: Silty Clay (CL-ML)	Native	169		10.9	19	12	1	8	71	20	
BH18	SS32	18.9	19.36	87.18	68.28	Unit 5	Till: Silty Clay (CL-ML)	Native	119		11.6							
BH18	SS33	19.81	20.27	87.18	67.37	Unit 4a	Silty Sand (SM)	Native	84		16.6							
BH18	SS34	20.27	20.57	87.18	66.91	Unit 4a	Silty Sand (SM)	Native	126		17.2			0	67	31	2	
BH18	SS35	20.88	21.03	87.18	66.30	Unit 4a	Silty Sand (SM)	Native	100	0.15	19.3							
BH18	SS36	21.34	21.79	87.18	65.84	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	44		15.2							22.9
BH18	SS37	21.95	22.4	87.18	65.23	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	62		12	16	11	7	23	53	17	
BH18	SS38	22.56	23.01	87.18	64.62	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	50		11.2							
BH19	SS1	0	0.61	86.58	86.58	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	48		1.5							
BH19	SS2	0.99	1.22	86.58	85.59	Unit 3	Till: Silty Sand with Gravel (SM)	Native	27		7							
BH19	SS3	1.52	1.98	86.58	85.06	Unit 3	Till: Silty Sand with Gravel (SM)	Native	55		3.2							
BH19	SS4	2.29	2.74	86.58	84.29	Unit 3	Till: Silty Sand with Gravel (SM)	Native	150		6.4			19	40	32	9	
BH19	SS5	7.62	7.7	86.58	78.96	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.08	8.2							
BH19	SS6	11.43	11.72	86.58	75.15	Unit 4a	Silty Sand (SM)	Native	100	0.14	14.8			0	73	24	4	
BH19	SS7	15.6	15.75	86.58	70.98	Unit 4b	Lean Clay (CL)	Native	156									
BH19	SS8	18.29	18.58	86.58	68.29	Unit 5	Till: Silty Clay (CL-ML)	Native	100	0.14	10.3							
BH19	SS9	21.34	21.79	86.58	65.24	Unit 5	Till: Silty Clay (CL-ML)	Native	69		12.5	19	13	2	13	59	26	
BH20	SS1	0.3	0.36	86.36	86.06	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	52									
BH20	SS2	0.76	1.22	86.36	85.60	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	8		9.3	14	10	16	37	35	12	
BH20	SS3	1.52	1.98	86.36	84.84	Unit 3	Silty Sand with Gravel (SM)	Native	27		6.4							
BH20	SS4	2.29	2.74	86.36	84.07	Unit 3	Silty Sand with Gravel (SM)	Native	102		5.1			15	44	33	9	
BH20	SS5	3.05	3.51	86.36	83.31	Unit 3	Silty Sand with Gravel (SM)	Native	121		4.5							
BH20	SS6	3.81	4.27	86.36	82.55	Unit 3	Silty Sand with Gravel (SM)	Native	111		6.5							
BH20	SS7	4.57	5.03	86.36	81.79	Unit 3	Silty Sand with Gravel (SM)	Native	66		7.2							
BH20	SS8	5.33	5.79	86.36	81.03	Unit 3	Silty Sand with Gravel (SM)	Native	40		6	12	10	30	37	28	6	
BH20	SS9	6.1	6.55	86.36	80.26	Unit 3	Silty Sand with Gravel (SM)	Native	81		6.1							
BH20	SS10	7.92	8.08	86.36	78.44	Unit 3	Silty Sand with Gravel (SM)	Native	70		6.7							
BH20	SS11	9.14	9.6	86.36	77.22	Unit 3	Silty Sand with Gravel (SM)	Native	115		6.3							
BH20	SS12	10.67	10.95	86.36	75.69	Unit 4a	Gravel with Sand (GW)	Native	100	0.13	5.3			67	30	3	1	
BH20	SS13	12.19	12.65	86.36	74.17	Unit 4a	Gravel with Sand (GW)	Native	135		5.2							
BH20	SS14	13.72	14.15	86.36	72.64	Unit 4a	Silty Sand (SM)	Native	162	0.29	18.1							
BH20	SS15	15.24	15.7	86.36	71.12	Unit 4a	Silty Sand (SM)	Native	127		15			0	61	36	3	
BH20	SS16	16.76	17.22	86.36	69.60	Unit 4b	Lean Clay (CL)	Native	29		22	33	15	0	2	48	50	21.1
BH20	SS17	18.42	18.54	86.36	67.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.10	0.4			2	17	63	19	
BH20	SS18	19.81	20.27	86.36	66.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	91		11.5							
BH78	SS1	0	0.61	86.82	86.82	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	30									
BH78	SS3	1.52	1.98	86.82	85.30	Unit 3	Till: Silty Sand with Gravel (SM)	Native	51		8							25.2
BH78	SS4	2.29	2.74	86.82	84.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	72		8							
BH78	SS5	3.05	3.5	86.82	83.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	63		9							
BH78	SS6	3.81	4.27	86.82	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	64		6.1							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH78	SS7	4.57	5.03	86.82	82.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	101		7.1			27	40	27	6	
BH78	SS8	5.33	5.78	86.82	81.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	65		7.9							
BH78	SS9	6.1	6.55	86.82	80.72	Unit 3	Till: Silty Sand with Gravel (SM)	Native	101		8.2							
BH78	SS10	7.62	8	86.82	79.20	Unit 3	Till: Silty Sand with Gravel (SM)	Native	189	0.23	7.3			16	46	31	7	25.1
BH78	SS11	9.14	9.6	86.82	77.68	Unit 3	Till: Silty Sand with Gravel (SM)	Native	195		5.8							
BH78	SS12	10.67	11	86.82	76.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	185	0.26	13.7			0	68	30	1	
BH78	SS13	12.19	12.53	86.82	74.63	Unit 4a	Silty Sand (SM)	Native	186	0.26	20.2							21.6
BH78	SS14	13.72	14.02	86.82	73.10	Unit 4a	Silty Sand (SM)	Native	100	0.15	18.2							
BH78	SS15	15.24	15.7	86.82	71.58	Unit 4a	Silty Sand (SM)	Native	162		18.4							
BH78	SS16	16.76	17.22	86.82	70.06	Unit 4a	Silty Sand (SM)	Native	81									
BH78	SS17	18.29	18.75	86.82	68.53	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	40		11.3							23
BH78	SS18	19.81	20.27	86.82	67.01	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	96		16.6			0	30	57	13	
BH78	SS19	21.34	21.79	86.82	65.48	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	52		12.8	19	12					25.7
BH78	SS20	22.56	23.07	86.82	64.26	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	80		17.9							

Table B-2e: SPT and Laboratory Data Summary - Reactor Auxiliary Bay Area

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
B-113	SS1	0.00	0.60	88.50	88.50	Unit 1	Fill - Sand and Gravel (GW) and topsoil (OH)	Fill	27		8.31							
B-113	SS2	0.76	1.21	88.50	87.74	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	27		13.47			0	31	48	21	
B-113	SS3	1.53	1.98	88.50	86.98	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	17		17.22	40	18	0	8	48	44	20.1
B-113	SS4	2.29	2.74	88.50	86.21	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	16		23.86	36	16	1	11	45	43	
B-113	SS5	3.05	3.50	88.50	85.45	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	7		38.7	38	17	1	8	39	52	
B-113	SS6	3.81	4.26	88.50	84.69	Unit 2b	Silty Sand (SM)	Native	4		9.96			13	41	37	9	
B-113	SS7	4.58	5.03	88.50	83.93	Unit 2b	Silty Sand (SM)	Native	9		8.3			8	47	35	10	
B-113	SS8	5.34	5.79	88.50	83.16	Unit 2b	Silty Sand (SM)	Native	14		8.02			8	45	38	9	23.8
B-113	SS9	6.10	6.55	88.50	82.40	Unit 2b	Silty Sand (SM)	Native	18		10.1							23.7
B-113	SS10	6.86	7.31	88.50	81.64	Unit 2b	Silty Sand (SM)	Native	17		9.79			11	40	39	10	23.8
B-113	SS11	7.63	8.08	88.50	80.88	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	92		7.02							24.3
B-113	SS12	8.39	8.67	88.50	80.11	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.13	6.17			18	38	34	10	24.2
B-113	SS13	9.15	9.58	88.50	79.35	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	89	0.28	7.1	13	9	6	41	40	13	24.3
B-113	SS14	9.91	10.36	88.50	78.59	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	59		7.4			3	41	44	12	24.1
B-113	SS15	10.68	11.13	88.50	77.83	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	90		6.81							
B-113	SS16	11.44	11.64	88.50	77.06	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.05	11.97			4	36	47	13	
B-113	SS17	12.20	12.35	88.50	76.30	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	53	0.15	14.71							
B-113	SS18	12.96	13.41	88.50	75.54	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	98		22.65			0	16	83	1	
B-113	SS19	13.73	13.83	88.50	74.78	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.10	17.52							
B-113	SS20	14.49	14.62	88.50	74.01	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.13	17.87							
B-113	SS21	15.25	15.38	88.50	73.25	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	60	0.13	15.66							
B-113	SS22	16.01	16.29	88.50	72.49	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.13	19.72			0	69	28	3	
B-113	SS23	16.78	17.23	88.50	71.73	Unit 4b	Lean Clay (CL)	Native	54		18.54	30	15					20.1
B-113	SS24	17.54	17.99	88.50	70.96	Unit 4b	Lean Clay (CL)	Native	40		19.65	33	14	0	3	48	49	21
B-113	SS25	18.30	18.75	88.50	70.20	Unit 4b	Lean Clay (CL)	Native	66		26.74							
B-113	SS26	19.06	19.51	88.50	69.44	Unit 4b	Lean Clay (CL)	Native	16		13.94	25	13	0	12	45	43	20.9
B-113	SS27	19.83	20.06	88.50	68.68	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	50	0.08	9.42							
B-113	SS28	20.59	20.89	88.50	67.91	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	61	0.15	8.71	17	11	1	15	65	19	23.6
B-113	SS29	21.35	21.48	88.50	67.15	Unit 4a	Silty Sand (SM)	Native	58	0.13	18.45							
B-113	SS30	22.11	22.24	88.50	66.39	Unit 4a	Silty Sand (SM)	Native	57	0.13	16.03			0	60	39	1	
B-113	SS31	22.88	23.33	88.50	65.63	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	70		10.28	15	10					23.7
B-113	SS32	23.64	24.07	88.50	64.86	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	80	0.28	8.07	16	10	6	21	50	23	23.6
B-113	SS33	24.40	24.70	88.50	64.10	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	63	0.15	7.05			4	42	39	15	24
B-113	SS34	25.16	25.26	88.50	63.34	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	60	0.10	6.5							
B-116	SS1	0	0.6	89.3	89.3	Unit 1	nd and Gravel (GW) over crushed rock over Silty Clay	Fill	25		13.35							21.5
B-116	SS2	0.75	1.2	89.3	88.55	Unit 2b	Sandy Silt (ML)	Native	34		6.56							23.7
B-116	SS3	1.5	1.95	89.3	87.8	Unit 2b	Sandy Silt (ML)	Native	26		16.34				44	49	7	20.7
B-116	SS4	3	3.45	89.3	86.3	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	17		18.43	29	14	1	41	47	11	21.7
B-116	SS5	4.6	5.05	89.3	84.7	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	2		40.38	41	17		4	47	49	
B-116	SS6	5.4	5.85	89.3	83.9	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	2		10.38							
B-116	SS7	6.1	6.55	89.3	83.2	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	3		11.53				44	49	7	
B-116	SS8	6.9	7.35	89.3	82.4	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	5		10.28							
B-116	SS9	7.6	8.05	89.3	81.7	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	5		9.03			6	44	37	13	22.9
B-116	SS10	8.4	8.6	89.3	80.9	Unit 3	Upper till - Silty Sand (SM)	Native	50	0.05	7.51							
B-116	SS11	9.1	9.55	89.3	80.2	Unit 2a	Lean Clay (CL)	Native	61		16.72			0	10	60	30	
B-116	SS12	9.9	10.18	89.3	79.4	Unit 2a	Lean Clay (CL)	Native	50	0.13	14.69	27	13					
B-116	SS13	10.7	10.93	89.3	78.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.08	20.09							
B-116	SS14	11.4	11.65	89.3	77.9	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.1	19.25			0	40	59	1	
B-116	SS15	12.2	12.48	89.3	77.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.13	14.74			0	67	32	1	
B-116	SS16	13	13.25	89.3	76.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.1	16.06			0	63	36	1	
B-116	SS17	13.7	13.85	89.3	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	55	0.15	21.36			0	23	76	1	
B-116	SS18	14.5	14.75	89.3	74.8	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.1	15.43			0	74	25	1	
B-116	SS19	15.2	15.48	89.3	74.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.13	16.36			0	60	39	1	
B-116	SS20	16	16.28	89.3	73.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.13	15.24			0	74	25	1	
B-116	SS21	16.8	17.1	89.3	72.5	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	54	0.15	17.07							
B-116	SS22	17.5	17.9	89.3	71.8	Unit 4b	Lean Clay (CL)	Native	82	0.25	19.8							21.1
B-116	SS23	18.3	18.75	89.3	71	Unit 4b	Lean Clay (CL)	Native	44		16.65	34	15	1	2	45	52	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
B-116	SS24	19.1	19.55	89.3	70.2	Unit 4b	Lean Clay (CL)	Native	40		26	35	16					20.2
B-116	SS25	20.6	21.05	89.3	68.7	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	60		8.83	14	10	4	22	49	25	23.6
B-116	SS26	21.3	21.58	89.3	68	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	50	0.13	8.34			1	25	60	14	23.8
B-116	SS27	22.1	22.2	89.3	67.2	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	50	0.1	13.89	18	12	0	6	75	19	
B-116	SS28	22.9	23	89.3	66.4	Unit 4a	Silt (ML)	Native	50	0.1	18.04							
B-116	SS29	23.6	23.7	89.3	65.7	Unit 4a	Silt (ML)	Native	50	0.1	14.96	13	10					
B-116	SS30	24.4	24.68	89.3	64.9	Unit 5	Lower till - Sandy Silt (ML)	Native	50	0.13	7.12							
B-116	SS31	25.1	25.2	89.3	64.2	Unit 5	Lower till - Sandy Silt (ML)	Native	50	0.1								
BH1	SS1	0	0.61	89.62	89.62	Unit 1	Sandy Silt (ML)	Fill	3									
BH1	SS2	0.61	1.07	89.62	89.01	Unit 1	Sandy Silt (ML)	Fill	7		20.4							
BH1	SS3	1.22	1.68	89.62	88.4	Unit 2a	sandy Lean Clay (CL)	Native	5		23.3							
BH1	SS5	2.44	2.9	89.62	87.18	Unit 2a	sandy Lean Clay (CL)	Native	13		19.5	25	13	5	26	44	24	
BH1	SS7	3.66	4.11	89.62	85.96	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	11		11.4	14	11	17	38	35	10	
BH1	SS8	4.27	4.52	89.62	85.35	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.10	8.3							
BH1	SS9	4.88	5.08	89.62	84.74	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	11.9							
BH1	SS10	5.49	5.69	89.62	84.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	12.2							
BH1	SS11	6.1	6.5	89.62	83.52	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	178	0.25	10.6	14	10	3	32	53	13	27.7
BH1	SS12	6.71	6.96	89.62	82.91	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.10	8.7							
BH1	SS13	7.32	7.54	89.62	82.3	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.07	13.9	14	10	8	39	40	13	
BH1	SS14	7.92	8.36	89.62	81.70	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	126	0.25	11							
BH1	SS15	8.53	8.99	89.62	81.09	Unit 4b	Lean Clay (CL)	Native	123		16.6							
BH1	SS16	9.14	9.6	89.62	80.48	Unit 4b	Lean Clay (CL)	Native	103		15.4	25	15	0	3	71	26	
BH1	SS17	9.75	10.21	89.62	79.87	Unit 4b	Lean Clay (CL)	Native	75		17.3							25.5
BH1	SS18	10.36	10.82	89.62	79.26	Unit 4b	Lean Clay (CL)	Native	67		19	18	12	0	11	69	19	
BH1	SS19	10.97	11.25	89.62	78.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	100	0.13	17.9							
BH1	SS20	11.58	12.02	89.62	78.04	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	182	0.28	17.4			0	35	59	5	23.6
BH1	SS21	12.19	12.65	89.62	77.43	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	169		18.8							
BH1	SS22	12.8	13.26	89.62	76.82	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	113		16.8							
BH1	SS23	13.41	13.84	89.62	76.21	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	175	0.28	16.6							24.2
BH1	SS24	14.02	14.43	89.62	75.60	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	200	0.25	14.2							
BH1	SS25	14.63	15.04	89.62	74.99	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	197	0.25	13.8							
BH1	SS26	15.24	15.67	89.62	74.38	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	180	0.28	16.5							
BH1	SS27	15.85	16.31	89.62	73.77	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	151		13.9			0	75	24	1	
BH1	SS28	16.46	16.92	89.62	73.16	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	118		14.6							
BH1	SS29	17.07	17.53	89.62	72.55	Unit 4b	Silty Clay (CL-ML)	Native	76		21.9	20	16	0	1	78	21	
BH1	SS30	17.68	18.14	89.62	71.94	Unit 4b	Silty Clay (CL-ML)	Native	62		21.3							26.7
BH1	SS31	18.29	18.75	89.62	71.33	Unit 4b	Lean Clay (CL)	Native	26		24.5							
BH1	SS32	18.9	19.35	89.62	70.72	Unit 4b	Lean Clay (CL)	Native	23		23.5	29	15	0	2	54	45	
BH1	SS33	19.51	19.96	89.62	70.11	Unit 4b	Lean Clay (CL)	Native	35		26.4							
BH1	SS34	20.12	20.57	89.62	69.50	Unit 4b	Lean Clay (CL)	Native	36		23.1							
BH1	SS35	20.73	21.18	89.62	68.89	Unit 4b	Lean Clay (CL)	Native	23		20.1							
BH1	SS36	21.34	21.49	89.62	68.28	Unit 5	Till: Sandy Silt (ML)	Native	100	0.14	12.6			1	35	56	8	
BH1	SS37	21.95	22.38	89.62	67.67	Unit 5	Till: Sandy Silt (ML)	Native	194	0.28	12.7							
BH1	SS38	22.56	22.78	89.62	67.06	Unit 4a	Sandy Silt (ML)	Native	100	0.07	15.8			0	48	49	3	
BH1	SS39	23.16	23.62	89.62	66.46	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	78		9							
BH1	SS40	23.77	24.21	89.62	65.85	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	146	0.28	11.2	17	12	3	19	61	17	
BH1	SS41	24.38	24.84	89.62	65.24	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	105		10							
BH1	SS42	24.99	25.29	89.62	64.63	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	100	0.07	11.2							
BH2	SS1	0.33	0.61	89.41	89.08	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	28									
BH2	SS2	1.02	1.22	89.41	88.39	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	57									
BH2	SS3	1.65	1.98	89.41	87.76	Unit 1	Fill: Sandy Silt (ML)	Fill	16		12.7							
BH2	SS4	2.29	2.74	89.41	87.12	Unit 2a	Lean Clay with Sand (CL)	Native	12		23.7	31	17	0	15	67	18	
BH2	SS6	3.81	4.27	89.41	85.60	Unit 2a	Lean Clay with Sand (CL)	Native	4		26.7	30	14	5	14	47	34	
BH2	SS8	6.1	6.55	89.41	83.31	Unit 2b	Silty Sand (SM)	Native	4		12.7	12	9	7	46	37	10	
BH2	SS9	7.62	8.05	89.41	81.79	Unit 3	Till: Sandy Silt (ML)	Native	185	0.28	10.1			3	46	45	6	
BH2	SS10	9.14	9.41	89.41	80.27	Unit 3	Till: Sandy Silt (ML)	Native	100	0.11	9.4							
BH2	SS11	10.67	11.13	89.41	78.74	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	170		16.1			5	28	65	2	
BH2	SS12	12.19	12.65	89.41	77.22	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	142		15.6							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH2	SS13	13.72	14.11	89.41	75.69	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	196	0.24	14.1							
BH2	SS14	15.24	15.66	89.41	74.17	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	198	0.27	18							
BH2	SS15	16.76	17.22	89.41	72.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	83		14.5			0	69	30	1	
BH2	SS16	18.29	18.75	89.41	71.12	Unit 4b	Lean Clay (CL)	Native	59		20.5	28	14	0	3	53	43	
BH2	SS17	19.81	20.27	89.41	69.60	Unit 4b	Lean Clay (CL)	Native	40		20.7							
BH2	SS18	21.34	21.77	89.41	68.07	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	176	0.28	8.6							
BH2	SS19	22.86	23.32	89.41	66.55	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	179		10.1	15	11	8	29	51	13	
BH2	SS20	24.37	24.83	89.41	65.04	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.14	7.2							
BH4	SS1	0	0.61	89.64	89.64	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	18									
BH4	SS2	0.76	1.22	89.64	88.88	Unit 1	Fill: Silty Sand (SM)	Fill	17		12.3							
BH4	SS3	1.52	1.98	89.64	88.12	Unit 1	Fill: Silty Sand (SM)	Fill	21									
BH4	SS4	4.57	5.03	89.64	85.07	Unit 2b	Silty Sand (SM)	Native	3		11.3							
BH4	SS5	7.62	8.08	89.64	82.02	Unit 2b	Silty Sand (SM)	Native	8		10.5			7	46	37	10	
BH4	SS6	10.67	11.13	89.64	78.97	Unit 4a	Silty Sand (SM)	Native	154		15.3							
BH4	SS7	13.72	14.17	89.64	75.92	Unit 4a	Silty Sand (SM)	Native	127		15.3			0	77	22	1	
BH4	SS8	16.76	17.22	89.64	72.88	Unit 4a	Silty Sand (SM)	Native	160		19.9							
BH4	SS9	19.81	20.27	89.64	69.83	Unit 4b	Lean Clay (CL)	Native	24		24.7	36	16	0	2	40	58	
BH4	SS10	22.86	22.99	89.64	66.78	Unit 4a	Silt (ML)	Native	100	0.13	20.4							
BH4	SS11	24.38	24.66	89.64	65.26	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.13	6.9	14	10	10	36	42	13	23.9
BH5	SS1	0.31	0.38	88.97	88.66	Unit 1	Fill: Poorly Graded Gravel with Sand (GP)	Fill	29									
BH5	SS2	0.76	1.22	88.97	88.21	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	47		4.5							
BH5	SS3	1.83	1.98	88.97	87.14	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	44									
BH5	SS4	4.57	5.03	88.97	84.40	Unit 2a	Sandy Silty Clay (CL-ML)	Native	3		12.3	14	9	13	33	37	17	
BH5	SS5	7.62	8.08	88.97	81.35	Unit 2a	Sandy Silty Clay (CL-ML)	Native	9		8.8							
BH5	SS6	10.67	11.13	88.97	78.30	Unit 3	Till: Sandy Silt (ML)	Native	133		12.2			0	41	49	10	
BH5	SS7	13.72	14.16	88.97	75.25	Unit 4a	Silty Sand (SM)	Native	172	0.29	15.5							
BH5	SS8	16.76	17.01	88.97	72.21	Unit 4a	Silty Sand (SM)	Native	100	0.09	18.2			0	58	39	3	
BH5	SS9	19.81	20.27	88.97	69.16	Unit 5	Till: Lean Clay (CL)	Native	44		17.1	25	12	1	14	48	38	
BH5	SS10	22.86	23.32	88.97	66.11	Unit 5	Till: Lean Clay (CL)	Native	108		9.4							
BH5	SS11	23.77	24.31	88.97	65.20	Unit 5	Till: Silty Sand with Gravel (SM)	Native	192	0.28	5.6	13	10	16	42	33	9	
BH10	SS1	0	0.61	88.40	88.40	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	40									
BH10	SS2	1.17	1.22	88.40	87.23	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	13									
BH10	SS3	1.52	1.98	88.40	86.88	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	6		21.1	26	15	1	24	56	19	
BH10	SS4	2.29	2.74	88.40	86.11	Unit 2a	Lean Clay (CL)	Native	19		22.4	37	17					
BH10	SS6	3.81	4.42	88.40	84.59	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	10									
BH10	SS7	4.57	5.03	88.40	83.83	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	6									
BH10	SS8	5.33	5.79	88.40	83.07	Unit 3	Till: Silty Sand (SM)	Native	18									
BH10	SS9	6.1	6.55	88.40	82.30	Unit 3	Till: Silty Sand (SM)	Native	20		9.3							
BH10	SS10	7.62	8.08	88.40	80.78	Unit 3	Till: Silty Sand (SM)	Native	133									
BH10	SS11	9.14	9.6	88.40	79.26	Unit 3	Till: Silty Sand (SM)	Native	110		6.9			5	46	39	10	
BH10	SS12	10.67	11.13	88.40	77.73	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	94		15.6							
BH10	SS13	12.19	12.65	88.40	76.21	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	40									
BH10	SS14	13.72	14.1	88.40	74.68	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	193	0.23	13.8			0	72	25	2	
BH10	SS15	15.44	15.7	88.40	72.96	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	158									
BH10	SS16	18.29	18.75	88.40	70.11	Unit 4b	Lean Clay (CL)	Native	21		21.9	29	15	0	4	53	43	
BH10	SS17	21.54	21.69	88.40	66.86	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	148	0.13	15.4							
BH10	SS18	23.86	24.29	88.40	64.54	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	161	0.18	24.3			10	35	12	43	
BH15	SS1	0	0.13	87.37	87.37	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	50	0.13								
BH15	SS2	0.76	1.22	87.37	86.61	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	98		2.7							
BH15	SS3	1.52	1.98	87.37	85.85	Unit 3	Till: Silty Sand (SM)	Native	25		7.4							
BH15	SS4	2.29	2.74	87.37	85.08	Unit 3	Till: Silty Sand (SM)	Native	82		5			7	47	37	10	
BH15	SS5	4.57	4.85	87.37	82.80	Unit 3	Till: Silty Sand (SM)	Native	50	0.13	8							
BH15	SS6	7.62	7.75	87.37	79.75	Unit 3	Till: Silty Sand (SM)	Native	50	0.13								
BH15	SS7	10.67	10.8	87.37	76.70	Unit 4a	Silty Sand (SM)	Native	50	0.13	14.9							
BH15	SS8	15.24	15.7	87.37	72.13	Unit 4b	Lean Clay (CL)	Native	95		21.6	24	14	0	5	68	28	
BH15	SS9	18.29	18.52	87.37	69.08	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	50	0.08	9.1							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH15	SS10	21.34	21.79	87.37	66.03	Unit 4b	Silty Clay (CL-ML)	Native	56		13.4	19	13					
BH16	SS1	0	0.61	88.63	88.63	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	36									
BH16	SS2	0.76	1.22	88.63	87.87	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	51		4.8							
BH16	SS3	1.52	1.98	88.63	87.11	Unit 2a	Lean Clay with Sand (CL)	Native	12		18.9	24	14					19.7
BH16	SS5	3.05	3.51	88.63	85.58	Unit 2a	Lean Clay with Sand (CL)	Native	12		8.4							
BH16	SS6	3.81	4.27	88.63	84.82	Unit 2b	Silty Sand (SM)	Native	5		13							
BH16	SS7	5.33	5.79	88.63	83.30	Unit 2b	Silty Sand (SM)	Native	17		9							
BH16	SS8	6.1	6.55	88.63	82.53	Unit 2b	Silty Sand (SM)	Native	7		9.1	11	10					
BH16	SS9	7.62	8.08	88.63	81.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	64		6.8	12	11					
BH16	SS10	9.14	9.42	88.63	79.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	50	0.13								
BH16	SS11	10.67	11.13	88.63	77.96	Unit 4b	Lean Clay (CL)	Native	78		15.2	27	15					
BH16	SS12	12.34	12.65	88.63	76.29	Unit 4a	Silty Sand (SM)	Native	73									
BH16	SS13	13.72	13.94	88.63	74.91	Unit 4a	Silty Sand (SM)	Native	50	0.08	15.6							
BH16	SS14	15.2	15.37	88.63	73.43	Unit 4a	Silty Sand (SM)	Native	50	0.13								
BH16	SS15	18.29	18.75	88.63	70.34	Unit 4b	Lean Clay (CL)	Native	38		22.3	35	17					
BH16	SS16	21.34	21.46	88.63	67.29	Unit 4a	Sandy Silt (ML)	Native	50	0.13								
BH77	SS1	0	0.61	87.80	87.80	Unit 1	Fill: Sand with Gravel (SP)	Fill	35		0.7							
BH77	SS2	0.76	1.22	87.80	87.04	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	17		21.6							
BH77	SS3	1.52	1.98	87.80	86.28	Unit 2b	Silty Sand with Grvel (SM)	Native	7		8.3	12	10	17	42	31	10	
BH77	SS4	2.29	2.74	87.80	85.51	Unit 2b	Silty Sand with Grvel (SM)	Native	17		7.1							
BH77	SS5	3.05	3.5	87.80	84.75	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	48		5.9			20	43	30	8	
BH77	SS6	3.81	4.27	87.80	83.99	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	136		7.5							
BH77	SS7	4.57	5.03	87.80	83.23	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	118		8.2							19.1
BH77	SS8	5.33	5.78	87.80	82.47	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	134		7.4							
BH77	SS9	6.1	6.55	87.80	81.70	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	149		7.4	13	10	16	41	34	10	
BH77	SS10	7.62	8.03	87.80	80.18	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	185	0.25	9.2			6	40	44	10	
BH77	SS11	9.14	9.37	87.80	78.66	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	100	0.08	10.9							
BH77	SS12	10.67	10.92	87.80	77.13	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	100	0.10	8.9							
BH77	SS13	12.19	12.65	87.80	75.61	Unit 4a	Silty Sand with Gravel (SM)	Native	135		19			1	35	62	2	
BH77	SS14	13.72	14.14	87.80	74.08	Unit 4a	Silty Sand with Gravel (SM)	Native	192	0.27	14.9							
BH77	SS15	15.24	15.84	87.80	72.56	Unit 4a	Silty Sand with Gravel (SM)	Native	176	0.29	16.3							
BH77	SS16	16.76	17.22	87.80	71.04	Unit 4b	Lean Clay (CL)	Native	33		21.7	28	14					
BH77	SS17	18.29	18.75	87.80	69.51	Unit 4b	Lean Clay (CL)	Native	24		19.4	30	14	9	5	44	42	
BH77	SS18	19.81	20.03	87.80	67.99	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.06	17.5							
BH77	SS19	21.34	21.62	87.80	66.46	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.13	16.1			0	50	48	2	
BH77	SS20	22.86	23.32	87.80	64.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	89		11	17	11	4	22	53	22	
BH77	SS21	24.01	24.27	87.80	63.79	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	113	0.20	6.5							

Table B-2f: SPT and Laboratory Data Summary - Independent Spent Fuel Storage Installation Area

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
B-113	SS1	0.00	0.60	88.50	88.50	Unit 1	Fill - Sand and Gravel (GW) and topsoil (OH)	Fill	27		8.31							
B-113	SS2	0.76	1.21	88.50	87.74	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	27		13.47			0	31	48	21	
B-113	SS3	1.53	1.98	88.50	86.98	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	17		17.22	40	18	0	8	48	44	20.1
B-113	SS4	2.29	2.74	88.50	86.21	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	16		23.86	36	16	1	11	45	43	
B-113	SS5	3.05	3.50	88.50	85.45	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	7		38.7	38	17	1	8	39	52	
B-113	SS6	3.81	4.26	88.50	84.69	Unit 2b	Silty Sand (SM)	Native	4		9.96			13	41	37	9	
B-113	SS7	4.58	5.03	88.50	83.93	Unit 2b	Silty Sand (SM)	Native	9		8.3			8	47	35	10	
B-113	SS8	5.34	5.79	88.50	83.16	Unit 2b	Silty Sand (SM)	Native	14		8.02			8	45	38	9	23.8
B-113	SS9	6.10	6.55	88.50	82.40	Unit 2b	Silty Sand (SM)	Native	18		10.1							23.7
B-113	SS10	6.86	7.31	88.50	81.64	Unit 2b	Silty Sand (SM)	Native	17		9.79			11	40	39	10	23.8
B-113	SS11	7.63	8.08	88.50	80.88	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	92		7.02							24.3
B-113	SS12	8.39	8.67	88.50	80.11	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.13	6.17			18	38	34	10	24.2
B-113	SS13	9.15	9.58	88.50	79.35	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	89	0.28	7.1	13	9	6	41	40	13	24.3
B-113	SS14	9.91	10.36	88.50	78.59	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	59		7.4			3	41	44	12	24.1
B-113	SS15	10.68	11.13	88.50	77.83	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	90		6.81							
B-113	SS16	11.44	11.64	88.50	77.06	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.05	11.97			4	36	47	13	
B-113	SS17	12.20	12.35	88.50	76.30	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	53	0.15	14.71							
B-113	SS18	12.96	13.41	88.50	75.54	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	98		22.65			0	16	83	1	
B-113	SS19	13.73	13.83	88.50	74.78	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.10	17.52							
B-113	SS20	14.49	14.62	88.50	74.01	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.13	17.87							
B-113	SS21	15.25	15.38	88.50	73.25	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	60	0.13	15.66							
B-113	SS22	16.01	16.29	88.50	72.49	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.13	19.72			0	69	28	3	
B-113	SS23	16.78	17.23	88.50	71.73	Unit 4b	Lean Clay (CL)	Native	54		18.54	30	15					20.1
B-113	SS24	17.54	17.99	88.50	70.96	Unit 4b	Lean Clay (CL)	Native	40		19.65	33	14	0	3	48	49	21
B-113	SS25	18.30	18.75	88.50	70.20	Unit 4b	Lean Clay (CL)	Native	66		26.74							
B-113	SS26	19.06	19.51	88.50	69.44	Unit 4b	Lean Clay (CL)	Native	16		13.94	25	13	0	12	45	43	20.9
B-113	SS27	19.83	20.06	88.50	68.68	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	50	0.08	9.42							
B-113	SS28	20.59	20.89	88.50	67.91	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	61	0.15	8.71	17	11	1	15	65	19	23.6
B-113	SS29	21.35	21.48	88.50	67.15	Unit 4a	Silty Sand (SM)	Native	58	0.13	18.45							
B-113	SS30	22.11	22.24	88.50	66.39	Unit 4a	Silty Sand (SM)	Native	57	0.13	16.03			0	60	39	1	
B-113	SS31	22.88	23.33	88.50	65.63	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	70		10.28	15	10					23.7
B-113	SS32	23.64	24.07	88.50	64.86	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	80	0.28	8.07	16	10	6	21	50	23	23.6
B-113	SS33	24.40	24.70	88.50	64.10	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	63	0.15	7.05			4	42	39	15	24
B-113	SS34	25.16	25.26	88.50	63.34	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	60	0.10	6.5							
B-104	SS1	0.00	0.60	88.30	88.30	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	26		13.7							
B-104	SS2	0.60	1.05	88.30	87.70	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	36		5							
B-104	SS3	1.21	1.66	88.30	87.09	Unit 2a	Sandy Lean Clay (CL)	Native	15		14.6	32	19	0	48	26	26	19.9
B-104	SS4	1.83	2.28	88.30	86.47	Unit 2a	Sandy Lean Clay (CL)	Native	18		21.7							
B-104	SS6	3.04	3.49	88.30	85.26	Unit 2b	Silty Gravel (GM)	Native	14		9.2							
B-104	SS7	3.65	4.10	88.30	84.65	Unit 2b	Silty Gravel (GM)	Native	59		8.2			64	14	19	3	
B-104	SS8	4.27	4.72	88.30	84.03	Unit 2b	Silty Gravel (GM) / Silty Gravel with Sand (GM)	Native	78		7							
B-104	SS9	4.88	5.33	88.30	83.42	Unit 2b	Silty Gravel with Sand (GM)	Native	67		8.41			45	20	29	6	23.9
B-104	SS10	5.49	5.94	88.30	82.81	Unit 2b	Sandy Silt with Gravel (ML)	Native	45		8							
B-104	SS11	6.10	6.23	88.30	82.20	Unit 2b	Sandy Silt with Gravel (ML)	Native	52	0.13	6.36			24	36	35	5	
B-104	SS12	6.69	6.82	88.30	81.61	Unit 2b	Silt (ML)	Native	54	0.13	19			1	9	89	1	
B-104	SS13	7.31	7.44	88.30	80.99	Unit 2b	Silt (ML)	Native	50	0.13	13.2							
B-104	SS14	7.91	8.01	88.30	80.39	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	55	0.10	16.8			2	41	53	4	
B-104	SS15	8.53	8.66	88.30	79.77	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	54	0.13	16.8							
B-104	SS16	9.13	9.21	88.30	79.17	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	55	0.08	8.33			15	36	41	8	
B-104	SS17	9.74	9.84	88.30	78.56	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	51	0.10	8.5							
B-104	SS18	10.35	10.43	88.30	77.95	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	52	0.08	10.92			1	54	38	7	
B-104	SS19	10.96	11.04	88.30	77.34	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	53	0.08								
B-104	SS20	11.57	11.72	88.30	76.73	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	56	0.15	23.3							
B-104	SS21	12.17	12.40	88.30	76.13	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	50	0.08	19.3							19.9
B-104	SS22	12.77	12.90	88.30	75.53	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	52	0.13	17.3							
B-104	SS23	13.37	13.45	88.30	74.93	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	53	0.08	21							
B-104	SS24	13.98	14.08	88.30	74.32	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	50	0.10	18.8							
B-104	SS25	14.59	14.74	88.30	73.71	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	54	0.15	18							
B-104	SS26	15.24	15.37	88.30	73.06	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	55	0.13	20.4			0	57	0	0	
B-104	SS27	15.85	16.10	88.30	72.45	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	51	0.10	18.3							
B-104	SS28	16.46	16.74	88.30	71.84	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	54	0.13	18.1			0	49	44	7	21.4
B-104	SS29	17.07	17.52	88.30	71.23	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	36		21.3	27	17	0	43	31	26	20.6
B-104	SS31	18.28	18.73	88.30	70.02	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	52		22.9							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
B-104	SS32	18.89	19.34	88.30	69.41	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	21		23	31	18	0	40	34	26	21.9
B-104	SS34	20.11	20.24	88.30	68.19	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	52	0.13	11.4			0	27	63	10	
B-104	SS35	20.72	20.82	88.30	67.58	Unit 4a	Silty Sand (SM)	Native	54	0.10								
B-104	SS36	21.33	21.43	88.30	66.97	Unit 4a	Silty Sand (SM)	Native	66	0.10	17.4			0	71	28	1	
B-104	SS37	21.93	22.36	88.30	66.37	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	94	0.28	10.4							
B-104	SS38	22.54	22.84	88.30	65.76	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	55	0.15	10.1							23.8
B-104	SS39	23.15	23.40	88.30	65.15	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	52	0.10	9.5							
B-104	SS40	23.76	24.04	88.30	64.54	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	54	0.13	7.8			5	48	32	15	22.4
B-104	SS41	24.37	24.80	88.30	63.93	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	89	0.28	11.8							
B-104	SS42	24.98	25.18	88.30	63.32	Unit 5	Lower till : Sandy Silt (ML)	Native	51	0.05								
BH1	SS1	0	0.61	89.62	89.62	Unit 1	Sandy Silt (ML)	Fill	3									
BH1	SS2	0.61	1.07	89.62	89.01	Unit 1	Sandy Silt (ML)	Fill	7		20.4							
BH1	SS3	1.22	1.68	89.62	88.40	Unit 2a	sandy Lean Clay (CL)	Native	5		23.3							
BH1	SS5	2.44	2.9	89.62	87.18	Unit 2a	sandy Lean Clay (CL)	Native	13		19.5	25	13	5	26	44	24	
BH1	SS7	3.66	4.11	89.62	85.96	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	11		11.4	14	11	17	38	35	10	
BH1	SS8	4.27	4.52	89.62	85.35	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.10	8.3							
BH1	SS9	4.88	5.08	89.62	84.74	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	11.9							
BH1	SS10	5.49	5.69	89.62	84.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	12.2							
BH1	SS11	6.1	6.5	89.62	83.52	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	178	0.25	10.6	14	10	3	32	53	13	27.7
BH1	SS12	6.71	6.96	89.62	82.91	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.10	8.7							
BH1	SS13	7.32	7.54	89.62	82.30	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.07	13.9	14	10	8	39	40	13	
BH1	SS14	7.92	8.36	89.62	81.70	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	126	0.25	11							
BH1	SS15	8.53	8.99	89.62	81.09	Unit 4b	Lean Clay (CL)	Native	123		16.6							
BH1	SS16	9.14	9.6	89.62	80.48	Unit 4b	Lean Clay (CL)	Native	103		15.4	25	15	0	3	71	26	
BH1	SS17	9.75	10.21	89.62	79.87	Unit 4b	Lean Clay (CL)	Native	75		17.3							25.5
BH1	SS18	10.36	10.82	89.62	79.26	Unit 4b	Lean Clay (CL)	Native	67		19	18	12	0	11	69	19	
BH1	SS19	10.97	11.25	89.62	78.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	100	0.13	17.9							
BH1	SS20	11.58	12.02	89.62	78.04	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	182	0.28	17.4			0	35	59	5	23.6
BH1	SS21	12.19	12.65	89.62	77.43	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	169		18.8							
BH1	SS22	12.8	13.26	89.62	76.82	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	113		16.8							
BH1	SS23	13.41	13.84	89.62	76.21	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	175	0.28	16.6							24.2
BH1	SS24	14.02	14.43	89.62	75.60	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	200	0.25	14.2							
BH1	SS25	14.63	15.04	89.62	74.99	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	197	0.25	13.8							
BH1	SS26	15.24	15.67	89.62	74.38	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	180	0.28	16.5							
BH1	SS27	15.85	16.31	89.62	73.77	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	151		13.9			0	75	24	1	
BH1	SS28	16.46	16.92	89.62	73.16	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	118		14.6							
BH1	SS29	17.07	17.53	89.62	72.55	Unit 4b	Silty Clay (CL-ML)	Native	76		21.9	20	16	0	1	78	21	
BH1	SS30	17.68	18.14	89.62	71.94	Unit 4b	Silty Clay (CL-ML)	Native	62		21.3							26.7
BH1	SS31	18.29	18.75	89.62	71.33	Unit 4b	Lean Clay (CL)	Native	26		24.5							
BH1	SS32	18.9	19.35	89.62	70.72	Unit 4b	Lean Clay (CL)	Native	23		23.5	29	15	0	2	54	45	
BH1	SS33	19.51	19.96	89.62	70.11	Unit 4b	Lean Clay (CL)	Native	35		26.4							
BH1	SS34	20.12	20.57	89.62	69.50	Unit 4b	Lean Clay (CL)	Native	36		23.1							
BH1	SS35	20.73	21.18	89.62	68.89	Unit 4b	Lean Clay (CL)	Native	23		20.1							
BH1	SS36	21.34	21.49	89.62	68.28	Unit 5	Till: Sandy Silt (ML)	Native	100	0.14	12.6			1	35	56	8	
BH1	SS37	21.95	22.38	89.62	67.67	Unit 5	Till: Sandy Silt (ML)	Native	194	0.28	12.7							
BH1	SS38	22.56	22.78	89.62	67.06	Unit 4a	Sandy Silt (ML)	Native	100	0.07	15.8			0	48	49	3	
BH1	SS39	23.16	23.62	89.62	66.46	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	78		9							
BH1	SS40	23.77	24.21	89.62	65.85	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	146	0.28	11.2	17	12	3	19	61	17	
BH1	SS41	24.38	24.84	89.62	65.24	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	105		10							
BH1	SS42	24.99	25.29	89.62	64.63	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	100	0.07	11.2							
BH3	SS1	0.3	0.61	89.89	89.59	Unit 1	Fill: Shale rock fragments	Fill	29		8.5							
BH3	SS2	0.76	1.22	89.89	89.13	Unit 2a	Lean Clay with Sand (CL)	Native	10		18.8							
BH3	SS4	2.29	2.74	89.89	87.60	Unit 2a	Lean Clay with Sand (CL)	Native	10		21.3	30	16	9	22	55	15	
BH3	SS6	3.81	4.27	89.89	86.08	Unit 2a	Lean Clay with Sand (CL)	Native	8		21.6							21.5
BH3	SS7	5.34	5.8	89.89	84.55	Unit 2a	Lean Clay with Sand (CL)	Native	3		15.4	18	10	6	27	44	23	
BH3	SS8	6.1	6.71	89.89	83.79	Unit 2b	Silty Sand with Gravel (SM)	Native	2		10							
BH3	SS9	6.71	7.32	89.89	83.18	Unit 3	Till: Sandy Silt (ML)	Native	97		7.9							
BH3	SS10	7.63	8.11	89.89	82.26	Unit 3	Till: Sandy Silt (ML)	Native	118		7.9			2	39	47	12	
BH3	SS11	9.15	9.64	89.89	80.74	Unit 3	Till: Sandy Silt (ML)	Native	122		9.1							
BH3	SS12	10.68	11.16	89.89	79.21	Unit 4b	Lean Clay (CL)	Native	78		17.7	30	15	0	2	61	37	
BH3	SS13	12.5	12.62	89.89	77.39	Unit 4a	Silty Sand (SM)	Native	14	0.27	15							
BH3	SS14	13.73	14.15	89.89	76.16	Unit 4a	Silty Sand (SM)	Native	167	0.25	17.6							
BH3	SS15	15.25	15.71	89.89	74.64	Unit 4a	Silty Sand (SM)	Native	164	0.28	15.2			0	66	32	1	
BH3	SS16	16.77	17.04	89.89	73.12	Unit 4a	Silty Sand (SM)	Native	100	0.15	15.7							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH3	SS17	18.3	18.79	89.89	71.59	Unit 4b	Lean Clay (CL)	Native	24		22.7							
BH3	SS18	19.83	20.31	89.89	70.06	Unit 4a	Silt (ML)	Native	52		21.6	19	16	0	1	85	14	
BH3	SS19	21.35	21.84	89.89	68.54	Unit 4b	Lean Clay (CL)	Native	20		19.4							
BH3	SS20	22.88	23.27	89.89	67.01	Unit 4a	Silt with Sand (ML)	Native	172	0.23	13			1	14	77	9	25.7
BH3	SS21	24.4	24.89	89.89	65.49	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	72		15.3	18	12	2	15	62	21	
BH3	SS22	25.32	25.44	89.89	64.57	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.14	9.4							

Table B-2g: SPT and Laboratory Data Summary - EME Route Area

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
B-104	SS1	0.00	0.60	88.3	88.3	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	26		13.7							
B-104	SS2	0.60	1.05	88.3	87.7	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	36		5							
B-104	SS3	1.21	1.66	88.3	87.09	Unit 2a	Sandy Lean Clay (CL)	Native	15		14.6	32	19	0	48	26	26	19.9
B-104	SS4	1.83	2.28	88.3	86.47	Unit 2a	Sandy Lean Clay (CL)	Native	18		21.7							
B-104	SS6	3.04	3.49	88.3	85.26	Unit 2b	Silty Gravel (GM)	Native	14		9.2							
B-104	SS7	3.65	4.10	88.3	84.65	Unit 2b	Silty Gravel (GM)	Native	59		8.2			64	14	19	3	
B-104	SS8	4.27	4.72	88.3	84.03	Unit 2b	Silty Gravel (GM) / Silty Gravel with Sand (GM)	Native	78		7							
B-104	SS9	4.88	5.33	88.3	83.42	Unit 2b	Silty Gravel with Sand (GM)	Native	67		8.41			45	20	29	6	23.9
B-104	SS10	5.49	5.94	88.3	82.81	Unit 2b	Sandy Silt with Gravel (ML)	Native	45		8							
B-104	SS11	6.10	6.23	88.3	82.2	Unit 2b	Sandy Silt with Gravel (ML)	Native	52	0.13	6.36			24	36	35	5	
B-104	SS12	6.69	6.82	88.3	81.61	Unit 2b	Silt (ML)	Native	54	0.13	19			1	9	89	1	
B-104	SS13	7.31	7.44	88.3	80.99	Unit 2b	Silt (ML)	Native	50	0.13	13.2							
B-104	SS14	7.91	8.01	88.3	80.39	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	55	0.1	16.8			2	41	53	4	
B-104	SS15	8.53	8.66	88.3	79.77	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	54	0.13	16.8							
B-104	SS16	9.13	9.21	88.3	79.17	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	55	0.08	8.33			15	36	41	8	
B-104	SS17	9.74	9.84	88.3	78.56	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	51	0.1	8.5							
B-104	SS18	10.35	10.43	88.3	77.95	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	52	0.08	10.92			1	54	38	7	
B-104	SS19	10.96	11.04	88.3	77.34	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	53	0.08								
B-104	SS20	11.57	11.72	88.3	76.73	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	56	0.15	23.3							
B-104	SS21	12.17	12.40	88.3	76.13	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	50	0.08	19.3							19.9
B-104	SS22	12.77	12.90	88.3	75.53	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	52	0.13	17.3							
B-104	SS23	13.37	13.45	88.3	74.93	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	53	0.08	21							
B-104	SS24	13.98	14.08	88.3	74.32	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	50	0.1	18.8							
B-104	SS25	14.59	14.74	88.3	73.71	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	54	0.15	18							
B-104	SS26	15.24	15.37	88.3	73.06	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	55	0.13	20.4			0	57	0	0	
B-104	SS27	15.85	16.10	88.3	72.45	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	51	0.1	18.3							
B-104	SS28	16.46	16.74	88.3	71.84	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	54	0.13	18.1			0	49	44	7	21.4
B-104	SS29	17.07	17.52	88.3	71.23	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	36		21.3	27	17	0	43	31	26	20.6
B-104	SS31	18.28	18.73	88.3	70.02	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	52		22.9							
B-104	SS32	18.89	19.34	88.3	69.41	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	21		23	31	18	0	40	34	26	21.9
B-104	SS34	20.11	20.24	88.3	68.19	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	52	0.13	11.4			0	27	63	10	
B-104	SS35	20.72	20.82	88.3	67.58	Unit 4a	Silty Sand (SM)	Native	54	0.1								
B-104	SS36	21.33	21.43	88.3	66.97	Unit 4a	Silty Sand (SM)	Native	66	0.1	17.4			0	71	28	1	
B-104	SS37	21.93	22.36	88.3	66.37	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	94	0.28	10.4							
B-104	SS38	22.54	22.84	88.3	65.76	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	55	0.15	10.1							23.8
B-104	SS39	23.15	23.40	88.3	65.15	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	52	0.1	9.5							
B-104	SS40	23.76	24.04	88.3	64.54	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	54	0.13	7.8			5	48	32	15	22.4
B-104	SS41	24.37	24.80	88.3	63.93	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	89	0.28	11.8							
B-104	SS42	24.98	25.18	88.3	63.32	Unit 5	Lower till : Sandy Silt (ML)	Native	51	0.05								
B-113	SS1	0.00	0.60	88.5	88.5	Unit 1	Fill - Sand and Gravel (GW) and topsoil (OH)	Fill	27		8.31							
B-113	SS2	0.76	1.21	88.5	87.7375	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	27		13.47			0	31	48	21	
B-113	SS3	1.53	1.98	88.5	86.975	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	17		17.22	40	18	0	8	48	44	20.1
B-113	SS4	2.29	2.74	88.5	86.2125	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	16		23.86	36	16	1	11	45	43	
B-113	SS5	3.05	3.50	88.5	85.45	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	7		38.7	38	17	1	8	39	52	
B-113	SS6	3.81	4.26	88.5	84.6875	Unit 2b	Silty Sand (SM)	Native	4		9.96			13	41	37	9	
B-113	SS7	4.58	5.03	88.5	83.925	Unit 2b	Silty Sand (SM)	Native	9		8.3			8	47	35	10	
B-113	SS8	5.34	5.79	88.5	83.1625	Unit 2b	Silty Sand (SM)	Native	14		8.02			8	45	38	9	23.8
B-113	SS9	6.10	6.55	88.5	82.4	Unit 2b	Silty Sand (SM)	Native	18		10.1							23.7
B-113	SS10	6.86	7.31	88.5	81.6375	Unit 2b	Silty Sand (SM)	Native	17		9.79			11	40	39	10	23.8
B-113	SS11	7.63	8.08	88.5	80.875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	92		7.02							24.3
B-113	SS12	8.39	8.67	88.5	80.1125	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.13	6.17			18	38	34	10	24.2
B-113	SS13	9.15	9.58	88.5	79.35	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	89	0.28	7.1	13	9	6	41	40	13	24.3
B-113	SS14	9.91	10.36	88.5	78.5875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	59		7.4			3	41	44	12	24.1
B-113	SS15	10.68	11.13	88.5	77.825	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	90		6.81							
B-113	SS16	11.44	11.64	88.5	77.0625	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.05	11.97			4	36	47	13	
B-113	SS17	12.20	12.35	88.5	76.3	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	53	0.15	14.71							
B-113	SS18	12.96	13.41	88.5	75.5375	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	98		22.65			0	16	83	1	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
B-113	SS19	13.73	13.83	88.5	74.775	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.1	17.52							
B-113	SS20	14.49	14.62	88.5	74.0125	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.13	17.87							
B-113	SS21	15.25	15.38	88.5	73.25	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	60	0.13	15.66							
B-113	SS22	16.01	16.29	88.5	72.4875	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	50	0.13	19.72			0	69	28	3	
B-113	SS23	16.78	17.23	88.5	71.725	Unit 4b	Lean Clay (CL)	Native	54		18.54	30	15					20.1
B-113	SS24	17.54	17.99	88.5	70.9625	Unit 4b	Lean Clay (CL)	Native	40		19.65	33	14	0	3	48	49	21
B-113	SS25	18.30	18.75	88.5	70.2	Unit 4b	Lean Clay (CL)	Native	66		26.74							
B-113	SS26	19.06	19.51	88.5	69.4375	Unit 4b	Lean Clay (CL)	Native	16		13.94	25	13	0	12	45	43	20.9
B-113	SS27	19.83	20.06	88.5	68.675	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	50	0.08	9.42							
B-113	SS28	20.59	20.89	88.5	67.9125	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	61	0.15	8.71	17	11	1	15	65	19	23.6
B-113	SS29	21.35	21.48	88.5	67.15	Unit 4a	Silty Sand (SM)	Native	58	0.13	18.45							
B-113	SS30	22.11	22.24	88.5	66.3875	Unit 4a	Silty Sand (SM)	Native	57	0.13	16.03			0	60	39	1	
B-113	SS31	22.88	23.33	88.5	65.625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	70		10.28	15	10					23.7
B-113	SS32	23.64	24.07	88.5	64.8625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	80	0.28	8.07	16	10	6	21	50	23	23.6
B-113	SS33	24.40	24.70	88.5	64.1	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	63	0.15	7.05			4	42	39	15	24
B-113	SS34	25.16	25.26	88.5	63.3375	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	60	0.1	6.5							
B-116	SS1	0	0.6	89.3	89.3	Unit 1	and and Gravel (GW) over crushed rock over Silty Clay (C	Fill	25		13.35							21.5
B-116	SS2	0.75	1.2	89.3	88.55	Unit 2b	Sandy Silt (ML)	Native	34		6.56							23.7
B-116	SS3	1.5	1.95	89.3	87.8	Unit 2b	Sandy Silt (ML)	Native	26		16.34				44	49	7	20.7
B-116	SS4	3	3.45	89.3	86.3	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	17		18.43	29	14	1	41	47	11	21.7
B-116	SS5	4.6	5.05	89.3	84.7	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	2		40.38	41	17		4	47	49	
B-116	SS6	5.4	5.85	89.3	83.9	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	2		10.38							
B-116	SS7	6.1	6.55	89.3	83.2	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	3		11.53				44	49	7	
B-116	SS8	6.9	7.35	89.3	82.4	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	5		10.28							
B-116	SS9	7.6	8.05	89.3	81.7	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	5		9.03			6	44	37	13	22.9
B-116	SS10	8.4	8.6	89.3	80.9	Unit 3	Upper till - Silty Sand (SM)	Native	50	0.05	7.51							
B-116	SS11	9.1	9.55	89.3	80.2	Unit 2a	Lean Clay (CL)	Native	61		16.72			0	10	60	30	
B-116	SS12	9.9	10.18	89.3	79.4	Unit 2a	Lean Clay (CL)	Native	50	0.13	14.69	27	13					
B-116	SS13	10.7	10.93	89.3	78.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.08	20.09							
B-116	SS14	11.4	11.65	89.3	77.9	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.1	19.25			0	40	59	1	
B-116	SS15	12.2	12.48	89.3	77.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.13	14.74			0	67	32	1	
B-116	SS16	13	13.25	89.3	76.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.1	16.06			0	63	36	1	
B-116	SS17	13.7	13.85	89.3	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	55	0.15	21.36			0	23	76	1	
B-116	SS18	14.5	14.75	89.3	74.8	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.1	15.43			0	74	25	1	
B-116	SS19	15.2	15.48	89.3	74.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.13	16.36			0	60	39	1	
B-116	SS20	16	16.28	89.3	73.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	50	0.13	15.24			0	74	25	1	
B-116	SS21	16.8	17.1	89.3	72.5	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	54	0.15	17.07							
B-116	SS22	17.5	17.9	89.3	71.8	Unit 4b	Lean Clay (CL)	Native	82	0.25	19.8							21.1
B-116	SS23	18.3	18.75	89.3	71	Unit 4b	Lean Clay (CL)	Native	44		16.65	34	15	1	2	45	52	
B-116	SS24	19.1	19.55	89.3	70.2	Unit 4b	Lean Clay (CL)	Native	40		26	35	16					20.2
B-116	SS25	20.6	21.05	89.3	68.7	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	60		8.83	14	10	4	22	49	25	23.6
B-116	SS26	21.3	21.58	89.3	68	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	50	0.13	8.34			1	25	60	14	23.8
B-116	SS27	22.1	22.2	89.3	67.2	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	50	0.1	13.89	18	12	0	6	75	19	
B-116	SS28	22.9	23	89.3	66.4	Unit 4a	Silt (ML)	Native	50	0.1	18.04							
B-116	SS29	23.6	23.7	89.3	65.7	Unit 4a	Silt (ML)	Native	50	0.1	14.96	13	10					
B-116	SS30	24.4	24.68	89.3	64.9	Unit 5	Lower till - Sandy Silt (ML)	Native	50	0.13	7.12							
B-116	SS31	25.1	25.2	89.3	64.2	Unit 5	Lower till - Sandy Silt (ML)	Native	50	0.1								
B-118	SS1	0.00	0.60	89	89	Unit 1	Fill : Silty Sand (SM) to Sandy Silt (ML) and Gravel (GW)	Fill	27		6.57							
B-118	SS2	0.75	1.20	89	88.25	Unit 1	Fill : Silty Sand (SM) to Sandy Silt (ML) and Gravel (GW)	Fill	30		5.37							
B-118	SS3	1.50	1.95	89	87.5	Unit 1	Fill : Lean Clay with Sand (CL)	Fill	23		15.48	34	17	1	25	48	26	19.2
B-118	SS4	2.29	2.74	89	86.7125	Unit 2a	Lean Clay (CL)	Native	7		20.7	43	22	1	12	50	37	18.6
B-118	SS5	3.05	3.50	89	85.95	Unit 2a	Lean Clay (CL)	Native	11		20.73							
B-118	SS6	3.79	4.24	89	85.21	Unit 2a	Lean Clay (CL)	Native	3		32.29	35	17	1	6	45	48	18.3
B-118	SS7	5.29	5.74	89	83.71	Unit 2b	Silty Clayey Sand (SC-SM)	Native	1		19.93							
B-118	SS8	6.10	6.55	89	82.9	Unit 2b	Silty Clayey Sand (SC-SM)	Native	1		11.46			10	44	35	12	
B-118	SS9	6.88	7.33	89	82.12	Unit 2b	Silty Clayey Sand (SC-SM)	Native	16		11.39							
B-118	SS10	7.58	8.03	89	81.42	Unit 3	Upper till : Silty Sand with Gravel (SM) t0 Sandy Silt (ML)	Native	21		8.08			17	41	33	9	23.6
B-118	SS11	8.38	8.81	89	80.62	Unit 3	Upper till : Silty Sand with Gravel (SM) t0 Sandy Silt (ML)	Native	98	0.28	7.05							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
B-118	SS12	9.08	9.38	89	79.92	Unit 4a	Sandy Silt (ML)	Native	50	0.15	10.57			1	43	52	4	
B-118	SS13	9.88	10.16	89	79.12	Unit 3	Upper till : Sandly Silt (ML)	Native	50	0.13	7.33							
B-118	SS14	10.67	10.95	89	78.33	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.13	7.86			4	60	30	6	
B-118	SS15	11.37	11.82	89	77.63	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	49		16.98							
B-118	SS16	12.17	12.62	89	76.83	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	80		16.97			0	36	63	1	21.9
B-118	SS17	12.97	13.27	89	76.03	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	50	0.15	14.8							20.4
B-118	SS18	13.67	13.97	89	75.33	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	53	0.15	20.35			0	43	56	1	21.1
B-118	SS19	14.47	14.77	89	74.53	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	54	0.15	22.05							
B-118	SS20	15.21	15.66	89	73.79	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	105		23.46			0	49	50	1	21.6
B-118	SS21	16.00	16.28	89	73	Unit 4b	Lean Clay (CL)	Native	53	0.13	22.3							
B-118	SS22	16.80	17.25	89	72.2	Unit 4b	Lean Clay (CL)	Native	49		23.03	27	15	0	2	58	40	20.5
B-118	SS23	17.50	17.95	89	71.5	Unit 4b	Lean Clay (CL)	Native	78		21.79							
B-118	SS24	18.29	18.74	89	70.71	Unit 4b	Lean Clay (CL)	Native	24		24.11	41	17	0	1	38	61	20.2
B-118	SS25	19.09	19.54	89	69.91	Unit 4b	Lean Clay (CL)	Native	26		24.7							
B-118	SS27	20.59	20.99	89	68.4125	Unit 5	Lower till : Silt with Sand (ML)	Native	85	0.25	9.83							
B-118	SS28	21.29	21.44	89	67.71	Unit 4a	Silt (ML)	Native	55	0.15	24.26			0	8	87	5	
B-118	SS29	21.89	22.34	89	67.11	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	75		28.21							
B-118	SS30	22.88	23.33	89	66.125	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	80		10.68							
B-118	SS31	23.58	23.71	89	65.42	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	55	0.13	12.33			19	30	42	9	
B-118	SS32	24.38	24.53	89	64.62	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	58	0.15	7.18							
BO-2	SS1	9.09	9.24	89.06	79.97	Unit 4a	Sand, trace silt	Native	150									
BO-2	SS2	9.86	9.91	89.06	79.2	Unit 4a	Sand, trace silt	Native	150	0.05								
BO-2	SS3	10.61	10.66	89.06	78.45	Unit 4a	Sand, trace silt	Native	150	0.05								
BO-2	SS6	12.08	12.13	89.06	76.98	Unit 3	Till : Sand with Silt (SP-SM), trace gravel, trace clay	Native	150	0.05								
BO-2	SS7	12.45	12.5	89.06	76.61	Unit 4a	Silt with clay	Native	150	0.05								
BO-2	SS8	12.84	12.99	89.06	76.22	Unit 4a	Silt with clay	Native	150	0.15								
BO-2	SS10	14.61	14.86	89.06	74.45	Unit 3	Till : Sand with silt	Native	97									
BO-2	SS11	15.13	15.18	89.06	73.93	Unit 3	Till : Sand with silt	Native	150	0.05								
BO-2	SS12	15.28	15.43	89.06	73.78	Unit 4a	Sand, trace silt	Native	42									
BO-2	SS13	15.87	16.02	89.06	73.19	Unit 4a	Sand, trace silt	Native	150	0.15								
BO-2	SS14	16.02	16.22	89.06	73.04	Unit 4a	Sand, trace silt	Native	43									
BO-2	SS15	16.64	16.79	89.06	72.42	Unit 5	Till : Sand with silt	Native	150	0.15								
BO-13	SS1	1.31	1.76	86.32	85.01	Unit 2b	Silt with Clay	Native	100									
BO-13	SS2	1.76	2.06	86.32	84.56	Unit 2b	Silt with Clay	Native	59									
BO-13	SS3	2.84	3.29	86.32	83.48	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	51									
BO-13	SS4	4.34	4.79	86.32	81.98	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	53									
BO-13	SS5	5.95	6.4	86.32	80.37	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	93									
BO-13	SS6	7.5	7.95	86.32	78.82	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-13	SS7	9.02	9.47	86.32	77.3	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	143									
BO-13	SS8	10.64	11.09	86.32	75.68	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	87									
BO-13	SS9	12.1	12.55	86.32	74.22	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	145									
BO-13	SS10	13.48	13.93	86.32	72.84	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-13	SS11	15.21	15.51	86.32	71.11	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-13	SS12	16.9	17.35	86.32	69.42	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-13	SS13	18.29	18.49	86.32	68.03	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.2								
BO-13	SS14	20	20.39	86.32	66.32	Unit 4a	Sand, trace clay	Native	124	0.24								
BO-13	SS15	21.49	21.94	86.32	64.83	Unit 5	Till : Silt with Sand, little gravel, trace clay	Native	150									
BO-14	SS1	1.37	1.82	88.82	87.45	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	43									
BO-14	SS2	2.96	3.41	88.82	85.86	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	104									
BO-14	SS3	4.56	4.86	88.82	84.26	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-14	SS4	6.1	6.55	88.82	82.72	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	61									
BO-14	SS5	7.64	8.09	88.82	81.18	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	52									
BO-14	SS6	9.19	9.64	88.82	79.63	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	143									
BO-14	SS7	10.72	11.17	88.82	78.1	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	31									
BO-14	SS8	11.48	11.93	88.82	77.34	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	56									
BO-14	SS9	12.61	13.06	88.82	76.21	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	32									
BO-14	SS10	14.12	14.57	88.82	74.7	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	60									

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BO-14	SS11	15.64	16.09	88.82	73.18	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	131									
BO-14	SS12	17.19	17.64	88.82	71.63	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-14	SS13	18.7	19	88.82	70.12	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-14	SS14	20.09	20.24	88.82	68.73	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-14	SS15	21.42	21.66	88.82	67.4	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	150	0.09								
BO-14	SS16	23.04	23.25	88.82	65.78	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.06								
BO-14	SS17	24.46	24.91	88.82	64.36	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	142									
BO-14	SS18	25.95	26.4	88.82	62.87	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	150									
BO-15	SS1	0	0.45	86.14	86.14	Unit 1	Topsoil	Native	7									
BO-15	SS2	1.55	2	86.14	84.59	Unit 2b	Silt with Clay	Native	29									
BO-15	SS3	3.11	3.41	86.14	83.03	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-15	SS4	4.55	4.85	86.14	81.59	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-15	SS5	5.94	6.21	86.14	80.2	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.12								
BO-15	SS6	7.56	8.01	86.14	78.58	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	68									
BO-15	SS8	9.76	10.06	86.14	76.38	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-15	SS10	11.4	11.7	86.14	74.74	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-15	SS12	12.82	13.27	86.14	73.32	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-15	SS13	14.68	14.83	86.14	71.46	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-15	SS15	16.1	16.25	86.14	70.04	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	136	0.15								
BO-15	SS18	17.49	17.64	86.14	68.65	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	130	0.15								
BO-15	SS21	18.89	19.19	86.14	67.25	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	120	0.15								
BO-15	SS23	20.74	21.04	86.14	65.4	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	120	0.15								
BO-15	SS26	22.2	22.5	86.14	63.94	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	117	0.15								
BO-16	SS1	0.36	0.81	86.93	86.57	Unit 2b	Silt, little clay	Native	6									
BO-16	SS2	1.4	1.7	86.93	85.53	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	74									
BO-16	SS3	3.35	3.8	86.93	83.58	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	112									
BO-16	SS5	4.63	4.93	86.93	82.3	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	140									
BO-16	SS8	6.29	6.59	86.93	80.64	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-16	SS13	12.86	13.16	86.93	74.07	Unit 4a	Sand, little Silt	Native	150									
BO-16	SS14	13.16	13.46	86.93	73.77	Unit 4a	Sand, little Silt	Native	150									
BO-16	SS15	14.38	14.68	86.93	72.55	Unit 4a	Sand, little Silt	Native	150									
BO-16	SS17	16.15	16.6	86.93	70.78	Unit 4a	Silt with Clay	Native	137									
BO-16	SS22	22.24	22.54	86.93	64.69	Unit 4a	Sand, trace Silt	Native	150									
BO-21	SS1	1.73	2.18	87.75	86.02	Unit 2b	Layered Silt with Clay	Native	20									
BO-21	SS2	3.33	3.78	87.75	84.42	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	26									
BO-21	SS3	4.83	5.28	87.75	82.92	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	16									
BO-21	SS4	6.43	6.73	87.75	81.32	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	167	0.15								
BO-21	SS5	7.93	8.18	87.75	79.82	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	150	0.1								
BO-21	SS6	10.039	10.489	87.75	77.711	Unit 4a	Sand, trace Silt	Native	150	0.3								
BO-21	SS7	9.83	10.23	87.75	77.92	Unit 4a	Silt, little Sand	Native	150	0.25								
BO-21	SS8	10.33	10.675	87.75	77.42	Unit 4a	Sand, little Silt	Native	88									
BO-21	SS9	10.73	11.03	87.75	77.02	Unit 4a	Sand, little Silt	Native	22									
BO-21	SS10	11.43	11.68	87.75	76.32	Unit 4a	Sand, little Silt	Native	150	0.25								
BO-21	SS11	11.93	12.23	87.75	75.82	Unit 4a	Silt, little fine sand	Native	98									
BO-21	SS12	12.43	12.63	87.75	75.32	Unit 4a	Silt, little fine sand	Native	150	0.2								
BO-21	SS13	12.66	13.06	87.75	75.09	Unit 4a	Silt	Native	114									
BO-21	SS14	13.03	13.48	87.75	74.72	Unit 4a	Sand, trace Silt	Native	90									
BO-21	SS15	14.03	14.36	87.75	73.72	Unit 4a	Sand, trace Silt	Native	82									
BO-21	SS16	14.53	15.13	87.75	73.22	Unit 4a	Sand, trace Silt	Native	50									
BO-21	SS17	15.33	15.88	87.75	72.42	Unit 4a	Silt, little Clay	Native	53									
BO-21	SS18	16.93	17.23	87.75	70.82	Unit 4a	Silt, little Sand	Native	54									
BO-23	SS1	1.67	1.97	99.58	97.91	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	84	0.15								
BO-23	SS2	3.19	3.64	99.58	96.39	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	75									
BO-23	SS3	4.72	5.02	99.58	94.86	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	96	0.15								
BO-23	SS4	6.26	6.41	99.58	93.32	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	74									
BO-23	SS5	7.77	7.92	99.58	91.81	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BO-23	SS6	9.3	9.45	99.58	90.28	Unit 4a	Sand, some silt	Native	140									
BO-23	SS7	10.78	11.08	99.58	88.8	Unit 4a	Sand, some silt	Native	150	0.15								
BO-23	SS8	12.29	12.44	99.58	87.29	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-23	SS9	13.77	13.92	99.58	85.81	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-23	SS10	14.74	15.19	99.58	84.84	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	174									
BO-23	SS11	16.12	16.49	99.58	83.46	Unit 4a	Silt with clay	Native	221	0.22								
BO-23	SS12	17.57	18.02	99.58	82.01	Unit 4a	Silt with clay	Native	150	0.06								
BO-23	SS13	19.09	19.54	99.58	80.49	Unit 4a	Sand, trace silt	Native	150	0.06								
BO-23	SS14	20.76	21.06	99.58	78.82	Unit 4a	Sand, trace silt	Native	52									
BO-23	SS15	21.71	22.16	99.58	77.87	Unit 4a	Sand, trace silt	Native	11									
BO-23	SS16	23.54	23.99	99.58	76.04	Unit 4a	Sand, trace silt	Native	10									
BO-23	SS17	27.23	27.68	99.58	72.35	Unit 4a	Silt, some clay	Native	67									
BO-24	SS1	0.39	0.84	86.35	85.96	Unit 2b	Silt with Clay	Native	4									
BO-24	SS2	0.94	1.39	86.35	85.41	Unit 2b	Silt with Clay	Native	6									
BO-24	SS3	1.42	1.87	86.35	84.93	Unit 2b	Silt with Clay	Native	25									
BO-24	SS4	1.89	2.34	86.35	84.46	Unit 2b	Silt with Clay	Native	39									
BO-24	SS5	2.31	2.76	86.35	84.04	Unit 2b	Silt with Clay	Native	28									
BO-24	SS6	2.8	3.25	86.35	83.55	Unit 2b	Silt with Clay	Native	17									
BO-24	SS7	3.1	3.55	86.35	83.25	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	107									
BO-24	SS8	3.73	4.18	86.35	82.62	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	64									
BO-24	SS9	4.13	4.58	86.35	82.22	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	86									
BO-24	SS10	4.57	5.02	86.35	81.78	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	136									
BO-24	SS11	5.02	5.47	86.35	81.33	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-24	SS12	5.47	5.92	86.35	80.88	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	136									
BO-24	SS13	5.92	6.37	86.35	80.43	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-24	SS14	6.37	6.82	86.35	79.98	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	135									
BO-24	SS15	6.97	7.42	86.35	79.38	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-24	SS16	7.45	7.9	86.35	78.9	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-24	SS17	7.9	8.35	86.35	78.45	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-24	SS18	8.43	8.88	86.35	77.92	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	105									
BO-24	SS19	8.88	9.33	86.35	77.47	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	69									
BO-24	SS20	9.33	9.78	86.35	77.02	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	73									
BO-24	SS21	9.86	10.31	86.35	76.49	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150									
BO-24	SS22	10.31	10.76	86.35	76.04	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	111									
BO-24	SS23	10.8	11.25	86.35	75.55	Unit 4a	Sand, little Silt	Native	73									
BO-24	SS24	11.25	11.55	86.35	75.1	Unit 4a	Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-24	SS25	11.55	11.85	86.35	74.8	Unit 4a	Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-24	SS26	11.85	12.15	86.35	74.5	Unit 4a	Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-24	SS27	12.15	12.45	86.35	74.2	Unit 4a	Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-24	SS28	12.45	12.72	86.35	73.9	Unit 4a		Native	150	0.12								
BO-24	SS30	13.95	14.4	86.35	72.4	Unit 4a	Silt, little sand	Native	150									
BO-24	SS32	14.43	14.73	86.35	71.92	Unit 4a	Silt, little sand	Native	150	0.15								
BO-24	SS33	14.73	14.94	86.35	71.62	Unit 4a	Silt, little sand	Native	150	0.06								
BO-24	SS34	14.94	15.21	86.35	71.41	Unit 4a	Sand with Silt	Native	150	0.12								
BO-24	SS35	15.21	15.48	86.35	71.14	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.12								
BO-24	SS36	15.48	15.78	86.35	70.87	Unit 4a	Sand with Silt	Native	150	0.15								
BO-24	SS37	15.78	16.23	86.35	70.57	Unit 4a	Silt, some clay	Native	150	0.15								
BO-24	SS38	16.25	16.55	86.35	70.1	Unit 4a	Silt, some clay	Native	150	0.15								
BO-24	SS39	16.64	16.94	86.35	69.71	Unit 4a	Silt, some clay	Native	120									
BO-24	SS40	17.05	17.5	86.35	69.3	Unit 4a	Silt, some clay	Native	81									
BO-24	SS41	17.65	18.1	86.35	68.7	Unit 4a	Silt, some clay	Native	141									
BO-24	SS42	18.23	18.53	86.35	68.12	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	136	0.15								
BO-24	SS43	18.6	18.9	86.35	67.75	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-24	SS44	18.97	19.27	86.35	67.38	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	150	0.15								
BO-24	SS45	19.38	19.65	86.35	66.97	Unit 4a	Silt, little Clay	Native	150	0.12								
BO-24	SS46	20.4	20.64	86.35	65.95	Unit 4a	Silt, little Clay	Native	150	0.09								
BO-24	SS47	20.71	20.95	86.35	65.64	Unit 4a	Silt, little Clay	Native	150	0.09								
BO-24	SS48	21.45	21.72	86.35	64.9	Unit 4a	Silt, little Clay	Native	150	0.12								
BO-24	SS49	21.73	22.03	86.35	64.62	Unit 4a	Silt, little Sand	Native	150	0.15								

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BO-24	SS50	22.08	22.53	86.35	64.27	Unit 4a	Silt, little Sand	Native	110									
BO-24	SS51	22.62	23.07	86.35	63.73	Unit 5	Till : Silt with Sand, little gravel, little clay	Native	54									
BO-24	SS52	23.07	23.52	86.35	63.28	Unit 5	Till : Silt with Sand, little gravel, little clay	Native	84									
BO-24	SS53	23.52	23.97	86.35	62.83	Unit 5	Till : Silt with Sand, little gravel, little clay	Native	150									
BO-47	SS1	0	0.45	95.13	95.13	Unit 1	Topsoil	Native	3									
BO-47	SS2	0.45	0.9	95.13	94.68	Unit 2b	Silt, little clay, trace sand	Native	15									
BO-47	SS3	1.37	1.52	95.13	93.76	Unit 3	Till : Sand with silt to trace silt	Native	150	0.15								
BO-47	SS4	1.51	1.87	95.13	93.62	Unit 3	Till : Sand with silt to trace silt	Native	150	0.21								
BO-47	SS5	3.08	3.26	95.13	92.05	Unit 3	Till : Sand with silt to trace silt	Native	150	0.03								
BO-47	SS6	4.65	4.8	95.13	90.48	Unit 3	Till : Sand with silt to trace silt	Native	150	0.15								
BO-47	SS7	6.21	6.45	95.13	88.92	Unit 3	Till : Sand with silt to trace silt	Native	150	0.09								
BO-47	SS8	7.78	8.02	95.13	87.35	Unit 3	Till : Sand with silt to trace silt	Native	150	0.09								
BO-47	SS9	9.32	9.53	95.13	85.81	Unit 3	Till : Sand with silt to trace silt	Native	150	0.06								
BO-47	SS10	10.89	11.1	95.13	84.24	Unit 3	Till : Sand with silt to trace silt	Native	150	0.06								
BO-47	SS11	12.4	12.61	95.13	82.73	Unit 3	Till : Sand with silt to trace silt	Native	150	0.06								
BO-47	SS12	13.92	14.19	95.13	81.21	Unit 3	Till : Sand with silt to trace silt	Native	150	0.12								
BO-47	SS13	15.51	15.75	95.13	79.62	Unit 3	Till : Sand with silt to trace silt	Native	150	0.09								
BO-47	SS14	16.1	16.37	95.13	79.03	Unit 3	Till : Sand with silt to trace silt	Native	150	0.12								
BO-47	SS15	18.63	18.93	95.13	76.5	Unit 3	Till : Sand with silt to trace silt	Native	150	0.15								
BO-47	SS16	20.19	20.46	95.13	74.94	Unit 3	Till : Sand with silt to trace silt	Native	150	0.12								
BO-47	SS17	21.78	22.05	95.13	73.35	Unit 4a	Silt, little clay	Native	150	0.12								
BO-47	SS18	23.39	23.84	95.13	71.74	Unit 4a	Silt, little clay	Native	187									
AMC-01	SS1	0	0.61	98.92	98.92	Unit 1	Sandy Silt (ML)	Fill	37									
AMC-01	SS3	4.57	4.85	98.92	94.35	Unit 3	Silty Sand (SM)	Native	50	0.28								
AMC-01	SS4	7.6	7.75	98.92	91.32	Unit 3	Silty Sand (SM)	Native	50	0.14								
AMC-01	SS5	15.25	15.68	98.92	83.67	Unit 4b	Fat Clay interbedded with Gravelly Fat Clay (CH)	Native	92	0.43								
AMC-01	SS6	22.87	23.02	98.92	76.05	Unit 5	Poorly Graded Sand with Silt (SP-SM)	Native	50	0.14								
AMC-03alt	SS1	0	0.31	99.8	99.8	Unit 1	Silty Sand (SM)	Fill	6									
AMC-03alt	SS2	3.05	3.5	99.8	96.75	Unit 1	Silty Sand with Gravel (SM)	Fill	96									
AMC-03alt	SS3	7.61	8.06	99.8	92.19	Unit 1	Sandy Silt with Gravel (ML)	Fill	80									
AMC-03alt	SS4	15.25	15.53	99.8	84.55	Unit 5	Sandy Silt (ML)	Native	50	0.28								
BH1	SS1	0	0.61	89.62	89.62	Unit 1	Sandy Silt (ML)	Fill	3									
BH1	SS2	0.61	1.07	89.62	89.01	Unit 1	Sandy Silt (ML)	Fill	7		20.4							
BH1	SS3	1.22	1.68	89.62	88.4	Unit 2a	sandy Lean Clay (CL)	Native	5		23.3							
BH1	SS5	2.44	2.9	89.62	87.18	Unit 2a	sandy Lean Clay (CL)	Native	13		19.5	25	13	5	26	44	24	
BH1	SS7	3.66	4.11	89.62	85.96	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	11		11.4	14	11	17	38	35	10	
BH1	SS8	4.27	4.52	89.62	85.35	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.1	8.3							
BH1	SS9	4.88	5.08	89.62	84.74	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	11.9							
BH1	SS10	5.49	5.69	89.62	84.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05	12.2							
BH1	SS11	6.1	6.5	89.62	83.52	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	178	0.25	10.6	14	10	3	32	53	13	27.7
BH1	SS12	6.71	6.96	89.62	82.91	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.1	8.7							
BH1	SS13	7.32	7.54	89.62	82.3	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.07	13.9	14	10	8	39	40	13	
BH1	SS14	7.92	8.36	89.62	81.7	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	126	0.25	11							
BH1	SS15	8.53	8.99	89.62	81.09	Unit 4b	Lean Clay (CL)	Native	123		16.6							
BH1	SS16	9.14	9.6	89.62	80.48	Unit 4b	Lean Clay (CL)	Native	103		15.4	25	15	0	3	71	26	
BH1	SS17	9.75	10.21	89.62	79.87	Unit 4b	Lean Clay (CL)	Native	75		17.3							25.5
BH1	SS18	10.36	10.82	89.62	79.26	Unit 4b	Lean Clay (CL)	Native	67		19	18	12	0	11	69	19	
BH1	SS19	10.97	11.25	89.62	78.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	100	0.13	17.9							
BH1	SS20	11.58	12.02	89.62	78.04	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	182	0.28	17.4			0	35	59	5	23.6
BH1	SS21	12.19	12.65	89.62	77.43	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	169		18.8							
BH1	SS22	12.8	13.26	89.62	76.82	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	113		16.8							
BH1	SS23	13.41	13.84	89.62	76.21	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	175	0.28	16.6							24.2
BH1	SS24	14.02	14.43	89.62	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	200	0.25	14.2							
BH1	SS25	14.63	15.04	89.62	74.99	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	197	0.25	13.8							
BH1	SS26	15.24	15.67	89.62	74.38	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	180	0.28	16.5							
BH1	SS27	15.85	16.31	89.62	73.77	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	151		13.9			0	75	24	1	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH1	SS28	16.46	16.92	89.62	73.16	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	118		14.6							
BH1	SS29	17.07	17.53	89.62	72.55	Unit 4b	Silty Clay (CL-ML)	Native	76		21.9	20	16	0	1	78	21	
BH1	SS30	17.68	18.14	89.62	71.94	Unit 4b	Silty Clay (CL-ML)	Native	62		21.3							26.7
BH1	SS31	18.29	18.75	89.62	71.33	Unit 4b	Lean Clay (CL)	Native	26		24.5							
BH1	SS32	18.9	19.35	89.62	70.72	Unit 4b	Lean Clay (CL)	Native	23		23.5	29	15	0	2	54	45	
BH1	SS33	19.51	19.96	89.62	70.11	Unit 4b	Lean Clay (CL)	Native	35		26.4							
BH1	SS34	20.12	20.57	89.62	69.5	Unit 4b	Lean Clay (CL)	Native	36		23.1							
BH1	SS35	20.73	21.18	89.62	68.89	Unit 4b	Lean Clay (CL)	Native	23		20.1							
BH1	SS36	21.34	21.49	89.62	68.28	Unit 5	Till: Sandy Silt (ML)	Native	100	0.14	12.6			1	35	56	8	
BH1	SS37	21.95	22.38	89.62	67.67	Unit 5	Till: Sandy Silt (ML)	Native	194	0.28	12.7							
BH1	SS38	22.56	22.78	89.62	67.06	Unit 4a	Sandy Silt (ML)	Native	100	0.07	15.8			0	48	49	3	
BH1	SS39	23.16	23.62	89.62	66.46	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	78		9							
BH1	SS40	23.77	24.21	89.62	65.85	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	146	0.28	11.2	17	12	3	19	61	17	
BH1	SS41	24.38	24.84	89.62	65.24	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	105		10							
BH1	SS42	24.99	25.29	89.62	64.63	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	100	0.07	11.2							
BH3	SS1	0.3	0.61	89.89	89.59	Unit 1	Fill: Shale rock fragments	Fill	29		8.5							
BH3	SS2	0.76	1.22	89.89	89.13	Unit 2a	Lean Clay with Sand (CL)	Native	10		18.8							
BH3	SS4	2.29	2.74	89.89	87.6	Unit 2a	Lean Clay with Sand (CL)	Native	10		21.3	30	16	9	22	55	15	
BH3	SS6	3.81	4.27	89.89	86.08	Unit 2a	Lean Clay with Sand (CL)	Native	8		21.6							21.5
BH3	SS7	5.34	5.8	89.89	84.55	Unit 2a	Lean Clay with Sand (CL)	Native	3		15.4	18	10	6	27	44	23	
BH3	SS8	6.1	6.71	89.89	83.79	Unit 2b	Silty Sand with Gravel (SM)	Native	2		10							
BH3	SS9	6.71	7.32	89.89	83.18	Unit 3	Till: Sandy Silt (ML)	Native	97		7.9							
BH3	SS10	7.63	8.11	89.89	82.26	Unit 3	Till: Sandy Silt (ML)	Native	118		7.9			2	39	47	12	
BH3	SS11	9.15	9.64	89.89	80.74	Unit 3	Till: Sandy Silt (ML)	Native	122		9.1							
BH3	SS12	10.68	11.16	89.89	79.21	Unit 4b	Lean Clay (CL)	Native	78		17.7	30	15	0	2	61	37	
BH3	SS13	12.5	12.62	89.89	77.39	Unit 4a	Silty Sand (SM)	Native	14	0.27	15							
BH3	SS14	13.73	14.15	89.89	76.16	Unit 4a	Silty Sand (SM)	Native	167	0.25	17.6							
BH3	SS15	15.25	15.71	89.89	74.64	Unit 4a	Silty Sand (SM)	Native	164	0.28	15.2			0	66	32	1	
BH3	SS16	16.77	17.04	89.89	73.12	Unit 4a	Silty Sand (SM)	Native	100	0.15	15.7							
BH3	SS17	18.3	18.79	89.89	71.59	Unit 4b	Lean Clay (CL)	Native	24		22.7							
BH3	SS18	19.83	20.31	89.89	70.06	Unit 4a	Silt (ML)	Native	52		21.6	19	16	0	1	85	14	
BH3	SS19	21.35	21.84	89.89	68.54	Unit 4b	Lean Clay (CL)	Native	20		19.4							
BH3	SS20	22.88	23.27	89.89	67.01	Unit 4a	Silt with Sand (ML)	Native	172	0.23	13			1	14	77	9	25.7
BH3	SS21	24.4	24.89	89.89	65.49	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	72		15.3	18	12	2	15	62	21	
BH3	SS22	25.32	25.44	89.89	64.57	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.14	9.4							
BH6	SS1	0	0.61	85.25	85.25	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	16		6.2							
BH6	SS2	0.76	1.12	85.25	84.49	Unit 1	Fill: Lean Clay (CL)	Fill	28									
BH6	SS3	1.52	1.98	85.25	83.73	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	56		5.3							
BH6	SS4	2.29	2.74	85.25	82.96	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	83		5.2							
BH6	SS5	3.05	3.51	85.25	82.2	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	92		5.8			14	43	36	7	
BH6	SS6	3.81	4.27	85.25	81.44	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	102		11.2							
BH6	SS7	4.57	5.03	85.25	80.68	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	72		8.5							
BH6	SS8	5.33	5.79	85.25	79.92	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	66		6.2							24
BH6	SS9	6.1	6.55	85.25	79.15	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	94		7.1	12	10	5	42	41	11	
BH6	SS10	7.62	8.08	85.25	77.63	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	85		7.1							
BH6	SS11	9.14	9.6	85.25	76.11	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	166	0.29	5.3							
BH6	SS12	10.67	10.96	85.25	74.58	Unit 4a	Poorly Graded Gravel with Sand (GP)	Native	100	0.14	9.9							
BH6	SS13	12.19	12.65	85.25	73.06	Unit 3	Till: Silty Sand (SM)	Native	97		7.3							
BH6	SS14	13.71	14.17	85.25	71.54	Unit 3	Till: Silty Sand (SM)	Native	142		7.5	12	10	9	40	41	10	
BH6	SS15	15.24	15.7	85.25	70.01	Unit 4a	Silty Sand with Gravel (SM)	Native	183	0.29	10.3			24	45	29	2	
BH6	SS16	16.76	17.22	85.25	68.49	Unit 3	Till: Sandy Silt (ML)	Native	181	0.25	8.2							
BH6	SS17	18.29	18.75	85.25	66.96	Unit 4a	Silt (ML)	Native	94		19.4							
BH6	SS18	19.81	20.27	85.25	65.44	Unit 4a	Silt (ML)	Native	71									
BH6	SS19	20.57	21.03	85.25	64.68	Unit 4b	Lean Clay with Sand (CL)	Native	36		12.5	19	11	2	16	53	30	
BH6	SS20	21.34	21.79	85.25	63.91	Unit 5	Lean Clay with Sand (CL)	Native	97									
BH6	SS21	22.1	22.33	85.25	63.15	Unit 5	Lean Clay with Sand (CL)	Native	100	0.08								
BH7	SS1	0	0.61	88.1	88.1	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	18									

