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13 March 2017

Simon Ash
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AUCKLAND 1010

Dear Simon,

PRELIMINARY SITE INVESTIGATION AT 65-94A SCOTT ROAD, TE KAUWHATA

1.0 Introduction

Lakeside Developments 2017 Limited (LDL) has engaged Pattle Delamore Partners Limited (PDP) to undertake a preliminary site investigation (PSI) for a private plan change application purposes at 65-94A Scott Road, Te Kauwhata ('the site'), comprising of six properties legally described as Section 52 Block XV Maramarua SD ('Property A'), Lot 1 DP 35516 ('Property B'), Lot 1 DP SA 85309 and Section 90 Block XV Maramarua SD ('Property C'), Lot 3 DP 489788 ('Property D'), Lot 2 DP 489788 ('Property E'), and Lot 1 DP 489788 ('Property F'); shown on Figure 1.

The desktop study has been limited to a review of existing available information for the site including; council property records, property title information, historical aerial photographs and other property information. For Property E, a previous PSI was completed in March 2016 by Contaminated Site Investigation Limited (CSI). Information from this report (appended) has been incorporated in this investigation. Following the desktop review a reconnaissance for properties A - D was undertaken on 30 September 2016. Based on the findings from the desktop review and site reconnaissance, a limited sampling and analysis plan was developed in consultation with LDL. The sampling of surface soil and water was undertaken at the site on 11 October 2016. A copy of the laboratory transcript is provided in Appendix A. For Properties E and F, a site visit was undertaken on 1 March 2017.

This report provides the results of the PSI review and has been prepared in general accordance with the requirements of the Ministry for the Environment (MfE) Contaminated Land Management Guideline No. 1 Reporting on Contaminated Sites in New Zealand (CLMG No. 1) (MfE, 2011a). It has been certified by a suitably qualified and experienced practitioner as required by the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (the NES).

2.0 Executive Summary

This Preliminary Site Investigation has confirmed that specific areas of the site have been subject to HAIL land use as noted below. However, chemical concentrations across the remainder (the majority) of the site are generally within background levels for the Waikato region or below the laboratory detection limits. On this basis there do not appear to be any significant and widespread potential contamination issues that might impact on the proposed private plan change and residential development.

The potential contamination issues identified at the site, and the recommendations to address these issues, are as follows:

- Asbestos cladding on farm buildings (possibly on Property A, C and F) – to be surveyed and removed in accordance with Asbestos Regulations 2016;
- Farm dump - elevated contaminant concentrations were detected in soil and leachate samples from this area. It was recommended that the buried waste and contaminated soil be excavated, removed and disposed of to an approved landfill. This occurred in February 2017 with 153.8 tonnes of farm dump material removed to Hampton Downs Landfill. The former farm dump area was subsequently inspected by PDP (refer to Section 7.2 for details);
- Low lying paddocks in the southeast part of the site – arsenic concentration marginally exceeds the human health standard for residential land use in the composite soil sample (and in four of the five individual sub-samples) from this area. The arsenic concentrations comply with the human health standard for recreational land use, and it is expected that most/all of this low lying area will be used for this purpose. Further sampling is recommended to confirm that the arsenic concentrations in residential land bordering this area comply with the human health standard for residential land use;
- Flood bank - arsenic concentration marginally exceeds the human health standard for residential land use in the composite soil sample from this area. However, no further action is required as the arsenic concentration complies with the human health standard for the expected land use (recreational);
- Shooting range – lead concentration exceeds the human health standard for residential land use in the composite soil sample from this area. The lead concentration complies with the human health standard for recreational land use, and it is expected that some of this area will be used for this purpose. Further sampling is recommended to confirm that the lead concentrations in residential land in this vicinity comply with the human health standard for residential land use, with any soil not suitable for residential use being removed and disposed of to an approved landfill facility as part of the redevelopment;
- Silage area - heavy metal concentrations exceed background levels in composite soil sample collected from the silage/old tyre areas but comply with human health standards for residential land use. No further action is required for this area although some surface soils may be removed to an approved disposal facility as part of the proposed site redevelopment;
- Diesel storage tank – hydrocarbon concentration in the surface soil sample from this area exceeds the human health standard for residential land use. The hydrocarbon contamination is expected to be localised and the contaminated soil will be excavated, removed from the site and disposed of to an approved landfill;
- Chemical storage shed – chemical concentrations in the surface soil sample from this area complies with human health standards for residential land use. No further action is required for this area although some surface soils may be removed to an approved disposal facility as part of the proposed site redevelopment; and
- For Property E, the CSI PSI report identifies the potential for bulk application of superphosphate and DDT to the site paddocks, and the potential passive discharge of zinc to the site paddocks from facial eczema treatments for cattle. These impacts were investigated by comprehensive soil sampling as part of the CSI report and results were within Waikato Region background criteria. CSI concluded that the NES was not applicable to the site, and no further investigations were required at the site.

3.0 Scope

According to LDL the proposed future of the site is for a private plan change to residential use, and a residential development. Therefore the scope of the PSI is to be undertaken in consideration of the proposed private plan change. The PSI review work undertaken by PDP is as follows:

- A review of publically available historical aerial photographs;
- A review of publically available previous contaminated site investigation reports;
- A review of the Land Information Memorandums (LIM) and council property file records provided by Waikato District Council (WaiDC);
- A review of Certificates of Title (CT);
- A review of the contaminated site enquiry obtained from the WaiDC and Waikato Regional Council (WRC);
- An interview and discussion on site with representatives of the current site owners/operators to discuss the historical use of the site, with a specific focus on identifying potential contamination sources and/or land uses;
- A reconnaissance of the property to visually inspect the condition of the site including any historical sheds/buildings that can be identified;
- Development of a sampling and analysis plan in consultation with LDL;
- The collection of surface soil and water samples from the site, and analysis of samples by an IANZ accredited laboratory, according to the proposed sampling and analysis plan;
- Comparison of the sample results with relevant assessment criteria;
- Consideration of the regional and national regulations; and
- Preparation of a report summarising the findings of the information review.