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH7	SS2	0.76	1.22	88.1	87.34	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	52		3.4							
BH7	SS3	1.52	1.98	88.1	86.58	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	23									
BH7	SS4	2.29	2.74	88.1	85.81	Unit 2a	Lean Clay (CL)	Native	11		24.1	38	17	4	9	49	38	
BH7	SS5	3.05	3.51	88.1	85.05	Unit 2a	Lean Clay (CL)	Native	19		19							
BH7	SS7	4.57	5.03	88.1	83.53	Unit 2b	Silty Sand	Native	11		9.1							
BH7	SS8	5.33	5.79	88.1	82.77	Unit 3	Till: Silty Sand (SM)	Native	94									
BH7	SS9	6.1	6.55	88.1	82	Unit 3	Till: Silty Sand (SM)	Native	156		7.2			5	47	38	10	
BH7	SS10	7.62	8.08	88.1	80.48	Unit 3	Till: Silty Sand (SM)	Native	118									
BH7	SS11	9.14	9.6	88.1	78.96	Unit 3	Till: Silty Sand (SM)	Native	147		6.5							
BH7	SS12	10.67	11.13	88.1	77.43	Unit 3	Till: Silty Sand (SM)	Native	181									
BH7	SS13	12.19	12.57	88.1	75.91	Unit 4a	Silty Sand (SM)	Native	199	0.23	14.8							
BH7	SS14	13.72	14	88.1	74.38	Unit 4a	Silty Sand (SM)	Native	100	0.13								
BH7	SS15	15.24	15.67	88.1	72.86	Unit 4a	Silty Sand (SM)	Native	179	0.28	16.7							
BH7	SS16	18.29	18.75	88.1	69.81	Unit 4b	Lean Clay (CL)	Native	29		19.9	33	16	0	4	47	49	
BH7	SS17	21.34	21.73	88.1	66.76	Unit 4a	Silty Sand (SM)	Native	158	0.24								
BH7	SS18	23.57	24	88.1	64.53	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	135	0.28	21.2							
BH8	SS1	0	0.61	87.48	87.48	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	19		4.1							
BH8	SS2	0.61	1.07	87.48	86.87	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	11		9.5							21.1
BH8	SS3	1.22	1.68	87.48	86.26	Unit 2a	Lean Clay with Sand (CL)	Native	14		22.5							
BH8	SS4	1.83	2.29	87.48	85.65	Unit 2a	Lean Clay with Sand (CL)	Native	15		19.6	26	13	5	24	44	27	
BH8	SS5	2.44	2.9	87.48	85.04	Unit 2a	Lean Clay with Sand (CL)	Native	10		10.2							
BH8	SS6	3.05	3.51	87.48	84.43	Unit 3	Till: Silty Sand with Gravel (SM)	Native	61		8.2							
BH8	SS7	3.66	3.94	87.48	83.82	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	8.3							
BH8	SS8	4.27	4.72	87.48	83.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	95		6.7	12	10	26	40	28	7	
BH8	SS9	4.88	5.33	87.48	82.6	Unit 3	Till: Silty Sand with Gravel (SM)	Native	77		5.8							
BH8	SS10	5.49	5.94	87.48	81.99	Unit 3	Till: Silty Sand with Gravel (SM)	Native	116		4.3							
BH8	SS11	6.1	6.55	87.48	81.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	70		6.5							
BH8	SS12	6.71	7.16	87.48	80.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	102		5.3							
BH8	SS13	7.32	7.77	87.48	80.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	68		7.5	12	9	12	44	35	9	
BH8	SS14	7.92	8.06	87.48	79.56	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.14	3.4							
BH8	SS15	8.53	8.97	87.48	78.95	Unit 3	Till: Silty Sand with Gravel (SM)	Native	182	0.28	6.6							
BH8	SS16	9.14	9.39	87.48	78.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.09								
BH8	SS17	9.75	9.88	87.48	77.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	1.9							
BH8	SS18	10.36	10.82	87.48	77.12	Unit 4a	Sandy Silt (ML)	Native	163		15.7			0	44	54	2	
BH8	SS19	10.97	11.39	87.48	76.51	Unit 4a	Sandy Silt (ML)	Native	168	0.27	14.1							
BH8	SS20	11.58	12	87.48	75.9	Unit 4a	Sandy Silt (ML)	Native	178	0.27	15.7							
BH8	SS21	12.19	12.46	87.48	75.29	Unit 4a	Sandy Silt (ML)	Native	100	0.11	13.1							
BH8	SS22	12.8	13.09	87.48	74.68	Unit 4a	Sandy Silt (ML)	Native	100	0.14	19.1							
BH8	SS23	13.41	13.69	87.48	74.07	Unit 4a	Sandy Silt (ML)	Native	100	0.13	12.6							
BH8	SS24	14.02	14.45	87.48	73.46	Unit 4a	Sandy Silt (ML)	Native	197	0.28	17.1							
BH8	SS25	14.63	15.05	87.48	72.85	Unit 4a	Sandy Silt (ML)	Native	195	0.27	16			0	30	69	2	
BH8	SS26	15.24	15.7	87.48	72.24	Unit 4a	Sandy Silt (ML)	Native	145		16.6							
BH8	SS27	15.85	16.31	87.48	71.63	Unit 4b	Lean Clay (CL)	Native	52		19.6	25	14	0	6	57	36	
BH8	SS28	16.46	16.92	87.48	71.02	Unit 4b	Lean Clay (CL)	Native	32		19.9							
BH8	SS29	17.07	17.53	87.48	70.41	Unit 4b	Lean Clay (CL)	Native	33		19.9							
BH8	SS30	17.68	18.14	87.48	69.8	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	63		9.5	15	11	3	23	60	15	
BH8	SS31	18.29	18.58	87.48	69.19	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.14	9.3	16	12	9	19	60	13	
BH8	SS32	18.9	19.33	87.48	68.58	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	142	0.28	17.7							
BH8	SS33	19.51	19.79	87.48	67.97	Unit 4a	Sandy Silt (ML)	Native	100	0.13	16.8			0	38	58	4	
BH8	SS34	20.12	20.38	87.48	67.36	Unit 4a	Sandy Silt (ML)	Native	100	0.11	14.5							
BH8	SS35	20.73	21.18	87.48	66.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	133		11.2	17	11	0	23	58	19	
BH8	SS36	21.34	21.79	87.48	66.14	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	84		8.5							
BH8	SS37	21.95	22.4	87.48	65.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	117		8.5							
BH8	SS38	22.56	22.94	87.48	64.92	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	194	0.23	6.6	13	10	23	38	31	8	
BH15	SS1	0	0.13	87.37	87.37	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	50	0.13								
BH15	SS2	0.76	1.22	87.37	86.61	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	98		2.7							
BH15	SS3	1.52	1.98	87.37	85.85	Unit 3	Till: Silty Sand (SM)	Native	25		7.4							
BH15	SS4	2.29	2.74	87.37	85.08	Unit 3	Till: Silty Sand (SM)	Native	82		5			7	47	37	10	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH15	SS5	4.57	4.85	87.37	82.8	Unit 3	Till: Silty Sand (SM)	Native	50	0.13	8							
BH15	SS6	7.62	7.75	87.37	79.75	Unit 3	Till: Silty Sand (SM)	Native	50	0.13								
BH15	SS7	10.67	10.8	87.37	76.7	Unit 4a	Silty Sand (SM)	Native	50	0.13	14.9							
BH15	SS8	15.24	15.7	87.37	72.13	Unit 4b	Lean Clay (CL)	Native	95		21.6	24	14	0	5	68	28	
BH15	SS9	18.29	18.52	87.37	69.08	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	50	0.08	9.1							
BH15	SS10	21.34	21.79	87.37	66.03	Unit 4b	Silty Clay (CL-ML)	Native	56		13.4	19	13					
BH16	SS1	0	0.61	88.63	88.63	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	36									
BH16	SS2	0.76	1.22	88.63	87.87	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	51		4.8							
BH16	SS3	1.52	1.98	88.63	87.11	Unit 2a	Lean Clay with Sand (CL)	Native	12		18.9	24	14					19.7
BH16	SS5	3.05	3.51	88.63	85.58	Unit 2a	Lean Clay with Sand (CL)	Native	12		8.4							
BH16	SS6	3.81	4.27	88.63	84.82	Unit 2b	Silty Sand (SM)	Native	5		13							
BH16	SS7	5.33	5.79	88.63	83.3	Unit 2b	Silty Sand (SM)	Native	17		9							
BH16	SS8	6.1	6.55	88.63	82.53	Unit 2b	Silty Sand (SM)	Native	7		9.1	11	10					
BH16	SS9	7.62	8.08	88.63	81.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	64		6.8	12	11					
BH16	SS10	9.14	9.42	88.63	79.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	50	0.13								
BH16	SS11	10.67	11.13	88.63	77.96	Unit 4b	Lean Clay (CL)	Native	78		15.2	27	15					
BH16	SS12	12.34	12.65	88.63	76.29	Unit 4a	Silty Sand (SM)	Native	73									
BH16	SS13	13.72	13.94	88.63	74.91	Unit 4a	Silty Sand (SM)	Native	50	0.08	15.6							
BH16	SS14	15.2	15.37	88.63	73.43	Unit 4a	Silty Sand (SM)	Native	50	0,13								
BH16	SS15	18.29	18.75	88.63	70.34	Unit 4b	Lean Clay (CL)	Native	38		22.3	35	17					
BH16	SS16	21.34	21.46	88.63	67.29	Unit 4a	Sandy Silt (ML)	Native	50	0.13								
BH17	SS1	0.31	0.61	86.82	86.51	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23									
BH17	SS2	0.89	1.22	86.82	85.93	Unit 2b	Silty Sand with Gravel (SM)	Native	12		11.1							
BH17	SS3	1.52	1.98	86.82	85.3	Unit 2b	Silty Sand with Gravel (SM)	Native	3		8.9	12	10	21	40	31	8	
BH17	SS4	2.29	2.74	86.82	84.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	125		4.7							22.9
BH17	SS5	3.05	3.35	86.82	83.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	67		5							
BH17	SS6	3.81	4.27	86.82	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	54		6.7			26	40	26	8	
BH17	SS7	4.57	4.85	86.82	82.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	5.6							
BH17	SS8	5.33	5.79	86.82	81.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	89		7.7							
BH17	SS9	6.1	6.55	86.82	80.72	Unit 3	Till: Silty Sand with Gravel (SM)	Native	96		7.6							
BH17	SS10	7.62	8.03	86.82	79.2	Unit 3	Till: Silty Sand with Gravel (SM)	Native	158	0.23	7.1	12	10	13	43	36	8	
BH17	SS11	9.14	9.42	86.82	77.68	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	5.8							
BH17	SS12	10.67	11.13	86.82	76.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	150	0.28	9.2							
BH17	SS13	12.19	12.24	86.82	74.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05								
BH17	SS14	13.72	13.77	86.82	73.1	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.05								
BH17	SS15	14.48	14.66	86.82	72.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.03								
BH17	SS16	15.24	15.52	86.82	71.58	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH17	SS17	16	16.46	86.82	70.82	Unit 4b	Lean Clay with Sand (CL)	Native	33		22							
BH17	SS18	16.76	17.22	86.82	70.06	Unit 4b	Lean Clay with Sand (CL)	Native	68		12.8	19	11	2	23	48	27	
BH17	SS19	18.29	18.75	86.82	68.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	107		9.9	18	12	12	13	57	19	
BH17	SS20	19.86	20.27	86.82	66.96	Unit 4a	Silt with Sand (ML)	Native	148		17.9							
BH17	SS21	21.34	21.62	86.82	65.48	Unit 4a	Silt with Sand (ML)	Native	100	0.13	20.2			0	17	81	2	
BH20	SS1	0.3	0.36	86.36	86.06	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	52									
BH20	SS2	0.76	1.22	86.36	85.6	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	8		9.3	14	10	16	37	35	12	
BH20	SS3	1.52	1.98	86.36	84.84	Unit 3	Silty Sand with Gravel (SM)	Native	27		6.4							
BH20	SS4	2.29	2.74	86.36	84.07	Unit 3	Silty Sand with Gravel (SM)	Native	102		5.1			15	44	33	9	
BH20	SS5	3.05	3.51	86.36	83.31	Unit 3	Silty Sand with Gravel (SM)	Native	121		4.5							
BH20	SS6	3.81	4.27	86.36	82.55	Unit 3	Silty Sand with Gravel (SM)	Native	111		6.5							
BH20	SS7	4.57	5.03	86.36	81.79	Unit 3	Silty Sand with Gravel (SM)	Native	66		7.2							
BH20	SS8	5.33	5.79	86.36	81.03	Unit 3	Silty Sand with Gravel (SM)	Native	40		6	12	10	30	37	28	6	
BH20	SS9	6.1	6.55	86.36	80.26	Unit 3	Silty Sand with Gravel (SM)	Native	81		6.1							
BH20	SS10	7.92	8.08	86.36	78.44	Unit 3	Silty Sand with Gravel (SM)	Native	70		6.7							
BH20	SS11	9.14	9.6	86.36	77.22	Unit 3	Silty Sand with Gravel (SM)	Native	115		6.3							
BH20	SS12	10.67	10.95	86.36	75.69	Unit 4a	Gravel with Sand (GW)	Native	100	0.13	5.3			67	30	3	1	
BH20	SS13	12.19	12.65	86.36	74.17	Unit 4a	Gravel with Sand (GW)	Native	135		5.2							
BH20	SS14	13.72	14.15	86.36	72.64	Unit 4a	Silty Sand (SM)	Native	162	0.29	18.1							
BH20	SS15	15.24	15.7	86.36	71.12	Unit 4a	Silty Sand (SM)	Native	127		15			0	61	36	3	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH20	SS16	16.76	17.22	86.36	69.6	Unit 4b	Lean Clay (CL)	Native	29		22	33	15	0	2	48	50	21.1
BH20	SS17	18.42	18.54	86.36	67.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.1	0.4			2	17	63	19	
BH20	SS18	19.81	20.27	86.36	66.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	91		11.5							
BH27	SS1	0.3	0.53	95.47	95.17	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	18									
BH27	SS2	0.76	1.2	95.47	94.71	Unit 3	Till: Sandy Lean Clay (CL)	Native	18		11.2	20	11	13	29	40	17	
BH27	SS3	1.52	1.98	95.47	93.95	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	59		6.6							
BH27	SS4	2.29	2.74	95.47	93.18	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	78		0.9							
BH27	SS5	3.05	3.35	95.47	92.42	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	75		5							
BH27	SS6	3.81	4.27	95.47	91.66	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	184		6.8							25.4
BH27	SS7	4.57	5.03	95.47	90.9	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	61		7			34	7	52	6	
BH27	SS8	5.33	5.78	95.47	90.14	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	154	0.28	8.2							
BH27	SS9	6.1	6.55	95.47	89.37	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	100	0.1	7.3							
BH27	SS10	7.62	8.08	95.47	87.85	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	186	0.28	6.4							
BH27	SS11	9.14	9.49	95.47	86.33	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	192	0.19	4			23	32	38	7	
BH27	SS12	10.67	10.83	95.47	84.8	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	100	0.48	9.1							
BH27	SS13	12.19	12.65	95.47	83.28	Unit 4b	Lean Clya (CL)	Native	133		14.1	23	14	6	6	67	22	
BH27	SS14	13.72	14.17	95.47	81.75	Unit 4b	Lean Clay (CL)	Native	123		18.1							20.6
BH27	SS15	15.24	15.52	95.47	80.23	Unit 4a	Silty Sand (SM)	Native	100	0.13	14.1							
BH27	SS16	18.3	18.76	95.47	77.17	Unit 4a	Silty Sand (SM)	Native	149		18.2							21.5
BH27	SS17	21.36	21.65	95.47	74.11	Unit 4a	Silty Sand (SM)	Native	100	0.14	17.1			0	56	43	1	
BH27	SS18	24.42	24.88	95.47	71.05	Unit 4b	Lean Clay (CL)	Native	24		23.9	38	16	0	2	44	54	
BH27	SS19	27.64	27.69	95.47	67.83	Unit 4a	Silt with Sand (ML)	Native	100	0.12	18.8							
BH27	SS20	30.39	30.62	95.47	65.08	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.14	7.7	15	10	41	34	19	6	
BH28	SS1	0	0.61	95.35	95.35	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	12									
BH28	SS2	1.07	1.37	95.35	94.28	Unit 3	Till: Silty Sand (SM)	Native	35									
BH28	SS3	1.52	1.83	95.35	93.83	Unit 3	Till: Silty Sand (SM)	Native	67									
BH28	SS4	2.29	2.74	95.35	93.06	Unit 3	Till: Silty Sand (SM)	Native	80		6.9			12	42	40	6	
BH28	SS5	3.05	3.33	95.35	92.3	Unit 3	Till: Silty Sand (SM)	Native	100	0.13								
BH28	SS6	4.57	4.64	95.35	90.78	Unit 3	Till: Silty Sand (SM)	Native	100	0.06								
BH28	SS7	5.33	5.79	95.35	90.02	Unit 3	Till: Silty Sand (SM)	Native	128									
BH28	SS8	6.1	6.55	95.35	89.25	Unit 3	Till: Silty Sand (SM)	Native	66		10.9			7	47	39	8	
BH28	SS9	7.62	8.08	95.35	87.73	Unit 3	Till: Silty Sand (SM)	Native	100									
BH28	SS10	9.14	9.53	95.35	86.21	Unit 3	Till: Silty Sand (SM)	Native	185	0.23	8.4							
BH28	SS11	10.67	11.05	95.35	84.68	Unit 4a	Silty Sand (SM)	Native	183	0.23	15.5			10	53	34	2	
BH28	SS12	12.19	12.33	95.35	83.16	Unit 4a	Silty Sand (SM)	Native	100	0.14								
BH28	SS13	13.72	13.84	95.35	81.63	Unit 4a	Poorly Graded Gravel with Sand (GP)	Native	100	0.13								
BH28	SS14	15.24	15.7	95.35	80.11	Unit 4b	Lean Clay (CL)	Native	145		17.5	25	13	0	10	60	30	
BH28	SS15	18.44	18.66	95.35	76.91	Unit 4a	Silty Sand (SM)	Native	183	0.22	8.4							
BH28	SS16	21.34	21.46	95.35	74.01	Unit 4a	Silty Sand (SM)	Native	100	0.13								
BH28	SS17	24.38	24.84	95.35	70.97	Unit 4b	Lean Clay (CL)	Native	36		28.3	38	18					
BH28	SS19	27.71	27.8	95.35	67.64	Unit 5	Till: Sandy Silt (ML)	Native	158	0.22								
BH28	SS20	28.96	29.24	95.35	66.39	Unit 5	Till: Sandy Silt (ML)	Native	100	0.13								
BH28	SS21	30.48	30.68	95.35	64.87	Unit 5	Till: Sandy Silt (ML)	Native	100	0.05	18.6							
BH30	SS1	0	0.61	86.55	86.55	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	27		4.1			22	51	21	6	
BH30	SS2	0.76	1.22	86.55	85.79	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	15									
BH30	SS3	1.52	1.98	86.55	85.03	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22		5.4							
BH30	SS4	2.29	2.74	86.55	84.26	Unit 3	Till: Silty Sand with Gravel (SM)	Native	31		5.8							
BH30	SS5	3.05	3.5	86.55	83.5	Unit 3	Till: Silty Sand with Gravel (SM)	Native	177		3.9							
BH30	SS6	3.66	4.27	86.55	82.89	Unit 3	Till: Silty Sand with Gravel (SM)	Native	170		6.5	12	9	25	39	29	8	
BH30	SS7	4.57	5.03	86.55	81.98	Unit 3	Till: Silty Sand with Gravel (SM)	Native	123		5.5							
BH30	SS8	5.33	5.78	86.55	81.22	Unit 3	Till: Silty Sand with Gravel (SM)	Native	73		6.6							24.8
BH30	SS9	6.1	6.55	86.55	80.45	Unit 3	Till: Silty Sand with Gravel (SM)	Native	138		6.8							
BH30	SS10	7.62	8.08	86.55	78.93	Unit 3	Till: Silty Sand with Gravel (SM)	Native	74		7.2							
BH30	SS11	9.14	9.6	86.55	77.41	Unit 3	Till: Silty Sand with Gravel (SM)	Native	59		7.3			16	46	32	7	23.8
BH30	SS12	10.67	11.13	86.55	75.88	Unit 3	Till: Silty Sand with Gravel (SM)	Native	81		5.3							
BH30	SS13	12.5	12.65	86.55	74.05	Unit 4a	Silty Sand (SM)	Native	83		11.7			13	70	15	2	
BH30	SS14	13.72	14.17	86.55	72.83	Unit 3	Till: Silty Sand with Gravel (SM)	Native	82		6.5	11	10	22	43	30	6	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH30	SS15	15.24	15.7	86.55	71.31	Unit 4b	Lean Clay (CL)	Native	48		18	29	15	1	6	51	42	22.3
BH30	SS16	18.59	18.75	86.55	67.96	Unit 4a	Silty Sand (SM)	Native	143	0.29	15.8							20.9
BH30	SS17	21.34	21.79	86.55	65.21	Unit 5	Till: Silty Sand (SM)	Native	120		7.9	13	10	13	38	38	11	
BH30	SS18	22.02	22.27	86.55	64.53	Unit 5	Till: Silty Sand (SM)	Native	100	0.13	4.6							
BH50-3	SS1	0	0.46	90.2	90.2	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	16		6.2							
BH50-3	SS2	0.76	1.12	90.2	89.44	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	34									
BH50-3	SS3	1.6	1.98	90.2	88.6	Unit 2a	Lean Clay with Sand (CL)	Native	12		16.2	24	13	7	30	44	20	
BH50-3	SS4	2.29	2.58	90.2	87.91	Unit 3	Till: Sandy Silt (ML)	Native	100	0.14	9.1							
BH50-3	SS5	3.05	3.51	90.2	87.15	Unit 3	Till: Sandy Silt (ML)	Native	63		11.6							
BH50-3	SS6	3.81	4.27	90.2	86.39	Unit 3	Till: Sandy Silt (ML)	Native	116		10.2							
BH50-3	SS7	4.78	5.03	90.2	85.42	Unit 3	Till: Sandy Silt (ML)	Native	101		10.8							
BH50-3	SS8	5.33	5.61	90.2	84.87	Unit 3	Till: Sandy Silt (ML)	Native	100	0.13	8.4			5	39	48	9	
BH50-3	SS9	6.1	6.3	90.2	84.1	Unit 3	Till: Sandy Silt (ML)	Native	100	0.05	7.6							
BH50-3	SS11	9.14	9.55	90.2	81.06	Unit 4b	Lean Clay with Sand (CL)	Native	163	0.23	14.9							
BH50-3	SS12	10.74	11.13	90.2	79.46	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	90		15.6							
BH50-3	SS13	12.19	12.65	90.2	78.01	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	183		15.6							
BH50-3	SS14	13.72	14.17	90.2	76.48	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	123		18.7			0	36	63	0	
BH50-3	SS15	15.24	15.7	90.2	74.96	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	161		18.1							
BH50-3	SS16	16.76	17.15	90.2	73.44	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	188	0.23	14.7							
BH50-3	SS17	18.29	18.69	90.2	71.91	Unit 4a	Lean Clay with Sand / Sandy Silt (ML)	Native	78		21.9							
BH50-3	SS18	20.04	20.27	90.2	70.16	Unit 4b	Lean Clay with Sand (CL)	Native	22		19.1							
BH50-3	SS19	21.34	21.79	90.2	68.86	Unit 4b	Lean Clay with Sand (CL)	Native	24		21.3	28	14					20.7
BH50-3	SS20	23.06	23.11	90.2	67.14	Unit 4a	Silt with Sand (ML)	Native	100	0.1	20.1							
BH50-3	SS21	24.4	24.89	90.2	65.8	Unit 5	Till: Silty Sand with Gravel (SM)	Native	47		9.7							
BH50-3	SS22	25.91	26.17	90.2	64.29	Unit 5	Till: Silty Sand with Gravel (SM)	Native	100	0.1				25	40	29	7	
BH51	SS1	0	0.61	99.06	99.06	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24		4.5							
BH51	SS2	0.76	1.2	99.06	98.3	Unit 2a	Lean Clay with Sand (CL)	Native	26		14	27	14	2	24	51	24	
BH51	SS3	1.52	1.98	99.06	97.54	Unit 3	Till: Silty Sand (SM)	Native	69		5.6							
BH51	SS4	2.29	2.72	99.06	96.77	Unit 3	Till: Silty Sand (SM)	Native	159	0.27	5.7	12	10	9	43	38	10	
BH51	SS5	3.05	3.34	99.06	96.01	Unit 3	Till: Silty Sand (SM)	Native	100	0.14	4.7							
BH51	SS6	3.81	4.06	99.06	95.25	Unit 3	Till: Silty Sand (SM)	Native	100	0.1	7.8							
BH51	SS7	4.57	4.85	99.06	94.49	Unit 3	Till: Silty Sand (SM)	Native	100	0.1	6.1							
BH51	SS8	5.33	5.59	99.06	93.73	Unit 3	Till: Silty Sand (SM)	Native	100	0.1	6							
BH51	SS9	6.1	6.48	99.06	92.96	Unit 3	Till: Silty Clayey Sand (SC-SM)	Native	179	0.22	7.2	14	9	12	40	36	13	
BH51	SS10	7.62	8.08	99.06	91.44	Unit 3	Till: Silty Clayey Sand (SC-SM)	Native	183		11.7							
BH51	SS11	9.14	9.6	99.06	89.92	Unit 4a	Sandy Silt to Silt with Sand (ML)	Native	82		17			0	28	68	4	17.1
BH51	SS12	10.9	11.11	99.06	88.16	Unit 4b	Silty Clay with Sand (CL-ML)	Native	167	0.29	15.9							
BH51	SS13	12.19	12.65	99.06	86.87	Unit 4b	Silty Clay with Sand (CL-ML)	Native	122		13.6	17	13	1	14	66	18	23.1
BH51	SS14	13.72	14.17	99.06	85.34	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	158		9.1	13	9	10	35	42	14	24.6
BH51	SS15	15.24	15.44	99.06	83.82	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.05	9.5							
BH51	SS16	18.29	18.75	99.06	80.77	Unit 4a	Silty Sand (SM)	Native	136	0.29	13.1			17	49	31	3	
BH51	SS17	21.34	21.79	99.06	77.72	Unit 4a	Silty Sand (SM)	Native	98		17							17.5
BH51	SS18	24.38	24.65	99.06	74.68	Unit 4a	Silty Sand (SM)	Native	100	0.11	13.5			0	59	39	2	
BH51	SS19	27.43	27.89	99.06	71.63	Unit 4b	Lean Clay (CL)	Native	35		21.5	33	15	0	4	48	48	
BH51	SS20	30.48	30.94	99.06	68.58	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	121		8	15	10	7	30	46	17	
BH51	SS21	33.45	33.64	99.06	65.61	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.03								
BH52	SS1	0	0.61	97.26	97.26	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	17		6.2							
BH52	SS2	0.76	1.2	97.26	96.5	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	19		6.5							
BH52	SS3	1.52	1.66	97.26	95.74	Unit 2a	Sandy Lean Clay (CL-ML)	Native	15	0.14	8.7	17	11	11	39	37	14	
BH52	SS4	2.29	2.58	97.26	94.97	Unit 3	Till: Sandy Silt (ML)	Native	100	0.14	5.3							
BH52	SS5	3.05	3.33	97.26	94.21	Unit 3	Till: Sandy Silt (ML)	Native	100	0.14	9.8							
BH52	SS6	4.57	4.86	97.26	92.69	Unit 3	Till: Sandy Silt (ML)	Native	100	0.13	10.8	13	11	8	38	46	8	
BH52	SS7	6.1	6.55	97.26	91.16	Unit 3	Till: Sandy Silt (ML)	Native	188		9.2							
BH52	SS8	7.62	7.77	97.26	89.64	Unit 3	Till: Sandy Silt (ML)	Native	100		12.5							
BH52	SS9	9.14	9.24	97.26	88.12	Unit 3	Till: Sandy Silt (ML)	Native	100	0.14	11.7							
BH52	SS10	10.67	10.78	97.26	86.59	Unit 3	Till: Sandy Lean Clay (CL)	Native	100	0.12	12	18	10	7	36	43	14	
BH52	SS11	12.19	12.83	97.26	85.07	Unit 4a	Silt (ML)	Native	168	0.11	17.5							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH52	SS12	13.72	13.97	97.26	83.54	Unit 4a	Silt (ML)	Native	100	0.1	17.9	17	15	0	9	76	15	
BH52	SS13	15.24	15.7	97.26	82.02	Unit 4a	Silt (ML)	Native	136		18.2							21.7
BH52	SS14	18.32	18.52	97.26	78.94	Unit 4a	Silt (ML)	Native	100	0.07	14.8							
BH52	SS15	21.34	21.57	97.26	75.92	Unit 4a	Silt (ML)	Native	100	0.07	17.8			0	13	84	3	21.9
BH52	SS16	24.38	24.52	97.26	72.88	Unit 4a	Silt (ML)	Native	100	0.14	21.5							
BH52	SS17	27.43	27.89	97.26	69.83	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	160		9.8	15	11	1	26	59	15	
BH52	SS18	30.48	30.72	97.26	66.78	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	195	0.24	9.3							
BH52	SS19	31.25	31.27	97.26	66.01	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.01								
BH53	SS1	0	0.61	96.07	96.07	Unit 1	Fill: Sandy Silty Clay (CL-ML)	Fill	14		15.1							
BH53	SS2	0.61	1.07	96.07	95.46	Unit 1	Fil: Sandy Lean Clay (CL)	Fill	12		17.5							
BH53	SS3	1.22	1.68	96.07	94.85	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	25		8.1							
BH53	SS4	1.83	2.29	96.07	94.24	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	57		4.3							
BH53	SS5	2.44	2.9	96.07	93.63	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	78		4.1							
BH53	SS6	3.05	3.51	96.07	93.02	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	151	0.23	6.5							
BH53	SS7	3.66	4.11	96.07	92.41	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	161		7	14	10	18	39	34	9	
BH53	SS8	4.27	4.72	96.07	91.8	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	137		8							
BH53	SS9	4.88	5.26	96.07	91.19	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	149	0.23	5.9							
BH53	SS10	5.49	5.9	96.07	90.58	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	82		6.9							
BH53	SS11	6.1	6.55	96.07	89.97	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	88		9.3							
BH53	SS12	6.71	7.16	96.07	89.36	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	119		8.9							
BH53	SS13	7.32	7.6	96.07	88.75	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.13	9	15	10	10	31	46	13	
BH53	SS14	7.92	8.21	96.07	88.15	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.13	7.4							
BH53	SS15	8.53	8.92	96.07	87.54	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	160	0.23	6.6							
BH53	SS16	9.14	9.37	96.07	86.93	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.05	8.5							
BH53	SS17	9.75	10	96.07	86.32	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	100	0.13	3.2							
BH53	SS18	10.36	10.77	96.07	85.71	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	158	0.25	7.7							19
BH53	SS19	10.97	11.43	96.07	85.1	Unit 3	Till: Lean Clay with Gravel (CL)	Native	65		15.1							
BH53	SS20	11.58	12.04	96.07	84.49	Unit 3	Till: Lean Clay with Gravel (CL)	Native	94		13.2	28	14	12	10	49	29	
BH53	SS21	12.19	12.6	96.07	83.88	Unit 3	Till: Lean Clay with Gravel (CL)	Native	131	0.25	13.6							
BH53	SS22	12.8	13.26	96.07	83.27	Unit 3	Till: Lean Clay with Gravel (CL)	Native	126		14							
BH53	SS23	13.41	13.72	96.07	82.66	Unit 3	Till: Lean Clay with Gravel (CL)	Native	90		16.9							
BH53	SS24	14.02	14.43	96.07	82.05	Unit 4a	Silty Sand (SM)	Native	188	0.25	17.1							
BH53	SS25	14.63	15.09	96.07	81.44	Unit 4b	Lean Clay with Sand (CL)	Native	93		18.5							
BH53	SS26	15.24	15.7	96.07	80.83	Unit 4b	Lean Clay with Sand (CL)	Native	135		16.8	28	14	1	11	60	29	
BH53	SS27	16.18	16.31	96.07	79.89	Unit 4a	Silty Sand (SM)	Native	112		16.1							
BH53	SS28	16.46	16.89	96.07	79.61	Unit 4a	Silty Sand (SM)	Native	191	0.28	16.7							23.2
BH53	SS29	17.07	17.5	96.07	79	Unit 4a	Silty Sand (SM)	Native	179	0.28	16.8							
BH53	SS30	17.68	18.11	96.07	78.39	Unit 4a	Silty Sand (SM)	Native	170	0.28	14.2							
BH53	SS31	18.29	18.57	96.07	77.78	Unit 4a	Silty Sand (SM)	Native	100	0.13	16.4							
BH53	SS32	18.9	19.18	96.07	77.17	Unit 4a	Silty Sand (SM)	Native	100	0.13	18.4			0	53	47	1	
BH53	SS33	19.51	19.76	96.07	76.56	Unit 4a	Silty Sand (SM)	Native	100	0.1	16.7							
BH53	SS34	20.12	20.4	96.07	75.95	Unit 4a	Silty Sand (SM)	Native	100	0.13	18.1							
BH53	SS35	20.73	21.01	96.07	75.34	Unit 4a	Silty Sand (SM)	Native	100	0.13	14.9							
BH53	SS36	21.34	21.59	96.07	74.73	Unit 4a	Silty Sand (SM)	Native	100	0.13	16.8							
BH53	SS37	21.95	22.4	96.07	74.12	Unit 4a	Silty Sand (SM)	Native	167		15.6							
BH53	SS38	22.81	22.96	96.07	73.26	Unit 4a	Silt with Sand (ML)	Native	180	0.28	20.7							
BH53	SS39	23.16	23.45	96.07	72.91	Unit 4a	Silt with Sand (ML)	Native	100	0.13	17			0	26	72	3	
BH53	SS40	23.77	24.23	96.07	72.3	Unit 4a	Silt with Sand (ML)	Native	139		21.4							
BH53	SS41	24.38	24.79	96.07	71.69	Unit 4b	Lean Clay (CL)	Native	40		21.1	31	16	6	5	46	43	
BH53	SS42	24.99	25.45	96.07	71.08	Unit 4b	Lean Clay (CL)	Native	21		20.6							
BH53	SS43	25.7	25.93	96.07	70.37	Unit 4b	Lean Clay (CL)	Native	29		25							
BH53	SS44	26.21	26.67	96.07	69.86	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	186		9.2	16	12	2	20	62	16	
BH53	SS45	27.1	27.23	96.07	68.97	Unit 4a	Silty Sand (SM)	Native	157	0.25	15.2							
BH53	SS46	27.43	27.84	96.07	68.64	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	171	0.25	11.1							
BH53	SS47	28.04	28.5	96.07	68.03	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	135		10.1							
BH53	SS48	28.65	29.11	96.07	67.42	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	111		7.3	14	9					
BH53	SS49	29.26	29.72	96.07	66.81	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	157		10.5			7	36	43	14	24.5
BH53	SS50	29.87	30.28	96.07	66.2	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	144	0.25	6.3							
BH53	SS51	30.48	30.76	96.07	65.59	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.13	6.8							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH54	SS1	0	0.6096	96.67	96.67	Unit 1	Fill: Silty Sand with Gravle (SM)	Fill	29		5.9							
BH54	SS2	0.79	1.22	96.67	95.88	Unit 3	Till: Silty Sand with Gravel (SM)	Native	55		6.2							
BH54	SS3	1.52	1.98	96.67	95.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	46		7.3							
BH54	SS4	2.29	2.74	96.67	94.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	58		7			15	40	36	8	
BH54	SS5	3.05	3.51	96.67	93.62	Unit 3	Till: Silty Sand with Gravel (SM)	Native	137		6.9							
BH54	SS6	3.84	4.22	96.67	92.83	Unit 3	Till: Silty Sand with Gravel (SM)	Native	173	0.22	6.7							24.2
BH54	SS7	4.57	4.85	96.67	92.1	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13	9.5							
BH54	SS8	5.33	5.6	96.67	91.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.11	8							
BH54	SS9	6.1	6.29	96.67	90.57	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.04	8.7							
BH54	SS10	7.62	8.08	96.67	89.05	Unit 4b	Lean Clay (CL)	Native	98		15.3	20	14	2	9	65	24	
BH54	SS11	9.14	9.6	96.67	87.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	117		7.3							
BH54	SS12	10.67	11.15	96.67	86	Unit 3	Till: Silty Sand with Gravel (SM)	Native	83		7.6							
BH54	SS13	12.19	12.47	96.67	84.48	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH54	SS14	13.72	14.14	96.67	82.95	Unit 4a	Sandy Silt (ML)	Native	190	0.25	10.6			4	34	58	4	
BH54	SS15	15.24	15.62	96.67	81.43	Unit 4b	Silty Clay (CL-ML) and Sandy Silt (ML)	Native	195	0.23	15.8	18	14	0	11	72	17	22.5
BH54	SS16	18.3	18.59	96.67	78.37	Unit 4a	Silty Sand (SM)	Native	100	0.14	18.9							21.8
BH54	SS17	21.34	21.73	96.67	75.33	Unit 4a	Silty Sand (SM)	Native	185	0.24	13.9							21.9
BH54	SS18	24.38	24.87	96.67	72.29	Unit 4b	Lean Clay (CL)	Native	43		19.3	24	14	0	2	64	33	
BH54	SS19	27.43	27.79	96.67	69.24	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	125	0.29	20.8							
BH54	SS20	30.48	30.89148	96.67	66.19	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	198	0.24	10.3	16	12	7	25	58	10	
BH55	SS1	0	0.61	95.28	95.28	Unit 1	Fill: Silty Sand with Gravle (SM)	Fill	15		17.7							
BH55	SS2	0.79	1.22	95.28	94.49	Unit 1	Fill: Sandy Lean Clay with Gravel (CL)	Fill	16									
BH55	SS3	1.52	2.01	95.28	93.76	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	27		6.5							
BH55	SS4	4.57	5.01	95.28	90.71	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	175	0.26	8.3			14	40	37	10	
BH55	SS5	7.62	7.76	95.28	87.66	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.11	12.6	13	10	7	39	42	13	
BH55	SS6	10.67	10.95	95.28	84.61	Unit 4a	Silty Sand (SM)	Native	100	0.12	10.4			7	56	33	5	22.8
BH55	SS7	13.72	14.2	95.28	81.56	Unit 4b	Silty Clay (CL-ML)	Native	76		15.3	21	14	1	11	68	20	
BH55	SS8	16.79	17.25	95.28	78.49	Unit 4a	Silty Sand (SM)	Native	146		19.5							22.4
BH55	SS9	19.83	19.94	95.28	75.45	Unit 4a	Silty Sand (SM)	Native	100	0.11	15.7							
BH55	SS10	22.86	23.34	95.28	72.42	Unit 4a	Silt with Sand (ML)	Native	181		19			0	24	66	10	
BH55	SS11	25.9	26.39	95.28	69.38	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	180		9.5	17	11	4	21	56	19	
BH55	SS12	28.95	29.44	95.28	66.33	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	173		10.1							
BH55	SS13	30.21	30.9	95.28	65.07	Unit 4a	Silty Sand with Gravel (SM)	Native	113		6.6			34	43	19	5	
BH55	SS14	30.97	31	95.28	64.31	Unit 4a	Silty Sand with Gravel (SM)	Native	100	0.02								
BH57	SS1	0	0.61	89.77	89.77	Unit 1	Fill: Silty Sand with Gravle (SM)	Fill	26		5.4							
BH57	SS2	0.76	1.22	89.77	89.01	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	23		13.5							
BH57	SS3	1.52	1.98	89.77	88.25	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	26		8.9							
BH57	SS4	2.29	2.74	89.77	87.48	Unit 2a	Lean Clay (CL)	Native	13		19.7							
BH57	SS5	3.05	3.50	89.77	86.72	Unit 2a	Lean Clay (CL)	Native	20		21.1							
BH57	SS6	3.81	4.27	89.77	85.96	Unit 2a	Lean Clay (CL)	Native	5		28.9	35	15	0	9	48	43	
BH57	SS7	5.33	5.9	89.77	84.44	Unit 2a	Lean Clay (CL)	Native	6		17.8							
BH57	SS8	6.1	6.55	89.77	83.67	Unit 2b	Silty Clayey Sand (SC-SM)	Native	29		10.6			13	43	34	10	
BH57	SS9	7.62	8.08	89.77	82.15	Unit 4a	Silty Sand (SM)	Native	150		12.3							24.5
BH57	SS10	9.14	9.6	89.77	80.63	Unit 4a	Silty Sand (SM)	Native	165		13.4			4	51	41	5	
BH57	SS11	10.67	11.13	89.77	79.1	Unit 4a	Silty Sand (SM)	Native	136	0.29	14.9							
BH57	SS12	12.19	12.65	89.77	77.58	Unit 4b	Silty Clay with Sand (CL-ML)	Native	139		18							
BH57	SS13	13.72	13.97	89.77	76.05	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.1	15							
BH57	SS14	15.24	15.7	89.77	74.53	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	124		20.2							
BH57	SS15	18.29	18.72	89.77	71.48	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	192	0.29	18.2							
BH57	SS16	21.34	21.79	89.77	68.43	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	104		10.9	16	11	1	21	57	21	
BH57	SS17	22.86	23.32	89.77	66.91	Unit 4a	Silty Sand (SM)	Native	134		23.1							
BH57	SS18	24.38	24.84	89.77	65.39	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	38		9.7	16	11	6	24	50	21	
BH57	SS19	24.99	25.09	89.77	64.78	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100		7.9							
BH58	SS1	0	0.61	95.23	95.23	Unit 1	Fill: Silty Sand (SM)	Fill	17	0.04	8.9							
BH58	SS2	0.61	1.07	95.23	94.62	Unit 3	Till: Silty Sand (SM)	Native	13		9.9							
BH58	SS3	1.2	1.68	95.23	94.03	Unit 3	Till: Silty Sand (SM)	Native	33		8							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH58	SS4	1.83	2.29	95.23	93.4	Unit 3	Till: Silty Sand (SM)	Native	46		11.7							
BH58	SS5	2.44	2.9	95.23	92.79	Unit 3	Till: Silty Sand (SM)	Native	54		7.6							23.7
BH58	SS6	3.05	3.51	95.23	92.18	Unit 3	Till: Silty Sand (SM)	Native	83		9.5			8	45	38	8	
BH58	SS7	3.66	3.94	95.23	91.57	Unit 3	Till: Silty Sand (SM)	Native	100	0.13	11							
BH58	SS8	4.27	4.72	95.23	90.96	Unit 3	Till: Silty Sand (SM)	Native	171	0.27	10.1							
BH58	SS9	4.88	5.28	95.23	90.35	Unit 3	Till: Silty Sand (SM)	Native	143	0.25	10.8							
BH58	SS10	5.48	5.91	95.23	89.75	Unit 3	Till: Silty Sand (SM)	Native	175	0.25	11.7							
BH58	SS11	6.01	6.52	95.23	89.22	Unit 3	Till: Silty Sand (SM)	Native	100	0.11	9.8							
BH58	SS12	6.71	6.94	95.23	88.52	Unit 3	Till: Silty Sand (SM)	Native	100	0.07	9							
BH58	SS13	7.32	7.57	95.23	87.91	Unit 3	Till: Silty Sand (SM)	Native	100	0.1	11.5							
BH58	SS14	7.92	8.18	95.23	87.31	Unit 3	Till: Silty Sand (SM)	Native	100	0.1	8.5							
BH58	SS15	8.53	9.02	95.23	86.7	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	98		9.8	15	11	5	27	55	14	
BH58	SS16	9.14	9.57	95.23	86.09	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	141	0.25	10.8							27.2
BH58	SS17	9.75	10.12	95.23	85.48	Unit 3	Till: Silty Sand with Gravel (SM)	Native	200	0.2	7.1							
BH58	SS18	10.36	10.66	95.23	84.87	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.15	8.1							
BH58	SS19	10.97	11.27	95.23	84.26	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.14	16.6							
BH58	SS20	11.58	11.86	95.23	83.65	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.12	14.6			0	56	43	1	
BH58	SS21	12.19	12.44	95.23	83.04	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.1	18.3							
BH58	SS22	12.8	13.01	95.23	82.43	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.02	10.8							25.7
BH58	SS23	13.41	13.88	95.23	81.82	Unit 4b	lean Clay (CL)	Native	148	0.29	15.3							
BH58	SS24	14.02	14.5	95.23	81.21	Unit 4b	lean Clay (CL)	Native	143		16.2	24	15	0	2	70	28	
BH58	SS25	14.63	15.12	95.23	80.6	Unit 4b	lean Clay (CL)	Native	56		16.6							
BH58	SS26	15.24	15.73	95.23	79.99	Unit 4b	lean Clay (CL)	Native	80		17.2							
BH58	SS27	15.84	16.33	95.23	79.39	Unit 4b	lean Clay (CL)	Native	101		15.8							
BH58	SS28	16.45	16.85	95.23	78.78	Unit 4b	lean Clay (CL)	Native	172	0.1	14.8							
BH58	SS29	17.07	17.36	95.23	78.16	Unit 4b	lean Clay (CL)	Native	100	0.12	21							
BH58	SS30	17.68	17.96	95.23	77.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.11	21.8							
BH58	SS31	18.3	18.71	95.23	76.93	Unit 4a	Silty Sand (SM)	Native	200	0.25	21.2							
BH58	SS32	18.91	19.37	95.23	76.32	Unit 4a	Silty Sand (SM)	Native	171	0.3	17.4							
BH58	SS33	19.53	19.76	95.23	75.7	Unit 4a	Silty Sand (SM)	Native	100	0.07	16.6							
BH58	SS34	20.12	20.6	95.23	75.11	Unit 4a	Silty Sand (SM)	Native	168		15.5			0	78	20	2	
BH58	SS35	20.72	21.21	95.23	74.51	Unit 4a	Silty Sand (SM)	Native	164		15.3							
BH58	SS36	21.33	21.82	95.23	73.9	Unit 4a	Silty Sand (SM)	Native	146		17.5							
BH58	SS37	21.94	22.43	95.23	73.29	Unit 4a	Silty Sand (SM)	Native	132		18							
BH58	SS38	22.55	22.98	95.23	72.68	Unit 4a	Silt (ML)	Native	163	0.25	22.3	19	16	0	6	74	19	
BH58	SS39	23.16	23.65	95.23	72.07	Unit 4a	Sandy Silt (ML)	Native	155		20.7							
BH58	SS40	23.77	24.26	95.23	71.46	Unit 4b	Lean Clay with Sand (CL)	Native	62		20.7							
BH58	SS41	24.38	24.87	95.23	70.85	Unit 4b	Lean Clay with Sand (CL)	Native	27		20.3	32	15					
BH58	SS42	24.99	25.48	95.23	70.24	Unit 4b	Lean Clay with Sand (CL)	Native	35		21.8							
BH58	SS43	25.6	26.09	95.23	69.63	Unit 4b	Lean Clay with Sand (CL)	Native	48		11.2							
BH58	SS44	26.21	26.7	95.23	69.02	Unit 4b	Lean Clay with Sand (CL)	Native	33		10							
BH58	SS45	26.82	27.21	95.23	68.41	Unit 4b	Silty Clay with Sand (CL-ML)	Native	162	0.22	13.8	15	12	3	20	61	16	
BH58	SS46	27.48	27.76	95.23	67.75	Unit 4b	Silty Clay with Sand (CL-ML)	Native	100	0.11	16.9							
BH58	SS47	28.09	28.37	95.23	67.14	Unit 4a	Silty Sand (SM)	Native	100	0.12	19							
BH58	SS48	28.65	29.13	95.23	66.58	Unit 5	Till: Silt with Sand (ML)	Native	145		6.7							
BH58	SS49	29.26	29.82	95.23	65.97	Unit 5	Till: Silt with Sand (ML)	Native	100	0.11	12.6	16	14	5	21	61	13	
BH58	SS50	29.87	30.16	95.23	65.36	Unit 5	Till: Silt with Sand (ML)	Native	100	0.11	9							
BH58	SS51	30.43	30.83	95.23	64.8	Unit 5	Till: Silt with Sand (ML)	Native	182	0.25	8.3							
BH59	SS1	0	0.61	89.94	89.94	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	33		5.5			5	50	35	10	
BH59	SS2	0.76	1.22	89.94	89.18	Unit 1	Fill: Silty Sand (SM)	Fill	50									
BH59	SS3	1.52	1.98	89.94	88.42	Unit 2a	Lean Clay with Sand (CL)	Native	5		29.2							
BH59	SS4	2.29	2.74	89.94	87.65	Unit 2a	Lean Clay with Sand (CL)	Native	3		25.5	32	15					
BH59	SS5	3.05	3.50	89.94	86.89	Unit 2a	Lean Clay with Sand (CL)	Native	7		27.7							
BH59	SS6	3.81	4.27	89.94	86.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	49									
BH59	SS7	4.57	4.98	89.94	85.37	Unit 3	Till: Silty Sand with Gravel (SM)	Native	149	0.1	9.8							
BH59	SS8	5.33	5.61	89.94	84.61	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.13								
BH59	SS9	6.1	6.24	89.94	83.84	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.14	8.4							
BH59	SS10	7.62	8	89.94	82.32	Unit 3	Till: Silty Sand with Gravel (SM)	Native	162	0.23								
BH59	SS11	9.14	9.6	89.94	80.8	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	95		15.9							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH59	SS12	10.67	11.13	89.94	79.27	Unit 4b	Sandy Silt (ML) to Silty Sand (SM)	Native	133									
BH59	SS13	12.19	12.65	89.94	77.75	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	149		14.6			0	69	30	1	
BH59	SS14	13.72	14.17	89.94	76.22	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	157	0.28								
BH59	SS15	15.24	15.53	89.94	74.7	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	100	0.14	15.7							
BH59	SS16	16.76	17.15	89.94	73.18	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	157	0.23								
BH59	SS17	18.29	18.75	89.94	71.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	143									
BH59	SS18	19.81	20.27	89.94	70.13	Unit 4b	Lean Clay (CL)	Native	19		24.8							
BH59	SS19	21.34	21.79	89.94	68.6	Unit 4b	Lean Clay (CL)	Native	27		11.5	25	13					
BH59	SS20	22.86	23.11	89.94	67.08	Unit 4a	Poorly graded Sand (SP)	Native	100	0.1	16.1							
BH59	SS21	24.38	24.79	89.94	65.56	Unit 5	Till: Silty Sand (SM)	Native	147	0.25	9.3							
BH59	SS22	25.84	26.25	89.94	64.1	Unit 5	Till: Silty Sand (SM)	Native	167									
BH60	SS1	0	0.61	90.17	90.17	Unit 1	Fill: Poorly Graded Sand with Silt (SP-SM)	Fill	12		3.5							
BH60	SS2	0.76	1.22	90.17	89.41	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	22									
BH60	SS3	1.52	1.98	90.17	88.65	Unit 1	Fill: Silty Clay with Sand (CL-ML)	Fill	14									
BH60	SS4	2.29	2.74	90.17	87.88	Unit 2a	Lean Clay with Sand (CL)	Native	4		31.3	33	14	2	22	43	33	
BH60	SS5	3.05	3.51	90.17	87.12	Unit 3	Till: Silty Sand with Gravel (SM)	Native	80		6.1							
BH60	SS6	3.81	4.27	90.17	86.36	Unit 3	Till: Silty Sand with Gravel (SM)	Native	102		9.3							
BH60	SS7	4.57	5.03	90.17	85.6	Unit 3	Till: Silty Sand with Gravel (SM)	Native	133		12.1			36	31	27	6	
BH60	SS8	5.33	5.47	90.17	84.84	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.14	9.6							
BH60	SS9	6.1	6.32	90.17	84.07	Unit 3	Till: Silty Sand with Gravel (SM)	Native	100	0.08	6.7							
BH60	SS10	7.62	8.08	90.17	82.55	Unit 3	Till: Silty Sand with Gravel (SM)	Native	119		9							
BH60	SS11	8.38	8.81	90.17	81.79	Unit 4b	Lean Clay (CL)	Native	153	0.28	15.8							
BH60	SS12	9.14	9.6	90.17	81.03	Unit 4b	Lean Clay (CL)	Native	109		15.8	34	15	0	13	41	46	
BH60	SS13	10.67	11.13	90.17	79.5	Unit 4b	Lean Clay (CL)	Native	91		18.8							
BH60	SS14	12.19	12.6	90.17	77.98	Unit 4a	Silty Sand (SM)	Native	183	0.25	15			0	66	32	2	
BH60	SS15	13.72	14.17	90.17	76.45	Unit 4a	Silty Sand (SM)	Native	47		20							
BH60	SS16	15.24	15.7	90.17	74.93	Unit 4b	Sandy Lean Clay (CL)	Native	110		20.4							
BH60	SS17	16.76	17.12	90.17	73.41	Unit 4a	Sandy Silt (ML)	Native	171	0.25	19.5							
BH60	SS18	18.47	18.75	90.17	71.7	Unit 4a	Silty Sand (SM)	Native	109		22.6							
BH60	SS19	19.81	20.27	90.17	70.36	Unit 4b	Lean Clay (CL)	Native	17		22.2							
BH60	SS20	21.34	21.79	90.17	68.83	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	90		14.8							
BH60	SS21	22.86	23.22	90.17	67.31	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	167		15.7							
BH60	SS22	24.38	24.82	90.17	65.79	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	188		8.2	14	10	13	36	39	13	
BH61	SS1	0	0.61	89.78	89.78	Unit 1	Fill: Poorly graded Sand with Silt (SP-SM)	Fill	27									
BH61	SS2	0.76	1.22	89.78	89.02	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	84									
BH61	SS3	1.52	1.98	89.78	88.26	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	36		4.6							
BH61	SS4	2.29	2.74	89.78	87.49	Unit 2a	Lean Clay with Sand (CL)	Native	11		22.6	28	14	1	22	53	25	20
BH61	SS5	3.05	3.51	89.78	86.73	Unit 2a	Lean Clay with Sand (CL)	Native	5		28.7							
BH61	SS8	4.72	5.18	89.78	85.06	Unit 2b	Silty Sand (SM) to Sandy Silt (ML)	Native	1		10.6	12	9	8	42	39	11	
BH61	SS9	5.33	5.49	89.78	84.45	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	142		11.7							
BH61	SS10	6.1	6.38	89.78	83.68	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	100	0.13	9.5			7	43	42	8	
BH61	SS11	7.62	8.08	89.78	82.16	Unit 3	Till: Sandy Lean Clay with Gravel (CL)	Native	125		15.3							
BH61	SS12	9.14	9.6	89.78	80.64	Unit 3	Till: Sandy Lean Clay with Gravel (CL)	Native	106		13.2	23	11	20	26	32	22	
BH61	SS13	10.67	11.13	89.78	79.11	Unit 4a	Silt with Sand (ML)	Native	131		15.3							
BH61	SS14	12.19	12.65	89.78	77.59	Unit 4a	Silty Sand (SM)	Native	121		14							
BH61	SS15	13.72	14.01	89.78	76.06	Unit 4a	Silty Sand (SM)	Native	100	0.14	14.6			5	67	28	1	
BH61	SS16	15.24	15.51	89.78	74.54	Unit 4a	Silty Sand (SM)	Native	100	0.11	13.5							
BH61	SS17	16.76	17.22	89.78	73.02	Unit 4b	Lean Clay (CL)	Native	62		22.2							
BH61	SS18	18.29	18.75	89.78	71.49	Unit 4b	Lean Clay (CL)	Native	76		20.4							
BH61	SS19	19.81	20.27	89.78	69.97	Unit 4b	Lean Clay (CL)	Native	31	0.28	22	32	16	1	5	46	48	
BH61	SS20	21.34	21.79	89.78	68.44	Unit 5	Till: Silt (ML)	Native	152	0.13	24.9							
BH61	SS21	22.86	23.14	89.78	66.92	Unit 5	Till: Silt (ML)	Native	100	0.06	15.8	16	14	1	12	74	14	
BH61	SS22	24.38	24.6	89.78	65.4	Unit 5	Till: Silt (ML)	Native	100	0.13	7.2							
BH62	SS1	0	0.609	88.88	88.88	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	28									
BH62	SS2	0.609	1.097	88.88	88.271	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	44									
BH62	SS3	1.21	1.7	88.88	87.67	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	12		7.9							
BH62	SS4	1.82	2.31	88.88	87.06	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	35		13.3							21.4

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH62	SS5	2.44	2.92	88.88	86.44	Unit 2a	Lean Clay with Sand (CL)	Native	12		19.6							
BH62	SS6	3.05	3.53	88.88	85.83	Unit 2a	Lean Clay with Sand (CL)	Native	17		20.2	29	14					
BH62	SS7	3.66	4.11	88.88	85.22	Unit 2b	Sandy Silt (ML)	Native	11		21.8							
BH62	SS8	4.26	4.75	88.88	84.62	Unit 2b	Sandy Silt (ML)	Native	3		9.3							
BH62	SS10	5.48	5.97	88.88	83.4	Unit 2b	Sandy Silt (ML)	Native	2		10							
BH62	SS11	6.09	6.58	88.88	82.79	Unit 2b	Sandy Silt (ML)	Native	7		8.7							
BH62	SS12	6.7	7.19	88.88	82.18	Unit 2b	Sandy Silt (ML)	Native	14		7.7							
BH62	SS13	7.31	7.8	88.88	81.57	Unit 3	Till: Silty Sand (SM)	Native	14		9.1							
BH62	SS14	7.92	8.41	88.88	80.96	Unit 3	Till: Silty Sand (SM)	Native	126		7.4							
BH62	SS15	8.53	9.02	88.88	80.35	Unit 3	Till: Silty Sand (SM)	Native	136		6.5			11	41	39	9	
BH62	SS16	9.14	9.63	88.88	79.74	Unit 3	Till: Silty Sand (SM)	Native	159		6.9							
BH62	SS17	9.75	10.21	88.88	79.13	Unit 3	Till: Silty Sand (SM)	Native	180		6.9							
BH62	SS18	10.36	10.82	88.88	78.52	Unit 4a	Silty Sand (SM)	Native	169		14.8							
BH62	SS19	10.97	11.43	88.88	77.91	Unit 4a	Silty Sand (SM)	Native	180		14.3			0	60	39	1	
BH62	SS20	11.58	12.07	88.88	77.3	Unit 4a	Silty Sand (SM)	Native	126		13.5							21.7
BH62	SS21	12.19	12.5	88.88	76.69	Unit 4a	Silty Sand (SM)	Native	100	0.14	16.7							
BH62	SS22	12.8	13.1	88.88	76.08	Unit 4a	Silty Sand (SM)	Native	100	0.13	16.1							
BH62	SS23	13.41	13.7	88.88	75.47	Unit 4a	Silty Sand (SM)	Native	100	0.14	19.5							
BH62	SS24	14.02	14.43	88.88	74.86	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	180	0.25	19.1							
BH62	SS25	14.63	14.91	88.88	74.25	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	100	0.13	15.8							
BH62	SS26	15.24	15.65	88.88	73.64	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	171	0.24	17.9							
BH62	SS27	15.84	16.03	88.88	73.04	Unit 4b	Lean Clay (CL)	Native	81		21	23	15	0	3	68	29	
BH62	SS28	16.46	16.92	88.88	72.42	Unit 4a	Silty Sand (SM)	Native	164		21.7							
BH62	SS29	17.07	17.55	88.88	71.81	Unit 4b	lean Clay (CL)	Native	173		20.2	17	14					
BH62	SS30	17.67	18.16	88.88	71.21	Unit 4b	lean Clay (CL)	Native	54		21.5							
BH62	SS31	18.28	18.77	88.88	70.6	Unit 4b	lean Clay (CL)	Native	41		22.9							
BH62	SS32	18.89	19.38	88.88	69.99	Unit 4b	lean Clay (CL)	Native	24		21.9	32	16					
BH62	SS33	19.51	19.96	88.88	69.37	Unit 4b	lean Clay (CL)	Native	24		18.5							
BH62	SS34	20.11	20.54	88.88	68.77	Unit 4a	Silty Sand (SM)	Native	165		15.3							22.1
BH62	SS35	20.73	21.18	88.88	68.15	Unit 4a	Silty Sand (SM)	Native	195	0.29	19.6							
BH62	SS36	21.33	21.82	88.88	67.55	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	118		12.1							
BH62	SS37	21.94	22.43	88.88	66.94	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	82		7.4	15	10	4	33	45	18	
BH62	SS38	22.55	23.04	88.88	66.33	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	144		9							
BH62	SS39	23.16	23.31	88.88	65.72	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	100	0.14	7							
BH62	SS40	23.77	24.23	88.88	65.11	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	183		6							
BH63	SS1	0	0.61	87.87	87.87	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	17		4.8							
BH63	SS2	0.76	1.22	87.87	87.11	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24		5.5			19	47	28	7	
BH63	SS3	1.52	1.98	87.87	86.35	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	14		11.3							
BH63	SS4	4.57	5.03	87.87	83.3	Unit 3	Till: Silty Sand with Gravel (SM)	Native	166		6.3			21	41	30	7	24.3
BH63	SS5	7.62	8.08	87.87	80.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	115		6.9							24.2
BH63	SS6	10.67	11.13	87.87	77.2	Unit 4a	Sandy Silt (ML)	Native	201		13			0	32	57	11	20.3
BH63	SS7	13.72	14.17	87.87	74.15	Unit 4a	Sandy Silt (ML)	Native	279		17.6							21.2
BH63	SS8	16.76	17.22	87.87	71.11	Unit 4b	lean Clay (CL)	Native	43		23.3	35	15	0	3	45	52	
BH63	SS9	19.81	19.96	87.87	68.06	Unit 5	Till: Silty Sand with Gravel (SM)	Native	110	0.15	12.6							25.6
BH63	SS10	22.86	23.13	87.87	65.01	Unit 5	Till: Silty Sand with Gravel (SM)	Native	100	0.19	7.1							
BH65	SS1	0.03	0.61	89.32	89.29	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	12	0.02								
BH65	SS2	0.61	1.07	89.32	88.71	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	39									
BH65	SS3	1.22	1.68	89.32	88.1	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	54		4.4							
BH65	SS4	1.83	2.29	89.32	87.49	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22									
BH65	SS5	2.44	2.9	89.32	86.88	Unit 2a	Lean Clay with Sand (CL) to Lean Clay (CL)	Native	13		21.6	30	15	1	17	60	22	
BH65	SS8	4.37	4.83	89.32	84.95	Unit 2a	Lean Clay with Sand (CL) to Lean Clay (CL)	Native	2		41.6	41	17	0	4	45	51	
BH65	SS10	5.49	5.94	89.32	83.83	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	2		11.8							
BH65	SS12	6.71	7.16	89.32	82.61	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	6		8							
BH65	SS13	7.32	7.77	89.32	82	Unit 3	Till: Silty Sand with Gravel (SM)	Native	37		7							
BH65	SS14	7.92	8.38	89.32	81.4	Unit 3	Till: Silty Sand with Gravel (SM)	Native	198		9.5							23.3
BH65	SS15	8.53	8.99	89.32	80.79	Unit 3	Till: Silty Sand with Gravel (SM)	Native	135		8.1			20	32	39	9	
BH65	SS16	9.14	9.6	89.32	80.18	Unit 4a	Silty Sand (SM)	Native	134		11.8							
BH65	SS17	9.75	10.16	89.32	79.57	Unit 4a	Silty Sand (SM)	Native	179	0.25	12.2			5	73	21	0	

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH65	SS18	10.36	10.8	89.32	78.96	Unit 4a	Silty Sand (SM)	Native	181	0.25	11.2							
BH65	SS19	10.97	11.43	89.32	78.35	Unit 4a	Silty Sand (SM)	Native	200	0.28	15							
BH65	SS20	11.58	12.04	89.32	77.74	Unit 4a	Silty Sand (SM)	Native	159		14.3							
BH65	SS21	12.19	12.6	89.32	77.13	Unit 4a	Silty Sand (SM)	Native	186	0.23	9.4							
BH65	SS22	12.8	13.1	89.32	76.52	Unit 4b	Sandy Silty Clay (CL-ML)	Native	85		11.9							
BH65	SS23	13.41	13.87	89.32	75.91	Unit 4b	Sandy Silty Clay (CL-ML)	Native	99		13.5	16	11	8	26	52	14	
BH65	SS24	14.02	14.47	89.32	75.3	Unit 4a	Silty Sand (SM)	Native	184	0.29	14.9			2	10	87	1	
BH65	SS25	14.63	15.07	89.32	74.69	Unit 4a	Silty Sand (SM)	Native	174	0.29	14.3							
BH65	SS26	15.24	15.7	89.32	74.08	Unit 4a	Silty Sand (SM)	Native	184		18.7							
BH65	SS27	15.84	16.31	89.32	73.48	Unit 4a	Silty Sand (SM)	Native	160		17.3							
BH65	SS28	16.46	16.92	89.32	72.86	Unit 4a	Silt with Sand (ML)	Native	170	0.29	19.5							
BH65	SS29	17.07	17.45	89.32	72.25	Unit 4b	Lean Clay with Sand (CL)	Native	42		22.6	28	15					
BH65	SS30	17.67	18.16	89.32	71.65	Unit 4b	Sandy Lean Clay (CL)	Native	133		24.6			0	5	89	7	
BH65	SS31	18.28	18.77	89.32	71.04	Unit 4b	lean Clay (CL)	Native	33		21.6	30	15					
BH65	SS33	19.51	19.96	89.32	69.81	Unit 4b	lean Clay (CL)	Native	26		23.7	31	15	0	2	55	43	
BH65	SS35	20.73	21.18	89.32	68.59	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	166	0.26	21							
BH65	SS36	21.33	21.6	89.32	67.99	Unit 4b	Sandy Silty Clay (CL-ML)	Native	100	0.11	17.5							
BH65	SS37	21.94	22.23	89.32	67.38	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.13	20.1	23	12					
BH65	SS38	22.56	23.01	89.32	66.76	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	70		7.8							
BH65	SS39	23.16	23.62	89.32	66.16	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	115		9.6	16	11	3	25	58	14	
BH65	SS40	23.77	24.21	89.32	65.55	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	160	0.28	7.8							
BH65	SS41	24.38	24.64	89.32	64.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	100	0.1	15.2							
BH65	SS42	24.99	25.43	89.32	64.33	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	143	0.28	16.6							
BH66	SS1	0.31	0.56	89.49	89.18	Unit 1	Fill: Poorly Graded Gravelly Sand (SP)	Fill	6									
BH66	SS2	0.76	1.22	89.49	88.73	Unit 1	Fill: Silty Sand (SM)	Fill	58		5.1			12	44	35	10	
BH66	SS3	1.52	1.98	89.49	87.97	Unit 1	Fill: Silty Sand (SM)	Fill	26									
BH66	SS4	2.29	2.9	89.49	87.2	Unit 2a	Lean Clay with Sand (CL)	Native	11		18.9							
BH66	SS5	3.05	3.51	89.49	86.44	Unit 2a	Lean Clay with Sand (CL)	Native	18		19	32	15					
BH66	SS6	4.04	4.27	89.49	85.45	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	4		12.8							
BH66	SS7	5.33	5.94	89.49	84.16	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	2		8							
BH66	SS9	6.86	7.32	89.49	82.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	15									
BH66	SS10	7.62	8.08	89.49	81.87	Unit 3	Till: Silty Sand with Gravel (SM)	Native	105		7.7							
BH66	SS11	9.14	9.6	89.49	80.35	Unit 4a	Sandy Silt (ML)	Native	121									
BH66	SS12	10.67	11.13	89.49	78.82	Unit 4a	Sandy Silt (ML)	Native	183		13.7			5	28	61	6	
BH66	SS13	12.19	12.62	89.49	77.3	Unit 4a	Sandy Silt (ML)	Native	180	0.28	11							
BH66	SS14	13.72	14.01	89.49	75.77	Unit 4a	Sandy Silt (ML)	Native	195	0.14								
BH66	SS15	15.24	15.68	89.49	74.25	Unit 4a	Sandy Silt (ML)	Native	100	0.29	17							
BH66	SS16	18.57	18.75	89.49	70.92	Unit 4b	Lean Clay (CL)	Native	118		18.9							
BH66	SS17	21.34	21.79	89.49	68.15	Unit 4b	Lean Clay (CL)	Native	19		24.6	30	16	0	7	48	45	
BH66	SS18	24.38	24.84	89.49	65.11	Unit 5	Till: Lean Clay with Sand (CL)	Native	64		9.1	20	12	5	17	56	23	
BH69	SS1	0	0.61	87.54	87.54	Unit 1	Fill: Silty Sand with gravel (SM)	Fill	28									
BH69	SS2	0.76	1.22	87.54	86.78	Unit 1	Fill: Silty Sand with gravel (SM)	Fill	56		5.2							
BH69	SS3	1.53	1.98	87.54	86.01	Unit 1	Fill: Sandy Lean Clay with Gravel (CL)	Fill	24		9.4							21.8
BH69	SS4	2.29	2.75	87.54	85.25	Unit 3	Till: Silty Sand (SM)	Native	7		8.7							
BH69	SS5	3.05	3.51	87.54	84.49	Unit 3	Till: Silty Sand (SM)	Native	36		7.2	12	9	12	45	35	8	
BH69	SS6	4.58	5.03	87.54	82.96	Unit 3	Till: Silty Sand (SM)	Native	65		6							
BH69	SS7	6.1	6.56	87.54	81.44	Unit 3	Till: Silty Sand (SM)	Native	157		7.1							
BH69	SS8	7.63	8.11	87.54	79.91	Unit 3	Till: Silty Sand (SM)	Native	77		6.1							23
BH69	SS9	9.15	9.25	87.54	78.39	Unit 3	Till: Silty Sand (SM)	Native	100	0.1								
BH69	SS10	10.68	11.1	87.54	76.86	Unit 3	Till: Silty Sand (SM)	Native	192	0.28	9.4							
BH69	SS11	12.2	12.48	87.54	75.34	Unit 4a	Sandy Silt (ML)	Native	100	0.13	16.3							20.8
BH69	SS12	13.73	14	87.54	73.81	Unit 4a	Sandy Silt (ML)	Native	100	0.13	16.8			0	48	51	1	
BH69	SS13	15.24	15.48	87.54	72.3	Unit 4a	Sandy Silt (ML)	Native	100	0.09	15.5							22.2
BH69	SS14	18.29	18.57	87.54	69.25	Unit 5	Till: Lean Clay with Sand (CL)	Native	100	0.13	10.4							22.9
BH69	SS15	21.35	21.81	87.54	66.19	Unit 5	Till: Lean Clay with Sand (CL)	Native	63		11.2	16	10	2	29	45	24	24
BH69	SS16	22.86	23.14	87.54	64.68	Unit 5	Till: Lean Clay with Sand (CL)	Native	100	0.13	8.9							
BH70	SS1	0	0.61	96.4	96.4	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	35		4.6							17.9

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH70	SS2	0.61	1.07	96.4	95.79	Unit 1	Fill: Silty Clayey Sand (SC-SM)	Fill	12		11.7							
BH70	SS3	1.22	1.68	96.4	95.18	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	43		6.3							
BH70	SS4	1.83	2.29	96.4	94.57	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	88		6.4							
BH70	SS5	2.44	2.84	96.4	93.96	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	191	0.25	7.8			5	45	42	8	
BH70	SS6	3.05	3.5	96.4	93.35	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	132	0.28	8.5							
BH70	SS7	3.66	4.11	96.4	92.74	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	53		5.8							
BH70	SS8	4.27	4.52	96.4	92.13	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	145	0.1	5.2							25.8
BH70	SS9	4.88	5.33	96.4	91.52	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	181		8.1							
BH70	SS10	5.5	5.9	96.4	90.9	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	132		6.7							
BH70	SS11	6.1	6.55	96.4	90.3	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	136		7.9	13	10	10	37	44	9	
BH70	SS12	6.71	7.16	96.4	89.69	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	95		9.3							
BH70	SS13	7.32	7.77	96.4	89.08	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	94		9	14	10	9	35	46	11	
BH70	SS14	7.92	8.33	96.4	88.48	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	166	0.25	10.2							
BH70	SS15	8.53	8.94	96.4	87.87	Unit 4b	Sandy Silty Clay (CL-ML)	Native	170	0.25	14.3							
BH70	SS16	9.14	9.53	96.4	87.26	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	190	0.23	10.5	16	11	11	27	46	16	
BH70	SS17	9.75	10.01	96.4	86.65	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	100	0.1	8							
BH70	SS18	10.36	10.82	96.4	86.04	Unit 3	Till: Lean Clay with Sand (CL)	Native	86		13.6	29	14	10	14	41	35	
BH70	SS19	10.97	11.41	96.4	85.43	Unit 4a	Silt (ML)	Native	142	0.28	17.2							
BH70	SS20	11.58	11.96	96.4	84.82	Unit 4a	Silt (ML)	Native	196	0.1	15.3							
BH70	SS21	12.19	12.6	96.4	84.21	Unit 4a	Silt (ML)	Native	164	0.25	17.3			0	8	79	13	
BH70	SS22	12.8	13.03	96.4	83.6	Unit 4a	Silt (ML)	Native	100	0.07	13.2							
BH70	SS23	13.41	13.66	96.4	82.99	Unit 4a	Silt (ML)	Native	100	0.1	18.1	19	17	0	4	84	11	
BH70	SS24	14.02	14.48	96.4	82.38	Unit 4b	lean Clay (CL)	Native	82		18.1							
BH70	SS25	14.63	15.09	96.4	81.77	Unit 4b	lean Clay (CL)	Native	60		20.7	33	15	1	4	53	42	
BH70	SS26	15.24	15.7	96.4	81.16	Unit 4b	lean Clay (CL)	Native	113		19.7							
BH70	SS27	15.85	16.13	96.4	80.55	Unit 4a	Silty Sand (SM)	Native	100	0.13	14.4							
BH70	SS28	16.46	16.89	96.4	79.94	Unit 4a	Silty Sand (SM)	Native	195	0.28	16.1							
BH70	SS29	17.07	17.45	96.4	79.33	Unit 4a	Silty Sand (SM)	Native	198	0.23	12.5			0	63	36	1	
BH70	SS30	17.68	17.96	96.4	78.72	Unit 4a	Silty Sand (SM)	Native	100	0.13	18.3							
BH70	SS31	18.29	18.42	96.4	78.11	Unit 4a	Silty Sand (SM)	Native	100	0.13	16.9							
BH70	SS32	18.9	19.18	96.4	77.5	Unit 4a	Silty Sand (SM)	Native	100	0.13	18.8							
BH70	SS33	19.51	19.79	96.4	76.89	Unit 4a	Silty Sand (SM)	Native	100	0.13	16.7							
BH70	SS34	20.12	20.52	96.4	76.28	Unit 4a	Silty Sand (SM)	Native	176	0.25	18.2	23	15	0	5	70	25	
BH70	SS35	20.73	21.01	96.4	75.67	Unit 4a	Silty Sand (SM)	Native	100	0.1	13.6							
BH70	SS36	21.34	21.62	96.4	75.06	Unit 4a	Silty Sand (SM)	Native	100	0.13	17							
BH70	SS37	21.95	22.4	96.4	74.45	Unit 4b	lean Clay (CL)	Native	95		21.6	25	15	0	2	61	37	
BH70	SS38	22.56	22.84	96.4	73.84	Unit 4b	lean Clay (CL)	Native	100	0.1	19.8							
BH70	SS39	23.16	23.57	96.4	73.24	Unit 4a	Silt with Sand (ML)	Native	109	0.25	19.9							19.3
BH70	SS40	23.77	24.23	96.4	72.63	Unit 4b	lean Clay (CL)	Native	51		20							
BH70	SS41	24.38	24.84	96.4	72.02	Unit 4b	lean Clay (CL)	Native	41		24.6	37	16	0	2	45	53	
BH70	SS42	24.99	25.45	96.4	71.41	Unit 4b	lean Clay (CL)	Native	47		19.6							
BH70	SS43	25.6	26.06	96.4	70.8	Unit 5	Till: Silt with Sand (ML)	Native	95		14							
BH70	SS44	26.21	26.66	96.4	70.19	Unit 5	Till: Silt with Sand (ML)	Native	137	0.29	12.7							23.9
BH70	SS45	26.82	27.27	96.4	69.58	Unit 5	Till: Silt with Sand (ML)	Native	116	0.29	8.6	15	12	5	18	60	17	
BH70	SS46	27.43	27.89	96.4	68.97	Unit 5	Till: Silt with Sand (ML)	Native	166	0.29	9.6							
BH70	SS47	28.04	28.5	96.4	68.36	Unit 5	Till: Silt with Sand (ML)	Native	100		9.5							
BH70	SS48	28.65	29.11	96.4	67.75	Unit 5	Till: Silt with Sand (ML)	Native	74		10.4							
BH70	SS49	29.26	29.72	96.4	67.14	Unit 5	Till: Silt with Sand (ML)	Native	90		7.9							
BH70	SS50	29.87	30.33	96.4	66.53	Unit 5	Till: Silt with Sand (ML)	Native	142		7.7							
BH70	SS51	30.48	30.5	96.4	65.92	Unit 5	Till: Silt with Sand (ML)	Native	100	0.03	3.5							
BH72	SS1	0	0.61	96.65	96.65	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	26									
BH72	SS2	0.762	1.219	96.65	95.888	Unit 1	Fill: Lean Clay (CL)	Fill	17									
BH72	SS3	1.52	1.98	96.65	95.13	Unit 1	Fill: Silty Sand (SM)	Fill	26		6.1							
BH72	SS4	2.29	2.74	96.65	94.36	Unit 3	Till: Sandy Silt (ML)	Native	90		6							
BH72	SS5	3.05	3.51	96.65	93.6	Unit 3	Till: Sandy Silt (ML)	Native	122		6.9							
BH72	SS6	3.81	4.09	96.65	92.84	Unit 3	Till: Sandy Silt (ML)	Native	100	0.13	6.6							
BH72	SS7	4.57	5	96.65	92.08	Unit 3	Till: Sandy Silt (ML)	Native	196	0.28	8.8			3	40	49	9	
BH72	SS8	5.33	5.47	96.65	91.32	Unit 3	Till: Sandy Silt (ML)	Native	100	0.14	7.6							
BH72	SS9	6.1	6.24	96.65	90.55	Unit 3	Till: Sandy Silt (ML)	Native	100	0.14	9							25.9

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH72	SS10	7.62	7.75	96.65	89.03	Unit 3	Till: Sandy Silt (ML)	Native	100	0.13	10.6							
BH72	SS11	9.14	9.6	96.65	87.51	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	75		8.5	14	10	14	36	38	11	23.2
BH72	SS12	10.67	11.13	96.65	85.98	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	55		9.6							
BH72	SS13	12.19	12.65	96.65	84.46	Unit 4a	Silty Sand (SM)	Native	81		15.7			1	65	32	1	
BH72	SS14	13.72	13.94	96.65	82.93	Unit 4a	Silty Sand (SM)	Native	100	0.08	14							25.2
BH72	SS15	15.24	15.44	96.65	81.41	Unit 4a	Silty Sand (SM)	Native	100	0.05	15.8							
BH72	SS16	18.29	18.41	96.65	78.36	Unit 4b	Sandy Silty Clay (CL-ML)	Native	100	0.13	13.7							
BH72	SS17	21.34	21.56	96.65	75.31	Unit 4a	Silty Sand (SM)	Native	100	0.08	15.8							
BH72	SS18	24.38	24.84	96.65	72.27	Unit 4a	Silt with Sand (ML)	Native	127		22.3	31	15	1	9	46	45	
BH72	SS19	27.43	27.63	96.65	69.22	Unit 5	Till: Sandy Silt (ML)	Native	100	0.05	11.8	13	10	4	32	50	15	
BH72	SS20	30.48	30.58	96.65	66.17	Unit 5	Till: Sandy Silt (ML)	Native	100	0.1	13.3							
BH75	SS1	0	0.61	86.53	86.53	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	32		4.3							
BH75	SS2	0.61	1.22	86.53	85.92	Unit 2a	Lean Clay (CL)	Native	13		25.5	39	19	0	9	53	38	
BH75	SS3	1.52	1.98	86.53	85.01	Unit 2b	Sandy Silt (ML)	Native	12		11.6	13	10	5	41	42	13	
BH75	SS4	2.29	2.74	86.53	84.24	Unit 3	Till: Silty Sand (SM)	Native	94		5.5							
BH75	SS5	3.05	3.51	86.53	83.48	Unit 3	Till: Silty Sand (SM)	Native	163		4.6	12	10	12	45	34	9	
BH75	SS6	3.81	4.27	86.53	82.72	Unit 3	Till: Silty Sand (SM)	Native	158		6.6							
BH75	SS7	4.57	5.03	86.53	81.96	Unit 3	Till: Silty Sand (SM)	Native	110		7.4							
BH75	SS8	5.33	5.78	86.53	81.2	Unit 3	Till: Silty Sand (SM)	Native	85		7.2							23.4
BH75	SS9	6.1	6.47	86.53	80.43	Unit 3	Till: Silty Sand (SM)	Native	182	0.22	6.8							
BH75	SS10	7.62	8.08	86.53	78.91	Unit 3	Till: Silty Sand (SM)	Native	196	0.27	7.9			8	44	41	7	
BH75	SS11	9.14	9.57	86.53	77.39	Unit 3	Till: Silty Sand (SM)	Native	191	0.25	7.9							
BH75	SS12	10.67	10.92	86.53	75.86	Unit 3	Till: Silty Sand (SM)	Native	100	0.1	5.6							
BH75	SS13	12.19	12.39	86.53	74.34	Unit 4a	Silty Sand (SM)	Native	142	0.27	11.4							
BH75	SS14	13.72	14.17	86.53	72.81	Unit 4a	Silty Sand (SM)	Native	142	0.27	15.7			8	44	47	1	
BH75	SS15	15.24	15.6	86.53	71.29	Unit 4b	Silty Clay (CL-ML)	Native	146	0.2	20.9	19	13	1	6	70	23	
BH75	SS16	18.3	18.76	86.53	68.23	Unit 5	Silty Clay with Sand (CL-ML)	Native	180		14.7	16	12	2	17	65	17	26.8
BH75	SS17	21.36	21.82	86.53	65.17	Unit 5	Silty Clay with Sand (CL-ML)	Native	41		13.5			3	20	52	26	25.1
BH76	SS1	0	0.61	86.12	86.12	Unit 1	Fill: Silty Sand (SM)	Fill	5		14.3			21	56	17	6	
BH76	SS2	0.76	1.22	86.12	85.36	Unit 1	Fill: Silty Sand (SM)	Fill	1									
BH76	SS3	1.52	1.98	86.12	84.6	Unit 3	Till: Silty Sand (SM)	Native	65		6.9							
BH76	SS4	2.29	2.74	86.12	83.83	Unit 3	Till: Silty Sand (SM)	Native	78		5							
BH76	SS5	3.05	3.48	86.12	83.07	Unit 3	Till: Silty Sand (SM)	Native	180	0.28	4.4							
BH76	SS6	3.81	4.27	86.12	82.31	Unit 3	Till: Silty Sand (SM)	Native	146		7.1							
BH76	SS7	4.57	5.03	86.12	81.55	Unit 3	Till: Silty Sand (SM)	Native	94		6.9			14	42	36	8	
BH76	SS8	5.33	5.79	86.12	80.79	Unit 3	Till: Silty Sand (SM)	Native	106		12.3							
BH76	SS9	6.1	6.55	86.12	80.02	Unit 3	Till: Silty Sand (SM)	Native	108		6.6							
BH76	SS10	7.62	8.08	86.12	78.5	Unit 3	Till: Silty Sand (SM)	Native	99		7.8							
BH76	SS11	9.14	9.6	86.12	76.98	Unit 3	Till: Silty Sand (SM)	Native	168		6.6							
BH76	SS12	10.67	11.13	86.12	75.45	Unit 3	Till: Silty Sand (SM)	Native	89		7.3	12	10	8	46	37	9	
BH76	SS13	12.19	12.6	86.12	73.93	Unit 3	Till: Silty Sand (SM)	Native	173	0.25	7.7							
BH76	SS14	13.72	14.01	86.12	72.4	Unit 4a	Silty Sand (SM)	Native	100	0.16	16							
BH76	SS15	15.24	15.54	86.12	70.88	Unit 4a	Silty Sand (SM)	Native	139		15.6							
BH76	SS16	16.76	17.22	86.12	69.36	Unit 4b	Lean Clay (CL)	Native	35		20.9	33	16	0	5	43	52	
BH76	SS17	18.29	18.75	86.12	67.83	Unit 4a	Silt (ML)	Native	111		12.6			1	13	61	24	22.4
BH76	SS18	19.81	20.07	86.12	66.31	Unit 4a	Silt (ML)	Native	100	0.1	15.2							
BH76	SS19	21.34	21.79	86.12	64.78	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	79		8.5	14	9	5	36	44	16	20.9
BH78	SS1	0	0.61	86.82	86.82	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	30									
BH78	SS3	1.52	1.98	86.82	85.3	Unit 3	Till: Silty Sand with Gravel (SM)	Native	51		8							25.2
BH78	SS4	2.29	2.74	86.82	84.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	72		8							
BH78	SS5	3.05	3.5	86.82	83.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	63		9							
BH78	SS6	3.81	4.27	86.82	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	64		6.1							
BH78	SS7	4.57	5.03	86.82	82.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	101		7.1			27	40	27	6	
BH78	SS8	5.33	5.78	86.82	81.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	65		7.9							
BH78	SS9	6.1	6.55	86.82	80.72	Unit 3	Till: Silty Sand with Gravel (SM)	Native	101		8.2							
BH78	SS10	7.62	8	86.82	79.2	Unit 3	Till: Silty Sand with Gravel (SM)	Native	189	0.23	7.3			16	46	31	7	25.1
BH78	SS11	9.14	9.6	86.82	77.68	Unit 3	Till: Silty Sand with Gravel (SM)	Native	195		5.8							

BH ID	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	N Value	Pen. if Refused	Moisture Content	LL	PL	Gravel	Sand	Silt	Clay	Total Unit wt
-	-	m	m	Ground	Sample	-	-	-	-	m	%	%	%	%	%	%	%	kN/m^3
BH78	SS12	10.67	11	86.82	76.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	185	0.26	13.7			0	68	30	1	
BH78	SS13	12.19	12.53	86.82	74.63	Unit 4a	Silty Sand (SM)	Native	186	0.26	20.2							21.6
BH78	SS14	13.72	14.02	86.82	73.1	Unit 4a	Silty Sand (SM)	Native	100	0.15	18.2							
BH78	SS15	15.24	15.7	86.82	71.58	Unit 4a	Silty Sand (SM)	Native	162		18.4							
BH78	SS16	16.76	17.22	86.82	70.06	Unit 4a	Silty Sand (SM)	Native	81									
BH78	SS17	18.29	18.75	86.82	68.53	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	40		11.3							23
BH78	SS18	19.81	20.27	86.82	67.01	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	96		16.6			0	30	57	13	
BH78	SS19	21.34	21.79	86.82	65.48	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	52		12.8	19	12					25.7
BH78	SS20	22.56	23.07	86.82	64.26	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	80		17.9							

Table B3-a: Crosshole Results - BH15

Depth	Compressional Wave Velocity (m/s)	Shear Wave Velocity (m/s)
0	1434	480
1	1526	484
2	1488	488
3	1535	493
4	1605	497
5	1627	511
6	1801	527
7	1933	534
8	2048	545
9	2067	562
10	1994	584
11	2083	589
12	2243	620
13	2211	649
14	2348	645
15	2302	628
16	2207	637
17	2266	648
18	2213	646
19	2273	637
20	2418	637
21	2359	653
22	2387	642
23	2418	652
24	2382	683
25	2470	689
26	2362	697
27	2413	720
28	2690	727

Table B3-b: Crosshole Results - BH28

Depth	Compressional Wave Velocity (m/s)	Shear Wave Velocity (m/s)
0	1114	523
1	1116	569
2	1271	579
3	1420	586
4	1600	594
5	1874	601
6	1923	609
7	1788	638
8	1873	662
9	1888	682
10	1810	712
11	1694	730
12	1587	741
13	1485	747
14	1429	756
15	1559	762
16	1631	772
17	1701	782
18	1796	785
19	1873	781
20	1988	784
21	2094	785
22	2222	786
23	2384	786

Table B3-c: Crosshole Results - BH66

Depth	Compressional Wave Velocity (m/s)	Shear Wave Velocity (m/s)
0	1184	394
1	1216	398
2	1260	403
3	1289	407
4	1367	412
5	1364	414
6	1279	433
7	1302	483
8	1303	519
9	1379	527
10	1516	541
11	1468	553
12	1635	567
13	1690	569
14	1637	573
15	1709	584
16	1649	588
17	1669	598
18	1673	604
19	1675	614
20	1664	614
21	1776	661
22	1909	700
23	2228	716
24	2413	761
25	2732	792

Table B3-d: VSP Results - BH03

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.00	0.57	420	265	2141	0.17	150	352	177
0.57	1.57	560	293	2039	0.31	175	459	406
1.57	2.57	740	338	2039	0.37	233	637	806
2.57	3.57	1200	347	2039	0.45	246	714	2609
3.57	4.57	1200	349	2039	0.45	248	722	2605
4.57	5.57	1800	369	2039	0.48	278	821	6236
5.57	6.57	1800	399	2039	0.47	325	957	6174
6.57	7.57	1800	429	2345	0.47	432	1269	7022
7.57	8.57	2200	453	2345	0.48	481	1422	10708
8.57	9.57	2200	470	2345	0.48	518	1529	10659
9.57	10.57	2200	484	2141	0.47	502	1479	9694
10.57	11.57	2200	498	2141	0.47	531	1564	9654
11.57	12.57	2200	510	2141	0.47	557	1639	9620
12.57	13.57	2200	520	2243	0.47	607	1784	10047
13.57	14.57	2200	530	2243	0.47	630	1851	10016
14.57	15.57	2200	540	2243	0.47	654	1920	9984
15.57	16.57	2200	552	2243	0.47	683	2004	9945
16.57	17.57	2200	565	2243	0.46	716	2098	9901
17.57	18.57	2200	581	2141	0.46	723	2114	9399
18.57	19.57	2200	599	2141	0.46	768	2243	9338
19.57	20.57	2200	621	2243	0.46	865	2520	9703
20.57	21.57	2200	649	2141	0.45	902	2619	9160
21.57	22.57	2200	684	2141	0.45	1002	2898	9027
22.57	23.57	2200	732	2243	0.44	1202	3456	9254
23.57	24.57	2200	795	2345	0.42	1482	4224	9374
24.57	25.57	2400	875	2641	0.42	2022	5756	12516
25.57	26.57	2400	970	2641	0.40	2485	6970	11899
26.57	27.57	3400	1082	2641	0.44	3092	8927	26407
27.57	28.57	3400	1212	2641	0.43	3879	11074	25357
28.57	29.57	4400	1317	2681	0.45	4650	13493	45704
29.57	30.57	4400	1317	2681	0.45	4650	13493	45704
30.57	31.57	4400	1317	2681	0.45	4650	13493	45704
31.57	32.57	4400	1317	2681	0.45	4650	13493	45704
32.57	33.57	4400	1317	2681	0.45	4650	13493	45704
33.57	34.57	4400	1317	2681	0.45	4650	13493	45704
34.57	35.57	4400	1317	2681	0.45	4650	13493	45704
35.57	36.57	4400	1317	2681	0.45	4650	13493	45704
36.57	37.57	4400	1317	2681	0.45	4650	13493	45704
37.57	38.57	4400	1317	2681	0.45	4650	13493	45704
38.57	39.57	4400	1317	2681	0.45	4650	13493	45704

Table B3-e: VSP Results - BH04

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.3	440	304	2141	0.04	198	413	151
0.3	1.3	500	300	2141	0.22	193	470	278
1.3	2.3	600	297	2141	0.34	189	505	519
2.3	3.3	1200	302	2141	0.47	195	573	2823
3.3	4.3	2000	306	2039	0.49	191	568	7901
4.3	5.3	2000	310	2039	0.49	196	583	7895
5.3	6.3	2000	317	2039	0.49	205	609	7883
6.3	7.3	2000	326	2039	0.49	217	644	7867
7.3	8.3	2000	336	2039	0.49	230	684	7849
8.3	9.3	2000	348	2039	0.48	247	733	7827
9.3	10.3	2000	362	2243	0.48	294	872	8580
10.3	11.3	2000	377	2243	0.48	319	945	8547
11.3	12.3	2000	393	2243	0.48	346	1025	8510
12.3	13.3	2000	411	2243	0.48	379	1120	8467
13.3	14.3	2000	431	2243	0.48	417	1230	8416
14.3	15.3	2000	454	2243	0.47	462	1362	8356
15.3	16.3	2000	480	2243	0.47	517	1519	8283
16.3	17.3	2000	509	2243	0.47	581	1703	8197
17.3	18.3	2000	542	2243	0.46	659	1925	8093
18.3	19.3	2000	581	2141	0.45	723	2102	7600
19.3	20.3	2000	626	2141	0.45	839	2426	7445
20.3	21.3	2000	677	2141	0.44	981	2817	7256
21.3	22.3	2000	734	2243	0.42	1208	3437	7361
22.3	23.3	2000	798	2243	0.41	1428	4015	7068
23.3	24.3	2000	871	2345	0.38	1779	4921	7008
24.3	25.3	4800	955	2345	0.48	2139	6328	51177
25.3	26.3	4800	1049	2641	0.47	2906	8573	56974
26.3	27.3	4800	1149	2641	0.47	3487	10248	56200
27.3	28.3	4800	1257	2641	0.46	4173	12211	55285
28.3	29.3	4800	1373	2641	0.46	4979	14492	54210
29.3	30.3	4800	1500	2681	0.45	6032	17444	53727
30.3	31.3	4800	1640	2681	0.43	7211	20679	52156
31.3	32.3	4800	1796	2681	0.42	8648	24536	50240
32.3	33.3	4800	1971	2681	0.40	10415	29133	47883
33.3	34.3	4800	2169	2681	0.37	12613	34603	44953
34.3	35.3	4800	2395	2681	0.33	15378	41037	41266
35.3	36.3	4800	2657	2681	0.28	18927	48419	36534
36.3	37.3	4800	2712	2681	0.27	19719	49909	35479
37.3	38.3	4800	2712	2681	0.27	19719	49909	35479
38.3	39.3	4800	2712	2681	0.27	19719	49909	35479
39.3	40.3	4800	2712	2681	0.27	19719	49909	35479

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.3	41.3	4800	2712	2681	0.27	19719	49909	35479
41.3	42.3	4800	2712	2681	0.27	19719	49909	35479
42.3	43.3	4800	2712	2681	0.27	19719	49909	35479
43.3	44.3	4800	2712	2681	0.27	19719	49909	35479
44.3	45.3	4800	2712	2681	0.27	19719	49909	35479
45.3	46.3	4800	2712	2681	0.27	19719	49909	35479
46.3	47.3	4800	2712	2681	0.27	19719	49909	35479
47.3	48.3	4800	2712	2681	0.27	19719	49909	35479
48.3	49.3	4800	2712	2681	0.27	19719	49909	35479
49.3	50.3	4800	2712	2681	0.27	19719	49909	35479
50.3	51.3	4800	2712	2681	0.27	19719	49909	35479
51.3	52.3	4800	2712	2681	0.27	19719	49909	35479
52.3	53.3	4800	2712	2681	0.27	19719	49909	35479
53.3	54.3	4800	2712	2681	0.27	19719	49909	35479
54.3	55.3	4800	2712	2681	0.27	19719	49909	35479
55.3	56.3	4800	2712	2681	0.27	19719	49909	35479
56.3	57.3	4800	2712	2681	0.27	19719	49909	35479
57.3	58.3	4800	2712	2681	0.27	19719	49909	35479
58.3	59.3	4800	2712	2681	0.27	19719	49909	35479
59.3	60.3	4800	2712	2681	0.27	19719	49909	35479
60.3	61.3	4800	2712	2681	0.27	19719	49909	35479
61.3	62.3	4800	2712	2681	0.27	19719	49909	35479
62.3	63.3	4800	2712	2681	0.27	19719	49909	35479
63.3	64.3	4800	2712	2681	0.27	19719	49909	35479
64.3	65.3	4800	2712	2681	0.27	19719	49909	35479
65.3	66.3	4800	2712	2681	0.27	19719	49909	35479
66.3	67.3	4800	2712	2681	0.27	19719	49909	35479
67.3	68.3	4800	2712	2681	0.27	19719	49909	35479
68.3	69.3	4800	2712	2681	0.27	19719	49909	35479
69.3	70.3	4800	2712	2681	0.27	19719	49909	35479
70.3	71.3	4800	2712	2681	0.27	19719	49909	35479
71.3	72.3	4800	2712	2681	0.27	19719	49909	35479
72.3	73.3	4800	2712	2681	0.27	19719	49909	35479
73.3	74.3	4800	2712	2681	0.27	19719	49909	35479
74.3	75.3	4800	2712	2681	0.27	19719	49909	35479
75.3	76.3	4800	2712	2681	0.27	19719	49909	35479
76.3	77.3	4800	2712	2681	0.27	19719	49909	35479
77.3	78.3	4800	2712	2681	0.27	19719	49909	35479
78.3	79.3	4800	2712	2681	0.27	19719	49909	35479
79.3	80.3	4800	2712	2681	0.27	19719	49909	35479
80.3	81.3	4800	2712	2681	0.27	19719	49909	35479
81.3	82.3	4800	2712	2681	0.27	19719	49909	35479

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
82.3	83.3	4800	2712	2681	0.27	19719	49909	35479
83.3	84.3	4800	2712	2681	0.27	19719	49909	35479
84.3	85.3	4800	2712	2681	0.27	19719	49909	35479
85.3	86.3	4800	2712	2681	0.27	19719	49909	35479
86.3	87.3	4800	2712	2681	0.27	19719	49909	35479
87.3	88.3	4800	2712	2681	0.27	19719	49909	35479
88.3	89.3	4800	2712	2681	0.27	19719	49909	35479
89.3	90.3	4800	2712	2681	0.27	19719	49909	35479
90.3	91.3	4800	2712	2679	0.27	19704	49872	35452
91.3	92.3	4800	2712	2679	0.27	19704	49872	35452
92.3	93.3	4800	2712	2679	0.27	19704	49872	35452
93.3	94.3	4800	2712	2679	0.27	19704	49872	35452
94.3	95.3	4800	2712	2679	0.27	19704	49872	35452
95.3	96.3	4800	2712	2679	0.27	19704	49872	35452
96.3	97.3	4800	2712	2679	0.27	19704	49872	35452
97.3	98.3	4800	2712	2679	0.27	19704	49872	35452
98.3	99.3	4800	2712	2679	0.27	19704	49872	35452
99.3	100.3	4800	2712	2679	0.27	19704	49872	35452
100.3	101.3	4800	2712	2679	0.27	19704	49872	35452
101.3	102.3	4800	2712	2679	0.27	19704	49872	35452
102.3	103.3	4800	2712	2679	0.27	19704	49872	35452
103.3	104.3	4800	2712	2679	0.27	19704	49872	35452
104.3	105.3	4800	2712	2679	0.27	19704	49872	35452
105.3	106.3	4800	2712	2679	0.27	19704	49872	35452
106.3	107.3	4800	2712	2679	0.27	19704	49872	35452
107.3	108.3	4800	2712	2679	0.27	19704	49872	35452
108.3	109.3	4800	2712	2679	0.27	19704	49872	35452
109.3	110.3	4800	2712	2679	0.27	19704	49872	35452
110.3	111.3	4800	2712	2679	0.27	19704	49872	35452
111.3	112.3	4800	2712	2679	0.27	19704	49872	35452
112.3	113.3	4800	2712	2679	0.27	19704	49872	35452
113.3	114.3	4800	2712	2679	0.27	19704	49872	35452
114.3	115.3	4800	2712	2679	0.27	19704	49872	35452
115.3	116.3	4800	2712	2679	0.27	19704	49872	35452
116.3	117.3	4800	2712	2679	0.27	19704	49872	35452
117.3	118.3	4800	2712	2679	0.27	19704	49872	35452
118.3	119.3	4800	2712	2679	0.27	19704	49872	35452
119.3	120.3	4800	2712	2679	0.27	19704	49872	35452

Table B3-f: VSP Results - BH09

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.3	370	188	2141	0.33	76	201	192
0.3	1.3	470	212	2141	0.37	96	264	345
1.3	2.3	1000	268	2141	0.46	154	449	1936
2.3	3.3	1400	326	2039	0.47	217	638	3708
3.3	4.3	2200	376	2039	0.48	288	856	9484
4.3	5.3	2200	418	2039	0.48	356	1055	9394
5.3	6.3	2200	458	2039	0.48	428	1264	9298
6.3	7.3	2200	492	2345	0.47	568	1673	10593
7.3	8.3	2200	520	2345	0.47	634	1865	10504
8.3	9.3	2200	538	2345	0.47	679	1993	10445
9.3	10.3	2200	548	2345	0.47	704	2066	10411
10.3	11.3	2200	553	2345	0.47	717	2103	10394
11.3	12.3	2200	558	2243	0.47	698	2047	9925
12.3	13.3	2200	567	2243	0.46	721	2112	9895
13.3	14.3	2200	579	2243	0.46	752	2200	9854
14.3	15.3	2200	595	2243	0.46	794	2320	9797
15.3	16.3	2200	612	2243	0.46	840	2450	9736
16.3	17.3	2200	632	2141	0.46	855	2489	9222
17.3	18.3	2200	657	2141	0.45	924	2682	9130
18.3	19.3	2200	686	2141	0.45	1008	2914	9019
19.3	20.3	2400	719	2345	0.45	1212	3517	11891
20.3	21.3	2400	756	2345	0.44	1340	3873	11720
21.3	22.3	2400	796	2243	0.44	1421	4088	11025
22.3	23.3	2400	841	2243	0.43	1586	4537	10804
23.3	24.3	2400	892	2345	0.42	1866	5298	11019
24.3	25.3	2400	949	2641	0.41	2378	6695	12041
25.3	26.3	2400	1013	2641	0.39	2710	7543	11599
26.3	27.3	4600	1080	2641	0.47	3080	9062	51776
27.3	28.3	4600	1149	2641	0.47	3487	10228	51235
28.3	29.3	4600	1219	2681	0.46	3984	11651	51418
29.3	30.3	4600	1290	2681	0.46	4461	13004	50781
30.3	31.3	4600	1363	2681	0.45	4981	14463	50089
31.3	32.3	4600	1436	2681	0.45	5528	15989	49359
32.3	33.3	4600	1511	2681	0.44	6121	17623	48569
33.3	34.3	4600	1586	2681	0.43	6744	19322	47738
34.3	35.3	4600	1662	2681	0.42	7406	21105	46856
35.3	36.3	4600	1738	2681	0.42	8098	22946	45932
36.3	37.3	4600	1814	2681	0.41	8822	24842	44967
37.3	38.3	4600	1891	2681	0.40	9587	26811	43947
38.3	39.3	4600	1967	2681	0.39	10373	28798	42899
39.3	40.3	4600	2043	2681	0.38	11190	30821	41810