4.0 Site Setting

4.1 Site Description

The site is comprised of 6 separate properties, totalling approximately 194 hectares (ha), legally described as Section 52 Block XV Maramarua Survey District ('Property A'), Lot 1 DP 35516 ('Property B'), Lot 1 DP SA 85309 and Section 90 Block XV Maramarua Survey District ('Property C'), Lot 3 DP 489788 ('Property D'), Lot 2 DP 489788 ('Property E'), and Lot 1 DP 489788 ('Property F') . The site is located approximately 15 km north of Huntly and approximately 30 km southeast of Pukekohe.

The site lies within the jurisdiction of WRC and WaiDC. The site is zoned 'Rural' and 'Countryside Living' according to the WaiDC Operative District Plan. The site is currently owned by Lakeside Farms Limited and operated by Brian White (and family) for dairy farming.

The property is situated at the end of Scott Road and site access is provided off of Scott Road. Internal access within Property A to F is via private gravel farm tracks. Eighteen notable buildings are present at the site; these include three timber residential dwellings, two milking sheds, a cabin and the remaining are storage sheds for livestock, tractors, farming equipment, or storage of feed supplements and herbicides. Further detail of the site buildings and land features is provided in Section 7.0 from the site visit.

The location and layout of the site is shown on Figure 1.

4.2 Site Surroundings

The general area surrounding the site is used for agricultural purposes. The area south of the site is used as pastoral land for dairy farming purposes with few rural residential properties, and Te Kauwhata Township is situated north of the site. Immediately west of the site is the main trunk railway line. Meanwhile, Lake Waikare and Lake Kopuera are located immediately east and west of the site. Lake Waikare receives both stormwater and wastewater discharges from Te Kauwhata Township. The Te Kauwhata wastewater treatment ponds are located approximately 90 m northeast of the site and separated from the north eastern site boundary of Property D by dense scrub and wetland.

Beyond the wastewater treatment ponds and located approximately 300 m northeast of the site, an old trench landfill area which operated in the 1950s and 1960s was identified in a preliminary geotechnical report completed by Earthtech Consulting Limited (EC) in 2010 for a proposed heavy vehicle bypass adjacent to the northern site boundary. A copy of the geotechnical report is provided in Appendix B. Meeting notes provided within the geotechnical report (EC, 2010) commented that leachate from the old trench landfill drained out into the swamp at the southern end of the landfill and refuse spilled out on the eastern side of the road reserve onto neighbouring farmland properties at times (located approximately 300 m from the site). Leachate controls (two collector lines, pumping manhole and power cable) were installed after closure circa. 1998 and the landfill was capped with clay from a local quarry. The old landfill extended south over the wetland on the eastern side of the Te Kauwhata wastewater treatment ponds, and towards the west and north to create the current landfilled profile.

5.0 Geology and Hydrogeology

The Geology of the Auckland Area (Edbrooke, 2001) geological map indicates that the property is underlain by the Whangamarino Formation consisting of slightly pumiceous clays with lignite, gravel and some pure pumice silt and sand. This is generally consistent with the findings from the geotechnical investigation completed by Maunsell Limited in 2008 for the proposed Lakeside Farm Subdivision in the northern part of the site. A copy of the geotechnical report was made available through the LIM report and provided in Appendix C. Immediately to the east and west the geology is thought to change to Taupo Pumice Alluvium comprised of pumice sand, silts and gravels. The geotechnical investigation boreholes identified silty clay to a depth of greater than 5.0 metres below ground level and water levels were recorded between 0.9 m and 2.4 m deep. Based on Maunsell's assessment (2008) the recorded water levels indicated that the groundwater flow direction was eastward towards Lake Waikare. A recent geotechnical investigation was completed in 2016 for the consideration of proposed residential subdivision at the site. The following geological descriptions for the site included swampy alluvium consisting of soft saturated clays and silts restricted to the bottom of swampy gully areas; organic silt (top soil) underlain by very stiff silt (brown ash), interlayered sequence of pumiceous sand and clay (Puketoka Formation) and interlayered sequence of clay, silt, lignite and pumice sands (Whangamarino Formation) for the rolling hill country; and soft peat and silt with some loose sands within the alluvial plains (EC, 2016). Groundwater levels recorded during the EC geotechnical investigation (2016) were at depths between 2.4 m and 3.9 m at higher ground and from the surface to 0.5 m deep within the alluvial plains.

The topography of the area consists of gently rolling hills. The nearest surface water bodies are Lake Waikare located immediately adjacent to the site along the eastern site boundary, and Lake Kopuera located immediately adjacent to the site along the south western boundary.

6.0 Desktop Review of Site History

6.1 Aerial Photographs

The historical aerial photographs of the site from between 1949 and 2016, sourced from Opus and Google Earth have been reviewed and are provided in Appendix D. A summary of the key observations from the photographs is provided in Table 6.1.

Table 6.1: Summary of Historical Aerial Photographs

Year	Description of Site Use
1949	The site and surrounding land use appears to be in pastoral use. A railway line (north to south) is present off-site and adjacent to the western site boundary. Scott Road is present north of the site. Swamp and scrublands appear to occupy parts of the eastern and southern areas of the site.
1963	The site remains pastoral. The cluster of trees that were present in the 1949 aerial towards the west and south from the end of Scott Road has decreased and some areas appeared to be cleared. A new building is present at the end of Scott Road immediately south. A few paddocks at the site have been further subdivided and the present day raceway tracks providing access from the end of Scott Road to the northeast, south, southwest and western parts of the site are formed. The aerial shows commercial and residential land use which is the Te Kauwhata Township in areas approximately 300 m north of the site.
1977	The site remains unchanged from pastoral use. Swamp and scrublands that occupied the eastern and southern areas of the site are no longer present and the areas appear to have been modified for pastoral land use. Building development in areas approximately 300 m towards the north of the site (Te Kauwhata Township) appears to have intensified. A man-made pond is formed approximately 100 m northeast of the site.
2002	The site remains unchanged from pastoral use. Trees are present in gullies at various parts of the site.
2008	The site remains unchanged from pastoral use. White mottled patches are shown in the aerial over the present day farm dump/burn pit area at the site. A small pond immediately south of the farm dump is apparent. A new milking shed is built at the southeast from the end of Scott Road at the site. A pile of what appears to be hay bales are present in the aerial covering an area of approximately 1,000 m^2 on-site. A residential property is built at 54 Scott Road.
2009 and 2010	A small dam is present on-site and located approximately 300 m south of the milking shed and 200 m southeast of the farm dump area. Land use at the site is largely unchanged.
2012 - 2016	Stockpile area is present on-site approximately 300 m southeast from the end of Scott Road and covers an area of approximately 2,000 m^2. The present day settling ponds are present in the southeast corner at the site. Land use at the site is largely unchanged.

6.2 Certificates of Title

The current and historical CTs for the site are summarised in Table 6.2 below with further information provided where relevant. Historical CTs were found dating back to 1947. The CTs are attached in Appendix E.

Table 6.2: Relevant Information from Certificates of Title

Legal Description	Certificate of Title
Section 52 Block XV Maramarua Survey District (Property A)	**SA870/89 (issued in 1947):** ∴ The historical and current CTs concern 63.4 ha of land. ∴ The title interests note "saving and excepting all minerals within the meaning of the Land Act 1924 on or under the land and reserving always to Her Majesty the Queen and all persons lawfully entitled to work the said minerals a right of ingress, egress and regress over the said land". ∴ The historical CT was listed to private individuals. A transfer to Lakeside Farms (1993) Limited occurred in 1994. ∴ The current site proprietor is listed as Lakeside Farms (1993) Limited.
Lot 1 Deposited Plan 35516 (Property B)	**SA922/186 (issued in 1949):** ∴ The historical and current CTs concern 20.9 ha of land. ∴ The title interests note that the property is subject to mining rights created by Transfer 91217 and excepting all coal clay and minerals in or under the said land. ∴ The historical CT was listed to private individuals. A transfer of the CT occurred in 1994 to Lakeside Farms (1993) Limited. ∴ The current site proprietor is listed as Lakeside Farms (1993) Limited.
Lot 1 DP SA 85309 and Section 90 Blk XV Maramarua Survey District (Property C)	**SA66B/991 (issued in 1999):** ∴ The historical and current CTs concern 47.2 ha of land. ∴ The title interests are subject to Section 241(2) Resource Management Act 1991 (affects DPS 83606) and Section 8 Coal Mines Act 1950. ∴ The historical CT was listed to private individuals. A transfer to Lakeside Farms (1993) Limited occurred in 2002. ∴ The current site proprietor is listed as Lakeside Farms (1993) Limited.
Lot 3 DP 489788 (Property D)	**SA705543 (issued in 2016):** ∴ Prior reference is SA66B/990. ∴ The current site proprietor is listed as Lakeside Farms (1993) Limited. ∴ Current CT refers to 47.5 ha of land.

Table 6.2: Relevant Information from Certificates of Title	
Legal Description	**Certificate of Title**
Lot 2 DP 489788 (Property E)	**SA705542 (issued in 2016)** ⁘ Prior reference is SA66B/990. ⁘ The current site proprietor is listed as Lakeside Farms (1993) Limited. ⁘ Current CT refers to 14.1 ha of land.
Lot 1 DP 489788 (Property F)	**SA705541 (issued in 2016)** ⁘ Prior reference is SA66B/990. ⁘ The current site proprietor is listed as Lakeside Farms (1993) Limited. ⁘ Current CT refers to 7,640 m^2 of land

6.3 Council Files

A Land Information Memorandum (LIM) for the site was obtained from the WaiDC on 15 September 2016. A copy of the LIM for the site is provided in Appendix C.

Documents relevant to the historical and current use of the site provided in the LIM is summarised below:

- The property is not connected to a community water supply;
- The property has an existing on-site wastewater disposal system as the property is located outside an area currently served by a community system for wastewater disposal. The property is also located outside an area currently served by a community system for stormwater or land drainage disposal;
- The property is located in the Te Kauwhata Stormwater Catchment Management Area. Surface water ponding may occur on some properties during high rainfall events and the property is subject to floods (Wetland Margins). Under the Waikato District Plan, the property has been identified as being a flood risk area. It was noted that part of the land at the site may be subject to flooding or inundation;
- Several subdivision consents were issued between 1987 and 2010 which related to the relocation of boundaries, and subdivision of land for proposed residential development in areas at the northeast side of Scott Road;
- A land use consent relating to a minor increase in the distance of a proposed shed at 94 Scott Road from the property boundary. The change was not considered in the original consent and was considered to be no more than minor; and
- Several building consents/permits have been issued for the site since 1957 and were relating to extensions to the residential dwelling, transportation of a residential dwelling to the site and installation of a conservatory, septic tank, heaters, and replacing a garage. Other building consents/permits were for farming purposes such as the construction of a hay barn, garage workshop, the replacement and construction of sheds used for general storage or housing livestock.

According to WaiDC, information from the property file is provided in the LIM report and no information relating to contamination records for the site is provided.

6.4 Site Contamination Enquiry

A site contamination enquiry was requested and obtained from WRC on 13 October 2016. A copy of the enquiry for the site is provided in Appendix F.

The enquiry involves a search of the WRC Land Use Information Register (LUIR) of properties known to be contaminated on the basis of chemical measurements, or potentially contaminated on the basis of past land use. WRC confirmed that the site did not currently appear in the LUIR. The nearest properties of the Hazardous Activities and Industries List (HAIL) (MfE, 2011b) from the site that were listed from the search were relating to the persistent pesticide storage or use for Clyde Juices Limited/Te Kauwhata Viticultural Research Station/Rongopai Wines at the northwest adjacent property, and storage of fuel, chemicals or liquid waste, skin or wool processing including a tannery or fellmongery and fertiliser manufacture or bulk storage for Agrissentials NZ Limited/Richmond Abattoir/Paramount Export/PPCS at the northeast adjacent property.

6.5 HAIL Report

A Property Enquiry — HAIL report was provided by WaiDC on 20 September 2016 (attached in Appendix F). WaiDC provided a summary of registered HAIL activities or likely HAIL activities having occurred at the site, which included a record of an "*unverified HAIL A2: Chemical manufacture, formulation or bulk storage"* at the site. The unverified HAIL A2 activity was identified from a PSI completed by Contaminated Site Investigation Limited in March 2016. The PSI was undertaken in support of a subdivision application (SUB0133/16) at 94A Scott Road, Te Kauwhata (Lot 1 DPS 85308; 14.1 hectares) located at the north eastern portion of the site. The PSI stated that "*chemicals are stored in a shed located in a building to the south, which is part of a wider farm*". WaiDC noted that further information/investigation will be required into the existence of chemical storage on site. Further details on the existing CSI PSI is provided in Section 6.6 below (with the full CSI PSI provided in Appendix B).