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.3	41.3	4600	2119	2681	0.37	12038	32872	40679
41.3	42.3	4600	2194	2681	0.35	12905	34916	39523
42.3	43.3	4600	2268	2681	0.34	13791	36943	38343
43.3	44.3	4600	2342	2681	0.33	14705	38970	37123
44.3	45.3	4600	2415	2681	0.31	15636	40959	35882
45.3	46.3	4600	2415	2681	0.31	15636	40959	35882
46.3	47.3	4600	2486	2681	0.29	16569	42871	34638
47.3	48.3	4600	2556	2681	0.28	17515	44723	33376
48.3	49.3	4600	2601	2681	0.27	18138	45888	32547
49.3	50.3	4600	2601	2681	0.27	18138	45888	32547
50.3	51.3	4600	2601	2681	0.27	18138	45888	32547
51.3	52.3	4600	2601	2681	0.27	18138	45888	32547
52.3	53.3	4600	2601	2681	0.27	18138	45888	32547
53.3	54.3	4600	2601	2681	0.27	18138	45888	32547
54.3	55.3	4600	2601	2681	0.27	18138	45888	32547
55.3	56.3	4600	2601	2681	0.27	18138	45888	32547
56.3	57.3	4600	2601	2681	0.27	18138	45888	32547
57.3	58.3	4600	2601	2681	0.27	18138	45888	32547
58.3	59.3	4600	2601	2681	0.27	18138	45888	32547
59.3	60.3	4600	2601	2681	0.27	18138	45888	32547
60.3	61.3	4600	2601	2681	0.27	18138	45888	32547
61.3	62.3	4600	2601	2681	0.27	18138	45888	32547
62.3	63.3	4600	2601	2681	0.27	18138	45888	32547
63.3	64.3	4600	2601	2681	0.27	18138	45888	32547
64.3	65.3	4600	2601	2681	0.27	18138	45888	32547
65.3	66.3	4600	2601	2681	0.27	18138	45888	32547
66.3	67.3	4600	2601	2681	0.27	18138	45888	32547
67.3	68.3	4600	2601	2681	0.27	18138	45888	32547
68.3	69.3	4600	2601	2681	0.27	18138	45888	32547
69.3	70.3	4600	2601	2681	0.27	18138	45888	32547
70.3	71.3	4600	2601	2681	0.27	18138	45888	32547
71.3	72.3	4600	2601	2681	0.27	18138	45888	32547
72.3	73.3	4600	2601	2681	0.27	18138	45888	32547
73.3	74.3	4600	2601	2681	0.27	18138	45888	32547
74.3	75.3	4600	2601	2681	0.27	18138	45888	32547
75.3	76.3	4600	2601	2681	0.27	18138	45888	32547
76.3	77.3	4600	2601	2681	0.27	18138	45888	32547
77.3	78.3	4600	2601	2681	0.27	18138	45888	32547
78.3	79.3	4600	2601	2681	0.27	18138	45888	32547
79.3	80.3	4600	2601	2681	0.27	18138	45888	32547
80.3	81.3	4600	2601	2681	0.27	18138	45888	32547
81.3	82.3	4600	2601	2681	0.27	18138	45888	32547

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
82.3	83.3	4600	2601	2681	0.27	18138	45888	32547
83.3	84.3	4600	2601	2681	0.27	18138	45888	32547
84.3	85.3	4600	2601	2681	0.27	18138	45888	32547
85.3	86.3	4600	2601	2681	0.27	18138	45888	32547
86.3	87.3	4600	2601	2681	0.27	18138	45888	32547
87.3	88.3	4600	2601	2681	0.27	18138	45888	32547
88.3	89.3	4600	2601	2681	0.27	18138	45888	32547
89.3	90.3	4600	2601	2679	0.27	18124	45854	32522
90.3	91.3	4600	2601	2679	0.27	18124	45854	32522
91.3	92.3	4600	2601	2679	0.27	18124	45854	32522
92.3	93.3	4600	2601	2679	0.27	18124	45854	32522
93.3	94.3	4600	2601	2679	0.27	18124	45854	32522
94.3	95.3	4600	2601	2679	0.27	18124	45854	32522
95.3	96.3	4600	2601	2679	0.27	18124	45854	32522
96.3	97.3	4600	2601	2679	0.27	18124	45854	32522
97.3	98.3	4600	2601	2679	0.27	18124	45854	32522
98.3	99.3	4600	2601	2679	0.27	18124	45854	32522
99.3	100.3	4600	2601	2679	0.27	18124	45854	32522
100.3	101.3	4600	2601	2679	0.27	18124	45854	32522
101.3	102.3	4600	2601	2679	0.27	18124	45854	32522
102.3	103.3	4600	2601	2679	0.27	18124	45854	32522
103.3	104.3	4600	2601	2679	0.27	18124	45854	32522
104.3	105.3	4600	2601	2679	0.27	18124	45854	32522
105.3	106.3	4600	2601	2679	0.27	18124	45854	32522
106.3	107.3	4600	2601	2679	0.27	18124	45854	32522
107.3	108.3	4600	2601	2679	0.27	18124	45854	32522
108.3	109.3	4600	2601	2679	0.27	18124	45854	32522
109.3	110.3	4600	2601	2679	0.27	18124	45854	32522
110.3	111.3	4600	2601	2679	0.27	18124	45854	32522
111.3	112.3	4600	2601	2679	0.27	18124	45854	32522
112.3	113.3	4600	2601	2679	0.27	18124	45854	32522
113.3	114.3	4600	2601	2679	0.27	18124	45854	32522
114.3	115.3	4600	2601	2679	0.27	18124	45854	32522
115.3	116.3	4600	2601	2679	0.27	18124	45854	32522
116.3	117.3	4600	2601	2679	0.27	18124	45854	32522
117.3	118.3	4600	2601	2679	0.27	18124	45854	32522
118.3	119.3	4600	2601	2679	0.27	18124	45854	32522
119.3	120.3	4600	2601	2679	0.27	18124	45854	32522

Table B3-g: VSP Results - BH11

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.4	510	360	2141	0.00	277	557	187
0.4	1.4	550	388	2141	0.00	322	648	218
1.4	2.4	700	451	2039	0.15	415	950	446
2.4	3.4	1200	518	2345	0.39	629	1744	2538
3.4	4.4	1200	566	2345	0.36	751	2039	2375
4.4	5.4	2200	580	2345	0.46	789	2308	10298
5.4	6.4	2200	582	2345	0.46	794	2323	10291
6.4	7.4	2200	585	2345	0.46	803	2346	10280
7.4	8.4	2200	583	2345	0.46	797	2331	10287
8.4	9.4	2200	578	2345	0.46	783	2292	10305
9.4	10.4	2200	575	2345	0.46	775	2269	10316
10.4	11.4	2200	577	2243	0.46	747	2185	9860
11.4	12.4	2200	580	2243	0.46	755	2207	9850
12.4	13.4	2200	586	2243	0.46	770	2252	9829
13.4	14.4	2200	595	2243	0.46	794	2320	9797
14.4	15.4	2200	608	2243	0.46	829	2419	9751
15.4	16.4	2200	624	2141	0.46	834	2428	9251
16.4	17.4	2200	641	2141	0.45	880	2557	9190
17.4	18.4	2200	661	2141	0.45	935	2714	9115
18.4	19.4	2200	683	2345	0.45	1094	3165	9891
19.4	20.4	2200	707	2345	0.44	1172	3381	9787
20.4	21.4	2200	735	2243	0.44	1212	3483	9240
21.4	22.4	2200	767	2345	0.43	1380	3948	9510
22.4	23.4	2200	805	2345	0.42	1520	4324	9324
23.4	24.4	3000	850	2641	0.46	1908	5558	21225
24.4	25.4	3000	900	2641	0.45	2139	6206	20917
25.4	26.4	3000	951	2641	0.44	2389	6899	20584
26.4	27.4	3000	999	2641	0.44	2636	7578	20255
27.4	28.4	3000	1045	2681	0.43	2928	8379	20225
28.4	29.4	3000	1088	2681	0.42	3174	9040	19898
29.4	30.4	4000	1127	2681	0.46	3405	9922	38356
30.4	31.4	4000	1163	2681	0.45	3626	10544	38061
31.4	32.4	4000	1196	2681	0.45	3835	11128	37783
32.4	33.4	4000	1226	2681	0.45	4030	11671	37523
33.4	34.4	4000	1254	2681	0.45	4216	12188	37275
34.4	35.4	4600	1279	2681	0.46	4386	12790	50882
35.4	36.4	4600	1299	2681	0.46	4524	13180	50698
36.4	37.4	4600	1319	2681	0.46	4664	13575	50511
37.4	38.4	4600	1341	2681	0.45	4821	14016	50302
38.4	39.4	4600	1365	2681	0.45	4995	14504	50070
39.4	40.4	4600	1392	2681	0.45	5195	15061	49803
40.4	41.4	4600	1421	2681	0.45	5414	15670	49512

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
41.4	42.4	4600	1454	2681	0.44	5668	16375	49173
42.4	43.4	4600	1490	2681	0.44	5952	17159	48794
43.4	44.4	4600	1530	2681	0.44	6276	18047	48362
44.4	45.4	4600	1570	2681	0.43	6608	18954	47919
45.4	46.4	4600	1570	2681	0.43	6608	18954	47919
46.4	47.4	4600	1609	2681	0.43	6941	19855	47476
47.4	48.4	4600	1645	2681	0.43	7255	20701	47057
48.4	49.4	4600	1680	2681	0.42	7567	21536	46641
49.4	50.4	4600	1711	2681	0.42	7849	22286	46265
50.4	51.4	4600	1740	2681	0.42	8117	22996	45907
51.4	52.4	4600	1766	2681	0.41	8361	23639	45581
52.4	53.4	4600	1790	2681	0.41	8590	24238	45276
53.4	54.4	4600	1810	2681	0.41	8783	24741	45019
54.4	55.4	4600	1828	2681	0.41	8959	25196	44785
55.4	56.4	4600	1842	2681	0.40	9097	25552	44601
56.4	57.4	4600	1854	2681	0.40	9215	25859	44443
57.4	58.4	4600	1862	2681	0.40	9295	26064	44336
58.4	59.4	4600	1868	2681	0.40	9355	26218	44256
59.4	60.4	4600	1870	2681	0.40	9375	26269	44230
60.4	61.4	4600	1870	2681	0.40	9375	26269	44230
61.4	62.4	4600	1866	2681	0.40	9335	26167	44283
62.4	63.4	4600	1860	2681	0.40	9275	26013	44363
63.4	64.4	4600	1851	2681	0.40	9186	25782	44482
64.4	65.4	4600	1839	2681	0.40	9067	25476	44641
65.4	66.4	4600	1824	2681	0.41	8920	25095	44837
66.4	67.4	4600	1807	2681	0.41	8754	24665	45058
67.4	68.4	4600	1788	2681	0.41	8571	24188	45302
68.4	69.4	4600	1779	2681	0.41	8485	23963	45417
69.4	70.4	4600	1792	2681	0.41	8609	24288	45251
70.4	71.4	4600	1818	2681	0.41	8861	24943	44915
71.4	72.4	4600	1846	2681	0.40	9136	25655	44549
72.4	73.4	4600	1873	2681	0.40	9405	26347	44190
73.4	74.4	4600	1899	2681	0.40	9668	27018	43839
74.4	75.4	4600	1925	2681	0.39	9935	27695	43484
75.4	76.4	4600	1950	2681	0.39	10195	28350	43137
76.4	77.4	4600	1974	2681	0.39	10447	28983	42801
77.4	78.4	4600	1998	2681	0.38	10703	29619	42460
78.4	79.4	4600	2021	2681	0.38	10950	30232	42129
79.4	80.4	4600	2044	2681	0.38	11201	30847	41795
80.4	81.4	4600	2066	2681	0.37	11443	31439	41472
81.4	82.4	4600	2087	2681	0.37	11677	32005	41160
82.4	83.4	4600	2108	2681	0.37	11913	32573	40845
83.4	84.4	4600	2128	2681	0.36	12141	33116	40542

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
84.4	85.4	4600	2148	2681	0.36	12370	33660	40237
85.4	86.4	4600	2167	2681	0.36	12590	34178	39944
86.4	87.4	4600	2186	2681	0.35	12811	34697	39648
87.4	88.4	4600	2205	2681	0.35	13035	35217	39350
88.4	89.4	4600	2223	2679	0.35	13239	35683	39036
89.4	90.4	4600	2241	2679	0.34	13454	36176	38749
90.4	91.4	4600	2259	2679	0.34	13671	36669	38459
91.4	92.4	4600	2277	2679	0.34	13890	37162	38168
92.4	93.4	4600	2295	2679	0.33	14110	37655	37874
93.4	94.4	4600	2313	2679	0.33	14333	38148	37578
94.4	95.4	4600	2332	2679	0.33	14569	38668	37262
95.4	96.4	4800	2350	2679	0.34	14795	39720	41998
96.4	97.4	4800	2369	2679	0.34	15035	40263	41678
97.4	98.4	4800	2389	2679	0.34	15290	40835	41338
98.4	99.4	4800	2410	2679	0.33	15560	41435	40978
99.4	100.4	4800	2432	2679	0.33	15845	42063	40597
100.4	101.4	4800	2455	2679	0.32	16146	42719	40196
101.4	102.4	4800	2480	2679	0.32	16477	43431	39755
102.4	103.4	4800	2483	2679	0.32	16517	43516	39702
103.4	104.4	4800	2488	2679	0.32	16583	43658	39613
104.4	105.4	4800	2494	2679	0.32	16663	43828	39506
105.4	106.4	4800	2499	2679	0.31	16730	43970	39417
106.4	107.4	4800	2504	2679	0.31	16797	44112	39328
107.4	108.4	4800	2508	2679	0.31	16851	44225	39256
108.4	109.4	4800	2512	2679	0.31	16905	44338	39184
109.4	110.4	4800	2516	2679	0.31	16959	44452	39112
110.4	111.4	4800	2520	2679	0.31	17013	44565	39041
111.4	112.4	4800	2524	2679	0.31	17067	44678	38968
112.4	113.4	4800	2528	2679	0.31	17121	44791	38896
113.4	114.4	4800	2532	2679	0.31	17175	44904	38824
114.4	115.4	4800	2536	2679	0.31	17229	45017	38752
115.4	116.4	4800	2540	2679	0.31	17284	45129	38679
116.4	117.4	4800	2544	2679	0.30	17338	45242	38606
117.4	118.4	4800	2547	2679	0.30	17379	45327	38552
118.4	119.4	4800	2550	2679	0.30	17420	45411	38497
119.4	120.4	4800	2553	2679	0.30	17461	45495	38443

Table B3-f: VSP Results - BH13

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.3	600	321	2141	0.30	221	573	477
0.3	1.3	750	363	2141	0.35	282	760	828
1.3	2.3	1400	443	2141	0.44	420	1214	3636
2.3	3.3	1400	482	2345	0.43	545	1561	3870
3.3	4.3	1800	504	2345	0.46	596	1736	6804
4.3	5.3	2200	528	2345	0.47	654	1921	10478
5.3	6.3	2200	555	2345	0.47	722	2118	10387
6.3	7.3	2200	573	2345	0.46	770	2254	10323
7.3	8.3	2200	579	2345	0.46	786	2300	10302
8.3	9.3	2200	585	2345	0.46	803	2346	10280
9.3	10.3	2200	591	2345	0.46	819	2393	10258
10.3	11.3	2200	592	2243	0.46	786	2297	9808
11.3	12.3	2200	595	2243	0.46	794	2320	9797
12.3	13.3	2200	601	2243	0.46	810	2365	9776
13.3	14.3	2200	611	2243	0.46	837	2442	9740
14.3	15.3	2200	623	2243	0.46	871	2536	9695
15.3	16.3	2200	640	2243	0.45	919	2671	9631
16.3	17.3	2200	661	2141	0.45	935	2714	9115
17.3	18.3	2400	688	2141	0.46	1013	2950	10981
18.3	19.3	2400	721	2345	0.45	1219	3536	11882
19.3	20.3	2400	764	2345	0.44	1369	3952	11682
20.3	21.3	2400	819	2243	0.43	1505	4315	10914
21.3	22.3	2400	889	2345	0.42	1853	5265	11036
22.3	23.3	2400	969	2641	0.40	2480	6956	11906
23.3	24.3	3000	1055	2641	0.43	2939	8404	19850
24.3	25.3	3000	1143	2641	0.42	3450	9765	19169
25.3	26.3	3000	1235	2641	0.40	4028	11262	18398
26.3	27.3	4600	1330	2641	0.45	4672	13589	49655
27.3	28.3	4600	1428	2681	0.45	5467	15818	49441
28.3	29.3	4600	1528	2681	0.44	6260	18002	48384
29.3	30.3	4600	1632	2681	0.43	7141	20394	47209
30.3	31.3	4600	1738	2681	0.42	8098	22946	45932
31.3	32.3	4600	1847	2681	0.40	9146	25680	44535
32.3	33.3	4600	1959	2681	0.39	10289	28587	43012
33.3	34.3	4600	2076	2681	0.37	11555	31708	41324
34.3	35.3	4600	2196	2681	0.35	12929	34970	39491
35.3	36.3	4600	2322	2681	0.33	14455	38423	37456
36.3	37.3	4600	2455	2681	0.30	16158	42040	35185
37.3	38.3	4600	2508	2681	0.29	16864	43458	34245
38.3	39.3	4600	2508	2681	0.29	16864	43458	34245
39.3	40.3	4600	2508	2681	0.29	16864	43458	34245

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.3	41.3	4600	2508	2681	0.29	16864	43458	34245
41.3	42.3	4600	2508	2681	0.29	16864	43458	34245
42.3	43.3	4600	2508	2681	0.29	16864	43458	34245
43.3	44.3	4600	2508	2681	0.29	16864	43458	34245
44.3	45.3	4600	2508	2681	0.29	16864	43458	34245
45.3	46.3	4600	2508	2681	0.29	16864	43458	34245
46.3	47.3	4600	2508	2681	0.29	16864	43458	34245
47.3	48.3	4600	2508	2681	0.29	16864	43458	34245
48.3	49.3	4600	2508	2681	0.29	16864	43458	34245
49.3	50.3	4600	2508	2681	0.29	16864	43458	34245
50.3	51.3	4600	2508	2681	0.29	16864	43458	34245
51.3	52.3	4600	2508	2681	0.29	16864	43458	34245
52.3	53.3	4600	2508	2681	0.29	16864	43458	34245
53.3	54.3	4600	2508	2681	0.29	16864	43458	34245
54.3	55.3	4600	2508	2681	0.29	16864	43458	34245
55.3	56.3	4600	2508	2681	0.29	16864	43458	34245
56.3	57.3	4600	2508	2681	0.29	16864	43458	34245
57.3	58.3	4600	2508	2681	0.29	16864	43458	34245
58.3	59.3	4800	2508	2681	0.31	16864	44258	39285
59.3	60.3	4800	2508	2681	0.31	16864	44258	39285
60.3	61.3	4800	2508	2681	0.31	16864	44258	39285
61.3	62.3	4800	2508	2681	0.31	16864	44258	39285
62.3	63.3	4800	2508	2681	0.31	16864	44258	39285
63.3	64.3	4800	2508	2681	0.31	16864	44258	39285
64.3	65.3	4800	2508	2681	0.31	16864	44258	39285
65.3	66.3	4800	2508	2681	0.31	16864	44258	39285
66.3	67.3	4800	2508	2681	0.31	16864	44258	39285
67.3	68.3	4800	2508	2681	0.31	16864	44258	39285
68.3	69.3	4800	2508	2681	0.31	16864	44258	39285
69.3	70.3	4800	2508	2681	0.31	16864	44258	39285
70.3	71.3	4800	2508	2681	0.31	16864	44258	39285
71.3	72.3	4800	2508	2681	0.31	16864	44258	39285
72.3	73.3	4800	2508	2681	0.31	16864	44258	39285
73.3	74.3	4800	2508	2681	0.31	16864	44258	39285
74.3	75.3	4800	2508	2681	0.31	16864	44258	39285
75.3	76.3	4800	2508	2681	0.31	16864	44258	39285
76.3	77.3	4800	2508	2681	0.31	16864	44258	39285
77.3	78.3	4800	2508	2681	0.31	16864	44258	39285
78.3	79.3	4800	2508	2681	0.31	16864	44258	39285
79.3	80.3	4800	2508	2681	0.31	16864	44258	39285

Table B3-g: VSP Results - BH14

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.3	580	224	2141	0.41	107	303	577
0.3	1.3	600	256	2039	0.39	134	371	556
1.3	2.3	800	313	2345	0.41	230	648	1194
2.3	3.3	1000	348	2345	0.43	284	813	1966
3.3	4.3	1800	385	2345	0.48	348	1026	7134
4.3	5.3	1800	416	2345	0.47	406	1195	7057
5.3	6.3	2200	441	2345	0.48	456	1349	10742
6.3	7.3	2200	459	2345	0.48	494	1460	10691
7.3	8.3	2200	471	2243	0.48	498	1469	10193
8.3	9.3	2200	482	2141	0.47	497	1467	9699
9.3	10.3	2200	492	2141	0.47	518	1527	9671
10.3	11.3	2200	497	2243	0.47	554	1632	10117
11.3	12.3	2200	498	2243	0.47	556	1639	10114
12.3	13.3	2200	499	2243	0.47	559	1645	10111
13.3	14.3	2200	502	2243	0.47	565	1665	10102
14.3	15.3	2200	510	2243	0.47	583	1717	10078
15.3	16.3	2200	524	2243	0.47	616	1811	10035
16.3	17.3	2200	542	2243	0.47	659	1934	9978
17.3	18.3	2200	561	2141	0.47	674	1975	9464
18.3	19.3	2200	583	2141	0.46	728	2128	9392
19.3	20.3	2200	607	2243	0.46	826	2411	9754
20.3	21.3	2200	636	2243	0.45	907	2639	9646
21.3	22.3	2200	675	2243	0.45	1022	2960	9493
22.3	23.3	3000	723	2345	0.47	1226	3602	19471
23.3	24.3	3000	781	2641	0.46	1611	4716	21621
24.3	25.3	3000	848	2641	0.46	1899	5533	21237
25.3	26.3	4800	927	2641	0.48	2269	6721	57823
26.3	27.3	4800	1015	2641	0.48	2721	8035	57221
27.3	28.3	4800	1113	2681	0.47	3321	9775	57342
28.3	29.3	4800	1219	2681	0.47	3984	11677	56458
29.3	30.3	4800	1334	2681	0.46	4771	13914	55409
30.3	31.3	4800	1458	2681	0.45	5699	16518	54171
31.3	32.3	4800	1592	2681	0.44	6795	19545	52710
32.3	33.3	4800	1736	2681	0.42	8080	23023	50997
33.3	34.3	4800	1893	2681	0.41	9607	27052	48961
34.3	35.3	4800	2062	2681	0.39	11399	31618	46571
35.3	36.3	4800	2246	2681	0.36	13524	36782	43738
36.3	37.3	4800	2447	2681	0.32	16053	42523	40366
37.3	38.3	4800	2666	2681	0.28	19055	48665	36363
38.3	39.3	4800	2713	2681	0.27	19733	49936	35459
39.3	40.3	4800	2713	2681	0.27	19733	49936	35459

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.3	41.3	4800	2713	2681	0.27	19733	49936	35459
41.3	42.3	4800	2713	2681	0.27	19733	49936	35459
42.3	43.3	4800	2713	2681	0.27	19733	49936	35459
43.3	44.3	4800	2713	2681	0.27	19733	49936	35459
44.3	45.3	4800	2713	2681	0.27	19733	49936	35459
45.3	46.3	4800	2713	2681	0.27	19733	49936	35459
46.3	47.3	4800	2713	2681	0.27	19733	49936	35459
47.3	48.3	4800	2713	2681	0.27	19733	49936	35459
48.3	49.3	4800	2713	2681	0.27	19733	49936	35459
49.3	50.3	4800	2713	2681	0.27	19733	49936	35459
50.3	51.3	4800	2713	2681	0.27	19733	49936	35459
51.3	52.3	4800	2713	2681	0.27	19733	49936	35459
52.3	53.3	4800	2713	2681	0.27	19733	49936	35459
53.3	54.3	4800	2713	2681	0.27	19733	49936	35459
54.3	55.3	4800	2713	2681	0.27	19733	49936	35459
55.3	56.3	4800	2713	2681	0.27	19733	49936	35459
56.3	57.3	4800	2713	2681	0.27	19733	49936	35459
57.3	58.3	4800	2713	2681	0.27	19733	49936	35459
58.3	59.3	4800	2713	2681	0.27	19733	49936	35459
59.3	60.3	4800	2713	2681	0.27	19733	49936	35459
60.3	61.3	4800	2713	2681	0.27	19733	49936	35459
61.3	62.3	4800	2713	2681	0.27	19733	49936	35459
62.3	63.3	4800	2713	2681	0.27	19733	49936	35459
63.3	64.3	4800	2713	2681	0.27	19733	49936	35459
64.3	65.3	4800	2713	2681	0.27	19733	49936	35459
65.3	66.3	4800	2713	2681	0.27	19733	49936	35459
66.3	67.3	4800	2713	2681	0.27	19733	49936	35459
67.3	68.3	4800	2713	2681	0.27	19733	49936	35459
68.3	69.3	4800	2713	2681	0.27	19733	49936	35459
69.3	70.3	4800	2713	2681	0.27	19733	49936	35459
70.3	71.3	4800	2713	2681	0.27	19733	49936	35459
71.3	72.3	4800	2713	2681	0.27	19733	49936	35459
72.3	73.3	4800	2713	2681	0.27	19733	49936	35459
73.3	74.3	4800	2713	2681	0.27	19733	49936	35459
74.3	75.3	4800	2713	2681	0.27	19733	49936	35459
75.3	76.3	4800	2713	2681	0.27	19733	49936	35459
76.3	77.3	4800	2713	2681	0.27	19733	49936	35459
77.3	78.3	4800	2713	2681	0.27	19733	49936	35459
78.3	79.3	4800	2713	2681	0.27	19733	49936	35459
79.3	80.3	4800	2713	2681	0.27	19733	49936	35459
80.3	81.3	4800	2713	2681	0.27	19733	49936	35459
81.3	82.3	4800	2713	2681	0.27	19733	49936	35459

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
82.3	83.3	4800	2713	2681	0.27	19733	49936	35459
83.3	84.3	4800	2713	2681	0.27	19733	49936	35459
84.3	85.3	4800	2713	2681	0.27	19733	49936	35459
85.3	86.3	4800	2713	2681	0.27	19733	49936	35459
86.3	87.3	4800	2713	2681	0.27	19733	49936	35459
87.3	88.3	4800	2713	2681	0.27	19733	49936	35459
88.3	89.3	4800	2713	2681	0.27	19733	49936	35459
89.3	90.3	4800	2713	2679	0.27	19718	49899	35433
90.3	91.3	4800	2713	2679	0.27	19718	49899	35433
91.3	92.3	4800	2713	2679	0.27	19718	49899	35433
92.3	93.3	4800	2713	2679	0.27	19718	49899	35433
93.3	94.3	4800	2713	2679	0.27	19718	49899	35433
94.3	95.3	4800	2713	2679	0.27	19718	49899	35433
95.3	96.3	4800	2713	2679	0.27	19718	49899	35433
96.3	97.3	4800	2713	2679	0.27	19718	49899	35433
97.3	98.3	4800	2713	2679	0.27	19718	49899	35433
98.3	99.3	4800	2713	2679	0.27	19718	49899	35433
99.3	100.3	4800	2713	2679	0.27	19718	49899	35433
100.3	101.3	4800	2713	2679	0.27	19718	49899	35433
101.3	102.3	4800	2713	2679	0.27	19718	49899	35433
102.3	103.3	4800	2713	2679	0.27	19718	49899	35433
103.3	104.3	4800	2713	2679	0.27	19718	49899	35433
104.3	105.3	4800	2713	2679	0.27	19718	49899	35433
105.3	106.3	4800	2713	2679	0.27	19718	49899	35433
106.3	107.3	4800	2713	2679	0.27	19718	49899	35433
107.3	108.3	4800	2713	2679	0.27	19718	49899	35433
108.3	109.3	4800	2713	2679	0.27	19718	49899	35433
109.3	110.3	4800	2713	2679	0.27	19718	49899	35433
110.3	111.3	4800	2713	2679	0.27	19718	49899	35433
111.3	112.3	4800	2713	2679	0.27	19718	49899	35433
112.3	113.3	4800	2713	2679	0.27	19718	49899	35433
113.3	114.3	4800	2713	2679	0.27	19718	49899	35433
114.3	115.3	4800	2713	2679	0.27	19718	49899	35433
115.3	116.3	4800	2713	2679	0.27	19718	49899	35433
116.3	117.3	4800	2713	2679	0.27	19718	49899	35433
117.3	118.3	4800	2713	2679	0.27	19718	49899	35433
118.3	119.3	4800	2713	2679	0.27	19718	49899	35433

Table B3-h: VSP Results - BH15

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.2	900	318	2141	0.43	217	619	1446
0.2	1.2	900	367	2141	0.40	288	808	1350
1.2	2.2	900	455	2345	0.33	485	1290	1252
2.2	3.2	1200	480	2345	0.40	540	1518	2656
3.2	4.2	1400	492	2345	0.43	568	1623	3839
4.2	5.2	1400	508	2345	0.42	605	1724	3789
5.2	6.2	1400	523	2345	0.42	641	1820	3741
6.2	7.2	1900	539	2345	0.46	681	1984	7557
7.2	8.2	1900	550	2345	0.45	709	2063	7520
8.2	9.2	1900	560	2345	0.45	735	2136	7485
9.2	10.2	2000	570	2243	0.46	729	2122	8000
10.2	11.2	2000	582	2243	0.45	760	2209	7959
11.2	12.2	2000	594	2243	0.45	791	2298	7917
12.2	13.2	2200	607	2243	0.46	826	2411	9754
13.2	14.2	2200	621	2141	0.46	826	2405	9262
14.2	15.2	2200	636	2141	0.45	866	2519	9208
15.2	16.2	2200	654	2141	0.45	916	2658	9141
16.2	17.2	2400	673	2141	0.46	970	2826	11039
17.2	18.2	2400	695	2345	0.45	1133	3294	11997
18.2	19.2	2400	721	2345	0.45	1219	3536	11882
19.2	20.2	2400	751	2345	0.45	1323	3824	11744
20.2	21.2	2400	787	2141	0.44	1326	3818	10564
21.2	22.2	2400	830	2141	0.43	1475	4224	10366
22.2	23.2	2400	883	2141	0.42	1669	4747	10106
23.2	24.2	2400	948	2641	0.41	2373	6682	12048
24.2	25.2	4000	1028	2641	0.46	2791	8176	38535
25.2	26.2	4000	1124	2641	0.46	3337	9724	37807
26.2	27.2	4000	1232	2641	0.45	4009	11606	36911
27.2	28.2	4000	1353	2681	0.44	4908	14090	36352
28.2	29.2	4000	1492	2681	0.42	5968	16940	34939
29.2	30.2	4000	1657	2681	0.40	7361	20558	33081
30.2	31.2	4000	1854	2681	0.36	9215	25125	30609
31.2	32.2	4000	2080	2681	0.31	11599	30498	27431
32.2	33.2	4400	2339	2681	0.30	14668	38225	32347
33.2	34.2	4400	2534	2681	0.25	17215	43102	28951
34.2	35.2	4400	2534	2681	0.25	17215	43102	28951
35.2	36.2	4400	2534	2681	0.25	17215	43102	28951
36.2	37.2	4400	2534	2681	0.25	17215	43102	28951
37.2	38.2	4400	2534	2681	0.25	17215	43102	28951
38.2	39.2	4400	2534	2681	0.25	17215	43102	28951
39.2	40.2	4400	2534	2681	0.25	17215	43102	28951

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.2	41.2	4400	2534	2681	0.25	17215	43102	28951
41.2	42.2	4400	2534	2681	0.25	17215	43102	28951
42.2	43.2	4400	2534	2681	0.25	17215	43102	28951
43.2	44.2	4400	2534	2681	0.25	17215	43102	28951
44.2	45.2	4400	2534	2681	0.25	17215	43102	28951
45.2	46.2	4400	2534	2681	0.25	17215	43102	28951
46.2	47.2	4400	2534	2681	0.25	17215	43102	28951
47.2	48.2	4400	2534	2681	0.25	17215	43102	28951
48.2	49.2	4400	2534	2681	0.25	17215	43102	28951
49.2	50.2	4400	2534	2681	0.25	17215	43102	28951
50.2	51.2	4400	2534	2681	0.25	17215	43102	28951
51.2	52.2	4400	2534	2681	0.25	17215	43102	28951
52.2	53.2	4400	2534	2681	0.25	17215	43102	28951
53.2	54.2	4400	2534	2681	0.25	17215	43102	28951
54.2	55.2	4400	2534	2681	0.25	17215	43102	28951
55.2	56.2	4400	2534	2681	0.25	17215	43102	28951
56.2	57.2	4400	2534	2681	0.25	17215	43102	28951
57.2	58.2	4400	2534	2681	0.25	17215	43102	28951
58.2	59.2	4400	2534	2681	0.25	17215	43102	28951
59.2	60.2	4400	2534	2681	0.25	17215	43102	28951
60.2	61.2	4400	2534	2681	0.25	17215	43102	28951
61.2	62.2	4400	2534	2681	0.25	17215	43102	28951
62.2	63.2	4400	2534	2681	0.25	17215	43102	28951
63.2	64.2	4400	2534	2681	0.25	17215	43102	28951
64.2	65.2	4400	2534	2681	0.25	17215	43102	28951
65.2	66.2	4400	2534	2681	0.25	17215	43102	28951
66.2	67.2	4400	2534	2681	0.25	17215	43102	28951
67.2	68.2	4400	2534	2681	0.25	17215	43102	28951
68.2	69.2	4400	2534	2681	0.25	17215	43102	28951
69.2	70.2	4400	2534	2681	0.25	17215	43102	28951
70.2	71.2	4400	2534	2681	0.25	17215	43102	28951
71.2	72.2	4400	2534	2681	0.25	17215	43102	28951
72.2	73.2	4400	2534	2681	0.25	17215	43102	28951
73.2	74.2	4400	2534	2681	0.25	17215	43102	28951
74.2	75.2	4400	2534	2681	0.25	17215	43102	28951
75.2	76.2	4400	2534	2681	0.25	17215	43102	28951
76.2	77.2	4400	2534	2681	0.25	17215	43102	28951
77.2	78.2	4400	2534	2681	0.25	17215	43102	28951
78.2	79.2	4400	2534	2681	0.25	17215	43102	28951
79.2	79.7	4400	2534	2681	0.25	17215	43102	28951

Table B3-i: VSP Results - BH16

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.4	520	152	2141	0.45	49	144	513
0.4	1.4	580	171	2141	0.45	63	182	637
1.4	2.4	700	218	2039	0.45	97	280	870
2.4	3.4	1200	277	2039	0.47	156	461	2728
3.4	4.4	1800	347	2039	0.48	246	727	6279
4.4	5.4	1800	411	2039	0.47	344	1014	6147
5.4	6.4	1800	457	2039	0.47	426	1248	6039
6.4	7.4	2000	483	2039	0.47	476	1398	7522
7.4	8.4	2000	501	2345	0.47	589	1726	8595
8.4	9.4	2000	513	2345	0.46	617	1808	8557
9.4	10.4	2000	519	2345	0.46	632	1849	8538
10.4	11.4	2000	521	2141	0.46	581	1701	7789
11.4	12.4	2000	523	2141	0.46	586	1714	7783
12.4	13.4	2000	528	2243	0.46	625	1829	8138
13.4	14.4	2000	537	2243	0.46	647	1890	8110
14.4	15.4	2000	549	2243	0.46	676	1973	8071
15.4	16.4	2000	566	2243	0.46	719	2093	8014
16.4	17.4	2000	587	2141	0.45	738	2144	7580
17.4	18.4	2000	613	2141	0.45	805	2330	7491
18.4	19.4	2000	646	2141	0.44	893	2576	7373
19.4	20.4	2000	687	2141	0.43	1010	2896	7217
20.4	21.4	2000	740	2243	0.42	1228	3490	7334
21.4	22.4	2000	802	2243	0.40	1443	4052	7048
22.4	23.4	2000	871	2243	0.38	1702	4707	6703
23.4	24.4	2000	949	2243	0.35	2020	5473	6279
24.4	25.4	2000	1035	2641	0.32	2829	7453	6792
25.4	26.4	3000	1129	2641	0.42	3366	9544	19281
26.4	27.4	3000	1227	2641	0.40	3976	11130	18468
27.4	28.4	3000	1330	2641	0.38	4672	12872	17540
28.4	29.4	4800	1439	2681	0.45	5552	16107	54368
29.4	30.4	4800	1553	2681	0.44	6466	18642	53149
30.4	31.4	4800	1673	2681	0.43	7504	21474	51765
31.4	32.4	4800	1800	2681	0.42	8686	24638	50188
32.4	33.4	4800	1933	2681	0.40	10018	28114	48414
33.4	34.4	4800	2074	2681	0.39	11532	31950	46394
34.4	35.4	4800	2222	2681	0.36	13237	36100	44121
35.4	36.4	4800	2303	2681	0.35	14220	38406	42811
36.4	37.4	4800	2303	2681	0.35	14220	38406	42811
37.4	38.4	4800	2303	2681	0.35	14220	38406	42811
38.4	39.4	4800	2303	2681	0.35	14220	38406	42811
39.4	40.4	4800	2303	2681	0.35	14220	38406	42811

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.4	41.4	4800	2303	2681	0.35	14220	38406	42811
41.4	42.4	4800	2303	2681	0.35	14220	38406	42811
42.4	43.4	4800	2303	2681	0.35	14220	38406	42811
43.4	44.4	4800	2303	2681	0.35	14220	38406	42811
44.4	45.4	4800	2303	2681	0.35	14220	38406	42811
45.4	46.4	4800	2303	2681	0.35	14220	38406	42811
46.4	47.4	4800	2303	2681	0.35	14220	38406	42811
47.4	48.4	4800	2303	2681	0.35	14220	38406	42811
48.4	49.4	4800	2303	2681	0.35	14220	38406	42811
49.4	50.4	4800	2303	2681	0.35	14220	38406	42811
50.4	51.4	4800	2303	2681	0.35	14220	38406	42811
51.4	52.4	4800	2303	2681	0.35	14220	38406	42811
52.4	53.4	4800	2303	2681	0.35	14220	38406	42811
53.4	54.4	4800	2303	2681	0.35	14220	38406	42811
54.4	55.4	4800	2303	2681	0.35	14220	38406	42811
55.4	56.4	4800	2303	2681	0.35	14220	38406	42811
56.4	57.4	4800	2303	2681	0.35	14220	38406	42811
57.4	58.4	4800	2303	2681	0.35	14220	38406	42811
58.4	59.4	4800	2303	2681	0.35	14220	38406	42811
59.4	60.4	4800	2303	2681	0.35	14220	38406	42811
60.4	61.4	4800	2303	2681	0.35	14220	38406	42811
61.4	62.4	4800	2303	2681	0.35	14220	38406	42811
62.4	63.4	4800	2303	2681	0.35	14220	38406	42811
63.4	64.4	4800	2303	2681	0.35	14220	38406	42811
64.4	65.4	4800	2303	2681	0.35	14220	38406	42811
65.4	66.4	4800	2303	2681	0.35	14220	38406	42811
66.4	67.4	4800	2303	2681	0.35	14220	38406	42811
67.4	68.4	4800	2303	2681	0.35	14220	38406	42811
68.4	69.4	4800	2303	2681	0.35	14220	38406	42811
69.4	70.4	4800	2303	2681	0.35	14220	38406	42811
70.4	71.4	4800	2303	2681	0.35	14220	38406	42811
71.4	72.4	4800	2303	2681	0.35	14220	38406	42811
72.4	73.4	4800	2303	2681	0.35	14220	38406	42811
73.4	74.4	4800	2303	2681	0.35	14220	38406	42811
74.4	75.4	4800	2303	2681	0.35	14220	38406	42811
75.4	76.4	4800	2303	2681	0.35	14220	38406	42811
76.4	77.4	4800	2303	2681	0.35	14220	38406	42811
77.4	78.4	4800	2303	2681	0.35	14220	38406	42811
78.4	79.4	4800	2303	2681	0.35	14220	38406	42811
79.4	80.4	4800	2303	2681	0.35	14220	38406	42811
80.4	81.4	4800	2303	2681	0.35	14220	38406	42811
81.4	82.4	4800	2303	2681	0.35	14220	38406	42811

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
82.4	83.4	4800	2303	2681	0.35	14220	38406	42811
83.4	84.4	4800	2303	2681	0.35	14220	38406	42811
84.4	85.4	4800	2303	2681	0.35	14220	38406	42811
85.4	86.4	4800	2303	2681	0.35	14220	38406	42811
86.4	87.4	4800	2303	2681	0.35	14220	38406	42811
87.4	88.4	4800	2303	2681	0.35	14220	38406	42811
88.4	89.4	4800	2303	2679	0.35	14209	38378	42779
89.4	90.4	4800	2303	2679	0.35	14209	38378	42779
90.4	91.4	4800	2303	2679	0.35	14209	38378	42779
91.4	92.4	4800	2303	2679	0.35	14209	38378	42779
92.4	93.4	4800	2303	2679	0.35	14209	38378	42779
93.4	94.4	4800	2303	2679	0.35	14209	38378	42779
94.4	95.4	4800	2303	2679	0.35	14209	38378	42779
95.4	96.4	4800	2303	2679	0.35	14209	38378	42779
96.4	97.4	4800	2303	2679	0.35	14209	38378	42779
97.4	97.7	4800	2303	2679	0.35	14209	38378	42779

Table B3-j: VSP Results - BH17

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.3	520	235	2141	0.37	118	324	421
0.3	1.3	800	255	2039	0.44	133	383	1128
1.3	2.3	1000	301	2039	0.45	185	536	1793
2.3	3.3	1200	363	2345	0.45	309	896	2965
3.3	4.3	1200	439	2345	0.42	452	1286	2774
4.3	5.3	2400	510	2345	0.48	610	1801	12694
5.3	6.3	2400	566	2345	0.47	751	2209	12506
6.3	7.3	2400	604	2345	0.47	855	2509	12367
7.3	8.3	2400	625	2345	0.46	916	2681	12286
8.3	9.3	2400	633	2345	0.46	940	2749	12254
9.3	10.3	2400	635	2345	0.46	946	2766	12246
10.3	11.3	2400	638	2345	0.46	955	2791	12235
11.3	12.3	2400	644	2345	0.46	973	2842	12210
12.3	13.3	2400	654	2345	0.46	1003	2929	12170
13.3	14.3	2400	667	2345	0.46	1043	3042	12116
14.3	15.3	2400	683	2345	0.46	1094	3185	12049
15.3	16.3	2400	703	2141	0.45	1058	3075	10921
16.3	17.3	2400	728	2141	0.45	1135	3289	10819
17.3	18.3	2400	759	2345	0.44	1351	3903	11706
18.3	19.3	2400	796	2345	0.44	1486	4274	11526
19.3	20.3	2400	842	2243	0.43	1590	4547	10799
20.3	21.3	2400	901	2243	0.42	1821	5164	10492
21.3	22.3	3000	976	2345	0.44	2234	6437	18127
22.3	23.3	3000	1060	2641	0.43	2967	8479	19812
23.3	24.3	3000	1149	2641	0.41	3487	9861	19120
24.3	25.3	3000	1239	2641	0.40	4054	11329	18363
25.3	26.3	4600	1329	2641	0.45	4665	13569	49664
26.3	27.3	4600	1419	2681	0.45	5398	15627	49532
27.3	28.3	4600	1509	2681	0.44	6105	17578	48590
28.3	29.3	4600	1598	2681	0.43	6846	19599	47602
29.3	30.3	4600	1684	2681	0.42	7603	21632	46593
30.3	31.3	4600	1768	2681	0.41	8380	23688	45556
31.3	32.3	4600	1848	2681	0.40	9156	25706	44522
32.3	33.3	4600	1925	2681	0.39	9935	27695	43484
33.3	34.3	4600	1996	2681	0.38	10681	29566	42488
34.3	35.3	4600	2063	2681	0.37	11410	31358	41516
35.3	36.3	4600	2123	2681	0.36	12084	32980	40618
36.3	37.3	4600	2178	2681	0.36	12718	34478	39773
37.3	38.3	4600	2226	2681	0.35	13285	35792	39017
38.3	39.3	4600	2267	2681	0.34	13778	36915	38359
39.3	40.3	4600	2302	2681	0.33	14207	37875	37787

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.3	41.3	4600	2337	2681	0.33	14642	38833	37207
41.3	42.3	4600	2376	2681	0.32	15135	39898	36550
42.3	43.3	4600	2393	2681	0.31	15353	40361	36260
43.3	44.3	4600	2393	2681	0.31	15353	40361	36260
44.3	45.3	4600	2393	2681	0.31	15353	40361	36260
45.3	46.3	4600	2393	2681	0.31	15353	40361	36260
46.3	47.3	4600	2393	2681	0.31	15353	40361	36260
47.3	48.3	4600	2393	2681	0.31	15353	40361	36260
48.3	49.3	4600	2393	2681	0.31	15353	40361	36260
49.3	50.3	4600	2393	2681	0.31	15353	40361	36260
50.3	51.3	4600	2393	2681	0.31	15353	40361	36260
51.3	52.3	4600	2393	2681	0.31	15353	40361	36260
52.3	53.3	4600	2393	2681	0.31	15353	40361	36260
53.3	54.3	4600	2393	2681	0.31	15353	40361	36260
54.3	55.3	4600	2393	2681	0.31	15353	40361	36260
55.3	56.3	4600	2393	2681	0.31	15353	40361	36260
56.3	57.3	4600	2393	2681	0.31	15353	40361	36260
57.3	58.3	4600	2393	2681	0.31	15353	40361	36260
58.3	59.3	4600	2393	2681	0.31	15353	40361	36260
59.3	60.3	4600	2393	2681	0.31	15353	40361	36260
60.3	61.3	4600	2393	2681	0.31	15353	40361	36260
61.3	62.3	4600	2393	2681	0.31	15353	40361	36260
62.3	63.3	4600	2393	2681	0.31	15353	40361	36260
63.3	64.3	4600	2393	2681	0.31	15353	40361	36260
64.3	65.3	4600	2393	2681	0.31	15353	40361	36260
65.3	66.3	4600	2393	2681	0.31	15353	40361	36260
66.3	67.3	4600	2393	2681	0.31	15353	40361	36260
67.3	68.3	4600	2393	2681	0.31	15353	40361	36260
68.3	69.3	4600	2393	2681	0.31	15353	40361	36260
69.3	70.3	4600	2393	2681	0.31	15353	40361	36260
70.3	71.3	4600	2393	2681	0.31	15353	40361	36260
71.3	72.3	4600	2393	2681	0.31	15353	40361	36260
72.3	73.3	4600	2393	2681	0.31	15353	40361	36260
73.3	74.3	4600	2393	2681	0.31	15353	40361	36260
74.3	75.3	4600	2393	2681	0.31	15353	40361	36260
75.3	76.3	4600	2393	2681	0.31	15353	40361	36260
76.3	77.3	4600	2393	2681	0.31	15353	40361	36260
77.3	78.3	4600	2393	2681	0.31	15353	40361	36260
78.3	79.3	4600	2393	2681	0.31	15353	40361	36260
79.3	79.8	4600	2393	2681	0.31	15353	40361	36260

Table B3-k: VSP Results - BH28

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	1	570	402	2141	0.01	346	696	234
1.0	2	800	452	2345	0.27	479	1213	862
2.0	3	1000	544	2345	0.29	694	1790	1420
3.0	4	1200	576	2345	0.35	778	2101	2339
4.0	5	1200	592	2345	0.34	822	2201	2281
5.0	6	2000	620	2345	0.45	901	2608	8178
6.0	7	2000	649	2345	0.44	988	2847	8063
7.0	8	2000	675	2345	0.44	1068	3068	7955
8.0	9	2200	694	2345	0.44	1129	3263	9844
9.0	10	2200	705	2345	0.44	1166	3363	9796
10.0	11	2200	709	2243	0.44	1128	3252	9353
11.0	12	2200	704	2243	0.44	1112	3208	9374
12.0	13	2200	693	2243	0.44	1077	3113	9420
13.0	14	2200	677	2243	0.45	1028	2977	9485
14.0	15	2200	664	2243	0.45	989	2868	9538
15.0	16	2200	654	2141	0.45	916	2658	9141
16.0	17	2200	647	2141	0.45	896	2604	9167
17.0	18	2200	641	2141	0.45	880	2557	9190
18.0	19	2200	637	2243	0.45	910	2647	9643
19.0	20	2200	634	2243	0.45	902	2623	9654
20.0	21	2200	632	2243	0.46	896	2607	9662
21.0	22	2200	631	2243	0.46	893	2599	9665
22.0	23	2200	631	2243	0.46	893	2599	9665
23.0	24	2200	632	2141	0.46	855	2489	9222
24.0	25	2200	636	2141	0.45	866	2519	9208
25.0	26	2200	645	2141	0.45	891	2588	9175
26.0	27	2200	658	2141	0.45	927	2690	9126
27.0	28	2200	678	2141	0.45	984	2849	9050
28.0	29	2200	705	2345	0.44	1166	3363	9796
29.0	30	2200	743	2345	0.44	1295	3717	9624
30.0	31	2200	797	2345	0.42	1490	4244	9364
31.0	32	2200	864	2641	0.41	1971	5555	10154
32.0	33	2200	942	2641	0.39	2344	6504	9658
33.0	34	3000	1031	2641	0.43	2807	8046	20026
34.0	35	3000	1134	2681	0.42	3448	9768	19532
35.0	36	3000	1256	2681	0.39	4229	11789	18490
36.0	37	4800	1392	2681	0.45	5195	15108	54844
37.0	38	4800	1544	2681	0.44	6391	18436	53248
38.0	39	4800	1716	2681	0.43	7895	22527	51244
39.0	40	4800	1723	2681	0.43	7959	22700	51158
40.0	41	4800	1723	2681	0.43	7959	22700	51158

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
41.0	42	4800	1723	2681	0.43	7959	22700	51158
42.0	43	4800	1723	2681	0.43	7959	22700	51158
43.0	44	4800	1723	2681	0.43	7959	22700	51158
44.0	45	4800	1723	2681	0.43	7959	22700	51158
45.0	46	4800	1723	2681	0.43	7959	22700	51158
46.0	47	4800	1723	2681	0.43	7959	22700	51158
47.0	48	4800	1723	2681	0.43	7959	22700	51158
48.0	49	4800	1723	2681	0.43	7959	22700	51158
49.0	50	4800	1723	2681	0.43	7959	22700	51158
50.0	50.5	4800	1723	2681	0.43	7959	22700	51158

Table B3-l: VSP Results - BH50

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.4	480	204	2141	0.39	89	248	374
0.4	1.4	550	205	2141	0.42	90	255	528
1.4	2.4	900	215	2039	0.47	94	277	1526
2.4	3.4	1100	240	2345	0.48	135	398	2657
3.4	4.4	1200	273	2345	0.47	175	515	3144
4.4	5.4	1800	308	2345	0.48	222	661	7301
5.4	6.4	1800	341	2345	0.48	273	808	7234
6.4	7.4	2000	372	2345	0.48	325	962	8947
7.4	8.4	2000	399	2345	0.48	373	1105	8882
8.4	9.4	2000	421	2345	0.48	416	1228	8826
9.4	10.4	2000	440	2141	0.47	414	1222	8011
10.4	11.4	2000	457	2141	0.47	447	1317	7968
11.4	12.4	2000	474	2243	0.47	504	1482	8300
12.4	13.4	2000	492	2243	0.47	543	1594	8248
13.4	14.4	2000	513	2243	0.46	590	1729	8185
14.4	15.4	2000	537	2243	0.46	647	1890	8110
15.4	16.4	2000	565	2243	0.46	716	2086	8017
16.4	17.4	2000	597	2243	0.45	799	2320	7906
17.4	18.4	2000	634	2141	0.44	861	2486	7417
18.4	19.4	2000	680	2343	0.43	1083	3109	7927
19.4	20.4	2000	736	2141	0.42	1160	3298	7018
20.4	21.4	2000	804	2141	0.40	1384	3885	6719
21.4	22.4	2000	880	2141	0.38	1658	4576	6353
22.4	23.4	2000	964	2141	0.35	1990	5367	5911
23.4	24.4	2000	1060	2243	0.30	2520	6576	5612
24.4	25.4	2000	1171	2345	0.24	3216	7969	5093
25.4	26.4	2000	1302	2641	0.13	4477	10138	4595
26.4	27.4	3600	1461	2641	0.40	5637	15800	26711
27.4	28.4	3600	1654	2641	0.37	7225	19742	24594
28.4	29.4	3600	1889	2641	0.31	9424	24691	21662
29.4	30.4	3600	2175	2681	0.21	12683	30758	17835
30.4	31.4	3600	2527	2681	0.01	17120	34731	11919
31.4	32.4	4400	2696	2681	0.20	19487	46746	25922
32.4	33.4	4400	2696	2681	0.20	19487	46746	25922
33.4	34.4	4400	2696	2681	0.20	19487	46746	25922
34.4	35.4	4400	2696	2681	0.20	19487	46746	25922
35.4	36.4	4400	2696	2681	0.20	19487	46746	25922
36.4	37.4	4400	2696	2681	0.20	19487	46746	25922
37.4	38.4	4400	2696	2681	0.20	19487	46746	25922
38.4	39.4	4400	2696	2681	0.20	19487	46746	25922
39.4	40.4	4400	2696	2681	0.20	19487	46746	25922

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.4	41.4	4400	2696	2681	0.20	19487	46746	25922
41.4	42.4	4400	2696	2681	0.20	19487	46746	25922
42.4	43.4	4800	2696	2681	0.27	19487	49479	35788
43.4	44.4	4800	2696	2681	0.27	19487	49479	35788
44.4	45.4	4800	2696	2681	0.27	19487	49479	35788
45.4	46.4	4800	2696	2681	0.27	19487	49479	35788
46.4	47.4	4800	2696	2681	0.27	19487	49479	35788
47.4	48.4	4800	2696	2681	0.27	19487	49479	35788
48.4	49.4	4800	2696	2681	0.27	19487	49479	35788
49.4	50.4	4800	2696	2681	0.27	19487	49479	35788
50.4	51.4	4800	2696	2681	0.27	19487	49479	35788
51.4	52.4	4800	2696	2681	0.27	19487	49479	35788
52.4	53.4	4800	2696	2681	0.27	19487	49479	35788
53.4	54.4	4800	2696	2681	0.27	19487	49479	35788
54.4	55.4	4800	2696	2681	0.27	19487	49479	35788
55.4	56.4	4800	2696	2681	0.27	19487	49479	35788
56.4	57.4	4800	2696	2681	0.27	19487	49479	35788
57.4	58.4	4800	2696	2681	0.27	19487	49479	35788
58.4	59.4	4800	2696	2681	0.27	19487	49479	35788
59.4	60.4	4800	2696	2681	0.27	19487	49479	35788
60.4	61.4	4800	2696	2681	0.27	19487	49479	35788
61.4	62.4	4800	2696	2681	0.27	19487	49479	35788
62.4	63.4	4800	2696	2681	0.27	19487	49479	35788
63.4	64.4	4800	2696	2681	0.27	19487	49479	35788
64.4	65.4	4800	2696	2681	0.27	19487	49479	35788
65.4	66.4	4800	2696	2681	0.27	19487	49479	35788
66.4	67.4	4800	2696	2681	0.27	19487	49479	35788
67.4	68.4	4800	2696	2681	0.27	19487	49479	35788
68.4	69.4	4800	2696	2681	0.27	19487	49479	35788
69.4	70.4	4800	2696	2681	0.27	19487	49479	35788
70.4	71.4	4800	2696	2681	0.27	19487	49479	35788
71.4	72.4	4800	2696	2681	0.27	19487	49479	35788
72.4	73.4	4800	2696	2681	0.27	19487	49479	35788
73.4	74.4	4800	2696	2681	0.27	19487	49479	35788
74.4	75.4	4800	2696	2681	0.27	19487	49479	35788
75.4	76.4	4800	2696	2681	0.27	19487	49479	35788
76.4	77.4	4800	2696	2681	0.27	19487	49479	35788
77.4	78.4	4800	2696	2681	0.27	19487	49479	35788
78.4	79.4	4800	2696	2681	0.27	19487	49479	35788
79.4	80.4	4800	2696	2681	0.27	19487	49479	35788
80.4	81.4	4800	2696	2681	0.27	19487	49479	35788
81.4	82.4	4800	2696	2681	0.27	19487	49479	35788

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
82.4	83.4	4800	2696	2681	0.27	19487	49479	35788
83.4	84.4	4800	2696	2681	0.27	19487	49479	35788
84.4	85.4	4800	2696	2681	0.27	19487	49479	35788
85.4	86.4	4800	2696	2681	0.27	19487	49479	35788
86.4	87.4	4800	2696	2681	0.27	19487	49479	35788
87.4	88.4	4800	2696	2681	0.27	19487	49479	35788
88.4	89.4	4800	2696	2681	0.27	19487	49479	35788
89.4	90.4	4800	2696	2681	0.27	19487	49479	35788
90.4	91.4	4800	2696	2679	0.27	19472	49442	35761
91.4	92.4	4800	2696	2679	0.27	19472	49442	35761
92.4	93.4	4800	2696	2679	0.27	19472	49442	35761
93.4	94.4	4800	2696	2679	0.27	19472	49442	35761
94.4	95.4	4800	2696	2679	0.27	19472	49442	35761
95.4	96.4	4800	2696	2679	0.27	19472	49442	35761
96.4	97.4	4800	2696	2679	0.27	19472	49442	35761
97.4	98.4	4800	2696	2679	0.27	19472	49442	35761
98.4	99.4	4800	2696	2679	0.27	19472	49442	35761
99.4	100.4	4800	2696	2679	0.27	19472	49442	35761
100.4	101.4	4800	2696	2679	0.27	19472	49442	35761
101.4	102.4	4800	2696	2679	0.27	19472	49442	35761
102.4	103.4	4800	2696	2679	0.27	19472	49442	35761
103.4	104.4	4800	2696	2679	0.27	19472	49442	35761
104.4	105.4	4800	2696	2679	0.27	19472	49442	35761
105.4	106.4	4800	2696	2679	0.27	19472	49442	35761
106.4	107.4	4800	2696	2679	0.27	19472	49442	35761
107.4	108.4	4800	2696	2679	0.27	19472	49442	35761
108.4	109.4	4800	2696	2679	0.27	19472	49442	35761
109.4	110.4	4800	2696	2679	0.27	19472	49442	35761
110.4	111.4	4800	2696	2679	0.27	19472	49442	35761
111.4	112.4	4800	2696	2679	0.27	19472	49442	35761
112.4	113.4	4800	2696	2679	0.27	19472	49442	35761
113.4	114.4	4800	2696	2679	0.27	19472	49442	35761
114.4	115.4	4800	2696	2679	0.27	19472	49442	35761
115.4	116.4	4800	2696	2679	0.27	19472	49442	35761
116.4	117.4	4800	2696	2679	0.27	19472	49442	35761
117.4	118.4	4800	2696	2679	0.27	19472	49442	35761
118.4	119.4	4800	2696	2679	0.27	19472	49442	35761

Table B3-m: VSP Results - BH53

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.1	380	183	2141	0.35	72	193	214
0.1	1.1	530	213	2141	0.40	97	273	472
1.1	2.1	700	287	2345	0.40	193	540	892
2.1	3.1	800	370	2345	0.36	321	876	1073
3.1	4.1	1200	460	2345	0.41	496	1403	2715
4.1	5.1	1200	520	2345	0.38	634	1756	2531
5.1	6.1	1200	564	2345	0.36	746	2026	2382
6.1	7.1	1200	599	2345	0.33	841	2245	2255
7.1	8.1	1800	611	2345	0.43	875	2512	6431
8.1	9.1	1800	606	2345	0.44	861	2473	6450
9.1	10.1	1800	598	2345	0.44	839	2412	6480
10.1	11.1	1800	593	2345	0.44	825	2373	6498
11.1	12.1	1800	584	2345	0.44	800	2305	6531
12.1	13.1	1800	575	2345	0.44	775	2238	6564
13.1	14.1	1800	568	2345	0.44	757	2186	6589
14.1	15.1	1800	564	2243	0.45	713	2063	6316
15.1	16.1	1800	561	2141	0.45	674	1949	6038
16.1	17.1	1800	561	2243	0.45	706	2042	6326
17.1	18.1	2200	565	2243	0.46	716	2098	9901
18.1	19.1	2200	572	2243	0.46	734	2148	9878
19.1	20.1	2200	584	2243	0.46	765	2237	9836
20.1	21.1	2200	600	2243	0.46	807	2358	9779
21.1	22.1	2200	621	2243	0.46	865	2520	9703
22.1	23.1	2200	647	2141	0.45	896	2604	9167
23.1	24.1	2200	678	2243	0.45	1031	2985	9481
24.1	25.1	2200	716	2141	0.44	1098	3163	8899
25.1	26.1	2200	760	2141	0.43	1237	3542	8714
26.1	27.1	2200	811	2345	0.42	1542	4385	9293
27.1	28.1	2200	872	2243	0.41	1706	4799	8582
28.1	29.1	2200	945	2345	0.39	2094	5809	8558
29.1	30.1	2200	1028	2345	0.36	2478	6742	8046
30.1	31.1	3000	1119	2345	0.42	2936	8334	17190
31.1	32.1	3000	1217	2641	0.40	3912	10964	18554
32.1	33.1	3000	1324	2641	0.38	4630	12769	17596
33.1	34.1	3000	1439	2641	0.35	5469	14772	16477
34.1	35.1	3000	1564	2681	0.31	6558	17226	15385
35.1	36.1	4000	1701	2681	0.39	7757	21559	32553
36.1	37.1	4000	1852	2681	0.36	9196	25078	30635
37.1	38.1	4000	2019	2681	0.33	10929	29050	28324
38.1	39.1	4000	2136	2681	0.30	12232	31817	26587
39.1	40.1	4400	2136	2681	0.35	12232	32925	35595

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.1	41.1	4400	2136	2681	0.35	12232	32925	35595
41.1	42.1	4400	2136	2681	0.35	12232	32925	35595
42.1	43.1	4400	2136	2681	0.35	12232	32925	35595
43.1	44.1	4400	2136	2681	0.35	12232	32925	35595
44.1	45.1	4400	2136	2681	0.35	12232	32925	35595
45.1	46.1	4400	2136	2681	0.35	12232	32925	35595
46.1	47.1	4400	2136	2681	0.35	12232	32925	35595
47.1	48.1	4400	2136	2681	0.35	12232	32925	35595
48.1	49.1	4400	2136	2681	0.35	12232	32925	35595
49.1	50.1	4400	2136	2681	0.35	12232	32925	35595
50.1	51.1	4400	2136	2681	0.35	12232	32925	35595
51.1	52.1	4400	2136	2681	0.35	12232	32925	35595
52.1	53.1	4400	2136	2681	0.35	12232	32925	35595
53.1	54.1	4400	2136	2681	0.35	12232	32925	35595
54.1	55.1	4400	2136	2681	0.35	12232	32925	35595
55.1	56.1	4400	2136	2681	0.35	12232	32925	35595
56.1	57.1	4400	2136	2681	0.35	12232	32925	35595
57.1	58.1	4400	2136	2681	0.35	12232	32925	35595
58.1	59.1	4400	2136	2681	0.35	12232	32925	35595
59.1	60.1	4400	2136	2681	0.35	12232	32925	35595
60.1	61.1	4400	2136	2681	0.35	12232	32925	35595
61.1	62.1	4400	2136	2681	0.35	12232	32925	35595
62.1	63.1	4400	2136	2681	0.35	12232	32925	35595
63.1	64.1	4400	2136	2681	0.35	12232	32925	35595
64.1	65.1	4400	2136	2681	0.35	12232	32925	35595
65.1	66.1	4400	2136	2681	0.35	12232	32925	35595
66.1	67.1	4400	2136	2681	0.35	12232	32925	35595
67.1	68.1	4400	2136	2681	0.35	12232	32925	35595
68.1	69.1	4400	2136	2681	0.35	12232	32925	35595
69.1	70.1	4400	2136	2681	0.35	12232	32925	35595
70.1	71.1	4400	2136	2681	0.35	12232	32925	35595
71.1	72.1	4400	2136	2681	0.35	12232	32925	35595
72.1	73.1	4400	2136	2681	0.35	12232	32925	35595
73.1	74.1	4400	2136	2681	0.35	12232	32925	35595
74.1	75.1	4400	2136	2681	0.35	12232	32925	35595
75.1	76.1	4400	2136	2681	0.35	12232	32925	35595
76.1	77.1	4400	2136	2681	0.35	12232	32925	35595
77.1	78.1	4400	2136	2681	0.35	12232	32925	35595
78.1	79.1	4400	2136	2681	0.35	12232	32925	35595
79.1	80.1	4400	2136	2681	0.35	12232	32925	35595

Table B3-n: VSP Results - BH59

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.4	450	170	2141	0.42	62	175	351
0.4	1.4	620	193	2141	0.45	80	231	717
1.4	2.4	800	249	2039	0.45	126	366	1136
2.4	3.4	1400	305	2039	0.48	190	560	3744
3.4	4.4	1600	338	2345	0.48	268	791	5646
4.4	5.4	1600	342	2345	0.48	274	810	5637
5.4	6.4	1600	345	2345	0.48	279	824	5631
6.4	7.4	1600	358	2345	0.47	301	886	5602
7.4	8.4	1600	375	2345	0.47	330	970	5564
8.4	9.4	1600	392	2243	0.47	345	1012	5283
9.4	10.4	1600	410	2243	0.46	377	1105	5239
10.4	11.4	1600	429	2243	0.46	413	1206	5192
11.4	12.4	1600	448	2243	0.46	450	1312	5142
12.4	13.4	1600	473	2243	0.45	502	1457	5073
13.4	14.4	1600	502	2243	0.45	565	1634	4988
14.4	15.4	1600	537	2243	0.44	647	1858	4880
15.4	16.4	2000	580	2243	0.45	755	2194	7966
16.4	17.4	2000	635	2243	0.44	904	2612	7766
17.4	18.4	2000	701	2243	0.43	1102	3152	7502
18.4	19.4	2000	771	2243	0.41	1333	3767	7194
19.4	20.4	2000	844	2141	0.39	1525	4245	6531
20.4	21.4	2000	918	2141	0.37	1804	4931	6158
21.4	22.4	2000	994	2141	0.34	2115	5652	5743
22.4	23.4	2000	1075	2243	0.30	2592	6723	5516
23.4	24.4	3400	1160	2345	0.43	3155	9051	22901
24.4	25.4	3400	1250	2345	0.42	3664	10420	22223
25.4	26.4	3400	1344	2345	0.41	4236	11923	21460
26.4	27.4	3400	1437	2641	0.39	5454	15175	23259
27.4	28.4	3400	1531	2641	0.37	6190	16997	22276
28.4	29.4	3400	1630	2681	0.35	7123	19244	21495
29.4	30.4	4400	1735	2681	0.41	8070	22725	41144
30.4	31.4	4400	1848	2681	0.39	9156	25507	39696
31.4	32.4	4400	1901	2681	0.39	9689	26842	38986
32.4	33.4	4400	1901	2681	0.39	9689	26842	38986
33.4	34.4	4400	1901	2681	0.39	9689	26842	38986
34.4	35.4	4400	1901	2681	0.39	9689	26842	38986
35.4	36.4	4400	1901	2681	0.39	9689	26842	38986
36.4	37.4	4400	1901	2681	0.39	9689	26842	38986
37.4	38.4	4400	1901	2681	0.39	9689	26842	38986
38.4	39.4	4400	1901	2681	0.39	9689	26842	38986
39.4	40.4	4400	1901	2681	0.39	9689	26842	38986

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.4	41.4	4400	1901	2681	0.39	9689	26842	38986
41.4	42.4	4400	1901	2681	0.39	9689	26842	38986
42.4	43.4	4400	1901	2681	0.39	9689	26842	38986
43.4	44.4	4400	1901	2681	0.39	9689	26842	38986
44.4	45.4	4400	1901	2681	0.39	9689	26842	38986
45.4	46.4	4400	1901	2681	0.39	9689	26842	38986
46.4	47.4	4400	1901	2681	0.39	9689	26842	38986
47.4	48.4	4400	1901	2681	0.39	9689	26842	38986
48.4	49.4	4400	1901	2681	0.39	9689	26842	38986
49.4	50.4	4400	1901	2681	0.39	9689	26842	38986
50.4	51.4	4400	1901	2681	0.39	9689	26842	38986
51.4	52.4	4400	1901	2681	0.39	9689	26842	38986
52.4	53.4	4400	1901	2681	0.39	9689	26842	38986
53.4	54.4	4400	1901	2681	0.39	9689	26842	38986
54.4	55.4	4400	1901	2681	0.39	9689	26842	38986
55.4	56.4	4400	1901	2681	0.39	9689	26842	38986
56.4	57.4	4400	1901	2681	0.39	9689	26842	38986
57.4	58.4	4400	1901	2681	0.39	9689	26842	38986
58.4	59.4	4400	1901	2681	0.39	9689	26842	38986
59.4	60.4	4400	1901	2681	0.39	9689	26842	38986
60.4	61.4	4400	1901	2681	0.39	9689	26842	38986
61.4	62.4	4400	1901	2681	0.39	9689	26842	38986
62.4	63.4	4400	1901	2681	0.39	9689	26842	38986
63.4	64.4	4400	1901	2681	0.39	9689	26842	38986
64.4	65.4	4400	1901	2681	0.39	9689	26842	38986
65.4	66.4	4400	1901	2681	0.39	9689	26842	38986
66.4	67.4	4400	1901	2681	0.39	9689	26842	38986
67.4	68.4	4400	1901	2681	0.39	9689	26842	38986
68.4	69.4	4400	1901	2681	0.39	9689	26842	38986
69.4	70.4	4400	1901	2681	0.39	9689	26842	38986
70.4	71.4	4400	1901	2681	0.39	9689	26842	38986
71.4	72.4	4400	1901	2681	0.39	9689	26842	38986
72.4	73.4	4400	1901	2681	0.39	9689	26842	38986
73.4	74.4	4400	1901	2681	0.39	9689	26842	38986
74.4	75.4	4400	1901	2681	0.39	9689	26842	38986
75.4	76.4	4400	1901	2681	0.39	9689	26842	38986
76.4	77.4	4400	1901	2681	0.39	9689	26842	38986
77.4	78.4	4400	1901	2681	0.39	9689	26842	38986
78.4	79.4	4400	1901	2681	0.39	9689	26842	38986
79.4	80.4	4400	1901	2681	0.39	9689	26842	38986

Table B3-o: VSP Results - BH65

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.3	520	215	2141	0.40	99	276	447
0.3	1.3	600	234	2141	0.41	117	331	614
1.3	2.3	600	277	2141	0.36	164	448	552
2.3	3.3	900	322	2039	0.43	211	603	1370
3.3	4.3	1200	353	2039	0.45	254	738	2597
4.3	5.3	1200	367	2039	0.45	275	796	2570
5.3	6.3	2000	380	2039	0.48	294	872	7763
6.3	7.3	2000	395	2039	0.48	318	941	7732
7.3	8.3	2000	412	2345	0.48	398	1177	8849
8.3	9.3	2000	428	2345	0.48	430	1268	8807
9.3	10.3	2000	445	2243	0.47	444	1309	8380
10.3	11.3	2000	462	2243	0.47	479	1409	8334
11.3	12.3	2000	479	2243	0.47	515	1513	8286
12.3	13.3	2000	497	2141	0.47	529	1552	7859
13.3	14.3	2000	516	2141	0.46	570	1670	7804
14.3	15.3	2000	536	2243	0.46	644	1883	8113
15.3	16.3	2000	559	2243	0.46	701	2043	8037
16.3	17.3	2000	584	2243	0.45	765	2224	7952
17.3	18.3	2000	612	2141	0.45	802	2323	7495
18.3	19.3	2000	645	2243	0.44	933	2691	7728
19.3	20.3	2000	684	2141	0.43	1002	2872	7228
20.3	21.3	2000	729	2345	0.42	1246	3548	7718
21.3	22.3	2000	786	2141	0.41	1323	3726	6800
22.3	23.3	2000	855	2345	0.39	1714	4759	7094
23.3	24.3	2000	931	2345	0.36	2033	5535	6670
24.3	25.3	3400	1012	2345	0.45	2402	6971	23906
25.3	26.3	3400	1099	2641	0.44	3190	9197	26277
26.3	27.3	3400	1192	2641	0.43	3753	10732	25527
27.3	28.3	3400	1294	2641	0.42	4422	12518	24634
28.3	29.3	3400	1405	2681	0.40	5292	14787	23936
29.3	30.3	4800	1530	2681	0.44	6276	18118	53402
30.3	31.3	4800	1670	2681	0.43	7477	21401	51801
31.3	32.3	4800	1824	2681	0.42	8920	25253	49877
32.3	33.3	4800	1990	2681	0.40	10617	29647	47614
33.3	34.3	4800	2171	2681	0.37	12636	34659	44922
34.3	35.3	4800	2367	2681	0.34	15021	40236	41742
35.3	36.3	4800	2549	2681	0.30	17420	45417	38544
36.3	37.3	4800	2549	2681	0.30	17420	45417	38544
37.3	38.3	4800	2549	2681	0.30	17420	45417	38544
38.3	39.3	4800	2549	2681	0.30	17420	45417	38544
39.3	40.3	4800	2549	2681	0.30	17420	45417	38544

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.3	41.3	4800	2549	2681	0.30	17420	45417	38544
41.3	42.3	4800	2549	2681	0.30	17420	45417	38544
42.3	43.3	4800	2549	2681	0.30	17420	45417	38544
43.3	44.3	4800	2549	2681	0.30	17420	45417	38544
44.3	45.3	4800	2549	2681	0.30	17420	45417	38544
45.3	46.3	4800	2549	2681	0.30	17420	45417	38544
46.3	47.3	4800	2549	2681	0.30	17420	45417	38544
47.3	48.3	4800	2549	2681	0.30	17420	45417	38544
48.3	49.3	4800	2549	2681	0.30	17420	45417	38544
49.3	50.3	4800	2549	2681	0.30	17420	45417	38544
50.3	51.3	4800	2549	2681	0.30	17420	45417	38544
51.3	52.3	4800	2549	2681	0.30	17420	45417	38544
52.3	53.3	4800	2549	2681	0.30	17420	45417	38544
53.3	54.3	4800	2549	2681	0.30	17420	45417	38544
54.3	55.3	4800	2549	2681	0.30	17420	45417	38544
55.3	56.3	4800	2549	2681	0.30	17420	45417	38544
56.3	57.3	4800	2549	2681	0.30	17420	45417	38544
57.3	58.3	4800	2549	2681	0.30	17420	45417	38544
58.3	59.3	4800	2549	2681	0.30	17420	45417	38544
59.3	60.3	4800	2549	2681	0.30	17420	45417	38544
60.3	61.3	4800	2549	2681	0.30	17420	45417	38544
61.3	62.3	4800	2549	2681	0.30	17420	45417	38544
62.3	63.3	4800	2549	2681	0.30	17420	45417	38544
63.3	64.3	4800	2549	2681	0.30	17420	45417	38544
64.3	65.3	4800	2549	2681	0.30	17420	45417	38544
65.3	66.3	4800	2549	2681	0.30	17420	45417	38544
66.3	67.3	4800	2549	2681	0.30	17420	45417	38544
67.3	68.3	4800	2549	2681	0.30	17420	45417	38544
68.3	69.3	4800	2549	2681	0.30	17420	45417	38544
69.3	70.3	4800	2549	2681	0.30	17420	45417	38544
70.3	71.3	4800	2549	2681	0.30	17420	45417	38544
71.3	72.3	4800	2549	2681	0.30	17420	45417	38544
72.3	73.3	4800	2549	2681	0.30	17420	45417	38544
73.3	74.3	4800	2549	2681	0.30	17420	45417	38544
74.3	75.3	4800	2549	2681	0.30	17420	45417	38544
75.3	76.3	4800	2549	2681	0.30	17420	45417	38544
76.3	77.3	4800	2549	2681	0.30	17420	45417	38544
77.3	78.3	4800	2549	2681	0.30	17420	45417	38544
78.3	79.3	4800	2549	2681	0.30	17420	45417	38544
79.3	80.3	4800	2549	2681	0.30	17420	45417	38544
80.3	81.3	4800	2549	2681	0.30	17420	45417	38544
81.3	82.3	4800	2549	2681	0.30	17420	45417	38544

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
82.3	83.3	4800	2549	2681	0.30	17420	45417	38544
83.3	84.3	4800	2549	2681	0.30	17420	45417	38544
84.3	85.3	4800	2549	2681	0.30	17420	45417	38544
85.3	86.3	4800	2549	2681	0.30	17420	45417	38544
86.3	87.3	4800	2549	2681	0.30	17420	45417	38544
87.3	88.3	4800	2549	2681	0.30	17420	45417	38544
88.3	89.3	4800	2549	2681	0.30	17420	45417	38544
89.3	90.3	4800	2549	2681	0.30	17420	45417	38544
90.3	91.3	4800	2549	2679	0.30	17407	45383	38515
91.3	92.3	4800	2549	2679	0.30	17407	45383	38515
92.3	93.3	4800	2549	2679	0.30	17407	45383	38515
93.3	94.3	4800	2549	2679	0.30	17407	45383	38515
94.3	95.3	4800	2549	2679	0.30	17407	45383	38515
95.3	96.3	4800	2549	2679	0.30	17407	45383	38515
96.3	97.3	4800	2549	2679	0.30	17407	45383	38515
97.3	98.3	4800	2549	2679	0.30	17407	45383	38515
98.3	99.3	4800	2549	2679	0.30	17407	45383	38515
99.3	100.3	4800	2549	2679	0.30	17407	45383	38515
100.3	101.3	4800	2549	2679	0.30	17407	45383	38515
101.3	102.3	4800	2549	2679	0.30	17407	45383	38515
102.3	103.3	4800	2549	2679	0.30	17407	45383	38515
103.3	104.3	4800	2549	2679	0.30	17407	45383	38515
104.3	105.3	4800	2549	2679	0.30	17407	45383	38515
105.3	106.3	4800	2549	2679	0.30	17407	45383	38515
106.3	107.3	4800	2549	2679	0.30	17407	45383	38515
107.3	108.3	4800	2549	2679	0.30	17407	45383	38515
108.3	109.3	4800	2549	2679	0.30	17407	45383	38515
109.3	110.3	4800	2549	2679	0.30	17407	45383	38515
110.3	111.3	4800	2549	2679	0.30	17407	45383	38515
111.3	112.3	4800	2549	2679	0.30	17407	45383	38515
112.3	113.3	4800	2549	2679	0.30	17407	45383	38515
113.3	114.3	4800	2549	2679	0.30	17407	45383	38515
114.3	115.3	4800	2549	2679	0.30	17407	45383	38515
115.3	116.3	4800	2549	2679	0.30	17407	45383	38515
116.3	117.3	4800	2549	2679	0.30	17407	45383	38515
117.3	118.3	4800	2549	2679	0.30	17407	45383	38515
118.3	119.3	4800	2549	2679	0.30	17407	45383	38515

Table B3-p: VSP Results - BH66

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.4	560	307	2141	0.29	202	519	402
0.4	1.4	750	293	2141	0.41	184	518	959
1.4	2.4	1000	285	2141	0.46	174	506	1909
2.4	3.4	1400	300	2039	0.48	184	542	3752
3.4	4.4	1600	321	2039	0.48	210	621	4940
4.4	5.4	2000	345	2039	0.48	243	721	7832
5.4	6.4	2000	371	2039	0.48	281	832	7782
6.4	7.4	2000	397	2345	0.48	370	1094	8887
7.4	8.4	2000	422	2345	0.48	418	1233	8823
8.4	9.4	2000	446	2243	0.47	446	1315	8377
9.4	10.4	2000	470	2243	0.47	495	1457	8311
10.4	11.4	2000	493	2243	0.47	545	1600	8245
11.4	12.4	2000	516	2243	0.46	597	1749	8176
12.4	13.4	2000	539	2243	0.46	652	1904	8103
13.4	14.4	2000	563	2243	0.46	711	2072	8024
14.4	15.4	2000	588	2243	0.45	776	2253	7938
15.4	16.4	2000	615	2243	0.45	848	2456	7841
16.4	17.4	2000	645	2243	0.44	933	2691	7728
17.4	18.4	2000	678	2243	0.44	1031	2959	7597
18.4	19.4	2000	715	2141	0.43	1095	3123	7105
19.4	20.4	2000	756	2141	0.42	1224	3467	6932
20.4	21.4	2000	804	2141	0.40	1384	3885	6719
21.4	22.4	2000	860	2141	0.39	1583	4391	6453
22.4	23.4	2000	928	2141	0.36	1844	5026	6106
23.4	24.4	3000	1013	2345	0.44	2406	6909	17897
24.4	25.4	3000	1116	2345	0.42	2921	8293	17211
25.4	26.4	3000	1232	2641	0.40	4009	11213	18424
26.4	27.4	3000	1359	2641	0.37	4878	13373	17266
27.4	28.4	3000	1499	2641	0.33	5934	15828	15857
28.4	29.4	4300	1655	2681	0.41	7343	20753	39781
29.4	30.4	4300	1833	2681	0.39	9008	25023	37561
30.4	31.4	4300	2037	2681	0.36	11124	30155	34739
31.4	32.4	4300	2086	2681	0.35	11666	31408	34017
32.4	33.4	4300	2086	2681	0.35	11666	31408	34017
33.4	34.4	4300	2086	2681	0.35	11666	31408	34017
34.4	35.4	4300	2086	2681	0.35	11666	31408	34017
35.4	36.4	4300	2086	2681	0.35	11666	31408	34017
36.4	37.4	4300	2086	2681	0.35	11666	31408	34017
37.4	38.4	4300	2086	2681	0.35	11666	31408	34017
38.4	39.4	4300	2086	2681	0.35	11666	31408	34017
39.4	40.4	4300	2086	2681	0.35	11666	31408	34017

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.4	41.4	4300	2086	2681	0.35	11666	31408	34017
41.4	42.4	4300	2086	2681	0.35	11666	31408	34017
42.4	43.4	4300	2086	2681	0.35	11666	31408	34017
43.4	44.4	4300	2086	2681	0.35	11666	31408	34017
44.4	45.4	4300	2086	2681	0.35	11666	31408	34017
45.4	46.4	4300	2086	2681	0.35	11666	31408	34017
46.4	47.4	4300	2086	2681	0.35	11666	31408	34017
47.4	48.4	4300	2086	2681	0.35	11666	31408	34017
48.4	49.4	4300	2086	2681	0.35	11666	31408	34017
49.4	50.4	4300	2086	2681	0.35	11666	31408	34017
50.4	51.4	4300	2086	2681	0.35	11666	31408	34017
51.4	52.4	4300	2086	2681	0.35	11666	31408	34017
52.4	53.4	4300	2086	2681	0.35	11666	31408	34017
53.4	54.4	4300	2086	2681	0.35	11666	31408	34017
54.4	55.4	4300	2086	2681	0.35	11666	31408	34017
55.4	56.4	4300	2086	2681	0.35	11666	31408	34017
56.4	57.4	4300	2086	2681	0.35	11666	31408	34017
57.4	58.4	4300	2086	2681	0.35	11666	31408	34017
58.4	59.4	4300	2086	2681	0.35	11666	31408	34017
59.4	60.4	4300	2086	2681	0.35	11666	31408	34017
60.4	61.4	4300	2086	2681	0.35	11666	31408	34017
61.4	62.4	4300	2086	2681	0.35	11666	31408	34017
62.4	63.4	4300	2086	2681	0.35	11666	31408	34017
63.4	64.4	4300	2086	2681	0.35	11666	31408	34017
64.4	65.4	4300	2086	2681	0.35	11666	31408	34017
65.4	66.4	4300	2086	2681	0.35	11666	31408	34017
66.4	67.4	4300	2086	2681	0.35	11666	31408	34017
67.4	68.4	4300	2086	2681	0.35	11666	31408	34017
68.4	69.4	4300	2086	2681	0.35	11666	31408	34017
69.4	70.4	4300	2086	2681	0.35	11666	31408	34017
70.4	71.4	4300	2086	2681	0.35	11666	31408	34017
71.4	72.4	4300	2086	2681	0.35	11666	31408	34017
72.4	73.4	4300	2086	2681	0.35	11666	31408	34017
73.4	74.4	4300	2086	2681	0.35	11666	31408	34017
74.4	75.4	4300	2086	2681	0.35	11666	31408	34017
75.4	76.4	4300	2086	2681	0.35	11666	31408	34017
76.4	77.4	4300	2086	2681	0.35	11666	31408	34017
77.4	78.4	4300	2086	2681	0.35	11666	31408	34017
78.4	79.4	4300	2086	2681	0.35	11666	31408	34017
79.4	80.4	4300	2086	2681	0.35	11666	31408	34017

Table B3-q: VSP Results - BH71

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.4	470	183	2141	0.41	72	202	377
0.4	1.4	620	196	2141	0.44	82	238	713
1.4	2.4	840	227	2039	0.46	105	307	1299
2.4	3.4	1400	263	2039	0.48	141	418	3808
3.4	4.4	1400	300	2039	0.48	184	542	3752
4.4	5.4	1400	338	2345	0.47	268	787	4239
5.4	6.4	1400	375	2345	0.46	330	964	4157
6.4	7.4	1400	406	2345	0.45	387	1124	4081
7.4	8.4	2000	431	2345	0.48	436	1286	8799
8.4	9.4	2000	454	2345	0.47	483	1424	8736
9.4	10.4	2000	476	2345	0.47	531	1562	8672
10.4	11.4	2000	495	2345	0.47	575	1686	8614
11.4	12.4	2000	517	2243	0.46	600	1756	8173
12.4	13.4	2000	541	2243	0.46	656	1918	8097
13.4	14.4	2000	565	2243	0.46	716	2086	8017
14.4	15.4	2000	590	2243	0.45	781	2268	7931
15.4	16.4	2000	622	2243	0.45	868	2510	7815
16.4	17.4	2000	661	2141	0.44	935	2692	7317
17.4	18.4	2000	707	2141	0.43	1070	3058	7137
18.4	19.4	2000	762	2141	0.42	1243	3518	6906
19.4	20.4	2000	826	2345	0.40	1600	4471	7247
20.4	21.4	3400	898	2345	0.46	1891	5531	24587
21.4	22.4	3400	977	2345	0.45	2238	6514	24124
22.4	23.4	3400	1064	2345	0.45	2655	7676	23569
23.4	24.4	3400	1161	2345	0.43	3161	9065	22894
24.4	25.4	3400	1272	2641	0.42	4273	12124	24832
25.4	26.4	3400	1397	2641	0.40	5154	14416	23658
26.4	27.4	3400	1530	2641	0.37	6182	16977	22287
27.4	28.4	3400	1673	2641	0.34	7392	19814	20674
28.4	29.4	3400	1830	2681	0.30	8978	23273	19021
29.4	30.4	3400	2004	2681	0.23	10767	26569	16636
30.4	31.4	3400	2199	2681	0.14	12964	29570	13707
31.4	32.4	4800	2421	2681	0.33	15714	41780	40818
32.4	33.4	4800	2676	2681	0.27	19199	48938	36172
33.4	34.4	4800	2813	2681	0.24	21215	52547	33484
34.4	35.4	4800	2813	2681	0.24	21215	52547	33484
35.4	36.4	4800	2813	2681	0.24	21215	52547	33484
36.4	37.4	4800	2813	2681	0.24	21215	52547	33484
37.4	38.4	4800	2813	2681	0.24	21215	52547	33484
38.4	39.4	4800	2813	2681	0.24	21215	52547	33484
39.4	40.4	4800	2813	2681	0.24	21215	52547	33484

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.4	41.4	4800	2813	2681	0.24	21215	52547	33484
41.4	42.4	4800	2813	2681	0.24	21215	52547	33484
42.4	43.4	4800	2813	2681	0.24	21215	52547	33484
43.4	44.4	4800	2813	2681	0.24	21215	52547	33484
44.4	45.4	4800	2813	2681	0.24	21215	52547	33484
45.4	46.4	4800	2813	2681	0.24	21215	52547	33484
46.4	47.4	4800	2813	2681	0.24	21215	52547	33484
47.4	48.4	4800	2813	2681	0.24	21215	52547	33484
48.4	49.4	4800	2813	2681	0.24	21215	52547	33484
49.4	50.4	4800	2813	2681	0.24	21215	52547	33484
50.4	51.4	4800	2813	2681	0.24	21215	52547	33484
51.4	52.4	4800	2813	2681	0.24	21215	52547	33484
52.4	53.4	4800	2813	2681	0.24	21215	52547	33484
53.4	54.4	4800	2813	2681	0.24	21215	52547	33484
54.4	55.4	4800	2813	2681	0.24	21215	52547	33484
55.4	56.4	4800	2813	2681	0.24	21215	52547	33484
56.4	57.4	4800	2813	2681	0.24	21215	52547	33484
57.4	58.4	4800	2813	2681	0.24	21215	52547	33484
58.4	59.4	4800	2813	2681	0.24	21215	52547	33484
59.4	60.4	4800	2813	2681	0.24	21215	52547	33484
60.4	61.4	4800	2813	2681	0.24	21215	52547	33484
61.4	62.4	4800	2813	2681	0.24	21215	52547	33484
62.4	63.4	4800	2813	2681	0.24	21215	52547	33484
63.4	64.4	4800	2813	2681	0.24	21215	52547	33484
64.4	65.4	4800	2813	2681	0.24	21215	52547	33484
65.4	66.4	4800	2813	2681	0.24	21215	52547	33484
66.4	67.4	4800	2813	2681	0.24	21215	52547	33484
67.4	68.4	4800	2813	2681	0.24	21215	52547	33484
68.4	69.4	4800	2813	2681	0.24	21215	52547	33484
69.4	70.4	4800	2813	2681	0.24	21215	52547	33484
70.4	71.4	4800	2813	2681	0.24	21215	52547	33484
71.4	72.4	4800	2813	2681	0.24	21215	52547	33484
72.4	73.4	4800	2813	2681	0.24	21215	52547	33484
73.4	74.4	4800	2813	2681	0.24	21215	52547	33484
74.4	75.4	4800	2813	2681	0.24	21215	52547	33484
75.4	76.4	4800	2813	2681	0.24	21215	52547	33484
76.4	77.4	4800	2813	2681	0.24	21215	52547	33484
77.4	78.4	4800	2813	2681	0.24	21215	52547	33484
78.4	79.4	4800	2813	2681	0.24	21215	52547	33484
79.4	80.4	4800	2813	2681	0.24	21215	52547	33484
80.4	81.4	4800	2813	2681	0.24	21215	52547	33484
81.4	82.4	4800	2813	2681	0.24	21215	52547	33484

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
82.4	83.4	4800	2813	2681	0.24	21215	52547	33484
83.4	84.4	4800	2813	2681	0.24	21215	52547	33484
84.4	85.4	4800	2813	2681	0.24	21215	52547	33484
85.4	86.4	4800	2813	2681	0.24	21215	52547	33484
86.4	87.4	4800	2813	2681	0.24	21215	52547	33484
87.4	88.4	4800	2813	2681	0.24	21215	52547	33484
88.4	89.4	4800	2813	2679	0.24	21199	52507	33459
89.4	90.4	4800	2813	2679	0.24	21199	52507	33459
90.4	91.4	4800	2813	2679	0.24	21199	52507	33459
91.4	92.4	4800	2813	2679	0.24	21199	52507	33459
92.4	93.4	4800	2813	2679	0.24	21199	52507	33459
93.4	94.4	4800	2813	2679	0.24	21199	52507	33459
94.4	95.4	4800	2813	2679	0.24	21199	52507	33459
95.4	96.4	4800	2813	2679	0.24	21199	52507	33459
96.4	97.4	4800	2813	2679	0.24	21199	52507	33459
97.4	98.4	4800	2813	2679	0.24	21199	52507	33459
98.4	99.4	4800	2813	2679	0.24	21199	52507	33459
99.4	100.4	4800	2813	2679	0.24	21199	52507	33459
100.4	101.4	4800	2813	2679	0.24	21199	52507	33459
101.4	102.4	4800	2813	2679	0.24	21199	52507	33459
102.4	103.4	4800	2813	2679	0.24	21199	52507	33459
103.4	104.4	4800	2813	2679	0.24	21199	52507	33459
104.4	105.4	4800	2813	2679	0.24	21199	52507	33459
105.4	106.4	4800	2813	2679	0.24	21199	52507	33459
106.4	107.4	4800	2813	2679	0.24	21199	52507	33459
107.4	108.4	4800	2813	2679	0.24	21199	52507	33459
108.4	109.4	4800	2813	2679	0.24	21199	52507	33459
109.4	110.4	4800	2813	2679	0.24	21199	52507	33459
110.4	111.4	4800	2813	2679	0.24	21199	52507	33459
111.4	112.4	4800	2813	2679	0.24	21199	52507	33459
112.4	113.4	4800	2813	2679	0.24	21199	52507	33459
113.4	114.4	4800	2813	2679	0.24	21199	52507	33459
114.4	115.4	4800	2813	2679	0.24	21199	52507	33459
115.4	116.4	4800	2813	2679	0.24	21199	52507	33459
116.4	117.4	4800	2813	2679	0.24	21199	52507	33459
117.4	118.4	4800	2813	2679	0.24	21199	52507	33459
118.4	119.4	4800	2813	2679	0.24	21199	52507	33459
119.4	120	4800	2813	2679	0.24	21199	52507	33459

Table B3-r: VSP Results - BH78

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
0.0	0.3	610	290	2141	0.35	180	488	557
0.3	1.3	700	330	2141	0.36	233	633	738
1.3	2.3	1200	415	2345	0.43	404	1157	2838
2.3	3.3	1600	492	2345	0.45	568	1644	5246
3.3	4.3	1600	574	2345	0.43	773	2204	4973
4.3	5.3	1600	641	2345	0.40	964	2706	4719
5.3	6.3	2000	678	2345	0.44	1078	3094	7943
6.3	7.3	2000	683	2345	0.43	1094	3137	7921
7.3	8.3	2000	669	2345	0.44	1050	3016	7981
8.3	9.3	2000	650	2345	0.44	991	2855	8059
9.3	10.3	2000	634	2345	0.44	943	2722	8123
10.3	11.3	2000	624	2243	0.45	873	2526	7808
11.3	12.3	2000	623	2243	0.45	871	2518	7811
12.3	13.3	2000	630	2243	0.44	890	2573	7785
13.3	14.3	2000	643	2243	0.44	927	2675	7736
14.3	15.3	2000	659	2243	0.44	974	2804	7673
15.3	16.3	2000	674	2243	0.44	1019	2926	7613
16.3	17.3	2000	695	2141	0.43	1034	2960	7185
17.3	18.3	2000	724	2141	0.42	1122	3198	7068
18.3	19.3	2000	762	2345	0.42	1362	3854	7565
19.3	20.3	2400	810	2345	0.44	1539	4418	11456
20.3	21.3	2400	865	2345	0.43	1755	5002	11168
21.3	22.3	2400	928	2345	0.41	2019	5703	10815
22.3	23.3	3200	1000	2345	0.45	2345	6781	20886
23.3	24.3	3200	1074	2641	0.44	3046	8752	22982
24.3	25.3	3200	1149	2641	0.43	3487	9944	22395
25.3	26.3	4800	1224	2641	0.47	3957	11595	55573
26.3	27.3	4800	1298	2641	0.46	4450	12998	54916
27.3	28.3	4800	1371	2681	0.46	5039	14670	55051
28.3	29.3	4800	1442	2681	0.45	5575	16171	54337
29.3	30.3	4800	1511	2681	0.45	6121	17690	53609
30.3	31.3	4800	1578	2681	0.44	6676	19219	52869
31.3	32.3	4800	1641	2681	0.43	7220	20703	52144
32.3	33.3	4800	1702	2681	0.43	7766	22182	51415
33.3	34.3	4800	1759	2681	0.42	8295	23599	50710
34.3	35.3	4800	1813	2681	0.42	8812	24971	50020
35.3	36.3	4800	1862	2681	0.41	9295	26239	49377
36.3	37.3	4800	1908	2681	0.41	9760	27449	48757
37.3	38.3	4800	1950	2681	0.40	10195	28568	48178
38.3	39.3	4800	1987	2681	0.40	10585	29566	47657
39.3	40.3	4800	2020	2681	0.39	10940	30464	47184

Layer Depth (m)				Estimated Bulk Density (kg/m^3)	Dynamic Engineering Properties			
Top	Bottom	Compressional Wave (m/s)	Shear Wave (m/s)		Poissons Ratio	Shear Modulus (MPa)	Deformation Modulus (MPa)	Bulk Modulus (MPa)
40.3	41.3	4800	2049	2681	0.39	11256	31260	46762
41.3	42.3	4800	2073	2681	0.39	11521	31922	46409
42.3	43.3	4800	2094	2681	0.38	11756	32504	46096
43.3	44.3	4800	2110	2681	0.38	11936	32949	45855
44.3	45.3	4800	2122	2681	0.38	12072	33284	45674
45.3	46.3	4800	2122	2681	0.38	12072	33284	45674
46.3	47.3	4800	2129	2681	0.38	12152	33480	45568
47.3	48.3	4800	2133	2681	0.38	12198	33592	45507
48.3	49.3	4800	2139	2681	0.38	12266	33760	45415
49.3	50.3	4800	2151	2681	0.37	12404	34096	45231
50.3	51.3	4800	2164	2681	0.37	12555	34462	45030
51.3	52.3	4800	2174	2681	0.37	12671	34743	44875
52.3	53.3	4800	2184	2681	0.37	12788	35025	44720
53.3	54.3	4800	2192	2681	0.37	12882	35251	44594
54.3	55.3	4800	2199	2681	0.37	12964	35449	44485
55.3	56.3	4800	2204	2681	0.37	13023	35591	44406
56.3	57.3	4800	2209	2681	0.37	13082	35732	44327
57.3	58.3	4800	2212	2681	0.37	13118	35817	44280
58.3	59.3	4800	2215	2681	0.36	13154	35902	44232
59.3	60.3	4800	2217	2681	0.36	13177	35959	44200
60.3	61.3	4800	2218	2681	0.36	13189	35987	44185
61.3	62.3	4800	2219	2681	0.36	13201	36015	44169
62.3	63.3	4800	2219	2681	0.36	13201	36015	44169
63.3	64.3	4800	2219	2681	0.36	13201	36015	44169
64.3	65.3	4800	2219	2681	0.36	13201	36015	44169
65.3	66.3	4800	2218	2681	0.36	13189	35987	44185
66.3	67.3	4800	2211	2681	0.37	13106	35789	44295
67.3	68.3	4800	2199	2681	0.37	12964	35449	44485
68.3	69.3	4800	2187	2681	0.37	12823	35110	44673
69.3	70.3	4800	2176	2681	0.37	12694	34800	44844
70.3	71.3	4800	2165	2681	0.37	12566	34490	45015
71.3	72.3	4800	2155	2681	0.37	12451	34209	45169
72.3	73.3	4800	2145	2681	0.38	12335	33928	45323
73.3	74.3	4800	2136	2681	0.38	12232	33676	45461
74.3	75.3	4800	2128	2681	0.38	12141	33452	45583
75.3	76.3	4800	2120	2681	0.38	12049	33228	45704
76.3	77.3	4800	2112	2681	0.38	11959	33005	45825
77.3	78.3	4800	2105	2681	0.38	11880	32810	45931
78.3	79.3	4800	2098	2681	0.38	11801	32615	46036
79.3	80.3	4800	2091	2681	0.38	11722	32421	46141

Table B4: Summary of Cyclic Triaxial and Simple Shear Test Results

Test Type	Unit	Borehole ID	Sample no	Stress/Strain controlled	Soil Type	Effective Vertical Consolidation Stress (kPa)	Cyclic stress ratio	Number of cycles completed
Cyclic Simple Shear	Unit 2A	BH1S	3	Stress	Brown Clay with Sand, Moist	43	0.25	200
		BH8S	3 (5'9" - 6'8")	Stress	Grayish brown Clay with Gravel, Moist	40	0.25	52
		BH8SB	3 (6'9" - 6'11")	Stress	Grayish brown Clay with Gravel, Moist	41	0.15	200
		BH11S	3	Stress	Brown Clay, Moist	43	0.40	200
		BH66S	3-3	Stress	Brown Clay with Sand, Moist	59	0.15	200
		BH66S	5	Stress	Brown Clay with Sand, Moist	64	0.20	200
		BH66S	8	Stress	Brown Clay with Sand, Moist	73	0.25	200
	Unit 4B	BH1S	16	Stress	Gray Clay, Moist	129	0.25	200
		BH1S	28	Stress	Gray Clay, Moist	239	0.25	200
		BH8S	7-1	Stress	Gray Clay, Moist	216	0.25	200
		BH11S	8	Stress	Gray Clay, Moist	221	0.39	8
		BH18S	34	Stress	Gray Clay with Sand, Moist	217	0.15	200
		BH18S	36	Stress	Gray Clay with Sand, Moist	221	0.25	200
		BH28S	42	Stress	Gray Clay, Moist	300	0.25	200
		BH28S	44	Stress	Gray Clay, Moist	310	0.15	200
		BH66S	32	Stress	Dark Gray Clay, Moist	211	0.15	200
		BH66S	34-2	Stress	Dark Gray Clay, Moist	228	0.20	200
		BH66S	41-2	Stress	Dark Gray Clay, Moist	249	0.25	200
		BH83S	3	Stress	Gray Silty Clay with Sand, Moist	210	0.25	200
	Unit 5	BH1S	32	Stress	Gray Gravely Silty Clay with Sand, Moist	277	0.25	200
		BH1S	33-2	Stress	Gray Gravely Silty Clay with Sand, Moist	277	0.40	66
		BH8S	18-1	Stress	Gray Silty Clay with Sand, Moist	236	0.25	200
		BH8S	18-2	Stress	Gray Silty Clay with Sand, Moist	236	0.34	5
		BH8S	20-1	Stress	Gray Silty Clay with Sand, Moist	244	0.15	200
		BH11S	17	Stress	Gray Silty Clay with Gravel, Moist	243	0.25	200
		BH18S	40-2	Stress	Gray Sandy Silty Clay, Moist	242	0.30	95
		BH18S	44-2	Stress	Gray Sandy Silty Clay, Moist	277	0.20	200
		BH28S	51-2	Stress	Gray Silty Sand, Moist	352	0.30	111
		BH66S	43	Stress	Gray Silty Sand, Moist	291	0.15	200
		BH66S	45	Stress	Gray Silty Sand, Moist	296	0.25	200
Cyclic Triaxial	Unit 2b	BH66SB	10-3	Stress	Gray Silty Clayey Sand with Gravel, Wet	90	0.22	10
	Unit 3	BH18S	6	Stress	Gray Clay with Sand, Moist	83	0.40	9
		BH18S	12	Stress	Gray Clay with Sand, Moist	83	0.35	65
		BH18S	14	Stress	Light Grayish Brown Silty Sand, Moist	84	0.35	200
		BH28S	11	Stress	Gray Silt, Wet	88	0.25	183
		BH28S	27	Stress	Gray Sand with Clay and Gravel, Moist	210	0.25	200
		BH66S	16-3	Stress	Gray Clay with Sand, Moist	113	0.22	200
		BH28S	4	Stress	Gray Silt, Wet	88	0.15	200
		BH66S	15-3	Stress	Gray Clay with Sand, Moist	115	0.16	200
		BH66S	14-3	Stress	Gray Clay with Sand, Moist	145	0.1	200
	Unit 4a	BH18S	20	Stress	Gray Silty Sand, Moist	162	0.35	134
		BH28S	12	Stress	Gray Sand with Clay, Wet	171	0.25	196
		BH28S	14	Stress	Gray Sand, Moist	247	0.25	200
		BH66S	19	Stress	Gray Silty Sand, Moist	166	0.1	200
		BH66S	21	Stress	Gray Clay with Sand, Moist	166	0.16	200
		BH66S	25	Stress	Gray Sand with Clay, Wet	166	0.22	200

Appendix C SPT Blow counts Processed Data

Table C-1: SPT Blow counts Processed Data

Table C-1a: SPT Blow Count Processed Data - Reactor Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
								Ground	Sample																		Iterative calculation Boulanger & Idriss 2014		
	-	-	-	m	m	m	m			-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH10	21-Jun-21	SS1	0	0.61	0.31	88.09	88.4	88.4	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	24.42	7.1	21	7	0	7	40	40		1.00	1.29	0.6	0.3	1.7	50	6	56
21451329	BH10	21-Jun-21	SS2	1.17	1.22	1.20	87.20	88.4	87.23	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.42	7.1	21	25	0	25	40	13		1.00	1.29	0.7	0.4	1.7	19	6	25
21451329	BH10	21-Jun-21	SS3	1.52	1.98	1.75	86.65	88.4	86.88	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.42	7.1	21	37	0	37	75	6		1.00	1.29	0.7	0.5	1.6	9	6	15
21451329	BH10	21-Jun-21	SS4	2.29	2.74	2.52	85.88	88.4	86.11	Unit 2a	Lean Clay (CL)	Native	24.42	7.1	20.2	51	0	51	77.95	19		1.36	1.29	0.8	0.4	1.3	24	6	30
21451329	BH10	21-Jun-21	SS6	3.81	4.42	4.12	84.28	88.4	84.59	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.42	7.1	23.2	96	0	96	46	10		1.36	1.29	0.9	0.5	1.0	11	6	17
21451329	BH10	21-Jun-21	SS7	4.57	5.03	4.80	83.60	88.4	83.83	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.42	7.1	23.2	111	0	111	46	6		1.36	1.29	0.9	0.5	0.9	6	6	12
21451329	BH10	21-Jun-21	SS8	5.33	5.79	5.56	82.84	88.4	83.07	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	135	0	135	48.072	18		1.37	1.29	0.9	0.4	0.9	19	6	24
21451329	BH10	21-Jun-21	SS9	6.1	6.55	6.33	82.07	88.4	82.3	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	154	0	154	48.072	20		1.37	1.29	0.9	0.4	0.8	20	6	26
21451329	BH10	21-Jun-21	SS10	7.62	8.08	7.85	80.55	88.4	80.78	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	191	7	183	48.072	133		1.37	1.29	1.0	0.3	0.9	142	6	148
21451329	BH10	21-Jun-21	SS11	9.14	9.6	9.37	79.03	88.4	79.26	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	228	22	205	49	110		1.37	1.29	1.0	0.3	0.8	117	6	123
21451329	BH10	21-Jun-21	SS12	10.67	11.13	10.90	77.50	88.4	77.73	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	241	37	204	50	94		1.41	1.29	1.0	0.3	0.8	100	6	106
21451329	BH10	21-Jun-21	SS13	12.19	12.65	12.42	75.98	88.4	76.21	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	274	52	222	50	40		1.41	1.29	1.0	0.3	0.8	42	6	47
21451329	BH10	21-Jun-21	SS14	13.72	14.1	13.91	74.49	88.4	74.68	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	307	67	241	27	193	0.23	1.41	1.29	1.0	0.3	0.8	197	5	202
21451329	BH10	21-Jun-21	SS15	15.44	15.7	15.57	72.83	88.4	72.96	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	344	83	261	50	158		1.41	1.29	1.0	0.3	0.8	158	6	163
21451329	BH10	21-Jun-21	SS16	18.29	18.75	18.52	69.88	88.4	70.11	Unit 4b	Lean Clay (CL)	Native	24.42	7.1	22.2	411	112	299	96	21		1.41	1.29	1.0	0.4	0.6	17	5	23
21451329	BH10	21-Jun-21	SS17	21.54	21.69	21.62	66.78	88.4	66.86	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.42	7.1	23.7	512	142	370	68	148	0.13	1.43	1.29	1.0	0.3	0.7	135	6	140
21451329	BH10	21-Jun-21	SS18	23.86	24.29	24.08	64.32	88.4	64.54	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.42	7.1	23.7	571	167	404	55	161	0.18	1.43	1.29	1.0	0.3	0.7	143	6	149
21451329	BH11	28-Jun-21	SS1	0.15	0.61	0.38	87.51	87.89	87.74	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.24	2.5	21	8	0	8	40	50		1.00	1.08	0.6	0.3	1.7	53	6	59
21451329	BH11	28-Jun-21	SS2	0.61	1.07	0.84	87.05	87.89	87.28	Unit 2a	Lean Clay with Sand (CL)	Native	23.24	2.5	20.2	17	0	17	83	16		1.36	1.08	0.6	0.4	1.7	19	6	24
21451329	BH11	28-Jun-21	SS3	1.4	1.68	1.54	86.35	87.89	86.49	Unit 2a	Lean Clay with Sand (CL)	Native	23.24	2.5	20.2	31	0	31	77.95	11		1.36	1.08	0.7	0.4	1.7	14	6	20
21451329	BH11	28-Jun-21	SS4	1.83	2.29	2.06	85.83	87.89	86.06	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	50	0	50	48.072	12		1.37	1.08	0.7	0.5	1.4	13	6	19
21451329	BH11	28-Jun-21	SS5	2.44	2.9	2.67	85.22	87.89	85.45	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	65	2	63	48.072	24		1.37	1.08	0.8	0.4	1.2	24	6	30
21451329	BH11	28-Jun-21	SS6	3.05	3.51	3.28	84.61	87.89	84.84	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	80	8	72	48.072	14		1.37	1.08	0.8	0.4	1.2	14	6	20
21451329	BH11	28-Jun-21	SS7	3.66	4.11	3.89	84.00	87.89	84.23	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	95	14	81	30	44		1.37	1.08	0.8	0.3	1.1	42	5	48
21451329	BH11	28-Jun-21	SS8	4.27	4.72	4.50	83.39	87.89	83.62	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	109	20	90	48.072	80		1.37	1.08	0.9	0.3	1.0	77	6	83
21451329	BH11	28-Jun-21	SS9	4.88	5.33	5.11	82.78	87.89	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	124	26	99	48.072	76		1.37	1.08	0.9	0.3	1.0	73	6	79
21451329	BH11	28-Jun-21	SS10	5.49	5.61	5.55	82.34	87.89	82.4	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	135	30	105	48.072	100	0.13	1.37	1.08	0.9	0.3	1.0	97	6	102
21451329	BH11	28-Jun-21	SS11	6.1	6.55	6.33	81.56	87.89	81.79	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	154	38	116	43	138		1.37	1.08	0.9	0.3	1.0	133	6	139
21451329	BH11	28-Jun-21	SS12	6.71	6.99	6.85	81.04	87.89	81.18	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	166	43	124	48.072	100	0.13	1.37	1.08	0.9	0.3	0.9	96	6	102
21451329	BH11	28-Jun-21	SS13	7.32	7.53	7.43	80.46	87.89	80.57	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	181	48	132	48.072	100	0.06	1.37	1.08	1.0	0.3	0.9	96	6	102
21451329	BH11	28-Jun-21	SS14	7.92	8.2	8.06	79.83	87.89	79.97	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	196	55	141	48.072	100	0.13	1.37	1.08	1.0	0.3	0.9	96	6	102
21451329	BH11	28-Jun-21	SS15	8.53	8.81	8.67	79.22	87.89	79.36	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	211	61	150	52	100	0.13	1.37	1.08	1.0	0.3	0.9	96	6	102
21451329	BH11	28-Jun-21	SS16	9.14	9.35	9.25	78.64	87.89	78.75	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	225	66	159	48.072	100	0.05	1.37	1.08	1.0	0.3	0.9	95	6	101
21451329	BH11	28-Jun-21	SS17	9.75	10.03	9.89	78.00	87.89	78.14	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.24	2.5	24.3	240	72	168	48.072	100	0.13	1.37	1.08	1.0	0.3	0.9	94	6	99
21451329	BH11	28-Jun-21	SS18	10.36	10.82	10.59	77.30	87.89	77.53	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	256	79	176	50	142		1.41	1.08	1.0	0.3	0.9	131	6	137
21451329	BH11	28-Jun-21	SS19	10.97	11.43	11.20	76.69	87.89	76.92	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	269	85	184	50	149		1.41	1.08	1.0	0.3	0.9	136	6	142
21451329	BH11	28-Jun-21	SS20	11.58	12.03	11.81	76.08	87.89	76.31	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	283	91	191	47	170	0.29	1.41	1.08	1.0	0.3	0.8	154	6	160
21451329	BH11	28-Jun-21	SS21	12.19	12.47	12.33	75.56	87.89	75.7	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	294	96	198	50	100	0.13	1.41	1.08	1.0	0.3	0.8	90	6	95
21451329	BH11	28-Jun-21	SS22	12.8	13.09	12.95	74.94	87.89	75.09	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	308	103	205	50	100	0.14	1.41	1.08	1.0	0.3	0.8	89	6	95
21451329	BH11	28-Jun-21	SS23	13.41	13.87	13.64	74.25	87.89	74.48	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	301	109	192	50	95		1.41	1.08	1.0	0.3	0.8	86	6	92
21451329	BH11	28-Jun-21	SS24	14.02	14.43	14.23	73.66	87.89	73.87	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	314	115	199	24	112	0.25	1.41	1.08	1.0	0.3	0.8	100	5	105
21451329	BH11	28-Jun-21	SS25	14.63	14.86	14.75	73.14	87.89	73.26	Unit 4a	Silty Sand (SM)	Native	23.24	2.5	22.1	326	120	206	50	100	0.08	1.41	1.08	1.0	0.3	0.8	89	6	95
21451329	BH11	28-Jun-21	SS26	15.47	15.7	15.59	72.30	87.89	72.42	Unit 4b	Lean Clay (CL)	Native	23.24	2.5	22.2	345	128	216	95	103		1.41	1.08	1.0	0.3	0.8	90	6	96
21451329	BH11	28-Jun-21	SS27	15.85	16.31	16.08	71.81	87.89	72.04	Unit 4b	Silty Clay (CL-ML)	Native	23.24	2.5	22.2	357	133	224	94	98		1.41	1.08	1.0	0.3	0.8	85	6	91
21451329	BH11	28-Jun-21	SS28	16.46	16.92	16.69	71.20	87.89	71.43	Unit 4b	Silty Clay (CL-ML)	Native	23.24	2.5	22.2	371	139	231	92.423	106		1.41	1.08	1.0	0.3	0.8	91	6	97
21451329	BH11	28-Jun-21	SS29	17.07	17.52	17.30	70.59	87.89	70.82	Unit 4b	Lean Clay (CL)	Native	23.24	2.5	22.2	384	145	239	98	22		1.41	1.08	1.0	0.4	0.7	16	5	22
21451329	BH11	28-Jun-21	SS30	17.68	18.14	17.91	69.98	87.89	70.21	Unit 4b	Lean Clay (CL)	Native	23.24	2.5	22.2	398	151	246	92.423	15		1.41	1.08	1.0	0.5	0.7	10	6	16
21451329	BH11	28-Jun-21	SS31	18.54	18.75	18.65	69.24	87.89	69.35	Unit 5	Till: Silt with Sand (ML)	Native	23.24	2.5	23.7	442	158	284	68	83		1.43	1.08	1.0	0.3	0.8	68	6	73
21451329	BH11	28-Jun-21	SS32	18.9	19.36	19.13	68.76	87.89	68.99	Unit 5	Till: Silt with Sand (ML)	Native	23.24	2.5	23.7	453	163	290	79	145		1.43	1.08	1.0	0.3	0.8	118	6	123
21451329	BH11	28-Jun-21	SS33	19.51	19.96	19.74	68.15	87.89	68.38	Unit 5	Till: Silt with Sand (ML)	Native	23.24	2.5	23.7	468	169	299	68	115		1.43	1.08	1.0	0.3	0.7	93	6	98
21451329	BH11	28-Jun-21	SS34	20.12	20.37	20.25	67.64	87.89	67.77	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	23.24	2.5	22.1	448	174	273	50	100	0.1	1.41	1.08	1.0	0.3	0.8	83	6	88
21451329	BH11	28-Jun-21	SS35	20.85	21.01	20.93	66.96	87.89	67.04	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	23.24	2.5	22.1	463	181	282	50	100	0.13	1.41	1.08	1.0	0.3	0.8	82	6	87
21451329	BH11	28-Jun-21	SS36	21.34	21.59	21.47	66.42	87.89	66.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	23.24	2.5	22.1	474	186	288	65	100	0.1	1.41	1.08	1.0	0.3	0.8	81	6	87
21451329	BH11	28-Jun-21	SS37	21.95	22.4	22.18	65.71	87.89	65.94	Unit 5	Till: Sandy Silt (ML)	Native	23.24	2.5	23.7	526	193	333	66	136		1.43	1.08	1.0	0.3	0.7	107	6	112
21451329	BH11	28-Jun-21	SS36	22.56	23	22.78	65.11	87.89	65.33	Unit 5	Till: Sandy Silt (ML)	Native	23.24	2.5	23.7	540	199	341	68	70	0.07	1.43	1.08	1.0	0.3	0.7	54	6	60
21451329	BH11	28-Jun-21	SS37	23.16	23.24	23.20	64.69	87.89	64.73	Unit 5	Till: Sandy Silt (ML)	Native	23.24	2.5	23.7	550	203	347	68	100	0.08	1.43	1.08	1.0	0.3	0.7	78	6	83
21451329	BH14	30-Jun-21	SS1	0.31	0.61	0.46	87.15	87.61	87.3	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.56	9.11	21	10	0	10	40	19		1.00	1.29	0.6	0.4	1.7	25	6	30
21451329	BH14	30-Jun-21	SS2	0.76	1.22	0.99	86.62	87.61	86.85	Unit 2a	Lean Clay with Sand (CL)	Native	23.56	9.11	20.2	20	0	20	88	9		1.36	1.29	0.7	0.5	1.7	13	6	18
21451329	BH14	30-Jun-21	SS3	1.52	1.98	1.75	85.86	87.61	86.09	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	39	0	39	48.072	12		1.37	1.29	0.7	0.4	1.5	17	6	22
21451329	BH14	30-Jun-21	SS4	2.59	2.74	2.67	84.94	87.61	85.02	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	65	0	65	47	14		1.37	1.29	0.8	0.4	1.2	17	6	23
21451329	BH14	30-Jun-21	SS5	3.05	3.51	3.28	84.33	87.61	84.56	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	80	0	80	48.072	59		1.37	1.29	0.8	0.3	1.1	66	6	71
21451329	BH14	30-Jun-21	SS6	3.81	4.27	4.04	83.57	87.61	83.8	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	98	0	98	48.072	54		1.37	1.29	0.9	0.3	1.0	59	6	65
21451329	BH14	30-Jun-21	SS7	4.57	5.03	4.80	82.81	87.61	83.04	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	117	0	117	48.072	53		1.37	1.29	0.9	0.3	1.0	58	6	63
21451329	BH14	30-Jun-21	SS8	5.33	5.79	5.56	82.05	87.61	82.28	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	135	0	135	48.072	46		1.37	1.29	0.9	0.3	0.9	50	6	55
21451329	BH14	30-Jun-21	SS9	6.1	6.55	6.33	81.28	87.61	81.51	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	154	0	154	48.072	89		1.37	1.29	0.9	0.3	0.9	95	6	101
21451329	BH14	30-Jun-21	SS10	7.72	8.08	7.90	79.71	87.61	79.89	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	175	0	175	38	139		1.41	1.29	1.0	0.3	0.9	151	6	156
21451329	BH14	30-Jun-21	SS11	9.14	9.56	9.35	78.26	87.61	78.47	Unit 4b	Sandy Lean Clay (CL)	Native	23.56	9.11	22.2	208	2	205	92.423	188	0.27	1.41	1.29	1.0	0.3	0.8	200	6	205
21451329	BH14	30-Jun-21	SS12	10.67	11.07	10.87	76.74	87.61	76.94	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	240	17	223	50	154	0.25	1.41	1.29	1.0	0.3	0.8	160	6	166
21451329	BH14	30-Jun-21	SS13	12.19	12.6	12.40	75.21	87.61	75.42	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	274	32	242	50	184	0.25	1.41	1.29	1.0	0.3	0.8	187	6	193
21451329	BH14	30-Jun-21	SS14	13.72	14.01	13.87	73.74	87.61	73.89	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	307	47	260	50	100	0.14	1.41	1.29	1.0	0.3	0.8	100	6	106
21451329	BH14	30-Jun-21	SS15	15.24	15.65	15.45	72.16	87.61	72.37	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	341	62	279	44	185	0.25	1.41	1.29	1.0	0.3	0.8	181	6	187

Table C-1a: SPT Blow Count Processed Data - Reactor Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation: Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH14	30-Jun-21	SS16	16.76	17.22	16.99	70.62	87.61	70.85	Unit 4a	Silt with Sand (ML)	Native	23.56	9.11	22.1	375	77	298	50	93		1.41	1.29	1.0	0.3	0.8	90	6	95
21451329	BH14	30-Jun-21	SS17	18.29	18.75	18.52	69.09	87.61	69.32	Unit 4b	Sandy Lean Clay (CL)	Native	23.56	9.11	22.2	411	92	319	92.423	21		1.41	1.29	1.0	0.4	0.6	17	6	22
21451329	BH14	30-Jun-21	SS18	19.81	20.17	19.99	67.62	87.61	67.8	Unit 4a	Silt with Sand (ML)	Native	23.56	9.11	22.1	444	107	337	50	181	0.2	1.41	1.29	1.0	0.3	0.7	169	6	175
21451329	BH14	30-Jun-21	SS19	21.34	21.54	21.44	66.17	87.61	66.27	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	476	121	355	50	100	0.05	1.41	1.29	1.0	0.3	0.7	92	6	98
21451329	BH14	30-Jun-21	SS20	22.86	23.32	23.09	64.52	87.61	64.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.56	9.11	23.7	515	137	378	75	67		1.43	1.29	1.0	0.3	0.7	61	6	66
21451329	BH9	30-Sep-21	SS1	0	0.61	0.31	88.52	88.83	88.83	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.71	8.87	21	7	0	7	40	35	0.11	1.00	1.08	0.6	0.3	1.7	37	6	42
21451329	BH9	30-Sep-21	SS2	0.76	1.22	0.99	87.84	88.83	88.07	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.71	8.87	21	21	0	21	78	28		1.00	1.08	0.7	0.3	1.6	32	6	38
21451329	BH9	30-Sep-21	SS3	1.52	1.83	1.68	87.15	88.83	87.31	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.71	8.87	21	35	0	35	40	33		1.00	1.08	0.7	0.3	1.4	35	6	40
21451329	BH9	30-Sep-21	SS4	2.29	2.74	2.52	86.31	88.83	86.54	Unit 2a	Lean Clay (CL)	Native	24.71	8.87	20.2	51	0	51	77.95	4		1.36	1.08	0.8	0.5	1.4	5	6	10
21451329	BH9	30-Sep-21	SS6	3.81	4.27	4.04	84.79	88.83	85.02	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.2	94	0	94	46	15		1.36	1.08	0.9	0.4	1.0	14	6	20
21451329	BH9	30-Sep-21	SS7	4.57	5.03	4.80	84.03	88.83	84.26	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.2	111	0	111	46	7		1.36	1.08	0.9	0.5	0.9	6	6	12
21451329	BH9	30-Sep-21	SS8	5.18	5.78	5.48	83.35	88.83	83.65	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.2	127	0	127	46	7		1.36	1.08	0.9	0.5	0.9	6	6	12
21451329	BH9	30-Sep-21	SS9	6.1	6.55	6.33	82.50	88.83	82.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	154	0	154	48.072	36		1.37	1.08	0.9	0.3	0.9	32	6	37
21451329	BH9	30-Sep-21	SS10	6.86	7.32	7.09	81.74	88.83	81.97	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	172	0	172	38	138		1.37	1.08	1.0	0.3	0.9	123	6	128
21451329	BH9	30-Sep-21	SS11	7.62	7.9	7.76	81.07	88.83	81.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	189	0	189	48.072	100	0.13	1.37	1.08	1.0	0.3	0.8	89	6	94
21451329	BH9	30-Sep-21	SS12	9.14	9.35	9.25	79.58	88.83	79.69	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	225	4	221	48.072	100	0.05	1.37	1.08	1.0	0.3	0.8	87	6	93
21451329	BH9	30-Sep-21	SS13	10.67	10.95	10.81	78.02	88.83	78.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	263	19	244	48.072	100	0.13	1.37	1.08	1.0	0.3	0.8	85	6	91
21451329	BH9	30-Sep-21	SS14	12.19	12.53	12.36	76.47	88.83	76.64	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	297	34	263	50	185	0.13	1.41	1.08	1.0	0.3	0.8	154	6	160
21451329	BH9	30-Sep-21	SS15	13.72	14.17	13.95	74.88	88.83	75.11	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	332	50	282	21	39		1.41	1.08	1.0	0.3	0.7	30	5	34
21451329	BH9	30-Sep-21	SS16	15.24	15.66	15.45	73.38	88.83	73.59	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	365	65	301	50	157	0.26	1.41	1.08	1.0	0.3	0.7	126	6	132
21451329	BH9	30-Sep-21	SS17	16.76	17.22	16.99	71.84	88.83	72.07	Unit 4b	Lean Clay (CL)	Native	24.71	8.87	22.2	377	80	298	92.423	136		1.41	1.08	1.0	0.3	0.8	110	6	115
21451329	BH9	30-Sep-21	SS18	18.29	18.75	18.52	70.31	88.83	70.54	Unit 4b	Lean Clay (CL)	Native	24.71	8.87	22.2	411	95	316	99	33		1.41	1.08	1.0	0.4	0.7	23	5	29
21451329	BH9	30-Sep-21	SS19	19.81	20.27	20.04	68.79	88.83	69.02	Unit 4b	Lean Clay (CL)	Native	24.71	8.87	22.2	445	110	335	73	53		1.41	1.08	1.0	0.3	0.7	41	6	47
21451329	BH9	30-Sep-21	SS20	21.34	21.56	21.45	67.38	88.83	67.49	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	476	123	353	50	100	0.07	1.41	1.08	1.0	0.3	0.7	77	6	83
21451329	BH9	30-Sep-21	SS21	22.86	23.27	23.07	65.76	88.83	65.97	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	510	139	371	36	183	0.25	1.41	1.08	1.0	0.3	0.7	139	6	145
21451329	BH9	30-Sep-21	SS22	24.38	24.79	24.59	64.24	88.83	64.45	Unit 5	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.7	583	154	429	49	143	0.25	1.43	1.08	1.0	0.3	0.7	105	6	110
21451329	BH12-3	20-Oct-21	SS1	0	0.3	0.15	87.29	87.44	87.44	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23.47	1.76	21	3	0	3	40	11	0.15	1.00	1.36	0.5	0.4	1.7	14	6	19
21451329	BH12-3	20-Oct-21	SS2	3.05	3.5	3.28	84.16	87.44	84.39	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.47	1.76	24.3	79	15	64	48.072	93		1.37	1.36	0.8	0.3	1.1	116	6	122
21451329	BH12-3	20-Oct-21	SS3	6.1	6.43	6.27	81.17	87.44	81.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.47	1.76	24.3	152	44	108	48.072	164	0.18	1.37	1.36	0.9	0.3	1.0	204	6	209
21451329	BH12-3	20-Oct-21	SS4	9.14	9.34	9.24	78.20	87.44	78.3	Unit 3	Till: Sand Silty Clay (CL-ML)	Native	23.47	1.76	24.3	225	73	151	48.072	190	0.2	1.37	1.36	1.0	0.3	0.9	232	6	237
21451329	BH12-3	20-Oct-21	SS5	12.19	12.48	12.34	75.10	87.44	75.25	Unit 4a	Silty Sand (SM)	Native	23.47	1.76	22.1	273	104	169	50	163	0.29	1.41	1.36	1.0	0.3	0.9	193	6	198
21451329	BH12-3	20-Oct-21	SS6	15.24	15.7	15.47	71.97	87.44	72.2	Unit 4b	Silty Clay (CL-ML)	Native	23.47	1.76	22.2	343	134	209	92.423	80		1.41	1.36	1.0	0.3	0.8	90	6	95
21451329	BH12-3	20-Oct-21	SS7	18.29	18.69	18.49	68.95	87.44	69.15	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.47	1.76	23.7	438	164	274	68	187	0.25	1.43	1.36	1.0	0.3	0.8	195	6	200

Table C-1b: SPT Blow Count Processed Data - Turbine Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\left| \begin{array}{l} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{array} \right.$ d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
								Ground	Sample																		Iterative calculation Boulanger & Idriss 2014		
	-	-	-	m	m	m	m			-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH66	14-Jun-21	SS1	0.31	0.56	0.44	89.05	89.49	89.18	Unit 1	Fill: Poorly Graded Gravelly Sand (SP)	Fill	25.95	2.5	21	9	0	9	40	6		1.00	1.36	0.6	0.5	1.7	8	6	14
21451329	BH66	14-Jun-21	SS2	0.76	1.22	0.99	88.50	89.49	88.73	Unit 1	Fill: Silty Sand (SM)	Fill	25.95	2.5	21	21	0	21	45	58		1.00	1.36	0.7	0.3	1.5	78	6	84
21451329	BH66	14-Jun-21	SS3	1.52	1.98	1.75	87.74	89.49	87.97	Unit 1	Fill: Silty Sand (SM)	Fill	25.95	2.5	21	37	0	37	40	26		1.00	1.36	0.7	0.3	1.3	34	6	40
21451329	BH66	14-Jun-21	SS4	2.29	2.9	2.60	86.89	89.49	87.2	Unit 2a	Lean Clay with Sand (CL)	Native	25.95	2.5	20.2	54	1	53	77.95	11		1.36	1.36	0.8	0.4	1.3	15	6	21
21451329	BH66	14-Jun-21	SS5	3.05	3.51	3.28	86.21	89.49	86.44	Unit 2a	Lean Clay with Sand (CL)	Native	25.95	2.5	20.2	68	8	60	77.95	18		1.36	1.36	0.8	0.4	1.2	24	6	30
21451329	BH66	14-Jun-21	SS6	4.04	4.27	4.16	85.33	89.49	85.45	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.95	2.5	23.2	88	16	72	46	4		1.36	1.36	0.9	0.5	1.2	6	6	11
21451329	BH66	14-Jun-21	SS7	5.33	5.94	5.64	83.85	89.49	84.16	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.95	2.5	23.2	122	31	92	46	2		1.36	1.36	0.9	0.6	1.1	3	6	8
21451329	BH66	14-Jun-21	SS9	6.86	7.32	7.09	82.40	89.49	82.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.95	2.5	24.3	158	45	113	48.072	15		1.37	1.36	1.0	0.4	1.0	19	6	24
21451329	BH66	14-Jun-21	SS10	7.62	8.08	7.85	81.64	89.49	81.87	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.95	2.5	24.3	176	52	124	48.072	105		1.37	1.36	1.0	0.3	0.9	132	6	137
21451329	BH66	14-Jun-21	SS11	9.14	9.6	9.37	80.12	89.49	80.35	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	210	67	142	50	121		1.41	1.36	1.0	0.3	0.9	150	6	155
21451329	BH66	14-Jun-21	SS12	10.67	11.13	10.90	78.59	89.49	78.82	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	244	82	161	67	183		1.41	1.36	1.0	0.3	0.9	219	6	225
21451329	BH66	14-Jun-21	SS13	12.19	12.62	12.41	77.08	89.49	77.3	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	277	97	180	50	180	0.28	1.41	1.36	1.0	0.3	0.9	210	6	215
21451329	BH66	14-Jun-21	SS14	13.72	14.01	13.87	75.62	89.49	75.77	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	309	112	198	50	195	0.14	1.41	1.36	1.0	0.3	0.8	221	6	227
21451329	BH66	14-Jun-21	SS15	15.24	15.68	15.46	74.03	89.49	74.25	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	344	127	217	50	100	0.29	1.41	1.36	1.0	0.3	0.8	111	6	116
21451329	BH66	14-Jun-21	SS16	18.57	18.75	18.66	70.83	89.49	70.92	Unit 4b	Lean Clay (CL)	Native	25.95	2.5	22.2	415	159	257	92.423	118		1.41	1.36	1.0	0.3	0.8	125	6	131
21451329	BH66	14-Jun-21	SS17	21.34	21.79	21.57	67.92	89.49	68.15	Unit 4b	Lean Clay (CL)	Native	25.95	2.5	22.2	480	187	293	93	19		1.41	1.36	1.0	0.4	0.6	16	6	22
21451329	BH66	14-Jun-21	SS18	24.38	24.84	24.61	64.88	89.49	65.11	Unit 5	Till: Lean Clay with Sand (CL)	Native	25.95	2.5	23.7	552	217	335	79	64		1.43	1.36	1.0	0.3	0.7	63	6	69
21451329	BH2	10-Sep-21	SS1	0.33	0.61	0.47	88.94	89.41	89.08	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.83	2.61	21	10	0	10	40	28		1.00	1.29	0.6	0.3	1.7	36	6	42
21451329	BH2	10-Sep-21	SS2	1.02	1.22	1.12	88.29	89.41	88.39	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.83	2.61	21	24	0	24	40	57		1.00	1.29	0.7	0.3	1.5	72	6	77
21451329	BH2	10-Sep-21	SS3	1.65	1.98	1.82	87.59	89.41	87.76	Unit 1	Fill: Sandy Silt (ML)	Fill	24.83	2.61	21	38	0	38	40	16		1.00	1.29	0.7	0.4	1.4	22	6	27
21451329	BH2	10-Sep-21	SS4	2.29	2.74	2.52	86.89	89.41	87.12	Unit 2a	Lean Clay with Sand (CL)	Native	24.83	2.61	20.2	51	0	51	85	12		1.36	1.29	0.8	0.4	1.3	16	6	21
21451329	BH2	10-Sep-21	SS6	3.81	4.27	4.04	85.37	89.41	85.6	Unit 2a	Lean Clay with Sand (CL)	Native	24.83	2.61	20.2	82	14	68	81	4		1.36	1.29	0.9	0.5	1.2	5	6	11
21451329	BH2	10-Sep-21	SS8	6.1	6.55	6.33	83.08	89.41	83.31	Unit 2b	Silty Sand (SM)	Native	24.83	2.61	23.2	147	36	110	47	4		1.36	1.29	0.9	0.5	0.9	5	6	10
21451329	BH2	10-Sep-21	SS9	7.62	8.05	7.84	81.57	89.41	81.79	Unit 3	Till: Sandy Silt (ML)	Native	24.83	2.61	24.3	191	51	139	51	185	0.28	1.37	1.29	1.0	0.3	0.9	213	6	218
21451329	BH2	10-Sep-21	SS10	9.14	9.41	9.28	80.13	89.41	80.27	Unit 3	Till: Sandy Silt (ML)	Native	24.83	2.61	24.3	226	65	160	48.072	100	0.11	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH2	10-Sep-21	SS11	10.67	11.13	10.90	78.51	89.41	78.74	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	241	81	160	67	170		1.41	1.29	1.0	0.3	0.9	193	6	199
21451329	BH2	10-Sep-21	SS12	12.19	12.65	12.42	76.99	89.41	77.22	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	274	96	178	50	142		1.41	1.29	1.0	0.3	0.9	157	6	162
21451329	BH2	10-Sep-21	SS13	13.72	14.11	13.92	75.49	89.41	75.69	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	308	111	197	50	196	0.24	1.41	1.29	1.0	0.3	0.8	211	6	216
21451329	BH2	10-Sep-21	SS14	15.24	15.66	15.45	73.96	89.41	74.17	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	341	126	215	50	198	0.27	1.41	1.29	1.0	0.3	0.8	208	6	214
21451329	BH2	10-Sep-21	SS15	16.76	17.22	16.99	72.42	89.41	72.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	375	141	234	31	83		1.41	1.29	1.0	0.3	0.8	85	5	91
21451329	BH2	10-Sep-21	SS16	18.29	18.75	18.52	70.89	89.41	71.12	Unit 4b	Lean Clay (CL)	Native	24.83	2.61	22.2	411	156	255	96	59		1.41	1.29	1.0	0.3	0.8	59	5	65
21451329	BH2	10-Sep-21	SS17	19.81	20.27	20.04	69.37	89.41	69.6	Unit 4b	Lean Clay (CL)	Native	24.83	2.61	22.2	445	171	274	92.423	40		1.41	1.29	1.0	0.3	0.8	39	6	45
21451329	BH2	10-Sep-21	SS18	21.34	21.77	21.56	67.85	89.41	68.07	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.83	2.61	23.7	481	186	295	68	176	0.28	1.43	1.29	1.0	0.3	0.8	170	6	176
21451329	BH2	10-Sep-21	SS19	22.86	23.32	23.09	66.32	89.41	66.55	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.83	2.61	23.7	517	201	316	64	179		1.43	1.29	1.0	0.3	0.7	170	6	175
21451329	BH2	10-Sep-21	SS20	24.37	24.83	24.60	64.81	89.41	65.04	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.83	2.61	23.7	553	216	337	68	100	0.14	1.43	1.29	1.0	0.3	0.7	93	6	99
21451329	BH5	27-Aug-21	SS1	0.31	0.38	0.35	88.62	88.97	88.66	Unit 1	Fill: Poorly Graded Gravel with Sand (GP)	Fill	25.07	2.5	21	7	0	7	40	29		1.00	1.36	0.6	0.3	1.7	39	6	44
21451329	BH5	27-Aug-21	SS2	0.76	1.22	0.99	87.98	88.97	88.21	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.07	2.5	21	21	0	21	40	47		1.00	1.36	0.7	0.3	1.5	63	6	69
21451329	BH5	27-Aug-21	SS3	1.83	1.98	1.91	87.06	88.97	87.14	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.07	2.5	21	40	0	40	40	44		1.00	1.36	0.7	0.3	1.3	56	6	61
21451329	BH5	27-Aug-21	SS4	4.57	5.03	4.80	84.17	88.97	84.4	Unit 2a	Sandy Silty Clay (CL-ML)	Native	25.07	2.5	20.2	97	23	74	54	3		1.36	1.36	0.9	0.5	1.2	4	6	10
21451329	BH5	27-Aug-21	SS5	7.62	8.08	7.85	81.12	88.97	81.35	Unit 2a	Sandy Silty Clay (CL-ML)	Native	25.07	2.5	20.2	159	52	106	77.95	9		1.36	1.36	1.0	0.5	1.0	12	6	17
21451329	BH5	27-Aug-21	SS6	10.67	11.13	10.90	78.07	88.97	78.3	Unit 3	Till: Sandy Silt (ML)	Native	25.07	2.5	24.3	265	82	182	59	133		1.37	1.36	1.0	0.3	0.9	154	6	160
21451329	BH5	27-Aug-21	SS7	13.72	14.16	13.94	75.03	88.97	75.25	Unit 4a	Silty Sand (SM)	Native	25.07	2.5	22.1	308	112	196	50	172	0.29	1.41	1.36	1.0	0.3	0.8	196	6	201
21451329	BH5	27-Aug-21	SS8	16.76	17.01	16.89	72.08	88.97	72.21	Unit 4a	Silty Sand (SM)	Native	25.07	2.5	22.1	373	141	232	42	100	0.09	1.41	1.36	1.0	0.3	0.8	109	6	114
21451329	BH5	27-Aug-21	SS9	19.81	20.27	20.04	68.93	88.97	69.16	Unit 5	Till: Lean Clay (CL)	Native	25.07	2.5	23.7	475	172	303	86	44		1.43	1.36	1.0	0.3	0.7	45	6	50
21451329	BH5	27-Aug-21	SS10	22.86	23.32	23.09	65.88	88.97	66.11	Unit 5	Till: Lean Clay (CL)	Native	25.07	2.5	23.7	547	202	345	68	108		1.43	1.36	1.0	0.3	0.7	106	6	111
21451329	BH5	27-Aug-21	SS11	23.77	24.31	24.04	64.93	88.97	65.2	Unit 5	Till: Silty Sand with Gravel (SM)	Native	25.07	2.5	23.7	570	211	358	42	192	0.28	1.43	1.36	1.0	0.3	0.7	186	6	192
21451329	BH67	13-Sep-21	SS1	0	0.61	0.31	88.21	88.52	88.52	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.35	6.97	21	7	0	7	24	29		1.00	1.36	0.6	0.3	1.7	38	5	43
21451329	BH67	13-Sep-21	SS2	0.76	1.22	0.99	87.53	88.52	87.76	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.35	6.97	21	21	0	21	40	54		1.00	1.36	0.7	0.3	1.5	73	6	78
21451329	BH67	13-Sep-21	SS3	1.52	1.98	1.75	86.77	88.52	87	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.35	6.97	21	37	0	37	46	20		1.00	1.36	0.7	0.3	1.4	28	6	33
21451329	BH67	13-Sep-21	SS4	4.57	5.03	4.80	83.72	88.52	83.95	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.35	6.97	23.2	111	0	111	38	6		1.36	1.36	0.9	0.5	0.9	7	6	12
21451329	BH67	13-Sep-21	SS5	9.14	9.6	9.37	79.15	88.52	79.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.35	6.97	24.3	228	24	204	45	90		1.37	1.36	1.0	0.3	0.8	101	6	107
21451329	BH67	13-Sep-21	SS6	12.19	12.65	12.42	76.10	88.52	76.33	Unit 4a	Silty Sand (SM)	Native	24.35	6.97	22.1	274	53	221	39	141		1.41	1.36	1.0	0.3	0.8	155	6	161
21451329	BH67	13-Sep-21	SS7	15.24	15.7	15.47	73.05	88.52	73.28	Unit 4a	Silty Sand (SM)	Native	24.35	6.97	22.1	342	83	259	50	165		1.41	1.36	1.0	0.3	0.8	175	6	180
21451329	BH67	13-Sep-21	SS8	18.29	18.75	18.52	70.00	88.52	70.23	Unit 4b	Lean Clay (CL)	Native	24.35	6.97	22.2	410	113	296	98	33		1.41	1.36	1.0	0.3	0.7	32	5	37
21451329	BH67	13-Sep-21	SS9	21.34	21.62	21.48	67.04	88.52	67.18	Unit 5	Sandy Silty Clay (CL-ML)	Native	24.35	6.97	23.7	509	142	367	53	100	0.13	1.43	1.36	1.0	0.3	0.7	96	6	102
21451329	BH68	2-Sep-21	SS1	0	0.61	0.31	88.48	88.79	88.79	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.84	2.5	21	7	0	7	40	35		1.00	1.36	0.6	0.3	1.7	46	6	52
21451329	BH68	2-Sep-21	SS2	0.61	1.07	0.84	87.95	88.79	88.18	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.84	2.5	21	18	0	18	40	87		1.00	1.36	0.6	0.3	1.6	119	6	125
21451329	BH68	2-Sep-21	SS3	1.22	1.68	1.45	87.34	88.79	87.57	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.84	2.5	21	30	0	30	40	24		1.00	1.36	0.7	0.3	1.4	33	6	38
21451329	BH68	2-Sep-21	SS4	1.83	2.29	2.06	86.73	88.79	86.96	Unit 2a	Lean Clay with Sand (CL)	Native	24.84	2.5	20.2	42	0	42	84	5		1.36	1.36	0.7	0.5	1.6	8	6	13
21451329	BH68	2-Sep-21	SS6	4.88	5.78	5.33	83.46	88.79	83.91	Unit 2b	Sandy Silty Clay (CL-ML)	Native	24.84	2.5	23.2	124	28	96	54	3		1.36	1.36	0.9	0.5	1.0	4	6	9
21451329	BH68	2-Sep-21	SS8	6.71	7.17	6.94	81.85	88.79	82.08	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	169	44	125	48.072	26		1.37	1.36	1.0	0.3	0.9	31	6	37
21451329	BH68	2-Sep-21	SS9	7.32	7.78	7.55	81.24	88.79	81.47	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	183	50	134	42	13		1.37	1.36	1.0	0.4	0.9	15	6	21
21451329	BH68	2-Sep-21	SS10	7.93	8.39	8.16	80.63	88.79	80.86	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	198	56	143	48.072	55		1.37	1.36	1.0	0.3	0.9	67	6	72
21451329	BH68	2-Sep-21	SS11	8.53	8.99	8.76	80.03	88.79	80.26	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	213	61	151	48.072	23		1.37	1.36	1.0	0.3	0.9	27	6	33
21451329	BH68	2-Sep-21	SS12	9.15	9.61	9.38	79.41	88.79	79.64	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	228	67	160	48.072	80		1.37	1.36	1.0	0.3	0.9	96	6	102
21451329	BH68	2-Sep-21	SS13	9.76	10.22	9.99	78.80	88.79	79.03	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	243	73	169	48.072	64		1.37	1.36	1.0	0.3	0.9	76	6	81
21451329	BH68	2-Sep-21	SS14	10.37	10.65	10.51	78.28	88.79	78.42	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	255	79	177	48.072	100	0.13	1.37	1.36	1.0	0.3	0.9	117	6	123
21451329	BH68	2-Sep-21	SS15	10.98	11.44	11.21	77.58	88.79	77.81	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	272	85	187	44	173		1.37	1.36	1.0	0.3	0.8	199	6	205
21451329	BH68	2-Sep-21	SS16	11.59	12.05	11.82	76.97	88.79	77.2	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	287	91	196	48.072	143		1.37	1.36	1.0	0.3	0.8	163	6	168
21451329	BH68	2-Sep-21	SS17	12.2	12.66	12.43	76.36	88.79	76.59	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	24.3	302	97	205	48.072	72		1.37	1.36	1.0	0.3	0.8	81	6	87
21451329	BH68	2-Sep-21	SS18	12.81	13.27	13.04	75.75	88.79	75.98	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	316	103	212	47	116		1.41	1.36	1.0	0.3	0.8	129	6	135

Table C-1b: SPT Blow Count Processed Data - Turbine Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation: Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH68	2-Sep-21	SS19	13.42	13.7	13.56	75.23	88.79	75.37	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	300	108	191	50	100	0.13	1.41	1.36	1.0	0.3	0.8	115	6	120
21451329	BH68	2-Sep-21	SS20	14.03	14.31	14.17	74.62	88.79	74.76	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	313	114	199	50	100	0.13	1.41	1.36	1.0	0.3	0.8	113	6	119
21451329	BH68	2-Sep-21	SS21	14.64	15.1	14.87	73.92	88.79	74.15	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	329	121	207	50	181		1.41	1.36	1.0	0.3	0.8	203	6	209
21451329	BH68	2-Sep-21	SS22	15.25	15.53	15.39	73.40	88.79	73.54	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	340	126	214	38	100	0.13	1.41	1.36	1.0	0.3	0.8	111	6	117
21451329	BH68	2-Sep-21	SS23	15.86	16.32	16.09	72.70	88.79	72.93	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	356	133	222	50	180		1.41	1.36	1.0	0.3	0.8	198	6	204
21451329	BH68	2-Sep-21	SS24	16.47	16.93	16.70	72.09	88.79	72.32	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	369	139	230	50	177		1.41	1.36	1.0	0.3	0.8	193	6	199
21451329	BH68	2-Sep-21	SS25	17.08	17.53	17.31	71.48	88.79	71.71	Unit 4a	Silty Sand (SM)	Native	24.84	2.5	22.1	383	145	237	50	117		1.41	1.36	1.0	0.3	0.8	127	6	132
21451329	BH68	2-Sep-21	SS26	17.69	18.15	17.92	70.87	88.79	71.1	Unit 4b	lean Clay (CL)	Native	24.84	2.5	22.2	398	151	247	92.423	29		1.41	1.36	1.0	0.3	0.7	29	6	35
21451329	BH68	2-Sep-21	SS27	18.3	18.76	18.53	70.26	88.79	70.49	Unit 4b	lean Clay (CL)	Native	24.84	2.5	20.3	376	157	219	92.423	29		1.41	1.36	1.0	0.3	0.8	31	6	36
21451329	BH68	2-Sep-21	SS28	18.91	19.37	19.14	69.65	88.79	69.88	Unit 4b	lean Clay (CL)	Native	24.84	2.5	22.2	425	163	262	98	53		1.41	1.36	1.0	0.3	0.8	56	5	61
21451329	BH68	2-Sep-21	SS29	19.52	19.98	19.75	69.04	88.79	69.27	Unit 4b	lean Clay (CL)	Native	24.84	2.5	22.2	438	169	269	92.423	27		1.41	1.36	1.0	0.4	0.7	26	6	31
21451329	BH68	2-Sep-21	SS30	20.13	20.59	20.36	68.43	88.79	68.66	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	24.84	2.5	23.7	483	175	307	66	31		1.43	1.36	1.0	0.3	0.7	29	6	35
21451329	BH68	2-Sep-21	SS31	20.74	21.02	20.88	67.91	88.79	68.05	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	24.84	2.5	23.7	495	180	315	68	100	0.13	1.43	1.36	1.0	0.3	0.7	100	6	106
21451329	BH68	2-Sep-21	SS32	21.35	21.48	21.42	67.37	88.79	67.44	Unit 5	Till: Silt with Sand (ML)	Native	24.84	2.5	23.7	508	186	322	79	100	0.13	1.43	1.36	1.0	0.3	0.7	100	6	105
21451329	BH68	2-Sep-21	SS33	21.96	22.24	22.10	66.69	88.79	66.83	Unit 5	Till: Silt with Sand (ML)	Native	24.84	2.5	23.7	524	192	331	68	100	0.13	1.43	1.36	1.0	0.3	0.7	99	6	105
21451329	BH68	2-Sep-21	SS34	22.57	23.06	22.82	65.97	88.79	66.22	Unit 5	Till: Lean Clay with Gravel (CL)	Native	24.84	2.5	23.7	541	199	341	68	125		1.43	1.36	1.0	0.3	0.7	123	6	128
21451329	BH68	2-Sep-21	SS35	23.18	23.59	23.39	65.40	88.79	65.61	Unit 5	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	23.7	554	205	349	57	174	0.25	1.43	1.36	1.0	0.3	0.7	170	6	176
21451329	BH68	2-Sep-21	SS36	23.79	24.07	23.93	64.86	88.79	65	Unit 5	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	23.7	567	210	357	68	100	0.1	1.43	1.36	1.0	0.3	0.7	97	6	103
21451329	BH68	2-Sep-21	SS37	24.38	24.66	24.52	64.27	88.79	64.41	Unit 5	Till: Silty Sand with Gravel (SM)	Native	24.84	2.5	23.7	581	216	365	68	100	0.1	1.43	1.36	1.0	0.3	0.7	97	6	102
21451329	BH7	16-Jun-21	SS1	0	0.61	0.31	87.79	88.1	88.1	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	24	2.5	21	7	0	7	40	18		1.00	1.29	0.6	0.4	1.7	23	6	28
21451329	BH7	16-Jun-21	SS2	0.76	1.22	0.99	87.11	88.1	87.34	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24	2.5	21	21	0	21	40	52		1.00	1.29	0.7	0.3	1.5	66	6	72
21451329	BH7	16-Jun-21	SS3	1.52	1.98	1.75	86.35	88.1	86.58	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24	2.5	21	37	0	37	40	23		1.00	1.29	0.7	0.3	1.4	30	6	35
21451329	BH7	16-Jun-21	SS4	2.29	2.74	2.52	85.58	88.1	85.81	Unit 2a	Lean Clay (CL)	Native	24	2.5	20.2	51	0	51	87	11		1.36	1.29	0.8	0.4	1.3	15	6	20
21451329	BH7	16-Jun-21	SS5	3.05	3.51	3.28	84.82	88.1	85.05	Unit 2a	Lean Clay (CL)	Native	24	2.5	20.2	66	8	59	77.95	19		1.36	1.29	0.8	0.4	1.2	24	6	30
21451329	BH7	16-Jun-21	SS7	4.57	5.03	4.80	83.30	88.1	83.53	Unit 2b	Silty Sand	Native	24	2.5	23.2	111	23	89	46	11		1.36	1.29	0.9	0.5	1.1	13	6	19
21451329	BH7	16-Jun-21	SS8	5.33	5.79	5.56	82.54	88.1	82.77	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	135	30	105	48.072	94		1.37	1.29	0.9	0.3	1.0	108	6	114
21451329	BH7	16-Jun-21	SS9	6.1	6.55	6.33	81.77	88.1	82	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	154	38	116	48	156		1.37	1.29	0.9	0.3	1.0	180	6	186
21451329	BH7	16-Jun-21	SS10	7.62	8.08	7.85	80.25	88.1	80.48	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	191	52	138	48.072	118		1.37	1.29	1.0	0.3	0.9	136	6	141
21451329	BH7	16-Jun-21	SS11	9.14	9.6	9.37	78.73	88.1	78.96	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	228	67	160	48.072	147		1.37	1.29	1.0	0.3	0.9	167	6	172
21451329	BH7	16-Jun-21	SS12	10.67	11.13	10.90	77.20	88.1	77.43	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	265	82	182	48.072	181		1.37	1.29	1.0	0.3	0.9	199	6	204
21451329	BH7	16-Jun-21	SS13	12.19	12.57	12.38	75.72	88.1	75.91	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	298	97	201	50	199	0.23	1.41	1.29	1.0	0.3	0.8	213	6	219
21451329	BH7	16-Jun-21	SS14	13.72	14	13.86	74.24	88.1	74.38	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	330	111	219	50	100	0.13	1.41	1.29	1.0	0.3	0.8	105	6	110
21451329	BH7	16-Jun-21	SS15	15.24	15.67	15.46	72.64	88.1	72.86	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	366	127	239	50	179	0.28	1.41	1.29	1.0	0.3	0.8	183	6	189
21451329	BH7	16-Jun-21	SS16	18.29	18.75	18.52	69.58	88.1	69.81	Unit 4b	Lean Clay (CL)	Native	24	2.5	22.2	434	157	276	96	29		1.41	1.29	1.0	0.4	0.7	26	5	32
21451329	BH7	16-Jun-21	SS17	21.34	21.73	21.54	66.56	88.1	66.76	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	476	187	289	50	158	0.24	1.41	1.29	1.0	0.3	0.8	154	6	159
21451329	BH7	16-Jun-21	SS18	23.57	24	23.79	64.31	88.1	64.53	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24	2.5	23.7	564	209	355	68	135	0.28	1.43	1.29	1.0	0.3	0.7	124	6	130
21451329	BH71	21-Sep-21	SS1	0	0.25	0.13	88.19	88.32	88.32	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	24.18	7.54	21	3	0	3	40	14		1.00	1.29	0.5	0.4	1.7	17	6	22
21451329	BH71	21-Sep-21	SS2	0.76	1.22	0.99	87.33	88.32	87.56	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	24.18	7.54	21	21	0	21	40	25		1.00	1.29	0.7	0.3	1.6	34	6	39
21451329	BH71	21-Sep-21	SS3	1.52	1.98	1.75	86.57	88.32	86.8	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	24.18	7.54	21	37	0	37	40	10		1.00	1.29	0.7	0.4	1.6	14	6	20
21451329	BH71	21-Sep-21	SS4	2.29	2.74	2.52	85.80	88.32	86.03	Unit 2a	Lean Clay with Sand (CL)	Native	24.18	7.54	20.2	51	0	51	85	24		1.36	1.29	0.8	0.3	1.2	30	6	35
21451329	BH71	21-Sep-21	SS5	3.05	3.5	3.28	85.04	88.32	85.27	Unit 2a	Lean Clay with Sand (CL)	Native	24.18	7.54	20.2	66	0	66	77.95	15		1.36	1.29	0.8	0.4	1.2	19	6	24
21451329	BH71	21-Sep-21	SS6	3.81	4.27	4.04	84.28	88.32	84.51	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.18	7.54	23.2	94	0	94	35	18		1.36	1.29	0.9	0.4	1.0	20	6	26
21451329	BH71	21-Sep-21	SS7	4.57	5.03	4.80	83.52	88.32	83.75	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	24.18	7.54	24.3	117	0	117	48.072	5		1.37	1.29	0.9	0.5	0.9	5	6	11
21451329	BH71	21-Sep-21	SS8	5.33	5.78	5.56	82.76	88.32	82.99	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	24.18	7.54	24.3	135	0	135	48.072	15		1.37	1.29	0.9	0.4	0.9	15	6	21
21451329	BH71	21-Sep-21	SS9	6.1	6.55	6.33	81.99	88.32	82.22	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	24.18	7.54	24.3	154	0	154	48.072	64		1.37	1.29	0.9	0.3	0.9	69	6	74
21451329	BH71	21-Sep-21	SS10	7.62	8.08	7.85	80.47	88.32	80.7	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	24.18	7.54	24.3	191	3	188	51	173		1.37	1.29	1.0	0.3	0.8	184	6	189
21451329	BH71	21-Sep-21	SS11	9.14	9.4	9.27	79.05	88.32	79.18	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	24.18	7.54	24.3	225	17	208	48.072	100	0.1	1.37	1.29	1.0	0.3	0.8	106	6	112
21451329	BH71	21-Sep-21	SS12	10.67	10.71	10.69	77.63	88.32	77.65	Unit 3	Till: Sandy Silt to Silt with Sand (ML)	Native	24.18	7.54	24.3	260	31	229	83	100	0.13	1.37	1.29	1.0	0.3	0.8	103	6	109
21451329	BH71	21-Sep-21	SS13	12.19	12.62	12.41	75.91	88.32	76.13	Unit 4a	Silty Sand (SM)	Native	24.18	7.54	22.1	298	48	250	50	171	0.28	1.41	1.29	1.0	0.3	0.8	173	6	178
21451329	BH71	21-Sep-21	SS14	13.72	14.1	13.91	74.41	88.32	74.6	Unit 4a	Silty Sand (SM)	Native	24.18	7.54	22.1	331	62	268	37	186	0.23	1.41	1.29	1.0	0.3	0.8	184	6	190
21451329	BH71	21-Sep-21	SS15	15.24	15.7	15.47	72.85	88.32	73.08	Unit 4a	Silty Sand (SM)	Native	24.18	7.54	22.1	365	78	288	50	188		1.41	1.29	1.0	0.3	0.8	183	6	189
21451329	BH71	21-Sep-21	SS16	16.76	17.22	16.99	71.33	88.32	71.56	Unit 4b	Lean Clay (CL)	Native	24.18	7.54	22.2	399	93	306	94	63		1.41	1.29	1.0	0.3	0.7	60	6	66
21451329	BH71	21-Sep-21	SS17	18.29	18.75	18.52	69.80	88.32	70.03	Unit 4b	Lean Clay (CL)	Native	24.18	7.54	20.3	376	108	268	92.423	24		1.41	1.29	1.0	0.4	0.7	21	6	27
21451329	BH71	21-Sep-21	SS18	19.81	20.27	20.04	68.28	88.32	68.51	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.18	7.54	23.7	475	123	352	62	50		1.43	1.29	1.0	0.3	0.7	46	6	52
21451329	BH71	21-Sep-21	SS19	21.34	21.79	21.57	66.75	88.32	66.98	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.18	7.54	22.3	481	138	343	68	83		1.43	1.29	1.0	0.3	0.7	77	6	83
21451329	BH71	21-Sep-21	SS20	22.86	23.22	23.04	65.28	88.32	65.46	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.18	7.54	23.7	516	152	364	68	61		1.43	1.29	1.0	0.3	0.7	56	6	61
21451329	BH71	21-Sep-21	SS21	23.9	24.18	24.04	64.28	88.32	64.42	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.18	7.54	23.7	570	162	408	68	100	0.13	1.43	1.29	1.0	0.3	0.7	89	6	94
21451329	BH73	2-Sep-21	SS1	0	0.61	0.31	87.65	87.96	87.96	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.08	2.5	21	7	0	7	40	49		1.00	1.08	0.6	0.3	1.7	51	6	57
21451329	BH73	2-Sep-21	SS2	0.79	1.21	1.00	86.96	87.96	87.17	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	24.08	2.5	21	21	0	21	40	33		1.00	1.08	0.7	0.3	1.6	36	6	42
21451329	BH73	2-Sep-21	SS3	1.52	1.98	1.75	86.21	87.96	86.44	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	24.08	2.5	21	37	0	37	40	16		1.00	1.08	0.7	0.4	1.5	19	6	24
21451329	BH73	2-Sep-21	SS4	2.29	2.74	2.52	85.44	87.96	85.67	Unit 2b	Silty Sand (SM)	Native	24.08	2.5	23.2	58	0	58	45	7		1.36	1.08	0.8	0.5	1.3	8	6	13
21451329	BH73	2-Sep-21	SS5	3.81	4.27	4.04	83.92	87.96	84.15	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	98	15	83	48.072	105		1.37	1.08	0.9	0.3	1.1	101	6	107
21451329	BH73	2-Sep-21	SS6	4.57	5.05	4.81	83.15	87.96	83.39	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	23.7	114	23	91	48.072	73		1.37	1.08	0.9	0.3	1.0	71	6	77
21451329	BH73	2-Sep-21	SS7	5.36	5.79	5.58	82.38	87.96	82.6	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	136	30	105	40	85		1.37	1.08	0.9	0.3	1.0	82	6	88
21451329	BH73	2-Sep-21	SS8	6.1	6.58	6.34	81.62	87.96	81.86	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	154	38	116	48.072	103		1.37	1.08	0.9	0.3	1.0	99	6	105
21451329	BH73	2-Sep-21	SS9	7.62	8.1	7.86	80.10	87.96	80.34	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	191	53	138	48.072	145		1.37	1.08	1.0	0.3	0.9	140	6	145
21451329	BH73	2-Sep-21	SS10	9.14	9.26	9.20	78.76	87.96	78.82	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	224	66	158	48.072	100	0.1	1.37	1.08	1.0	0.3	0.9	95	6	101
21451329	BH73	2-Sep-21	SS11	10.67	10.94	10.81	77.15	87.96	77.29	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	263	82	181	50	100	0.23	1.37	1.08	1.0	0.3	0.9	92	6	98
21451329	BH73	2-Sep-21	SS12	12.19	12.58	12.39	75.57	87.96	75.77	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	298	97	201	50	190	0.33	1.41	1.08	1.0	0.3	0.8	170	6	176
21451329	BH73	2-Sep-21	SS13	13.72	14	13.86	74.10	87.96	74.24	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	330	111	219	50	100	0.28	1.41	1.08	1.0	0.3	0.8	88	6	93
21451329	BH73	2-Sep-21	SS14	15.24	15.65	15.45	72.51	87.96	72.72	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	365	127	238	78	193	0.4	1.41	1.08	1.0	0.3	0.8	165	6	171

Table C-1b: SPT Blow Count Processed Data - Turbine Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH73	2-Sep-21	SS15	18.29	18.77	18.53	69.43	87.96	69.67	Unit 4b	Lean Clay (CL)	Native	24.08	2.5	22.2	434	157	276	88	63		1.41	1.08	1.0	0.3	0.8	52	6	57
21451329	BH73	2-Sep-21	SS16	21.33	21.59	21.46	66.50	87.96	66.63	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	498	186	312	73	100	0.1	1.41	1.08	1.0	0.3	0.7	80	6	85
21451329	BH73	2-Sep-21	SS17	22.86	23.34	23.10	64.86	87.96	65.1	Unit 5	Sandy Silt (ML)	Native	24.08	2.5	23.7	547	202	345	54	107		1.43	1.08	1.0	0.3	0.7	83	6	89
21451329	BH73	2-Sep-21	SS18	23.85	23.95	23.90	64.06	87.96	64.11	Unit 5	Sandy Silt (ML)	Native	24.08	2.5	23.7	566	210	356	68	100	0.1	1.43	1.08	1.0	0.3	0.7	77	6	83
21451329	BH8	8-Sep-21	SS1	0	0.61	0.31	87.17	87.48	87.48	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23.29	2.5	21	7	0	7	40	19		1.00	1.29	0.6	0.4	1.7	24	6	29
21451329	BH8	8-Sep-21	SS2	0.61	1.07	0.84	86.64	87.48	86.87	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	23.29	2.5	21.1	18	0	18	40	11		1.00	1.29	0.6	0.4	1.7	15	6	21
21451329	BH8	8-Sep-21	SS3	1.22	1.68	1.45	86.03	87.48	86.26	Unit 2a	Lean Clay with Sand (CL)	Native	23.29	2.5	20.2	30	0	30	77.95	14		1.36	1.29	0.7	0.4	1.6	20	6	26
21451329	BH8	8-Sep-21	SS4	1.83	2.29	2.06	85.42	87.48	85.65	Unit 2a	Lean Clay with Sand (CL)	Native	23.29	2.5	20.2	42	0	42	71	15		1.36	1.29	0.7	0.4	1.4	20	6	26
21451329	BH8	8-Sep-21	SS5	2.44	2.9	2.67	84.81	87.48	85.04	Unit 2a	Lean Clay with Sand (CL)	Native	23.29	2.5	20.2	54	2	52	77.95	10		1.36	1.29	0.8	0.4	1.3	13	6	19
21451329	BH8	8-Sep-21	SS6	3.05	3.51	3.28	84.20	87.48	84.43	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	80	8	72	48.072	61		1.37	1.29	0.8	0.3	1.1	70	6	75
21451329	BH8	8-Sep-21	SS7	3.66	3.94	3.80	83.68	87.48	83.82	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	92	13	80	48.072	100	0.13	1.37	1.29	0.8	0.3	1.1	115	6	121
21451329	BH8	8-Sep-21	SS8	4.27	4.72	4.50	82.98	87.48	83.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	109	20	90	35	95		1.37	1.29	0.9	0.3	1.0	109	6	115
21451329	BH8	8-Sep-21	SS9	4.88	5.33	5.11	82.37	87.48	82.6	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	124	26	99	48.072	77		1.37	1.29	0.9	0.3	1.0	89	6	94
21451329	BH8	8-Sep-21	SS10	5.49	5.94	5.72	81.76	87.48	81.99	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	139	32	107	48.072	116		1.37	1.29	0.9	0.3	1.0	134	6	139
21451329	BH8	8-Sep-21	SS11	6.1	6.55	6.33	81.15	87.48	81.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	154	38	116	48.072	70		1.37	1.29	0.9	0.3	1.0	81	6	86
21451329	BH8	8-Sep-21	SS12	6.71	7.16	6.94	80.54	87.48	80.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	169	44	125	48.072	102		1.37	1.29	1.0	0.3	0.9	118	6	123
21451329	BH8	8-Sep-21	SS13	7.32	7.77	7.55	79.93	87.48	80.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	183	50	134	44	68		1.37	1.29	1.0	0.3	0.9	78	6	84
21451329	BH8	8-Sep-21	SS14	7.92	8.06	7.99	79.49	87.48	79.56	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	194	54	140	48.072	100	0.14	1.37	1.29	1.0	0.3	0.9	115	6	121
21451329	BH8	8-Sep-21	SS15	8.53	8.97	8.75	78.73	87.48	78.95	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	213	61	151	48.072	182	0.28	1.37	1.29	1.0	0.3	0.9	209	6	215
21451329	BH8	8-Sep-21	SS16	9.14	9.39	9.27	78.21	87.48	78.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	225	66	159	48.072	100	0.09	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH8	8-Sep-21	SS17	9.75	9.88	9.82	77.66	87.48	77.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	239	72	167	48.072	100	0.13	1.37	1.29	1.0	0.3	0.9	112	6	118
21451329	BH8	8-Sep-21	SS18	10.36	10.82	10.59	76.89	87.48	77.12	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	234	79	155	56	163		1.41	1.29	1.0	0.3	0.9	187	6	192
21451329	BH8	8-Sep-21	SS19	10.97	11.39	11.18	76.30	87.48	76.51	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	247	85	162	50	168	0.27	1.41	1.29	1.0	0.3	0.9	190	6	196
21451329	BH8	8-Sep-21	SS20	11.58	12	11.79	75.69	87.48	75.9	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	261	91	169	50	178	0.27	1.41	1.29	1.0	0.3	0.9	199	6	205
21451329	BH8	8-Sep-21	SS21	12.19	12.46	12.33	75.15	87.48	75.29	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	272	96	176	50	100	0.11	1.41	1.29	1.0	0.3	0.9	111	6	116
21451329	BH8	8-Sep-21	SS22	12.8	13.09	12.95	74.53	87.48	74.68	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	286	103	184	50	100	0.14	1.41	1.29	1.0	0.3	0.9	110	6	115
21451329	BH8	8-Sep-21	SS23	13.41	13.69	13.55	73.93	87.48	74.07	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	299	108	191	50	100	0.13	1.41	1.29	1.0	0.3	0.8	108	6	114
21451329	BH8	8-Sep-21	SS24	14.02	14.45	14.24	73.24	87.48	73.46	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	315	115	200	50	197	0.28	1.41	1.29	1.0	0.3	0.8	211	6	217
21451329	BH8	8-Sep-21	SS25	14.63	15.05	14.84	72.64	87.48	72.85	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	328	121	207	71	195	0.27	1.41	1.29	1.0	0.3	0.8	207	6	213
21451329	BH8	8-Sep-21	SS26	15.24	15.7	15.47	72.01	87.48	72.24	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	342	127	215	50	145		1.41	1.29	1.0	0.3	0.8	152	6	158
21451329	BH8	8-Sep-21	SS27	15.85	16.31	16.08	71.40	87.48	71.63	Unit 4b	Lean Clay (CL)	Native	23.29	2.5	22.2	357	133	224	93	52		1.41	1.29	1.0	0.3	0.8	54	6	60
21451329	BH8	8-Sep-21	SS28	16.46	16.92	16.69	70.79	87.48	71.02	Unit 4b	Lean Clay (CL)	Native	23.29	2.5	22.2	371	139	231	92.423	32		1.41	1.29	1.0	0.3	0.8	32	6	37
21451329	BH8	8-Sep-21	SS29	17.07	17.53	17.30	70.18	87.48	70.41	Unit 4b	Lean Clay (CL)	Native	23.29	2.5	22.2	384	145	239	92.423	33		1.41	1.29	1.0	0.3	0.8	32	6	38
21451329	BH8	8-Sep-21	SS30	17.68	18.14	17.91	69.57	87.48	69.8	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	424	151	273	75	63		1.43	1.29	1.0	0.3	0.8	62	6	68
21451329	BH8	8-Sep-21	SS31	18.29	18.58	18.44	69.04	87.48	69.19	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	437	156	281	73	100	0.14	1.43	1.29	1.0	0.3	0.8	98	6	104
21451329	BH8	8-Sep-21	SS32	18.9	19.33	19.12	68.36	87.48	68.58	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	453	163	290	68	142	0.28	1.43	1.29	1.0	0.3	0.8	138	6	143
21451329	BH8	8-Sep-21	SS33	19.51	19.79	19.65	67.83	87.48	67.97	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	434	168	266	62	100	0.13	1.41	1.29	1.0	0.3	0.8	99	6	105
21451329	BH8	8-Sep-21	SS34	20.12	20.38	20.25	67.23	87.48	67.36	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	448	174	273	50	100	0.11	1.41	1.29	1.0	0.3	0.8	99	6	104
21451329	BH8	8-Sep-21	SS35	20.73	21.18	20.96	66.52	87.48	66.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	497	181	316	77	133		1.43	1.29	1.0	0.3	0.7	126	6	132
21451329	BH8	8-Sep-21	SS36	21.34	21.79	21.57	65.91	87.48	66.14	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	511	187	324	68	84		1.43	1.29	1.0	0.3	0.7	79	6	85
21451329	BH8	8-Sep-21	SS37	21.95	22.4	22.18	65.30	87.48	65.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	526	193	333	68	117		1.43	1.29	1.0	0.3	0.7	110	6	115
21451329	BH8	8-Sep-21	SS38	22.56	22.94	22.75	64.73	87.48	64.92	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	539	199	341	39	194	0.23	1.43	1.29	1.0	0.3	0.7	181	6	186
21451329	BH9	30-Sep-21	SS1	0	0.61	0.31	88.52	88.83	88.83	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.71	8.87	21	7	0	7	40	35	0.11	1.00	1.08	0.6	0.3	1.7	37	6	42
21451329	BH9	30-Sep-21	SS2	0.76	1.22	0.99	87.84	88.83	88.07	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.71	8.87	21	21	0	21	78	28		1.00	1.08	0.7	0.3	1.6	32	6	38
21451329	BH9	30-Sep-21	SS3	1.52	1.83	1.68	87.15	88.83	87.31	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.71	8.87	21	35	0	35	40	33		1.00	1.08	0.7	0.3	1.4	35	6	40
21451329	BH9	30-Sep-21	SS4	2.29	2.74	2.52	86.31	88.83	86.54	Unit 2a	Lean Clay (CL)	Native	24.71	8.87	20.2	51	0	51	77.95	4		1.36	1.08	0.8	0.5	1.4	5	6	10
21451329	BH9	30-Sep-21	SS6	3.81	4.27	4.04	84.79	88.83	85.02	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.2	94	0	94	46	15		1.36	1.08	0.9	0.4	1.0	14	6	20
21451329	BH9	30-Sep-21	SS7	4.57	5.03	4.80	84.03	88.83	84.26	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.2	111	0	111	46	7		1.36	1.08	0.9	0.5	0.9	6	6	12
21451329	BH9	30-Sep-21	SS8	5.18	5.78	5.48	83.35	88.83	83.65	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.2	127	0	127	46	7		1.36	1.08	0.9	0.5	0.9	6	6	12
21451329	BH9	30-Sep-21	SS9	6.1	6.55	6.33	82.50	88.83	82.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	154	0	154	48.072	36		1.37	1.08	0.9	0.3	0.9	32	6	37
21451329	BH9	30-Sep-21	SS10	6.86	7.32	7.09	81.74	88.83	81.97	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	172	0	172	38	138		1.37	1.08	1.0	0.3	0.9	123	6	128
21451329	BH9	30-Sep-21	SS11	7.62	7.9	7.76	81.07	88.83	81.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	189	0	189	48.072	100	0.13	1.37	1.08	1.0	0.3	0.8	89	6	94
21451329	BH9	30-Sep-21	SS12	9.14	9.35	9.25	79.58	88.83	79.69	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	225	4	221	48.072	100	0.05	1.37	1.08	1.0	0.3	0.8	87	6	93
21451329	BH9	30-Sep-21	SS13	10.67	10.95	10.81	78.02	88.83	78.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.71	8.87	24.3	263	19	244	48.072	100	0.13	1.37	1.08	1.0	0.3	0.8	85	6	91
21451329	BH9	30-Sep-21	SS14	12.19	12.53	12.36	76.47	88.83	76.64	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	297	34	263	50	185	0.13	1.41	1.08	1.0	0.3	0.8	154	6	160
21451329	BH9	30-Sep-21	SS15	13.72	14.17	13.95	74.88	88.83	75.11	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	332	50	282	21	39		1.41	1.08	1.0	0.3	0.7	30	5	34
21451329	BH9	30-Sep-21	SS16	15.24	15.66	15.45	73.38	88.83	73.59	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	365	65	301	50	157	0.26	1.41	1.08	1.0	0.3	0.7	126	6	132
21451329	BH9	30-Sep-21	SS17	16.76	17.22	16.99	71.84	88.83	72.07	Unit 4b	Lean Clay (CL)	Native	24.71	8.87	22.2	377	80	298	92.423	136		1.41	1.08	1.0	0.3	0.8	110	6	115
21451329	BH9	30-Sep-21	SS18	18.29	18.75	18.52	70.31	88.83	70.54	Unit 4b	Lean Clay (CL)	Native	24.71	8.87	22.2	411	95	316	99	33		1.41	1.08	1.0	0.4	0.7	23	5	29
21451329	BH9	30-Sep-21	SS19	19.81	20.27	20.04	68.79	88.83	69.02	Unit 4b	Lean Clay (CL)	Native	24.71	8.87	22.2	445	110	335	73	53		1.41	1.08	1.0	0.3	0.7	41	6	47
21451329	BH9	30-Sep-21	SS20	21.34	21.56	21.45	67.38	88.83	67.49	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	476	123	353	50	100	0.07	1.41	1.08	1.0	0.3	0.7	77	6	83
21451329	BH9	30-Sep-21	SS21	22.86	23.27	23.07	65.76	88.83	65.97	Unit 4a	Silty Sand (SM)	Native	24.71	8.87	22.1	510	139	371	36	183	0.25	1.41	1.08	1.0	0.3	0.7	139	6	145
21451329	BH9	30-Sep-21	SS22	24.38	24.79	24.59	64.24	88.83	64.45	Unit 5	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	24.71	8.87	23.7	583	154	429	49	143	0.25	1.43	1.08	1.0	0.3	0.7	105	6	110

Table C-1c: SPT Blow Count Processed Data - Rad waste Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \quad \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation: Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH13	23-Jun-21	SS1	0.31	0.61	0.46	86.68	87.14	86.83	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	22.87	2.5	21	10	0	10	40	43		1.00	1.29	0.6	0.3	1.7	56	6	61
21451329	BH13	23-Jun-21	SS2	0.76	1.22	0.99	86.15	87.14	86.38	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	22.87	2.5	21	21	0	21	40	6		1.00	1.29	0.7	0.5	1.7	9	6	14
21451329	BH13	23-Jun-21	SS3	1.52	1.98	1.75	85.39	87.14	85.62	Unit 1	Fill: Silty Sand (SM)	Fill	22.87	2.5	21	37	0	37	40	9		1.00	1.29	0.7	0.5	1.6	13	6	19
21451329	BH13	23-Jun-21	SS4	2.52	2.74	2.63	84.51	87.14	84.62	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	64	1	63	48.072	56		1.37	1.29	0.8	0.3	1.1	64	6	69
21451329	BH13	23-Jun-21	SS5	3.05	3.51	3.28	83.86	87.14	84.09	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	80	8	72	48.072	52		1.37	1.29	0.8	0.3	1.1	60	6	65
21451329	BH13	23-Jun-21	SS6	3.81	4.27	4.04	83.10	87.14	83.33	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	98	15	83	48.072	63		1.37	1.29	0.9	0.3	1.1	72	6	78
21451329	BH13	23-Jun-21	SS7	4.57	5.03	4.80	82.34	87.14	82.57	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	117	23	94	48.072	67		1.37	1.29	0.9	0.3	1.0	77	6	83
21451329	BH13	23-Jun-21	SS8	5.56	5.79	5.68	81.46	87.14	81.58	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	138	31	107	30	107		1.37	1.29	0.9	0.3	1.0	123	5	129
21451329	BH13	23-Jun-21	SS9	6.1	6.55	6.33	80.81	87.14	81.04	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	154	38	116	37	56		1.37	1.29	0.9	0.3	1.0	65	6	70
21451329	BH13	23-Jun-21	SS10	7.62	8.08	7.85	79.29	87.14	79.52	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	191	52	138	48.072	36		1.37	1.29	1.0	0.3	0.9	41	6	47
21451329	BH13	23-Jun-21	SS11	9.14	9.44	9.29	77.85	87.14	78	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.87	2.5	24.3	226	67	159	48.072	100	0.13	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH13	23-Jun-21	SS12	10.67	10.95	10.81	76.33	87.14	76.47	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	22.87	2.5	22.1	239	82	157	50	100	0.13	1.41	1.29	1.0	0.3	0.9	114	6	120
21451329	BH13	23-Jun-21	SS13	12.19	12.6	12.40	74.74	87.14	74.95	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	22.87	2.5	22.1	274	97	177	50	100	0.25	1.41	1.29	1.0	0.3	0.9	111	6	116
21451329	BH13	23-Jun-21	SS14	13.72	14.15	13.94	73.20	87.14	73.42	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	22.87	2.5	22.1	308	112	196	69	157	0.28	1.41	1.29	1.0	0.3	0.8	169	6	175
21451329	BH13	23-Jun-21	SS15	15.24	15.7	15.47	71.67	87.14	71.9	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	22.87	2.5	22.1	342	127	215	50	134		1.41	1.29	1.0	0.3	0.8	141	6	146
21451329	BH13	23-Jun-21	SS16	16.76	17.22	16.99	70.15	87.14	70.38	Unit 4b	Lean Clay (CL)	Native	22.87	2.5	22.2	377	142	235	92.423	15		1.41	1.29	1.0	0.5	0.7	13	6	19
21451329	BH13	23-Jun-21	SS18	18.29	18.75	18.52	68.62	87.14	68.85	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	22.87	2.5	23.7	439	157	282	68	74		1.43	1.29	1.0	0.3	0.8	72	6	78
21451329	BH13	23-Jun-21	SS19	19.81	20.27	20.04	67.10	87.14	67.33	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	22.87	2.5	23.7	475	172	303	68	98		1.43	1.29	1.0	0.3	0.7	94	6	100
21451329	BH13	23-Jun-21	SS20	21.34	21.79	21.57	65.57	87.14	65.8	Unit 4a	Sandy Silt (ML)	Native	22.87	2.5	22.1	509	187	322	50	70		1.41	1.29	1.0	0.3	0.7	66	6	72
21451329	BH13	23-Jun-21	SS21	22.1	22.33	22.22	64.92	87.14	65.04	Unit 4a	Sandy Silt (ML)	Native	22.87	2.5	22.1	523	193	330	50	100	0.08	1.41	1.29	1.0	0.3	0.7	94	6	99
21451329	BH17	5-Aug-21	SS1	0.31	0.61	0.46	86.36	86.82	86.51	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.66	2.66	21	10	0	10	40	23		1.00	1.00	0.6	0.4	1.7	23	6	29
21451329	BH17	5-Aug-21	SS2	0.89	1.22	1.06	85.76	86.82	85.93	Unit 2b	Silty Sand with Gravel (SM)	Native	22.66	2.66	23.2	24	0	24	46	12		1.36	1.00	0.7	0.4	1.7	14	6	19
21451329	BH17	5-Aug-21	SS3	1.52	1.98	1.75	85.07	86.82	85.3	Unit 2b	Silty Sand with Gravel (SM)	Native	22.66	2.66	23.2	40	0	40	39	3		1.36	1.00	0.7	0.6	1.7	4	6	9
21451329	BH17	5-Aug-21	SS4	2.29	2.74	2.52	84.30	86.82	84.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	22.9	58	0	58	48.072	125		1.37	1.00	0.8	0.3	1.2	112	6	118
21451329	BH17	5-Aug-21	SS5	3.05	3.35	3.20	83.62	86.82	83.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	78	5	72	48.072	67		1.37	1.00	0.8	0.3	1.1	59	6	65
21451329	BH17	5-Aug-21	SS6	3.81	4.27	4.04	82.78	86.82	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	98	14	85	34	54		1.37	1.00	0.9	0.3	1.0	48	5	54
21451329	BH17	5-Aug-21	SS7	4.57	4.85	4.71	82.11	86.82	82.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	114	20	94	48.072	100	0.13	1.37	1.00	0.9	0.3	1.0	89	6	95
21451329	BH17	5-Aug-21	SS8	5.33	5.79	5.56	81.26	86.82	81.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	135	28	107	48.072	89		1.37	1.00	0.9	0.3	1.0	80	6	85
21451329	BH17	5-Aug-21	SS9	6.1	6.55	6.33	80.49	86.82	80.72	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	154	36	118	48.072	96		1.37	1.00	0.9	0.3	1.0	86	6	92
21451329	BH17	5-Aug-21	SS10	7.62	8.03	7.83	78.99	86.82	79.2	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	190	51	140	44	158	0.23	1.37	1.00	1.0	0.3	0.9	141	6	147
21451329	BH17	5-Aug-21	SS11	9.14	9.42	9.28	77.54	86.82	77.68	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	226	65	161	48.072	100	0.13	1.37	1.00	1.0	0.3	0.9	88	6	94
21451329	BH17	5-Aug-21	SS12	10.67	11.13	10.90	75.92	86.82	76.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	265	81	184	48.072	150	0.28	1.37	1.00	1.0	0.3	0.9	128	6	133
21451329	BH17	5-Aug-21	SS13	12.19	12.24	12.22	74.60	86.82	74.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	297	94	203	48.072	100	0.05	1.37	1.00	1.0	0.3	0.8	83	6	89
21451329	BH17	5-Aug-21	SS14	13.72	13.77	13.75	73.07	86.82	73.1	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	334	109	225	48.072	100	0.05	1.37	1.00	1.0	0.3	0.8	81	6	86
21451329	BH17	5-Aug-21	SS15	14.48	14.66	14.57	72.25	86.82	72.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	354	117	237	48.072	100	0.03	1.37	1.00	1.0	0.3	0.8	80	6	85
21451329	BH17	5-Aug-21	SS16	15.24	15.52	15.38	71.44	86.82	71.58	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	374	125	249	48.072	100	0.13	1.37	1.00	1.0	0.3	0.8	79	6	84
21451329	BH17	5-Aug-21	SS17	16	16.46	16.23	70.59	86.82	70.82	Unit 4b	Lean Clay with Sand (CL)	Native	22.66	2.66	22.2	360	133	227	92.423	33		1.41	1.00	1.0	0.4	0.7	24	6	30
21451329	BH17	5-Aug-21	SS18	16.76	17.22	16.99	69.83	86.82	70.06	Unit 4b	Lean Clay with Sand (CL)	Native	22.66	2.66	22.2	377	141	237	75	68		1.41	1.00	1.0	0.3	0.8	54	6	60
21451329	BH17	5-Aug-21	SS19	18.29	18.75	18.52	68.30	86.82	68.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	22.66	2.66	23.7	413	156	258	76	107		1.43	1.00	1.0	0.3	0.8	83	6	89
21451329	BH17	5-Aug-21	SS20	19.86	20.27	20.07	66.75	86.82	66.96	Unit 4a	Silt with Sand (ML)	Native	22.66	2.66	22.1	448	171	277	50	148		1.41	1.00	1.0	0.3	0.8	113	6	119
21451329	BH17	5-Aug-21	SS21	21.34	21.62	21.48	65.34	86.82	65.48	Unit 4a	Silt with Sand (ML)	Native	22.66	2.66	22.1	479	185	294	83	100	0.13	1.41	1.00	1.0	0.3	0.8	75	6	81
21451329	BH73	2-Sep-21	SS1	0	0.61	0.31	87.65	87.96	87.96	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.08	2.5	21	7	0	7	40	49		1.00	1.08	0.6	0.3	1.7	51	6	57
21451329	BH73	2-Sep-21	SS2	0.79	1.21	1.00	86.96	87.96	87.17	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	24.08	2.5	21	21	0	21	40	33		1.00	1.08	0.7	0.3	1.6	36	6	42
21451329	BH73	2-Sep-21	SS3	1.52	1.98	1.75	86.21	87.96	86.44	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	24.08	2.5	21	37	0	37	40	16		1.00	1.08	0.7	0.4	1.5	19	6	24
21451329	BH73	2-Sep-21	SS4	2.29	2.74	2.52	85.44	87.96	85.67	Unit 2b	Silty Sand (SM)	Native	24.08	2.5	23.2	58	0	58	45	7		1.36	1.08	0.8	0.5	1.3	8	6	13
21451329	BH73	2-Sep-21	SS5	3.81	4.27	4.04	83.92	87.96	84.15	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	98	15	83	48.072	105		1.37	1.08	0.9	0.3	1.1	101	6	107
21451329	BH73	2-Sep-21	SS6	4.57	5.05	4.81	83.15	87.96	83.39	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	23.7	114	23	91	48.072	73		1.37	1.08	0.9	0.3	1.0	71	6	77
21451329	BH73	2-Sep-21	SS7	5.36	5.79	5.58	82.38	87.96	82.6	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	136	30	105	40	85		1.37	1.08	0.9	0.3	1.0	82	6	88
21451329	BH73	2-Sep-21	SS8	6.1	6.58	6.34	81.62	87.96	81.86	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	154	38	116	48.072	103		1.37	1.08	0.9	0.3	1.0	99	6	105
21451329	BH73	2-Sep-21	SS9	7.62	8.1	7.86	80.10	87.96	80.34	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	191	53	138	48.072	145		1.37	1.08	1.0	0.3	0.9	140	6	145
21451329	BH73	2-Sep-21	SS10	9.14	9.26	9.20	78.76	87.96	78.82	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	224	66	158	48.072	100	0.1	1.37	1.08	1.0	0.3	0.9	95	6	101
21451329	BH73	2-Sep-21	SS11	10.67	10.94	10.81	77.15	87.96	77.29	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.08	2.5	24.3	263	82	181	50	100	0.23	1.37	1.08	1.0	0.3	0.9	92	6	98
21451329	BH73	2-Sep-21	SS12	12.19	12.58	12.39	75.57	87.96	75.77	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	298	97	201	50	190	0.33	1.41	1.08	1.0	0.3	0.8	170	6	176
21451329	BH73	2-Sep-21	SS13	13.72	14	13.86	74.10	87.96	74.24	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	330	111	219	50	100	0.28	1.41	1.08	1.0	0.3	0.8	88	6	93
21451329	BH73	2-Sep-21	SS14	15.24	15.65	15.45	72.51	87.96	72.72	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	365	127	238	78	193	0.4	1.41	1.08	1.0	0.3	0.8	165	6	171
21451329	BH73	2-Sep-21	SS15	18.29	18.77	18.53	69.43	87.96	69.67	Unit 4b	Lean Clay (CL)	Native	24.08	2.5	22.2	434	157	276	88	63		1.41	1.08	1.0	0.3	0.8	52	6	57
21451329	BH73	2-Sep-21	SS16	21.33	21.59	21.46	66.50	87.96	66.63	Unit 4a	Silty Sand (SM)	Native	24.08	2.5	22.1	498	186	312	73	100	0.1	1.41	1.08	1.0	0.3	0.7	80	6	85
21451329	BH73	2-Sep-21	SS17	22.86	23.34	23.10	64.86	87.96	65.1	Unit 5	Sandy Silt (ML)	Native	24.08	2.5	23.7	547	202	345	54	107		1.43	1.08	1.0	0.3	0.7	83	6	89
21451329	BH73	2-Sep-21	SS18	23.85	23.95	23.90	64.06	87.96	64.11	Unit 5	Sandy Silt (ML)	Native	24.08	2.5	23.7	566	210	356	68	100	0.1	1.43	1.08	1.0	0.3	0.7	77	6	83
21451329	BH12-3	20-Oct-21	SS1	0	0.3	0.15	87.29	87.44	87.44	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23.47	1.76	21	3	0	3	40	11	0.15	1.00	1.36	0.5	0.4	1.7	14	6	19
21451329	BH12-3	20-Oct-21	SS2	3.05	3.5	3.28	84.16	87.44	84.39	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.47	1.76	24.3	79	15	64	48.072	93		1.37	1.36	0.8	0.3	1.1	116	6	122
21451329	BH12-3	20-Oct-21	SS3	6.1	6.43	6.27	81.17	87.44	81.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.47	1.76	24.3	152	44	108	48.072	164	0.18	1.37	1.36	0.9	0.3	1.0	204	6	209
21451329	BH12-3	20-Oct-21	SS4	9.14	9.34	9.24	78.20	87.44	78.3	Unit 3	Till: Sand Silty Clay (CL-ML)	Native	23.47	1.76	24.3	225	73	151	48.072	190	0.2	1.37	1.36	1.0	0.3	0.9	232	6	237
21451329	BH12-3	20-Oct-21	SS5	12.19	12.48	12.34	75.10	87.44	75.25	Unit 4a	Silty Sand (SM)	Native	23.47	1.76	22.1	273	104	169	50	163	0.29	1.41	1.36	1.0	0.3	0.9	193	6	198
21451329	BH12-3	20-Oct-21	SS6	15.24	15.7	15.47	71.97	87.44	72.2	Unit 4b	Silty Clay (CL-ML)	Native	23.47	1.76	22.2	343	134	209	92.423	80		1.41	1.36	1.0	0.3	0.8	90	6	95
21451329	BH12-3	20-Oct-21	SS7	18.29	18.69	18.49	68.95	87.44	69.15	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.47	1.76	23.7	438	164	274	68	187	0.25	1.43	1.36	1.0	0.3	0.8	195	6	200