The WaiDC HAIL report included a review of aerial photographs (1963, 1977-1979, 1993 and 2002) and noted the site as pastoral. Significant areas of wetland were present in 1963, and the presence of milking shed and farm buildings were noted in the available aerial photographs of 1977 to 2002.

6.6 Historical Environmental Investigations

A search of records provided by the local and regional council, LDL and site records for any previous environmental reports undertaken at the site was completed. A copy of the preliminary site investigation (PSI) report completed by Contaminated Site Investigation (CSI) Limited in March 2016 was obtained from WaiDC. The PSI report was undertaken at 94A Scott Road (Property E) covering an area of approximately 14 ha (to the northwest of Property D). The PSI noted that the piece of land was proposed to be subdivided into 24 lot rural subdivision with an access road.

The potential HAIL activities identified from the PSI concerned records of superphosphate application to the land, the use of persistent pesticides, and the passive release of facial eczema remedies applied to stock grazing at the site. The active contaminants identified by the PSI were cadmium (from superphosphate), DDT (from the pesticides), and zinc (from the facial eczema treatments). CSI completed a site walkover on 8 March 2016 which included the collection of 14 soil samples tested for arsenic, cadmium, zinc and DDT and the collection of soil sample analysed for pH from the surface at 30 mm depth. According to the PSI, the soil results were found to be well below the relevant assessment criteria from NES guidelines, Canadian guidelines, Auckland Regional Council's Protection Ecological Receptor Guidelines and the soil results were within the established background range for pastoral land in the Waikato Region.

The CSI report concludes that due to these chemical contaminant levels (i.e. below the applicable background criteria of the Waikato Region), the NES is not applicable to this site, and that no further contaminated land investigations are required.

Anecdotal information from the current owner and operator (Brendon White) at the time of the PSI (March 2016) confirmed that the investigation area has been for pastoral use since 1948. To his knowledge the site has never been used for horticultural purposes; chemical storage; sheep or livestock dipping; farm dumping or offal pitting. The site walkover conducted by CSI confirmed that the land was used for pastoral purposes, and no soil staining, vegetation stress, odour, sheep/livestock dipping structures or landfills/offal pits or chemical storage was noted.

A copy of the CSI PSI report is Appendix B.

7.0 Summary of Site Visit

A site visit was undertaken by PDP on 29 September 2016 for Properties A - D. Site photographs are provided in Appendix G.

A second site visit was undertaken by PDP on 1 March 2017 for properties E and F.

7.1 Site Visit – September 2016

The site visit involved an interview with the landowner, and site reconnaissance and visual survey of the site conditions. Properties A to D were identified to largely be pastoral paddocks used for dairy farming. A network of gravel farm tracks run from the southern end of Scott Road through Property A to D towards the south, east and west. No suspected asbestos containing material (ACM) was observed on farm tracks or around farm gates or water troughs. The paddocks are divided by typical wire and batten farm fencing. One residential dwelling is located at Property C and another residential dwelling is located at Property D; the two dwellings are timber houses and appear to be in relatively good condition. An old cabin is located within Property A on the eastern side and is made from timber and corrugated iron. The old cabin is surrounded by some inorganic rubbish i.e. an empty 100 L rusty drum, old tyres, planks of timber, sheets of fibreboard, corrugated metal sheets and broken sheets of plaster board. A small pile of timber logs for firewood is stored on the western side of the old cabin.

Eight sheds are located within Property A at the end of Scott Road and are used either for the storage of tractors, farming equipment, old furniture, old rubber tyres, several 10 kg boxes of 2,4-D Amine 800 WSG herbicide, animal feed for calves. One of the corrugated iron storage sheds contained two half used crates of 25 kg bags of magnesium chloride flakes used for supplementing stock drinking water or feed.

There are two milking sheds on Property A, one milking shed is found at the end of Scott Road and the other is a newer milking shed that is located southeast from the end of Scott Road. Apart from the milking sheds, the other work sheds are constructed directly over the ground and do not have concrete or sealed floors. Three sheds on Property C and one small shed on Property A are constructed of timber framing, masonry walls, corrugated iron roofing and fibre cement cladding (potential asbestos containing material (ACM)).

On Property A at the end of Scott's Road, a mobile 1,000 L steel tank containing diesel is located on the south side of a corrugated iron storage shed. Another mobile disused 500 L steel tank formerly containing diesel is stored inside one of the storage sheds at the end of Scott Road towards the southeast.

Multiple concrete water troughs are scattered across the site. Drainage channels have formed within the paddocks incising up to 500 mm deep and discharging into larger drainage features. At some locations where drainage gullies connect with Lake Waikare towards the east of the site and a settling pond (approximately 0.3 ha) which is located at the southern end of Property C, is surrounded by an

embankment. There are four smaller drainage ponds which appear at topographically low points at the western part of Property C, the southern part of Property B and the northern part of Property A.

A stockpile bay (approximately 30 m^3) of imported coarse sand is located at the end of Scott Road adjacent to the storage sheds. Several small stockpiles of dirt, broken concrete, fencing and timber (approximately 90 m^3) are located in various locations across the site.

A farm dump within a gully covering an area of approximately 450 m^2 is located near the centre of Property A. Immediately south and in the topographically down gradient direction of the farm dump is a line of small bushes, a tree and beyond is a small pond. The farm dump reportedly contains general rubbish (timber, a refrigerator, aerosol cans, metal scraps, fencing, plastic containers and bottles, rubber tyres, concrete rubble, hose pipe, timber and ash) according to Mr. Brian White. (This farm dump has been subsequently removed, see Section 7.2 for details.)

The land slopes generally off towards the south, which appears to be the natural topography.