Table C-1d: SPT Blow Count Processed Data - Control Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\left| \begin{array}{l} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{array} \right.$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
								Ground	Sample																			Iterative calculation	
																												Boulanger & Idriss 2014	
	-	-	-	m	m	m	m			-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS1	0.36	0.81	0.59	86.34	86.93	86.57	Unit 2b	Silt, little clay	Native	23.5	10.8	23.2	14	0	14	46	6		1.36	1.00	0.6	0.5	1.7	6	6	12
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS2	1.4	1.7	1.55	85.38	86.93	85.53	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	37	0	37	48.072	74		1.37	1.00	0.7	0.3	1.3	68	6	74
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS3	3.35	3.8	3.58	83.35	86.93	83.58	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	86	0	86	48.072	112		1.37	1.00	0.8	0.3	1.0	97	6	102
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS5	4.63	4.93	4.78	82.15	86.93	82.3	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	116	0	116	48.072	140		1.37	1.00	0.9	0.3	1.0	119	6	124
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS8	6.29	6.59	6.44	80.49	86.93	80.64	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	156	0	156	48.072	150		1.37	1.00	0.9	0.3	0.9	125	6	131
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS13	12.86	13.16	13.01	73.92	86.93	74.07	Unit 4a	Sand, little Silt	Native	23.5	10.8	22.1	288	22	266	50	150		1.41	1.00	1.0	0.3	0.8	116	6	122
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS14	13.16	13.46	13.31	73.62	86.93	73.77	Unit 4a	Sand, little Silt	Native	23.5	10.8	22.1	294	25	270	50	150		1.41	1.00	1.0	0.3	0.8	116	6	121
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS15	14.38	14.68	14.53	72.40	86.93	72.55	Unit 4a	Sand, little Silt	Native	23.5	10.8	22.1	321	37	285	50	150		1.41	1.00	1.0	0.3	0.8	114	6	120
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS17	16.15	16.6	16.38	70.55	86.93	70.78	Unit 4a	Silt with Clay	Native	23.5	10.8	22.1	362	55	307	50	137		1.41	1.00	1.0	0.3	0.7	102	6	108
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS22	22.24	22.54	22.39	64.54	86.93	64.69	Unit 4a	Sand, trace Silt	Native	23.5	10.8	22.1	495	114	381	50	150		1.41	1.00	1.0	0.3	0.7	105	6	111
21451329	BH15	28-Jun-21	SS1	0	0.13	0.07	87.30	87.37	87.37	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.47	5.12	21	1	0	1	40	50	0.13	1.00	1.36	0.5	0.3	1.7	62	6	67
21451329	BH15	28-Jun-21	SS2	0.76	1.22	0.99	86.38	87.37	86.61	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.47	5.12	21	21	0	21	40	98		1.00	1.36	0.7	0.3	1.5	132	6	138
21451329	BH15	28-Jun-21	SS3	1.52	1.98	1.75	85.62	87.37	85.85	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	39	0	39	48.072	25		1.37	1.36	0.7	0.3	1.3	33	6	38
21451329	BH15	28-Jun-21	SS4	2.29	2.74	2.52	84.85	87.37	85.08	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	58	0	58	47	82		1.37	1.36	0.8	0.3	1.2	100	6	105
21451329	BH15	28-Jun-21	SS5	4.57	4.85	4.71	82.66	87.37	82.8	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	111	0	111	48.072	50	0.13	1.37	1.36	0.9	0.3	1.0	58	6	64
21451329	BH15	28-Jun-21	SS6	7.62	7.75	7.69	79.68	87.37	79.75	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	184	25	158	48.072	50	0.13	1.37	1.36	1.0	0.3	0.9	58	6	64
21451329	BH15	28-Jun-21	SS7	10.67	10.8	10.74	76.63	87.37	76.7	Unit 4a	Silty Sand (SM)	Native	23.47	5.12	22.1	251	55	196	50	50	0.13	1.41	1.36	1.0	0.3	0.8	57	6	63
21451329	BH15	28-Jun-21	SS8	15.24	15.7	15.47	71.90	87.37	72.13	Unit 4b	Lean Clay (CL)	Native	23.47	5.12	22.2	356	102	254	96	95		1.41	1.36	1.0	0.3	0.8	101	5	106
21451329	BH15	28-Jun-21	SS9	18.29	18.52	18.41	68.96	87.37	69.08	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.47	5.12	23.7	426	130	295	68	50	0.08	1.43	1.36	1.0	0.3	0.8	51	6	57
21451329	BH15	28-Jun-21	SS10	21.34	21.79	21.57	65.80	87.37	66.03	Unit 4b	Silty Clay (CL-ML)	Native	23.47	5.12	22.2	496	161	334	92.423	56		1.41	1.36	1.0	0.3	0.7	55	6	61
21451329	BH14	30-Jun-21	SS1	0.31	0.61	0.46	87.15	87.61	87.3	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.56	9.11	21	10	0	10	40	19		1.00	1.29	0.6	0.4	1.7	25	6	30
21451329	BH14	30-Jun-21	SS2	0.76	1.22	0.99	86.62	87.61	86.85	Unit 2a	Lean Clay with Sand (CL)	Native	23.56	9.11	20.2	20	0	20	88	9		1.36	1.29	0.7	0.5	1.7	13	6	18
21451329	BH14	30-Jun-21	SS3	1.52	1.98	1.75	85.86	87.61	86.09	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	39	0	39	48.072	12		1.37	1.29	0.7	0.4	1.5	17	6	22
21451329	BH14	30-Jun-21	SS4	2.59	2.74	2.67	84.94	87.61	85.02	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	65	0	65	47	14		1.37	1.29	0.8	0.4	1.2	17	6	23
21451329	BH14	30-Jun-21	SS5	3.05	3.51	3.28	84.33	87.61	84.56	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	80	0	80	48.072	59		1.37	1.29	0.8	0.3	1.1	66	6	71
21451329	BH14	30-Jun-21	SS6	3.81	4.27	4.04	83.57	87.61	83.8	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	98	0	98	48.072	54		1.37	1.29	0.9	0.3	1.0	59	6	65
21451329	BH14	30-Jun-21	SS7	4.57	5.03	4.80	82.81	87.61	83.04	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	117	0	117	48.072	53		1.37	1.29	0.9	0.3	1.0	58	6	63
21451329	BH14	30-Jun-21	SS8	5.33	5.79	5.56	82.05	87.61	82.28	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	135	0	135	48.072	46		1.37	1.29	0.9	0.3	0.9	50	6	55
21451329	BH14	30-Jun-21	SS9	6.1	6.55	6.33	81.28	87.61	81.51	Unit 3	Till: Silty Sand (SM)	Native	23.56	9.11	24.3	154	0	154	48.072	89		1.37	1.29	0.9	0.3	0.9	95	6	101
21451329	BH14	30-Jun-21	SS10	7.72	8.08	7.90	79.71	87.61	79.89	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	175	0	175	38	139		1.41	1.29	1.0	0.3	0.9	151	6	156
21451329	BH14	30-Jun-21	SS11	9.14	9.56	9.35	78.26	87.61	78.47	Unit 4b	Sandy Lean Clay (CL)	Native	23.56	9.11	22.2	208	2	205	92.423	188	0.27	1.41	1.29	1.0	0.3	0.8	200	6	205
21451329	BH14	30-Jun-21	SS12	10.67	11.07	10.87	76.74	87.61	76.94	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	240	17	223	50	154	0.25	1.41	1.29	1.0	0.3	0.8	160	6	166
21451329	BH14	30-Jun-21	SS13	12.19	12.6	12.40	75.21	87.61	75.42	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	274	32	242	50	184	0.25	1.41	1.29	1.0	0.3	0.8	187	6	193
21451329	BH14	30-Jun-21	SS14	13.72	14.01	13.87	73.74	87.61	73.89	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	307	47	260	50	100	0.14	1.41	1.29	1.0	0.3	0.8	100	6	106
21451329	BH14	30-Jun-21	SS15	15.24	15.65	15.45	72.16	87.61	72.37	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	341	62	279	44	185	0.25	1.41	1.29	1.0	0.3	0.8	181	6	187
21451329	BH14	30-Jun-21	SS16	16.76	17.22	16.99	70.62	87.61	70.85	Unit 4a	Silt with Sand (ML)	Native	23.56	9.11	22.1	375	77	298	50	93		1.41	1.29	1.0	0.3	0.8	90	6	95
21451329	BH14	30-Jun-21	SS17	18.29	18.75	18.52	69.09	87.61	69.32	Unit 4b	Sandy Lean Clay (CL)	Native	23.56	9.11	22.2	411	92	319	92.423	21		1.41	1.29	1.0	0.4	0.6	17	6	22
21451329	BH14	30-Jun-21	SS18	19.81	20.17	19.99	67.62	87.61	67.8	Unit 4a	Silt with Sand (ML)	Native	23.56	9.11	22.1	444	107	337	50	181	0.2	1.41	1.29	1.0	0.3	0.7	169	6	175
21451329	BH14	30-Jun-21	SS19	21.34	21.54	21.44	66.17	87.61	66.27	Unit 4a	Silty Sand (SM)	Native	23.56	9.11	22.1	476	121	355	50	100	0.05	1.41	1.29	1.0	0.3	0.7	92	6	98
21451329	BH14	30-Jun-21	SS20	22.86	23.32	23.09	64.52	87.61	64.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.56	9.11	23.7	515	137	378	75	67		1.43	1.29	1.0	0.3	0.7	61	6	66
21451329	BH18	12-Aug-21	SS1	0.31	0.41	0.36	86.82	87.18	86.87	Unit 1	ill: Silty Sand with Gravel (SM) / Sandy Silty Clay (CL-M	Fill	23.61	2.5	21	8	0	8	40	48		1.00	1.00	0.6	0.3	1.7	47	6	53
21451329	BH18	12-Aug-21	SS2	0.61	1.07	0.84	86.34	87.18	86.57	Unit 3	Till: Silty Sand (SM)	Native	23.61	2.5	24.3	19	0	19	48.072	34		1.37	1.00	0.6	0.3	1.6	35	6	41
21451329	BH18	12-Aug-21	SS3	1.3	1.68	1.49	85.69	87.18	85.88	Unit 3	Till: Silty Sand (SM)	Native	23.61	2.5	24.3	35	0	35	48.072	19		1.37	1.00	0.7	0.4	1.5	20	6	26
21451329	BH18	12-Aug-21	SS4	1.83	2.29	2.06	85.12	87.18	85.35	Unit 3	Till: Silty Sand (SM)	Native	23.61	2.5	24.3	50	0	50	48.072	72		1.37	1.00	0.7	0.3	1.2	64	6	70
21451329	BH18	12-Aug-21	SS5	2.44	2.9	2.67	84.51	87.18	84.74	Unit 3	Till: Silty Sand (SM)	Native	23.61	2.5	24.3	65	2	63	46	141		1.37	1.00	0.8	0.3	1.1	125	6	130
21451329	BH18	12-Aug-21	SS6	3.05	3.35	3.20	83.98	87.18	84.13	Unit 3	Till: Silty Sand (SM)	Native	23.61	2.5	24.3	78	7	71	48.072	100	0.12	1.37	1.00	0.8	0.3	1.1	89	6	95
21451329	BH18	12-Aug-21	SS7	3.89	4.11	4.00	83.18	87.18	83.29	Unit 3	Till: Silty Sand (SM)	Native	23.61	2.5	24.3	97	15	82	48.072	78		1.37	1.00	0.9	0.3	1.1	70	6	75
21451329	BH18	12-Aug-21	SS8	4.27	4.48	4.38	82.80	87.18	82.91	Unit 4a	Well graded Sand (SW)	Native	23.61	2.5	22.1	106	18	87	50	100	0.06	1.41	1.00	0.9	0.3	1.0	90	6	95
21451329	BH18	12-Aug-21	SS9	5.08	5.33	5.21	81.97	87.18	82.1	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.61	2.5	24.3	127	27	100	48.072	55		1.37	1.00	0.9	0.3	1.0	49	6	55
21451329	BH18	12-Aug-21	SS10	5.49	5.94	5.72	81.46	87.18	81.69	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.61	2.5	24.3	139	32	107	48.072	71		1.37	1.00	0.9	0.3	1.0	64	6	69
21451329	BH18	12-Aug-21	SS11	6.32	6.55	6.44	80.74	87.18	80.86	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.61	2.5	24.3	156	39	118	48.072	68		1.37	1.00	0.9	0.3	1.0	61	6	67
21451329	BH18	12-Aug-21	SS12	6.99	7.16	7.08	80.10	87.18	80.19	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.61	2.5	24.3	172	45	127	48.072	66		1.37	1.00	1.0	0.3	0.9	59	6	65
21451329	BH18	12-Aug-21	SS13	7.32	7.77	7.55	79.63	87.18	79.86	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	23.61	2.5	24.3	183	50	134	48.072	46		1.37	1.00	1.0	0.3	0.9	41	6	47
21451329	BH18	12-Aug-21	SS14	7.92	8.38	8.15	79.03	87.18	79.26	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	23.61	2.5	24.3	198	55	143	56	26		1.37	1.00	1.0	0.4	0.9	22	6	28
21451329	BH18	12-Aug-21	SS15	8.53	8.83	8.68	78.50	87.18	78.65	Unit 3	Till: Sandy Silt (ML)	Native	23.61	2.5	24.3	211	61	150	48.072	100	0.15	1.37	1.00	1.0	0.3	0.9	89	6	95
21451329	BH18	12-Aug-21	SS16	9.14	9.43	9.29	77.89	87.18	78.04	Unit 3	Till: Sandy Silt (ML)	Native	23.61	2.5	24.3	226	67	159	57	100	0.13	1.37	1.00	1.0	0.3	0.9	88	6	94
21451329	BH18	12-Aug-21	SS17	9.75	9.99	9.87	77.31	87.18	77.43	Unit 3	Till: Sandy Silt (ML)	Native	23.61	2.5	24.3	240	72	168	48.072	100	0.09	1.37	1.00	1.0	0.3	0.9	87	6	93
21451329	BH18	12-Aug-21	SS18	10.36	10.82	10.59	76.59	87.18	76.82	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	256	79	176	50	174		1.41	1.00	1.0	0.3	0.9	150	6	155
21451329	BH18	12-Aug-21	SS19	10.97	11.43	11.20	75.98	87.18	76.21	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	269	85	184	50	136		1.41	1.00	1.0	0.3	0.9	116	6	121
21451329	BH18	12-Aug-21	SS20	11.58	12	11.79	75.39	87.18	75.6	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	282	91	191	50	195	0.11	1.41	1.00	1.0	0.3	0.8	164	6	170
21451329	BH18	12-Aug-21	SS21	12.19	12.6	12.40	74.78	87.18	74.99	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	296	97	199	30	187	0.25	1.41	1.00	1.0	0.3	0.8	156	5	161
21451329	BH18	12-Aug-21	SS22	12.8	13.23	13.02	74.16	87.18	74.38	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	309	103	206	50	100	0.13	1.41	1.00	1.0	0.3	0.8	83	6	88
21451329	BH18	12-Aug-21	SS23	13.41	13.87	13.64	73.54	87.18	73.77	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	301	109	192	50	153		1.41	1.00	1.0	0.3	0.8	129	6	134
21451329	BH18	12-Aug-21	SS24	14.02	14.48	14.25	72.93	87.18	73.16	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	315	115	200	50	171		1.41	1.00	1.0	0.3	0.8	143	6	148
21451329	BH18	12-Aug-21	SS25	14.63	15.09	14.86	72.32	87.18	72.55	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	328	121	207	50	126		1.41	1.00	1.0	0.3	0.8	104	6	110
21451329	BH18	12-Aug-21	SS26	15.24	15.7	15.47	71.71	87.18	71.94	Unit 4b	Lean Clay (CL)	Native	23.61	2.5	22.2	342	127	215	92.423	106		1.41	1.00	1.0	0.3	0.8	87	6	92
21451329	BH18	12-Aug-21	SS27	15.85	16.31	16.08	71.10	87.18	71.33	Unit 4b	Lean Clay (CL)	Native	23.61	2.5	22.2	357	133	224	98	32		1.41	1.00	1.0	0.4	0.7	24	5	29
21451329	BH18	12-Aug-21	SS28	16.46	16.92	16.69	70.49	87.18	70.72	Unit 4b	Lean Clay (CL)	Native	23.61	2.5	22.2	371	139	231	92.423	27		1.41	1.00	1.0	0.4	0.7	19	6	25
21451329	BH18	12-Aug-21	SS29	17.37	17.53	17.45	69.73	87.18	69.81	Unit 5	Till: Silty Clay (CL-ML)	Native	23.61	2.5	23.7	414	147	267	68	24		1.43	1.00	1.0	0.4	0.7	16	6	21
21451329	BH18	12-Aug-21	SS30	17.68	18.14	17.91	69.27	87.18	69.5	Unit 5	Till: Silty Clay (CL-ML)	Native	23.61	2.5	23.7	424	151	273	68	33		1.43	1.00	1.0	0.4	0.7	23	6	28
21451329	BH18	12-Aug-21	SS31	18.29	18.75	18.52	68.66	87.18	68.89	Unit 5	Till: Silty Clay (CL-ML)	Native	23.61	2.5	23.7	439	157	282	91	169		1.43	1.00	1.0	0.3	0.8	129	6	134

Table C-1d: SPT Blow Count Processed Data - Control Building Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
								Ground	Sample																		Iterative calculation		
																											Boulanger & Idriss 2014		
	-	-	-	m	m	m	m			-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH18	12-Aug-21	SS32	18.9	19.36	19.13	68.05	87.18	68.28	Unit 5	Till: Silty Clay (CL-ML)	Native	23.61	2.5	23.7	453	163	290	68	119		1.43	1.00	1.0	0.3	0.8	90	6	95
21451329	BH18	12-Aug-21	SS33	19.81	20.27	20.04	67.14	87.18	67.37	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	443	172	271	50	84		1.41	1.00	1.0	0.3	0.8	65	6	70
21451329	BH18	12-Aug-21	SS34	20.27	20.57	20.42	66.76	87.18	66.91	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	451	176	275	33	126		1.41	1.00	1.0	0.3	0.8	97	5	102
21451329	BH18	12-Aug-21	SS35	20.88	21.03	20.96	66.22	87.18	66.3	Unit 4a	Silty Sand (SM)	Native	23.61	2.5	22.1	463	181	282	50	100	0.15	1.41	1.00	1.0	0.3	0.8	76	6	82
21451329	BH18	12-Aug-21	SS36	21.34	21.79	21.57	65.61	87.18	65.84	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	23.61	2.5	22.9	494	187	307	68	44		1.43	1.00	1.0	0.3	0.7	31	6	36
21451329	BH18	12-Aug-21	SS37	21.95	22.4	22.18	65.00	87.18	65.23	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	23.61	2.5	23.7	526	193	333	70	62		1.43	1.00	1.0	0.3	0.7	45	6	51
21451329	BH18	12-Aug-21	SS38	22.56	23.01	22.79	64.39	87.18	64.62	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	23.61	2.5	23.7	540	199	341	68	50		1.43	1.00	1.0	0.3	0.7	35	6	40
21451329	BH19	3-Aug-21	SS1	0	0.61	0.31	86.27	86.58	86.58	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.71	2.5	21	7	0	7	40	48		1.00	1.00	0.6	0.3	1.7	47	6	52
21451329	BH19	3-Aug-21	SS2	0.99	1.22	1.11	85.47	86.58	85.59	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.71	2.5	24.3	26	0	26	48.072	27		1.37	1.00	0.7	0.3	1.6	28	6	34
21451329	BH19	3-Aug-21	SS3	1.52	1.98	1.75	84.83	86.58	85.06	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.71	2.5	24.3	42	0	42	48.072	55		1.37	1.00	0.7	0.3	1.3	50	6	56
21451329	BH19	3-Aug-21	SS4	2.29	2.74	2.52	84.06	86.58	84.29	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.71	2.5	24.3	61	0	61	41	150		1.37	1.00	0.8	0.3	1.1	132	6	138
21451329	BH19	3-Aug-21	SS5	7.62	7.7	7.66	78.92	86.58	78.96	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.71	2.5	24.3	186	51	136	48.072	100	0.08	1.37	1.00	1.0	0.3	0.9	90	6	95
21451329	BH19	3-Aug-21	SS6	11.43	11.72	11.58	75.00	86.58	75.15	Unit 4a	Silty Sand (SM)	Native	22.71	2.5	22.1	256	89	167	28	100	0.14	1.41	1.00	1.0	0.3	0.9	87	5	93
21451329	BH19	3-Aug-21	SS7	15.6	15.75	15.68	70.90	86.58	70.98	Unit 4b	Lean Clay (CL)	Native	22.71	2.5	22.2	348	129	219	92.423	156		1.41	1.00	1.0	0.3	0.8	127	6	132
21451329	BH19	3-Aug-21	SS8	18.29	18.58	18.44	68.14	86.58	68.29	Unit 5	Till: Silty Clay (CL-ML)	Native	22.71	2.5	23.7	414	156	257	68	100	0.14	1.43	1.00	1.0	0.3	0.8	78	6	84
21451329	BH19	3-Aug-21	SS9	21.34	21.79	21.57	65.01	86.58	65.24	Unit 5	Till: Silty Clay (CL-ML)	Native	22.71	2.5	23.7	511	187	324	85	69		1.43	1.00	1.0	0.3	0.7	51	6	56
21451329	BH20	15-Jul-21	SS1	0.3	0.36	0.33	86.03	86.36	86.06	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	N/A	2.5	21	7	0	7	40	52		1.00	1.36	0.6	0.3	1.7	69	6	75
21451329	BH20	15-Jul-21	SS2	0.76	1.22	0.99	85.37	86.36	85.6	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	N/A	2.5	23.2	22	0	22	47	8		1.36	1.36	0.7	0.5	1.7	12	6	18
21451329	BH20	15-Jul-21	SS3	1.52	1.98	1.75	84.61	86.36	84.84	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	41	0	41	48.072	27		1.37	1.36	0.7	0.3	1.3	35	6	40
21451329	BH20	15-Jul-21	SS4	2.29	2.74	2.52	83.84	86.36	84.07	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	61	0	61	42	102		1.37	1.36	0.8	0.3	1.1	122	6	128
21451329	BH20	15-Jul-21	SS5	3.05	3.51	3.28	83.08	86.36	83.31	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	80	8	72	48.072	121		1.37	1.36	0.8	0.3	1.1	146	6	152
21451329	BH20	15-Jul-21	SS6	3.81	4.27	4.04	82.32	86.36	82.55	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	98	15	83	48.072	111		1.37	1.36	0.9	0.3	1.1	135	6	141
21451329	BH20	15-Jul-21	SS7	4.57	5.03	4.80	81.56	86.36	81.79	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	117	23	94	48.072	66		1.37	1.36	0.9	0.3	1.0	80	6	86
21451329	BH20	15-Jul-21	SS8	5.33	5.79	5.56	80.80	86.36	81.03	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	135	30	105	34	40		1.37	1.36	0.9	0.3	1.0	49	5	54
21451329	BH20	15-Jul-21	SS9	6.1	6.55	6.33	80.03	86.36	80.26	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	154	38	116	48.072	81		1.37	1.36	0.9	0.3	1.0	99	6	104
21451329	BH20	15-Jul-21	SS10	7.92	8.08	8.00	78.36	86.36	78.44	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	194	54	140	48.072	70		1.37	1.36	1.0	0.3	0.9	85	6	91
21451329	BH20	15-Jul-21	SS11	9.14	9.6	9.37	76.99	86.36	77.22	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	228	67	160	48.072	115		1.37	1.36	1.0	0.3	0.9	138	6	144
21451329	BH20	15-Jul-21	SS12	10.67	10.95	10.81	75.55	86.36	75.69	Unit 4a	Gravel with Sand (GW)	Native	N/A	2.5	22.1	239	82	157	4	100	0.13	1.41	1.36	1.0	0.3	0.9	121	0	121
21451329	BH20	15-Jul-21	SS13	12.19	12.65	12.42	73.94	86.36	74.17	Unit 4a	Gravel with Sand (GW)	Native	N/A	2.5	22.1	274	97	177	50	135		1.41	1.36	1.0	0.3	0.9	158	6	163
21451329	BH20	15-Jul-21	SS14	13.72	14.15	13.94	72.42	86.36	72.64	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	308	112	196	50	162	0.29	1.41	1.36	1.0	0.3	0.8	184	6	190
21451329	BH20	15-Jul-21	SS15	15.24	15.7	15.47	70.89	86.36	71.12	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	342	127	215	39	127		1.41	1.36	1.0	0.3	0.8	141	6	147
21451329	BH20	15-Jul-21	SS16	16.76	17.22	16.99	69.37	86.36	69.6	Unit 4b	Lean Clay (CL)	Native	N/A	2.5	21.1	374	142	232	98	29		1.41	1.36	1.0	0.3	0.8	30	5	35
21451329	BH20	15-Jul-21	SS17	18.42	18.54	18.48	67.88	86.36	67.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	N/A	2.5	23.7	409	157	253	82	100	0.1	1.43	1.36	1.0	0.3	0.8	106	6	112
21451329	BH20	15-Jul-21	SS18	19.81	20.27	20.04	66.32	86.36	66.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	N/A	2.5	22.1	444	172	272	50	91		1.41	1.36	1.0	0.3	0.8	95	6	101
21451329	BH78	19-Oct-21	SS1	0	0.61	0.31	86.51	86.82	86.82	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23.07	2.5	21	7	0	7	40	30		1.00	1.29	0.6	0.3	1.7	38	6	43
21451329	BH78	19-Oct-21	SS3	1.52	1.98	1.75	85.07	86.82	85.3	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	25.2	44	0	44	48.072	51		1.37	1.29	0.7	0.3	1.2	59	6	64
21451329	BH78	19-Oct-21	SS4	2.29	2.74	2.52	84.30	86.82	84.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	61	0	61	48.072	72		1.37	1.29	0.8	0.3	1.1	82	6	87
21451329	BH78	19-Oct-21	SS5	3.05	3.5	3.28	83.54	86.82	83.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	80	8	72	48.072	63		1.37	1.29	0.8	0.3	1.1	72	6	78
21451329	BH78	19-Oct-21	SS6	3.81	4.27	4.04	82.78	86.82	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	98	15	83	48.072	64		1.37	1.29	0.9	0.3	1.1	74	6	79
21451329	BH78	19-Oct-21	SS7	4.57	5.03	4.80	82.02	86.82	82.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	117	23	94	33	101		1.37	1.29	0.9	0.3	1.0	116	5	122
21451329	BH78	19-Oct-21	SS8	5.33	5.78	5.56	81.26	86.82	81.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	135	30	105	48.072	65		1.37	1.29	0.9	0.3	1.0	75	6	81
21451329	BH78	19-Oct-21	SS9	6.1	6.55	6.33	80.49	86.82	80.72	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	154	38	116	48.072	101		1.37	1.29	0.9	0.3	1.0	117	6	122
21451329	BH78	19-Oct-21	SS10	7.62	8	7.81	79.01	86.82	79.2	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	25.1	196	52	144	38	189	0.23	1.37	1.29	1.0	0.3	0.9	215	6	221
21451329	BH78	19-Oct-21	SS11	9.14	9.6	9.37	77.45	86.82	77.68	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	228	67	160	48.072	195		1.37	1.29	1.0	0.3	0.9	221	6	227
21451329	BH78	19-Oct-21	SS12	10.67	11	10.84	75.98	86.82	76.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.07	2.5	24.3	263	82	182	31	185	0.26	1.37	1.29	1.0	0.3	0.9	203	5	209
21451329	BH78	19-Oct-21	SS13	12.19	12.53	12.36	74.46	86.82	74.63	Unit 4a	Silty Sand (SM)	Native	23.07	2.5	21.6	296	97	200	50	186	0.26	1.41	1.29	1.0	0.3	0.8	199	6	205
21451329	BH78	19-Oct-21	SS14	13.72	14.02	13.87	72.95	86.82	73.1	Unit 4a	Silty Sand (SM)	Native	23.07	2.5	22.1	330	112	218	50	100	0.15	1.41	1.29	1.0	0.3	0.8	105	6	110
21451329	BH78	19-Oct-21	SS15	15.24	15.7	15.47	71.35	86.82	71.58	Unit 4a	Silty Sand (SM)	Native	23.07	2.5	22.1	365	127	238	50	162		1.41	1.29	1.0	0.3	0.8	166	6	171
21451329	BH78	19-Oct-21	SS16	16.76	17.22	16.99	69.83	86.82	70.06	Unit 4a	Silty Sand (SM)	Native	23.07	2.5	22.1	399	142	256	50	81		1.41	1.29	1.0	0.3	0.8	81	6	87
21451329	BH78	19-Oct-21	SS17	18.29	18.75	18.52	68.30	86.82	68.53	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	23.07	2.5	23	426	157	269	68	40		1.43	1.29	1.0	0.3	0.8	39	6	45
21451329	BH78	19-Oct-21	SS18	19.81	20.27	20.04	66.78	86.82	67.01	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	23.07	2.5	23.7	475	172	303	70	96		1.43	1.29	1.0	0.3	0.7	92	6	98
21451329	BH78	19-Oct-21	SS19	21.34	21.79	21.57	65.25	86.82	65.48	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	23.07	2.5	25.7	554	187	367	68	52		1.43	1.29	1.0	0.3	0.7	47	6	53
21451329	BH78	19-Oct-21	SS20	22.56	23.07	22.82	64.00	86.82	64.26	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	23.07	2.5	23.7	584	199	385	68	80		1.43	1.29	1.0	0.3	0.7	72	6	78

Table C-1e: SPT Blow Count Processed Data - Reactor Auxiliary Bay Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																										Iterative calculation			
																										Boulanger & Idriss 2014			
	-	-	-	m	m	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK054-REP-01210-00098	B-113	11-Dec-12	SS1	0.00	0.60	0.30	88.20	88.5	88.5	Unit 1	Fill - Sand and Gravel (GW) and topsoil (OH)	Fill	25.8	2.5	21	6	0	6	40	27		1.00	1.27	0.6	0.3	1.7	33	6	39
NK054-REP-01210-00098	B-113	11-Dec-12	SS2	0.76	1.21	0.99	87.51	88.5	87.7375	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	20	0	20	69	27		1.36	1.27	0.7	0.3	1.6	36	6	41
NK054-REP-01210-00098	B-113	11-Dec-12	SS3	1.53	1.98	1.75	86.75	88.5	86.975	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.1	36	0	36	92	17		1.36	1.27	0.7	0.4	1.5	23	6	29
NK054-REP-01210-00098	B-113	11-Dec-12	SS4	2.29	2.74	2.51	85.99	88.5	86.2125	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	51	0	51	88	16		1.36	1.27	0.8	0.4	1.3	21	6	26
NK054-REP-01210-00098	B-113	11-Dec-12	SS5	3.05	3.50	3.28	85.22	88.5	85.45	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	66	8	59	91	7		1.36	1.27	0.8	0.5	1.3	9	6	15
NK054-REP-01210-00098	B-113	11-Dec-12	SS6	3.81	4.26	4.04	84.46	88.5	84.6875	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.2	84	15	69	46	4		1.36	1.27	0.9	0.5	1.2	5	6	11
NK054-REP-01210-00098	B-113	11-Dec-12	SS7	4.58	5.03	4.80	83.70	88.5	83.925	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.2	102	23	79	45	9		1.36	1.27	0.9	0.5	1.1	11	6	17
NK054-REP-01210-00098	B-113	11-Dec-12	SS8	5.34	5.79	5.56	82.94	88.5	83.1625	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.8	120	30	90	47	14		1.36	1.27	0.9	0.4	1.0	17	6	23
NK054-REP-01210-00098	B-113	11-Dec-12	SS9	6.10	6.55	6.33	82.17	88.5	82.4	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.7	138	38	100	46	18		1.36	1.27	0.9	0.4	1.0	21	6	27
NK054-REP-01210-00098	B-113	11-Dec-12	SS10	6.86	7.31	7.09	81.41	88.5	81.6375	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.8	156	45	111	49	17		1.36	1.27	1.0	0.4	1.0	20	6	25
NK054-REP-01210-00098	B-113	11-Dec-12	SS11	7.63	8.08	7.85	80.65	88.5	80.875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	175	52	122	48.072	92		1.37	1.27	1.0	0.3	0.9	108	6	114
NK054-REP-01210-00098	B-113	11-Dec-12	SS12	8.39	8.67	8.53	79.97	88.5	80.1125	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.2	191	59	132	44	50	0.13	1.37	1.27	1.0	0.3	0.9	59	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS13	9.15	9.58	9.37	79.13	88.5	79.35	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	211	67	144	53	89	0.28	1.37	1.27	1.0	0.3	0.9	103	6	108
NK054-REP-01210-00098	B-113	11-Dec-12	SS14	9.91	10.36	10.14	78.36	88.5	78.5875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.1	230	75	155	56	59		1.37	1.27	1.0	0.3	0.9	67	6	72
NK054-REP-01210-00098	B-113	11-Dec-12	SS15	10.68	11.13	10.90	77.60	88.5	77.825	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	248	82	166	48.072	90		1.37	1.27	1.0	0.3	0.9	100	6	106
NK054-REP-01210-00098	B-113	11-Dec-12	SS16	11.44	11.64	11.54	76.96	88.5	77.0625	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	264	89	175	60	50	0.05	1.37	1.27	1.0	0.3	0.9	55	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS17	12.20	12.35	12.28	76.22	88.5	76.3	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	280	96	184	50	53	0.15	1.41	1.27	1.0	0.3	0.9	57	6	63
NK054-REP-01210-00098	B-113	11-Dec-12	SS18	12.96	13.41	13.19	75.31	88.5	75.5375	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	300	105	196	84	98		1.41	1.27	1.0	0.3	0.8	104	6	110
NK054-REP-01210-00098	B-113	11-Dec-12	SS19	13.73	13.83	13.78	74.72	88.5	74.775	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	314	111	203	50	50	0.1	1.41	1.27	1.0	0.3	0.8	53	6	58
NK054-REP-01210-00098	B-113	11-Dec-12	SS20	14.49	14.62	14.55	73.95	88.5	74.0125	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	331	118	212	50	50	0.13	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-113	11-Dec-12	SS21	15.25	15.38	15.32	73.18	88.5	73.25	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	348	126	222	50	60	0.13	1.41	1.27	1.0	0.3	0.8	62	6	67
NK054-REP-01210-00098	B-113	11-Dec-12	SS22	16.01	16.29	16.15	72.35	88.5	72.4875	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	366	134	232	31	50	0.13	1.41	1.27	1.0	0.3	0.8	51	5	56
NK054-REP-01210-00098	B-113	11-Dec-12	SS23	16.78	17.23	17.00	71.50	88.5	71.725	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	20.1	383	142	241	92.423	54		1.41	1.27	1.0	0.3	0.8	54	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS24	17.54	17.99	17.76	70.74	88.5	70.9625	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	21	399	150	249	97	40		1.41	1.27	1.0	0.3	0.8	40	5	45
NK054-REP-01210-00098	B-113	11-Dec-12	SS25	18.30	18.75	18.53	69.97	88.5	70.2	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	22.2	416	157	259	92.423	66		1.41	1.27	1.0	0.3	0.8	65	6	71
NK054-REP-01210-00098	B-113	11-Dec-12	SS26	19.06	19.51	19.29	69.21	88.5	69.4375	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	20.9	432	165	267	88	16		1.41	1.27	1.0	0.5	0.6	13	6	19
NK054-REP-01210-00098	B-113	11-Dec-12	SS27	19.83	20.06	19.94	68.56	88.5	68.675	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	447	171	276	68	50	0.08	1.43	1.27	1.0	0.3	0.8	49	6	54
NK054-REP-01210-00098	B-113	11-Dec-12	SS28	20.59	20.89	20.74	67.76	88.5	67.9125	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.6	466	179	287	84	61	0.15	1.43	1.27	1.0	0.3	0.8	59	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS29	21.35	21.48	21.42	67.08	88.5	67.15	Unit 4a	Silty Sand (SM)	Native	25.8	2.5	22.1	481	186	296	50	58	0.13	1.41	1.27	1.0	0.3	0.8	55	6	61
NK054-REP-01210-00098	B-113	11-Dec-12	SS30	22.11	22.24	22.18	66.32	88.5	66.3875	Unit 4a	Silty Sand (SM)	Native	25.8	2.5	22.1	498	193	305	40	57	0.13	1.41	1.27	1.0	0.3	0.7	54	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS31	22.88	23.33	23.10	65.40	88.5	65.625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	520	202	318	68	70		1.43	1.27	1.0	0.3	0.7	66	6	71
NK054-REP-01210-00098	B-113	11-Dec-12	SS32	23.64	24.07	23.85	64.65	88.5	64.8625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.6	538	209	328	73	80	0.28	1.43	1.27	1.0	0.3	0.7	74	6	80
NK054-REP-01210-00098	B-113	11-Dec-12	SS33	24.40	24.70	24.55	63.95	88.5	64.1	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	24	554	216	338	54	63	0.15	1.43	1.27	1.0	0.3	0.7	58	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS34	25.16	25.26	25.21	63.29	88.5	63.3375	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	570	223	347	68	60	0.1	1.43	1.27	1.0	0.3	0.7	55	6	60
NK054-REP-01210-00098	B-116	17-Dec-12	SS1	0	0.6	0.30	89.00	89.3	89.3	Unit 1	Fill - Sand and Gravel (GW) over crushed rock over Silty Clay (CL-ML)	Fill	25.2	2.5	21.5	6	0	6	40	25		1.00	1.27	0.6	0.3	1.7	31	6	36
NK054-REP-01210-00098	B-116	17-Dec-12	SS2	0.75	1.2	0.98	88.32	89.3	88.55	Unit 2b	Sandy Silt (ML)	Native	25.2	2.5	23.7	23	0	23	46	34		1.36	1.27	0.7	0.3	1.5	42	6	47
NK054-REP-01210-00098	B-116	17-Dec-12	SS3	1.5	1.95	1.73	87.57	89.3	87.8	Unit 2b	Sandy Silt (ML)	Native	25.2	2.5	20.7	38	0	38	56	26		1.36	1.27	0.7	0.3	1.4	32	6	38
NK054-REP-01210-00098	B-116	17-Dec-12	SS4	3	3.45	3.23	86.07	89.3	86.3	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	25.2	2.5	21.7	71	7	63	58	17		1.36	1.27	0.8	0.4	1.2	21	6	27
NK054-REP-01210-00098	B-116	17-Dec-12	SS5	4.6	5.05	4.83	84.47	89.3	84.7	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	25.2	2.5	20.2	103	23	80	96	2		1.36	1.27	0.9	0.6	1.1	3	5	8
NK054-REP-01210-00098	B-116	17-Dec-12	SS6	5.4	5.85	5.63	83.67	89.3	83.9	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	23.2	122	31	91	46	2		1.36	1.27	0.9	0.6	1.1	2	6	8
NK054-REP-01210-00098	B-116	17-Dec-12	SS7	6.1	6.55	6.33	82.97	89.3	83.2	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	23.2	138	38	100	56	3		1.36	1.27	0.9	0.6	1.0	4	6	9
NK054-REP-01210-00098	B-116	17-Dec-12	SS8	6.9	7.35	7.13	82.17	89.3	82.4	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	23.2	156	45	111	46	5		1.36	1.27	1.0	0.5	0.9	6	6	11
NK054-REP-01210-00098	B-116	17-Dec-12	SS9	7.6	8.05	7.83	81.47	89.3	81.7	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.9	172	52	120	50	5		1.36	1.27	1.0	0.5	0.9	6	6	11
NK054-REP-01210-00098	B-116	17-Dec-12	SS10	8.4	8.6	8.50	80.80	89.3	80.9	Unit 3	Upper till - Silty Sand (SM)	Native	25.2	2.5	24.3	189	59	130	48.072	50	0.05	1.37	1.27	1.0	0.3	0.9	59	6	64
NK054-REP-01210-00098	B-116	17-Dec-12	SS11	9.1	9.55	9.33	79.97	89.3	80.2	Unit 2a	Lean Clay (CL)	Native	25.2	2.5	20.2	205	67	138	90	61		1.36	1.27	1.0	0.3	0.9	71	6	77
NK054-REP-01210-00098	B-116	17-Dec-12	SS12	9.9	10.18	10.04	79.26	89.3	79.4	Unit 2a	Lean Clay (CL)	Native	25.2	2.5	20.2	220	74	146	77.95	50	0.13	1.36	1.27	1.0	0.3	0.9	58	6	63
NK054-REP-01210-00098	B-116	17-Dec-12	SS13	10.7	10.93	10.82	78.48	89.3	78.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	237	82	155	50	50	0.08	1.41	1.27	1.0	0.3	0.9	57	6	62
NK054-REP-01210-00098	B-116	17-Dec-12	SS14	11.4	11.65	11.53	77.77	89.3	77.9	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	253	89	164	60	50	0.1	1.41	1.27	1.0	0.3	0.9	56	6	61
NK054-REP-01210-00098	B-116	17-Dec-12	SS15	12.2	12.48	12.34	76.96	89.3	77.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	271	97	174	33	50	0.13	1.41	1.27	1.0	0.3	0.9	55	5	60
NK054-REP-01210-00098	B-116	17-Dec-12	SS16	13	13.25	13.13	76.17	89.3	76.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	288	104	184	37	50	0.1	1.41	1.27	1.0	0.3	0.9	54	6	60
NK054-REP-01210-00098	B-116	17-Dec-12	SS17	13.7	13.85	13.78	75.52	89.3	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	302	111	192	77	55	0.15	1.41	1.27	1.0	0.3	0.8	59	6	64
NK054-REP-01210-00098	B-116	17-Dec-12	SS18	14.5	14.75	14.63	74.67	89.3	74.8	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	321	119	202	26	50	0.1	1.41	1.27	1.0	0.3	0.8	53	5	58
NK054-REP-01210-00098	B-116	17-Dec-12	SS19	15.2	15.48	15.34	73.96	89.3	74.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	337	126	211	40	50	0.13	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-116	17-Dec-12	SS20	16	16.28	16.14	73.16	89.3	73.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	355	134	221	26	50	0.13	1.41	1.27	1.0	0.3	0.8	52	5	57
NK054-REP-01210-00098	B-116	17-Dec-12	SS21	16.8	17.1	16.95	72.35	89.3	72.5	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	372	142	231	50	54	0.15	1.41	1.27	1.0	0.3	0.8	55	6	61
NK054-REP-01210-00098	B-116	17-Dec-12	SS22	17.5	17.9	17.70	71.60	89.3	71.8	Unit 4b	Lean Clay (CL)	Native	25.2	2.5	21.1	388	149	239	92.423	82	0.25	1.41	1.27	1.0	0.3	0.8	83	6	88
NK054-REP-01210-00098	B-116	17-Dec-12	SS23	18.3	18.75	18.53	70.77	89.3	71	Unit 4b	Lean Clay (CL)	Native	25.2	2.5	22.2	407	157	249	97	44		1.41	1.27	1.0	0.3	0.8	44	5	49
NK054-REP-01210-00098	B-116	17-Dec-12	SS24	19.1	19.55	19.33	69.97	89.3	70.2	Unit 4b	Lean Clay (CL)	Native	25.2	2.5	20.2	423	165	258	92.423	40		1.41	1.27	1.0	0.3	0.8	39	6	45
NK054-REP-01210-00098	B-116	17-Dec-12	SS25	20.6	21.05	20.83	68.47	89.3	68.7	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	25.2	2.5	23.6	458	180	278	74	60		1.43	1.27	1.0	0.3	0.8	58	6	64
NK054-REP-01210-00098	B-116	17-Dec-12	SS26	21.3	21.58	21.44	67.86	89.3	68	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	25.2	2.5	23.8	473	186	287	74	50	0.13	1.43	1.27	1.0	0.3	0.8	48	6	54
NK054-REP-01210-00098	B-116	17-Dec-12	SS27	22.1	22.2	22.15	67.15	89.3	67.2	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	25.2	2.5	23.7	490	193	297	94	50	0.1	1.43	1.27	1.0	0.3	0.8	48	6	53
NK054-REP-01210-00098	B-116	17-Dec-12	SS28	22.9	23	22.95	66.35	89.3	66.4	Unit 4a	Silt (ML)	Native	25.2	2.5	22.1	507	201	307	50	50	0.1	1.41	1.27	1.0	0.3	0.7	47	6	53
NK054-REP-01210-00098	B-116	17-Dec-12	SS29	23.6	23.7	23.65	65.65	89.3	65.7	Unit 4a	Silt (ML)	Native	25.2	2.5	22.1	523	207	315	50	50	0.1	1.41	1.27	1.0	0.3	0.7	47	6	53
NK054-REP-01210-00098	B-116	17-Dec-12	SS30	24.40	24.68	24.54	64.76	89.3	64.9	Unit 5	Lower till - Sandy Silt (ML)	Native	25.2	2.5	23.7	544	216	328	68	50	0.13	1.43	1.27	1.0	0.3	0.7	46	6	52
NK054-REP-01210-00098	B-116	17-Dec-12	SS31	25.10	25.20	25.15	64.15	89.3	64.2	Unit 5	Lower till - Sandy Silt (ML)	Native	25.2	2.5	23.7	558	222	336	68	50	0.1	1.43	1.27	1.0	0.3	0.7	46	6	52
21451329	BH15	28-Jun-21	SS1	0	0.13	0.07	87.30	87.37	87.37	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.47	5.12	21	1	0	1	40	50	0.13	1.00	1.36	0.5	0.3	1.7	62	6	67
21451329	BH15	28-Jun-21	SS2	0.76	1.22	0.99	86.38	87.37	86.61	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.47	5.12	21	21	0	21	40	98		1.00	1.36	0.7	0.3	1.5	132	6	138
21451329	BH15	28-Jun-21	SS3	1.52	1.98	1.75	85.62	87.37	85.85	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	39	0	39	48.072	25		1.37	1.36	0.7	0.3	1.3	33	6	38
21451329	BH15	28-Jun-21	SS4	2.29	2.74	2.52	84.85	87.37	85.08	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	58	0	58	47	82		1.37	1.36	0.8	0.3	1.2	100	6	105
21451329	BH15	28-Jun-21	SS5	4.57	4.85	4.71	82.66	87.37	82.8	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	111	0	111	48.072	50	0.13	1.37	1.36	0.9	0.3	1.0	58	6	64
21451329	BH15	28-Jun-21	SS6	7.62	7.75	7.69	79.68	87.37	79.75	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	184	25	158	48.072	50	0.13	1.37	1.36	1.0	0.3	0.9	58	6	64
21451329	BH15	28-Jun-21	SS7	10.67	10.8	10.74	76.63	87.37	76.7	Unit 4a	Silty Sand (SM)	Native	23.47	5.12	22.1	251	55	196	50	50	0.13	1.41	1.36	1.0	0.3	0.8	57	6	63
21451329	BH15	28-Jun-21	SS8	15.24	15.7	15.47	71.90	87.37	72.13	Unit 4b	Lean Clay (CL)	Native	23.47	5.12	22.2	356	102	254	96	95		1.41	1.36	1.0	0.3	0.8	101	5	106
21451329	BH15	28-Jun-21	SS9	18.29	18.52	18.41	68.96	87.37	69.08	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.47	5.12	23.7	426	130	295	68	50	0.08	1.43	1.36	1.0	0.3	0.8	51	6	57
21451329	BH15	28-Jun-21	SS10	21.34	21.79	21.57	65.80	87.37	66.03	Unit 4b	Silty Clay (CL-ML)	Native	23.47	5.12	22.2	496	161	334	92.423	56		1.41	1.36	1.0	0.3	0.7	55	6	61
21451329	BH1	13-Oct-21	SS1	0	0.61	0.31	89.31	89.62	89.62	Unit 1	Sandy Silt (ML)	Fill	25.29	2.5	21	7	0	7	40	3		1.00	1.29	0.6	0.5	1.7	4	6	9
21451329	BH1	13-Oct-21	SS2	0.61	1.07	0.84	88.78	89.62	89.01	Unit 1	Sandy Silt (ML)	Fill	25.29	2.5	21	18	0	18	40	7		1.00	1.29	0.6	0.5	1.7	10	6	15
21451329	BH1	13-Oct-21	SS3	1.22	1.68	1.45	88.17	89.62	88.4	Unit 2a	sandy Lean Clay (CL)	Native	25.29	2.5	20.2	30	0	30	77.95	5		1.36	1.29	0.7	0.5	1.7	8	6	13

Table C-1e: SPT Blow Count Processed Data - Reactor Auxiliary Bay Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
								Ground	Sample																		Iterative calculation		
																											Boulanger & Idriss 2014		
	-	-	-	m	m	m	m			-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH1	13-Oct-21	SS5	2.44	2.9	2.67	86.95	89.62	87.18	Unit 2a	sandy Lean Clay (CL)	Native	25.29	2.5	20.2	54	2	52	68	13		1.36	1.29	0.8	0.4	1.3	17	6	23
21451329	BH1	13-Oct-21	SS7	3.66	4.11	3.89	85.73	89.62	85.96	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.29	2.5	23.2	90	14	77	45	11		1.36	1.29	0.8	0.4	1.1	13	6	19
21451329	BH1	13-Oct-21	SS8	4.27	4.52	4.40	85.22	89.62	85.35	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	107	19	88	48.072	100	0.1	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS9	4.88	5.08	4.98	84.64	89.62	84.74	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	121	24	97	48.072	100	0.05	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS10	5.49	5.69	5.59	84.03	89.62	84.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	136	30	106	48.072	100	0.05	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS11	6.1	6.5	6.30	83.32	89.62	83.52	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	27.7	175	37	137	66	178	0.25	1.37	1.29	0.9	0.3	0.9	196	6	202
21451329	BH1	13-Oct-21	SS12	6.71	6.96	6.84	82.78	89.62	82.91	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	166	43	124	48.072	100	0.1	1.37	1.29	0.9	0.3	0.9	115	6	121
21451329	BH1	13-Oct-21	SS13	7.32	7.54	7.43	82.19	89.62	82.3	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	181	48	132	53	100	0.07	1.37	1.29	1.0	0.3	0.9	115	6	121
21451329	BH1	13-Oct-21	SS14	7.92	8.36	8.14	81.48	89.62	81.7	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	198	55	142	48.072	126	0.25	1.37	1.29	1.0	0.3	0.9	145	6	151
21451329	BH1	13-Oct-21	SS15	8.53	8.99	8.76	80.86	89.62	81.09	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	194	61	133	92.423	123		1.41	1.29	1.0	0.3	0.9	146	6	152
21451329	BH1	13-Oct-21	SS16	9.14	9.6	9.37	80.25	89.62	80.48	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	208	67	141	97	103		1.41	1.29	1.0	0.3	0.9	121	5	126
21451329	BH1	13-Oct-21	SS17	9.75	10.21	9.98	79.64	89.62	79.87	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	25.5	254	73	181	92.423	75		1.41	1.29	1.0	0.3	0.9	82	6	88
21451329	BH1	13-Oct-21	SS18	10.36	10.82	10.59	79.03	89.62	79.26	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	235	79	156	88	67		1.41	1.29	1.0	0.3	0.9	77	6	82
21451329	BH1	13-Oct-21	SS19	10.97	11.25	11.11	78.51	89.62	78.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	246	84	161	50	100	0.13	1.41	1.29	1.0	0.3	0.9	113	6	119
21451329	BH1	13-Oct-21	SS20	11.58	12.02	11.80	77.82	89.62	78.04	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	23.6	262	91	171	64	182	0.28	1.41	1.29	1.0	0.3	0.9	203	6	209
21451329	BH1	13-Oct-21	SS21	12.19	12.65	12.42	77.20	89.62	77.43	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	276	97	178	50	169		1.41	1.29	1.0	0.3	0.9	187	6	192
21451329	BH1	13-Oct-21	SS22	12.8	13.26	13.03	76.59	89.62	76.82	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	289	103	186	50	113		1.41	1.29	1.0	0.3	0.8	123	6	129
21451329	BH1	13-Oct-21	SS23	13.41	13.84	13.63	75.99	89.62	76.21	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	24.2	304	109	194	50	175	0.28	1.41	1.29	1.0	0.3	0.8	189	6	194
21451329	BH1	13-Oct-21	SS24	14.02	14.43	14.23	75.39	89.62	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	317	115	202	50	200	0.25	1.41	1.29	1.0	0.3	0.8	214	6	219
21451329	BH1	13-Oct-21	SS25	14.63	15.04	14.84	74.78	89.62	74.99	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	328	121	207	50	197	0.25	1.41	1.29	1.0	0.3	0.8	209	6	215
21451329	BH1	13-Oct-21	SS26	15.24	15.67	15.46	74.16	89.62	74.38	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	342	127	215	50	180	0.28	1.41	1.29	1.0	0.3	0.8	189	6	195
21451329	BH1	13-Oct-21	SS27	15.85	16.31	16.08	73.54	89.62	73.77	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	355	133	222	25	151		1.41	1.29	1.0	0.3	0.8	157	5	162
21451329	BH1	13-Oct-21	SS28	16.46	16.92	16.69	72.93	89.62	73.16	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	369	139	230	50	118		1.41	1.29	1.0	0.3	0.8	122	6	127
21451329	BH1	13-Oct-21	SS29	17.07	17.53	17.30	72.32	89.62	72.55	Unit 4b	Silty Clay (CL-ML)	Native	25.29	2.5	22.2	384	145	239	99	76		1.41	1.29	1.0	0.3	0.8	78	5	83
21451329	BH1	13-Oct-21	SS30	17.68	18.14	17.91	71.71	89.62	71.94	Unit 4b	Silty Clay (CL-ML)	Native	25.29	2.5	26.7	478	151	327	92.423	62		1.41	1.29	1.0	0.3	0.7	58	6	64
21451329	BH1	13-Oct-21	SS31	18.29	18.75	18.52	71.10	89.62	71.33	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	411	157	254	92.423	26		1.41	1.29	1.0	0.4	0.7	24	6	29
21451329	BH1	13-Oct-21	SS32	18.9	19.35	19.13	70.49	89.62	70.72	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	425	163	262	99	23		1.41	1.29	1.0	0.4	0.7	20	5	26
21451329	BH1	13-Oct-21	SS33	19.51	19.96	19.74	69.88	89.62	70.11	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	438	169	269	92.423	35		1.41	1.29	1.0	0.3	0.7	33	6	39
21451329	BH1	13-Oct-21	SS34	20.12	20.57	20.35	69.27	89.62	69.5	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	452	175	277	92.423	36		1.41	1.29	1.0	0.3	0.7	34	6	40
21451329	BH1	13-Oct-21	SS35	20.73	21.18	20.96	68.66	89.62	68.89	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	465	181	284	92.423	23		1.41	1.29	1.0	0.4	0.7	19	6	25
21451329	BH1	13-Oct-21	SS36	21.34	21.49	21.42	68.20	89.62	68.28	Unit 5	Till: Sandy Silt (ML)	Native	25.29	2.5	23.7	508	186	322	64	100	0.14	1.43	1.29	1.0	0.3	0.7	94	6	100
21451329	BH1	13-Oct-21	SS37	21.95	22.38	22.17	67.45	89.62	67.67	Unit 5	Till: Sandy Silt (ML)	Native	25.29	2.5	23.7	525	193	332	68	194	0.28	1.43	1.29	1.0	0.3	0.7	182	6	187
21451329	BH1	13-Oct-21	SS38	22.56	22.78	22.67	66.95	89.62	67.06	Unit 4a	Sandy Silt (ML)	Native	25.29	2.5	22.1	501	198	303	52	100	0.07	1.41	1.29	1.0	0.3	0.7	96	6	102
21451329	BH1	13-Oct-21	SS39	23.16	23.62	23.39	66.23	89.62	66.46	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	554	205	349	68	78		1.43	1.29	1.0	0.3	0.7	72	6	78
21451329	BH1	13-Oct-21	SS40	23.77	24.21	23.99	65.63	89.62	65.85	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	569	211	358	78	146	0.28	1.43	1.29	1.0	0.3	0.7	134	6	140
21451329	BH1	13-Oct-21	SS41	24.38	24.84	24.61	65.01	89.62	65.24	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	583	217	366	68	105		1.43	1.29	1.0	0.3	0.7	96	6	101
21451329	BH1	13-Oct-21	SS42	24.99	25.29	25.14	64.48	89.62	64.63	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	596	222	374	68	100	0.07	1.43	1.29	1.0	0.3	0.7	91	6	96
21451329	BH10	21-Jun-21	SS1	0	0.61	0.31	88.09	88.4	88.4	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	24.42	7.1	21	7	0	7	40	40		1.00	1.29	0.6	0.3	1.7	50	6	56
21451329	BH10	21-Jun-21	SS2	1.17	1.22	1.20	87.20	88.4	87.23	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.42	7.1	21	25	0	25	40	13		1.00	1.29	0.7	0.4	1.7	19	6	25
21451329	BH10	21-Jun-21	SS3	1.52	1.98	1.75	86.65	88.4	86.88	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24.42	7.1	21	37	0	37	75	6		1.00	1.29	0.7	0.5	1.6	9	6	15
21451329	BH10	21-Jun-21	SS4	2.29	2.74	2.52	85.88	88.4	86.11	Unit 2a	Lean Clay (CL)	Native	24.42	7.1	20.2	51	0	51	77.95	19		1.36	1.29	0.8	0.4	1.3	24	6	30
21451329	BH10	21-Jun-21	SS6	3.81	4.42	4.12	84.28	88.4	84.59	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.42	7.1	23.2	96	0	96	46	10		1.36	1.29	0.9	0.5	1.0	11	6	17
21451329	BH10	21-Jun-21	SS7	4.57	5.03	4.80	83.60	88.4	83.83	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	24.42	7.1	23.2	111	0	111	46	6		1.36	1.29	0.9	0.5	0.9	6	6	12
21451329	BH10	21-Jun-21	SS8	5.33	5.79	5.56	82.84	88.4	83.07	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	135	0	135	48.072	18		1.37	1.29	0.9	0.4	0.9	19	6	24
21451329	BH10	21-Jun-21	SS9	6.1	6.55	6.33	82.07	88.4	82.3	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	154	0	154	48.072	20		1.37	1.29	0.9	0.4	0.8	20	6	26
21451329	BH10	21-Jun-21	SS10	7.62	8.08	7.85	80.55	88.4	80.78	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	191	7	183	48.072	133		1.37	1.29	1.0	0.3	0.9	142	6	148
21451329	BH10	21-Jun-21	SS11	9.14	9.6	9.37	79.03	88.4	79.26	Unit 3	Till: Silty Sand (SM)	Native	24.42	7.1	24.3	228	22	205	49	110		1.37	1.29	1.0	0.3	0.8	117	6	123
21451329	BH10	21-Jun-21	SS12	10.67	11.13	10.90	77.50	88.4	77.73	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	241	37	204	50	94		1.41	1.29	1.0	0.3	0.8	100	6	106
21451329	BH10	21-Jun-21	SS13	12.19	12.65	12.42	75.98	88.4	76.21	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	274	52	222	50	40		1.41	1.29	1.0	0.3	0.8	42	6	47
21451329	BH10	21-Jun-21	SS14	13.72	14.1	13.91	74.49	88.4	74.68	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	307	67	241	27	193	0.23	1.41	1.29	1.0	0.3	0.8	197	5	202
21451329	BH10	21-Jun-21	SS15	15.44	15.7	15.57	72.83	88.4	72.96	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.42	7.1	22.1	344	83	261	50	158		1.41	1.29	1.0	0.3	0.8	158	6	163
21451329	BH10	21-Jun-21	SS16	18.29	18.75	18.52	69.88	88.4	70.11	Unit 4b	Lean Clay (CL)	Native	24.42	7.1	22.2	411	112	299	96	21		1.41	1.29	1.0	0.4	0.6	17	5	23
21451329	BH10	21-Jun-21	SS17	21.54	21.69	21.62	66.78	88.4	66.86	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.42	7.1	23.7	512	142	370	68	148	0.13	1.43	1.29	1.0	0.3	0.7	135	6	140
21451329	BH10	21-Jun-21	SS18	23.86	24.29	24.08	64.32	88.4	64.54	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.42	7.1	23.7	571	167	404	55	161	0.18	1.43	1.29	1.0	0.3	0.7	143	6	149
21451329	BH16	29-Sep-21	SS1	0	0.61	0.31	88.32	88.63	88.63	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	24.08	5.52	21	7	0	7	40	36		1.00	1.36	0.6	0.3	1.7	48	6	53
21451329	BH16	29-Sep-21	SS2	0.76	1.22	0.99	87.64	88.63	87.87	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.08	5.52	21	21	0	21	40	51		1.00	1.36	0.7	0.3	1.5	69	6	74
21451329	BH16	29-Sep-21	SS3	1.52	1.98	1.75	86.88	88.63	87.11	Unit 2a	Lean Clay with Sand (CL)	Native	24.08	5.52	19.7	36	0	36	77.95	12		1.36	1.36	0.7	0.4	1.5	18	6	24
21451329	BH16	29-Sep-21	SS5	3.05	3.51	3.28	85.35	88.63	85.58	Unit 2a	Lean Clay with Sand (CL)	Native	24.08	5.52	20.2	66	0	66	77.95	12		1.36	1.36	0.8	0.4	1.2	16	6	21
21451329	BH16	29-Sep-21	SS6	3.81	4.27	4.04	84.59	88.63	84.82	Unit 2b	Silty Sand (SM)	Native	24.08	5.52	23.2	94	0	94	46	5		1.36	1.36	0.9	0.5	1.0	6	6	12
21451329	BH16	29-Sep-21	SS7	5.33	5.79	5.56	83.07	88.63	83.3	Unit 2b	Silty Sand (SM)	Native	24.08	5.52	23.2	129	0	129	46	17		1.36	1.36	0.9	0.4	0.9	19	6	25
21451329	BH16	29-Sep-21	SS8	6.1	6.55	6.33	82.30	88.63	82.53	Unit 2b	Silty Sand (SM)	Native	24.08	5.52	23.2	147	8	139	46	7		1.36	1.36	0.9	0.5	0.8	8	6	13
21451329	BH16	29-Sep-21	SS9	7.62	8.08	7.85	80.78	88.63	81.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.08	5.52	24.3	191	23	168	48.072	64		1.37	1.36	1.0	0.3	0.9	74	6	80
21451329	BH16	29-Sep-21	SS10	9.14	9.42	9.28	79.35	88.63	79.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.08	5.52	24.3	226	37	189	48.072	50	0.13	1.37	1.36	1.0	0.3	0.8	57	6	63
21451329	BH16	29-Sep-21	SS11	10.67	11.13	10.90	77.73	88.63	77.96	Unit 4b	Lean Clay (CL)	Native	24.08	5.52	22.2	242	53	189	92.423	78		1.41	1.36	1.0	0.3	0.8	90	6	95
21451329	BH16	29-Sep-21	SS12	12.34	12.65	12.50	76.13	88.63	76.29	Unit 4a	Silty Sand (SM)	Native	24.08	5.52	22.1	276	68	208	50	73		1.41	1.36	1.0	0.3	0.8	82	6	87
21451329	BH16	29-Sep-21	SS13	13.72	13.94	13.83	74.80	88.63	74.91	Unit 4a	Silty Sand (SM)	Native	24.08	5.52	22.1	306	82	224	50	50	0.08	1.41	1.36	1.0	0.3	0.8	55	6	61
21451329	BH16	29-Sep-21	SS14	15.2	15.37	15.29	73.34	88.63	73.43	Unit 4a	Silty Sand (SM)	Native	24.08	5.52	22.1	338	96	242	50	50	0,13	1.41	1.36	1.0	0.3	0.8	54	6	59
21451329	BH16	29-Sep-21	SS15	18.29	18.75	18.52	70.11	88.63	70.34	Unit 4b	Lean Clay (CL)	Native	24.08	5.52	22.2	411	128	284	92.423	38		1.41	1.36	1.0	0.3	0.8	39	6	44
21451329	BH16	29-Sep-21	SS16	21.34	21.46	21.40	67.23	88.63	67.29	Unit 4a	Sandy Silt (ML)	Native	24.08	5.52	22.1	473	156	317	50	50	0.13	1.41	1.36	1.0	0.3	0.7	50	6	56
21451329	BH2	10-Sep-21	SS1	0.33	0.61	0.47	88.94	89.41	89.08	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.83	2.61	21	10	0	10	40	28		1.00	1.29	0.6	0.3	1.7	36	6	42
21451329	BH2	10-Sep-21	SS2	1.02	1.22	1.12	88.29	89.41	88.39	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.83	2.61	21	24	0	24	40	57		1.00	1.29	0.7	0.3	1.5	72	6	77

Table C-1e: SPT Blow Count Processed Data - Reactor Auxiliary Bay Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idriss 2014)
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idriss 2014)
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Avg. Depth	Avg. Depth Elevation	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation: Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH2	10-Sep-21	SS3	1.65	1.98	1.82	87.59	89.41	87.76	Unit 1	Fill: Sandy Silt (ML)	Fill	24.83	2.61	21	38	0	38	40	16		1.00	1.29	0.7	0.4	1.4	22	6	27
21451329	BH2	10-Sep-21	SS4	2.29	2.74	2.52	86.89	89.41	87.12	Unit 2a	Lean Clay with Sand (CL)	Native	24.83	2.61	20.2	51	0	51	85	12		1.36	1.29	0.8	0.4	1.3	16	6	21
21451329	BH2	10-Sep-21	SS6	3.81	4.27	4.04	85.37	89.41	85.6	Unit 2a	Lean Clay with Sand (CL)	Native	24.83	2.61	20.2	82	14	68	81	4		1.36	1.29	0.9	0.5	1.2	5	6	11
21451329	BH2	10-Sep-21	SS8	6.1	6.55	6.33	83.08	89.41	83.31	Unit 2b	Silty Sand (SM)	Native	24.83	2.61	23.2	147	36	110	47	4		1.36	1.29	0.9	0.5	0.9	5	6	10
21451329	BH2	10-Sep-21	SS9	7.62	8.05	7.84	81.57	89.41	81.79	Unit 3	Till: Sandy Silt (ML)	Native	24.83	2.61	24.3	191	51	139	51	185	0.28	1.37	1.29	1.0	0.3	0.9	213	6	218
21451329	BH2	10-Sep-21	SS10	9.14	9.41	9.28	80.13	89.41	80.27	Unit 3	Till: Sandy Silt (ML)	Native	24.83	2.61	24.3	226	65	160	48.072	100	0.11	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH2	10-Sep-21	SS11	10.67	11.13	10.90	78.51	89.41	78.74	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	241	81	160	67	170		1.41	1.29	1.0	0.3	0.9	193	6	199
21451329	BH2	10-Sep-21	SS12	12.19	12.65	12.42	76.99	89.41	77.22	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	274	96	178	50	142		1.41	1.29	1.0	0.3	0.9	157	6	162
21451329	BH2	10-Sep-21	SS13	13.72	14.11	13.92	75.49	89.41	75.69	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	308	111	197	50	196	0.24	1.41	1.29	1.0	0.3	0.8	211	6	216
21451329	BH2	10-Sep-21	SS14	15.24	15.66	15.45	73.96	89.41	74.17	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	341	126	215	50	198	0.27	1.41	1.29	1.0	0.3	0.8	208	6	214
21451329	BH2	10-Sep-21	SS15	16.76	17.22	16.99	72.42	89.41	72.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.83	2.61	22.1	375	141	234	31	83		1.41	1.29	1.0	0.3	0.8	85	5	91
21451329	BH2	10-Sep-21	SS16	18.29	18.75	18.52	70.89	89.41	71.12	Unit 4b	Lean Clay (CL)	Native	24.83	2.61	22.2	411	156	255	96	59		1.41	1.29	1.0	0.3	0.8	59	5	65
21451329	BH2	10-Sep-21	SS17	19.81	20.27	20.04	69.37	89.41	69.6	Unit 4b	Lean Clay (CL)	Native	24.83	2.61	22.2	445	171	274	92.423	40		1.41	1.29	1.0	0.3	0.8	39	6	45
21451329	BH2	10-Sep-21	SS18	21.34	21.77	21.56	67.85	89.41	68.07	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.83	2.61	23.7	481	186	295	68	176	0.28	1.43	1.29	1.0	0.3	0.8	170	6	176
21451329	BH2	10-Sep-21	SS19	22.86	23.32	23.09	66.32	89.41	66.55	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.83	2.61	23.7	517	201	316	64	179		1.43	1.29	1.0	0.3	0.7	170	6	175
21451329	BH2	10-Sep-21	SS20	24.37	24.83	24.60	64.81	89.41	65.04	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.83	2.61	23.7	553	216	337	68	100	0.14	1.43	1.29	1.0	0.3	0.7	93	6	99
21451329	BH4	21-Jul-21	SS1	0	0.61	0.31	89.33	89.64	89.64	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	25.45	2.5	21	7	0	7	40	18		1.00	1.36	0.6	0.4	1.7	24	6	29
21451329	BH4	21-Jul-21	SS2	0.76	1.22	0.99	88.65	89.64	88.88	Unit 1	Fill: Silty Sand (SM)	Fill	25.45	2.5	21	21	0	21	40	17		1.00	1.36	0.7	0.4	1.7	26	6	31
21451329	BH4	21-Jul-21	SS3	1.52	1.98	1.75	87.89	89.64	88.12	Unit 1	Fill: Silty Sand (SM)	Fill	25.45	2.5	21	37	0	37	40	21		1.00	1.36	0.7	0.3	1.4	29	6	34
21451329	BH4	21-Jul-21	SS4	4.57	5.03	4.80	84.84	89.64	85.07	Unit 2b	Silty Sand (SM)	Native	25.45	2.5	23.2	111	23	89	46	3		1.36	1.36	0.9	0.5	1.1	4	6	9
21451329	BH4	21-Jul-21	SS5	7.62	8.08	7.85	81.79	89.64	82.02	Unit 2b	Silty Sand (SM)	Native	25.45	2.5	23.2	182	52	130	47	8		1.36	1.36	1.0	0.5	0.9	9	6	15
21451329	BH4	21-Jul-21	SS6	10.67	11.13	10.90	78.74	89.64	78.97	Unit 4a	Silty Sand (SM)	Native	25.45	2.5	22.1	241	82	158	50	154		1.41	1.36	1.0	0.3	0.9	185	6	191
21451329	BH4	21-Jul-21	SS7	13.72	14.17	13.95	75.69	89.64	75.92	Unit 4a	Silty Sand (SM)	Native	25.45	2.5	22.1	308	112	196	23	127		1.41	1.36	1.0	0.3	0.8	145	5	149
21451329	BH4	21-Jul-21	SS8	16.76	17.22	16.99	72.65	89.64	72.88	Unit 4a	Silty Sand (SM)	Native	25.45	2.5	22.1	375	142	233	50	160		1.41	1.36	1.0	0.3	0.8	174	6	180
21451329	BH4	21-Jul-21	SS9	19.81	20.27	20.04	69.60	89.64	69.83	Unit 4b	Lean Clay (CL)	Native	25.45	2.5	22.2	445	172	273	98	24		1.41	1.36	1.0	0.4	0.7	22	5	28
21451329	BH4	21-Jul-21	SS10	22.86	22.99	22.93	66.71	89.64	66.78	Unit 4a	Silt (ML)	Native	25.45	2.5	22.1	507	200	306	50	100	0.13	1.41	1.36	1.0	0.3	0.7	101	6	107
21451329	BH4	21-Jul-21	SS11	24.38	24.66	24.52	65.12	89.64	65.26	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	25.45	2.5	23.9	586	216	370	55	100	0.13	1.43	1.36	1.0	0.3	0.7	96	6	102
21451329	BH5	27-Aug-21	SS1	0.31	0.38	0.35	88.62	88.97	88.66	Unit 1	Fill: Poorly Graded Gravel with Sand (GP)	Fill	25.07	2.5	21	7	0	7	40	29		1.00	1.36	0.6	0.3	1.7	39	6	44
21451329	BH5	27-Aug-21	SS2	0.76	1.22	0.99	87.98	88.97	88.21	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.07	2.5	21	21	0	21	40	47		1.00	1.36	0.7	0.3	1.5	63	6	69
21451329	BH5	27-Aug-21	SS3	1.83	1.98	1.91	87.06	88.97	87.14	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.07	2.5	21	40	0	40	40	44		1.00	1.36	0.7	0.3	1.3	56	6	61
21451329	BH5	27-Aug-21	SS4	4.57	5.03	4.80	84.17	88.97	84.4	Unit 2a	Sandy Silty Clay (CL-ML)	Native	25.07	2.5	20.2	97	23	74	54	3		1.36	1.36	0.9	0.5	1.2	4	6	10
21451329	BH5	27-Aug-21	SS5	7.62	8.08	7.85	81.12	88.97	81.35	Unit 2a	Sandy Silty Clay (CL-ML)	Native	25.07	2.5	20.2	159	52	106	77.95	9		1.36	1.36	1.0	0.5	1.0	12	6	17
21451329	BH5	27-Aug-21	SS6	10.67	11.13	10.90	78.07	88.97	78.3	Unit 3	Till: Sandy Silt (ML)	Native	25.07	2.5	24.3	265	82	182	59	133		1.37	1.36	1.0	0.3	0.9	154	6	160
21451329	BH5	27-Aug-21	SS7	13.72	14.16	13.94	75.03	88.97	75.25	Unit 4a	Silty Sand (SM)	Native	25.07	2.5	22.1	308	112	196	50	172	0.29	1.41	1.36	1.0	0.3	0.8	196	6	201
21451329	BH5	27-Aug-21	SS8	16.76	17.01	16.89	72.08	88.97	72.21	Unit 4a	Silty Sand (SM)	Native	25.07	2.5	22.1	373	141	232	42	100	0.09	1.41	1.36	1.0	0.3	0.8	109	6	114
21451329	BH5	27-Aug-21	SS9	19.81	20.27	20.04	68.93	88.97	69.16	Unit 5	Till: Lean Clay (CL)	Native	25.07	2.5	23.7	475	172	303	86	44		1.43	1.36	1.0	0.3	0.7	45	6	50
21451329	BH5	27-Aug-21	SS10	22.86	23.32	23.09	65.88	88.97	66.11	Unit 5	Till: Lean Clay (CL)	Native	25.07	2.5	23.7	547	202	345	68	108		1.43	1.36	1.0	0.3	0.7	106	6	111
21451329	BH5	27-Aug-21	SS11	23.77	24.31	24.04	64.93	88.97	65.2	Unit 5	Till: Silty Sand with Gravel (SM)	Native	25.07	2.5	23.7	570	211	358	42	192	0.28	1.43	1.36	1.0	0.3	0.7	186	6	192
21451329	BH77	25-Aug-21	SS1	0	0.61	0.31	87.49	87.8	87.8	Unit 1	Fill: Sand with Gravel (SP)	Fill	24.19	2.5	21	7	0	7	40	35		1.00	1.29	0.6	0.3	1.7	44	6	49
21451329	BH77	25-Aug-21	SS2	0.76	1.22	0.99	86.81	87.8	87.04	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	24.19	2.5	21	21	0	21	40	17		1.00	1.29	0.7	0.4	1.7	24	6	30
21451329	BH77	25-Aug-21	SS3	1.52	1.98	1.75	86.05	87.8	86.28	Unit 2b	Silty Sand with Grvel (SM)	Native	24.19	2.5	23.2	38	0	38	41	7		1.36	1.29	0.7	0.5	1.6	10	6	16
21451329	BH77	25-Aug-21	SS4	2.29	2.74	2.52	85.28	87.8	85.51	Unit 2b	Silty Sand with Grvel (SM)	Native	24.19	2.5	23.2	58	0	58	46	17		1.36	1.29	0.8	0.4	1.2	21	6	27
21451329	BH77	25-Aug-21	SS5	3.05	3.5	3.28	84.52	87.8	84.75	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	80	8	72	38	48		1.37	1.29	0.8	0.3	1.1	55	6	61
21451329	BH77	25-Aug-21	SS6	3.81	4.27	4.04	83.76	87.8	83.99	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	98	15	83	48.072	136		1.37	1.29	0.9	0.3	1.1	156	6	162
21451329	BH77	25-Aug-21	SS7	4.57	5.03	4.80	83.00	87.8	83.23	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	19.1	92	23	69	48.072	118		1.37	1.29	0.9	0.3	1.1	148	6	153
21451329	BH77	25-Aug-21	SS8	5.33	5.78	5.56	82.24	87.8	82.47	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	135	30	105	48.072	134		1.37	1.29	0.9	0.3	1.0	155	6	160
21451329	BH77	25-Aug-21	SS9	6.1	6.55	6.33	81.47	87.8	81.7	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	154	38	116	44	149		1.37	1.29	0.9	0.3	1.0	172	6	178
21451329	BH77	25-Aug-21	SS10	7.62	8.03	7.83	79.97	87.8	80.18	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	190	52	138	54	185	0.25	1.37	1.29	1.0	0.3	0.9	213	6	219
21451329	BH77	25-Aug-21	SS11	9.14	9.37	9.26	78.54	87.8	78.66	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	225	66	159	48.072	100	0.08	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH77	25-Aug-21	SS12	10.67	10.92	10.80	77.00	87.8	77.13	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	262	81	181	48.072	100	0.1	1.37	1.29	1.0	0.3	0.9	110	6	116
21451329	BH77	25-Aug-21	SS13	12.19	12.65	12.42	75.38	87.8	75.61	Unit 4a	Silty Sand with Gravel (SM)	Native	24.19	2.5	22.1	298	97	201	64	135		1.41	1.29	1.0	0.3	0.8	144	6	150
21451329	BH77	25-Aug-21	SS14	13.72	14.14	13.93	73.87	87.8	74.08	Unit 4a	Silty Sand with Gravel (SM)	Native	24.19	2.5	22.1	332	112	219	50	192	0.27	1.41	1.29	1.0	0.3	0.8	201	6	206
21451329	BH77	25-Aug-21	SS15	15.24	15.84	15.54	72.26	87.8	72.56	Unit 4a	Silty Sand with Gravel (SM)	Native	24.19	2.5	22.1	367	128	239	50	176	0.29	1.41	1.29	1.0	0.3	0.8	180	6	185
21451329	BH77	25-Aug-21	SS16	16.76	17.22	16.99	70.81	87.8	71.04	Unit 4b	Lean Clay (CL)	Native	24.19	2.5	22.2	399	142	257	92.423	33		1.41	1.29	1.0	0.3	0.7	31	6	37
21451329	BH77	25-Aug-21	SS17	18.29	18.75	18.52	69.28	87.8	69.51	Unit 4b	Lean Clay (CL)	Native	24.19	2.5	22.2	411	157	254	86	24		1.41	1.29	1.0	0.4	0.7	22	6	27
21451329	BH77	25-Aug-21	SS18	19.81	20.03	19.92	67.88	87.8	67.99	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.19	2.5	22.1	440	171	269	50	100	0.06	1.41	1.29	1.0	0.3	0.8	99	6	105
21451329	BH77	25-Aug-21	SS19	21.34	21.62	21.48	66.32	87.8	66.46	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.19	2.5	22.1	475	186	289	50	100	0.13	1.41	1.29	1.0	0.3	0.8	97	6	103
21451329	BH77	25-Aug-21	SS20	22.86	23.32	23.09	64.71	87.8	64.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	24.19	2.5	23.7	513	202	311	75	89		1.43	1.29	1.0	0.3	0.7	85	6	90
21451329	BH77	25-Aug-21	SS21	24.01	24.27	24.14	63.66	87.8	63.79	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	24.19	2.5	23.7	572	212	360	68	113	0.2	1.43	1.29	1.0	0.3	0.7	104	6	109

Table C-1f: SPT Blow Count Processed Data - Independent Spent Fuel Storage Installation Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\left| \begin{array}{l} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{array} \right.$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
																									Iterative calculation		
																									Boulanger & Idriss 2014		
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK054-REP-01210-00098	B-113	11-Dec-12	SS1	0.00	0.60	88.5	88.5	Unit 1	Fill - Sand and Gravel (GW) and topsoil (OH)	Fill	25.8	2.5	21	6	0	6	40	27		1.00	1.27	0.6	0.3	1.7	33	6	39
NK054-REP-01210-00098	B-113	11-Dec-12	SS2	0.76	1.21	88.5	87.7375	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	20	0	20	69	27		1.36	1.27	0.7	0.3	1.6	36	6	41
NK054-REP-01210-00098	B-113	11-Dec-12	SS3	1.53	1.98	88.5	86.975	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.1	36	0	36	92	17		1.36	1.27	0.7	0.4	1.5	23	6	29
NK054-REP-01210-00098	B-113	11-Dec-12	SS4	2.29	2.74	88.5	86.2125	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	51	0	51	88	16		1.36	1.27	0.8	0.4	1.3	21	6	26
NK054-REP-01210-00098	B-113	11-Dec-12	SS5	3.05	3.50	88.5	85.45	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	66	8	59	91	7		1.36	1.27	0.8	0.5	1.3	9	6	15
NK054-REP-01210-00098	B-113	11-Dec-12	SS6	3.81	4.26	88.5	84.6875	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.2	84	15	69	46	4		1.36	1.27	0.9	0.5	1.2	5	6	11
NK054-REP-01210-00098	B-113	11-Dec-12	SS7	4.58	5.03	88.5	83.925	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.2	102	23	79	45	9		1.36	1.27	0.9	0.5	1.1	11	6	17
NK054-REP-01210-00098	B-113	11-Dec-12	SS8	5.34	5.79	88.5	83.1625	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.8	120	30	90	47	14		1.36	1.27	0.9	0.4	1.0	17	6	23
NK054-REP-01210-00098	B-113	11-Dec-12	SS9	6.10	6.55	88.5	82.4	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.7	138	38	100	46	18		1.36	1.27	0.9	0.4	1.0	21	6	27
NK054-REP-01210-00098	B-113	11-Dec-12	SS10	6.86	7.31	88.5	81.6375	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.8	156	45	111	49	17		1.36	1.27	1.0	0.4	1.0	20	6	25
NK054-REP-01210-00098	B-113	11-Dec-12	SS11	7.63	8.08	88.5	80.875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	175	52	122	48.072	92		1.37	1.27	1.0	0.3	0.9	108	6	114
NK054-REP-01210-00098	B-113	11-Dec-12	SS12	8.39	8.67	88.5	80.1125	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.2	191	59	132	44	50	0.13	1.37	1.27	1.0	0.3	0.9	59	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS13	9.15	9.58	88.5	79.35	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	211	67	144	53	89	0.28	1.37	1.27	1.0	0.3	0.9	103	6	108
NK054-REP-01210-00098	B-113	11-Dec-12	SS14	9.91	10.36	88.5	78.5875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.1	230	75	155	56	59		1.37	1.27	1.0	0.3	0.9	67	6	72
NK054-REP-01210-00098	B-113	11-Dec-12	SS15	10.68	11.13	88.5	77.825	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	248	82	166	48.072	90		1.37	1.27	1.0	0.3	0.9	100	6	106
NK054-REP-01210-00098	B-113	11-Dec-12	SS16	11.44	11.64	88.5	77.0625	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	264	89	175	60	50	0.05	1.37	1.27	1.0	0.3	0.9	55	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS17	12.20	12.35	88.5	76.3	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	280	96	184	50	53	0.15	1.41	1.27	1.0	0.3	0.9	57	6	63
NK054-REP-01210-00098	B-113	11-Dec-12	SS18	12.96	13.41	88.5	75.5375	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	300	105	196	84	98		1.41	1.27	1.0	0.3	0.8	104	6	110
NK054-REP-01210-00098	B-113	11-Dec-12	SS19	13.73	13.83	88.5	74.775	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	314	111	203	50	50	0.10	1.41	1.27	1.0	0.3	0.8	53	6	58
NK054-REP-01210-00098	B-113	11-Dec-12	SS20	14.49	14.62	88.5	74.0125	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	331	118	212	50	50	0.13	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-113	11-Dec-12	SS21	15.25	15.38	88.5	73.25	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	348	126	222	50	60	0.13	1.41	1.27	1.0	0.3	0.8	62	6	67
NK054-REP-01210-00098	B-113	11-Dec-12	SS22	16.01	16.29	88.5	72.4875	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	366	134	232	31	50	0.13	1.41	1.27	1.0	0.3	0.8	51	5	56
NK054-REP-01210-00098	B-113	11-Dec-12	SS23	16.78	17.23	88.5	71.725	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	20.1	383	142	241	92.423	54		1.41	1.27	1.0	0.3	0.8	54	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS24	17.54	17.99	88.5	70.9625	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	21	399	150	249	97	40		1.41	1.27	1.0	0.3	0.8	40	5	45
NK054-REP-01210-00098	B-113	11-Dec-12	SS25	18.30	18.75	88.5	70.2	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	22.2	416	157	259	92.423	66		1.41	1.27	1.0	0.3	0.8	65	6	71
NK054-REP-01210-00098	B-113	11-Dec-12	SS26	19.06	19.51	88.5	69.4375	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	20.9	432	165	267	88	16		1.41	1.27	1.0	0.5	0.6	13	6	19
NK054-REP-01210-00098	B-113	11-Dec-12	SS27	19.83	20.06	88.5	68.675	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	447	171	276	68	50	0.08	1.43	1.27	1.0	0.3	0.8	49	6	54
NK054-REP-01210-00098	B-113	11-Dec-12	SS28	20.59	20.89	88.5	67.9125	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.6	466	179	287	84	61	0.15	1.43	1.27	1.0	0.3	0.8	59	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS29	21.35	21.48	88.5	67.15	Unit 4a	Silty Sand (SM)	Native	25.8	2.5	22.1	481	186	296	50	58	0.13	1.41	1.27	1.0	0.3	0.8	55	6	61
NK054-REP-01210-00098	B-113	11-Dec-12	SS30	22.11	22.24	88.5	66.3875	Unit 4a	Silty Sand (SM)	Native	25.8	2.5	22.1	498	193	305	40	57	0.13	1.41	1.27	1.0	0.3	0.7	54	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS31	22.88	23.33	88.5	65.625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	520	202	318	68	70		1.43	1.27	1.0	0.3	0.7	66	6	71
NK054-REP-01210-00098	B-113	11-Dec-12	SS32	23.64	24.07	88.5	64.8625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.6	538	209	328	73	80	0.28	1.43	1.27	1.0	0.3	0.7	74	6	80
NK054-REP-01210-00098	B-113	11-Dec-12	SS33	24.40	24.70	88.5	64.1	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	24	554	216	338	54	63	0.15	1.43	1.27	1.0	0.3	0.7	58	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS34	25.16	25.26	88.5	63.3375	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	570	223	347	68	60	0.1	1.43	1.27	1.0	0.3	0.7	55	6	60
NK054-REP-01210-00098	B-104	2-Feb-13	SS1	0.00	0.60	88.3	88.3	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	25.1	2.5	21	6	0	6	40	26		1.00	1.27	0.6	0.3	1.7	32	6	38
NK054-REP-01210-00098	B-104	2-Feb-13	SS2	0.60	1.05	88.3	87.7	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	25.1	2.5	21	17	0	17	40	36		1.00	1.27	0.6	0.3	1.6	46	6	52
NK054-REP-01210-00098	B-104	2-Feb-13	SS3	1.21	1.66	88.3	87.09	Unit 2a	Sandy Lean Clay (CL)	Native	25.1	2.5	19.9	30	0	30	52	15		1.36	1.27	0.7	0.4	1.6	21	6	27
NK054-REP-01210-00098	B-104	2-Feb-13	SS4	1.83	2.28	88.3	86.47	Unit 2a	Sandy Lean Clay (CL)	Native	25.1	2.5	20.2	42	0	42	77.95	18		1.36	1.27	0.7	0.4	1.4	23	6	29
NK054-REP-01210-00098	B-104	2-Feb-13	SS6	3.04	3.49	88.3	85.26	Unit 2b	Silty Gravel (GM)	Native	25.1	2.5	23.2	76	8	68	46	14		1.36	1.27	0.8	0.4	1.2	17	6	23
NK054-REP-01210-00098	B-104	2-Feb-13	SS7	3.65	4.10	88.3	84.65	Unit 2b	Silty Gravel (GM)	Native	25.1	2.5	23.2	90	14	76	22	59		1.36	1.27	0.8	0.3	1.1	68	5	73
NK054-REP-01210-00098	B-104	2-Feb-13	SS8	4.27	4.72	88.3	84.03	Unit 2b	Silty Gravel (GM) / Silty Gravel with Sand (GM)	Native	25.1	2.5	23.2	104	20	85	46	78		1.36	1.27	0.9	0.3	1.0	90	6	96
NK054-REP-01210-00098	B-104	2-Feb-13	SS9	4.88	5.33	88.3	83.42	Unit 2b	Silty Gravel with Sand (GM)	Native	25.1	2.5	23.9	119	26	93	35	67		1.36	1.27	0.9	0.3	1.0	77	6	83
NK054-REP-01210-00098	B-104	2-Feb-13	SS10	5.49	5.94	88.3	82.81	Unit 2b	Sandy Silt with Gravel (ML)	Native	25.1	2.5	23.2	133	32	102	46	45		1.36	1.27	0.9	0.3	1.0	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS11	6.10	6.23	88.3	82.2	Unit 2b	Sandy Silt with Gravel (ML)	Native	25.1	2.5	23.2	144	36	108	40	52	0.13	1.36	1.27	0.9	0.3	1.0	60	6	66
NK054-REP-01210-00098	B-104	2-Feb-13	SS12	6.69	6.82	88.3	81.61	Unit 2b	Silt (ML)	Native	25.1	2.5	23.2	157	42	115	90	54	0.13	1.36	1.27	0.9	0.3	1.0	63	6	68
NK054-REP-01210-00098	B-104	2-Feb-13	SS13	7.31	7.44	88.3	80.99	Unit 2b	Silt (ML)	Native	25.1	2.5	23.2	172	48	124	46	50	0.13	1.36	1.27	1.0	0.3	0.9	58	6	63
NK054-REP-01210-00098	B-104	2-Feb-13	SS14	7.91	8.01	88.3	80.39	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	186	54	132	57	55	0.1	1.37	1.27	1.0	0.3	0.9	64	6	69
NK054-REP-01210-00098	B-104	2-Feb-13	SS15	8.53	8.66	88.3	79.77	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	201	60	141	48.072	54	0.13	1.37	1.27	1.0	0.3	0.9	62	6	68
NK054-REP-01210-00098	B-104	2-Feb-13	SS16	9.13	9.21	88.3	79.17	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	215	65	150	49	55	0.08	1.37	1.27	1.0	0.3	0.9	63	6	68
NK054-REP-01210-00098	B-104	2-Feb-13	SS17	9.74	9.84	88.3	78.56	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	230	72	159	48.072	51	0.1	1.37	1.27	1.0	0.3	0.9	57	6	63
NK054-REP-01210-00098	B-104	2-Feb-13	SS18	10.35	10.43	88.3	77.95	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	243	77	166	45	52	0.08	1.41	1.27	1.0	0.3	0.9	58	6	63
NK054-REP-01210-00098	B-104	2-Feb-13	SS19	10.96	11.04	88.3	77.34	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	257	83	174	50	53	0.08	1.41	1.27	1.0	0.3	0.9	58	6	64
NK054-REP-01210-00098	B-104	2-Feb-13	SS20	11.57	11.72	88.3	76.73	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	271	90	182	50	56	0.15	1.41	1.27	1.0	0.3	0.9	61	6	66
NK054-REP-01210-00098	B-104	2-Feb-13	SS21	12.17	12.40	88.3	76.13	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	19.9	284	96	188	50	50	0.08	1.41	1.27	1.0	0.3	0.8	54	6	59
NK054-REP-01210-00098	B-104	2-Feb-13	SS22	12.77	12.90	88.3	75.53	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	296	101	195	50	52	0.13	1.41	1.27	1.0	0.3	0.8	55	6	61
NK054-REP-01210-00098	B-104	2-Feb-13	SS23	13.37	13.45	88.3	74.93	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	309	107	202	50	53	0.08	1.41	1.27	1.0	0.3	0.8	56	6	62
NK054-REP-01210-00098	B-104	2-Feb-13	SS24	13.98	14.08	88.3	74.32	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	323	113	209	50	50	0.1	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS25	14.59	14.74	88.3	73.71	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	337	119	217	50	54	0.15	1.41	1.27	1.0	0.3	0.8	56	6	62
NK054-REP-01210-00098	B-104	2-Feb-13	SS26	15.24	15.37	88.3	73.06	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	351	126	225	0	55	0.13	1.41	1.27	1.0	0.3	0.8	56	0	56
NK054-REP-01210-00098	B-104	2-Feb-13	SS27	15.85	16.10	88.3	72.45	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	366	132	233	50	51	0.1	1.41	1.27	1.0	0.3	0.8	52	6	57
NK054-REP-01210-00098	B-104	2-Feb-13	SS28	16.46	16.74	88.3	71.84	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	21.4	379	138	241	51	54	0.13	1.41	1.27	1.0	0.3	0.8	54	6	60
NK054-REP-01210-00098	B-104	2-Feb-13	SS29	17.07	17.52	88.3	71.23	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	20.6	393	145	248	57	36		1.41	1.27	1.0	0.3	0.8	35	6	41
NK054-REP-01210-00098	B-104	2-Feb-13	SS31	18.28	18.73	88.3	70.02	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	22.2	411	157	254	92.423	52		1.41	1.27	1.0	0.3	0.8	52	6	57
NK054-REP-01210-00098	B-104	2-Feb-13	SS32	18.89	19.34	88.3	69.41	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	21.9	424	163	261	60	21		1.41	1.27	1.0	0.4	0.7	18	6	24
NK054-REP-01210-00098	B-104	2-Feb-13	SS34	20.11	20.24	88.3	68.19	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	22.2	448	173	275	73	52	0.13	1.41	1.27	1.0	0.3	0.8	51	6	56
NK054-REP-01210-00098	B-104	2-Feb-13	SS35	20.72	20.82	88.3	67.58	Unit 4a	Silty Sand (SM)	Native	25.1	2.5	22.1	461	179	282	50	54	0.1	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS36	21.33	21.43	88.3	66.97	Unit 4a	Silty Sand (SM)	Native	25.1	2.5	22.1	475	185	289	29	66	0.1	1.41	1.27	1.0	0.3	0.8	63	5	69
NK054-REP-01210-00098	B-104	2-Feb-13	SS37	21.93	22.36	88.3	66.37	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.7	493	193	300	68	94	0.28	1.43	1.27	1.0	0.3	0.7	89	6	95
NK054-REP-01210-00098	B-104	2-Feb-13	SS38	22.54	22.84	88.3	65.76	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.8	506	198	308	68	55	0.15	1.43	1.27	1.0	0.3	0.7	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS39	23.15	23.40	88.3	65.15	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.7	520	204	316	68	52	0.1	1.43	1.27	1.0	0.3	0.7	49	6	54
NK054-REP-01210-00098	B-104	2-Feb-13	SS40	23.76	24.04	88.3	64.54	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	22.4	533	210	324	47	54	0.13	1.43	1.27	1.0	0.3	0.7	50	6	56
NK054-REP-01210-00098	B-104	2-Feb-13	SS41	24.37	24.80	88.3	63.93	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.7	550	217	333	68	89	0.28	1.43	1.27	1.0	0.3	0.7	82	6	88
NK054-REP-01210-00098	B-104	2-Feb-13	SS42	24.98	25.18	88.3	63.32	Unit 5	Lower till : Sandy Silt (ML)	Native	25.1	2.5	23.7	561	222	340	68	51	0.05	1.43	1.27	1.0	0.3	0.7	47	6	53
21451329	BH1	13-Oct-21	SS1	0	0.61	89.62	89.62	Unit 1	Sandy Silt (ML)	Fill	25.29	2.5	21	7	0	7	40	3		1.00	1.29	0.6	0.5	1.7	4	6	9
21451329	BH1	13-Oct-21	SS2	0.61	1.07	89.62	89.01	Unit 1	Sandy Silt (ML)	Fill	25.29	2.5	21	18	0	18	40	7		1.00	1.29	0.6	0.5	1.7	10	6	15
21451329	BH1	13-Oct-21	SS3	1.22	1.68	89.62	88.4	Unit 2a	sandy Lean Clay (CL)	Native	25.29	2.5	20.2	30	0	30	77.95	5		1.36	1.29	0.7	0.5	1.7	8	6	13