Mr. Brian White was met on site and provided some additional historical information, as follows:

- The land was originally used as a dairy farm since 1948 and has been family operated and owned for the past three generations;
- Mr. White owns the residential dwelling at 94A Scott Road and his son owns the residential dwelling at 65 Scott Road;
- MCPA and MCPB herbicides were used for pasture spraying for weed control historically, and were last used approximately 10 years ago. Other herbicides used more recently but in small quantities include Roundup and Escort. A small amount of Paraquat was used over a 2 year period over 30 years ago on what is now 94 Scott Road. No DDT was ever used at the site;
- A farm dump is located within a gully at the site and its location was confirmed by the landowner. Farm rubbish was burned off and then moved into the gully to form the farm dump. It was noted that the local New Zealand Police obtained permission from the landowner on two occasions to burn off and bury two truckloads marijuana at the site. A small quantity of diesel was used to supplement the burning of the marijuana piles. No further information on the exact location and date of this burning was provided;
- Mr. White confirmed that there was minimal storage and use of chemicals (typically the largest quantities consisted of 10-20 L packets/drums) at the site;
- Superphosphate fertiliser has been applied to the site;
- Mr. White commented that the Department of Conservation typically in the past has undertaken annual herbicide control of weeds around Lake Waikare. A letter provided by Mr. White from the Department of Conservation concerned a notice of discharge of herbicide over land and water for the control of pest plants under Resource Consent No. 124871 and is provided in Appendix B. The letter noted the use of metsulfuron-methyl (with an estimated withholding period of 5 days) by way of spraying with a knapsack by hand, gun and hose or aerial spraying by helicopter using low drift nozzles to control alligator weed and yellow flag iris at Lake Waikare from Te Onetea Stream along the Northern and Eastern shorelines along. Mr. White also noted that Kiwi Rail would spray for weeds along the railway track (adjacent to the western site boundary);
- Cropping has been undertaken at the site; maize, turnips and chicory plant were last grown five years ago to supplement a pasture-based feed for dairy cows; and
- It was noted that the last flooding event in the area occurred in 1998, and parts of the site towards the east, south and west were inundated.

No other observations or anecdotal information obtained was of relevance to the site history related to possible soil contamination at the site.

Furthermore, vegetation (grassed, shrubs and trees) on site did not show any visible signs of distress, with the exception of the tracks made by vehicle movements and where water had been ponded.

7.2 Site Visit – 1 March 2017

This site visit involved a visual survey of Properties E and F, and visual confirmation of the excavation of the farm dump on Property A.

Property E also comprises paddocks and associated gravel farm tracks. Two sheds were present on Property E and were inspected to check for the possible presence of ACM building materials. No such materials were confirmed or suspected to be present. No suspected ACM was observed on farm tracks or around farm gates or water troughs. The house on Property F is expected to be original (aerial images suggest that it has been present onsite since prior to 1952). The house was not investigated in detail, but did not appear to have any external cladding which appeared to contain ACM building materials.

The farm dump in the centre of Property A was visually inspected following the reported removal of the farm dump material to Hampton Downs Landfill in early February 2017. The visual inspection confirmed that the farm dump material has been removed, with the farm dump area excavated to below the topsoil layer (as observed around the edges of the excavated area) into the natural mottled orange-brown underlying subsoils. Few residual pieces of gravel and concrete were observed beyond the edges of the excavated area. No visual evidence of contamination was observed during investigation of the former farm dump area.

8.0 Conceptual Site Model

This section describes the conceptual site model (CSM) for the site and has been used to develop a limited sampling and analysis plan for plan change purposes, in consultation with LDL. The proposed future of the site is for a private plan change to residential use, and a residential development. Based on instruction from LDL, and in accordance with the high level nature of this report (for a private plan change), the CSM is conservative and identifies any/all of the potential HAIL activities which are occurring, or may have occurred, within the proposed development area. The CSM also outlines the applicable land-use scenarios, and the relevant guideline criteria for assessment of the proposed development area, both during the development works, and for the proposed end-use of the properties within the development area.

A risk to human health can only exist if there is a source (i.e. contaminated soil, groundwater or vapours), a receptor (i.e. people) and an exposure pathway between the source and the receptor. If any of these components is missing then there cannot be a risk (i.e. an ‘incomplete pathway’). If a contamination linkage is confirmed (i.e. a ‘complete pathway’) then there may be a risk on the site. A conceptual site model (CSM) is designed to identify the sources, receptors and pathways. A CSM for the site is presented below in Table 8.0.

Table 8.0: Conceptual Site Model	
HAIL land use	General storage and application of pesticides/herbicides for cropping due to historic use of the site for pastoral (dairy farm) land use. Farm dumping and burning of dairy farm waste and household materials (area covering approximately 450 m^2). Potential presence of ACM (cladding on walls of work/storage sheds). Storage tank for fuel (diesel storage tank 1,000 L). Potential uncontrolled fill material used for the construction of embankments from water features at the site, or on swamp margins to develop land suitable for pastoral use and the construction of embankments.
Identified potential contaminants of concern	Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel and zinc), polycyclic aromatic compounds, total petroleum hydrocarbons, and acid herbicides. Organochlorine pesticides (OCPs) is considered to be of low likelihood based on the anecdotal evidence provided. Paraquat is considered to be a hazardous substance; however, once diluted and applied to crop or soil, the product residue binds irreversibly to soil and effectively becomes biologically inactive. The US EPA (1995 and 1997) state that the use of currently registered products containing paraquat in accordance with approved labelling "will not pose unreasonable risk or adverse effects to humans or the environment". 2,4-D Amine has been used onsite but is not considered to be persistent pesticide (short half-life in the environment).
Potential mechanism of soils contamination	Potential bulk application from ground spray units; leaching to ground (low risk). Spills from diesel storage to ground. Multiple burning and dumping of waste, degrading persistent chemicals from waste; leaching in to ground. Demolition of ACM walls and dispersing material to ground. Bulk usage and storage of unsealed packs; spills and leaching in to ground.
Identified receptors	<u>Short term</u> Workers during any future site development involving soil disturbance. <u>Long term</u> Future maintenance/excavations at the site (if remaining on-site); Any future residential site users; Groundwater and surface water environments from site discharges.
Potentially complete exposure pathways identified	Dermal contact from workers during soil disturbance and long term future site users – potentially complete. Soil ingestion from workers during soil disturbance and long term future site users – potentially complete. Discharges to groundwater and/or surface water during soil disturbance – complete due to the shallow water table at the site and the presence of wetland margins immediately east of the site.

Table 8.0: Conceptual Site Model	
Applicable standards and guidelines for human health protection	NES SCS for residential land use, recreational land use and commercial/industrial outdoor worker (unpaved) land use. MfE (2011c) Tier 1 soil acceptance criteria for residential land use.
Applicable discharge criteria	WRC Background Elements in Waikato Region (Kim, 2009). Australian and New Zealand Environment and Conservation Council (ANZECC, 2000) trigger values for the protection of 80% freshwater species.