Table C-1f: SPT Blow Count Processed Data - Independent Spent Fuel Storage Installation Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R | $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																									Iterative calculation Boulanger & Idriss 2014		
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH1	13-Oct-21	SS5	2.44	2.9	89.62	87.18	Unit 2a	sandy Lean Clay (CL)	Native	25.29	2.5	20.2	54	2	52	68	13		1.36	1.29	0.8	0.4	1.3	17	6	23
21451329	BH1	13-Oct-21	SS7	3.66	4.11	89.62	85.96	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.29	2.5	23.2	90	14	77	45	11		1.36	1.29	0.8	0.4	1.1	13	6	19
21451329	BH1	13-Oct-21	SS8	4.27	4.52	89.62	85.35	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	107	19	88	48.072	100	0.1	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS9	4.88	5.08	89.62	84.74	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	121	24	97	48.072	100	0.05	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS10	5.49	5.69	89.62	84.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	136	30	106	48.072	100	0.05	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS11	6.1	6.5	89.62	83.52	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	27.7	175	37	137	66	178	0.25	1.37	1.29	0.9	0.3	0.9	196	6	202
21451329	BH1	13-Oct-21	SS12	6.71	6.96	89.62	82.91	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	166	43	124	48.072	100	0.1	1.37	1.29	0.9	0.3	0.9	115	6	121
21451329	BH1	13-Oct-21	SS13	7.32	7.54	89.62	82.3	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	181	48	132	53	100	0.07	1.37	1.29	1.0	0.3	0.9	115	6	121
21451329	BH1	13-Oct-21	SS14	7.92	8.36	89.62	81.7	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	198	55	142	48.072	126	0.25	1.37	1.29	1.0	0.3	0.9	145	6	151
21451329	BH1	13-Oct-21	SS15	8.53	8.99	89.62	81.09	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	194	61	133	92.423	123		1.41	1.29	1.0	0.3	0.9	146	6	152
21451329	BH1	13-Oct-21	SS16	9.14	9.6	89.62	80.48	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	208	67	141	97	103		1.41	1.29	1.0	0.3	0.9	121	5	126
21451329	BH1	13-Oct-21	SS17	9.75	10.21	89.62	79.87	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	25.5	254	73	181	92.423	75		1.41	1.29	1.0	0.3	0.9	82	6	88
21451329	BH1	13-Oct-21	SS18	10.36	10.82	89.62	79.26	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	235	79	156	88	67		1.41	1.29	1.0	0.3	0.9	77	6	82
21451329	BH1	13-Oct-21	SS19	10.97	11.25	89.62	78.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	246	84	161	50	100	0.13	1.41	1.29	1.0	0.3	0.9	113	6	119
21451329	BH1	13-Oct-21	SS20	11.58	12.02	89.62	78.04	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	23.6	262	91	171	64	182	0.28	1.41	1.29	1.0	0.3	0.9	203	6	209
21451329	BH1	13-Oct-21	SS21	12.19	12.65	89.62	77.43	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	276	97	178	50	169		1.41	1.29	1.0	0.3	0.9	187	6	192
21451329	BH1	13-Oct-21	SS22	12.8	13.26	89.62	76.82	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	289	103	186	50	113		1.41	1.29	1.0	0.3	0.8	123	6	129
21451329	BH1	13-Oct-21	SS23	13.41	13.84	89.62	76.21	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	24.2	304	109	194	50	175	0.28	1.41	1.29	1.0	0.3	0.8	189	6	194
21451329	BH1	13-Oct-21	SS24	14.02	14.43	89.62	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	317	115	202	50	200	0.25	1.41	1.29	1.0	0.3	0.8	214	6	219
21451329	BH1	13-Oct-21	SS25	14.63	15.04	89.62	74.99	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	328	121	207	50	197	0.25	1.41	1.29	1.0	0.3	0.8	209	6	215
21451329	BH1	13-Oct-21	SS26	15.24	15.67	89.62	74.38	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	342	127	215	50	180	0.28	1.41	1.29	1.0	0.3	0.8	189	6	195
21451329	BH1	13-Oct-21	SS27	15.85	16.31	89.62	73.77	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	355	133	222	25	151		1.41	1.29	1.0	0.3	0.8	157	5	162
21451329	BH1	13-Oct-21	SS28	16.46	16.92	89.62	73.16	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	369	139	230	50	118		1.41	1.29	1.0	0.3	0.8	122	6	127
21451329	BH1	13-Oct-21	SS29	17.07	17.53	89.62	72.55	Unit 4b	Silty Clay (CL-ML)	Native	25.29	2.5	22.2	384	145	239	99	76		1.41	1.29	1.0	0.3	0.8	78	5	83
21451329	BH1	13-Oct-21	SS30	17.68	18.14	89.62	71.94	Unit 4b	Silty Clay (CL-ML)	Native	25.29	2.5	26.7	478	151	327	92.423	62		1.41	1.29	1.0	0.3	0.7	58	6	64
21451329	BH1	13-Oct-21	SS31	18.29	18.75	89.62	71.33	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	411	157	254	92.423	26		1.41	1.29	1.0	0.4	0.7	24	6	29
21451329	BH1	13-Oct-21	SS32	18.9	19.35	89.62	70.72	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	425	163	262	99	23		1.41	1.29	1.0	0.4	0.7	20	5	26
21451329	BH1	13-Oct-21	SS33	19.51	19.96	89.62	70.11	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	438	169	269	92.423	35		1.41	1.29	1.0	0.3	0.7	33	6	39
21451329	BH1	13-Oct-21	SS34	20.12	20.57	89.62	69.5	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	452	175	277	92.423	36		1.41	1.29	1.0	0.3	0.7	34	6	40
21451329	BH1	13-Oct-21	SS35	20.73	21.18	89.62	68.89	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	465	181	284	92.423	23		1.41	1.29	1.0	0.4	0.7	19	6	25
21451329	BH1	13-Oct-21	SS36	21.34	21.49	89.62	68.28	Unit 5	Till: Sandy Silt (ML)	Native	25.29	2.5	23.7	508	186	322	64	100	0.14	1.43	1.29	1.0	0.3	0.7	94	6	100
21451329	BH1	13-Oct-21	SS37	21.95	22.38	89.62	67.67	Unit 5	Till: Sandy Silt (ML)	Native	25.29	2.5	23.7	525	193	332	68	194	0.28	1.43	1.29	1.0	0.3	0.7	182	6	187
21451329	BH1	13-Oct-21	SS38	22.56	22.78	89.62	67.06	Unit 4a	Sandy Silt (ML)	Native	25.29	2.5	22.1	501	198	303	52	100	0.07	1.41	1.29	1.0	0.3	0.7	96	6	102
21451329	BH1	13-Oct-21	SS39	23.16	23.62	89.62	66.46	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	554	205	349	68	78		1.43	1.29	1.0	0.3	0.7	72	6	78
21451329	BH1	13-Oct-21	SS40	23.77	24.21	89.62	65.85	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	569	211	358	78	146	0.28	1.43	1.29	1.0	0.3	0.7	134	6	140
21451329	BH1	13-Oct-21	SS41	24.38	24.84	89.62	65.24	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	583	217	366	68	105		1.43	1.29	1.0	0.3	0.7	96	6	101
21451329	BH1	13-Oct-21	SS42	24.99	25.29	89.62	64.63	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	596	222	374	68	100	0.07	1.43	1.29	1.0	0.3	0.7	91	6	96
21451329	BH3	28-Sep-21	SS1	0.3	0.61	89.89	89.59	Unit 1	Fill: Shale rock fragments	Fill	25.44	2.5	21	10	0	10	40	29		1.00	1.29	0.6	0.3	1.7	38	6	43
21451329	BH3	28-Sep-21	SS2	0.76	1.22	89.89	89.13	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	20.2	20	0	20	77.95	10		1.36	1.29	0.7	0.4	1.7	14	6	20
21451329	BH3	28-Sep-21	SS4	2.29	2.74	89.89	87.6	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	20.2	51	0	51	70	10		1.36	1.29	0.8	0.4	1.4	14	6	19
21451329	BH3	28-Sep-21	SS6	3.81	4.27	89.89	86.08	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	21.5	87	15	72	77.95	8		1.36	1.29	0.9	0.5	1.2	10	6	16
21451329	BH3	28-Sep-21	SS7	5.34	5.8	89.89	84.55	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	20.2	113	30	82	67	3		1.36	1.29	0.9	0.5	1.1	4	6	9
21451329	BH3	28-Sep-21	SS8	6.1	6.71	89.89	83.79	Unit 2b	Silty Sand with Gravel (SM)	Native	25.44	2.5	23.2	149	38	110	46	2		1.36	1.29	0.9	0.6	0.9	2	6	8
21451329	BH3	28-Sep-21	SS9	6.71	7.32	89.89	83.18	Unit 3	Till: Sandy Silt (ML)	Native	25.44	2.5	24.3	171	44	126	48.072	97		1.37	1.29	1.0	0.3	0.9	112	6	117
21451329	BH3	28-Sep-21	SS10	7.63	8.11	89.89	82.26	Unit 3	Till: Sandy Silt (ML)	Native	25.44	2.5	24.3	191	53	139	59	118		1.37	1.29	1.0	0.3	0.9	136	6	141
21451329	BH3	28-Sep-21	SS11	9.15	9.64	89.89	80.74	Unit 3	Till: Sandy Silt (ML)	Native	25.44	2.5	24.3	228	68	161	48.072	122		1.37	1.29	1.0	0.3	0.9	138	6	144
21451329	BH3	28-Sep-21	SS12	10.68	11.16	89.89	79.21	Unit 4b	Lean Clay (CL)	Native	25.44	2.5	22.2	242	83	160	98	78		1.41	1.29	1.0	0.3	0.9	89	5	94
21451329	BH3	28-Sep-21	SS13	12.5	12.62	89.89	77.39	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	278	99	179	50	14	0.27	1.41	1.29	1.0	0.4	0.8	14	6	20
21451329	BH3	28-Sep-21	SS14	13.73	14.15	89.89	76.16	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	308	112	196	50	167	0.25	1.41	1.29	1.0	0.3	0.8	180	6	185
21451329	BH3	28-Sep-21	SS15	15.25	15.71	89.89	74.64	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	342	127	215	33	164	0.28	1.41	1.29	1.0	0.3	0.8	172	5	178
21451329	BH3	28-Sep-21	SS16	16.77	17.04	89.89	73.12	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	374	141	232	50	100	0.15	1.41	1.29	1.0	0.3	0.8	103	6	109
21451329	BH3	28-Sep-21	SS17	18.3	18.79	89.89	71.59	Unit 4b	Lean Clay (CL)	Native	25.44	2.5	22.2	410	157	253	92.423	24		1.41	1.29	1.0	0.4	0.7	22	6	27
21451329	BH3	28-Sep-21	SS18	19.83	20.31	89.89	70.06	Unit 4a	Silt (ML)	Native	25.44	2.5	22.1	444	172	271	99	52		1.41	1.29	1.0	0.3	0.8	51	5	57
21451329	BH3	28-Sep-21	SS19	21.35	21.84	89.89	68.54	Unit 4b	Lean Clay (CL)	Native	25.44	2.5	22.2	480	187	292	92.423	20		1.41	1.29	1.0	0.4	0.6	16	6	22
21451329	BH3	28-Sep-21	SS20	22.88	23.27	89.89	67.01	Unit 4a	Silt with Sand (ML)	Native	25.44	2.5	25.7	518	202	316	86	172	0.23	1.41	1.29	1.0	0.3	0.7	163	6	169
21451329	BH3	28-Sep-21	SS21	24.4	24.89	89.89	65.49	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.44	2.5	23.7	555	217	337	83	72		1.43	1.29	1.0	0.3	0.7	67	6	73
21451329	BH3	28-Sep-21	SS22	25.32	25.44	89.89	64.57	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.44	2.5	23.7	602	224	377	68	100	0.14	1.43	1.29	1.0	0.3	0.7	91	6	96

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R: $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK054-REP-01210-00098	B-113	11-Dec-12	SS1	0.00	0.60	88.5	88.5	Unit 1	Fill - Sand and Gravel (GW) and topsoil (OH)	Fill	25.8	2.5	21	6	0	6	40	27		1.00	1.27	0.6	0.3	1.7	33	6	39
NK054-REP-01210-00098	B-113	11-Dec-12	SS2	0.76	1.21	88.5	87.7375	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	20	0	20	69	27		1.36	1.27	0.7	0.3	1.6	36	6	41
NK054-REP-01210-00098	B-113	11-Dec-12	SS3	1.53	1.98	88.5	86.975	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.1	36	0	36	92	17		1.36	1.27	0.7	0.4	1.5	23	6	29
NK054-REP-01210-00098	B-113	11-Dec-12	SS4	2.29	2.74	88.5	86.2125	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	51	0	51	88	16		1.36	1.27	0.8	0.4	1.3	21	6	26
NK054-REP-01210-00098	B-113	11-Dec-12	SS5	3.05	3.50	88.5	85.45	Unit 2a	Sandy Lean Clay to Lean Clay (CL)	Native	25.8	2.5	20.2	66	8	59	91	7		1.36	1.27	0.8	0.5	1.3	9	6	15
NK054-REP-01210-00098	B-113	11-Dec-12	SS6	3.81	4.26	88.5	84.6875	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.2	84	15	69	46	4		1.36	1.27	0.9	0.5	1.2	5	6	11
NK054-REP-01210-00098	B-113	11-Dec-12	SS7	4.58	5.03	88.5	83.925	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.2	102	23	79	45	9		1.36	1.27	0.9	0.5	1.1	11	6	17
NK054-REP-01210-00098	B-113	11-Dec-12	SS8	5.34	5.79	88.5	83.1625	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.8	120	30	90	47	14		1.36	1.27	0.9	0.4	1.0	17	6	23
NK054-REP-01210-00098	B-113	11-Dec-12	SS9	6.10	6.55	88.5	82.4	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.7	138	38	100	46	18		1.36	1.27	0.9	0.4	1.0	21	6	27
NK054-REP-01210-00098	B-113	11-Dec-12	SS10	6.86	7.31	88.5	81.6375	Unit 2b	Silty Sand (SM)	Native	25.8	2.5	23.8	156	45	111	49	17		1.36	1.27	1.0	0.4	1.0	20	6	25
NK054-REP-01210-00098	B-113	11-Dec-12	SS11	7.63	8.08	88.5	80.875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	175	52	122	48.072	92		1.37	1.27	1.0	0.3	0.9	108	6	114
NK054-REP-01210-00098	B-113	11-Dec-12	SS12	8.39	8.67	88.5	80.1125	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.2	191	59	132	44	50	0.13	1.37	1.27	1.0	0.3	0.9	59	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS13	9.15	9.58	88.5	79.35	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	211	67	144	53	89	0.28	1.37	1.27	1.0	0.3	0.9	103	6	108
NK054-REP-01210-00098	B-113	11-Dec-12	SS14	9.91	10.36	88.5	78.5875	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.1	230	75	155	56	59		1.37	1.27	1.0	0.3	0.9	67	6	72
NK054-REP-01210-00098	B-113	11-Dec-12	SS15	10.68	11.13	88.5	77.825	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	248	82	166	48.072	90		1.37	1.27	1.0	0.3	0.9	100	6	106
NK054-REP-01210-00098	B-113	11-Dec-12	SS16	11.44	11.64	88.5	77.0625	Unit 3	Upper till - Silty Sand (SM) to Sandy Silt (ML)	Native	25.8	2.5	24.3	264	89	175	60	50	0.05	1.37	1.27	1.0	0.3	0.9	55	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS17	12.20	12.35	88.5	76.3	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	280	96	184	50	53	0.15	1.41	1.27	1.0	0.3	0.9	57	6	63
NK054-REP-01210-00098	B-113	11-Dec-12	SS18	12.96	13.41	88.5	75.5375	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	300	105	196	84	98		1.41	1.27	1.0	0.3	0.8	104	6	110
NK054-REP-01210-00098	B-113	11-Dec-12	SS19	13.73	13.83	88.5	74.775	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	314	111	203	50	50	0.10	1.41	1.27	1.0	0.3	0.8	53	6	58
NK054-REP-01210-00098	B-113	11-Dec-12	SS20	14.49	14.62	88.5	74.0125	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	331	118	212	50	50	0.13	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-113	11-Dec-12	SS21	15.25	15.38	88.5	73.25	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	348	126	222	50	60	0.13	1.41	1.27	1.0	0.3	0.8	62	6	67
NK054-REP-01210-00098	B-113	11-Dec-12	SS22	16.01	16.29	88.5	72.4875	Unit 4a	Silt with Sand (ML) and Silty Sand (SM)	Native	25.8	2.5	22.1	366	134	232	31	50	0.13	1.41	1.27	1.0	0.3	0.8	51	5	56
NK054-REP-01210-00098	B-113	11-Dec-12	SS23	16.78	17.23	88.5	71.725	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	20.1	383	142	241	92.423	54		1.41	1.27	1.0	0.3	0.8	54	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS24	17.54	17.99	88.5	70.9625	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	21	399	150	249	97	40		1.41	1.27	1.0	0.3	0.8	40	5	45
NK054-REP-01210-00098	B-113	11-Dec-12	SS25	18.30	18.75	88.5	70.2	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	22.2	416	157	259	92.423	66		1.41	1.27	1.0	0.3	0.8	65	6	71
NK054-REP-01210-00098	B-113	11-Dec-12	SS26	19.06	19.51	88.5	69.4375	Unit 4b	Lean Clay (CL)	Native	25.8	2.5	20.9	432	165	267	88	16		1.41	1.27	1.0	0.5	0.6	13	6	19
NK054-REP-01210-00098	B-113	11-Dec-12	SS27	19.83	20.06	88.5	68.675	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	447	171	276	68	50	0.08	1.43	1.27	1.0	0.3	0.8	49	6	54
NK054-REP-01210-00098	B-113	11-Dec-12	SS28	20.59	20.89	88.5	67.9125	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.6	466	179	287	84	61	0.15	1.43	1.27	1.0	0.3	0.8	59	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS29	21.35	21.48	88.5	67.15	Unit 4a	Silty Sand (SM)	Native	25.8	2.5	22.1	481	186	296	50	58	0.13	1.41	1.27	1.0	0.3	0.8	55	6	61
NK054-REP-01210-00098	B-113	11-Dec-12	SS30	22.11	22.24	88.5	66.3875	Unit 4a	Silty Sand (SM)	Native	25.8	2.5	22.1	498	193	305	40	57	0.13	1.41	1.27	1.0	0.3	0.7	54	6	60
NK054-REP-01210-00098	B-113	11-Dec-12	SS31	22.88	23.33	88.5	65.625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	520	202	318	68	70		1.43	1.27	1.0	0.3	0.7	66	6	71
NK054-REP-01210-00098	B-113	11-Dec-12	SS32	23.64	24.07	88.5	64.8625	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.6	538	209	328	73	80	0.28	1.43	1.27	1.0	0.3	0.7	74	6	80
NK054-REP-01210-00098	B-113	11-Dec-12	SS33	24.40	24.70	88.5	64.1	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	24	554	216	338	54	63	0.15	1.43	1.27	1.0	0.3	0.7	58	6	64
NK054-REP-01210-00098	B-113	11-Dec-12	SS34	25.16	25.26	88.5	63.3375	Unit 5	Lower till - Silty Clay with Sand (CL-ML)	Native	25.8	2.5	23.7	570	223	347	68	60	0.1	1.43	1.27	1.0	0.3	0.7	55	6	60
NK054-REP-01210-00098	B-116	17-Dec-12	SS1	0	0.6	89.3	89.3	Unit 1	Fill - Sand and Gravel (GW) over crushed rock over Silty Clay (CL-ML)	Fill	25.2	2.5	21.5	6	0	6	40	25		1.00	1.27	0.6	0.3	1.7	31	6	36
NK054-REP-01210-00098	B-116	17-Dec-12	SS2	0.75	1.2	89.3	88.55	Unit 2b	Sandy Silt (ML)	Native	25.2	2.5	23.7	23	0	23	46	34		1.36	1.27	0.7	0.3	1.5	42	6	47
NK054-REP-01210-00098	B-116	17-Dec-12	SS3	1.5	1.95	89.3	87.8	Unit 2b	Sandy Silt (ML)	Native	25.2	2.5	20.7	38	0	38	56	26		1.36	1.27	0.7	0.3	1.4	32	6	38
NK054-REP-01210-00098	B-116	17-Dec-12	SS4	3	3.45	89.3	86.3	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	25.2	2.5	21.7	71	7	63	58	17		1.36	1.27	0.8	0.4	1.2	21	6	27
NK054-REP-01210-00098	B-116	17-Dec-12	SS5	4.6	5.05	89.3	84.7	Unit 2a	Lean Clay to Sandy Lean Clay (CL)	Native	25.2	2.5	20.2	103	23	80	96	2		1.36	1.27	0.9	0.6	1.1	3	5	8
NK054-REP-01210-00098	B-116	17-Dec-12	SS6	5.4	5.85	89.3	83.9	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	23.2	122	31	91	46	2		1.36	1.27	0.9	0.6	1.1	2	6	8
NK054-REP-01210-00098	B-116	17-Dec-12	SS7	6.1	6.55	89.3	83.2	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	23.2	138	38	100	56	3		1.36	1.27	0.9	0.6	1.0	4	6	9
NK054-REP-01210-00098	B-116	17-Dec-12	SS8	6.9	7.35	89.3	82.4	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	23.2	156	45	111	46	5		1.36	1.27	1.0	0.5	0.9	6	6	11
NK054-REP-01210-00098	B-116	17-Dec-12	SS9	7.6	8.05	89.3	81.7	Unit 2b	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.9	172	52	120	50	5		1.36	1.27	1.0	0.5	0.9	6	6	11
NK054-REP-01210-00098	B-116	17-Dec-12	SS10	8.4	8.6	89.3	80.9	Unit 3	Upper till - Silty Sand (SM)	Native	25.2	2.5	24.3	189	59	130	48.072	50	0.05	1.37	1.27	1.0	0.3	0.9	59	6	64
NK054-REP-01210-00098	B-116	17-Dec-12	SS11	9.1	9.55	89.3	80.2	Unit 2a	Lean Clay (CL)	Native	25.2	2.5	20.2	205	67	138	90	61		1.36	1.27	1.0	0.3	0.9	71	6	77
NK054-REP-01210-00098	B-116	17-Dec-12	SS12	9.9	10.18	89.3	79.4	Unit 2a	Lean Clay (CL)	Native	25.2	2.5	20.2	220	74	146	77.95	50	0.13	1.36	1.27	1.0	0.3	0.9	58	6	63
NK054-REP-01210-00098	B-116	17-Dec-12	SS13	10.7	10.93	89.3	78.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	237	82	155	50	50	0.08	1.41	1.27	1.0	0.3	0.9	57	6	62
NK054-REP-01210-00098	B-116	17-Dec-12	SS14	11.4	11.65	89.3	77.9	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	253	89	164	60	50	0.1	1.41	1.27	1.0	0.3	0.9	56	6	61
NK054-REP-01210-00098	B-116	17-Dec-12	SS15	12.2	12.48	89.3	77.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	271	97	174	33	50	0.13	1.41	1.27	1.0	0.3	0.9	55	5	60
NK054-REP-01210-00098	B-116	17-Dec-12	SS16	13	13.25	89.3	76.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	288	104	184	37	50	0.1	1.41	1.27	1.0	0.3	0.9	54	6	60
NK054-REP-01210-00098	B-116	17-Dec-12	SS17	13.7	13.85	89.3	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	302	111	192	77	55	0.15	1.41	1.27	1.0	0.3	0.8	59	6	64
NK054-REP-01210-00098	B-116	17-Dec-12	SS18	14.5	14.75	89.3	74.8	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	321	119	202	26	50	0.1	1.41	1.27	1.0	0.3	0.8	53	5	58
NK054-REP-01210-00098	B-116	17-Dec-12	SS19	15.2	15.48	89.3	74.1	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	337	126	211	40	50	0.13	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-116	17-Dec-12	SS20	16	16.28	89.3	73.3	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	355	134	221	26	50	0.13	1.41	1.27	1.0	0.3	0.8	52	5	57
NK054-REP-01210-00098	B-116	17-Dec-12	SS21	16.8	17.1	89.3	72.5	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.2	2.5	22.1	372	142	231	50	54	0.15	1.41	1.27	1.0	0.3	0.8	55	6	61
NK054-REP-01210-00098	B-116	17-Dec-12	SS22	17.5	17.9	89.3	71.8	Unit 4b	Lean Clay (CL)	Native	25.2	2.5	21.1	388	149	239	92.423	82	0.25	1.41	1.27	1.0	0.3	0.8	83	6	88
NK054-REP-01210-00098	B-116	17-Dec-12	SS23	18.3	18.75	89.3	71	Unit 4b	Lean Clay (CL)	Native	25.2	2.5	22.2	407	157	249	97	44		1.41	1.27	1.0	0.3	0.8	44	5	49
NK054-REP-01210-00098	B-116	17-Dec-12	SS24	19.1	19.55	89.3	70.2	Unit 4b	Lean Clay (CL)	Native	25.2	2.5	20.2	423	165	258	92.423	40		1.41	1.27	1.0	0.3	0.8	39	6	45
NK054-REP-01210-00098	B-116	17-Dec-12	SS25	20.6	21.05	89.3	68.7	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	25.2	2.5	23.6	458	180	278	74	60		1.43	1.27	1.0	0.3	0.8	58	6	64
NK054-REP-01210-00098	B-116	17-Dec-12	SS26	21.3	21.58	89.3	68	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	25.2	2.5	23.8	473	186	287	74	50	0.13	1.43	1.27	1.0	0.3	0.8	48	6	54
NK054-REP-01210-00098	B-116	17-Dec-12	SS27	22.1	22.2	89.3	67.2	Unit 5	Lower till - Silty Clay with Sand to Silty Clay (CL-ML)	Native	25.2	2.5	23.7	490	193	297	94	50	0.1	1.43	1.27	1.0	0.3	0.8	48	6	53
NK054-REP-01210-00098	B-116	17-Dec-12	SS28	22.9	23	89.3	66.4	Unit 4a	Silt (ML)	Native	25.2	2.5	22.1	507	201	307	50	50	0.1	1.41	1.27	1.0	0.3	0.7	47	6	53
NK054-REP-01210-00098	B-116	17-Dec-12	SS29	23.6	23.7	89.3	65.7	Unit 4a	Silt (ML)	Native	25.2	2.5	22.1	523	207	315	50	50	0.1	1.41	1.27	1.0	0.3	0.7	47	6	53
NK054-REP-01210-00098	B-116	17-Dec-12	SS30	24.40	24.68	89.3	64.9	Unit 5	Lower till - Sandy Silt (ML)	Native	25.2	2.5	23.7	544	216	328	68	50	0.13	1.43	1.27	1.0	0.3	0.7	46	6	52
NK054-REP-01210-00098	B-116	17-Dec-12	SS31	25.10	25.20	89.3	64.2	Unit 5	Lower till - Sandy Silt (ML)	Native	25.2	2.5	23.7	558	222	336	68	50	0.1	1.43	1.27	1.0	0.3	0.7	46	6	52
NK054-REP-01210-00098	B-118	2-Jan-13	SS1	0.00	0.60	89	89	Unit 1	Fill : Silty Sand (SM) to Sandy Silt (ML) and Gravel (GW)	Fill	24.8	2.5	21	6	0	6	40	27		1.00	1.27	0.6	0.3	1.7	33	6	39
NK054-REP-01210-00098	B-118	2-Jan-13	SS2	0.75	1.20	89	88.25	Unit 1	Fill : Silty Sand (SM) to Sandy Silt (ML) and Gravel (GW)	Fill	24.8	2.5	21	21	0	21	40	30		1.00	1.27	0.7	0.3	1.5	39	6	44
NK054-REP-01210-00098	B-118	2-Jan-13	SS3	1.50	1.95	89	87.5	Unit 1	Fill : Lean Clay with Sand (CL)	Fill	24.8	2.5	19.2	35	0	35	74	23		1.00	1.27	0.7	0.3	1.4	30	6	35
NK054-REP-01210-00098	B-118	2-Jan-13	SS4	2.29	2.74	89	86.7125	Unit 2a	Lean Clay (CL)	Native	24.8	2.5	18.6	49	0	49	87	7		1.36	1.27	0.8	0.5	1.4	10	6	15
NK054-REP-01210-00098	B-118	2-Jan-13	SS5	3.05	3.50	89	85.95	Unit 2a	Lean Clay (CL)	Native	24.8	2.5	20.2	65	8	57	77.95	11		1.36	1.27	0.8	0.4	1.3	15	6	20
NK054-REP-01210-00098	B-118	2-Jan-13	SS6	3.79	4.24	89	85.21	Unit 2a	Lean Clay (CL)	Native	24.8	2.5	18.3	79	15	64	93	3		1.36	1.27	0.9	0.5	1.3	4	6	10
NK054-REP-01210-00098	B-118	2-Jan-13	SS7	5.29	5.74	89	83.71	Unit 2b	Silty Clayey Sand (SC-SM)	Native	24.8	2.5	23.2	113	30	84	46	1		1.36	1.27	0.9	0.6	1.1	1	6	7
NK054-REP-01210-00098	B-118	2-Jan-13	SS8	6.10	6.55	89	82.9	Unit 2b	Silty Clayey Sand (SC-SM)	Native	24.8	2.5	23.2	132	38	95	47	1		1.36	1.27	0.9	0.6	1.0	1	6	7
NK054-REP-01210-00098	B-118	2-Jan-13	SS9	6.88	7.33	89	82.12	Unit 2b	Silty Clayey Sand (SC-SM)	Native	24.8	2.5	23.2	150	45	105	46	16		1.36	1.27	1.0	0.4	1.0	19	6	25
NK054-REP-01210-00098	B-118	2-Jan-13	SS10	7.58	8.03	89	81.42	Unit 3	Upper till : Silty Sand with Gravel (SM) t0 Sandy Silt (ML)	Native	24.8	2.5	23.6	167	52	115	42	21		1.37	1.27	1.0	0.4	1.0	25	6	30
NK054-REP-01210-00098	B-118	2-Jan-13	SS11	8.38	8.81	89	80.62	Unit 3	Upper till : Silty Sand with Gravel (SM) t0 Sandy Silt (ML)	Native	24.8	2.5	24.3	186	60	126	48.072	98	0.28	1.37	1.27	1.0	0.3	0.9	116	6	122

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK054-REP-01210-00098	B-118	2-Jan-13	SS12	9.08	9.38	89	79.92	Unit 4a	Sandy Silt (ML)	Native	24.8	2.5	22.1	200	66	134	56	50	0.15	1.41	1.27	1.0	0.3	0.9	59	6	64
NK054-REP-01210-00098	B-118	2-Jan-13	SS13	9.88	10.16	89	79.12	Unit 3	Upper till : Sandly Silt (ML)	Native	24.8	2.5	24.3	219	74	145	48.072	50	0.13	1.37	1.27	1.0	0.3	0.9	58	6	63
NK054-REP-01210-00098	B-118	2-Jan-13	SS14	10.67	10.95	89	78.33	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.8	2.5	22.1	237	82	155	36	50	0.13	1.41	1.27	1.0	0.3	0.9	57	6	62
NK054-REP-01210-00098	B-118	2-Jan-13	SS15	11.37	11.82	89	77.63	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.8	2.5	22.1	254	89	165	50	49		1.41	1.27	1.0	0.3	0.9	55	6	60
NK054-REP-01210-00098	B-118	2-Jan-13	SS16	12.17	12.62	89	76.83	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.8	2.5	21.9	272	97	174	64	80		1.41	1.27	1.0	0.3	0.9	88	6	93
NK054-REP-01210-00098	B-118	2-Jan-13	SS17	12.97	13.27	89	76.03	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.8	2.5	20.4	286	104	182	50	50	0.15	1.41	1.27	1.0	0.3	0.9	54	6	60
NK054-REP-01210-00098	B-118	2-Jan-13	SS18	13.67	13.97	89	75.33	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.8	2.5	21.1	301	111	190	57	53	0.15	1.41	1.27	1.0	0.3	0.8	57	6	62
NK054-REP-01210-00098	B-118	2-Jan-13	SS19	14.47	14.77	89	74.53	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.8	2.5	22.1	319	119	200	50	54	0.15	1.41	1.27	1.0	0.3	0.8	57	6	63
NK054-REP-01210-00098	B-118	2-Jan-13	SS20	15.21	15.66	89	73.79	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.8	2.5	21.6	336	127	209	51	105		1.41	1.27	1.0	0.3	0.8	110	6	115
NK054-REP-01210-00098	B-118	2-Jan-13	SS21	16.00	16.28	89	73	Unit 4b	Lean Clay (CL)	Native	24.8	2.5	22.2	352	134	218	92.423	53	0.13	1.41	1.27	1.0	0.3	0.8	55	6	60
NK054-REP-01210-00098	B-118	2-Jan-13	SS22	16.80	17.25	89	72.2	Unit 4b	Lean Clay (CL)	Native	24.8	2.5	20.5	370	143	228	98	49		1.41	1.27	1.0	0.3	0.8	50	5	56
NK054-REP-01210-00098	B-118	2-Jan-13	SS23	17.50	17.95	89	71.5	Unit 4b	Lean Clay (CL)	Native	24.8	2.5	22.2	386	149	236	92.423	78		1.41	1.27	1.0	0.3	0.8	79	6	85
NK054-REP-01210-00098	B-118	2-Jan-13	SS24	18.29	18.74	89	70.71	Unit 4b	Lean Clay (CL)	Native	24.8	2.5	20.2	402	157	245	99	24		1.41	1.27	1.0	0.4	0.7	22	5	27
NK054-REP-01210-00098	B-118	2-Jan-13	SS25	19.09	19.54	89	69.91	Unit 4b	Lean Clay (CL)	Native	24.8	2.5	22.2	419	165	254	92.423	26		1.41	1.27	1.0	0.4	0.7	23	6	29
NK054-REP-01210-00098	B-118	2-Jan-13	SS27	20.59	20.99	89	68.4125	Unit 5	Lower till : Silt with Sand (ML)	Native	24.8	2.5	23.7	454	179	275	68	85	0.25	1.43	1.27	1.0	0.3	0.8	83	6	88
NK054-REP-01210-00098	B-118	2-Jan-13	SS28	21.29	21.44	89	67.71	Unit 4a	Silt (ML)	Native	24.8	2.5	22.1	467	185	282	92	55	0.15	1.41	1.27	1.0	0.3	0.8	53	6	59
NK054-REP-01210-00098	B-118	2-Jan-13	SS29	21.89	22.34	89	67.11	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	24.8	2.5	23.7	485	192	292	68	75		1.43	1.27	1.0	0.3	0.8	72	6	77
NK054-REP-01210-00098	B-118	2-Jan-13	SS30	22.88	23.33	89	66.125	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	24.8	2.5	23.7	508	202	306	68	80		1.43	1.27	1.0	0.3	0.7	76	6	81
NK054-REP-01210-00098	B-118	2-Jan-13	SS31	23.58	23.71	89	65.42	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	24.8	2.5	23.7	521	207	314	51	55	0.13	1.43	1.27	1.0	0.3	0.7	52	6	57
NK054-REP-01210-00098	B-118	2-Jan-13	SS32	24.38	24.53	89	64.62	Unit 5	Lower till : Sandy Silt (ML) to Sandy Silt with Gravel (ML)	Native	24.8	2.5	23.7	540	215	325	68	58	0.15	1.43	1.27	1.0	0.3	0.7	54	6	60
NK054-REP-01210-00098	B-104	2-Feb-13	SS1	0.00	0.60	88.3	88.3	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	25.1	2.5	21	6	0	6	40	26		1.00	1.27	0.6	0.3	1.7	32	6	38
NK054-REP-01210-00098	B-104	2-Feb-13	SS2	0.60	1.05	88.3	87.7	Unit 1	Fill : Sand (SP) and Sandy Silt (ML)	Fill	25.1	2.5	21	17	0	17	40	36		1.00	1.27	0.6	0.3	1.6	46	6	52
NK054-REP-01210-00098	B-104	2-Feb-13	SS3	1.21	1.66	88.3	87.09	Unit 2a	Sandy Lean Clay (CL)	Native	25.1	2.5	19.9	30	0	30	52	15		1.36	1.27	0.7	0.4	1.6	21	6	27
NK054-REP-01210-00098	B-104	2-Feb-13	SS4	1.83	2.28	88.3	86.47	Unit 2a	Sandy Lean Clay (CL)	Native	25.1	2.5	20.2	42	0	42	77.95	18		1.36	1.27	0.7	0.4	1.4	23	6	29
NK054-REP-01210-00098	B-104	2-Feb-13	SS6	3.04	3.49	88.3	85.26	Unit 2b	Silty Gravel (GM)	Native	25.1	2.5	23.2	76	8	68	46	14		1.36	1.27	0.8	0.4	1.2	17	6	23
NK054-REP-01210-00098	B-104	2-Feb-13	SS7	3.65	4.10	88.3	84.65	Unit 2b	Silty Gravel (GM)	Native	25.1	2.5	23.2	90	14	76	22	59		1.36	1.27	0.8	0.3	1.1	68	5	73
NK054-REP-01210-00098	B-104	2-Feb-13	SS8	4.27	4.72	88.3	84.03	Unit 2b	Silty Gravel (GM) / Silty Gravel with Sand (GM)	Native	25.1	2.5	23.2	104	20	85	46	78		1.36	1.27	0.9	0.3	1.0	90	6	96
NK054-REP-01210-00098	B-104	2-Feb-13	SS9	4.88	5.33	88.3	83.42	Unit 2b	Silty Gravel with Sand (GM)	Native	25.1	2.5	23.9	119	26	93	35	67		1.36	1.27	0.9	0.3	1.0	77	6	83
NK054-REP-01210-00098	B-104	2-Feb-13	SS10	5.49	5.94	88.3	82.81	Unit 2b	Sandy Silt with Gravel (ML)	Native	25.1	2.5	23.2	133	32	102	46	45		1.36	1.27	0.9	0.3	1.0	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS11	6.10	6.23	88.3	82.2	Unit 2b	Sandy Silt with Gravel (ML)	Native	25.1	2.5	23.2	144	36	108	40	52	0.13	1.36	1.27	0.9	0.3	1.0	60	6	66
NK054-REP-01210-00098	B-104	2-Feb-13	SS12	6.69	6.82	88.3	81.61	Unit 2b	Silt (ML)	Native	25.1	2.5	23.2	157	42	115	90	54	0.13	1.36	1.27	0.9	0.3	1.0	63	6	68
NK054-REP-01210-00098	B-104	2-Feb-13	SS13	7.31	7.44	88.3	80.99	Unit 2b	Silt (ML)	Native	25.1	2.5	23.2	172	48	124	46	50	0.13	1.36	1.27	1.0	0.3	0.9	58	6	63
NK054-REP-01210-00098	B-104	2-Feb-13	SS14	7.91	8.01	88.3	80.39	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	186	54	132	57	55	0.1	1.37	1.27	1.0	0.3	0.9	64	6	69
NK054-REP-01210-00098	B-104	2-Feb-13	SS15	8.53	8.66	88.3	79.77	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	201	60	141	48.072	54	0.13	1.37	1.27	1.0	0.3	0.9	62	6	68
NK054-REP-01210-00098	B-104	2-Feb-13	SS16	9.13	9.21	88.3	79.17	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	215	65	150	49	55	0.08	1.37	1.27	1.0	0.3	0.9	63	6	68
NK054-REP-01210-00098	B-104	2-Feb-13	SS17	9.74	9.84	88.3	78.56	Unit 3	Upper till : Sandy Silt to Sandy Silt with Gravel (ML)	Native	25.1	2.5	24.3	230	72	159	48.072	51	0.1	1.37	1.27	1.0	0.3	0.9	57	6	63
NK054-REP-01210-00098	B-104	2-Feb-13	SS18	10.35	10.43	88.3	77.95	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	243	77	166	45	52	0.08	1.41	1.27	1.0	0.3	0.9	58	6	63
NK054-REP-01210-00098	B-104	2-Feb-13	SS19	10.96	11.04	88.3	77.34	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	257	83	174	50	53	0.08	1.41	1.27	1.0	0.3	0.9	58	6	64
NK054-REP-01210-00098	B-104	2-Feb-13	SS20	11.57	11.72	88.3	76.73	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	271	90	182	50	56	0.15	1.41	1.27	1.0	0.3	0.9	61	6	66
NK054-REP-01210-00098	B-104	2-Feb-13	SS21	12.17	12.40	88.3	76.13	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	19.9	284	96	188	50	50	0.08	1.41	1.27	1.0	0.3	0.8	54	6	59
NK054-REP-01210-00098	B-104	2-Feb-13	SS22	12.77	12.90	88.3	75.53	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	296	101	195	50	52	0.13	1.41	1.27	1.0	0.3	0.8	55	6	61
NK054-REP-01210-00098	B-104	2-Feb-13	SS23	13.37	13.45	88.3	74.93	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	309	107	202	50	53	0.08	1.41	1.27	1.0	0.3	0.8	56	6	62
NK054-REP-01210-00098	B-104	2-Feb-13	SS24	13.98	14.08	88.3	74.32	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	323	113	209	50	50	0.1	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS25	14.59	14.74	88.3	73.71	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	337	119	217	50	54	0.15	1.41	1.27	1.0	0.3	0.8	56	6	62
NK054-REP-01210-00098	B-104	2-Feb-13	SS26	15.24	15.37	88.3	73.06	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	351	126	225	0	55	0.13	1.41	1.27	1.0	0.3	0.8	56	0	56
NK054-REP-01210-00098	B-104	2-Feb-13	SS27	15.85	16.10	88.3	72.45	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	22.1	366	132	233	50	51	0.1	1.41	1.27	1.0	0.3	0.8	52	6	57
NK054-REP-01210-00098	B-104	2-Feb-13	SS28	16.46	16.74	88.3	71.84	Unit 4a	Silty Sand (SM) and Sandy Silt (ML)	Native	25.1	2.5	21.4	379	138	241	51	54	0.13	1.41	1.27	1.0	0.3	0.8	54	6	60
NK054-REP-01210-00098	B-104	2-Feb-13	SS29	17.07	17.52	88.3	71.23	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	20.6	393	145	248	57	36		1.41	1.27	1.0	0.3	0.8	35	6	41
NK054-REP-01210-00098	B-104	2-Feb-13	SS31	18.28	18.73	88.3	70.02	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	22.2	411	157	254	92.423	52		1.41	1.27	1.0	0.3	0.8	52	6	57
NK054-REP-01210-00098	B-104	2-Feb-13	SS32	18.89	19.34	88.3	69.41	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	21.9	424	163	261	60	21		1.41	1.27	1.0	0.4	0.7	18	6	24
NK054-REP-01210-00098	B-104	2-Feb-13	SS34	20.11	20.24	88.3	68.19	Unit 4b	Sandy Lean Clay (CL) to Lean Clay (CL)	Native	25.1	2.5	22.2	448	173	275	73	52	0.13	1.41	1.27	1.0	0.3	0.8	51	6	56
NK054-REP-01210-00098	B-104	2-Feb-13	SS35	20.72	20.82	88.3	67.58	Unit 4a	Silty Sand (SM)	Native	25.1	2.5	22.1	461	179	282	50	54	0.1	1.41	1.27	1.0	0.3	0.8	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS36	21.33	21.43	88.3	66.97	Unit 4a	Silty Sand (SM)	Native	25.1	2.5	22.1	475	185	289	29	66	0.1	1.41	1.27	1.0	0.3	0.8	63	5	69
NK054-REP-01210-00098	B-104	2-Feb-13	SS37	21.93	22.36	88.3	66.37	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.7	493	193	300	68	94	0.28	1.43	1.27	1.0	0.3	0.7	89	6	95
NK054-REP-01210-00098	B-104	2-Feb-13	SS38	22.54	22.84	88.3	65.76	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.8	506	198	308	68	55	0.15	1.43	1.27	1.0	0.3	0.7	52	6	58
NK054-REP-01210-00098	B-104	2-Feb-13	SS39	23.15	23.40	88.3	65.15	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.7	520	204	316	68	52	0.1	1.43	1.27	1.0	0.3	0.7	49	6	54
NK054-REP-01210-00098	B-104	2-Feb-13	SS40	23.76	24.04	88.3	64.54	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	22.4	533	210	324	47	54	0.13	1.43	1.27	1.0	0.3	0.7	50	6	56
NK054-REP-01210-00098	B-104	2-Feb-13	SS41	24.37	24.80	88.3	63.93	Unit 5	Lower till : Silty Clayey Sand (SC-SM)	Native	25.1	2.5	23.7	550	217	333	68	89	0.28	1.43	1.27	1.0	0.3	0.7	82	6	88
NK054-REP-01210-00098	B-104	2-Feb-13	SS42	24.98	25.18	88.3	63.32	Unit 5	Lower till : Sandy Silt (ML)	Native	25.1	2.5	23.7	561	222	340	68	51	0.05	1.43	1.27	1.0	0.3	0.7	47	6	53
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS1	9.09	9.24	89.06	79.97	Unit 4a	Sand, trace silt	Native	25.15	2.5	22.1	203	65	137	50	150		1.41	1.00	1.0	0.3	0.9	138	6	144
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS2	9.86	9.91	89.06	79.2	Unit 4a	Sand, trace silt	Native	25.15	2.5	22.1	219	72	146	50	150	0.05	1.41	1.00	1.0	0.3	0.9	136	6	141
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS3	10.61	10.66	89.06	78.45	Unit 4a	Sand, trace silt	Native	25.15	2.5	22.1	235	80	155	50	150	0.05	1.41	1.00	1.0	0.3	0.9	134	6	139
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS6	12.08	12.13	89.06	76.98	Unit 3	Till : Sand with Silt (SP-SM), trace gravel, trace clay	Native	25.15	2.5	24.3	294	94	200	48.072	150	0.05	1.37	1.00	1.0	0.3	0.8	125	6	131
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS7	12.45	12.5	89.06	76.61	Unit 4a	Silt with clay	Native	25.15	2.5	22.1	302	98	205	50	150	0.05	1.41	1.00	1.0	0.3	0.8	124	6	130
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS8	12.84	12.99	89.06	76.22	Unit 4a	Silt with clay	Native	25.15	2.5	22.1	312	102	210	50	150	0.15	1.41	1.00	1.0	0.3	0.8	123	6	129
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS10	14.61	14.86	89.06	74.45	Unit 3	Till : Sand with silt	Native	25.15	2.5	24.3	356	120	236	48.072	97		1.37	1.00	1.0	0.3	0.8	77	6	83
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS11	15.13	15.18	89.06	73.93	Unit 3	Till : Sand with silt	Native	25.15	2.5	24.3	367	124	242	48.072	150	0.05	1.37	1.00	1.0	0.3	0.8	119	6	124
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS12	15.28	15.43	89.06	73.78	Unit 4a	Sand, trace silt	Native	25.15	2.5	22.1	371	126	245	50	42		1.41	1.00	1.0	0.3	0.8	32	6	37
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS13	15.87	16.02	89.06	73.19	Unit 4a	Sand, trace silt	Native	25.15	2.5	22.1	384	132	252	50	150	0.15	1.41	1.00	1.0	0.3	0.8	118	6	123
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS14	16.02	16.22	89.06	73.04	Unit 4a	Sand, trace silt	Native	25.15	2.5	22.1	388	134	254	50	43		1.41	1.00	1.0	0.3	0.7	32	6	38
NK38-TH-12000-01-{69888}	BO-2	11-Mar-71	SS15	16.64	16.79	89.06	72.42	Unit 5	Till : Sand with silt	Native	25.15	2.5	23.7	402	139	263	68	150	0.15	1.43	1.00	1.0	0.3	0.8	116	6	122
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS1	1.73	2.18	87.75	86.02	Unit 2b	Layered Silt with Clay	Native	N/A	0	23.2	45	19	26	46	20		1.36	1.00	0.7	0.4	1.6	24	6	30
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS2	3.33	3.78	87.75	84.42	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	N/A	0	24.3	84	35	49	48.072	26		1.37	1.00	0.8	0.3	1.3	27	6	33
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS3	4.83	5.28	87.75	82.92	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	N/A	0	24.3	121	50	71	48.072	16		1.37	1.00	0.9	0.4	1.2	16	6	22

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R: $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS4	6.43	6.73	87.75	81.32	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	N/A	0	24.3	158	65	93	48.072	167	0.15	1.37	1.00	0.9	0.3	1.0	160	6	166
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS5	7.93	8.18	87.75	79.82	Unit 3	Till : Sand with Silt (SP-SM), little gravel, trace clay	Native	N/A	0	24.3	194	79	115	48.072	150	0.1	1.37	1.00	1.0	0.3	1.0	142	6	148
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS6	10.039	10.489	87.75	77.711	Unit 4a	Sand, trace Silt	Native	N/A	0	22.1	242	101	142	50	150	0.3	1.41	1.00	1.0	0.3	0.9	137	6	142
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS7	9.83	10.23	87.75	77.92	Unit 4a	Silt, little Sand	Native	N/A	0	22.1	237	98	139	50	150	0.25	1.41	1.00	1.0	0.3	0.9	138	6	143
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS8	10.33	10.675	87.75	77.42	Unit 4a	Sand, little Silt	Native	N/A	0	22.1	248	103	145	50	88		1.41	1.00	1.0	0.3	0.9	80	6	85
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS9	10.73	11.03	87.75	77.02	Unit 4a	Sand, little Silt	Native	N/A	0	22.1	256	107	149	50	22		1.41	1.00	1.0	0.4	0.9	19	6	24
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS10	11.43	11.68	87.75	76.32	Unit 4a	Sand, little Silt	Native	N/A	0	22.1	271	113	158	50	150	0.25	1.41	1.00	1.0	0.3	0.9	133	6	139
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS11	11.93	12.23	87.75	75.82	Unit 4a	Silt, little fine sand	Native	N/A	0	22.1	283	119	164	50	98		1.41	1.00	1.0	0.3	0.9	86	6	92
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS12	12.43	12.63	87.75	75.32	Unit 4a	Silt, little fine sand	Native	N/A	0	22.1	292	123	170	50	150	0.2	1.41	1.00	1.0	0.3	0.9	131	6	136
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS13	12.66	13.06	87.75	75.09	Unit 4a	Silt	Native	N/A	0	22.1	300	126	174	50	114		1.41	1.00	1.0	0.3	0.9	99	6	104
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS14	13.03	13.48	87.75	74.72	Unit 4a	Sand, trace Silt	Native	N/A	0	22.1	309	130	179	50	90		1.41	1.00	1.0	0.3	0.9	77	6	83
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS15	14.03	14.36	87.75	73.72	Unit 4a	Sand, trace Silt	Native	N/A	0	22.1	329	139	190	50	82		1.41	1.00	1.0	0.3	0.8	69	6	75
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS16	14.53	15.13	87.75	73.22	Unit 4a	Sand, trace Silt	Native	N/A	0	22.1	343	145	198	50	50		1.41	1.00	1.0	0.3	0.8	42	6	47
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS17	15.33	15.88	87.75	72.42	Unit 4a	Silt, little Clay	Native	N/A	0	22.1	361	153	207	50	53		1.41	1.00	1.0	0.3	0.8	44	6	49
NK38-TH-12000-01-{69888}	BO-21	23-Jun-71	SS18	16.93	17.23	87.75	70.82	Unit 4a	Silt, little Sand	Native	N/A	0	22.1	393	168	225	50	54		1.41	1.00	1.0	0.3	0.8	44	6	49
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS1	0.39	0.84	86.35	85.96	Unit 2b	Silt with Clay	Native	23.77	2.54	23.2	14	0	14	46	4		1.36	1.00	0.6	0.5	1.7	4	6	10
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS2	0.94	1.39	86.35	85.41	Unit 2b	Silt with Clay	Native	23.77	2.54	23.2	27	0	27	46	6		1.36	1.00	0.7	0.5	1.7	7	6	12
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS3	1.42	1.87	86.35	84.93	Unit 2b	Silt with Clay	Native	23.77	2.54	23.2	38	0	38	46	25		1.36	1.00	0.7	0.4	1.4	25	6	31
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS4	1.89	2.34	86.35	84.46	Unit 2b	Silt with Clay	Native	23.77	2.54	23.2	49	0	49	46	39		1.36	1.00	0.7	0.3	1.2	36	6	42
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS5	2.31	2.76	86.35	84.04	Unit 2b	Silt with Clay	Native	23.77	2.54	23.2	59	0	59	46	28		1.36	1.00	0.8	0.4	1.2	26	6	32
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS6	2.8	3.25	86.35	83.55	Unit 2b	Silt with Clay	Native	23.77	2.54	23.2	70	5	65	46	17		1.36	1.00	0.8	0.4	1.2	16	6	22
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS7	3.1	3.55	86.35	83.25	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	78	8	70	48.072	107		1.37	1.00	0.8	0.3	1.1	96	6	102
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS8	3.73	4.18	86.35	82.62	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	93	14	79	48.072	64		1.37	1.00	0.8	0.3	1.1	58	6	63
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS9	4.13	4.58	86.35	82.22	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	103	18	85	48.072	86		1.37	1.00	0.9	0.3	1.0	78	6	83
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS10	4.57	5.02	86.35	81.78	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	113	22	91	48.072	136		1.37	1.00	0.9	0.3	1.0	123	6	129
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS11	5.02	5.47	86.35	81.33	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	124	27	98	48.072	150		1.37	1.00	0.9	0.3	1.0	136	6	141
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS12	5.47	5.92	86.35	80.88	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	135	31	104	48.072	136		1.37	1.00	0.9	0.3	1.0	123	6	129
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS13	5.92	6.37	86.35	80.43	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	146	35	111	48.072	150		1.37	1.00	0.9	0.3	1.0	136	6	141
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS14	6.37	6.82	86.35	79.98	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	157	40	117	48.072	135		1.37	1.00	0.9	0.3	1.0	122	6	128
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS15	6.97	7.42	86.35	79.38	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	172	46	126	48.072	150		1.37	1.00	1.0	0.3	0.9	135	6	141
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS16	7.45	7.9	86.35	78.9	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	183	50	133	48.072	150		1.37	1.00	1.0	0.3	0.9	135	6	141
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS17	7.9	8.35	86.35	78.45	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	194	55	139	48.072	150		1.37	1.00	1.0	0.3	0.9	135	6	141
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS18	8.43	8.88	86.35	77.92	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	207	60	147	48.072	105		1.37	1.00	1.0	0.3	0.9	94	6	100
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS19	8.88	9.33	86.35	77.47	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	218	64	154	48.072	69		1.37	1.00	1.0	0.3	0.9	62	6	67
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS20	9.33	9.78	86.35	77.02	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	229	69	160	48.072	73		1.37	1.00	1.0	0.3	0.9	64	6	70
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS21	9.86	10.31	86.35	76.49	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	242	74	168	48.072	150		1.37	1.00	1.0	0.3	0.9	131	6	137
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS22	10.31	10.76	86.35	76.04	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	253	78	174	48.072	111		1.37	1.00	1.0	0.3	0.9	96	6	102
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS23	10.8	11.25	86.35	75.55	Unit 4a	Sand, little Silt	Native	23.77	2.54	22.1	264	83	180	50	73		1.41	1.00	1.0	0.3	0.9	63	6	68
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS24	11.25	11.55	86.35	75.1	Unit 4a	Sand with silt, little gravel, trace clay	Native	23.77	2.54	22.1	272	87	185	50	150	0.15	1.41	1.00	1.0	0.3	0.9	128	6	133
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS25	11.55	11.85	86.35	74.8	Unit 4a	Sand with silt, little gravel, trace clay	Native	23.77	2.54	22.1	278	90	189	50	150	0.15	1.41	1.00	1.0	0.3	0.8	127	6	133
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS26	11.85	12.15	86.35	74.5	Unit 4a	Sand with silt, little gravel, trace clay	Native	23.77	2.54	22.1	285	93	192	50	150	0.15	1.41	1.00	1.0	0.3	0.8	126	6	132
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS27	12.15	12.45	86.35	74.2	Unit 4a	Sand with silt, little gravel, trace clay	Native	23.77	2.54	22.1	292	96	196	50	150	0.15	1.41	1.00	1.0	0.3	0.8	126	6	131
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS28	12.45	12.72	86.35	73.9	Unit 4a		Native	23.77	2.54	22.1	298	99	200	50	150	0.12	1.41	1.00	1.0	0.3	0.8	125	6	131
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS30	13.95	14.4	86.35	72.4	Unit 4a	Silt, little sand	Native	23.77	2.54	22.1	313	114	199	50	150		1.41	1.00	1.0	0.3	0.8	125	6	131
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS32	14.43	14.73	86.35	71.92	Unit 4a	Silt, little sand	Native	23.77	2.54	22.1	322	118	204	50	150	0.15	1.41	1.00	1.0	0.3	0.8	124	6	130
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS33	14.73	14.94	86.35	71.62	Unit 4a	Silt, little sand	Native	23.77	2.54	22.1	328	121	207	50	150	0.06	1.41	1.00	1.0	0.3	0.8	124	6	129
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS34	14.94	15.21	86.35	71.41	Unit 4a	Sand with Silt	Native	23.77	2.54	22.1	333	123	210	50	150	0.12	1.41	1.00	1.0	0.3	0.8	123	6	129
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS35	15.21	15.48	86.35	71.14	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	340	126	214	48.072	150	0.12	1.37	1.00	1.0	0.3	0.8	123	6	128
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS36	15.48	15.78	86.35	70.87	Unit 4a	Sand with Silt	Native	23.77	2.54	22.1	346	128	218	50	150	0.15	1.41	1.00	1.0	0.3	0.8	122	6	128
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS37	15.78	16.23	86.35	70.57	Unit 4a	Silt, some clay	Native	23.77	2.54	22.1	354	132	222	50	150	0.15	1.41	1.00	1.0	0.3	0.8	122	6	127
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS38	16.25	16.55	86.35	70.1	Unit 4a	Silt, some clay	Native	23.77	2.54	22.1	363	136	227	50	150	0.15	1.41	1.00	1.0	0.3	0.8	121	6	127
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS39	16.64	16.94	86.35	69.71	Unit 4a	Silt, some clay	Native	23.77	2.54	22.1	372	140	232	50	120		1.41	1.00	1.0	0.3	0.8	96	6	102
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS40	17.05	17.5	86.35	69.3	Unit 4a	Silt, some clay	Native	23.77	2.54	22.1	382	145	238	50	81		1.41	1.00	1.0	0.3	0.8	64	6	70
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS41	17.65	18.1	86.35	68.7	Unit 4a	Silt, some clay	Native	23.77	2.54	22.1	396	150	245	50	141		1.41	1.00	1.0	0.3	0.8	111	6	117
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS42	18.23	18.53	86.35	68.12	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	408	155	253	48.072	136	0.15	1.37	1.00	1.0	0.3	0.8	107	6	112
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS43	18.6	18.9	86.35	67.75	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	417	159	258	48.072	150	0.15	1.37	1.00	1.0	0.3	0.8	117	6	123
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS44	18.97	19.27	86.35	67.38	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.77	2.54	24.3	426	163	263	48.072	150	0.15	1.37	1.00	1.0	0.3	0.8	116	6	122
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS45	19.38	19.65	86.35	66.97	Unit 4a	Silt, little Clay	Native	23.77	2.54	22.1	435	167	268	50	150	0.12	1.41	1.00	1.0	0.3	0.8	116	6	121
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS46	20.4	20.64	86.35	65.95	Unit 4a	Silt, little Clay	Native	23.77	2.54	22.1	457	176	280	50	150	0.09	1.41	1.00	1.0	0.3	0.8	114	6	120
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS47	20.71	20.95	86.35	65.64	Unit 4a	Silt, little Clay	Native	23.77	2.54	22.1	464	179	284	50	150	0.09	1.41	1.00	1.0	0.3	0.8	114	6	120
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS48	21.45	21.72	86.35	64.9	Unit 4a	Silt, little Clay	Native	23.77	2.54	22.1	480	187	294	50	150	0.12	1.41	1.00	1.0	0.3	0.8	113	6	119
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS49	21.73	22.03	86.35	64.62	Unit 4a	Silt, little Sand	Native	23.77	2.54	22.1	487	190	297	50	150	0.15	1.41	1.00	1.0	0.3	0.8	113	6	118
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS50	22.08	22.53	86.35	64.27	Unit 4a	Silt, little Sand	Native	23.77	2.54	22.1	496	194	302	50	110		1.41	1.00	1.0	0.3	0.7	82	6	88
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS51	22.62	23.07	86.35	63.73	Unit 5	Till : Silt with Sand, little gravel, little clay	Native	23.77	2.54	23.7	509	199	310	68	54		1.43	1.00	1.0	0.3	0.7	40	6	46
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS52	23.07	23.52	86.35	63.28	Unit 5	Till : Silt with Sand, little gravel, little clay	Native	23.77	2.54	23.7	520	204	316	68	84		1.43	1.00	1.0	0.3	0.7	62	6	68
NK38-TH-12000-01-{69888}	BO-24	19-Jul-71	SS53	23.52	23.97	86.35	62.83	Unit 5	Till : Silt with Sand, little gravel, little clay	Native	23.77	2.54	23.7	531	208	322	68	150		1.43	1.00	1.0	0.3	0.7	110	6	116
NK054-REP-07730-00005	DN-60	21-Jan-08	SS1	0	0.6	98.295	98.295	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	7	0	7	48.072	15		1.37	1.00	0.6	0.4	1.7	15	6	20

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R: $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																									Iterative calculation Boulanger & Idriss 2014		
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK054-REP-07730-00005	DN-60	21-Jan-08	SS2	1.5	1.95	98.295	96.795	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	42	0	42	48.072	87		1.37	1.00	0.7	0.3	1.3	79	6	85
NK054-REP-07730-00005	DN-60	21-Jan-08	SS3	3.05	3.1	98.295	95.245	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	75	0	75	48.072	100	0.03	1.37	1.00	0.8	0.3	1.1	87	6	93
NK054-REP-07730-00005	DN-60	21-Jan-08	SS4	4.6	4.75	98.295	93.695	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	114	0	114	48.072	70		1.37	1.00	0.9	0.3	1.0	59	6	65
NK054-REP-07730-00005	DN-60	21-Jan-08	SS5	6.1	6.25	98.295	92.195	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	150	0	150	48.072	135		1.37	1.00	0.9	0.3	0.9	113	6	118
NK054-REP-07730-00005	DN-60	21-Jan-08	SS6	7.6	7.72	98.295	90.695	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	186	0	186	48.072	175	0.1	1.37	1.00	1.0	0.3	0.8	144	6	150
NK054-REP-07730-00005	DN-60	21-Jan-08	SS7	9.15	9.45	98.295	89.145	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	226	0	226	48.072	120		1.37	1.00	1.0	0.3	0.8	97	6	102
NK054-REP-07730-00005	DN-60	21-Jan-08	SS8	10.62	10.77	98.295	87.675	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	260	0	260	48.072	77		1.37	1.00	1.0	0.3	0.8	60	6	65
NK054-REP-07730-00005	DN-60	21-Jan-08	SS9	12.2	12.6	98.295	86.095	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	301	0	301	48.072	190	0.25	1.37	1.00	1.0	0.3	0.7	142	6	148
NK054-REP-07730-00005	DN-60	21-Jan-08	SS10	13.7	13.85	98.295	84.595	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	335	0	335	48.072	180		1.37	1.00	1.0	0.3	0.7	131	6	137
NK054-REP-07730-00005	DN-60	21-Jan-08	SS11	15.25	15.4	98.295	83.045	Unit 3	Till : Silty Sand, little to some sand, trace gravel and clay	Native	30.97	15.8	24.3	373	0	373	48.072	76		1.37	1.00	1.0	0.3	0.7	54	6	59
NK054-REP-07730-00005	DN-60	21-Jan-08	SS12	16.775	17.375	98.295	81.52	Unit 4b	Interlayered clay silt and sand	Native	30.97	15.8	22.2	411	13	399	92.423	111		1.41	1.00	1.0	0.3	0.7	77	6	83
NK054-REP-07730-00005	DN-60	21-Jan-08	SS13	18.3	18.9	98.295	79.995	Unit 4a	Sand, trace silt	Native	30.97	15.8	22.1	445	27	417	50	39		1.41	1.00	1.0	0.4	0.6	23	6	28
NK054-REP-07730-00005	DN-60	21-Jan-08	SS14	20.6	20.9	98.295	77.695	Unit 4a	Sand, trace silt	Native	30.97	15.8	22.1	492	49	444	50	127		1.41	1.00	1.0	0.3	0.7	86	6	91
NK054-REP-07730-00005	DN-60	21-Jan-08	SS15	21.85	22.15	98.295	76.445	Unit 4b	Interlayered clay silt and sand	Native	30.97	15.8	22.2	520	61	459	92.423	136		1.41	1.00	1.0	0.3	0.7	91	6	97
NK054-REP-07730-00005	DN-60	21-Jan-08	SS16	23.4	23.7	98.295	74.895	Unit 4a	Sand, little silt	Native	30.97	15.8	22.1	554	76	478	50	164		1.41	1.00	1.0	0.3	0.7	109	6	114
NK054-REP-07730-00005	DN-60	21-Jan-08	SS17	24.9	25.2	98.295	73.395	Unit 4b	Interlayered clay silt and sand	Native	30.97	15.8	22.2	588	91	497	92.423	180		1.41	1.00	1.0	0.3	0.7	118	6	124
NK054-REP-07730-00005	DN-60	21-Jan-08	SS18	26.79	27.39	98.295	71.505	Unit 4b	Clayey Silt, trace sand and gravel	Native	30.97	15.8	22.2	633	111	522	92.423	45		1.41	1.00	1.0	0.4	0.6	25	6	30
NK054-REP-07730-00005	DN-60	21-Jan-08	SS19	28.2	28.5	98.295	70.095	Unit 5	Till : Sandy Silt	Native	30.97	15.8	23.7	663	123	540	68	159		1.43	1.00	1.0	0.3	0.6	102	6	108
NK054-REP-07730-00005	DN-60	21-Jan-08	SS20	29.8	30.4	98.295	68.495	Unit 5	Till : Sandy Silt	Native	30.97	15.8	23.7	704	140	564	68	144		1.43	1.00	1.0	0.3	0.6	91	6	97
NK054-REP-01210-0418696	AMC-01	30-Sep-10	SS1	0	0.61	98.92	98.92	Unit 1	Sandy Silt (ML)	Fill	34.34	2.5	21	7	0	7	40	37		1.00	1.00	0.6	0.3	1.7	36	6	42
NK054-REP-01210-0418696	AMC-01	30-Sep-10	SS3	4.57	4.85	98.92	94.35	Unit 3	Silty Sand (SM)	Native	34.34	2.5	24.3	113	22	92	48.072	50	0.28	1.37	1.00	0.9	0.3	1.0	45	6	51
NK054-REP-01210-0418696	AMC-01	30-Sep-10	SS4	7.6	7.75	98.92	91.32	Unit 3	Silty Sand (SM)	Native	34.34	2.5	24.3	186	51	135	48.072	50	0.14	1.37	1.00	1.0	0.3	0.9	45	6	51
NK054-REP-01210-0418696	AMC-01	30-Sep-10	SS5	15.25	15.68	98.92	83.67	Unit 4b	Fat Clay interbedded with Gravelly Fat Clay (CH)	Native	34.34	2.5	22.2	359	127	231	92.423	92	0.43	1.41	1.00	1.0	0.3	0.8	74	6	79
NK054-REP-01210-0418696	AMC-01	30-Sep-10	SS6	22.87	23.02	98.92	76.05	Unit 5	Poorly Graded Sand with Silt (SP-SM)	Native	34.34	2.5	23.7	536	201	335	68	50	0.14	1.43	1.00	1.0	0.3	0.7	35	6	41
NK054-REP-01210-0418696	AMC-03alt	21-Oct-10	SS1	0	0.31	99.8	99.8	Unit 1	Silty Sand (SM)	Fill	35.61	2.5	21	3	0	3	40	6		1.00	1.00	0.5	0.5	1.7	6	6	11
NK054-REP-01210-0418696	AMC-03alt	21-Oct-10	SS2	3.05	3.5	99.8	96.75	Unit 1	Silty Sand with Gravel (SM)	Fill	35.61	2.5	21	69	8	61	40	96		1.00	1.00	0.8	0.3	1.1	89	6	95
NK054-REP-01210-0418696	AMC-03alt	21-Oct-10	SS3	7.61	8.06	99.8	92.19	Unit 1	Sandy Silt with Gravel (ML)	Fill	35.61	2.5	21	165	52	112	40	80		1.00	1.00	1.0	0.3	1.0	76	6	81
NK054-REP-01210-0418696	AMC-03alt	21-Oct-10	SS4	15.25	15.53	99.8	84.55	Unit 5	Sandy Silt (ML)	Native	35.61	2.5	23.7	344	126	217	68	50	0.28	1.43	1.00	1.0	0.3	0.8	41	6	46
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS1	0	0.45	86.14	86.14	Unit 1	Topsoil	Native	22.1	0.11	21	5	1	4	40	7		1.00	1.00	0.6	0.5	1.7	7	6	12
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS2	1.55	2	86.14	84.59	Unit 2b	Silt with Clay	Native	22.1	0.11	23.2	41	16	24	46	29		1.36	1.00	0.7	0.3	1.5	33	6	38
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS3	3.11	3.41	86.14	83.03	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	77	31	46	48.072	150	0.15	1.37	1.00	0.8	0.3	1.2	150	6	156
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS4	4.55	4.85	86.14	81.59	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	112	45	67	48.072	150	0.15	1.37	1.00	0.9	0.3	1.1	147	6	152
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS5	5.94	6.21	86.14	80.2	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	145	59	87	48.072	150	0.12	1.37	1.00	0.9	0.3	1.0	144	6	150
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS6	7.56	8.01	86.14	78.58	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	187	75	111	48.072	68		1.37	1.00	1.0	0.3	1.0	64	6	70
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS8	9.76	10.06	86.14	76.38	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	241	96	145	48.072	150	0.15	1.37	1.00	1.0	0.3	0.9	136	6	142
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS10	11.4	11.7	86.14	74.74	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	281	112	168	48.072	150	0.15	1.37	1.00	1.0	0.3	0.9	131	6	136
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS12	12.82	13.27	86.14	73.32	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	317	127	190	48.072	150		1.37	1.00	1.0	0.3	0.8	127	6	132
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS13	14.68	14.83	86.14	71.46	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	359	144	215	48.072	150	0.15	1.37	1.00	1.0	0.3	0.8	123	6	128
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS15	16.1	16.25	86.14	70.04	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	393	158	236	48.072	136	0.15	1.37	1.00	1.0	0.3	0.8	109	6	114
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS18	17.49	17.64	86.14	68.65	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	427	171	256	48.072	130	0.15	1.37	1.00	1.0	0.3	0.8	102	6	107
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS21	18.89	19.19	86.14	67.25	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	463	186	277	48.072	120	0.15	1.37	1.00	1.0	0.3	0.8	92	6	97
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS23	20.74	21.04	86.14	65.4	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	508	204	304	48.072	120	0.15	1.37	1.00	1.0	0.3	0.7	90	6	95
NK38-TH-12000-01-{69888}	BO-15	31-May-71	SS26	22.2	22.5	86.14	63.94	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	22.1	0.11	24.3	543	218	325	48.072	117	0.15	1.37	1.00	1.0	0.3	0.7	86	6	91
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS1	0.36	0.81	86.93	86.57	Unit 2b	Silt, little clay	Native	23.5	10.8	23.2	14	0	14	46	6		1.36	1.00	0.6	0.5	1.7	6	6	12
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS2	1.4	1.7	86.93	85.53	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	37	0	37	48.072	74		1.37	1.00	0.7	0.3	1.3	68	6	74
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS3	3.35	3.8	86.93	83.58	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	86	0	86	48.072	112		1.37	1.00	0.8	0.3	1.0	97	6	102
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS5	4.63	4.93	86.93	82.3	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	116	0	116	48.072	140		1.37	1.00	0.9	0.3	1.0	119	6	124
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS8	6.29	6.59	86.93	80.64	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.5	10.8	24.3	156	0	156	48.072	150		1.37	1.00	0.9	0.3	0.9	125	6	131
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS13	12.86	13.16	86.93	74.07	Unit 4a	Sand, little Silt	Native	23.5	10.8	22.1	288	22	266	50	150		1.41	1.00	1.0	0.3	0.8	116	6	122
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS14	13.16	13.46	86.93	73.77	Unit 4a	Sand, little Silt	Native	23.5	10.8	22.1	294	25	270	50	150		1.41	1.00	1.0	0.3	0.8	116	6	121
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS15	14.38	14.68	86.93	72.55	Unit 4a	Sand, little Silt	Native	23.5	10.8	22.1	321	37	285	50	150		1.41	1.00	1.0	0.3	0.8	114	6	120
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS17	16.15	16.6	86.93	70.78	Unit 4a	Silt with Clay	Native	23.5	10.8	22.1	362	55	307	50	137		1.41	1.00	1.0	0.3	0.7	102	6	108
NK38-TH-12000-01-{69888}	BO-16	4-Jun-71	SS22	22.24	22.54	86.93	64.69	Unit 4a	Sand, trace Silt	Native	23.5	10.8	22.1	495	114	381	50	150		1.41	1.00	1.0	0.3	0.7	105	6	111
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS1	1.31	1.76	86.32	85.01	Unit 2b	Silt with Clay	Native	23.26	2.5	23.2	36	0	36	46	100		1.36	1.00	0.7	0.3	1.3	93	6	98
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS2	1.76	2.06	86.32	84.56	Unit 2b	Silt with Clay	Native	23.26	2.5	23.2	44	0	44	46	59		1.36	1.00	0.7	0.3	1.2	54	6	59
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS3	2.84	3.29	86.32	83.48	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	73	6	67	48.072	51		1.37	1.00	0.8	0.3	1.1	46	6	51
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS4	4.34	4.79	86.32	81.98	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	109	20	89	48.072	53		1.37	1.00	0.9	0.3	1.0	48	6	53
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS5	5.95	6.4	86.32	80.37	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	148	36	112	48.072	93		1.37	1.00	0.9	0.3	1.0	84	6	90
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS6	7.5	7.95	86.32	78.82	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	186	51	134	48.072	150		1.37	1.00	1.0	0.3	0.9	135	6	141
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS7	9.02	9.47	86.32	77.3	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	225	66	159	48.072	143		1.37	1.00	1.0	0.3	0.9	127	6	132
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS8	10.64	11.09	86.32	75.68	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	264	82	182	48.072	87		1.37	1.00	1.0	0.3	0.9	74	6	80
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS9	12.1	12.55	86.32	74.22	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	300	96	203	48.072	145		1.37	1.00	1.0	0.3	0.8	120	6	126
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS10	13.48	13.93	86.32	72.84	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	333	110	223	48.072	150		1.37	1.00	1.0	0.3	0.8	121	6	127
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS11	15.21	15.51	86.32	71.11	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	373	126	247	48.072	150	0.15	1.37	1.00	1.0	0.3	0.8	118	6	124
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS12	16.9	17.35	86.32	69.42	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	416	144	273	48.072	150		1.37	1.00	1.0	0.3	0.8	115	6	121
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS13	18.29	18.49	86.32	68.03	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	23.26	2.5	24.3	447	156	291	48.072	150	0.2	1.37	1.00	1.0	0.3	0.8	113	6	119

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R | $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS14	20	20.39	86.32	66.32	Unit 4a	Sand, trace clay	Native	23.26	2.5	22.1	446	174	273	50	124	0.24	1.41	1.00	1.0	0.3	0.8	95	6	101
NK38-TH-12000-01-{69888}	BO-13	6-May-71	SS15	21.49	21.94	86.32	64.83	Unit 5	Till : Silt with Sand, little gravel, trace clay	Native	23.26	2.5	23.7	515	189	326	68	150		1.43	1.00	1.0	0.3	0.7	110	6	115
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS1	1.37	1.82	88.82	87.45	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	27.19	10.24	24.3	39	0	39	48.072	43		1.37	1.00	0.7	0.3	1.3	39	6	45
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS2	2.96	3.41	88.82	85.86	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	27.19	10.24	24.3	78	0	78	48.072	104		1.37	1.00	0.8	0.3	1.1	90	6	96
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS3	4.56	4.86	88.82	84.26	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	114	0	114	48.072	150	0.15	1.37	1.00	0.9	0.3	1.0	127	6	133
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS4	6.1	6.55	88.82	82.72	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	154	0	154	48.072	61		1.37	1.00	0.9	0.3	0.9	51	6	56
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS5	7.64	8.09	88.82	81.18	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	191	0	191	48.072	52		1.37	1.00	1.0	0.3	0.8	43	6	48
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS6	9.19	9.64	88.82	79.63	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	229	0	229	48.072	143		1.37	1.00	1.0	0.3	0.8	115	6	121
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS7	10.72	11.17	88.82	78.1	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	266	7	259	48.072	31		1.37	1.00	1.0	0.4	0.7	22	6	27
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS8	11.48	11.93	88.82	77.34	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	285	14	270	48.072	56		1.37	1.00	1.0	0.3	0.8	43	6	49
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS9	12.61	13.06	88.82	76.21	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	312	26	287	48.072	32		1.37	1.00	1.0	0.4	0.7	21	6	27
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS10	14.12	14.57	88.82	74.7	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	349	40	308	48.072	60		1.37	1.00	1.0	0.3	0.7	45	6	50
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS11	15.64	16.09	88.82	73.18	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	386	55	330	48.072	131		1.37	1.00	1.0	0.3	0.7	96	6	101
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS12	17.19	17.64	88.82	71.63	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	423	70	353	48.072	150	0.15	1.37	1.00	1.0	0.3	0.7	108	6	113
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS13	18.7	19	88.82	70.12	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	458	84	374	48.072	150	0.15	1.37	1.00	1.0	0.3	0.7	106	6	112
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS14	20.09	20.24	88.82	68.73	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	490	97	393	48.072	150	0.15	1.37	1.00	1.0	0.3	0.7	105	6	110
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS15	21.42	21.66	88.82	67.4	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	27.19	10.24	24.3	523	111	413	48.072	150	0.09	1.37	1.00	1.0	0.3	0.7	103	6	109
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS16	23.04	23.25	88.82	65.78	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	563	127	436	48.072	150	0.06	1.37	1.00	1.0	0.3	0.7	102	6	107
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS17	24.46	24.91	88.82	64.36	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	27.19	10.24	24.3	600	142	458	48.072	142		1.37	1.00	1.0	0.3	0.7	95	6	101
NK38-TH-12000-01-{69888}	BO-14	21-May-71	SS18	25.95	26.4	88.82	62.87	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	27.19	10.24	24.3	636	156	480	48.072	150		1.37	1.00	1.0	0.3	0.7	99	6	105
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS1	1.67	1.97	99.58	97.91	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	N?A	7.37	24.3	44	0	44	48.072	84	0.15	1.37	1.00	0.7	0.3	1.2	76	6	81
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS2	3.19	3.64	99.58	96.39	Unit 3	Till : Silt with Sand, little gravel, trace clay	Native	N?A	7.37	24.3	83	0	83	48.072	75		1.37	1.00	0.8	0.3	1.0	65	6	71
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS3	4.72	5.02	99.58	94.86	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	N?A	7.37	24.3	118	0	118	48.072	96	0.15	1.37	1.00	0.9	0.3	1.0	81	6	87
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS4	6.26	6.41	99.58	93.32	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	N?A	7.37	24.3	154	0	154	48.072	74		1.37	1.00	0.9	0.3	0.9	62	6	67
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS5	7.77	7.92	99.58	91.81	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	N?A	7.37	24.3	191	5	186	48.072	150	0.15	1.37	1.00	1.0	0.3	0.8	124	6	130
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS6	9.3	9.45	99.58	90.28	Unit 4a	Sand, some silt	Native	N?A	7.37	22.1	225	20	205	50	140		1.41	1.00	1.0	0.3	0.8	116	6	122
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS7	10.78	11.08	99.58	88.8	Unit 4a	Sand, some silt	Native	N?A	7.37	22.1	242	35	207	50	150	0.15	1.41	1.00	1.0	0.3	0.8	124	6	130
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS8	12.29	12.44	99.58	87.29	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	N?A	7.37	24.3	301	49	252	48.072	150	0.15	1.37	1.00	1.0	0.3	0.8	118	6	123
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS9	13.77	13.92	99.58	85.81	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	N?A	7.37	24.3	337	64	273	48.072	150	0.15	1.37	1.00	1.0	0.3	0.8	115	6	121
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS10	14.74	15.19	99.58	84.84	Unit 3	Till : Sand with silt, little gravel, trace clay	Native	N?A	7.37	24.3	364	75	289	48.072	174		1.37	1.00	1.0	0.3	0.8	132	6	137
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS11	16.12	16.49	99.58	83.46	Unit 4a	Silt with clay	Native	N?A	7.37	22.1	360	88	273	50	221	0.22	1.41	1.00	1.0	0.3	0.8	170	6	175
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS12	17.57	18.02	99.58	82.01	Unit 4a	Silt with clay	Native	N?A	7.37	22.1	393	102	291	50	150	0.06	1.41	1.00	1.0	0.3	0.8	113	6	119
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS13	19.09	19.54	99.58	80.49	Unit 4a	Sand, trace silt	Native	N?A	7.37	22.1	427	117	310	50	150	0.06	1.41	1.00	1.0	0.3	0.7	111	6	117
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS14	20.76	21.06	99.58	78.82	Unit 4a	Sand, trace silt	Native	N?A	7.37	22.1	462	133	329	50	52		1.41	1.00	1.0	0.3	0.7	37	6	43
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS15	21.71	22.16	99.58	77.87	Unit 4a	Sand, trace silt	Native	N?A	7.37	22.1	485	143	342	50	11		1.41	1.00	1.0	0.5	0.5	6	6	11
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS16	23.54	23.99	99.58	76.04	Unit 4a	Sand, trace silt	Native	N?A	7.37	22.1	525	161	364	50	10		1.41	1.00	1.0	0.5	0.5	5	6	11
NK38-TH-12000-01-{69888}	BO-23	9-Jul-71	SS17	27.23	27.68	99.58	72.35	Unit 4a	Silt, some clay	Native	N?A	7.37	22.1	607	197	410	50	67		1.41	1.00	1.0	0.3	0.7	46	6	52
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS1	0	0.45	95.13	95.13	Unit 1	Topsoil	Native	N?A	6.31	21	5	0	5	40	3		1.00	1.00	0.6	0.6	1.7	3	6	8
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS2	0.45	0.9	95.13	94.68	Unit 2b	Silt, little clay, trace sand	Native	N?A	6.31	23.2	15	0	15	46	15		1.36	1.00	0.6	0.4	1.7	16	6	21
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS3	1.37	1.52	95.13	93.76	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	34	0	34	48.072	150	0.15	1.37	1.00	0.7	0.3	1.3	139	6	145
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS4	1.51	1.87	95.13	93.62	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	40	0	40	48.072	150	0.21	1.37	1.00	0.7	0.3	1.3	137	6	143
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS5	3.08	3.26	95.13	92.05	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	76	0	76	48.072	150	0.03	1.37	1.00	0.8	0.3	1.1	131	6	137
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS6	4.65	4.8	95.13	90.48	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	114	0	114	48.072	150	0.15	1.37	1.00	0.9	0.3	1.0	128	6	133
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS7	6.21	6.45	95.13	88.92	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	154	0	154	48.072	150	0.09	1.37	1.00	0.9	0.3	0.9	125	6	131
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS8	7.78	8.02	95.13	87.35	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	192	16	176	48.072	150	0.09	1.37	1.00	1.0	0.3	0.9	126	6	132
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS9	9.32	9.53	95.13	85.81	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	229	31	199	48.072	150	0.06	1.37	1.00	1.0	0.3	0.8	125	6	131
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS10	10.89	11.1	95.13	84.24	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	267	46	221	48.072	150	0.06	1.37	1.00	1.0	0.3	0.8	122	6	127
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS11	12.4	12.61	95.13	82.73	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	304	61	243	48.072	150	0.06	1.37	1.00	1.0	0.3	0.8	119	6	124
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS12	13.92	14.19	95.13	81.21	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	342	76	266	48.072	150	0.12	1.37	1.00	1.0	0.3	0.8	116	6	122
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS13	15.51	15.75	95.13	79.62	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	380	91	288	48.072	150	0.09	1.37	1.00	1.0	0.3	0.8	114	6	119
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS14	16.1	16.37	95.13	79.03	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	395	97	297	48.072	150	0.12	1.37	1.00	1.0	0.3	0.8	113	6	118
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS15	18.63	18.93	95.13	76.5	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	456	122	334	48.072	150	0.15	1.37	1.00	1.0	0.3	0.7	109	6	115
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS16	20.19	20.46	95.13	74.94	Unit 3	Till : Sand with silt to trace silt	Native	N?A	6.31	24.3	494	138	356	48.072	150	0.12	1.37	1.00	1.0	0.3	0.7	107	6	113
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS17	21.78	22.05	95.13	73.35	Unit 4a	Silt, little clay	Native	N?A	6.31	22.1	484	153	331	50	150	0.12	1.41	1.00	1.0	0.3	0.7	109	6	115
NK38-TH-12000-01-{69888}	BO-47	8-Nov-73	SS18	23.39	23.84	95.13	71.74	Unit 4a	Silt, little clay	Native	N?A	6.31	22.1	522	170	352	50	187		1.41	1.00	1.0	0.3	0.7	134	6	140
21451329	BH66	14-Jun-21	SS1	0.31	0.56	89.49	89.18	Unit 1	Fill: Poorly Graded Gravelly Sand (SP)	Fill	25.95	2.5	21	9	0	9	40	6		1.00	1.36	0.6	0.5	1.7	8	6	14
21451329	BH66	14-Jun-21	SS2	0.76	1.22	89.49	88.73	Unit 1	Fill: Silty Sand (SM)	Fill	25.95	2.5	21	21	0	21	45	58		1.00	1.36	0.7	0.3	1.5	78	6	84
21451329	BH66	14-Jun-21	SS3	1.52	1.98	89.49	87.97	Unit 1	Fill: Silty Sand (SM)	Fill	25.95	2.5	21	37	0	37	40	26		1.00	1.36	0.7	0.3	1.3	34	6	40
21451329	BH66	14-Jun-21	SS4	2.29	2.9	89.49	87.2	Unit 2a	Lean Clay with Sand (CL)	Native	25.95	2.5	20.2	54	1	53	77.95	11		1.36	1.36	0.8	0.4	1.3	15	6	21
21451329	BH66	14-Jun-21	SS5	3.05	3.51	89.49	86.44	Unit 2a	Lean Clay with Sand (CL)	Native	25.95	2.5	20.2	68	8	60	77.95	18		1.36	1.36	0.8	0.4	1.2	24	6	30
21451329	BH66	14-Jun-21	SS6	4.04	4.27	89.49	85.45	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.95	2.5	23.2	88	16	72	46	4		1.36	1.36	0.9	0.5	1.2	6	6	11
21451329	BH66	14-Jun-21	SS7	5.33	5.94	89.49	84.16	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.95	2.5	23.2	122	31	92	46	2		1.36	1.36	0.9	0.6	1.1	3	6	8
21451329	BH66	14-Jun-21	SS9	6.86	7.32	89.49	82.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.95	2.5	24.3	158	45	113	48.072	15		1.37	1.36	1.0	0.4	1.0	19	6	24
21451329	BH66	14-Jun-21	SS10	7.62	8.08	89.49	81.87	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.95	2.5	24.3	176	52	124	48.072	105		1.37	1.36	1.0	0.3	0.9	132	6	137
21451329	BH66	14-Jun-21	SS11	9.14	9.6	89.49	80.35	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	210	67	142	50	121		1.41	1.36	1.0	0.3	0.9	150	6	155
21451329	BH66	14-Jun-21	SS12	10.67	11.13	89.49	78.82	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	244	82	161	67	183		1.41	1.36	1.0	0.3	0.9	219	6	225

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																									Iterative calculation		
																									Boulanger & Idriss 2014		
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH66	14-Jun-21	SS13	12.19	12.62	89.49	77.3	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	277	97	180	50	180	0.28	1.41	1.36	1.0	0.3	0.9	210	6	215
21451329	BH66	14-Jun-21	SS14	13.72	14.01	89.49	75.77	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	309	112	198	50	195	0.14	1.41	1.36	1.0	0.3	0.8	221	6	227
21451329	BH66	14-Jun-21	SS15	15.24	15.68	89.49	74.25	Unit 4a	Sandy Silt (ML)	Native	25.95	2.5	22.1	344	127	217	50	100	0.29	1.41	1.36	1.0	0.3	0.8	111	6	116
21451329	BH66	14-Jun-21	SS16	18.57	18.75	89.49	70.92	Unit 4b	Lean Clay (CL)	Native	25.95	2.5	22.2	415	159	257	92.423	118		1.41	1.36	1.0	0.3	0.8	125	6	131
21451329	BH66	14-Jun-21	SS17	21.34	21.79	89.49	68.15	Unit 4b	Lean Clay (CL)	Native	25.95	2.5	22.2	480	187	293	93	19		1.41	1.36	1.0	0.4	0.6	16	6	22
21451329	BH66	14-Jun-21	SS18	24.38	24.84	89.49	65.11	Unit 5	Till: Lean Clay with Sand (CL)	Native	25.95	2.5	23.7	552	217	335	79	64		1.43	1.36	1.0	0.3	0.7	63	6	69
21451329	BH15	28-Jun-21	SS1	0	0.13	87.37	87.37	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.47	5.12	21	1	0	1	40	50	0.13	1.00	1.36	0.5	0.3	1.7	62	6	67
21451329	BH15	28-Jun-21	SS2	0.76	1.22	87.37	86.61	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.47	5.12	21	21	0	21	40	98		1.00	1.36	0.7	0.3	1.5	132	6	138
21451329	BH15	28-Jun-21	SS3	1.52	1.98	87.37	85.85	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	39	0	39	48.072	25		1.37	1.36	0.7	0.3	1.3	33	6	38
21451329	BH15	28-Jun-21	SS4	2.29	2.74	87.37	85.08	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	58	0	58	47	82		1.37	1.36	0.8	0.3	1.2	100	6	105
21451329	BH15	28-Jun-21	SS5	4.57	4.85	87.37	82.8	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	111	0	111	48.072	50	0.13	1.37	1.36	0.9	0.3	1.0	58	6	64
21451329	BH15	28-Jun-21	SS6	7.62	7.75	87.37	79.75	Unit 3	Till: Silty Sand (SM)	Native	23.47	5.12	24.3	184	25	158	48.072	50	0.13	1.37	1.36	1.0	0.3	0.9	58	6	64
21451329	BH15	28-Jun-21	SS7	10.67	10.8	87.37	76.7	Unit 4a	Silty Sand (SM)	Native	23.47	5.12	22.1	251	55	196	50	50	0.13	1.41	1.36	1.0	0.3	0.8	57	6	63
21451329	BH15	28-Jun-21	SS8	15.24	15.7	87.37	72.13	Unit 4b	Lean Clay (CL)	Native	23.47	5.12	22.2	356	102	254	96	95		1.41	1.36	1.0	0.3	0.8	101	5	106
21451329	BH15	28-Jun-21	SS9	18.29	18.52	87.37	69.08	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.47	5.12	23.7	426	130	295	68	50	0.08	1.43	1.36	1.0	0.3	0.8	51	6	57
21451329	BH15	28-Jun-21	SS10	21.34	21.79	87.37	66.03	Unit 4b	Silty Clay (CL-ML)	Native	23.47	5.12	22.2	496	161	334	92.423	56		1.41	1.36	1.0	0.3	0.7	55	6	61
21451329	BH28	20-Jul-21	SS1	0	0.61	95.35	95.35	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	31.39	1.99	21	7	0	7	40	12		1.00	1.08	0.6	0.5	1.7	13	6	18
21451329	BH28	20-Jul-21	SS2	1.07	1.37	95.35	94.28	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	29	0	29	48.072	35		1.37	1.08	0.7	0.3	1.4	37	6	42
21451329	BH28	20-Jul-21	SS3	1.52	1.83	95.35	93.83	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	40	0	40	48.072	67		1.37	1.08	0.7	0.3	1.3	66	6	72
21451329	BH28	20-Jul-21	SS4	2.29	2.74	95.35	93.06	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	60	5	55	46	80		1.37	1.08	0.8	0.3	1.2	78	6	84
21451329	BH28	20-Jul-21	SS5	3.05	3.33	95.35	92.3	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	76	12	65	48.072	100	0.13	1.37	1.08	0.8	0.3	1.1	98	6	104
21451329	BH28	20-Jul-21	SS6	4.57	4.64	95.35	90.78	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	111	26	85	48.072	100	0.06	1.37	1.08	0.9	0.3	1.0	98	6	104
21451329	BH28	20-Jul-21	SS7	5.33	5.79	95.35	90.02	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	134	35	99	48.072	128		1.37	1.08	0.9	0.3	1.0	126	6	131
21451329	BH28	20-Jul-21	SS8	6.1	6.55	95.35	89.25	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	153	43	110	47	66		1.37	1.08	0.9	0.3	1.0	65	6	70
21451329	BH28	20-Jul-21	SS9	7.62	8.08	95.35	87.73	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	190	57	132	48.072	100		1.37	1.08	1.0	0.3	0.9	97	6	103
21451329	BH28	20-Jul-21	SS10	9.14	9.53	95.35	86.21	Unit 3	Till: Silty Sand (SM)	Native	31.39	1.99	24.3	226	72	154	48.072	185	0.23	1.37	1.08	1.0	0.3	0.9	178	6	183
21451329	BH28	20-Jul-21	SS11	10.67	11.05	95.35	84.68	Unit 4a	Silty Sand (SM)	Native	31.39	1.99	22.1	260	87	173	36	183	0.23	1.41	1.08	1.0	0.3	0.9	170	6	176
21451329	BH28	20-Jul-21	SS12	12.19	12.33	95.35	83.16	Unit 4a	Silty Sand (SM)	Native	31.39	1.99	22.1	290	101	190	50	100	0.14	1.41	1.08	1.0	0.3	0.8	91	6	96
21451329	BH28	20-Jul-21	SS13	13.72	13.84	95.35	81.63	Unit 4a	Poorly Graded Gravel with Sand (GP)	Native	31.39	1.99	22.1	324	116	208	50	100	0.13	1.41	1.08	1.0	0.3	0.8	89	6	94
21451329	BH28	20-Jul-21	SS14	15.24	15.7	95.35	80.11	Unit 4b	Lean Clay (CL)	Native	31.39	1.99	22.2	362	132	229	90	145		1.41	1.08	1.0	0.3	0.8	125	6	131
21451329	BH28	20-Jul-21	SS15	18.44	18.66	95.35	76.91	Unit 4a	Silty Sand (SM)	Native	31.39	1.99	22.1	430	162	267	50	183	0.22	1.41	1.08	1.0	0.3	0.8	152	6	158
21451329	BH28	20-Jul-21	SS16	21.34	21.46	95.35	74.01	Unit 4a	Silty Sand (SM)	Native	31.39	1.99	22.1	493	190	302	50	100	0.13	1.41	1.08	1.0	0.3	0.7	80	6	86
21451329	BH28	20-Jul-21	SS17	24.38	24.84	95.35	70.97	Unit 4b	Lean Clay (CL)	Native	31.39	1.99	22.2	564	222	342	92.423	36		1.41	1.08	1.0	0.4	0.6	25	6	30
21451329	BH28	20-Jul-21	SS19	27.71	27.8	95.35	67.64	Unit 5	Till: Sandy Silt (ML)	Native	31.39	1.99	23.7	639	253	386	68	158	0.22	1.43	1.08	1.0	0.3	0.7	119	6	125
21451329	BH28	20-Jul-21	SS20	28.96	29.24	95.35	66.39	Unit 5	Till: Sandy Silt (ML)	Native	31.39	1.99	23.7	670	266	404	68	100	0.13	1.43	1.08	1.0	0.3	0.7	74	6	80
21451329	BH28	20-Jul-21	SS21	30.48	30.68	95.35	64.87	Unit 5	Till: Sandy Silt (ML)	Native	31.39	1.99	23.7	705	280	425	68	100	0.05	1.43	1.08	1.0	0.3	0.7	73	6	79
21451329	BH1	13-Oct-21	SS1	0	0.61	89.62	89.62	Unit 1	Sandy Silt (ML)	Fill	25.29	2.5	21	7	0	7	40	3		1.00	1.29	0.6	0.5	1.7	4	6	9
21451329	BH1	13-Oct-21	SS2	0.61	1.07	89.62	89.01	Unit 1	Sandy Silt (ML)	Fill	25.29	2.5	21	18	0	18	40	7		1.00	1.29	0.6	0.5	1.7	10	6	15
21451329	BH1	13-Oct-21	SS3	1.22	1.68	89.62	88.4	Unit 2a	sandy Lean Clay (CL)	Native	25.29	2.5	20.2	30	0	30	77.95	5		1.36	1.29	0.7	0.5	1.7	8	6	13
21451329	BH1	13-Oct-21	SS5	2.44	2.9	89.62	87.18	Unit 2a	sandy Lean Clay (CL)	Native	25.29	2.5	20.2	54	2	52	68	13		1.36	1.29	0.8	0.4	1.3	17	6	23
21451329	BH1	13-Oct-21	SS7	3.66	4.11	89.62	85.96	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.29	2.5	23.2	90	14	77	45	11		1.36	1.29	0.8	0.4	1.1	13	6	19
21451329	BH1	13-Oct-21	SS8	4.27	4.52	89.62	85.35	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	107	19	88	48.072	100	0.1	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS9	4.88	5.08	89.62	84.74	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	121	24	97	48.072	100	0.05	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS10	5.49	5.69	89.62	84.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.29	2.5	24.3	136	30	106	48.072	100	0.05	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH1	13-Oct-21	SS11	6.1	6.5	89.62	83.52	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	27.7	175	37	137	66	178	0.25	1.37	1.29	0.9	0.3	0.9	196	6	202
21451329	BH1	13-Oct-21	SS12	6.71	6.96	89.62	82.91	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	166	43	124	48.072	100	0.1	1.37	1.29	0.9	0.3	0.9	115	6	121
21451329	BH1	13-Oct-21	SS13	7.32	7.54	89.62	82.3	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	181	48	132	53	100	0.07	1.37	1.29	1.0	0.3	0.9	115	6	121
21451329	BH1	13-Oct-21	SS14	7.92	8.36	89.62	81.7	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	25.29	2.5	24.3	198	55	142	48.072	126	0.25	1.37	1.29	1.0	0.3	0.9	145	6	151
21451329	BH1	13-Oct-21	SS15	8.53	8.99	89.62	81.09	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	194	61	133	92.423	123		1.41	1.29	1.0	0.3	0.9	146	6	152
21451329	BH1	13-Oct-21	SS16	9.14	9.6	89.62	80.48	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	208	67	141	97	103		1.41	1.29	1.0	0.3	0.9	121	5	126
21451329	BH1	13-Oct-21	SS17	9.75	10.21	89.62	79.87	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	25.5	254	73	181	92.423	75		1.41	1.29	1.0	0.3	0.9	82	6	88
21451329	BH1	13-Oct-21	SS18	10.36	10.82	89.62	79.26	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	235	79	156	88	67		1.41	1.29	1.0	0.3	0.9	77	6	82
21451329	BH1	13-Oct-21	SS19	10.97	11.25	89.62	78.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	246	84	161	50	100	0.13	1.41	1.29	1.0	0.3	0.9	113	6	119
21451329	BH1	13-Oct-21	SS20	11.58	12.02	89.62	78.04	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	23.6	262	91	171	64	182	0.28	1.41	1.29	1.0	0.3	0.9	203	6	209
21451329	BH1	13-Oct-21	SS21	12.19	12.65	89.62	77.43	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	276	97	178	50	169		1.41	1.29	1.0	0.3	0.9	187	6	192
21451329	BH1	13-Oct-21	SS22	12.8	13.26	89.62	76.82	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	289	103	186	50	113		1.41	1.29	1.0	0.3	0.8	123	6	129
21451329	BH1	13-Oct-21	SS23	13.41	13.84	89.62	76.21	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	24.2	304	109	194	50	175	0.28	1.41	1.29	1.0	0.3	0.8	189	6	194
21451329	BH1	13-Oct-21	SS24	14.02	14.43	89.62	75.6	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	317	115	202	50	200	0.25	1.41	1.29	1.0	0.3	0.8	214	6	219
21451329	BH1	13-Oct-21	SS25	14.63	15.04	89.62	74.99	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	328	121	207	50	197	0.25	1.41	1.29	1.0	0.3	0.8	209	6	215
21451329	BH1	13-Oct-21	SS26	15.24	15.67	89.62	74.38	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	342	127	215	50	180	0.28	1.41	1.29	1.0	0.3	0.8	189	6	195
21451329	BH1	13-Oct-21	SS27	15.85	16.31	89.62	73.77	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	355	133	222	25	151		1.41	1.29	1.0	0.3	0.8	157	5	162
21451329	BH1	13-Oct-21	SS28	16.46	16.92	89.62	73.16	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	25.29	2.5	22.1	369	139	230	50	118		1.41	1.29	1.0	0.3	0.8	122	6	127
21451329	BH1	13-Oct-21	SS29	17.07	17.53	89.62	72.55	Unit 4b	Silty Clay (CL-ML)	Native	25.29	2.5	22.2	384	145	239	99	76		1.41	1.29	1.0	0.3	0.8	78	5	83
21451329	BH1	13-Oct-21	SS30	17.68	18.14	89.62	71.94	Unit 4b	Silty Clay (CL-ML)	Native	25.29	2.5	26.7	478	151	327	92.423	62		1.41	1.29	1.0	0.3	0.7	58	6	64
21451329	BH1	13-Oct-21	SS31	18.29	18.75	89.62	71.33	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	411	157	254	92.423	26		1.41	1.29	1.0	0.4	0.7	24	6	29
21451329	BH1	13-Oct-21	SS32	18.9	19.35	89.62	70.72	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	425	163	262	99	23		1.41	1.29	1.0	0.4	0.7	20	5	26