Note that the actual/potential HAIL identified is restricted to specific locations and limited areas on the site.

9.0 Preliminary Sampling Investigation

For plan change purposes and to understand the soil conditions at the site, a sampling and analysis plan was prepared in consultation with LDL. The sampling investigation was undertaken by PDP field operatives on 11 October 2016.

9.1 Sampling Method

Sampling was undertaken in general accordance with *MfE Contaminated Land Management Guidelines No. 5*: *Site Investigation and Analysis of Soils* (MfE, 2011d). The soil sampling was undertaken by PDP on 11 October 2016 where a range of broad-scale composite and targeted surface sampling was completed. The sample locations were chosen to ensure a good distribution across the site and to best target areas most likely to have been potentially impacted by current and former site use. The following samples were collected:

1. 30 general surface soil samples grouped into 6 composites (5 sub-samples each) were collected from across the open farmland on-site. These composite samples were tested for heavy metals, organochlorine pesticides (OCPs), polycyclic aromatic hydrocarbons (PAHs), and acid herbicides (AHs).
2. 17 surface soil samples grouped into 6 composites were collected at targeted locations based on potential HAIL activities noted during the desktop study and site reconnaissance. These included:
    a. Embankment fill area (2 sub-samples composited and tested for heavy metals, OCPs and PAHs.);
    b. Shooting range (4 sub-samples composited and tested for heavy metals);
    c. Flood bank bund (2 sub-samples composited and tested for heavy metals, OCPs and PAHs);
    d. Stockpile fill area (2 sub-samples composited and tested for heavy metals, OCPs, and PAHs);
    e. Silage fill area near cowshed (2 sub-samples composited and tested for heavy metals, OCPs, and PAHs, AHs); and
    f. Farm dump (4 sub-samples composited and tested for heavy metals, OCPs, PAHs, AHs, and TPHs).
3. Targeted individual soil sample taken from below the above ground diesel tank (SS39) and tested for total petroleum hydrocarbons (TPHs) and PAHs.
4. Targeted individual soil sample taken from the soil near the chemical storage shed (SS38) tested for heavy metals, OCPs and AHs.

5. 1 sediment sample taken from toe of farm dump and tested for heavy metals, OCPs, PAHs, AHs, and TPHs.
6. 1 leachate sample was taken from the toe of the farm dump and tested for heavy metals, OCPs, PAHs, AHs, and TPHs.

All surface soil samples (0 – 0.15 m) were collected using a spade and trowel and placed into clean containers provided by the laboratory. An individual sample was collected at each location as shown on Figure 1 and sent to Hill Laboratories (Hills) for analysis. Selected soil samples were then composited by the laboratory where it was appropriate to maximise the coverage of the site. The leachate sample was collected by excavating a small hole and allowing the leachate seepage to flow directly into the laboratory approved sampling bottles.

A fresh pair of nitrile gloves were used for each sample, and the sampling equipment was decontaminated (with Decon90) between sample locations. Samples were kept cool following collection and submitted to the laboratory following standard chain of custody procedures.

9.2 Assessment Criteria

Applicable evaluation criteria for soil samples have been selected and are presented below. The analytes for the samples listed above were selected according to the potential contaminants of concern identified in the CSM. The analysis suite was developed in consultation with LDL to meet the objectives of the investigation.

Appropriate guidelines have been selected for comparison to carry out a preliminary health and environmental risk assessment (as outlined in Table 1 appended). These guideline values were selected in accordance with the guidance provided in the MfE (2011e) 'Contaminated Land Management Guidelines No. 2: Hierarchy and application in New Zealand of environmental guideline values'. The samples have been compared to the NES SCS for residential (10% produce) land use, NES SCS for recreational land use and NES SCS for commercial/industrial outdoor worker (unpaved) land use (MfE, 2012).

In addition to the guideline values provided in Table 1, the results of the analysis for heavy metals have been compared to the background levels for these elements published in the WRC (Kim, 2009) for background concentration of elements commonly found in soil. This comparison provides an indication of whether the contaminant concentrations observed have been contributed to by anthropogenic processes (e.g. HAIL use). Hydrocarbons were considered a likely source of contaminants within the site (at the above ground diesel tank location). Selected samples were analysed for petroleum hydrocarbons and compared against the MfE values given for residential/agricultural land use within sandy silt at a depth of <1 m (MfE, 2011c) as this was considered the most common exposure pathway at this site.

9.3 Results and Comparison to Evaluation Criteria

A summary of the laboratory analysis for the soil samples are presented in Table 1 and the analytical results of the leachate sample is summarised in Table 2. The laboratory results of soil samples and a leachate sample are included in Appendix A. The laboratory results have been compared with evaluation criteria as reported with no adjustment for composite sample results (i.e. evaluation criteria have not been divided by the number of sub-samples in the composite sample due to the expected broad-scale nature of the potential contaminants of concern across composite sample areas (paddocks, etc.) and expected consistent application/deposition).

A summary of the results is as follows:

1. Paddock area composite samples (SS1-SS5; SS6-SS10; SS17,SS18, SS32 and SS37; SS19-SS22 and SS31; SS23-SS25, SS34 and SS40; SS42, SS44-SS47):

a. Heavy metals – within WRC background levels and the adopted human health evaluation criteria for residential land use, apart from arsenic concentration in composite sample collected from the southeast part of the site (SS19-SS22 & SS31) (although the arsenic concentration does comply with recreational land use). Analysis of individual samples SS19-SS22 & SS31 reported arsenic concentrations between 9 and 46 mg/kg (SS31 (9 mg/kg arsenic) meets the residential land use criterion, with other samples (SS19-SS22) meeting the recreational land use criterion).

b. OCPs, PAHs, and AHs – all less than laboratory screening level detection limit.

2. Targeted composite samples:

a. Embankment fill area (SS11 and SS12)

i. Heavy metals – all detected heavy metal concentrations were within WRC background levels and below the NES SCS for residential land use.

ii. OCPs and PAHs - all less than laboratory screening level detection limit.

b. Shooting range (SS13-SS16)

i. Heavy metals - concentrations of copper and zinc marginally exceeded the WRC background levels and lead concentrations exceeded the NES SCS for residential land use (but comply with NES SCS for recreational land use); all other heavy metal concentrations were within the WRC background levels.

c. Flood bank bund (SS41 and SS43)

i. Heavy metals – within WRC background levels and the adopted human health evaluation criteria for residential land uses, apart from arsenic concentrations which marginally exceeded the NES SCS for residential land use.

ii. OCPs and PAHs - all less than laboratory screening level detection limit.

d. Stockpile fill area (SS35 and SS36)

i. Heavy metals –all detected concentrations were within WRC background levels.

ii. OCPs and PAHs - all less than laboratory screening level detection limit.

e. Silage area containing old tyres near cowshed (SS48 and SS49)

i. Heavy metals – concentrations of cadmium and lead were above the WRC background levels and all other concentrations were below the NES SCS for residential land use.

ii. OCPs, PAHs and AHs - all less than laboratory screening level detection limit.

f. Farm dump (SS26, SS27, SS29 and SS30)

i. Heavy metals – concentrations of cadmium, copper, lead and zinc were above the WRC background levels and all other concentrations were below the NES SCS for residential land use.

ii. OCPs – apart from trace levels of 4,4'-DDT compounds, all other OCP compounds were less than laboratory screening level detection limit

iii. PAHs, AHs and TPHs - all less than laboratory screening level detection limit.

3. Above ground diesel tank (SS39):
    a. TPHs – elevated concentrations of TPH compounds within the C_{15}-C_{36} band range exceeded the relevant human health criteria of the MfE (2011c) Tier 1 soil acceptance criteria for residential land use and indicated the PAH surrogate as a limiting pathway.
    b. PAHs - Further testing of the sample for individual PAH compounds reported concentrations of pyrene at 12.3 mg/kg which exceeded the MfE (2011c) soil acceptance criteria for the protection of groundwater quality, the remaining PAH compounds were below laboratory detection limit.
    c. The gas chromatogram indicated a hydrocarbon sequence similar to diesel product.
4. Chemical storage shed (SS38):
    a. Heavy metals – apart from elevated zinc concentrations all other heavy metal concentrations were within the WRC background levels.
    b. OCPs and AHs – all less than laboratory screening level detection limit.
5. Sediment sample from toe of farm dump (SS28):
    a. Heavy metals – all concentrations were within the WRC background levels.
    b. OCPs, PAHs, AHs and TPHs - all less than laboratory screening level detection limit.
6. Leachate sample from the toe of farm dump:
    a. Heavy metals – concentrations of cadmium, copper, lead and zinc which exceeded the ANZECC guideline criteria for 80% of freshwater species.
    b. OCPs, PAHs, AHs and TPHs - all less than laboratory screening level detection limit.

The sampling results are further summarised in Table 9.3 below and compared to relevant standards and guidelines for the proposed land use.

Table 9.3: Summary of Sample Results and Comparison with Expected Land Use Criteria

Sample Location	Sample ID	Expected Land Use	Sample Result below guidelines for proposed use (Y/N)	Heavy Metals		OCP, PAHs and AHs	Arsenic			Comments
				Below WRC background levels (Y/N)	Below adopted residential land use criteria (Y/N)	Less than lab detection limits (Y/N)	Sample Result within background (Y/N)	Sample Result below adopted residential criteria (Y/N)	Sample Result below adopted recreational criteria (Y/N)	
Paddock (Property A West)	Composite SS17, SS18, SS32, SS33 and SS37	Low/Medium Density Residential Lots; Managed Grazed Farmland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Paddock (Property A East)	Composite SS23-SS25, SS34 and SS40	Low/Medium Density Residential Lots; Recreational Use	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Paddock (Property B)	Composite SS19-SS22 and SS31*	Recreational Use; Managed Grazed Farmland	Yes	Yes	No*	Yes	Yes*	No	Yes	* See note below regarding background concentration and individual sample results
Paddocks (Property C North)	Composite SS1-SS5	Low/Medium Density Residential Lots	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Paddocks (Property C South)	Composite SS6-SS10	Low Density Residential Lots; Managed Grazed Farmland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Paddock (Property D)	Composite SS42,SS44-SS47	Low/Medium Density Residential Lots; Recreational Use	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-

Table 9.3: Summary of Sample Results and Comparison with Expected Land Use Criteria

Sample Location	Sample ID	Expected Land Use	Sample Result below guidelines for proposed use (Y/N)	Heavy Metals		OCP, PAHs and AHs	Arsenic			Comments
				Below WRC background levels (Y/N)	Below adopted residential land use criteria (Y/N)	Less than lab detection limits (Y/N)	Sample Result within background (Y/N)	Sample Result below adopted residential criteria (Y/N)	Sample Result below adopted recreational criteria (Y/N)	
Paddock (Property E)	Refer to CSI PSI	Low/Medium Density Residential Lots	Yes	Yes	Yes	Yes	N/A	N/A	N/A	Arsenic not tested as a contaminant of concern
Embankment (Settling Ponds)	Composite SS11-SS12	Recreational Use	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Shooting Range	Composite SS13-SS16	Low Density Residential Lots	No	No	No	NA	Yes	Yes	Yes	Soil to be removed to an approved disposal facility
Embankment (Lake Waikare)	Composite SS41 and SS43	Recreational Use	Yes	Yes	No	Yes	Yes	Yes	Yes	-
Stockpile	SS35 and SS36	Medium Density Residential Lots	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Silage/Old Tyres	Composite SS48 and SS49	Medium Density Residential Lots	Yes	No	Yes	Yes	Yes	Yes	Yes	Soil to be removed to an approved disposal facility
Farm Dump	Composite SS26,SS27,SS29 and SS30	Medium Density Residential Lots	Yes	No	Yes	No	Yes	Yes	Yes	Farm dump material (153.8 t) removed to Hampton Downs Landfill on 7-8 February 2017 (landfill dockets attached in Appendix H)

Table 9.3: Summary of Sample Results and Comparison with Expected Land Use Criteria