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH1	13-Oct-21	SS33	19.51	19.96	89.62	70.11	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	438	169	269	92.423	35		1.41	1.29	1.0	0.3	0.7	33	6	39
21451329	BH1	13-Oct-21	SS34	20.12	20.57	89.62	69.5	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	452	175	277	92.423	36		1.41	1.29	1.0	0.3	0.7	34	6	40
21451329	BH1	13-Oct-21	SS35	20.73	21.18	89.62	68.89	Unit 4b	Lean Clay (CL)	Native	25.29	2.5	22.2	465	181	284	92.423	23		1.41	1.29	1.0	0.4	0.7	19	6	25
21451329	BH1	13-Oct-21	SS36	21.34	21.49	89.62	68.28	Unit 5	Till: Sandy Silt (ML)	Native	25.29	2.5	23.7	508	186	322	64	100	0.14	1.43	1.29	1.0	0.3	0.7	94	6	100
21451329	BH1	13-Oct-21	SS37	21.95	22.38	89.62	67.67	Unit 5	Till: Sandy Silt (ML)	Native	25.29	2.5	23.7	525	193	332	68	194	0.28	1.43	1.29	1.0	0.3	0.7	182	6	187
21451329	BH1	13-Oct-21	SS38	22.56	22.78	89.62	67.06	Unit 4a	Sandy Silt (ML)	Native	25.29	2.5	22.1	501	198	303	52	100	0.07	1.41	1.29	1.0	0.3	0.7	96	6	102
21451329	BH1	13-Oct-21	SS39	23.16	23.62	89.62	66.46	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	554	205	349	68	78		1.43	1.29	1.0	0.3	0.7	72	6	78
21451329	BH1	13-Oct-21	SS40	23.77	24.21	89.62	65.85	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	569	211	358	78	146	0.28	1.43	1.29	1.0	0.3	0.7	134	6	140
21451329	BH1	13-Oct-21	SS41	24.38	24.84	89.62	65.24	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	583	217	366	68	105		1.43	1.29	1.0	0.3	0.7	96	6	101
21451329	BH1	13-Oct-21	SS42	24.99	25.29	89.62	64.63	Unit 5	Till: Silty Caly with Sand (CL-ML)	Native	25.29	2.5	23.7	596	222	374	68	100	0.07	1.43	1.29	1.0	0.3	0.7	91	6	96
21451329	BH16	29-Sep-21	SS1	0	0.61	88.63	88.63	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	24.08	5.52	21	7	0	7	40	36		1.00	1.36	0.6	0.3	1.7	48	6	53
21451329	BH16	29-Sep-21	SS2	0.76	1.22	88.63	87.87	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.08	5.52	21	21	0	21	40	51		1.00	1.36	0.7	0.3	1.5	69	6	74
21451329	BH16	29-Sep-21	SS3	1.52	1.98	88.63	87.11	Unit 2a	Lean Clay with Sand (CL)	Native	24.08	5.52	19.7	36	0	36	77.95	12		1.36	1.36	0.7	0.4	1.5	18	6	24
21451329	BH16	29-Sep-21	SS5	3.05	3.51	88.63	85.58	Unit 2a	Lean Clay with Sand (CL)	Native	24.08	5.52	20.2	66	0	66	77.95	12		1.36	1.36	0.8	0.4	1.2	16	6	21
21451329	BH16	29-Sep-21	SS6	3.81	4.27	88.63	84.82	Unit 2b	Silty Sand (SM)	Native	24.08	5.52	23.2	94	0	94	46	5		1.36	1.36	0.9	0.5	1.0	6	6	12
21451329	BH16	29-Sep-21	SS7	5.33	5.79	88.63	83.3	Unit 2b	Silty Sand (SM)	Native	24.08	5.52	23.2	129	0	129	46	17		1.36	1.36	0.9	0.4	0.9	19	6	25
21451329	BH16	29-Sep-21	SS8	6.1	6.55	88.63	82.53	Unit 2b	Silty Sand (SM)	Native	24.08	5.52	23.2	147	8	139	46	7		1.36	1.36	0.9	0.5	0.8	8	6	13
21451329	BH16	29-Sep-21	SS9	7.62	8.08	88.63	81.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.08	5.52	24.3	191	23	168	48.072	64		1.37	1.36	1.0	0.3	0.9	74	6	80
21451329	BH16	29-Sep-21	SS10	9.14	9.42	88.63	79.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	24.08	5.52	24.3	226	37	189	48.072	50	0.13	1.37	1.36	1.0	0.3	0.8	57	6	63
21451329	BH16	29-Sep-21	SS11	10.67	11.13	88.63	77.96	Unit 4b	Lean Clay (CL)	Native	24.08	5.52	22.2	242	53	189	92.423	78		1.41	1.36	1.0	0.3	0.8	90	6	95
21451329	BH16	29-Sep-21	SS12	12.34	12.65	88.63	76.29	Unit 4a	Silty Sand (SM)	Native	24.08	5.52	22.1	276	68	208	50	73		1.41	1.36	1.0	0.3	0.8	82	6	87
21451329	BH16	29-Sep-21	SS13	13.72	13.94	88.63	74.91	Unit 4a	Silty Sand (SM)	Native	24.08	5.52	22.1	306	82	224	50	50	0.08	1.41	1.36	1.0	0.3	0.8	55	6	61
21451329	BH16	29-Sep-21	SS14	15.2	15.37	88.63	73.43	Unit 4a	Silty Sand (SM)	Native	24.08	5.52	22.1	338	96	242	50	50	0,13	1.41	1.36	1.0	0.3	0.8	54	6	59
21451329	BH16	29-Sep-21	SS15	18.29	18.75	88.63	70.34	Unit 4b	Lean Clay (CL)	Native	24.08	5.52	22.2	411	128	284	92.423	38		1.41	1.36	1.0	0.3	0.8	39	6	44
21451329	BH16	29-Sep-21	SS16	21.34	21.46	88.63	67.29	Unit 4a	Sandy Silt (ML)	Native	24.08	5.52	22.1	473	156	317	50	50	0.13	1.41	1.36	1.0	0.3	0.7	50	6	56
21451329	BH17	5-Aug-21	SS1	0.31	0.61	86.82	86.51	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.66	2.66	21	10	0	10	40	23		1.00	1.00	0.6	0.4	1.7	23	6	29
21451329	BH17	5-Aug-21	SS2	0.89	1.22	86.82	85.93	Unit 2b	Silty Sand with Gravel (SM)	Native	22.66	2.66	23.2	24	0	24	46	12		1.36	1.00	0.7	0.4	1.7	14	6	19
21451329	BH17	5-Aug-21	SS3	1.52	1.98	86.82	85.3	Unit 2b	Silty Sand with Gravel (SM)	Native	22.66	2.66	23.2	40	0	40	39	3		1.36	1.00	0.7	0.6	1.7	4	6	9
21451329	BH17	5-Aug-21	SS4	2.29	2.74	86.82	84.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	22.9	58	0	58	48.072	125		1.37	1.00	0.8	0.3	1.2	112	6	118
21451329	BH17	5-Aug-21	SS5	3.05	3.35	86.82	83.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	78	5	72	48.072	67		1.37	1.00	0.8	0.3	1.1	59	6	65
21451329	BH17	5-Aug-21	SS6	3.81	4.27	86.82	83.01	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	98	14	85	34	54		1.37	1.00	0.9	0.3	1.0	48	5	54
21451329	BH17	5-Aug-21	SS7	4.57	4.85	86.82	82.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	114	20	94	48.072	100	0.13	1.37	1.00	0.9	0.3	1.0	89	6	95
21451329	BH17	5-Aug-21	SS8	5.33	5.79	86.82	81.49	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	135	28	107	48.072	89		1.37	1.00	0.9	0.3	1.0	80	6	85
21451329	BH17	5-Aug-21	SS9	6.1	6.55	86.82	80.72	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	154	36	118	48.072	96		1.37	1.00	0.9	0.3	1.0	86	6	92
21451329	BH17	5-Aug-21	SS10	7.62	8.03	86.82	79.2	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	190	51	140	44	158	0.23	1.37	1.00	1.0	0.3	0.9	141	6	147
21451329	BH17	5-Aug-21	SS11	9.14	9.42	86.82	77.68	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	226	65	161	48.072	100	0.13	1.37	1.00	1.0	0.3	0.9	88	6	94
21451329	BH17	5-Aug-21	SS12	10.67	11.13	86.82	76.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	265	81	184	48.072	150	0.28	1.37	1.00	1.0	0.3	0.9	128	6	133
21451329	BH17	5-Aug-21	SS13	12.19	12.24	86.82	74.63	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	297	94	203	48.072	100	0.05	1.37	1.00	1.0	0.3	0.8	83	6	89
21451329	BH17	5-Aug-21	SS14	13.72	13.77	86.82	73.1	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	334	109	225	48.072	100	0.05	1.37	1.00	1.0	0.3	0.8	81	6	86
21451329	BH17	5-Aug-21	SS15	14.48	14.66	86.82	72.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	354	117	237	48.072	100	0.03	1.37	1.00	1.0	0.3	0.8	80	6	85
21451329	BH17	5-Aug-21	SS16	15.24	15.52	86.82	71.58	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.66	2.66	24.3	374	125	249	48.072	100	0.13	1.37	1.00	1.0	0.3	0.8	79	6	84
21451329	BH17	5-Aug-21	SS17	16	16.46	86.82	70.82	Unit 4b	Lean Clay with Sand (CL)	Native	22.66	2.66	22.2	360	133	227	92.423	33		1.41	1.00	1.0	0.4	0.7	24	6	30
21451329	BH17	5-Aug-21	SS18	16.76	17.22	86.82	70.06	Unit 4b	Lean Clay with Sand (CL)	Native	22.66	2.66	22.2	377	141	237	75	68		1.41	1.00	1.0	0.3	0.8	54	6	60
21451329	BH17	5-Aug-21	SS19	18.29	18.75	86.82	68.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	22.66	2.66	23.7	413	156	258	76	107		1.43	1.00	1.0	0.3	0.8	83	6	89
21451329	BH17	5-Aug-21	SS20	19.86	20.27	86.82	66.96	Unit 4a	Silt with Sand (ML)	Native	22.66	2.66	22.1	448	171	277	50	148		1.41	1.00	1.0	0.3	0.8	113	6	119
21451329	BH17	5-Aug-21	SS21	21.34	21.62	86.82	65.48	Unit 4a	Silt with Sand (ML)	Native	22.66	2.66	22.1	479	185	294	83	100	0.13	1.41	1.00	1.0	0.3	0.8	75	6	81
21451329	BH20	15-Jul-21	SS1	0.3	0.36	86.36	86.06	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	N/A	2.5	21	7	0	7	40	52		1.00	1.36	0.6	0.3	1.7	69	6	75
21451329	BH20	15-Jul-21	SS2	0.76	1.22	86.36	85.6	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	N/A	2.5	23.2	22	0	22	47	8		1.36	1.36	0.7	0.5	1.7	12	6	18
21451329	BH20	15-Jul-21	SS3	1.52	1.98	86.36	84.84	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	41	0	41	48.072	27		1.37	1.36	0.7	0.3	1.3	35	6	40
21451329	BH20	15-Jul-21	SS4	2.29	2.74	86.36	84.07	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	61	0	61	42	102		1.37	1.36	0.8	0.3	1.1	122	6	128
21451329	BH20	15-Jul-21	SS5	3.05	3.51	86.36	83.31	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	80	8	72	48.072	121		1.37	1.36	0.8	0.3	1.1	146	6	152
21451329	BH20	15-Jul-21	SS6	3.81	4.27	86.36	82.55	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	98	15	83	48.072	111		1.37	1.36	0.9	0.3	1.1	135	6	141
21451329	BH20	15-Jul-21	SS7	4.57	5.03	86.36	81.79	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	117	23	94	48.072	66		1.37	1.36	0.9	0.3	1.0	80	6	86
21451329	BH20	15-Jul-21	SS8	5.33	5.79	86.36	81.03	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	135	30	105	34	40		1.37	1.36	0.9	0.3	1.0	49	5	54
21451329	BH20	15-Jul-21	SS9	6.1	6.55	86.36	80.26	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	154	38	116	48.072	81		1.37	1.36	0.9	0.3	1.0	99	6	104
21451329	BH20	15-Jul-21	SS10	7.92	8.08	86.36	78.44	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	194	54	140	48.072	70		1.37	1.36	1.0	0.3	0.9	85	6	91
21451329	BH20	15-Jul-21	SS11	9.14	9.6	86.36	77.22	Unit 3	Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	228	67	160	48.072	115		1.37	1.36	1.0	0.3	0.9	138	6	144
21451329	BH20	15-Jul-21	SS12	10.67	10.95	86.36	75.69	Unit 4a	Gravel with Sand (GW)	Native	N/A	2.5	22.1	239	82	157	4	100	0.13	1.41	1.36	1.0	0.3	0.9	121	0	121
21451329	BH20	15-Jul-21	SS13	12.19	12.65	86.36	74.17	Unit 4a	Gravel with Sand (GW)	Native	N/A	2.5	22.1	274	97	177	50	135		1.41	1.36	1.0	0.3	0.9	158	6	163
21451329	BH20	15-Jul-21	SS14	13.72	14.15	86.36	72.64	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	308	112	196	50	162	0.29	1.41	1.36	1.0	0.3	0.8	184	6	190
21451329	BH20	15-Jul-21	SS15	15.24	15.7	86.36	71.12	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	342	127	215	39	127		1.41	1.36	1.0	0.3	0.8	141	6	147
21451329	BH20	15-Jul-21	SS16	16.76	17.22	86.36	69.6	Unit 4b	Lean Clay (CL)	Native	N/A	2.5	21.1	374	142	232	98	29		1.41	1.36	1.0	0.3	0.8	30	5	35
21451329	BH20	15-Jul-21	SS17	18.42	18.54	86.36	67.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	N/A	2.5	23.7	409	157	253	82	100	0.1	1.43	1.36	1.0	0.3	0.8	106	6	112
21451329	BH20	15-Jul-21	SS18	19.81	20.27	86.36	66.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	N/A	2.5	22.1	444	172	272	50	91		1.41	1.36	1.0	0.3	0.8	95	6	101
21451329	BH27	28-Sep-21	SS1	0.3	0.53	95.47	95.17	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	N/A	2.5	21	9	0	9	40	18		1.00	1.29	0.6	0.4	1.7	23	6	29
21451329	BH27	28-Sep-21	SS2	0.76	1.2	95.47	94.71	Unit 3	Till: Sandy Lean Clay (CL)	Native	N/A	2.5	24.3	22	0	22	57	18		1.37	1.29	0.7	0.4	1.7	26	6	31

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH27	28-Sep-21	SS3	1.52	1.98	95.47	93.95	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	41	0	41	48.072	59		1.37	1.29	0.7	0.3	1.3	69	6	75
21451329	BH27	28-Sep-21	SS4	2.29	2.74	95.47	93.18	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	61	0	61	48.072	78		1.37	1.29	0.8	0.3	1.1	89	6	94
21451329	BH27	28-Sep-21	SS5	3.05	3.35	95.47	92.42	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	78	7	71	48.072	75		1.37	1.29	0.8	0.3	1.1	86	6	91
21451329	BH27	28-Sep-21	SS6	3.81	4.27	95.47	91.66	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	25.4	103	15	88	48.072	184		1.37	1.29	0.9	0.3	1.0	209	6	214
21451329	BH27	28-Sep-21	SS7	4.57	5.03	95.47	90.9	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	117	23	94	58	61		1.37	1.29	0.9	0.3	1.0	70	6	76
21451329	BH27	28-Sep-21	SS8	5.33	5.78	95.47	90.14	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	135	30	105	48.072	154	0.28	1.37	1.29	0.9	0.3	1.0	178	6	183
21451329	BH27	28-Sep-21	SS9	6.1	6.55	95.47	89.37	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	154	38	116	48.072	100	0.1	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH27	28-Sep-21	SS10	7.62	8.08	95.47	87.85	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	191	52	138	48.072	186	0.28	1.37	1.29	1.0	0.3	0.9	214	6	220
21451329	BH27	28-Sep-21	SS11	9.14	9.49	95.47	86.33	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	226	67	160	45	192	0.19	1.37	1.29	1.0	0.3	0.9	218	6	224
21451329	BH27	28-Sep-21	SS12	10.67	10.83	95.47	84.8	Unit 3	Till: Gravelly Silt (ML) to Silty Sand with Gravel (SM)	Native	N/A	2.5	24.3	261	81	180	48.072	100	0.48	1.37	1.29	1.0	0.3	0.9	110	6	116
21451329	BH27	28-Sep-21	SS13	12.19	12.65	95.47	83.28	Unit 4b	Lean Clya (CL)	Native	N/A	2.5	22.2	276	97	178	89	133		1.41	1.29	1.0	0.3	0.9	147	6	152
21451329	BH27	28-Sep-21	SS14	13.72	14.17	95.47	81.75	Unit 4b	Lean Clay (CL)	Native	N/A	2.5	20.6	287	112	175	92.423	123		1.41	1.29	1.0	0.3	0.9	136	6	142
21451329	BH27	28-Sep-21	SS15	15.24	15.52	95.47	80.23	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	340	126	214	50	100	0.13	1.41	1.29	1.0	0.3	0.8	105	6	111
21451329	BH27	28-Sep-21	SS16	18.3	18.76	95.47	77.17	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	21.5	408	157	250	50	149		1.41	1.29	1.0	0.3	0.8	150	6	156
21451329	BH27	28-Sep-21	SS17	21.36	21.65	95.47	74.11	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	473	186	287	44	100	0.14	1.41	1.29	1.0	0.3	0.8	97	6	103
21451329	BH27	28-Sep-21	SS18	24.42	24.88	95.47	71.05	Unit 4b	Lean Clay (CL)	Native	N/A	2.5	22.2	547	217	330	98	24		1.41	1.29	1.0	0.4	0.6	19	5	25
21451329	BH27	28-Sep-21	SS19	27.64	27.69	95.47	67.83	Unit 4a	Silt with Sand (ML)	Native	N/A	2.5	22.1	614	247	367	50	100	0.12	1.41	1.29	1.0	0.3	0.7	91	6	97
21451329	BH27	28-Sep-21	SS20	30.39	30.62	95.47	65.08	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	N/A	2.5	23.7	681	275	407	25	100	0.14	1.43	1.29	1.0	0.3	0.7	89	5	94
21451329	BH29	14-Sep-21	SS1	0	0.61	87.27	87.27	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.96	2.5	21	7	0	7	40	12		1.00	1.29	0.6	0.4	1.7	15	6	21
21451329	BH29	14-Sep-21	SS2	0.76	1.22	87.27	86.51	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.96	2.5	21	21	0	21	40	25		1.00	1.29	0.7	0.3	1.6	34	6	39
21451329	BH29	14-Sep-21	SS3	1.52	1.98	87.27	85.75	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.96	2.5	24	39	0	39	35	12		1.00	1.29	0.7	0.4	1.5	17	6	22
21451329	BH29	14-Sep-21	SS4	2.29	2.74	87.27	84.98	Unit 2b	Silty Clayey Sand (SC-SM)	Native	22.96	2.5	23.2	58	0	58	48	6		1.36	1.29	0.8	0.5	1.3	8	6	13
21451329	BH29	14-Sep-21	SS5	3.05	3.5	87.27	84.22	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	24.3	80	8	72	48.072	20		1.37	1.29	0.8	0.4	1.1	24	6	29
21451329	BH29	14-Sep-21	SS6	3.81	4.27	87.27	83.46	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	24.3	98	15	83	40	42		1.37	1.29	0.9	0.3	1.1	48	6	54
21451329	BH29	14-Sep-21	SS7	4.82	5.03	87.27	82.45	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	24.3	120	24	96	48.072	86		1.37	1.29	0.9	0.3	1.0	99	6	105
21451329	BH29	14-Sep-21	SS8	5.33	5.78	87.27	81.94	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	24.3	135	30	105	48.072	105		1.37	1.29	0.9	0.3	1.0	121	6	127
21451329	BH29	14-Sep-21	SS9	6.1	6.55	87.27	81.17	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	24.3	154	38	116	43	180		1.37	1.29	0.9	0.3	1.0	208	6	213
21451329	BH29	14-Sep-21	SS10	7.62	8.08	87.27	79.65	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	26	204	52	152	48.072	115		1.37	1.29	1.0	0.3	0.9	129	6	135
21451329	BH29	14-Sep-21	SS11	9.14	9.38	87.27	78.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	24.3	225	66	159	48.072	100	0.24	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH29	14-Sep-21	SS12	10.67	11.05	87.27	76.6	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.96	2.5	25.1	273	82	191	48.072	175	0.23	1.37	1.29	1.0	0.3	0.8	190	6	195
21451329	BH29	14-Sep-21	SS13	12.19	12.65	87.27	75.08	Unit 4a	Silty Sand (SM)	Native	22.96	2.5	22.1	274	97	177	45	129		1.41	1.29	1.0	0.3	0.9	143	6	148
21451329	BH29	14-Sep-21	SS14	13.72	14.17	87.27	73.55	Unit 4a	Silty Sand (SM)	Native	22.96	2.5	22.1	308	112	196	87	163		1.41	1.29	1.0	0.3	0.8	175	6	181
21451329	BH29	14-Sep-21	SS15	15.58	15.7	87.27	71.69	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	22.96	2.5	22.1	346	129	217	50	61		1.41	1.29	1.0	0.3	0.8	64	6	70
21451329	BH29	14-Sep-21	SS16	18.29	18.75	87.27	68.98	Unit 4b	Lean Clay (CL)	Native	22.96	2.5	22.2	410	157	252	92.423	25		1.41	1.29	1.0	0.4	0.7	23	6	28
21451329	BH29	14-Sep-21	SS17	21.34	21.79	87.27	65.93	Unit 5	Till: Sandy Silt Clay (CL-ML)	Native	22.96	2.5	23.7	482	187	295	57	157		1.43	1.29	1.0	0.3	0.8	152	6	157
21451329	BH29	14-Sep-21	SS18	22.78	23.19	87.27	64.49	Unit 5	Till: Sandy Silt Clay (CL-ML)	Native	22.96	2.5	23.7	545	201	344	68	151	0.19	1.43	1.29	1.0	0.3	0.7	140	6	146
21451329	BH3	28-Sep-21	SS1	0.3	0.61	89.89	89.59	Unit 1	Fill: Shale rock fragments	Fill	25.44	2.5	21	10	0	10	40	29		1.00	1.29	0.6	0.3	1.7	38	6	43
21451329	BH3	28-Sep-21	SS2	0.76	1.22	89.89	89.13	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	20.2	20	0	20	77.95	10		1.36	1.29	0.7	0.4	1.7	14	6	20
21451329	BH3	28-Sep-21	SS4	2.29	2.74	89.89	87.6	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	20.2	51	0	51	70	10		1.36	1.29	0.8	0.4	1.4	14	6	19
21451329	BH3	28-Sep-21	SS6	3.81	4.27	89.89	86.08	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	21.5	87	15	72	77.95	8		1.36	1.29	0.9	0.5	1.2	10	6	16
21451329	BH3	28-Sep-21	SS7	5.34	5.8	89.89	84.55	Unit 2a	Lean Clay with Sand (CL)	Native	25.44	2.5	20.2	113	30	82	67	3		1.36	1.29	0.9	0.5	1.1	4	6	9
21451329	BH3	28-Sep-21	SS8	6.1	6.71	89.89	83.79	Unit 2b	Silty Sand with Gravel (SM)	Native	25.44	2.5	23.2	149	38	110	46	2		1.36	1.29	0.9	0.6	0.9	2	6	8
21451329	BH3	28-Sep-21	SS9	6.71	7.32	89.89	83.18	Unit 3	Till: Sandy Silt (ML)	Native	25.44	2.5	24.3	171	44	126	48.072	97		1.37	1.29	1.0	0.3	0.9	112	6	117
21451329	BH3	28-Sep-21	SS10	7.63	8.11	89.89	82.26	Unit 3	Till: Sandy Silt (ML)	Native	25.44	2.5	24.3	191	53	139	59	118		1.37	1.29	1.0	0.3	0.9	136	6	141
21451329	BH3	28-Sep-21	SS11	9.15	9.64	89.89	80.74	Unit 3	Till: Sandy Silt (ML)	Native	25.44	2.5	24.3	228	68	161	48.072	122		1.37	1.29	1.0	0.3	0.9	138	6	144
21451329	BH3	28-Sep-21	SS12	10.68	11.16	89.89	79.21	Unit 4b	Lean Clay (CL)	Native	25.44	2.5	22.2	242	83	160	98	78		1.41	1.29	1.0	0.3	0.9	89	5	94
21451329	BH3	28-Sep-21	SS13	12.5	12.62	89.89	77.39	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	278	99	179	50	14	0.27	1.41	1.29	1.0	0.4	0.8	14	6	20
21451329	BH3	28-Sep-21	SS14	13.73	14.15	89.89	76.16	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	308	112	196	50	167	0.25	1.41	1.29	1.0	0.3	0.8	180	6	185
21451329	BH3	28-Sep-21	SS15	15.25	15.71	89.89	74.64	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	342	127	215	33	164	0.28	1.41	1.29	1.0	0.3	0.8	172	5	178
21451329	BH3	28-Sep-21	SS16	16.77	17.04	89.89	73.12	Unit 4a	Silty Sand (SM)	Native	25.44	2.5	22.1	374	141	232	50	100	0.15	1.41	1.29	1.0	0.3	0.8	103	6	109
21451329	BH3	28-Sep-21	SS17	18.3	18.79	89.89	71.59	Unit 4b	Lean Clay (CL)	Native	25.44	2.5	22.2	410	157	253	92.423	24		1.41	1.29	1.0	0.4	0.7	22	6	27
21451329	BH3	28-Sep-21	SS18	19.83	20.31	89.89	70.06	Unit 4a	Silt (ML)	Native	25.44	2.5	22.1	444	172	271	99	52		1.41	1.29	1.0	0.3	0.8	51	5	57
21451329	BH3	28-Sep-21	SS19	21.35	21.84	89.89	68.54	Unit 4b	Lean Clay (CL)	Native	25.44	2.5	22.2	480	187	292	92.423	20		1.41	1.29	1.0	0.4	0.6	16	6	22
21451329	BH3	28-Sep-21	SS20	22.88	23.27	89.89	67.01	Unit 4a	Silt with Sand (ML)	Native	25.44	2.5	25.7	518	202	316	86	172	0.23	1.41	1.29	1.0	0.3	0.7	163	6	169
21451329	BH3	28-Sep-21	SS21	24.4	24.89	89.89	65.49	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.44	2.5	23.7	555	217	337	83	72		1.43	1.29	1.0	0.3	0.7	67	6	73
21451329	BH3	28-Sep-21	SS22	25.32	25.44	89.89	64.57	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.44	2.5	23.7	602	224	377	68	100	0.14	1.43	1.29	1.0	0.3	0.7	91	6	96
21451329	BH30	17-Sep-21	SS1	0	0.61	86.55	86.55	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.21	2.5	21	7	0	7	27	27		1.00	1.29	0.6	0.3	1.7	34	5	39
21451329	BH30	17-Sep-21	SS2	0.76	1.22	86.55	85.79	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.21	2.5	21	21	0	21	40	15		1.00	1.29	0.7	0.4	1.7	22	6	27
21451329	BH30	17-Sep-21	SS3	1.52	1.98	86.55	85.03	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.21	2.5	21	37	0	37	40	22		1.00	1.29	0.7	0.3	1.4	29	6	34
21451329	BH30	17-Sep-21	SS4	2.29	2.74	86.55	84.26	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	61	0	61	48.072	31		1.37	1.29	0.8	0.3	1.2	36	6	41
21451329	BH30	17-Sep-21	SS5	3.05	3.5	86.55	83.5	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	80	8	72	48.072	177		1.37	1.29	0.8	0.3	1.1	203	6	208
21451329	BH30	17-Sep-21	SS6	3.66	4.27	86.55	82.89	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	96	14	82	37	170		1.37	1.29	0.8	0.3	1.1	196	6	201
21451329	BH30	17-Sep-21	SS7	4.57	5.03	86.55	81.98	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	117	23	94	48.072	123		1.37	1.29	0.9	0.3	1.0	142	6	147
21451329	BH30	17-Sep-21	SS8	5.33	5.78	86.55	81.22	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.8	138	30	108	48.072	73		1.37	1.29	0.9	0.3	1.0	84	6	89
21451329	BH30	17-Sep-21	SS9	6.1	6.55	86.55	80.45	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	154	38	116	48.072	138		1.37	1.29	0.9	0.3	1.0	159	6	165
21451329	BH30	17-Sep-21	SS10	7.62	8.08	86.55	78.93	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	191	52	138	48.072	74		1.37	1.29	1.0	0.3	0.9	85	6	91
21451329	BH30	17-Sep-21	SS11	9.14	9.6	86.55	77.41	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	23.8	223	67	156	39	59		1.37	1.29	1.0	0.3	0.9	67	6	73

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R | $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH30	17-Sep-21	SS12	10.67	11.13	86.55	75.88	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	265	82	182	48.072	81		1.37	1.29	1.0	0.3	0.9	89	6	94
21451329	BH30	17-Sep-21	SS13	12.5	12.65	86.55	74.05	Unit 4a	Silty Sand (SM)	Native	22.21	2.5	22.1	278	99	179	17	83		1.41	1.29	1.0	0.3	0.9	91	4	95
21451329	BH30	17-Sep-21	SS14	13.72	14.17	86.55	72.83	Unit 3	Till: Silty Sand with Gravel (SM)	Native	22.21	2.5	24.3	311	112	199	36	82		1.37	1.29	1.0	0.3	0.8	88	6	93
21451329	BH30	17-Sep-21	SS15	15.24	15.7	86.55	71.31	Unit 4b	Lean Clay (CL)	Native	22.21	2.5	22.3	345	127	218	93	48		1.41	1.29	1.0	0.3	0.8	50	6	56
21451329	BH30	17-Sep-21	SS16	18.59	18.75	86.55	67.96	Unit 4a	Silty Sand (SM)	Native	22.21	2.5	20.9	390	159	232	50	143	0.29	1.41	1.29	1.0	0.3	0.8	147	6	153
21451329	BH30	17-Sep-21	SS17	21.34	21.79	86.55	65.21	Unit 5	Till: Silty Sand (SM)	Native	22.21	2.5	23.7	511	187	324	49	120		1.43	1.29	1.0	0.3	0.7	113	6	119
21451329	BH30	17-Sep-21	SS18	22.02	22.27	86.55	64.53	Unit 5	Till: Silty Sand (SM)	Native	22.21	2.5	23.7	525	193	332	68	100	0.13	1.43	1.29	1.0	0.3	0.7	94	6	99
21451329	BH50-3	25-Aug-21	SS1	0	0.46	90.2	90.2	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	26.17	2.01	21	5	0	5	40	16		1.00	1.00	0.6	0.4	1.7	15	6	21
21451329	BH50-3	25-Aug-21	SS2	0.76	1.12	90.2	89.44	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	26.17	2.01	21	20	0	20	40	34		1.00	1.00	0.7	0.3	1.6	36	6	41
21451329	BH50-3	25-Aug-21	SS3	1.6	1.98	90.2	88.6	Unit 2a	Lean Clay with Sand (CL)	Native	26.17	2.01	20.2	36	0	36	64	12		1.36	1.00	0.7	0.4	1.6	14	6	19
21451329	BH50-3	25-Aug-21	SS4	2.29	2.58	90.2	87.91	Unit 3	Till: Sandy Silt (ML)	Native	26.17	2.01	24.3	59	4	55	48.072	100	0.14	1.37	1.00	0.8	0.3	1.2	90	6	96
21451329	BH50-3	25-Aug-21	SS5	3.05	3.51	90.2	87.15	Unit 3	Till: Sandy Silt (ML)	Native	26.17	2.01	24.3	80	12	67	48.072	63		1.37	1.00	0.8	0.3	1.1	57	6	63
21451329	BH50-3	25-Aug-21	SS6	3.81	4.27	90.2	86.39	Unit 3	Till: Sandy Silt (ML)	Native	26.17	2.01	24.3	98	20	78	48.072	116		1.37	1.00	0.9	0.3	1.1	106	6	111
21451329	BH50-3	25-Aug-21	SS7	4.78	5.03	90.2	85.42	Unit 3	Till: Sandy Silt (ML)	Native	26.17	2.01	24.3	119	28	91	48.072	101		1.37	1.00	0.9	0.3	1.0	92	6	98
21451329	BH50-3	25-Aug-21	SS8	5.33	5.61	90.2	84.87	Unit 3	Till: Sandy Silt (ML)	Native	26.17	2.01	24.3	133	34	99	57	100	0.13	1.37	1.00	0.9	0.3	1.0	91	6	97
21451329	BH50-3	25-Aug-21	SS9	6.1	6.3	90.2	84.1	Unit 3	Till: Sandy Silt (ML)	Native	26.17	2.01	24.3	151	41	110	48.072	100	0.05	1.37	1.00	0.9	0.3	1.0	91	6	96
21451329	BH50-3	25-Aug-21	SS11	9.14	9.55	90.2	81.06	Unit 4b	Lean Clay with Sand (CL)	Native	26.17	2.01	22.2	208	72	136	92.423	163	0.23	1.41	1.00	1.0	0.3	0.9	150	6	156
21451329	BH50-3	25-Aug-21	SS12	10.74	11.13	90.2	79.46	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	26.17	2.01	22.1	242	88	154	50	90		1.41	1.00	1.0	0.3	0.9	80	6	86
21451329	BH50-3	25-Aug-21	SS13	12.19	12.65	90.2	78.01	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	26.17	2.01	22.1	274	102	172	50	183		1.41	1.00	1.0	0.3	0.9	159	6	164
21451329	BH50-3	25-Aug-21	SS14	13.72	14.17	90.2	76.48	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	26.17	2.01	22.1	308	117	191	63	123		1.41	1.00	1.0	0.3	0.8	104	6	109
21451329	BH50-3	25-Aug-21	SS15	15.24	15.7	90.2	74.96	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	26.17	2.01	22.1	342	132	210	50	161		1.41	1.00	1.0	0.3	0.8	132	6	138
21451329	BH50-3	25-Aug-21	SS16	16.76	17.15	90.2	73.44	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	26.17	2.01	22.1	375	147	228	50	188	0.23	1.41	1.00	1.0	0.3	0.8	151	6	157
21451329	BH50-3	25-Aug-21	SS17	18.29	18.69	90.2	71.91	Unit 4a	Lean Clay with Sand / Sandy Silt (ML)	Native	26.17	2.01	22.1	409	162	247	50	78		1.41	1.00	1.0	0.3	0.8	61	6	67
21451329	BH50-3	25-Aug-21	SS18	20.04	20.27	90.2	70.16	Unit 4b	Lean Clay with Sand (CL)	Native	26.17	2.01	22.2	446	178	268	92.423	22		1.41	1.00	1.0	0.4	0.6	14	6	20
21451329	BH50-3	25-Aug-21	SS19	21.34	21.79	90.2	68.86	Unit 4b	Lean Clay with Sand (CL)	Native	26.17	2.01	20.7	475	192	283	92.423	24		1.41	1.00	1.0	0.4	0.6	15	6	21
21451329	BH50-3	25-Aug-21	SS20	23.06	23.11	90.2	67.14	Unit 4a	Silt with Sand (ML)	Native	26.17	2.01	22.1	510	207	303	50	100	0.1	1.41	1.00	1.0	0.3	0.7	75	6	80
21451329	BH50-3	25-Aug-21	SS21	24.4	24.89	90.2	65.8	Unit 5	Till: Silty Sand with Gravel (SM)	Native	26.17	2.01	23.7	547	222	325	68	47		1.43	1.00	1.0	0.3	0.7	33	6	38
21451329	BH50-3	25-Aug-21	SS22	25.91	26.17	90.2	64.29	Unit 5	Till: Silty Sand with Gravel (SM)	Native	26.17	2.01	23.7	617	236	381	36	100	0.1	1.43	1.00	1.0	0.3	0.7	70	6	76
21451329	BH51	1-Oct-21	SS1	0	0.61	99.06	99.06	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	33.64	2.5	21	7	0	7	40	24		1.00	1.29	0.6	0.3	1.7	30	6	36
21451329	BH51	1-Oct-21	SS2	0.76	1.2	99.06	98.3	Unit 2a	Lean Clay with Sand (CL)	Native	33.64	2.5	20.2	20	0	20	75	26		1.36	1.29	0.7	0.3	1.6	35	6	41
21451329	BH51	1-Oct-21	SS3	1.52	1.98	99.06	97.54	Unit 3	Till: Silty Sand (SM)	Native	33.64	2.5	24.3	43	0	43	48.072	69		1.37	1.29	0.7	0.3	1.3	80	6	86
21451329	BH51	1-Oct-21	SS4	2.29	2.72	99.06	96.77	Unit 3	Till: Silty Sand (SM)	Native	33.64	2.5	24.3	61	0	61	48	159	0.27	1.37	1.29	0.8	0.3	1.1	180	6	186
21451329	BH51	1-Oct-21	SS5	3.05	3.34	99.06	96.01	Unit 3	Till: Silty Sand (SM)	Native	33.64	2.5	24.3	78	7	71	48.072	100	0.14	1.37	1.29	0.8	0.3	1.1	114	6	120
21451329	BH51	1-Oct-21	SS6	3.81	4.06	99.06	95.25	Unit 3	Till: Silty Sand (SM)	Native	33.64	2.5	24.3	96	14	82	48.072	100	0.1	1.37	1.29	0.8	0.3	1.1	115	6	121
21451329	BH51	1-Oct-21	SS7	4.57	4.85	99.06	94.49	Unit 3	Till: Silty Sand (SM)	Native	33.64	2.5	24.3	114	22	93	48.072	100	0.1	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH51	1-Oct-21	SS8	5.33	5.59	99.06	93.73	Unit 3	Till: Silty Sand (SM)	Native	33.64	2.5	24.3	133	29	104	48.072	100	0.1	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH51	1-Oct-21	SS9	6.1	6.48	99.06	92.96	Unit 3	Till: Silty Clayey Sand (SC-SM)	Native	33.64	2.5	24.3	153	37	116	49	179	0.22	1.37	1.29	0.9	0.3	1.0	207	6	212
21451329	BH51	1-Oct-21	SS10	7.62	8.08	99.06	91.44	Unit 3	Till: Silty Clayey Sand (SC-SM)	Native	33.64	2.5	24.3	191	52	138	48.072	183		1.37	1.29	1.0	0.3	0.9	211	6	216
21451329	BH51	1-Oct-21	SS11	9.14	9.6	99.06	89.92	Unit 4a	Sandy Silt to Silt with Sand (ML)	Native	33.64	2.5	17.1	160	67	93	72	82		1.41	1.29	1.0	0.3	1.0	107	6	113
21451329	BH51	1-Oct-21	SS12	10.9	11.11	99.06	88.16	Unit 4b	Silty Clay with Sand (CL-ML)	Native	33.64	2.5	22.2	244	83	161	92.423	167	0.29	1.41	1.29	1.0	0.3	0.9	189	6	195
21451329	BH51	1-Oct-21	SS13	12.19	12.65	99.06	86.87	Unit 4b	Silty Clay with Sand (CL-ML)	Native	33.64	2.5	23.1	277	97	180	84	122		1.41	1.29	1.0	0.3	0.9	134	6	140
21451329	BH51	1-Oct-21	SS14	13.72	14.17	99.06	85.34	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	33.64	2.5	24.6	315	112	202	56	158		1.37	1.29	1.0	0.3	0.8	169	6	174
21451329	BH51	1-Oct-21	SS15	15.24	15.44	99.06	83.82	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	33.64	2.5	24.3	373	126	247	48.072	100	0.05	1.37	1.29	1.0	0.3	0.8	101	6	107
21451329	BH51	1-Oct-21	SS16	18.29	18.75	99.06	80.77	Unit 4a	Silty Sand (SM)	Native	33.64	2.5	22.1	409	157	252	34	136	0.29	1.41	1.29	1.0	0.3	0.8	137	5	142
21451329	BH51	1-Oct-21	SS17	21.34	21.79	99.06	77.72	Unit 4a	Silty Sand (SM)	Native	33.64	2.5	17.5	463	187	276	50	98		1.41	1.29	1.0	0.3	0.8	96	6	102
21451329	BH51	1-Oct-21	SS18	24.38	24.65	99.06	74.68	Unit 4a	Silty Sand (SM)	Native	33.64	2.5	22.1	528	216	312	41	100	0.11	1.41	1.29	1.0	0.3	0.7	95	6	101
21451329	BH51	1-Oct-21	SS19	27.43	27.89	99.06	71.63	Unit 4b	Lean Clay (CL)	Native	33.64	2.5	22.2	614	247	367	96	35		1.41	1.29	1.0	0.3	0.6	29	5	35
21451329	BH51	1-Oct-21	SS20	30.48	30.94	99.06	68.58	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	33.64	2.5	23.7	686	277	410	63	121		1.43	1.29	1.0	0.3	0.7	107	6	113
21451329	BH51	1-Oct-21	SS21	33.45	33.64	99.06	65.61	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	33.64	2.5	23.7	795	305	491	68	100	0.03	1.43	1.29	1.0	0.3	0.7	85	6	90
21451329	BH52	7-Oct-21	SS1	0	0.61	97.26	97.26	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	31.73	2.5	21	7	0	7	40	17		1.00	1.36	0.6	0.4	1.7	22	6	28
21451329	BH52	7-Oct-21	SS2	0.76	1.2	97.26	96.5	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	31.73	2.5	21	21	0	21	40	19		1.00	1.36	0.7	0.3	1.7	29	6	34
21451329	BH52	7-Oct-21	SS3	1.52	1.66	97.26	95.74	Unit 2a	Sandy Lean Clay (CL-ML)	Native	31.73	2.5	20.2	32	0	32	51	15	0.14	1.36	1.36	0.7	0.4	1.5	22	6	28
21451329	BH52	7-Oct-21	SS4	2.29	2.58	97.26	94.97	Unit 3	Till: Sandy Silt (ML)	Native	31.73	2.5	24.3	59	0	59	48.072	100	0.14	1.37	1.36	0.8	0.3	1.1	120	6	126
21451329	BH52	7-Oct-21	SS5	3.05	3.33	97.26	94.21	Unit 3	Till: Sandy Silt (ML)	Native	31.73	2.5	24.3	78	7	71	48.072	100	0.14	1.37	1.36	0.8	0.3	1.1	121	6	127
21451329	BH52	7-Oct-21	SS6	4.57	4.86	97.26	92.69	Unit 3	Till: Sandy Silt (ML)	Native	31.73	2.5	24.3	115	22	93	54	100	0.13	1.37	1.36	0.9	0.3	1.0	122	6	127
21451329	BH52	7-Oct-21	SS7	6.1	6.55	97.26	91.16	Unit 3	Till: Sandy Silt (ML)	Native	31.73	2.5	24.3	154	38	116	48.072	188		1.37	1.36	0.9	0.3	1.0	229	6	235
21451329	BH52	7-Oct-21	SS8	7.62	7.77	97.26	89.64	Unit 3	Till: Sandy Silt (ML)	Native	31.73	2.5	24.3	187	51	136	48.072	100		1.37	1.36	1.0	0.3	0.9	122	6	127
21451329	BH52	7-Oct-21	SS9	9.14	9.24	97.26	88.12	Unit 3	Till: Sandy Silt (ML)	Native	31.73	2.5	24.3	223	66	158	48.072	100	0.14	1.37	1.36	1.0	0.3	0.9	120	6	126
21451329	BH52	7-Oct-21	SS10	10.67	10.78	97.26	86.59	Unit 3	Till: Sandy Lean Clay (CL)	Native	31.73	2.5	24.3	261	81	180	57	100	0.12	1.37	1.36	1.0	0.3	0.9	116	6	122
21451329	BH52	7-Oct-21	SS11	12.19	12.83	97.26	85.07	Unit 4a	Silt (ML)	Native	31.73	2.5	22.1	276	98	178	50	168	0.11	1.41	1.36	1.0	0.3	0.9	196	6	202
21451329	BH52	7-Oct-21	SS12	13.72	13.97	97.26	83.54	Unit 4a	Silt (ML)	Native	31.73	2.5	22.1	306	111	195	91	100	0.1	1.41	1.36	1.0	0.3	0.8	114	6	119
21451329	BH52	7-Oct-21	SS13	15.24	15.7	97.26	82.02	Unit 4a	Silt (ML)	Native	31.73	2.5	21.7	341	127	214	50	136		1.41	1.36	1.0	0.3	0.8	151	6	157
21451329	BH52	7-Oct-21	SS14	18.32	18.52	97.26	78.94	Unit 4a	Silt (ML)	Native	31.73	2.5	22.1	406	156	250	50	100	0.07	1.41	1.36	1.0	0.3	0.8	107	6	112
21451329	BH52	7-Oct-21	SS15	21.34	21.57	97.26	75.92	Unit 4a	Silt (ML)	Native	31.73	2.5	21.9	470	186	284	87	100	0.07	1.41	1.36	1.0	0.3	0.8	103	6	109
21451329	BH52	7-Oct-21	SS16	24.38	24.52	97.26	72.88	Unit 4a	Silt (ML)	Native	31.73	2.5	22.1	540	215	325	50	100	0.14	1.41	1.36	1.0	0.3	0.7	100	6	105
21451329	BH52	7-Oct-21	SS17	27.43	27.89	97.26	69.83	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	31.73	2.5	23.7	616	247	370	74	160		1.43	1.36	1.0	0.3	0.7	154	6	160
21451329	BH52	7-Oct-21	SS18	30.48	30.72	97.26	66.78	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	31.73	2.5	23.7	686	276	410	68	195	0.24	1.43	1.36	1.0	0.3	0.7	183	6	188

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH52	7-Oct-21	SS19	31.25	31.27	97.26	66.01	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	31.73	2.5	23.7	741	282	459	68	100	0.01	1.43	1.36	1.0	0.3	0.7	91	6	97
21451329	BH53	28-Sep-21	SS1	0	0.61	96.07	96.07	Unit 1	Fill: Sandy Silty Clay (CL-ML)	Fill	31.14	2.5	21	7	0	7	40	14		1.00	1.36	0.6	0.4	1.7	19	6	24
21451329	BH53	28-Sep-21	SS2	0.61	1.07	96.07	95.46	Unit 1	Fil: Sandy Lean Clay (CL)	Fill	31.14	2.5	21	18	0	18	40	12		1.00	1.36	0.6	0.4	1.7	18	6	23
21451329	BH53	28-Sep-21	SS3	1.22	1.68	96.07	94.85	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	32	0	32	48.072	25		1.37	1.36	0.7	0.3	1.4	33	6	39
21451329	BH53	28-Sep-21	SS4	1.83	2.29	96.07	94.24	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	50	0	50	48.072	57		1.37	1.36	0.7	0.3	1.2	69	6	75
21451329	BH53	28-Sep-21	SS5	2.44	2.9	96.07	93.63	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	65	2	63	48.072	78		1.37	1.36	0.8	0.3	1.1	94	6	99
21451329	BH53	28-Sep-21	SS6	3.05	3.51	96.07	93.02	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	80	8	72	48.072	151	0.23	1.37	1.36	0.8	0.3	1.1	183	6	188
21451329	BH53	28-Sep-21	SS7	3.66	4.11	96.07	92.41	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	95	14	81	43	161		1.37	1.36	0.8	0.3	1.1	196	6	201
21451329	BH53	28-Sep-21	SS8	4.27	4.72	96.07	91.8	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	109	20	90	48.072	137		1.37	1.36	0.9	0.3	1.0	167	6	173
21451329	BH53	28-Sep-21	SS9	4.88	5.26	96.07	91.19	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	123	25	98	48.072	149	0.23	1.37	1.36	0.9	0.3	1.0	182	6	187
21451329	BH53	28-Sep-21	SS10	5.49	5.9	96.07	90.58	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	139	31	107	48.072	82		1.37	1.36	0.9	0.3	1.0	100	6	106
21451329	BH53	28-Sep-21	SS11	6.1	6.55	96.07	89.97	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	154	38	116	48.072	88		1.37	1.36	0.9	0.3	1.0	107	6	113
21451329	BH53	28-Sep-21	SS12	6.71	7.16	96.07	89.36	Unit 3	Till: Silty Clayey Sand with Gravel (SC-SM)	Native	31.14	2.5	24.3	169	44	125	48.072	119		1.37	1.36	1.0	0.3	0.9	145	6	151
21451329	BH53	28-Sep-21	SS13	7.32	7.6	96.07	88.75	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	24.3	181	49	133	59	100	0.13	1.37	1.36	1.0	0.3	0.9	122	6	127
21451329	BH53	28-Sep-21	SS14	7.92	8.21	96.07	88.15	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	24.3	196	55	141	48.072	100	0.13	1.37	1.36	1.0	0.3	0.9	122	6	127
21451329	BH53	28-Sep-21	SS15	8.53	8.92	96.07	87.54	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	24.3	212	61	151	48.072	160	0.23	1.37	1.36	1.0	0.3	0.9	194	6	200
21451329	BH53	28-Sep-21	SS16	9.14	9.37	96.07	86.93	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	24.3	225	66	159	48.072	100	0.05	1.37	1.36	1.0	0.3	0.9	120	6	126
21451329	BH53	28-Sep-21	SS17	9.75	10	96.07	86.32	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	24.3	240	72	168	48.072	100	0.13	1.37	1.36	1.0	0.3	0.9	119	6	124
21451329	BH53	28-Sep-21	SS18	10.36	10.77	96.07	85.71	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	19	253	79	174	48.072	158	0.25	1.37	1.36	1.0	0.3	0.9	186	6	191
21451329	BH53	28-Sep-21	SS19	10.97	11.43	96.07	85.1	Unit 3	Till: Lean Clay with Gravel (CL)	Native	31.14	2.5	24.3	269	85	183	48.072	65		1.37	1.36	1.0	0.3	0.9	75	6	81
21451329	BH53	28-Sep-21	SS20	11.58	12.04	96.07	84.49	Unit 3	Till: Lean Clay with Gravel (CL)	Native	31.14	2.5	24.3	283	91	192	78	94		1.37	1.36	1.0	0.3	0.8	108	6	113
21451329	BH53	28-Sep-21	SS21	12.19	12.6	96.07	83.88	Unit 3	Till: Lean Clay with Gravel (CL)	Native	31.14	2.5	24.3	298	97	201	48.072	131	0.25	1.37	1.36	1.0	0.3	0.8	148	6	154
21451329	BH53	28-Sep-21	SS22	12.8	13.26	96.07	83.27	Unit 3	Till: Lean Clay with Gravel (CL)	Native	31.14	2.5	24.3	313	103	210	48.072	126		1.37	1.36	1.0	0.3	0.8	141	6	146
21451329	BH53	28-Sep-21	SS23	13.41	13.72	96.07	82.66	Unit 3	Till: Lean Clay with Gravel (CL)	Native	31.14	2.5	24.3	330	109	221	48.072	90		1.37	1.36	1.0	0.3	0.8	99	6	105
21451329	BH53	28-Sep-21	SS24	14.02	14.43	96.07	82.05	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	314	115	199	50	188	0.25	1.41	1.36	1.0	0.3	0.8	213	6	219
21451329	BH53	28-Sep-21	SS25	14.63	15.09	96.07	81.44	Unit 4b	Lean Clay with Sand (CL)	Native	31.14	2.5	22.2	330	121	209	92.423	93		1.41	1.36	1.0	0.3	0.8	104	6	110
21451329	BH53	28-Sep-21	SS26	15.24	15.7	96.07	80.83	Unit 4b	Lean Clay with Sand (CL)	Native	31.14	2.5	22.2	343	127	216	89	135		1.41	1.36	1.0	0.3	0.8	150	6	155
21451329	BH53	28-Sep-21	SS27	16.18	16.31	96.07	79.89	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	359	135	224	50	112		1.41	1.36	1.0	0.3	0.8	123	6	129
21451329	BH53	28-Sep-21	SS28	16.46	16.89	96.07	79.61	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	23.2	387	139	248	50	191	0.28	1.41	1.36	1.0	0.3	0.8	204	6	210
21451329	BH53	28-Sep-21	SS29	17.07	17.5	96.07	79	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	382	145	237	50	179	0.28	1.41	1.36	1.0	0.3	0.8	194	6	199
21451329	BH53	28-Sep-21	SS30	17.68	18.11	96.07	78.39	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	396	151	245	50	170	0.28	1.41	1.36	1.0	0.3	0.8	183	6	188
21451329	BH53	28-Sep-21	SS31	18.29	18.57	96.07	77.78	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	407	156	251	50	100	0.13	1.41	1.36	1.0	0.3	0.8	107	6	112
21451329	BH53	28-Sep-21	SS32	18.9	19.18	96.07	77.17	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	421	162	259	48	100	0.13	1.41	1.36	1.0	0.3	0.8	106	6	111
21451329	BH53	28-Sep-21	SS33	19.51	19.76	96.07	76.56	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	434	168	266	50	100	0.1	1.41	1.36	1.0	0.3	0.8	105	6	111
21451329	BH53	28-Sep-21	SS34	20.12	20.4	96.07	75.95	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	448	174	274	50	100	0.13	1.41	1.36	1.0	0.3	0.8	104	6	110
21451329	BH53	28-Sep-21	SS35	20.73	21.01	96.07	75.34	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	461	180	281	50	100	0.13	1.41	1.36	1.0	0.3	0.8	103	6	109
21451329	BH53	28-Sep-21	SS36	21.34	21.59	96.07	74.73	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	474	186	288	50	100	0.13	1.41	1.36	1.0	0.3	0.8	103	6	108
21451329	BH53	28-Sep-21	SS37	21.95	22.4	96.07	74.12	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	490	193	297	50	167		1.41	1.36	1.0	0.3	0.8	170	6	176
21451329	BH53	28-Sep-21	SS38	22.81	22.96	96.07	73.26	Unit 4a	Silt with Sand (ML)	Native	31.14	2.5	22.1	506	200	306	50	180	0.28	1.41	1.36	1.0	0.3	0.7	182	6	188
21451329	BH53	28-Sep-21	SS39	23.16	23.45	96.07	72.91	Unit 4a	Silt with Sand (ML)	Native	31.14	2.5	22.1	515	204	311	75	100	0.13	1.41	1.36	1.0	0.3	0.7	101	6	106
21451329	BH53	28-Sep-21	SS40	23.77	24.23	96.07	72.3	Unit 4a	Silt with Sand (ML)	Native	31.14	2.5	22.1	530	211	319	50	139		1.41	1.36	1.0	0.3	0.7	139	6	145
21451329	BH53	28-Sep-21	SS41	24.38	24.79	96.07	71.69	Unit 4b	Lean Clay (CL)	Native	31.14	2.5	22.2	546	217	329	89	40		1.41	1.36	1.0	0.3	0.7	39	6	45
21451329	BH53	28-Sep-21	SS42	24.99	25.45	96.07	71.08	Unit 4b	Lean Clay (CL)	Native	31.14	2.5	22.2	560	223	337	92.423	21		1.41	1.36	1.0	0.4	0.6	17	6	23
21451329	BH53	28-Sep-21	SS43	25.7	25.93	96.07	70.37	Unit 4b	Lean Clay (CL)	Native	31.14	2.5	22.2	573	229	344	92.423	29		1.41	1.36	1.0	0.4	0.6	25	6	31
21451329	BH53	28-Sep-21	SS44	26.21	26.67	96.07	69.86	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	31.14	2.5	23.7	627	235	392	78	186		1.43	1.36	1.0	0.3	0.7	176	6	182
21451329	BH53	28-Sep-21	SS45	27.1	27.23	96.07	68.97	Unit 4a	Silty Sand (SM)	Native	31.14	2.5	22.1	600	242	358	50	157	0.25	1.41	1.36	1.0	0.3	0.7	152	6	158
21451329	BH53	28-Sep-21	SS46	27.43	27.84	96.07	68.64	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	23.7	655	247	408	68	171	0.25	1.43	1.36	1.0	0.3	0.7	160	6	166
21451329	BH53	28-Sep-21	SS47	28.04	28.5	96.07	68.03	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	23.7	670	253	417	68	135		1.43	1.36	1.0	0.3	0.7	126	6	132
21451329	BH53	28-Sep-21	SS48	28.65	29.11	96.07	67.42	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	23.7	684	259	426	68	111		1.43	1.36	1.0	0.3	0.7	103	6	109
21451329	BH53	28-Sep-21	SS49	29.26	29.72	96.07	66.81	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	24.5	723	265	458	57	157		1.43	1.36	1.0	0.3	0.7	143	6	149
21451329	BH53	28-Sep-21	SS50	29.87	30.28	96.07	66.2	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	23.7	713	271	442	68	144	0.25	1.43	1.36	1.0	0.3	0.7	132	6	138
21451329	BH53	28-Sep-21	SS51	30.48	30.76	96.07	65.59	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	31.14	2.5	23.7	726	276	450	68	100	0.13	1.43	1.36	1.0	0.3	0.7	91	6	97
21451329	BH54	7-Oct-21	SS1	0	0.6096	96.67	96.67	Unit 1	Fill: Silty Sand with Gravle (SM)	Fill	32.72	2.5	21	6	0	6	40	29		1.00	1.00	0.6	0.3	1.7	28	6	34
21451329	BH54	7-Oct-21	SS2	0.79	1.22	96.67	95.88	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	24	0	24	48.072	55		1.37	1.00	0.7	0.3	1.5	53	6	59
21451329	BH54	7-Oct-21	SS3	1.52	1.98	96.67	95.15	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	42	0	42	48.072	46		1.37	1.00	0.7	0.3	1.3	42	6	48
21451329	BH54	7-Oct-21	SS4	2.29	2.74	96.67	94.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	61	0	61	44	58		1.37	1.00	0.8	0.3	1.1	51	6	57
21451329	BH54	7-Oct-21	SS5	3.05	3.51	96.67	93.62	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	80	8	72	48.072	137		1.37	1.00	0.8	0.3	1.1	122	6	128
21451329	BH54	7-Oct-21	SS6	3.84	4.22	96.67	92.83	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.2	98	15	83	48.072	173	0.22	1.37	1.00	0.9	0.3	1.1	155	6	161
21451329	BH54	7-Oct-21	SS7	4.57	4.85	96.67	92.1	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	114	22	93	48.072	100	0.13	1.37	1.00	0.9	0.3	1.0	90	6	95
21451329	BH54	7-Oct-21	SS8	5.33	5.6	96.67	91.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	133	29	104	48.072	100	0.11	1.37	1.00	0.9	0.3	1.0	90	6	95
21451329	BH54	7-Oct-21	SS9	6.1	6.29	96.67	90.57	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	151	36	114	48.072	100	0.04	1.37	1.00	0.9	0.3	1.0	90	6	95
21451329	BH54	7-Oct-21	SS10	7.62	8.08	96.67	89.05	Unit 4b	Lean Clay (CL)	Native	32.72	2.5	22.2	174	52	122	89	98		1.41	1.00	1.0	0.3	0.9	91	6	96
21451329	BH54	7-Oct-21	SS11	9.14	9.6	96.67	87.53	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	228	67	160	48.072	117		1.37	1.00	1.0	0.3	0.9	103	6	109
21451329	BH54	7-Oct-21	SS12	10.67	11.15	96.67	86	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	265	83	183	48.072	83		1.37	1.00	1.0	0.3	0.9	71	6	76
21451329	BH54	7-Oct-21	SS13	12.19	12.47	96.67	84.48	Unit 3	Till: Silty Sand with Gravel (SM)	Native	32.72	2.5	24.3	300	96	203	48.072	100	0.13	1.37	1.00	1.0	0.3	0.8	83	6	89
21451329	BH54	7-Oct-21	SS14	13.72	14.14	96.67	82.95	Unit 4a	Sandy Silt (ML)	Native	32.72	2.5	22.1	308	112	196	62	190	0.25	1.41	1.00	1.0	0.3	0.8	159	6	165

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R: $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH54	7-Oct-21	SS15	15.24	15.62	96.67	81.43	Unit 4b	Silty Clay (CL-ML) and Sandy Silt (ML)	Native	32.72	2.5	22.5	347	127	220	89	195	0.23	1.41	1.00	1.0	0.3	0.8	158	6	164
21451329	BH54	7-Oct-21	SS16	18.3	18.59	96.67	78.37	Unit 4a	Silty Sand (SM)	Native	32.72	2.5	21.8	402	156	246	50	100	0.14	1.41	1.00	1.0	0.3	0.8	79	6	85
21451329	BH54	7-Oct-21	SS17	21.34	21.73	96.67	75.33	Unit 4a	Silty Sand (SM)	Native	32.72	2.5	21.9	472	187	285	50	185	0.24	1.41	1.00	1.0	0.3	0.8	140	6	146
21451329	BH54	7-Oct-21	SS18	24.38	24.87	96.67	72.29	Unit 4b	Lean Clay (CL)	Native	32.72	2.5	22.2	540	217	323	97	43		1.41	1.00	1.0	0.3	0.7	29	5	35
21451329	BH54	7-Oct-21	SS19	27.43	27.79	96.67	69.24	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	32.72	2.5	23.7	611	246	365	68	125	0.29	1.43	1.00	1.0	0.3	0.7	89	6	95
21451329	BH54	7-Oct-21	SS20	30.48	30.891	96.67	66.19	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	32.72	2.5	23.7	684	277	407	68	198	0.24	1.43	1.00	1.0	0.3	0.7	137	6	142
21451329	BH55	1-Oct-21	SS1	0	0.61	95.28	95.28	Unit 1	Fill: Silty Sand with Gravle (SM)	Fill	31	2.5	21	7	0	7	40	15		1.00	1.36	0.6	0.4	1.7	20	6	25
21451329	BH55	1-Oct-21	SS2	0.79	1.22	95.28	94.49	Unit 1	Fill: Sandy Lean Clay with Gravel (CL)	Fill	31	2.5	21	21	0	21	40	16		1.00	1.36	0.7	0.4	1.7	24	6	30
21451329	BH55	1-Oct-21	SS3	1.52	2.01	95.28	93.76	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	31	2.5	24.3	40	0	40	48.072	27		1.37	1.36	0.7	0.3	1.3	35	6	41
21451329	BH55	1-Oct-21	SS4	4.57	5.01	95.28	90.71	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	31	2.5	24.3	116	22	94	47	175	0.26	1.37	1.36	0.9	0.3	1.0	213	6	219
21451329	BH55	1-Oct-21	SS5	7.62	7.76	95.28	87.66	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	31	2.5	24.3	187	51	136	55	100	0.11	1.37	1.36	1.0	0.3	0.9	122	6	127
21451329	BH55	1-Oct-21	SS6	10.67	10.95	95.28	84.61	Unit 4a	Silty Sand (SM)	Native	31	2.5	22.8	246	82	165	38	100	0.12	1.41	1.36	1.0	0.3	0.9	119	6	125
21451329	BH55	1-Oct-21	SS7	13.72	14.2	95.28	81.56	Unit 4b	Silty Clay (CL-ML)	Native	31	2.5	22.2	310	112	197	88	76		1.41	1.36	1.0	0.3	0.8	86	6	92
21451329	BH55	1-Oct-21	SS8	16.79	17.25	95.28	78.49	Unit 4a	Silty Sand (SM)	Native	31	2.5	22.4	378	142	236	50	146		1.41	1.36	1.0	0.3	0.8	158	6	164
21451329	BH55	1-Oct-21	SS9	19.83	19.94	95.28	75.45	Unit 4a	Silty Sand (SM)	Native	31	2.5	22.1	440	171	269	50	100	0.11	1.41	1.36	1.0	0.3	0.8	105	6	110
21451329	BH55	1-Oct-21	SS10	22.86	23.34	95.28	72.42	Unit 4a	Silt with Sand (ML)	Native	31	2.5	22.1	511	202	308	76	181		1.41	1.36	1.0	0.3	0.7	183	6	188
21451329	BH55	1-Oct-21	SS11	25.9	26.39	95.28	69.38	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	31	2.5	23.7	620	232	388	75	180		1.43	1.36	1.0	0.3	0.7	171	6	177
21451329	BH55	1-Oct-21	SS12	28.95	29.44	95.28	66.33	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	31	2.5	23.7	692	262	430	68	173		1.43	1.36	1.0	0.3	0.7	160	6	166
21451329	BH55	1-Oct-21	SS13	30.21	30.9	95.28	65.07	Unit 4a	Silty Sand with Gravel (SM)	Native	31	2.5	22.1	675	275	400	24	113		1.41	1.36	1.0	0.3	0.7	107	5	112
21451329	BH55	1-Oct-21	SS14	30.97	31	95.28	64.31	Unit 4a	Silty Sand with Gravel (SM)	Native	31	2.5	22.1	685	279	405	50	100	0.02	1.41	1.36	1.0	0.3	0.7	94	6	100
21451329	BH57	27-Sep-21	SS1	0	0.61	89.77	89.77	Unit 1	Fill: Silty Sand with Gravle (SM)	Fill	N/A	2.5	21	7	0	7	40	26		1.00	1.08	0.6	0.3	1.7	27	6	33
21451329	BH57	27-Sep-21	SS2	0.76	1.22	89.77	89.01	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	N/A	2.5	21	21	0	21	40	23		1.00	1.08	0.7	0.3	1.7	28	6	33
21451329	BH57	27-Sep-21	SS3	1.52	1.98	89.77	88.25	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	N/A	2.5	21	37	0	37	40	26		1.00	1.08	0.7	0.3	1.4	28	6	34
21451329	BH57	27-Sep-21	SS4	2.29	2.74	89.77	87.48	Unit 2a	Lean Clay (CL)	Native	N/A	2.5	20.2	51	0	51	77.95	13		1.36	1.08	0.8	0.4	1.3	15	6	20
21451329	BH57	27-Sep-21	SS5	3.05	3.50	89.77	86.72	Unit 2a	Lean Clay (CL)	Native	N/A	2.5	20.2	66	8	59	77.95	20		1.36	1.08	0.8	0.4	1.2	22	6	27
21451329	BH57	27-Sep-21	SS6	3.81	4.27	89.77	85.96	Unit 2a	Lean Clay (CL)	Native	N/A	2.5	20.2	82	15	67	91	5		1.36	1.08	0.9	0.5	1.2	6	6	11
21451329	BH57	27-Sep-21	SS7	5.33	5.9	89.77	84.44	Unit 2a	Lean Clay (CL)	Native	N/A	2.5	20.2	114	31	83	77.95	6		1.36	1.08	0.9	0.5	1.1	6	6	12
21451329	BH57	27-Sep-21	SS8	6.1	6.55	89.77	83.67	Unit 2b	Silty Clayey Sand (SC-SM)	Native	N/A	2.5	23.2	130	38	92	44	29		1.36	1.08	0.9	0.3	1.0	30	6	35
21451329	BH57	27-Sep-21	SS9	7.62	8.08	89.77	82.15	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	24.5	192	52	140	50	150		1.41	1.08	1.0	0.3	0.9	144	6	150
21451329	BH57	27-Sep-21	SS10	9.14	9.6	89.77	80.63	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	207	67	140	46	165		1.41	1.08	1.0	0.3	0.9	162	6	168
21451329	BH57	27-Sep-21	SS11	10.67	11.13	89.77	79.1	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	241	82	158	50	136	0.29	1.41	1.08	1.0	0.3	0.9	130	6	135
21451329	BH57	27-Sep-21	SS12	12.19	12.65	89.77	77.58	Unit 4b	Silty Clay with Sand (CL-ML)	Native	N/A	2.5	22.2	276	97	178	92.423	139		1.41	1.08	1.0	0.3	0.9	128	6	134
21451329	BH57	27-Sep-21	SS13	13.72	13.97	89.77	76.05	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	N/A	2.5	22.1	306	111	195	50	100	0.1	1.41	1.08	1.0	0.3	0.8	90	6	96
21451329	BH57	27-Sep-21	SS14	15.24	15.7	89.77	74.53	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	N/A	2.5	22.1	342	127	215	50	124		1.41	1.08	1.0	0.3	0.8	109	6	115
21451329	BH57	27-Sep-21	SS15	18.29	18.72	89.77	71.48	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	N/A	2.5	22.1	409	157	252	50	192	0.29	1.41	1.08	1.0	0.3	0.8	162	6	167
21451329	BH57	27-Sep-21	SS16	21.34	21.79	89.77	68.43	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	N/A	2.5	23.7	511	187	324	78	104		1.43	1.08	1.0	0.3	0.7	82	6	88
21451329	BH57	27-Sep-21	SS17	22.86	23.32	89.77	66.91	Unit 4a	Silty Sand (SM)	Native	N/A	2.5	22.1	510	202	308	50	134		1.41	1.08	1.0	0.3	0.7	107	6	113
21451329	BH57	27-Sep-21	SS18	24.38	24.84	89.77	65.39	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	N/A	2.5	23.7	583	217	366	71	38		1.43	1.08	1.0	0.4	0.6	26	6	31
21451329	BH57	27-Sep-21	SS19	24.99	25.09	89.77	64.78	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	N/A	2.5	23.7	593	221	372	68	100		1.43	1.08	1.0	0.3	0.7	76	6	82
21451329	BH59	28-Jun-21	SS1	0	0.61	89.94	89.94	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	26.1	2.5	21	7	0	7	45	33		1.00	1.29	0.6	0.3	1.7	41	6	47
21451329	BH59	28-Jun-21	SS2	0.76	1.22	89.94	89.18	Unit 1	Fill: Silty Sand (SM)	Fill	26.1	2.5	21	21	0	21	40	50		1.00	1.29	0.7	0.3	1.5	64	6	69
21451329	BH59	28-Jun-21	SS3	1.52	1.98	89.94	88.42	Unit 2a	Lean Clay with Sand (CL)	Native	26.1	2.5	20.2	36	0	36	77.95	5		1.36	1.29	0.7	0.5	1.7	8	6	13
21451329	BH59	28-Jun-21	SS4	2.29	2.74	89.94	87.65	Unit 2a	Lean Clay with Sand (CL)	Native	26.1	2.5	20.2	51	0	51	77.95	3		1.36	1.29	0.8	0.5	1.4	4	6	10
21451329	BH59	28-Jun-21	SS5	3.05	3.50	89.94	86.89	Unit 2a	Lean Clay with Sand (CL)	Native	26.1	2.5	20.2	66	8	59	77.95	7		1.36	1.29	0.8	0.5	1.3	10	6	15
21451329	BH59	28-Jun-21	SS6	3.81	4.27	89.94	86.13	Unit 3	Till: Silty Sand with Gravel (SM)	Native	26.1	2.5	24.3	98	15	83	48.072	49		1.37	1.29	0.9	0.3	1.1	56	6	62
21451329	BH59	28-Jun-21	SS7	4.57	4.98	89.94	85.37	Unit 3	Till: Silty Sand with Gravel (SM)	Native	26.1	2.5	24.3	116	22	94	48.072	149	0.1	1.37	1.29	0.9	0.3	1.0	172	6	177
21451329	BH59	28-Jun-21	SS8	5.33	5.61	89.94	84.61	Unit 3	Till: Silty Sand with Gravel (SM)	Native	26.1	2.5	24.3	133	29	104	48.072	100	0.13	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH59	28-Jun-21	SS9	6.1	6.24	89.94	83.84	Unit 3	Till: Silty Sand with Gravel (SM)	Native	26.1	2.5	24.3	150	36	114	48.072	100	0.14	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH59	28-Jun-21	SS10	7.62	8	89.94	82.32	Unit 3	Till: Silty Sand with Gravel (SM)	Native	26.1	2.5	24.3	190	52	138	48.072	162	0.23	1.37	1.29	1.0	0.3	0.9	187	6	192
21451329	BH59	28-Jun-21	SS11	9.14	9.6	89.94	80.8	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	26.1	2.5	22.1	207	67	140	50	95		1.41	1.29	1.0	0.3	0.9	112	6	117
21451329	BH59	28-Jun-21	SS12	10.67	11.13	89.94	79.27	Unit 4b	Sandy Silt (ML) to Silty Sand (SM)	Native	26.1	2.5	22.2	242	82	160	92.423	133		1.41	1.29	1.0	0.3	0.9	151	6	157
21451329	BH59	28-Jun-21	SS13	12.19	12.65	89.94	77.75	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	26.1	2.5	22.1	274	97	177	31	149		1.41	1.29	1.0	0.3	0.9	165	5	170
21451329	BH59	28-Jun-21	SS14	13.72	14.17	89.94	76.22	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	26.1	2.5	22.1	308	112	196	50	157	0.28	1.41	1.29	1.0	0.3	0.8	169	6	175
21451329	BH59	28-Jun-21	SS15	15.24	15.53	89.94	74.7	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	26.1	2.5	22.1	340	126	214	50	100	0.14	1.41	1.29	1.0	0.3	0.8	105	6	111
21451329	BH59	28-Jun-21	SS16	16.76	17.15	89.94	73.18	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	26.1	2.5	22.1	375	142	233	50	157	0.23	1.41	1.29	1.0	0.3	0.8	161	6	167
21451329	BH59	28-Jun-21	SS17	18.29	18.75	89.94	71.65	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	26.1	2.5	22.1	409	157	252	50	143		1.41	1.29	1.0	0.3	0.8	144	6	150
21451329	BH59	28-Jun-21	SS18	19.81	20.27	89.94	70.13	Unit 4b	Lean Clay (CL)	Native	26.1	2.5	22.2	445	172	273	92.423	19		1.41	1.29	1.0	0.4	0.7	16	6	21
21451329	BH59	28-Jun-21	SS19	21.34	21.79	89.94	68.6	Unit 4b	Lean Clay (CL)	Native	26.1	2.5	22.2	479	187	292	92.423	27		1.41	1.29	1.0	0.4	0.7	23	6	29
21451329	BH59	28-Jun-21	SS20	22.86	23.11	89.94	67.08	Unit 4a	Poorly graded Sand (SP)	Native	26.1	2.5	22.1	508	201	307	50	100	0.1	1.41	1.29	1.0	0.3	0.7	96	6	101
21451329	BH59	28-Jun-21	SS21	24.38	24.79	89.94	65.56	Unit 5	Till: Silty Sand (SM)	Native	26.1	2.5	23.7	583	217	366	68	147	0.25	1.43	1.29	1.0	0.3	0.7	134	6	140
21451329	BH59	28-Jun-21	SS22	25.84	26.25	89.94	64.1	Unit 5	Till: Silty Sand (SM)	Native	26.1	2.5	23.7	617	231	386	68	167		1.43	1.29	1.0	0.3	0.7	150	6	156
21451329	BH6	20-Jul-21	SS1	0	0.61	85.25	85.25	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	22.53	2.5	21	7	0	7	40	16		1.00	1.29	0.6	0.4	1.7	20	6	26
21451329	BH6	20-Jul-21	SS2	0.76	1.12	85.25	84.49	Unit 1	Fill: Lean Clay (CL)	Fill	22.53	2.5	21	20	0	20	40	28		1.00	1.29	0.7	0.3	1.6	37	6	43
21451329	BH6	20-Jul-21	SS3	1.52	1.98	85.25	83.73	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	39	0	39	48.072	56		1.37	1.29	0.7	0.3	1.3	67	6	72
21451329	BH6	20-Jul-21	SS4	2.29	2.74	85.25	82.96	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	61	0	61	48.072	83		1.37	1.29	0.8	0.3	1.1	94	6	100
21451329	BH6	20-Jul-21	SS5	3.05	3.51	85.25	82.2	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	80	8	72	43	92		1.37	1.29	0.8	0.3	1.1	105	6	111

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R: $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH6	20-Jul-21	SS6	3.81	4.27	85.25	81.44	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	98	15	83	48.072	102		1.37	1.29	0.9	0.3	1.1	117	6	123
21451329	BH6	20-Jul-21	SS7	4.57	5.03	85.25	80.68	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	117	23	94	48.072	72		1.37	1.29	0.9	0.3	1.0	83	6	89
21451329	BH6	20-Jul-21	SS8	5.33	5.79	85.25	79.92	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24	135	30	105	48.072	66		1.37	1.29	0.9	0.3	1.0	76	6	82
21451329	BH6	20-Jul-21	SS9	6.1	6.55	85.25	79.15	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	154	38	116	52	94		1.37	1.29	0.9	0.3	1.0	108	6	114
21451329	BH6	20-Jul-21	SS10	7.62	8.08	85.25	77.63	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	191	52	138	48.072	85		1.37	1.29	1.0	0.3	0.9	98	6	103
21451329	BH6	20-Jul-21	SS11	9.14	9.6	85.25	76.11	Unit 3	Till: Sandy Silt (ML) to Silty Sand (SM)	Native	22.53	2.5	24.3	228	67	160	48.072	166	0.29	1.37	1.29	1.0	0.3	0.9	188	6	194
21451329	BH6	20-Jul-21	SS12	10.67	10.96	85.25	74.58	Unit 4a	Poorly Graded Gravel with Sand (GP)	Native	22.53	2.5	22.1	239	82	158	50	100	0.14	1.41	1.29	1.0	0.3	0.9	114	6	120
21451329	BH6	20-Jul-21	SS13	12.19	12.65	85.25	73.06	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	302	97	204	48.072	97		1.37	1.29	1.0	0.3	0.8	103	6	109
21451329	BH6	20-Jul-21	SS14	13.71	14.17	85.25	71.54	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	339	112	227	51	142		1.37	1.29	1.0	0.3	0.8	147	6	153
21451329	BH6	20-Jul-21	SS15	15.24	15.7	85.25	70.01	Unit 4a	Silty Sand with Gravel (SM)	Native	22.53	2.5	22.1	342	127	215	31	183	0.29	1.41	1.29	1.0	0.3	0.8	192	5	198
21451329	BH6	20-Jul-21	SS16	16.76	17.22	85.25	68.49	Unit 3	Till: Sandy Silt (ML)	Native	22.53	2.5	24.3	413	142	271	48.072	181	0.25	1.37	1.29	1.0	0.3	0.8	179	6	185
21451329	BH6	20-Jul-21	SS17	18.29	18.75	85.25	66.96	Unit 4a	Silt (ML)	Native	22.53	2.5	22.1	409	157	252	50	94		1.41	1.29	1.0	0.3	0.8	95	6	100
21451329	BH6	20-Jul-21	SS18	19.81	20.27	85.25	65.44	Unit 4a	Silt (ML)	Native	22.53	2.5	22.1	443	172	271	50	71		1.41	1.29	1.0	0.3	0.8	70	6	76
21451329	BH6	20-Jul-21	SS19	20.57	21.03	85.25	64.68	Unit 4b	Lean Clay with Sand (CL)	Native	22.53	2.5	22.2	462	180	282	83	36		1.41	1.29	1.0	0.3	0.7	34	6	39
21451329	BH6	20-Jul-21	SS20	21.34	21.79	85.25	63.91	Unit 5	Lean Clay with Sand (CL)	Native	22.53	2.5	23.7	511	187	324	68	97		1.43	1.29	1.0	0.3	0.7	91	6	97
21451329	BH6	20-Jul-21	SS21	22.1	22.33	85.25	63.15	Unit 5	Lean Clay with Sand (CL)	Native	22.53	2.5	23.7	527	193	333	68	100	0.08	1.43	1.29	1.0	0.3	0.7	94	6	99
21451329	BH60	27-Aug-21	SS1	0	0.61	90.17	90.17	Unit 1	Fill: Poorly Graded Sand with Silt (SP-SM)	Fill	25.3	7.37	21	7	0	7	40	12		1.00	1.00	0.6	0.5	1.7	12	6	17
21451329	BH60	27-Aug-21	SS2	0.76	1.22	90.17	89.41	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	25.3	7.37	21	21	0	21	40	22		1.00	1.00	0.7	0.4	1.7	25	6	30
21451329	BH60	27-Aug-21	SS3	1.52	1.98	90.17	88.65	Unit 1	Fill: Silty Clay with Sand (CL-ML)	Fill	25.3	7.37	21	37	0	37	40	14		1.00	1.00	0.7	0.4	1.5	16	6	21
21451329	BH60	27-Aug-21	SS4	2.29	2.74	90.17	87.88	Unit 2a	Lean Clay with Sand (CL)	Native	25.3	7.37	20.2	51	0	51	76	4		1.36	1.00	0.8	0.5	1.4	4	6	10
21451329	BH60	27-Aug-21	SS5	3.05	3.51	90.17	87.12	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.3	7.37	24.3	80	0	80	48.072	80		1.37	1.00	0.8	0.3	1.1	69	6	75
21451329	BH60	27-Aug-21	SS6	3.81	4.27	90.17	86.36	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.3	7.37	24.3	98	0	98	48.072	102		1.37	1.00	0.9	0.3	1.0	87	6	93
21451329	BH60	27-Aug-21	SS7	4.57	5.03	90.17	85.6	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.3	7.37	24.3	117	0	117	33	133		1.37	1.00	0.9	0.3	1.0	113	5	118
21451329	BH60	27-Aug-21	SS8	5.33	5.47	90.17	84.84	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.3	7.37	24.3	131	0	131	48.072	100	0.14	1.37	1.00	0.9	0.3	0.9	84	6	90
21451329	BH60	27-Aug-21	SS9	6.1	6.32	90.17	84.07	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.3	7.37	24.3	151	0	151	48.072	100	0.08	1.37	1.00	0.9	0.3	0.9	84	6	89
21451329	BH60	27-Aug-21	SS10	7.62	8.08	90.17	82.55	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.3	7.37	24.3	191	5	186	48.072	119		1.37	1.00	1.0	0.3	0.8	99	6	104
21451329	BH60	27-Aug-21	SS11	8.38	8.81	90.17	81.79	Unit 4b	Lean Clay (CL)	Native	25.3	7.37	22.2	191	12	179	92.423	153	0.28	1.41	1.00	1.0	0.3	0.9	130	6	136
21451329	BH60	27-Aug-21	SS12	9.14	9.6	90.17	81.03	Unit 4b	Lean Clay (CL)	Native	25.3	7.37	22.2	208	20	188	87	109		1.41	1.00	1.0	0.3	0.8	92	6	98
21451329	BH60	27-Aug-21	SS13	10.67	11.13	90.17	79.5	Unit 4b	Lean Clay (CL)	Native	25.3	7.37	22.2	242	35	207	92.423	91		1.41	1.00	1.0	0.3	0.8	75	6	81
21451329	BH60	27-Aug-21	SS14	12.19	12.6	90.17	77.98	Unit 4a	Silty Sand (SM)	Native	25.3	7.37	22.1	274	49	225	34	183	0.25	1.41	1.00	1.0	0.3	0.8	148	5	153
21451329	BH60	27-Aug-21	SS15	13.72	14.17	90.17	76.45	Unit 4a	Silty Sand (SM)	Native	25.3	7.37	22.1	308	65	244	50	47		1.41	1.00	1.0	0.3	0.8	36	6	42
21451329	BH60	27-Aug-21	SS16	15.24	15.7	90.17	74.93	Unit 4b	Sandy Lean Clay (CL)	Native	25.3	7.37	22.2	343	79	264	92.423	110		1.41	1.00	1.0	0.3	0.8	85	6	91
21451329	BH60	27-Aug-21	SS17	16.76	17.12	90.17	73.41	Unit 4a	Sandy Silt (ML)	Native	25.3	7.37	22.1	374	94	280	50	171	0.25	1.41	1.00	1.0	0.3	0.8	130	6	136
21451329	BH60	27-Aug-21	SS18	18.47	18.75	90.17	71.7	Unit 4a	Silty Sand (SM)	Native	25.3	7.37	22.1	411	110	301	50	109		1.41	1.00	1.0	0.3	0.7	82	6	87
21451329	BH60	27-Aug-21	SS19	19.81	20.27	90.17	70.36	Unit 4b	Lean Clay (CL)	Native	25.3	7.37	22.2	445	124	321	92.423	17		1.41	1.00	1.0	0.5	0.6	10	6	15
21451329	BH60	27-Aug-21	SS20	21.34	21.79	90.17	68.83	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	25.3	7.37	23.7	511	139	372	68	90		1.43	1.00	1.0	0.3	0.7	64	6	69
21451329	BH60	27-Aug-21	SS21	22.86	23.22	90.17	67.31	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	25.3	7.37	23.7	546	154	392	68	167		1.43	1.00	1.0	0.3	0.7	117	6	122
21451329	BH60	27-Aug-21	SS22	24.38	24.82	90.17	65.79	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	25.3	7.37	23.7	583	169	414	52	188		1.43	1.00	1.0	0.3	0.7	129	6	135
21451329	BH61	6-Aug-21	SS1	0	0.61	89.78	89.78	Unit 1	Fill: Poorly graded Sand with Silt (SP-SM)	Fill	25.6	2.5	21	7	0	7	40	27		1.00	1.08	0.6	0.3	1.7	28	6	34
21451329	BH61	6-Aug-21	SS2	0.76	1.22	89.78	89.02	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.6	2.5	21	21	0	21	40	84		1.00	1.08	0.7	0.3	1.5	90	6	95
21451329	BH61	6-Aug-21	SS3	1.52	1.98	89.78	88.26	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.6	2.5	21	37	0	37	40	36		1.00	1.08	0.7	0.3	1.3	37	6	43
21451329	BH61	6-Aug-21	SS4	2.29	2.74	89.78	87.49	Unit 2a	Lean Clay with Sand (CL)	Native	25.6	2.5	20	50	0	50	78	11		1.36	1.08	0.8	0.5	1.4	13	6	18
21451329	BH61	6-Aug-21	SS5	3.05	3.51	89.78	86.73	Unit 2a	Lean Clay with Sand (CL)	Native	25.6	2.5	20.2	66	8	59	77.95	5		1.36	1.08	0.8	0.5	1.3	6	6	11
21451329	BH61	6-Aug-21	SS8	4.72	5.18	89.78	85.06	Unit 2b	Silty Sand (SM) to Sandy Silt (ML)	Native	25.6	2.5	23.2	115	24	91	50	1		1.36	1.08	0.9	0.6	1.1	1	6	7
21451329	BH61	6-Aug-21	SS9	5.33	5.49	89.78	84.45	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	25.6	2.5	24.3	131	29	103	48.072	142		1.37	1.08	0.9	0.3	1.0	137	6	143
21451329	BH61	6-Aug-21	SS10	6.1	6.38	89.78	83.68	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	25.6	2.5	24.3	152	37	115	50	100	0.13	1.37	1.08	0.9	0.3	1.0	97	6	102
21451329	BH61	6-Aug-21	SS11	7.62	8.08	89.78	82.16	Unit 3	Till: Sandy Lean Clay with Gravel (CL)	Native	25.6	2.5	24.3	191	52	138	48.072	125		1.37	1.08	1.0	0.3	0.9	120	6	126
21451329	BH61	6-Aug-21	SS12	9.14	9.6	89.78	80.64	Unit 3	Till: Sandy Lean Clay with Gravel (CL)	Native	25.6	2.5	24.3	228	67	160	54	106		1.37	1.08	1.0	0.3	0.9	101	6	106
21451329	BH61	6-Aug-21	SS13	10.67	11.13	89.78	79.11	Unit 4a	Silt with Sand (ML)	Native	25.6	2.5	22.1	241	82	158	50	131		1.41	1.08	1.0	0.3	0.9	125	6	130
21451329	BH61	6-Aug-21	SS14	12.19	12.65	89.78	77.59	Unit 4a	Silty Sand (SM)	Native	25.6	2.5	22.1	274	97	177	50	121		1.41	1.08	1.0	0.3	0.9	112	6	118
21451329	BH61	6-Aug-21	SS15	13.72	14.01	89.78	76.06	Unit 4a	Silty Sand (SM)	Native	25.6	2.5	22.1	307	112	195	29	100	0.14	1.41	1.08	1.0	0.3	0.8	90	5	95
21451329	BH61	6-Aug-21	SS16	15.24	15.51	89.78	74.54	Unit 4a	Silty Sand (SM)	Native	25.6	2.5	22.1	340	126	214	50	100	0.11	1.41	1.08	1.0	0.3	0.8	88	6	94
21451329	BH61	6-Aug-21	SS17	16.76	17.22	89.78	73.02	Unit 4b	Lean Clay (CL)	Native	25.6	2.5	22.2	377	142	235	92.423	62		1.41	1.08	1.0	0.3	0.8	53	6	59
21451329	BH61	6-Aug-21	SS18	18.29	18.75	89.78	71.49	Unit 4b	Lean Clay (CL)	Native	25.6	2.5	22.2	411	157	254	92.423	76		1.41	1.08	1.0	0.3	0.8	64	6	69
21451329	BH61	6-Aug-21	SS19	19.81	20.27	89.78	69.97	Unit 4b	Lean Clay (CL)	Native	25.6	2.5	22.2	445	172	273	94	31	0.28	1.41	1.08	1.0	0.4	0.7	23	6	28
21451329	BH61	6-Aug-21	SS20	21.34	21.79	89.78	68.44	Unit 5	Till: Silt (ML)	Native	25.6	2.5	23.7	511	187	324	68	152	0.13	1.43	1.08	1.0	0.3	0.7	120	6	125
21451329	BH61	6-Aug-21	SS21	22.86	23.14	89.78	66.92	Unit 5	Till: Silt (ML)	Native	25.6	2.5	23.7	545	201	344	88	100	0.06	1.43	1.08	1.0	0.3	0.7	78	6	83
21451329	BH61	6-Aug-21	SS22	24.38	24.6	89.78	65.4	Unit 5	Till: Silt (ML)	Native	25.6	2.5	23.7	580	216	365	68	100	0.13	1.43	1.08	1.0	0.3	0.7	76	6	82
21451329	BH62	29-Sep-21	SS1	0	0.609	88.88	88.88	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.38	1.25	21	6	0	6	40	28		1.00	1.36	0.6	0.3	1.7	37	6	43
21451329	BH62	29-Sep-21	SS2	0.609	1.097	88.88	88.271	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24.38	1.25	21	18	0	18	40	44		1.00	1.36	0.6	0.3	1.6	60	6	66
21451329	BH62	29-Sep-21	SS3	1.21	1.7	88.88	87.67	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	24.38	1.25	21	31	2	29	40	12		1.00	1.36	0.7	0.4	1.7	19	6	24
21451329	BH62	29-Sep-21	SS4	1.82	2.31	88.88	87.06	Unit 1	Fill: Sandy Silt with Gravel (ML)	Fill	24.38	1.25	21.4	44	8	36	40	35		1.00	1.36	0.7	0.3	1.3	46	6	52
21451329	BH62	29-Sep-21	SS5	2.44	2.92	88.88	86.44	Unit 2a	Lean Clay with Sand (CL)	Native	24.38	1.25	20.2	54	14	40	77.95	12		1.36	1.36	0.8	0.4	1.5	19	6	24
21451329	BH62	29-Sep-21	SS6	3.05	3.53	88.88	85.83	Unit 2a	Lean Clay with Sand (CL)	Native	24.38	1.25	20.2	66	20	46	77.95	17		1.36	1.36	0.8	0.4	1.3	25	6	30
21451329	BH62	29-Sep-21	SS7	3.66	4.11	88.88	85.22	Unit 2b	Sandy Silt (ML)	Native	24.38	1.25	23.2	90	26	64	46	11		1.36	1.36	0.8	0.4	1.2	15	6	21
21451329	BH62	29-Sep-21	SS8	4.26	4.75	88.88	84.62	Unit 2b	Sandy Silt (ML)	Native	24.38	1.25	23.2	105	32	73	46	3		1.36	1.36	0.9	0.5	1.2	4	6	10

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

$$C_R \begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH62	29-Sep-21	SS10	5.48	5.97	88.88	83.4	Unit 2b	Sandy Silt (ML)	Native	24.38	1.25	23.2	133	44	89	46	2		1.36	1.36	0.9	0.6	1.1	3	6	8
21451329	BH62	29-Sep-21	SS11	6.09	6.58	88.88	82.79	Unit 2b	Sandy Silt (ML)	Native	24.38	1.25	23.2	147	50	97	46	7		1.36	1.36	0.9	0.5	1.0	9	6	15
21451329	BH62	29-Sep-21	SS12	6.7	7.19	88.88	82.18	Unit 2b	Sandy Silt (ML)	Native	24.38	1.25	23.2	161	56	105	46	14		1.36	1.36	1.0	0.4	1.0	18	6	23
21451329	BH62	29-Sep-21	SS13	7.31	7.8	88.88	81.57	Unit 3	Till: Silty Sand (SM)	Native	24.38	1.25	24.3	184	62	122	48.072	14		1.37	1.36	1.0	0.4	0.9	17	6	23
21451329	BH62	29-Sep-21	SS14	7.92	8.41	88.88	80.96	Unit 3	Till: Silty Sand (SM)	Native	24.38	1.25	24.3	199	68	131	48.072	126		1.37	1.36	1.0	0.3	0.9	157	6	162
21451329	BH62	29-Sep-21	SS15	8.53	9.02	88.88	80.35	Unit 3	Till: Silty Sand (SM)	Native	24.38	1.25	24.3	213	74	139	48	136		1.37	1.36	1.0	0.3	0.9	169	6	174
21451329	BH62	29-Sep-21	SS16	9.14	9.63	88.88	79.74	Unit 3	Till: Silty Sand (SM)	Native	24.38	1.25	24.3	228	80	148	48.072	159		1.37	1.36	1.0	0.3	0.9	195	6	200
21451329	BH62	29-Sep-21	SS17	9.75	10.21	88.88	79.13	Unit 3	Till: Silty Sand (SM)	Native	24.38	1.25	24.3	243	86	157	48.072	180		1.37	1.36	1.0	0.3	0.9	217	6	223
21451329	BH62	29-Sep-21	SS18	10.36	10.82	88.88	78.52	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	256	92	164	50	169		1.41	1.36	1.0	0.3	0.9	201	6	207
21451329	BH62	29-Sep-21	SS19	10.97	11.43	88.88	77.91	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	269	98	172	40	180		1.41	1.36	1.0	0.3	0.9	212	6	218
21451329	BH62	29-Sep-21	SS20	11.58	12.07	88.88	77.3	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	21.7	283	104	179	50	126		1.41	1.36	1.0	0.3	0.9	147	6	152
21451329	BH62	29-Sep-21	SS21	12.19	12.5	88.88	76.69	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	295	109	186	50	100	0.14	1.41	1.36	1.0	0.3	0.8	115	6	121
21451329	BH62	29-Sep-21	SS22	12.8	13.1	88.88	76.08	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	308	115	193	50	100	0.13	1.41	1.36	1.0	0.3	0.8	114	6	120
21451329	BH62	29-Sep-21	SS23	13.41	13.7	88.88	75.47	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	300	121	179	50	100	0.14	1.41	1.36	1.0	0.3	0.9	117	6	122
21451329	BH62	29-Sep-21	SS24	14.02	14.43	88.88	74.86	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.38	1.25	22.1	314	127	187	50	180	0.25	1.41	1.36	1.0	0.3	0.8	207	6	213
21451329	BH62	29-Sep-21	SS25	14.63	14.91	88.88	74.25	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.38	1.25	22.1	326	133	194	50	100	0.13	1.41	1.36	1.0	0.3	0.8	114	6	120
21451329	BH62	29-Sep-21	SS26	15.24	15.65	88.88	73.64	Unit 4a	Sandy Silt (ML) to Silty Sand (SM)	Native	24.38	1.25	22.1	341	139	202	50	171	0.24	1.41	1.36	1.0	0.3	0.8	193	6	199
21451329	BH62	29-Sep-21	SS27	15.84	16.03	88.88	73.04	Unit 4b	Lean Clay (CL)	Native	24.38	1.25	22.2	354	144	210	97	81		1.41	1.36	1.0	0.3	0.8	91	5	96
21451329	BH62	29-Sep-21	SS28	16.46	16.92	88.88	72.42	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	369	151	217	50	164		1.41	1.36	1.0	0.3	0.8	182	6	187
21451329	BH62	29-Sep-21	SS29	17.07	17.55	88.88	71.81	Unit 4b	lean Clay (CL)	Native	24.38	1.25	22.2	384	158	227	92.423	173		1.41	1.36	1.0	0.3	0.8	189	6	195
21451329	BH62	29-Sep-21	SS30	17.67	18.16	88.88	71.21	Unit 4b	lean Clay (CL)	Native	24.38	1.25	22.2	398	164	234	92.423	54		1.41	1.36	1.0	0.3	0.8	59	6	64
21451329	BH62	29-Sep-21	SS31	18.28	18.77	88.88	70.6	Unit 4b	lean Clay (CL)	Native	24.38	1.25	22.2	411	170	242	92.423	41		1.41	1.36	1.0	0.3	0.8	44	6	50
21451329	BH62	29-Sep-21	SS32	18.89	19.38	88.88	69.99	Unit 4b	lean Clay (CL)	Native	24.38	1.25	22.2	425	176	249	92.423	24		1.41	1.36	1.0	0.4	0.7	23	6	29
21451329	BH62	29-Sep-21	SS33	19.51	19.96	88.88	69.37	Unit 4b	lean Clay (CL)	Native	24.38	1.25	22.2	438	181	257	92.423	24		1.41	1.36	1.0	0.4	0.7	23	6	28
21451329	BH62	29-Sep-21	SS34	20.11	20.54	88.88	68.77	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	449	187	262	50	165		1.41	1.36	1.0	0.3	0.8	174	6	180
21451329	BH62	29-Sep-21	SS35	20.73	21.18	88.88	68.15	Unit 4a	Silty Sand (SM)	Native	24.38	1.25	22.1	463	193	270	50	195	0.29	1.41	1.36	1.0	0.3	0.8	204	6	210
21451329	BH62	29-Sep-21	SS36	21.33	21.82	88.88	67.55	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.38	1.25	23.7	511	199	312	68	118		1.43	1.36	1.0	0.3	0.7	119	6	124
21451329	BH62	29-Sep-21	SS37	21.94	22.43	88.88	66.94	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.38	1.25	23.7	526	205	320	63	82		1.43	1.36	1.0	0.3	0.7	82	6	88
21451329	BH62	29-Sep-21	SS38	22.55	23.04	88.88	66.33	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.38	1.25	23.7	540	211	329	68	144		1.43	1.36	1.0	0.3	0.7	143	6	149
21451329	BH62	29-Sep-21	SS39	23.16	23.31	88.88	65.72	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.38	1.25	23.7	551	216	335	68	100	0.14	1.43	1.36	1.0	0.3	0.7	99	6	104
21451329	BH62	29-Sep-21	SS40	23.77	24.23	88.88	65.11	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24.38	1.25	23.7	569	223	346	68	183		1.43	1.36	1.0	0.3	0.7	179	6	185
21451329	BH63	14-Sep-21	SS1	0	0.61	87.87	87.87	Unit 1	Fill: Poorly graded Sand with Gravel (SP)	Fill	23.67	2.5	21	7	0	7	40	17		1.00	1.36	0.6	0.4	1.7	22	6	28
21451329	BH63	14-Sep-21	SS2	0.76	1.22	87.87	87.11	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23.67	2.5	21	21	0	21	35	24		1.00	1.36	0.7	0.3	1.6	34	6	40
21451329	BH63	14-Sep-21	SS3	1.52	1.98	87.87	86.35	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23.67	2.5	21	37	0	37	40	14		1.00	1.36	0.7	0.4	1.5	20	6	26
21451329	BH63	14-Sep-21	SS4	4.57	5.03	87.87	83.3	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.67	2.5	24.3	117	23	94	37	166		1.37	1.36	0.9	0.3	1.0	202	6	208
21451329	BH63	14-Sep-21	SS5	7.62	8.08	87.87	80.25	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.67	2.5	24.2	190	52	137	48.072	115		1.37	1.36	1.0	0.3	0.9	140	6	146
21451329	BH63	14-Sep-21	SS6	10.67	11.13	87.87	77.2	Unit 4a	Sandy Silt (ML)	Native	23.67	2.5	20.3	221	82	139	68	201		1.41	1.36	1.0	0.3	0.9	250	6	256
21451329	BH63	14-Sep-21	SS7	13.72	14.17	87.87	74.15	Unit 4a	Sandy Silt (ML)	Native	23.67	2.5	21.2	296	112	183	50	279		1.41	1.36	1.0	0.3	0.9	323	6	329
21451329	BH63	14-Sep-21	SS8	16.76	17.22	87.87	71.11	Unit 4b	lean Clay (CL)	Native	23.67	2.5	22.2	363	142	221	97	43		1.41	1.36	1.0	0.3	0.8	47	5	53
21451329	BH63	14-Sep-21	SS9	19.81	19.96	87.87	68.06	Unit 5	Till: Silty Sand with Gravel (SM)	Native	23.67	2.5	25.6	509	171	339	68	110	0.15	1.43	1.36	1.0	0.3	0.7	108	6	114
21451329	BH63	14-Sep-21	SS10	22.86	23.13	87.87	65.01	Unit 5	Till: Silty Sand with Gravel (SM)	Native	23.67	2.5	23.7	545	201	344	68	100	0.19	1.43	1.36	1.0	0.3	0.7	98	6	104
21451329	BH65	6-Aug-21	SS1	0.03	0.61	89.32	89.29	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.55	1.8	21	7	0	7	40	12	0.02	1.00	1.29	0.6	0.4	1.7	15	6	21
21451329	BH65	6-Aug-21	SS2	0.61	1.07	89.32	88.71	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.55	1.8	21	18	0	18	40	39		1.00	1.29	0.6	0.3	1.6	51	6	56
21451329	BH65	6-Aug-21	SS3	1.22	1.68	89.32	88.1	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.55	1.8	21	30	0	30	40	54		1.00	1.29	0.7	0.3	1.4	66	6	72
21451329	BH65	6-Aug-21	SS4	1.83	2.29	89.32	87.49	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	25.55	1.8	21	43	3	41	40	22		1.00	1.29	0.7	0.3	1.4	29	6	34
21451329	BH65	6-Aug-21	SS5	2.44	2.9	89.32	86.88	Unit 2a	Lean Clay with Sand (CL) to Lean Clay (CL)	Native	25.55	1.8	20.2	54	9	45	82	13		1.36	1.29	0.8	0.4	1.4	18	6	24
21451329	BH65	6-Aug-21	SS8	4.37	4.83	89.32	84.95	Unit 2a	Lean Clay with Sand (CL) to Lean Clay (CL)	Native	25.55	1.8	20.2	93	27	65	96	2		1.36	1.29	0.9	0.6	1.3	3	5	8
21451329	BH65	6-Aug-21	SS10	5.49	5.94	89.32	83.83	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.55	1.8	23.2	133	38	94	46	2		1.36	1.29	0.9	0.6	1.0	2	6	8
21451329	BH65	6-Aug-21	SS12	6.71	7.16	89.32	82.61	Unit 2b	Silty Clayey Sand with Gravel (SC-SM)	Native	25.55	1.8	23.2	161	50	111	46	6		1.36	1.29	1.0	0.5	0.9	7	6	13
21451329	BH65	6-Aug-21	SS13	7.32	7.77	89.32	82	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.55	1.8	24.3	183	56	127	48.072	37		1.37	1.29	1.0	0.3	0.9	43	6	49
21451329	BH65	6-Aug-21	SS14	7.92	8.38	89.32	81.4	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.55	1.8	23.3	190	62	128	48.072	198		1.37	1.29	1.0	0.3	0.9	235	6	240
21451329	BH65	6-Aug-21	SS15	8.53	8.99	89.32	80.79	Unit 3	Till: Silty Sand with Gravel (SM)	Native	25.55	1.8	24.3	213	68	145	48	135		1.37	1.29	1.0	0.3	0.9	157	6	163
21451329	BH65	6-Aug-21	SS16	9.14	9.6	89.32	80.18	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	207	74	133	50	134		1.41	1.29	1.0	0.3	0.9	160	6	165
21451329	BH65	6-Aug-21	SS17	9.75	10.16	89.32	79.57	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	220	80	140	21	179	0.25	1.41	1.29	1.0	0.3	0.9	211	5	215
21451329	BH65	6-Aug-21	SS18	10.36	10.8	89.32	78.96	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	234	86	148	50	181	0.25	1.41	1.29	1.0	0.3	0.9	210	6	216
21451329	BH65	6-Aug-21	SS19	10.97	11.43	89.32	78.35	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	248	92	155	50	200	0.28	1.41	1.29	1.0	0.3	0.9	229	6	235
21451329	BH65	6-Aug-21	SS20	11.58	12.04	89.32	77.74	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	261	98	163	50	159		1.41	1.29	1.0	0.3	0.9	180	6	185
21451329	BH65	6-Aug-21	SS21	12.19	12.6	89.32	77.13	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	274	104	170	50	186	0.23	1.41	1.29	1.0	0.3	0.9	208	6	213
21451329	BH65	6-Aug-21	SS22	12.8	13.1	89.32	76.52	Unit 4b	Sandy Silty Clay (CL-ML)	Native	25.55	1.8	22.2	286	109	177	92.423	85		1.41	1.29	1.0	0.3	0.9	94	6	100
21451329	BH65	6-Aug-21	SS23	13.41	13.87	89.32	75.91	Unit 4b	Sandy Silty Clay (CL-ML)	Native	25.55	1.8	22.2	303	116	187	66	99		1.41	1.29	1.0	0.3	0.8	108	6	114
21451329	BH65	6-Aug-21	SS24	14.02	14.47	89.32	75.3	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	315	122	193	88	184	0.29	1.41	1.29	1.0	0.3	0.8	199	6	204
21451329	BH65	6-Aug-21	SS25	14.63	15.07	89.32	74.69	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	328	128	200	50	174	0.29	1.41	1.29	1.0	0.3	0.8	186	6	192
21451329	BH65	6-Aug-21	SS26	15.24	15.7	89.32	74.08	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	342	134	208	50	184		1.41	1.29	1.0	0.3	0.8	195	6	201
21451329	BH65	6-Aug-21	SS27	15.84	16.31	89.32	73.48	Unit 4a	Silty Sand (SM)	Native	25.55	1.8	22.1	355	140	215	50	160		1.41	1.29	1.0	0.3	0.8	168	6	174
21451329	BH65	6-Aug-21	SS28	16.46	16.92	89.32	72.86	Unit 4a	Silt with Sand (ML)	Native	25.55	1.8	22.1	369	146	223	50	170	0.29	1.41	1.29	1.0	0.3	0.8	177	6	183
21451329	BH65	6-Aug-21	SS29	17.07	17.45	89.32	72.25	Unit 4b	Lean Clay with Sand (CL)	Native	25.55	1.8	22.2	383	152	232	92.423	42		1.41	1.29	1.0	0.3	0.8	43	6	49

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R | $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH65	6-Aug-21	SS30	17.67	18.16	89.32	71.65	Unit 4b	Sandy Lean Clay (CL)	Native	25.55	1.8	22.2	398	158	240	96	133		1.41	1.29	1.0	0.3	0.8	136	5	141
21451329	BH65	6-Aug-21	SS31	18.28	18.77	89.32	71.04	Unit 4b	lean Clay (CL)	Native	25.55	1.8	22.2	411	164	247	92.423	33		1.41	1.29	1.0	0.3	0.8	32	6	37
21451329	BH65	6-Aug-21	SS33	19.51	19.96	89.32	69.81	Unit 4b	lean Clay (CL)	Native	25.55	1.8	22.2	438	176	262	98	26		1.41	1.29	1.0	0.4	0.7	23	5	29
21451329	BH65	6-Aug-21	SS35	20.73	21.18	89.32	68.59	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	25.55	1.8	23.7	497	188	309	68	166	0.26	1.43	1.29	1.0	0.3	0.7	159	6	164
21451329	BH65	6-Aug-21	SS36	21.33	21.6	89.32	67.99	Unit 4b	Sandy Silty Clay (CL-ML)	Native	25.55	1.8	22.2	477	193	284	92.423	100	0.11	1.41	1.29	1.0	0.3	0.8	98	6	103
21451329	BH65	6-Aug-21	SS37	21.94	22.23	89.32	67.38	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.55	1.8	23.7	524	199	324	68	100	0.13	1.43	1.29	1.0	0.3	0.7	94	6	100
21451329	BH65	6-Aug-21	SS38	22.56	23.01	89.32	66.76	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.55	1.8	23.7	540	206	334	68	70		1.43	1.29	1.0	0.3	0.7	65	6	71
21451329	BH65	6-Aug-21	SS39	23.16	23.62	89.32	66.16	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.55	1.8	23.7	554	212	343	72	115		1.43	1.29	1.0	0.3	0.7	107	6	112
21451329	BH65	6-Aug-21	SS40	23.77	24.21	89.32	65.55	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.55	1.8	23.7	569	218	351	68	160	0.28	1.43	1.29	1.0	0.3	0.7	148	6	153
21451329	BH65	6-Aug-21	SS41	24.38	24.64	89.32	64.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.55	1.8	23.7	581	223	358	68	100	0.1	1.43	1.29	1.0	0.3	0.7	92	6	97
21451329	BH65	6-Aug-21	SS42	24.99	25.43	89.32	64.33	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	25.55	1.8	23.7	597	230	368	68	143	0.28	1.43	1.29	1.0	0.3	0.7	130	6	136
21451329	BH69	20-Sep-21	SS1	0	0.61	87.54	87.54	Unit 1	Fill: Silty Sand with gravel (SM)	Fill	23.3	2.5	21	7	0	7	40	28		1.00	1.36	0.6	0.3	1.7	37	6	43
21451329	BH69	20-Sep-21	SS2	0.76	1.22	87.54	86.78	Unit 1	Fill: Silty Sand with gravel (SM)	Fill	23.3	2.5	21	21	0	21	40	56		1.00	1.36	0.7	0.3	1.5	75	6	81
21451329	BH69	20-Sep-21	SS3	1.53	1.98	87.54	86.01	Unit 1	Fill: Sandy Lean Clay with Gravel (CL)	Fill	23.3	2.5	21.8	38	0	38	40	24		1.00	1.36	0.7	0.3	1.4	32	6	38
21451329	BH69	20-Sep-21	SS4	2.29	2.75	87.54	85.25	Unit 3	Till: Silty Sand (SM)	Native	23.3	2.5	24.3	61	0	61	48.072	7		1.37	1.36	0.8	0.5	1.3	9	6	15
21451329	BH69	20-Sep-21	SS5	3.05	3.51	87.54	84.49	Unit 3	Till: Silty Sand (SM)	Native	23.3	2.5	24.3	80	8	72	43	36		1.37	1.36	0.8	0.3	1.1	44	6	49
21451329	BH69	20-Sep-21	SS6	4.58	5.03	87.54	82.96	Unit 3	Till: Silty Sand (SM)	Native	23.3	2.5	24.3	117	23	94	48.072	65		1.37	1.36	0.9	0.3	1.0	79	6	85
21451329	BH69	20-Sep-21	SS7	6.1	6.56	87.54	81.44	Unit 3	Till: Silty Sand (SM)	Native	23.3	2.5	24.3	154	38	116	48.072	157		1.37	1.36	0.9	0.3	1.0	191	6	197
21451329	BH69	20-Sep-21	SS8	7.63	8.11	87.54	79.91	Unit 3	Till: Silty Sand (SM)	Native	23.3	2.5	23	189	53	137	48.072	77		1.37	1.36	1.0	0.3	0.9	94	6	100
21451329	BH69	20-Sep-21	SS9	9.15	9.25	87.54	78.39	Unit 3	Till: Silty Sand (SM)	Native	23.3	2.5	24.3	224	66	158	48.072	100	0.1	1.37	1.36	1.0	0.3	0.9	120	6	126
21451329	BH69	20-Sep-21	SS10	10.68	11.1	87.54	76.86	Unit 3	Till: Silty Sand (SM)	Native	23.3	2.5	24.3	265	82	182	48.072	192	0.28	1.37	1.36	1.0	0.3	0.9	223	6	228
21451329	BH69	20-Sep-21	SS11	12.2	12.48	87.54	75.34	Unit 4a	Sandy Silt (ML)	Native	23.3	2.5	20.8	257	97	160	50	100	0.13	1.41	1.36	1.0	0.3	0.9	120	6	126
21451329	BH69	20-Sep-21	SS12	13.73	14	87.54	73.81	Unit 4a	Sandy Silt (ML)	Native	23.3	2.5	22.1	307	112	195	52	100	0.13	1.41	1.36	1.0	0.3	0.8	114	6	120
21451329	BH69	20-Sep-21	SS13	15.24	15.48	87.54	72.3	Unit 4a	Sandy Silt (ML)	Native	23.3	2.5	22.2	341	126	215	50	100	0.09	1.41	1.36	1.0	0.3	0.8	111	6	117
21451329	BH69	20-Sep-21	SS14	18.29	18.57	87.54	69.25	Unit 5	Till: Lean Clay with Sand (CL)	Native	23.3	2.5	22.9	422	156	266	68	100	0.13	1.43	1.36	1.0	0.3	0.8	105	6	111
21451329	BH69	20-Sep-21	SS15	21.35	21.81	87.54	66.19	Unit 5	Till: Lean Clay with Sand (CL)	Native	23.3	2.5	24	518	187	331	69	63		1.43	1.36	1.0	0.3	0.7	62	6	68
21451329	BH69	20-Sep-21	SS16	22.86	23.14	87.54	64.68	Unit 5	Till: Lean Clay with Sand (CL)	Native	23.3	2.5	23.7	545	201	344	68	100	0.13	1.43	1.36	1.0	0.3	0.7	98	6	104
21451329	BH7	16-Jun-21	SS1	0	0.61	88.1	88.1	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	24	2.5	21	7	0	7	40	18		1.00	1.29	0.6	0.4	1.7	23	6	28
21451329	BH7	16-Jun-21	SS2	0.76	1.22	88.1	87.34	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	24	2.5	21	21	0	21	40	52		1.00	1.29	0.7	0.3	1.5	66	6	72
21451329	BH7	16-Jun-21	SS3	1.52	1.98	88.1	86.58	Unit 1	Fill: Lean Clay with Sand (CL)	Fill	24	2.5	21	37	0	37	40	23		1.00	1.29	0.7	0.3	1.4	30	6	35
21451329	BH7	16-Jun-21	SS4	2.29	2.74	88.1	85.81	Unit 2a	Lean Clay (CL)	Native	24	2.5	20.2	51	0	51	87	11		1.36	1.29	0.8	0.4	1.3	15	6	20
21451329	BH7	16-Jun-21	SS5	3.05	3.51	88.1	85.05	Unit 2a	Lean Clay (CL)	Native	24	2.5	20.2	66	8	59	77.95	19		1.36	1.29	0.8	0.4	1.2	24	6	30
21451329	BH7	16-Jun-21	SS7	4.57	5.03	88.1	83.53	Unit 2b	Silty Sand	Native	24	2.5	23.2	111	23	89	46	11		1.36	1.29	0.9	0.5	1.1	13	6	19
21451329	BH7	16-Jun-21	SS8	5.33	5.79	88.1	82.77	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	135	30	105	48.072	94		1.37	1.29	0.9	0.3	1.0	108	6	114
21451329	BH7	16-Jun-21	SS9	6.1	6.55	88.1	82	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	154	38	116	48	156		1.37	1.29	0.9	0.3	1.0	180	6	186
21451329	BH7	16-Jun-21	SS10	7.62	8.08	88.1	80.48	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	191	52	138	48.072	118		1.37	1.29	1.0	0.3	0.9	136	6	141
21451329	BH7	16-Jun-21	SS11	9.14	9.6	88.1	78.96	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	228	67	160	48.072	147		1.37	1.29	1.0	0.3	0.9	167	6	172
21451329	BH7	16-Jun-21	SS12	10.67	11.13	88.1	77.43	Unit 3	Till: Silty Sand (SM)	Native	24	2.5	24.3	265	82	182	48.072	181		1.37	1.29	1.0	0.3	0.9	199	6	204
21451329	BH7	16-Jun-21	SS13	12.19	12.57	88.1	75.91	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	298	97	201	50	199	0.23	1.41	1.29	1.0	0.3	0.8	213	6	219
21451329	BH7	16-Jun-21	SS14	13.72	14	88.1	74.38	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	330	111	219	50	100	0.13	1.41	1.29	1.0	0.3	0.8	105	6	110
21451329	BH7	16-Jun-21	SS15	15.24	15.67	88.1	72.86	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	366	127	239	50	179	0.28	1.41	1.29	1.0	0.3	0.8	183	6	189
21451329	BH7	16-Jun-21	SS16	18.29	18.75	88.1	69.81	Unit 4b	Lean Clay (CL)	Native	24	2.5	22.2	434	157	276	96	29		1.41	1.29	1.0	0.4	0.7	26	5	32
21451329	BH7	16-Jun-21	SS17	21.34	21.73	88.1	66.76	Unit 4a	Silty Sand (SM)	Native	24	2.5	22.1	476	187	289	50	158	0.24	1.41	1.29	1.0	0.3	0.8	154	6	159
21451329	BH7	16-Jun-21	SS18	23.57	24	88.1	64.53	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	24	2.5	23.7	564	209	355	68	135	0.28	1.43	1.29	1.0	0.3	0.7	124	6	130
21451329	BH70	13-Oct-21	SS1	0	0.61	96.4	96.4	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	30.6	2.5	17.9	6	0	6	40	35		1.00	1.36	0.6	0.3	1.7	46	6	52
21451329	BH70	13-Oct-21	SS2	0.61	1.07	96.4	95.79	Unit 1	Fill: Silty Clayey Sand (SC-SM)	Fill	30.6	2.5	21	17	0	17	40	12		1.00	1.36	0.6	0.4	1.7	18	6	23
21451329	BH70	13-Oct-21	SS3	1.22	1.68	96.4	95.18	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	32	0	32	48.072	43		1.37	1.36	0.7	0.3	1.4	55	6	61
21451329	BH70	13-Oct-21	SS4	1.83	2.29	96.4	94.57	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	50	0	50	48.072	88		1.37	1.36	0.7	0.3	1.2	107	6	113
21451329	BH70	13-Oct-21	SS5	2.44	2.84	96.4	93.96	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	64	1	63	50	191	0.25	1.37	1.36	0.8	0.3	1.1	230	6	235
21451329	BH70	13-Oct-21	SS6	3.05	3.5	96.4	93.35	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	80	8	72	48.072	132	0.28	1.37	1.36	0.8	0.3	1.1	160	6	165
21451329	BH70	13-Oct-21	SS7	3.66	4.11	96.4	92.74	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	95	14	81	48.072	53		1.37	1.36	0.8	0.3	1.1	64	6	70
21451329	BH70	13-Oct-21	SS8	4.27	4.52	96.4	92.13	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	25.8	114	19	95	48.072	145	0.1	1.37	1.36	0.9	0.3	1.0	173	6	179
21451329	BH70	13-Oct-21	SS9	4.88	5.33	96.4	91.52	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	124	26	99	48.072	181		1.37	1.36	0.9	0.3	1.0	221	6	226
21451329	BH70	13-Oct-21	SS10	5.5	5.9	96.4	90.9	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	139	31	107	48.072	132		1.37	1.36	0.9	0.3	1.0	161	6	167
21451329	BH70	13-Oct-21	SS11	6.1	6.55	96.4	90.3	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	154	38	116	53	136		1.37	1.36	0.9	0.3	1.0	166	6	171
21451329	BH70	13-Oct-21	SS12	6.71	7.16	96.4	89.69	Unit 3	Till: Silty Sand (SM) to Sandy Silt (ML)	Native	30.6	2.5	24.3	169	44	125	48.072	95		1.37	1.36	1.0	0.3	0.9	116	6	121
21451329	BH70	13-Oct-21	SS13	7.32	7.77	96.4	89.08	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	30.6	2.5	24.3	183	50	134	57	94		1.37	1.36	1.0	0.3	0.9	114	6	120
21451329	BH70	13-Oct-21	SS14	7.92	8.33	96.4	88.48	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	30.6	2.5	24.3	198	55	142	48.072	166	0.25	1.37	1.36	1.0	0.3	0.9	202	6	207
21451329	BH70	13-Oct-21	SS15	8.53	8.94	96.4	87.87	Unit 4b	Sandy Silty Clay (CL-ML)	Native	30.6	2.5	22.2	211	61	150	92.423	170	0.25	1.41	1.36	1.0	0.3	0.9	207	6	212
21451329	BH70	13-Oct-21	SS16	9.14	9.53	96.4	87.26	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	30.6	2.5	24.3	226	67	159	62	190	0.23	1.37	1.36	1.0	0.3	0.9	229	6	234
21451329	BH70	13-Oct-21	SS17	9.75	10.01	96.4	86.65	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	30.6	2.5	24.3	240	72	168	48.072	100	0.1	1.37	1.36	1.0	0.3	0.9	119	6	124
21451329	BH70	13-Oct-21	SS18	10.36	10.82	96.4	86.04	Unit 3	Till: Lean Clay with Sand (CL)	Native	30.6	2.5	24.3	257	79	178	76	86		1.37	1.36	1.0	0.3	0.9	100	6	106
21451329	BH70	13-Oct-21	SS19	10.97	11.41	96.4	85.43	Unit 4a	Silt (ML)	Native	30.6	2.5	22.1	247	85	162	50	142	0.28	1.41	1.36	1.0	0.3	0.9	170	6	175
21451329	BH70	13-Oct-21	SS20	11.58	11.96	96.4	84.82	Unit 4a	Silt (ML)	Native	30.6	2.5	22.1	260	91	169	50	196	0.1	1.41	1.36	1.0	0.3	0.9	232	6	237
21451329	BH70	13-Oct-21	SS21	12.19	12.6	96.4	84.21	Unit 4a	Silt (ML)	Native	30.6	2.5	22.1	274	97	177	92	164	0.25	1.41	1.36	1.0	0.3	0.9	192	6	197
21451329	BH70	13-Oct-21	SS22	12.8	13.03	96.4	83.6	Unit 4a	Silt (ML)	Native	30.6	2.5	22.1	286	102	183	50	100	0.07	1.41	1.36	1.0	0.3	0.9	116	6	121

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R | $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	Iterative calculation Boulanger & Idriss 2014 m	C_N	$(N_1)_{60}$	$\Delta(N_1)_{60}$	$(N_1)_{60cs}$
	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH70	13-Oct-21	SS23	13.41	13.66	96.4	82.99	Unit 4a	Silt (ML)	Native	30.6	2.5	22.1	299	108	191	95	100	0.1	1.41	1.36	1.0	0.3	0.8	115	6	120
21451329	BH70	13-Oct-21	SS24	14.02	14.48	96.4	82.38	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	316	115	201	92.423	82		1.41	1.36	1.0	0.3	0.8	93	6	98
21451329	BH70	13-Oct-21	SS25	14.63	15.09	96.4	81.77	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	330	121	209	95	60		1.41	1.36	1.0	0.3	0.8	67	6	73
21451329	BH70	13-Oct-21	SS26	15.24	15.7	96.4	81.16	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	343	127	216	92.423	113		1.41	1.36	1.0	0.3	0.8	125	6	131
21451329	BH70	13-Oct-21	SS27	15.85	16.13	96.4	80.55	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	353	132	221	50	100	0.13	1.41	1.36	1.0	0.3	0.8	110	6	116
21451329	BH70	13-Oct-21	SS28	16.46	16.89	96.4	79.94	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	369	139	230	50	195	0.28	1.41	1.36	1.0	0.3	0.8	213	6	218
21451329	BH70	13-Oct-21	SS29	17.07	17.45	96.4	79.33	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	381	145	237	37	198	0.23	1.41	1.36	1.0	0.3	0.8	214	6	220
21451329	BH70	13-Oct-21	SS30	17.68	17.96	96.4	78.72	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	394	150	244	50	100	0.13	1.41	1.36	1.0	0.3	0.8	107	6	113
21451329	BH70	13-Oct-21	SS31	18.29	18.42	96.4	78.11	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	406	156	250	50	100	0.13	1.41	1.36	1.0	0.3	0.8	107	6	112
21451329	BH70	13-Oct-21	SS32	18.9	19.18	96.4	77.5	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	421	162	259	50	100	0.13	1.41	1.36	1.0	0.3	0.8	106	6	111
21451329	BH70	13-Oct-21	SS33	19.51	19.79	96.4	76.89	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	434	168	266	50	100	0.13	1.41	1.36	1.0	0.3	0.8	105	6	111
21451329	BH70	13-Oct-21	SS34	20.12	20.52	96.4	76.28	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	449	175	274	95	176	0.25	1.41	1.36	1.0	0.3	0.8	183	6	189
21451329	BH70	13-Oct-21	SS35	20.73	21.01	96.4	75.67	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	461	180	281	50	100	0.1	1.41	1.36	1.0	0.3	0.8	103	6	109
21451329	BH70	13-Oct-21	SS36	21.34	21.62	96.4	75.06	Unit 4a	Silty Sand (SM)	Native	30.6	2.5	22.1	475	186	289	50	100	0.13	1.41	1.36	1.0	0.3	0.8	103	6	108
21451329	BH70	13-Oct-21	SS37	21.95	22.4	96.4	74.45	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	490	193	297	98	95		1.41	1.36	1.0	0.3	0.8	97	5	102
21451329	BH70	13-Oct-21	SS38	22.56	22.84	96.4	73.84	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	502	198	304	92.423	100	0.1	1.41	1.36	1.0	0.3	0.7	101	6	107
21451329	BH70	13-Oct-21	SS39	23.16	23.57	96.4	73.24	Unit 4a	Silt with Sand (ML)	Native	30.6	2.5	19.3	451	205	246	50	109	0.25	1.41	1.36	1.0	0.3	0.8	117	6	122
21451329	BH70	13-Oct-21	SS40	23.77	24.23	96.4	72.63	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	533	211	322	92.423	51		1.41	1.36	1.0	0.3	0.7	51	6	56
21451329	BH70	13-Oct-21	SS41	24.38	24.84	96.4	72.02	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	546	217	329	98	41		1.41	1.36	1.0	0.3	0.7	41	5	46
21451329	BH70	13-Oct-21	SS42	24.99	25.45	96.4	71.41	Unit 4b	lean Clay (CL)	Native	30.6	2.5	22.2	560	223	337	92.423	47		1.41	1.36	1.0	0.3	0.7	46	6	52
21451329	BH70	13-Oct-21	SS43	25.6	26.06	96.4	70.8	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	574	229	345	68	95		1.43	1.36	1.0	0.3	0.7	93	6	99
21451329	BH70	13-Oct-21	SS44	26.21	26.66	96.4	70.19	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.9	632	235	397	68	137	0.29	1.43	1.36	1.0	0.3	0.7	129	6	135
21451329	BH70	13-Oct-21	SS45	26.82	27.27	96.4	69.58	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	641	241	400	77	116	0.29	1.43	1.36	1.0	0.3	0.7	109	6	115
21451329	BH70	13-Oct-21	SS46	27.43	27.89	96.4	68.97	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	656	247	409	68	166	0.29	1.43	1.36	1.0	0.3	0.7	156	6	161
21451329	BH70	13-Oct-21	SS47	28.04	28.5	96.4	68.36	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	670	253	417	68	100		1.43	1.36	1.0	0.3	0.7	93	6	99
21451329	BH70	13-Oct-21	SS48	28.65	29.11	96.4	67.75	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	684	259	426	68	74		1.43	1.36	1.0	0.3	0.7	69	6	74
21451329	BH70	13-Oct-21	SS49	29.26	29.72	96.4	67.14	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	699	265	434	68	90		1.43	1.36	1.0	0.3	0.7	83	6	89
21451329	BH70	13-Oct-21	SS50	29.87	30.33	96.4	66.53	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	713	271	443	68	142		1.43	1.36	1.0	0.3	0.7	130	6	136
21451329	BH70	13-Oct-21	SS51	30.48	30.5	96.4	65.92	Unit 5	Till: Silt with Sand (ML)	Native	30.6	2.5	23.7	723	275	448	68	100	0.03	1.43	1.36	1.0	0.3	0.7	92	6	97
21451329	BH72	21-Sep-21	SS1	0	0.61	96.65	96.65	Unit 1	Fill: Poorly Graded Sand with Gravel (SP)	Fill	32.17	11.98	21	7	0	7	40	26		1.00	1.08	0.6	0.3	1.7	27	6	33
21451329	BH72	21-Sep-21	SS2	0.762	1.219	96.65	95.888	Unit 1	Fill: Lean Clay (CL)	Fill	32.17	11.98	21	21	0	21	40	17		1.00	1.08	0.7	0.4	1.7	20	6	26
21451329	BH72	21-Sep-21	SS3	1.52	1.98	96.65	95.13	Unit 1	Fill: Silty Sand (SM)	Fill	32.17	11.98	21	37	0	37	40	26		1.00	1.08	0.7	0.3	1.4	28	6	34
21451329	BH72	21-Sep-21	SS4	2.29	2.74	96.65	94.36	Unit 3	Till: Sandy Silt (ML)	Native	32.17	11.98	24.3	61	0	61	48.072	90		1.37	1.08	0.8	0.3	1.1	85	6	91
21451329	BH72	21-Sep-21	SS5	3.05	3.51	96.65	93.6	Unit 3	Till: Sandy Silt (ML)	Native	32.17	11.98	24.3	80	0	80	48.072	122		1.37	1.08	0.8	0.3	1.1	114	6	119
21451329	BH72	21-Sep-21	SS6	3.81	4.09	96.65	92.84	Unit 3	Till: Sandy Silt (ML)	Native	32.17	11.98	24.3	96	0	96	48.072	100	0.13	1.37	1.08	0.8	0.3	1.0	92	6	98
21451329	BH72	21-Sep-21	SS7	4.57	5	96.65	92.08	Unit 3	Till: Sandy Silt (ML)	Native	32.17	11.98	24.3	116	0	116	58	196	0.28	1.37	1.08	0.9	0.3	1.0	179	6	184
21451329	BH72	21-Sep-21	SS8	5.33	5.47	96.65	91.32	Unit 3	Till: Sandy Silt (ML)	Native	32.17	11.98	24.3	131	0	131	48.072	100	0.14	1.37	1.08	0.9	0.3	0.9	91	6	96
21451329	BH72	21-Sep-21	SS9	6.1	6.24	96.65	90.55	Unit 3	Till: Sandy Silt (ML)	Native	32.17	11.98	25.9	160	0	160	48.072	100	0.14	1.37	1.08	0.9	0.3	0.9	88	6	94
21451329	BH72	21-Sep-21	SS10	7.62	7.75	96.65	89.03	Unit 3	Till: Sandy Silt (ML)	Native	32.17	11.98	24.3	187	0	187	48.072	100	0.13	1.37	1.08	1.0	0.3	0.8	89	6	94
21451329	BH72	21-Sep-21	SS11	9.14	9.6	96.65	87.51	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	32.17	11.98	23.2	217	0	217	49	75		1.37	1.08	1.0	0.3	0.8	66	6	71
21451329	BH72	21-Sep-21	SS12	10.67	11.13	96.65	85.98	Unit 3	Till: Sandy Silty Clay (CL-ML)	Native	32.17	11.98	24.3	255	0	255	48.072	55		1.37	1.08	1.0	0.3	0.8	46	6	52
21451329	BH72	21-Sep-21	SS13	12.19	12.65	96.65	84.46	Unit 4a	Silty Sand (SM)	Native	32.17	11.98	22.1	288	4	284	33	81		1.41	1.08	1.0	0.3	0.8	66	5	72
21451329	BH72	21-Sep-21	SS14	13.72	13.94	96.65	82.93	Unit 4a	Silty Sand (SM)	Native	32.17	11.98	25.2	324	18	306	50	100	0.08	1.41	1.08	1.0	0.3	0.7	80	6	86
21451329	BH72	21-Sep-21	SS15	15.24	15.44	96.65	81.41	Unit 4a	Silty Sand (SM)	Native	32.17	11.98	22.1	357	33	324	50	100	0.05	1.41	1.08	1.0	0.3	0.7	79	6	85
21451329	BH72	21-Sep-21	SS16	18.29	18.41	96.65	78.36	Unit 4b	Sandy Silty Clay (CL-ML)	Native	32.17	11.98	22.2	424	62	361	92.423	100	0.13	1.41	1.08	1.0	0.3	0.7	77	6	82
21451329	BH72	21-Sep-21	SS17	21.34	21.56	96.65	75.31	Unit 4a	Silty Sand (SM)	Native	32.17	11.98	22.1	474	93	381	50	100	0.08	1.41	1.08	1.0	0.3	0.7	76	6	81
21451329	BH72	21-Sep-21	SS18	24.38	24.84	96.65	72.27	Unit 4a	Silt with Sand (ML)	Native	32.17	11.98	22.1	544	124	420	91	127		1.41	1.08	1.0	0.3	0.7	94	6	99
21451329	BH72	21-Sep-21	SS19	27.43	27.63	96.65	69.22	Unit 5	Till: Sandy Silt (ML)	Native	32.17	11.98	23.7	652	153	500	65	100	0.05	1.43	1.08	1.0	0.3	0.7	70	6	76
21451329	BH72	21-Sep-21	SS20	30.48	30.58	96.65	66.17	Unit 5	Till: Sandy Silt (ML)	Native	32.17	11.98	23.7	724	182	542	68	100	0.1	1.43	1.08	1.0	0.3	0.6	69	6	75
21451329	BH75	8-Sep-21	SS1	0	0.61	86.53	86.53	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	22.53	2.5	21	7	0	7	40	32		1.00	1.08	0.6	0.3	1.7	33	6	39
21451329	BH75	8-Sep-21	SS2	0.61	1.22	86.53	85.92	Unit 2a	Lean Clay (CL)	Native	22.53	2.5	20.2	19	0	19	91	13		1.36	1.08	0.6	0.4	1.7	15	6	21
21451329	BH75	8-Sep-21	SS3	1.52	1.98	86.53	85.01	Unit 2b	Sandy Silt (ML)	Native	22.53	2.5	23.2	38	0	38	55	12		1.36	1.08	0.7	0.4	1.5	14	6	20
21451329	BH75	8-Sep-21	SS4	2.29	2.74	86.53	84.24	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	61	0	61	48.072	94		1.37	1.08	0.8	0.3	1.1	89	6	95
21451329	BH75	8-Sep-21	SS5	3.05	3.51	86.53	83.48	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	80	8	72	43	163		1.37	1.08	0.8	0.3	1.1	156	6	162
21451329	BH75	8-Sep-21	SS6	3.81	4.27	86.53	82.72	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	98	15	83	48.072	158		1.37	1.08	0.9	0.3	1.1	152	6	158
21451329	BH75	8-Sep-21	SS7	4.57	5.03	86.53	81.96	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	117	23	94	48.072	110		1.37	1.08	0.9	0.3	1.0	106	6	112
21451329	BH75	8-Sep-21	SS8	5.33	5.78	86.53	81.2	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	23.4	130	30	100	48.072	85		1.37	1.08	0.9	0.3	1.0	83	6	89
21451329	BH75	8-Sep-21	SS9	6.1	6.47	86.53	80.43	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	153	37	116	48.072	182	0.22	1.37	1.08	0.9	0.3	1.0	176	6	181
21451329	BH75	8-Sep-21	SS10	7.62	8.08	86.53	78.91	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	191	52	138	48	196	0.27	1.37	1.08	1.0	0.3	0.9	189	6	194
21451329	BH75	8-Sep-21	SS11	9.14	9.57	86.53	77.39	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	227	67	160	48.072	191	0.25	1.37	1.08	1.0	0.3	0.9	181	6	187
21451329	BH75	8-Sep-21	SS12	10.67	10.92	86.53	75.86	Unit 3	Till: Silty Sand (SM)	Native	22.53	2.5	24.3	262	81	181	48.072	100	0.1	1.37	1.08	1.0	0.3	0.9	92	6	98
21451329	BH75	8-Sep-21	SS13	12.19	12.39	86.53	74.34	Unit 4a	Silty Sand (SM)	Native	22.53	2.5	22.1	295	96	199	50	142	0.27	1.41	1.08	1.0	0.3	0.8	127	6	133
21451329	BH75	8-Sep-21	SS14	13.72	14.17	86.53	72.81	Unit 4a	Silty Sand (SM)	Native	22.53	2.5	22.1	332	112	220	48	142	0.27	1.41	1.08	1.0	0.3	0.8	124	6	130
21451329	BH75	8-Sep-21	SS15	15.24	15.6	86.53	71.29	Unit 4b	Silty Clay (CL-ML)	Native	22.53	2.5	22.2	365	127	238	93	146	0.2	1.41	1.08	1.0	0.3	0.8	125	6	130
21451329	BH75	8-Sep-21	SS16	18.3	18.76	86.53	68.23	Unit 5	Silty Clay with Sand (CL-ML)	Native	22.53	2.5	26.8	448	157	291	82	180		1.43	1.08	1.0	0.3	0.8	146	6	152
21451329	BH75	8-Sep-21	SS17	21.36	21.82	86.53	65.17	Unit 5	Silty Clay with Sand (CL-ML)	Native	22.53	2.5	25.1	542	187	355	78	41		1.43	1.08	1.0	0.3	0.7	29	6	34

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R $\begin{cases} C_R = 0.48 + 0.225 \cdot \ln(d) \ ; \ d \le 10m; \\ C_R = 1 \ ; \ 10m < d < 30m \end{cases}$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																							Iterative calculation				
																							Boulanger & Idriss 2014				
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH76	9-Aug-21	SS1	0	0.61	86.12	86.12	Unit 1	Fill: Silty Sand (SM)	Fill	22.36	0.37	21	7	0	7	23	5		1.00	1.29	0.6	0.5	1.7	6	5	11
21451329	BH76	9-Aug-21	SS2	0.76	1.22	86.12	85.36	Unit 1	Fill: Silty Sand (SM)	Fill	22.36	0.37	21	21	6	15	40	1		1.00	1.29	0.7	0.6	1.7	1	6	7
21451329	BH76	9-Aug-21	SS3	1.52	1.98	86.12	84.6	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	39	14	26	48.072	65		1.37	1.29	0.7	0.3	1.4	86	6	92
21451329	BH76	9-Aug-21	SS4	2.29	2.74	86.12	83.83	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	61	21	40	48.072	78		1.37	1.29	0.8	0.3	1.3	99	6	104
21451329	BH76	9-Aug-21	SS5	3.05	3.48	86.12	83.07	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	79	28	51	48.072	180	0.28	1.37	1.29	0.8	0.3	1.2	226	6	231
21451329	BH76	9-Aug-21	SS6	3.81	4.27	86.12	82.31	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	98	36	62	48.072	146		1.37	1.29	0.9	0.3	1.1	181	6	187
21451329	BH76	9-Aug-21	SS7	4.57	5.03	86.12	81.55	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	117	43	73	44	94		1.37	1.29	0.9	0.3	1.1	116	6	121
21451329	BH76	9-Aug-21	SS8	5.33	5.79	86.12	80.79	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	135	51	84	48.072	106		1.37	1.29	0.9	0.3	1.0	130	6	135
21451329	BH76	9-Aug-21	SS9	6.1	6.55	86.12	80.02	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	154	58	95	48.072	108		1.37	1.29	0.9	0.3	1.0	131	6	137
21451329	BH76	9-Aug-21	SS10	7.62	8.08	86.12	78.5	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	191	73	117	48.072	99		1.37	1.29	1.0	0.3	1.0	119	6	125
21451329	BH76	9-Aug-21	SS11	9.14	9.6	86.12	76.98	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	228	88	139	48.072	168		1.37	1.29	1.0	0.3	0.9	198	6	203
21451329	BH76	9-Aug-21	SS12	10.67	11.13	86.12	75.45	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	265	103	162	46	89		1.37	1.29	1.0	0.3	0.9	101	6	106
21451329	BH76	9-Aug-21	SS13	12.19	12.6	86.12	73.93	Unit 3	Till: Silty Sand (SM)	Native	22.36	0.37	24.3	301	118	183	48.072	173	0.25	1.37	1.29	1.0	0.3	0.9	190	6	195
21451329	BH76	9-Aug-21	SS14	13.72	14.01	86.12	72.4	Unit 4a	Silty Sand (SM)	Native	22.36	0.37	22.1	334	132	201	50	100	0.16	1.41	1.29	1.0	0.3	0.8	107	6	112
21451329	BH76	9-Aug-21	SS15	15.24	15.54	86.12	70.88	Unit 4a	Silty Sand (SM)	Native	22.36	0.37	22.1	367	147	220	50	139		1.41	1.29	1.0	0.3	0.8	145	6	151
21451329	BH76	9-Aug-21	SS16	16.76	17.22	86.12	69.36	Unit 4b	Lean Clay (CL)	Native	22.36	0.37	22.2	403	163	240	95	35		1.41	1.29	1.0	0.3	0.8	35	6	40
21451329	BH76	9-Aug-21	SS17	18.29	18.75	86.12	67.83	Unit 4a	Silt (ML)	Native	22.36	0.37	22.4	415	178	237	85	111		1.41	1.29	1.0	0.3	0.8	114	6	119
21451329	BH76	9-Aug-21	SS18	19.81	20.07	86.12	66.31	Unit 4a	Silt (ML)	Native	22.36	0.37	22.1	441	192	249	50	100	0.1	1.41	1.29	1.0	0.3	0.8	101	6	107
21451329	BH76	9-Aug-21	SS19	21.34	21.79	86.12	64.78	Unit 5	Till: Sandy Silty Clay (CL-ML)	Native	22.36	0.37	20.9	451	208	243	60	79		1.43	1.29	1.0	0.3	0.8	80	6	86
21451329	BH77	25-Aug-21	SS1	0	0.61	87.8	87.8	Unit 1	Fill: Sand with Gravel (SP)	Fill	24.19	2.5	21	7	0	7	40	35		1.00	1.29	0.6	0.3	1.7	44	6	49
21451329	BH77	25-Aug-21	SS2	0.76	1.22	87.8	87.04	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	24.19	2.5	21	21	0	21	40	17		1.00	1.29	0.7	0.4	1.7	24	6	30
21451329	BH77	25-Aug-21	SS3	1.52	1.98	87.8	86.28	Unit 2b	Silty Sand with Grvel (SM)	Native	24.19	2.5	23.2	38	0	38	41	7		1.36	1.29	0.7	0.5	1.6	10	6	16
21451329	BH77	25-Aug-21	SS4	2.29	2.74	87.8	85.51	Unit 2b	Silty Sand with Grvel (SM)	Native	24.19	2.5	23.2	58	0	58	46	17		1.36	1.29	0.8	0.4	1.2	21	6	27
21451329	BH77	25-Aug-21	SS5	3.05	3.5	87.8	84.75	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	80	8	72	38	48		1.37	1.29	0.8	0.3	1.1	55	6	61
21451329	BH77	25-Aug-21	SS6	3.81	4.27	87.8	83.99	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	98	15	83	48.072	136		1.37	1.29	0.9	0.3	1.1	156	6	162
21451329	BH77	25-Aug-21	SS7	4.57	5.03	87.8	83.23	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	19.1	92	23	69	48.072	118		1.37	1.29	0.9	0.3	1.1	148	6	153
21451329	BH77	25-Aug-21	SS8	5.33	5.78	87.8	82.47	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	135	30	105	48.072	134		1.37	1.29	0.9	0.3	1.0	155	6	160
21451329	BH77	25-Aug-21	SS9	6.1	6.55	87.8	81.7	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	154	38	116	44	149		1.37	1.29	0.9	0.3	1.0	172	6	178
21451329	BH77	25-Aug-21	SS10	7.62	8.03	87.8	80.18	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	190	52	138	54	185	0.25	1.37	1.29	1.0	0.3	0.9	213	6	219
21451329	BH77	25-Aug-21	SS11	9.14	9.37	87.8	78.66	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	225	66	159	48.072	100	0.08	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH77	25-Aug-21	SS12	10.67	10.92	87.8	77.13	Unit 3	Till: Silty Sand with Gravel (SM) to Sandy Silt (ML)	Native	24.19	2.5	24.3	262	81	181	48.072	100	0.1	1.37	1.29	1.0	0.3	0.9	110	6	116
21451329	BH77	25-Aug-21	SS13	12.19	12.65	87.8	75.61	Unit 4a	Silty Sand with Gravel (SM)	Native	24.19	2.5	22.1	298	97	201	64	135		1.41	1.29	1.0	0.3	0.8	144	6	150
21451329	BH77	25-Aug-21	SS14	13.72	14.14	87.8	74.08	Unit 4a	Silty Sand with Gravel (SM)	Native	24.19	2.5	22.1	332	112	219	50	192	0.27	1.41	1.29	1.0	0.3	0.8	201	6	206
21451329	BH77	25-Aug-21	SS15	15.24	15.84	87.8	72.56	Unit 4a	Silty Sand with Gravel (SM)	Native	24.19	2.5	22.1	367	128	239	50	176	0.29	1.41	1.29	1.0	0.3	0.8	180	6	185
21451329	BH77	25-Aug-21	SS16	16.76	17.22	87.8	71.04	Unit 4b	Lean Clay (CL)	Native	24.19	2.5	22.2	399	142	257	92.423	33		1.41	1.29	1.0	0.3	0.7	31	6	37
21451329	BH77	25-Aug-21	SS17	18.29	18.75	87.8	69.51	Unit 4b	Lean Clay (CL)	Native	24.19	2.5	22.2	411	157	254	86	24		1.41	1.29	1.0	0.4	0.7	22	6	27
21451329	BH77	25-Aug-21	SS18	19.81	20.03	87.8	67.99	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.19	2.5	22.1	440	171	269	50	100	0.06	1.41	1.29	1.0	0.3	0.8	99	6	105
21451329	BH77	25-Aug-21	SS19	21.34	21.62	87.8	66.46	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	24.19	2.5	22.1	475	186	289	50	100	0.13	1.41	1.29	1.0	0.3	0.8	97	6	103
21451329	BH77	25-Aug-21	SS20	22.86	23.32	87.8	64.94	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	24.19	2.5	23.7	513	202	311	75	89		1.43	1.29	1.0	0.3	0.7	85	6	90
21451329	BH77	25-Aug-21	SS21	24.01	24.27	87.8	63.79	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	24.19	2.5	23.7	572	212	360	68	113	0.2	1.43	1.29	1.0	0.3	0.7	104	6	109
21451329	BH8	8-Sep-21	SS1	0	0.61	87.48	87.48	Unit 1	Fill: Silty Sand with Gravel (SM)	Fill	23.29	2.5	21	7	0	7	40	19		1.00	1.29	0.6	0.4	1.7	24	6	29
21451329	BH8	8-Sep-21	SS2	0.61	1.07	87.48	86.87	Unit 1	Fill: Sandy Lean Clay (CL)	Fill	23.29	2.5	21.1	18	0	18	40	11		1.00	1.29	0.6	0.4	1.7	15	6	21
21451329	BH8	8-Sep-21	SS3	1.22	1.68	87.48	86.26	Unit 2a	Lean Clay with Sand (CL)	Native	23.29	2.5	20.2	30	0	30	77.95	14		1.36	1.29	0.7	0.4	1.6	20	6	26
21451329	BH8	8-Sep-21	SS4	1.83	2.29	87.48	85.65	Unit 2a	Lean Clay with Sand (CL)	Native	23.29	2.5	20.2	42	0	42	71	15		1.36	1.29	0.7	0.4	1.4	20	6	26
21451329	BH8	8-Sep-21	SS5	2.44	2.9	87.48	85.04	Unit 2a	Lean Clay with Sand (CL)	Native	23.29	2.5	20.2	54	2	52	77.95	10		1.36	1.29	0.8	0.4	1.3	13	6	19
21451329	BH8	8-Sep-21	SS6	3.05	3.51	87.48	84.43	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	80	8	72	48.072	61		1.37	1.29	0.8	0.3	1.1	70	6	75
21451329	BH8	8-Sep-21	SS7	3.66	3.94	87.48	83.82	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	92	13	80	48.072	100	0.13	1.37	1.29	0.8	0.3	1.1	115	6	121
21451329	BH8	8-Sep-21	SS8	4.27	4.72	87.48	83.21	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	109	20	90	35	95		1.37	1.29	0.9	0.3	1.0	109	6	115
21451329	BH8	8-Sep-21	SS9	4.88	5.33	87.48	82.6	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	124	26	99	48.072	77		1.37	1.29	0.9	0.3	1.0	89	6	94
21451329	BH8	8-Sep-21	SS10	5.49	5.94	87.48	81.99	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	139	32	107	48.072	116		1.37	1.29	0.9	0.3	1.0	134	6	139
21451329	BH8	8-Sep-21	SS11	6.1	6.55	87.48	81.38	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	154	38	116	48.072	70		1.37	1.29	0.9	0.3	1.0	81	6	86
21451329	BH8	8-Sep-21	SS12	6.71	7.16	87.48	80.77	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	169	44	125	48.072	102		1.37	1.29	1.0	0.3	0.9	118	6	123
21451329	BH8	8-Sep-21	SS13	7.32	7.77	87.48	80.16	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	183	50	134	44	68		1.37	1.29	1.0	0.3	0.9	78	6	84
21451329	BH8	8-Sep-21	SS14	7.92	8.06	87.48	79.56	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	194	54	140	48.072	100	0.14	1.37	1.29	1.0	0.3	0.9	115	6	121
21451329	BH8	8-Sep-21	SS15	8.53	8.97	87.48	78.95	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	213	61	151	48.072	182	0.28	1.37	1.29	1.0	0.3	0.9	209	6	215
21451329	BH8	8-Sep-21	SS16	9.14	9.39	87.48	78.34	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	225	66	159	48.072	100	0.09	1.37	1.29	1.0	0.3	0.9	114	6	119
21451329	BH8	8-Sep-21	SS17	9.75	9.88	87.48	77.73	Unit 3	Till: Silty Sand with Gravel (SM)	Native	23.29	2.5	24.3	239	72	167	48.072	100	0.13	1.37	1.29	1.0	0.3	0.9	112	6	118
21451329	BH8	8-Sep-21	SS18	10.36	10.82	87.48	77.12	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	234	79	155	56	163		1.41	1.29	1.0	0.3	0.9	187	6	192
21451329	BH8	8-Sep-21	SS19	10.97	11.39	87.48	76.51	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	247	85	162	50	168	0.27	1.41	1.29	1.0	0.3	0.9	190	6	196
21451329	BH8	8-Sep-21	SS20	11.58	12	87.48	75.9	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	261	91	169	50	178	0.27	1.41	1.29	1.0	0.3	0.9	199	6	205
21451329	BH8	8-Sep-21	SS21	12.19	12.46	87.48	75.29	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	272	96	176	50	100	0.11	1.41	1.29	1.0	0.3	0.9	111	6	116
21451329	BH8	8-Sep-21	SS22	12.8	13.09	87.48	74.68	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	286	103	184	50	100	0.14	1.41	1.29	1.0	0.3	0.9	110	6	115
21451329	BH8	8-Sep-21	SS23	13.41	13.69	87.48	74.07	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	299	108	191	50	100	0.13	1.41	1.29	1.0	0.3	0.8	108	6	114
21451329	BH8	8-Sep-21	SS24	14.02	14.45	87.48	73.46	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	315	115	200	50	197	0.28	1.41	1.29	1.0	0.3	0.8	211	6	217
21451329	BH8	8-Sep-21	SS25	14.63	15.05	87.48	72.85	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	328	121	207	71	195	0.27	1.41	1.29	1.0	0.3	0.8	207	6	213
21451329	BH8	8-Sep-21	SS26	15.24	15.7	87.48	72.24	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	342	127	215	50	145		1.41	1.29	1.0	0.3	0.8	152	6	158

Table C-1g: SPT Blow Count Processed Data - EME Route Area

1) C_R - Rod length correction factor (Cetin et al. 2016)
2) C_N - Overburden correction factor; equation exponent "m" (Boulanger & Idr
3) $(N_1)_{60}$ - Corrected SPT N value normalized to 1 atm.
4) $(N_1)_{60cs}$ - Clean sand equivalent normalized SPT N value (Boulanger & Idris
5) Samples must be sorted in ascending order with depth for the σ_v calculation to function

Cell Colour Legend
Calculation cell
Referenced to Lookup Table
If no GWT data, assumed 2.5 mbgs (Refer to lookup tab)

Reference Equations:

C_R: $C_R = 0.48 + 0.225 \cdot \ln(d)$; $d \le 10m$; $C_R = 1$; $10m < d < 30m$

d = length from top of sampler to hammer striking point

$$C_N = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7 \qquad m = 0.784 - 0.0768\sqrt{(N_1)_{60cs}}$$

$$\Delta(N_1)_{60} = \exp\left(1.63 + \frac{9.7}{FC+0.01} - \left(\frac{15.7}{FC+0.01}\right)^2\right)$$

Report No.	BH ID	Date Completed	Sample #	Top Depth	Bottom Depth	Elevation (masl)		Soil Type	Soil Type - Factual description	Fill / Native	Depth of Rock	Depth of GW	γ	σ_v	u	σ'_v	Fines Content	N Value	Pen. if Refused	K_{DR}	C_E	C_R	m	C_N	$(N_1)_{60}$	Δ $(N_1)_{60}$	$(N_1)_{60cs}$
																									Iterative calculation		
																									Boulanger & Idriss 2014		
-	-	-	-	m	m	Ground	Sample	-	-	-	m		kN/m³	kPa	kPa	kPa	%	-	m			-	-	-	-	-	-
21451329	BH8	8-Sep-21	SS27	15.85	16.31	87.48	71.63	Unit 4b	Lean Clay (CL)	Native	23.29	2.5	22.2	357	133	224	93	52		1.41	1.29	1.0	0.3	0.8	54	6	60
21451329	BH8	8-Sep-21	SS28	16.46	16.92	87.48	71.02	Unit 4b	Lean Clay (CL)	Native	23.29	2.5	22.2	371	139	231	92.423	32		1.41	1.29	1.0	0.3	0.8	32	6	37
21451329	BH8	8-Sep-21	SS29	17.07	17.53	87.48	70.41	Unit 4b	Lean Clay (CL)	Native	23.29	2.5	22.2	384	145	239	92.423	33		1.41	1.29	1.0	0.3	0.8	32	6	38
21451329	BH8	8-Sep-21	SS30	17.68	18.14	87.48	69.8	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	424	151	273	75	63		1.43	1.29	1.0	0.3	0.8	62	6	68
21451329	BH8	8-Sep-21	SS31	18.29	18.58	87.48	69.19	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	437	156	281	73	100	0.14	1.43	1.29	1.0	0.3	0.8	98	6	104
21451329	BH8	8-Sep-21	SS32	18.9	19.33	87.48	68.58	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	453	163	290	68	142	0.28	1.43	1.29	1.0	0.3	0.8	138	6	143
21451329	BH8	8-Sep-21	SS33	19.51	19.79	87.48	67.97	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	434	168	266	62	100	0.13	1.41	1.29	1.0	0.3	0.8	99	6	105
21451329	BH8	8-Sep-21	SS34	20.12	20.38	87.48	67.36	Unit 4a	Sandy Silt (ML)	Native	23.29	2.5	22.1	448	174	273	50	100	0.11	1.41	1.29	1.0	0.3	0.8	99	6	104
21451329	BH8	8-Sep-21	SS35	20.73	21.18	87.48	66.75	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	497	181	316	77	133		1.43	1.29	1.0	0.3	0.7	126	6	132
21451329	BH8	8-Sep-21	SS36	21.34	21.79	87.48	66.14	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	511	187	324	68	84		1.43	1.29	1.0	0.3	0.7	79	6	85
21451329	BH8	8-Sep-21	SS37	21.95	22.4	87.48	65.53	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	526	193	333	68	117		1.43	1.29	1.0	0.3	0.7	110	6	115
21451329	BH8	8-Sep-21	SS38	22.56	22.94	87.48	64.92	Unit 5	Till: Silty Clay with Sand (CL-ML)	Native	23.29	2.5	23.7	539	199	341	39	194	0.23	1.43	1.29	1.0	0.3	0.7	181	6	186
21451329	BH58	5-Oct-21	SS1	0	0.61	95.23	95.23	Unit 1	Fill: Silty Sand (SM)	Fill	30.83	2.5	21	7	0	7	40	17	0.04	1.00	1.29	0.6	0.4	1.7	21	6	27
21451329	BH58	5-Oct-21	SS2	0.61	1.07	95.23	94.62	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	19	0	19	48.072	13		1.37	1.29	0.6	0.4	1.7	18	6	24
21451329	BH58	5-Oct-21	SS3	1.2	1.68	95.23	94.03	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	34	0	34	48.072	33		1.37	1.29	0.7	0.3	1.3	40	6	45
21451329	BH58	5-Oct-21	SS4	1.83	2.29	95.23	93.4	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	50	0	50	48.072	46		1.37	1.29	0.7	0.3	1.2	53	6	59
21451329	BH58	5-Oct-21	SS5	2.44	2.9	95.23	92.79	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	23.7	63	2	62	48.072	54		1.37	1.29	0.8	0.3	1.1	62	6	67
21451329	BH58	5-Oct-21	SS6	3.05	3.51	95.23	92.18	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	80	8	72	46	83		1.37	1.29	0.8	0.3	1.1	95	6	101
21451329	BH58	5-Oct-21	SS7	3.66	3.94	95.23	91.57	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	92	13	80	48.072	100	0.13	1.37	1.29	0.8	0.3	1.1	115	6	121
21451329	BH58	5-Oct-21	SS8	4.27	4.72	95.23	90.96	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	109	20	90	48.072	171	0.27	1.37	1.29	0.9	0.3	1.0	197	6	203
21451329	BH58	5-Oct-21	SS9	4.88	5.28	95.23	90.35	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	123	25	98	48.072	143	0.25	1.37	1.29	0.9	0.3	1.0	165	6	171
21451329	BH58	5-Oct-21	SS10	5.48	5.91	95.23	89.75	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	139	31	107	48.072	175	0.25	1.37	1.29	0.9	0.3	1.0	202	6	208
21451329	BH58	5-Oct-21	SS11	6.01	6.52	95.23	89.22	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	152	37	115	48.072	100	0.11	1.37	1.29	0.9	0.3	1.0	115	6	121
21451329	BH58	5-Oct-21	SS12	6.71	6.94	95.23	88.52	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	166	42	123	48.072	100	0.07	1.37	1.29	0.9	0.3	0.9	115	6	121
21451329	BH58	5-Oct-21	SS13	7.32	7.57	95.23	87.91	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	181	49	132	48.072	100	0.1	1.37	1.29	1.0	0.3	0.9	115	6	121
21451329	BH58	5-Oct-21	SS14	7.92	8.18	95.23	87.31	Unit 3	Till: Silty Sand (SM)	Native	30.83	2.5	24.3	196	54	141	48.072	100	0.1	1.37	1.29	1.0	0.3	0.9	115	6	121
21451329	BH58	5-Oct-21	SS15	8.53	9.02	95.23	86.7	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	30.83	2.5	24.3	213	62	152	69	98		1.37	1.29	1.0	0.3	0.9	113	6	118
21451329	BH58	5-Oct-21	SS16	9.14	9.57	95.23	86.09	Unit 3	Till: Silty Clay with Sand (CL-ML)	Native	30.83	2.5	27.2	229	67	162	48.072	141	0.25	1.37	1.29	1.0	0.3	0.9	160	6	165
21451329	BH58	5-Oct-21	SS17	9.75	10.12	95.23	85.48	Unit 3	Till: Silty Sand with Gravel (SM)	Native	30.83	2.5	24.3	242	73	169	48.072	200	0.2	1.37	1.29	1.0	0.3	0.9	224	6	230
21451329	BH58	5-Oct-21	SS18	10.36	10.66	95.23	84.87	Unit 3	Till: Silty Sand with Gravel (SM)	Native	30.83	2.5	24.3	255	79	177	48.072	100	0.15	1.37	1.29	1.0	0.3	0.9	111	6	116
21451329	BH58	5-Oct-21	SS19	10.97	11.27	95.23	84.26	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	30.83	2.5	22.1	246	85	161	50	100	0.14	1.41	1.29	1.0	0.3	0.9	113	6	119
21451329	BH58	5-Oct-21	SS20	11.58	11.86	95.23	83.65	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	30.83	2.5	22.1	259	90	169	44	100	0.12	1.41	1.29	1.0	0.3	0.9	112	6	118
21451329	BH58	5-Oct-21	SS21	12.19	12.44	95.23	83.04	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	30.83	2.5	22.1	272	96	176	50	100	0.1	1.41	1.29	1.0	0.3	0.9	111	6	116
21451329	BH58	5-Oct-21	SS22	12.8	13.01	95.23	82.43	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	30.83	2.5	25.7	332	102	230	50	100	0.02	1.41	1.29	1.0	0.3	0.8	103	6	109
21451329	BH58	5-Oct-21	SS23	13.41	13.88	95.23	81.82	Unit 4b	lean Clay (CL)	Native	30.83	2.5	22.2	303	109	194	92.423	148	0.29	1.41	1.29	1.0	0.3	0.8	160	6	165
21451329	BH58	5-Oct-21	SS24	14.02	14.5	95.23	81.21	Unit 4b	lean Clay (CL)	Native	30.83	2.5	22.2	317	115	201	98	143		1.41	1.29	1.0	0.3	0.8	153	5	158
21451329	BH58	5-Oct-21	SS25	14.63	15.12	95.23	80.6	Unit 4b	lean Clay (CL)	Native	30.83	2.5	22.2	330	121	209	92.423	56		1.41	1.29	1.0	0.3	0.8	59	6	65
21451329	BH58	5-Oct-21	SS26	15.24	15.73	95.23	79.99	Unit 4b	lean Clay (CL)	Native	30.83	2.5	22.2	344	127	216	92.423	80		1.41	1.29	1.0	0.3	0.8	84	6	89
21451329	BH58	5-Oct-21	SS27	15.84	16.33	95.23	79.39	Unit 4b	lean Clay (CL)	Native	30.83	2.5	22.2	357	133	224	92.423	101		1.41	1.29	1.0	0.3	0.8	105	6	110
21451329	BH58	5-Oct-21	SS28	16.45	16.85	95.23	78.78	Unit 4b	lean Clay (CL)	Native	30.83	2.5	22.2	370	139	231	92.423	172	0.1	1.41	1.29	1.0	0.3	0.8	177	6	183
21451329	BH58	5-Oct-21	SS29	17.07	17.36	95.23	78.16	Unit 4b	lean Clay (CL)	Native	30.83	2.5	22.2	382	144	238	92.423	100	0.12	1.41	1.29	1.0	0.3	0.8	102	6	108
21451329	BH58	5-Oct-21	SS30	17.68	17.96	95.23	77.55	Unit 4a	Silty Sand (SM) to Sandy Silt (ML)	Native	30.83	2.5	22.1	394	150	244	50	100	0.11	1.41	1.29	1.0	0.3	0.8	102	6	107
21451329	BH58	5-Oct-21	SS31	18.3	18.71	95.23	76.93	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	409	157	252	50	200	0.25	1.41	1.29	1.0	0.3	0.8	202	6	207
21451329	BH58	5-Oct-21	SS32	18.91	19.37	95.23	76.32	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	423	163	260	50	171	0.3	1.41	1.29	1.0	0.3	0.8	171	6	177
21451329	BH58	5-Oct-21	SS33	19.53	19.76	95.23	75.7	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	434	168	266	50	100	0.07	1.41	1.29	1.0	0.3	0.8	99	6	105
21451329	BH58	5-Oct-21	SS34	20.12	20.6	95.23	75.11	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	450	175	275	22	168		1.41	1.29	1.0	0.3	0.8	165	5	170
21451329	BH58	5-Oct-21	SS35	20.72	21.21	95.23	74.51	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	463	181	282	50	164		1.41	1.29	1.0	0.3	0.8	160	6	166
21451329	BH58	5-Oct-21	SS36	21.33	21.82	95.23	73.9	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	477	187	290	50	146		1.41	1.29	1.0	0.3	0.8	142	6	147
21451329	BH58	5-Oct-21	SS37	21.94	22.43	95.23	73.29	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	490	193	297	50	132		1.41	1.29	1.0	0.3	0.8	127	6	133
21451329	BH58	5-Oct-21	SS38	22.55	22.98	95.23	72.68	Unit 4a	Silt (ML)	Native	30.83	2.5	22.1	503	199	304	93	163	0.25	1.41	1.29	1.0	0.3	0.7	156	6	162
21451329	BH58	5-Oct-21	SS39	23.16	23.65	95.23	72.07	Unit 4a	Sandy Silt (ML)	Native	30.83	2.5	22.1	517	205	312	50	155		1.41	1.29	1.0	0.3	0.7	148	6	153
21451329	BH58	5-Oct-21	SS40	23.77	24.26	95.23	71.46	Unit 4b	Lean Clay with Sand (CL)	Native	30.83	2.5	22.2	533	211	322	92.423	62		1.41	1.29	1.0	0.3	0.7	59	6	64
21451329	BH58	5-Oct-21	SS41	24.38	24.87	95.23	70.85	Unit 4b	Lean Clay with Sand (CL)	Native	30.83	2.5	22.2	547	217	330	92.423	27		1.41	1.29	1.0	0.4	0.6	22	6	28
21451329	BH58	5-Oct-21	SS42	24.99	25.48	95.23	70.24	Unit 4b	Lean Clay with Sand (CL)	Native	30.83	2.5	22.2	560	223	337	92.423	35		1.41	1.29	1.0	0.3	0.7	30	6	36
21451329	BH58	5-Oct-21	SS43	25.6	26.09	95.23	69.63	Unit 4b	Lean Clay with Sand (CL)	Native	30.83	2.5	22.2	574	229	345	92.423	48		1.41	1.29	1.0	0.3	0.7	45	6	50
21451329	BH58	5-Oct-21	SS44	26.21	26.7	95.23	69.02	Unit 4b	Lean Clay with Sand (CL)	Native	30.83	2.5	22.2	587	235	352	92.423	33		1.41	1.29	1.0	0.3	0.6	28	6	33
21451329	BH58	5-Oct-21	SS45	26.82	27.21	95.23	68.41	Unit 4b	Silty Clay with Sand (CL-ML)	Native	30.83	2.5	22.2	600	241	359	77	162	0.22	1.41	1.29	1.0	0.3	0.7	149	6	154
21451329	BH58	5-Oct-21	SS46	27.48	27.76	95.23	67.75	Unit 4b	Silty Clay with Sand (CL-ML)	Native	30.83	2.5	22.2	613	246	367	92.423	100	0.11	1.41	1.29	1.0	0.3	0.7	91	6	97
21451329	BH58	5-Oct-21	SS47	28.09	28.37	95.23	67.14	Unit 4a	Silty Sand (SM)	Native	30.83	2.5	22.1	624	252	371	50	100	0.12	1.41	1.29	1.0	0.3	0.7	91	6	97
21451329	BH58	5-Oct-21	SS48	28.65	29.13	95.23	66.58	Unit 5	Till: Silt with Sand (ML)	Native	30.83	2.5	23.7	685	259	426	68	145		1.43	1.29	1.0	0.3	0.7	127	6	133
21451329	BH58	5-Oct-21	SS49	29.26	29.82	95.23	65.97	Unit 5	Till: Silt with Sand (ML)	Native	30.83	2.5	23.7	700	265	435	74	100	0.11	1.43	1.29	1.0	0.3	0.7	87	6	93
21451329	BH58	5-Oct-21	SS50	29.87	30.16	95.23	65.36	Unit 5	Till: Silt with Sand (ML)	Native	30.83	2.5	23.7	711	270	442	68	100	0.11	1.43	1.29	1.0	0.3	0.7	87	6	93
21451329	BH58	5-Oct-21	SS51	30.43	30.83	95.23	64.8	Unit 5	Till: Silt with Sand (ML)	Native	30.83	2.5	23.7	726	276	450	68	182	0.25	1.43	1.29	1.0	0.3	0.7	157	6	163

Appendix D Seismically Induced Settlement and Lateral Displacement

Figure D1 SPT-based liquefaction correlations (a) limiting shear strains and (b) contours of maximum shear strains

Figure D2 Relationship between Seismically Induced volumetric strain and maximum shear strain

Table D1: Summary of Adjustment Coefficients Regarding Lateral Spreading Distance.

Table D2: Seismically Induced Settlement and Lateral Spreading Calculation Sheet for DBE Hazard Level

Table D3: Seismically Induced Settlement and Lateral Spreading Calculation Sheet for BDBE Hazard Level

For borehole locations where liquefaction is expected, seismically induced lateral displacements and settlements were estimated using the approaches recommended by Idriss and Boulanger (2008) [29].

The seismically induced settlement assessment includes the following steps:

1. For each data point where FS_{liq} is less than 2, the vertical strain for seismically induced settlement was computed for the corresponding data point.
2. The seismically induced settlement at ground surface was then calculated by integrating the vertical strains over the depth interval for each liquefaction data point in the borehole.

The seismically induced settlement were calculated for each soil data point as a function of the equivalent clean sand corrected penetration resistance $(N1)_{60\text{-}cs}$, and factor of safety against liquefaction FS_{liq}, using the following equations, i.e., (1) to (4) as shown below, from Idriss & Boulanger (2008) [29].

$$\gamma_{lim} = 1.859.\left(1.1 - \sqrt{\frac{(N_1)_{60cs}}{46}}\right)^3 \geq 0 \qquad (1)$$

$$F_\alpha = 0.032 + 0.69.\sqrt{Max(N_1)_{60cs}, 7)} - 0.13\text{Max}\left((N_1)_{60cs}, 7\right) \qquad (2)$$

$$\gamma_{max} = \begin{cases} 0 & if\ FS_{liq} \geq 2 \\ \min\left(\gamma_{lim}, 0.035(2 - FS_{liq})\left(\frac{1-F_\alpha}{FS_{liq} - F_\alpha}\right)\right) & if\ F_\alpha \leq FS_{liq} < 2 \\ \gamma_{lim} & if\ FS_{liq} \leq F_\alpha \end{cases} \qquad (3)$$

$$\in_v = 1.5e^{-0.369\sqrt{(N_1)_{60cs}}} \min\left(0.08, \gamma_{max}\right) \qquad (4)$$

where

γ_{lim} is the limiting shear strain. The equation was developed based on the correlation shown in Figure D1.

F_α is a factor used to calculate the maximum shear strain.

γ_{max} is the maximum shear strain. The equation was developed based on the correlation shown in Figure D1.

$\in_v$ is the seismically induced volumetric strain (equivalent to the vertical strain in the one-dimensional settlement assessment). The correlation in the equation was developed based on Figure D2.

The seismically induced lateral spreading displacement assessment includes the following steps:

1. For each data point where FS_{liq} is less than 2, the maximum shear strain for seismically induced lateral spreading was computed for the corresponding data point.
2. The seismically induced lateral spreading displacement index at ground surface was then calculated by integrating the maximum shear strains over the depth interval for each data point in the borehole.

The seismically induced lateral spreading displacement index were calculated for each soil data point is expected as a function of the maximum shear strain and the thickness of the liquefiable soil using the equation (5) as shown below, as per Idriss & Boulanger (2008) [29].

$$LDI = \int_0^{Z_{max}} \gamma_{max} \cdot dz \qquad (5)$$

Where

γ_{max} is the maximum shear strain, see the equation (3).

LDI is the lateral displacement index.

The seismically induced lateral spreading displacement index was adjusted considering the distance from the shoreline slope face (L) and the height of the slope (H) by the following equation (6) from Zhang et al. (2004) [40]:

$$\frac{LD}{LDI} = 6 \times \left(\frac{L}{H}\right)^{-0.8} \qquad 4 < \frac{L}{H} < 40 \qquad (6)$$

Where LD is the lateral displacement at the location of interest. H is the height of the free face slope and L is the distance from the location of the interest to the slope. The above equation is for the cases of level ground which is applicable for the structures at the DNNP site which will have uniform finished surface at EL. 88 m.

Table D1 summarizes the adjustment ratio of LD/LDI for the seismically induced lateral spreading displacement and the corresponding input parameters.

Tables D2 and D3 provide the detailed calculation sheets for the seismically induced lateral spreading displacement index (LDI).

Figure D1 SPT-based liquefaction correlations (a) limiting shear strains and (b) contours of maximum shear strains (Figure 95 in Page 139 from Reference [29])

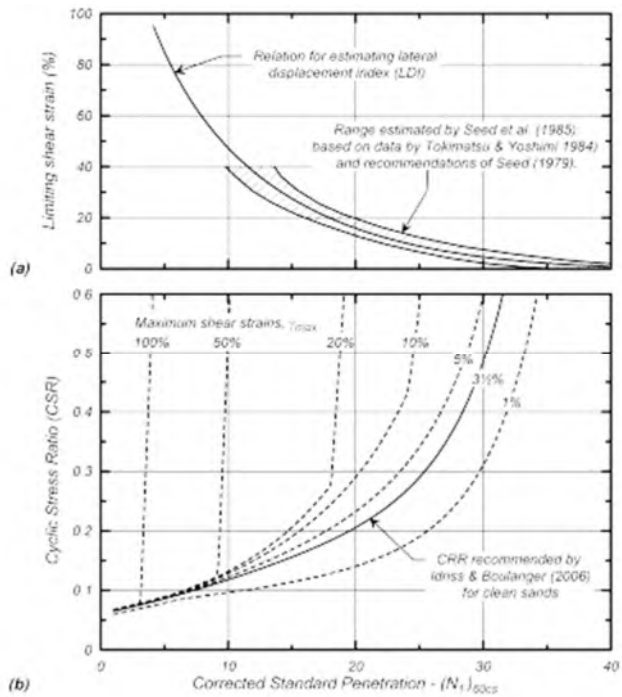

Figure D2 Relationship between seismically induced volumetric strain and maximum shear strain (Figure 102 in Page 153 from Reference [29])

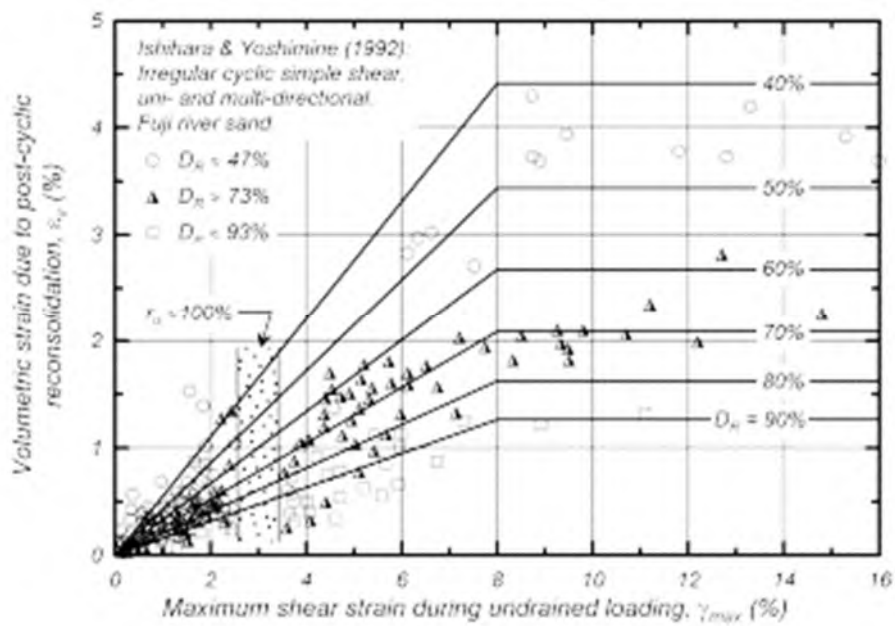

Table D1: Summary of Adjustment Ratio Regarding Lateral Spreading Distance.

Structure(s)	Relevant Borehole	Approx. Distance from Shoreline Slope (m)	Approx. Height of Shoreline Slope, (m)	L/H (1)	**Ratio (LD/LDl)**
Reactor Building (Structure No. 1)	N/A (it will be founded on bedrock)				
Turbine Building (Structure No. 2)	BH66	16	300	18.8	0.58
	BH71	16	240	15.0	0.69
Radwaste Building (Structure No. 3)	N/A (all its relevant boreholes screened out)				
Control Building (Structure No. 4)	BH14	16	170	10.6	0.91
	BH18	16	140	8.8	1.06
Reactor Auxiliary Bay (Structure No. 5)	BH1	16	130	8.1	1.12
	BH10	16	180	11.3	0.87
	BH77	16	120	7.5	1.20
	B-113	16	110	6.9	1.28
Independent Spent Fuel Storage Installation (Structure No. 6)	BH1	16	220	13.8	0.74
	BH3	16	170	10.6	0.91
	B-104	16	70	4.4	1.84
	B-113	16	110	6.9	1.28

Notes:

(1) the slope height of 16 m was evaluated as per the site plan drawing 006N034 Sheet 2 of 2 (Lake Profile). The finished grade was taken as EL. 88 m and the toe of free face slope was conservatively estimated as EL. 72 m, as shown also in the cross-section 2-2 from the Golder report ([27]) and the cross section A-A in NK054-REP-01210-00011 by AMEC (page 58 in the reference [26]).

(2) The distance from the borehole to slope was conservatively measured from the borehole to the shoreline marker line for the top of slope, as shown in Figure 4-1.

Table D-2: Seismically Induced Settlement and Lateral Spreading Calculation for DBE Hazard Level

Relevant Structure	BH ID	Sample #	Avg. Elevation	Soil Type	$(N_1)_{60cs}$	FSliq (Mean, DBE)	Limiting shear strain, γ_{lim}	Parameter, F_α	Maximum shear strain, γ_{max}	ΔH_i	Lateral displacement index, ΔLDI_i	Vertical reconsolidation strain, ε_v	Settlement, ΔS_i	LD/LDI	Total Settlement, S	Total Lateral Displacement Index, LDI	Total Lateral Displacement , LD
-	-	-	m	-	-	-	-	-	-	m	m	-	m		m	m	m
Turbine Building (Structure No. 2) Note1	BH66	SS17	67.9	Unit 4b	22	1.62	0.500	0.417	0.006	2.975	0.019	0.002	0.005	0.575	0.005	0.019	0.011
Control Building (Structure No. 4) Note1	BH14	SS17	69.1	Unit 4b	22	1.41	0.500	0.407	0.012	1.500	0.018	0.003	0.005	0.906	0.005	0.018	0.017
Reactor Auxiliary Bay (Structure No. 5) Note1	BH1	SS32	70.5	Unit 4b	26	1.87	0.500	0.188	0.002	0.610	0.001	0.000	0.000	0.737	0.0003	0.001	0.001
	BH1	SS35	68.7	Unit 4b	25	1.80	0.500	0.234	0.004	0.535	0.002	0.001	0.000	0.737	0.0004	0.002	0.001
	BH10	SS16	69.9	Unit 4b	23	1.47	0.500	0.378	0.011	3.025	0.032	0.003	0.008	0.865	0.008	0.032	0.028
	B-113	SS26	69.2	Unit 4b	19	1.39	0.500	0.593	0.011	0.705	0.008	0.003	0.002	1.283	0.002	0.008	0.010
Independent Spent Fuel Storage Installation (Structure No. 6) Note2	B-113	SS5	85.2	Unit 2a	15	0.75	0.500	0.757	0.500	0.765	0.383	0.029	0.022	1.283	0.074	0.857	1.100
	B-113	SS6	84.5	Unit 2b	11	0.61	0.500	0.893	0.500	0.760	0.380	0.036	0.027	1.283			
	B-113	SS7	83.7	Unit 2b	17	0.81	0.500	0.673	0.100	0.760	0.076	0.026	0.020	1.283			
	B-113	SS8	82.9	Unit 2b	23	1.41	0.500	0.378	0.012	0.765	0.009	0.003	0.002	1.283			
	B-113	SS10	81.4	Unit 2b	25	1.90	0.500	0.207	0.002	0.760	0.001	0.000	0.000	1.283			
	B-113	SS26	69.2	Unit 4b	19	1.39	0.500	0.593	0.011	0.705	0.008	0.003	0.002	1.283			
	B-104	SS3	86.9	Unit 2a	27	1.68	0.500	0.114	0.006	0.615	0.004	0.001	0.001	1.842	0.011	0.042	0.077
	B-104	SS4	86.2	Unit 2a	29	2.03	0.500	-0.025	0.000	0.915	0.000	0.000	0.000	1.842			
	B-104	SS6	85.0	Unit 2b	23	1.00	0.500	0.372	0.035	0.910	0.032	0.009	0.008	1.842			
	B-104	SS32	69.2	Unit 4b	24	1.63	0.500	0.318	0.007	0.835	0.006	0.002	0.001	1.842			
	BH1	SS5	87.0	Unit 2a	23	1.14	0.500	0.365	0.025	1.220	0.030	0.006	0.008	0.737	0.029	0.120	0.089
	BH1	SS7	85.7	Unit 2b	19	0.75	0.500	0.565	0.101	0.865	0.087	0.024	0.021	0.737			
	BH1	SS32	70.5	Unit 4b	26	1.87	0.500	0.188	0.002	0.610	0.001	0.000	0.000	0.737			
	BH1	SS35	68.7	Unit 4b	25	1.80	0.500	0.234	0.004	0.535	0.002	0.001	0.000	0.737			
	BH3	SS4	87.4	Unit 2a	19	1.00	0.500	0.565	0.035	1.525	0.053	0.010	0.016	0.906	0.154	1.840	1.670
	BH3	SS6	85.9	Unit 2a	16	0.56	0.500	0.720	0.500	1.525	0.763	0.028	0.042	0.906			
	BH3	SS7	84.3	Unit 2a	9	0.37	0.500	0.924	0.500	1.185	0.593	0.039	0.046	0.906			
	BH3	SS8	83.5	Unit 2b	8	0.33	0.500	0.944	0.500	0.725	0.363	0.043	0.031	0.906			
	BH3	SS13	77.3	Unit 4a	20	1.00	0.500	0.544	0.035	1.510	0.053	0.010	0.016	0.906			
	BH3	SS17	71.3	Unit 4b	27	2.20	0.500	0.100	0.000	1.580	0.000	0.000	0.000	0.906			
	BH3	SS19	68.3	Unit 4b	22	1.46	0.500	0.420	0.011	1.505	0.016	0.003	0.004	0.906			

Notes:

1. For the boreholes relevant to Structures No. 2 to No. 5, only the soil deposit below the over-excavation level of El.81 m was assessed for the seismically induced deformation assessment.
2. For the boreholes relevant to Structure No. 6, all native soil deposit below the expected finished grade El. 88 m was evaluated for the seismically induced deformation assessment. The Unit 1 soil (topsoil and existing fill) is expected to be removed or replaced by non-liquefiable engineered fill.

Table D-3: Seismically Induced Settlement and Lateral Spreading Calculation for BDBE Hazard Level

Relevant Structure	BH ID	Sample #	Avg. Elevation	Soil Type	$(N_1)_{60cs}$	FSliq (Mean, BDBE)	Limiting shear strain, γ_{lim}	Parameter, F_α	Maximum shear strain, γ_{max}	ΔH_i	Lateral displacement index, ΔLDI_i	Vertical reconsolidation strain, ε_v	Settlement, ΔS_i	LD/LDI	Total Settlement, S	Total Lateral Displacement Index, LDI	Total Lateral Displacement , LD
-	-	-	m	-	-	-	-	-	-	m	m	-	m		m	m	m
Turbine Building (Structure No. 2) Note1	BH66	SS17	67.9	Unit 4b	22	1.19	0.500	0.417	0.021	2.975	0.063	0.006	0.017	0.575	0.017	0.063	0.036
	BH71	SS17	69.8	Unit 4b	27	1.68	0.500	0.137	0.006	1.525	0.009	0.001	0.002	0.688	0.002	0.009	0.006
Control Building (Structure No. 4) Note1	BH18	SS29	69.7	Unit 5	27	1.66	0.500	0.129	0.007	0.610	0.004	0.002	0.001	1.058	0.001	0.004	0.004
	BH14	SS17	69.1	Unit 4b	22	0.99	0.500	0.407	0.036	1.500	0.054	0.010	0.014	0.906	0.014	0.054	0.049
Reactor Auxiliary Bay (Structure No. 5) Note1	BH1	SS32	70.5	Unit 4b	26	1.30	0.500	0.188	0.018	0.610	0.011	0.004	0.003	0.737	0.005	0.021	0.016
	BH1	SS35	68.7	Unit 4b	25	1.25	0.500	0.234	0.020	0.535	0.010	0.005	0.002	0.737			
	BH10	SS16	69.9	Unit 4b	23	1.00	0.500	0.378	0.035	3.025	0.105	0.009	0.027	0.865	0.027	0.105	0.091
	B-113	SS26	69.2	Unit 4b	19	0.96	0.500	0.593	0.041	0.705	0.029	0.013	0.009	1.283	0.009	0.029	0.037
	BH77	SS17	69.3	Unit 4b	27	1.86	0.500	0.102	0.003	1.465	0.004	0.001	0.001	1.197	0.001	0.004	0.004
Independent Spent Fuel Storage Installation (Structure No. 6) Note2	B-113	SS5	85.2	Unit 2a	15	0.75	0.500	0.757	0.500	0.765	0.383	0.029	0.022	1.283	0.083	0.885	1.140
	B-113	SS6	84.5	Unit 2b	11	0.59	0.500	0.893	0.500	0.760	0.380	0.036	0.027	1.283			
	B-113	SS7	83.7	Unit 2b	17	0.81	0.500	0.673	0.098	0.760	0.075	0.026	0.020	1.283			
	B-113	SS8	82.9	Unit 2b	23	1.26	0.500	0.378	0.018	0.765	0.014	0.005	0.004	1.283			
	B-113	SS10	81.4	Unit 2b	25	1.67	0.500	0.207	0.006	0.760	0.005	0.001	0.001	1.283			
	B-113	SS26	69.2	Unit 4b	19	0.96	0.500	0.593	0.041	0.705	0.029	0.013	0.009	1.283			
	B-104	SS3	86.9	Unit 2a	27	1.42	0.500	0.114	0.014	0.615	0.008	0.003	0.002	1.842	0.026	0.104	0.192
	B-104	SS4	86.2	Unit 2a	29	1.66	0.500	-0.025	0.007	0.915	0.007	0.001	0.001	1.842			
	B-104	SS6	85.0	Unit 2b	23	0.72	0.500	0.372	0.082	0.910	0.075	0.021	0.019	1.842			
	B-104	SS32	69.2	Unit 4b	24	1.30	0.500	0.318	0.017	0.835	0.014	0.004	0.004	1.842			
	BH1	SS5	87.0	Unit 2a	23	0.85	0.500	0.365	0.053	1.220	0.065	0.014	0.017	0.737	0.042	0.519	0.382
	BH1	SS7	85.7	Unit 2b	19	0.54	0.500	0.565	0.500	0.865	0.433	0.024	0.021	0.737			
	BH1	SS32	70.5	Unit 4b	26	1.30	0.500	0.188	0.018	0.610	0.011	0.004	0.003	0.737			
	BH1	SS35	68.7	Unit 4b	25	1.25	0.500	0.234	0.020	0.535	0.010	0.005	0.002	0.737			
	BH3	SS4	87.4	Unit 2a	19	0.87	0.500	0.565	0.056	1.525	0.085	0.017	0.025	0.906	0.183	1.941	1.760
	BH3	SS6	85.9	Unit 2a	16	0.47	0.500	0.720	0.500	1.525	0.763	0.028	0.042	0.906			
	BH3	SS7	84.3	Unit 2a	9	0.29	0.500	0.924	0.500	1.185	0.593	0.039	0.046	0.906			
	BH3	SS8	83.5	Unit 2b	8	0.30	0.500	0.944	0.500	0.725	0.363	0.043	0.031	0.906			
	BH3	SS13	77.3	Unit 4a	20	0.83	0.500	0.544	0.065	1.510	0.099	0.019	0.029	0.906			
	BH3	SS17	71.3	Unit 4b	27	1.79	0.500	0.100	0.004	1.580	0.006	0.001	0.001	0.906			
	BH3	SS19	68.3	Unit 4b	22	1.17	0.500	0.420	0.022	1.505	0.034	0.006	0.009	0.906			

Notes:

1. For the boreholes relevant to Structures No. 2 to No. 5, only the soil deposit below the over-excavation level of El.81 m was assessed for the seismically induced deformation assessment.

2. For the boreholes relevant to Structure No. 6, all native soil deposit below the expected finished grade El. 88 m were evaluated for the seismically induced deformation assessment. The Unit 1 soil (topsoil and existing fill) is expected to be removed or replaced by non-liquefiable engineered fill.