Sample Location	Sample ID	Expected Land Use	Sample Result below guidelines for proposed use (Y/N)	Heavy Metals		OCP, PAHs and AHs	Arsenic			Comments
				Below WRC background levels (Y/N)	Below adopted residential land use criteria (Y/N)	Less than lab detection limits (Y/N)	Sample Result within background (Y/N)	Sample Result below adopted residential criteria (Y/N)	Sample Result below adopted recreational criteria (Y/N)	
Diesel AST	SS39	Community Hub	No	NA	NA	No	Yes	Yes	Yes	Soil to be removed to an approved disposal facility
Chemical Storage Shed	SS38	Community Hub	Yes	No	Yes	Yes	Yes	Yes	Yes	
Toe of Farm Dump	SS28	Medium Density Residential Lots	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:
NA - Not analysed
Background arsenic concentrations up to 25 mg/kg (possibly from geothermal activity).
Individual sub-sample results tested for arsenic (SS19 – 33 mg/kg; SS20 – 22 mg/kg; SS21 – 46 mg/kg; SS22 – 42 mg/kg; SS31 – 9 mg/kg). All sub-sample results comply with NES SCS for arsenic for recreational land use. Sub-sample SS31 also complies with NES SCS for residential land use (10% produce).

10.0 Risk Assessment

10.1 Human Health Risk Assessment

As detailed above, a majority of the composite soil samples collected from the farm dump, paddocks (Property A, C, D and E), stockpile of fill material, silage area near the cow shed, and the settling pond embankment, including the target soil samples from the chemical storage shed and toe of the farm dump reported the various contaminants of concern at levels below the applicable human health criteria. All OCPs and AHs were reported below laboratory detection or at trace concentrations within all samples collected and therefore were not considered necessary for comparison to the adopted human health criteria.

Arsenic concentrations that marginally exceeded the human health evaluation criteria for residential land use for composite soil samples were localised to the paddocks in the southeast part of the site (SS19-SS22 and SS31) and the Lake Waikare flood bank bund (SS41 and SS43). These sample locations are outside of the land area proposed for residential use and within the land area proposed for recreational and managed grazing farmland use. Arsenic concentrations in the above composite samples complied with human health standards for recreational land use[1]. All other composite soil samples reported arsenic concentrations (<14 mg/kg) below the adopted human health NES SCS (<20 mg/kg). The analysis of the individual SS19 to SS22 and SS31 samples (and the low arsenic concentrations in the other composite samples) indicates that the elevated arsenic is limited to the low lying areas of the site and outside of the areas designated for residential land use.

Similarly, elevated lead concentrations in composite soil samples from the shooting range exceeded the human health evaluation criteria for residential land use. This lead concentration complied with human health standards for recreational land use and is considered to be localised. All other composite soil samples reported lead concentrations well below the adopted human health evaluation criteria.

The single targeted sample collected beneath the diesel above ground storage tank appeared to represent a localised impact at the surface as staining of the surface soil was evident. The TPH soil sample results were at values which prompted the testing for individual PAH compounds. Apart from pyrene, all other PAH compounds reported within the sample were at trace concentrations or below detection levels. Overall none of the PAH compounds were at levels exceeding any of the relevant MfE (2011c) route-specific human health based criteria.

Properties A, C and F may contain buildings with ACM building materials present. Before demolition of these buildings, the Asbestos Regulations 2016 require that a demolition survey be completed by a competent person for any building built before 1 January 2000. Any asbestos or ACM building materials confirmed or assumed to be present must be removed by a competent person (for <10 m^2 of non-friable ACM) or by a licenced asbestos removalist (for >10 m^2 non-friable ACM and for friable asbestos), and a clearance certificate issued, prior to the demolition of buildings.

10.2 Environmental Risk Assessment

A single soil sample from the chemical storage shed and composite soil samples collected from the shooting range, farm dump, silage/old tyre areas contained elevated heavy metal concentrations of cadmium, copper, lead and/or zinc which exceeded the WRC background levels.

[1] The individual samples comprising this composite were tested for arsenic and reported results were: SS19 – 33 mg/kg; SS20 – 22 mg/kg; SS21 – 46 mg/kg; SS22 – 42 mg/kg; and, SS31 – 9 mg/kg. All individual sample results comply with NES SCS for arsenic for recreational land use, with individual sample SS31 also complying with NES SCS for residential land use (10% produce).

Pyrene concentrations detected within the single soil sample collected from beneath the diesel AST were above the MfE (2011c) Tier 1 soil acceptance criteria for the protection of groundwater quality, however given that the hydrocarbon impact appears to be localised (<1 m^2) and surficial (i.e. from minor spills while refilling vehicles), it is unlikely for the nearest surface water receptors to be impacted due to hydrocarbon concentrations attenuating with depth and distance. It is proposed that this soil is removed and disposed of to an approved landfill facility.

The leachate sample collected from the farm dump contained heavy metal concentrations (cadmium, copper, lead and zinc) which exceeded the ANZECC guideline criteria for 80% of freshwater species. The source of the contamination (the farm dump material) has since been removed and disposed of to an approved landfill facility.

11.0 Conclusions and Recommendations

This Preliminary Site Investigation has confirmed that specific areas of the site have been subject to HAIL land use as noted below. However, chemical concentrations across the remainder (the majority) of the site are generally within background levels for the Waikato region or below the laboratory detection limits. On this basis there do not appear to be any significant and widespread potential contamination issues that might impact on the proposed private plan change and residential development.

In summary, the following potential areas of concern were investigated and the recommended measures to address the potentially contaminated areas are listed below:

- Asbestos cladding on farm buildings (possibly present in sheds and buildings on Property A, C, and F) – survey and remove in accordance with the Asbestos Regulations 2016;
- Farm dump – the farm dump material (including impacted soil) on Property A was excavated and removed to Hampton Downs Landfill facility on 7 and 8 February 2017. Landfill dockets totalling 153.8 tonnes are included in Appendix H. A site visit conducted by PDP on 1 March 2017 visually confirmed that the farm dump material had been removed. It is recommended that this visual observation be supported by the collection and analysis of soil validation samples from across the former farm dump location prior to any soil disturbance in this location;
- Paddocks in the southeast part of the site – the elevated arsenic concentrations (25 mg/kg in the composite sample (SS19-SS22 and SS31), and between 9 and 43 mg/kg in the respective individual samples) in the southeast part of the site exceed the NES SCS for residential (10% produce consumption) land use (20 mg/kg), but comply with the NES SCS for recreational land use. Further sampling may be required to investigate arsenic concentrations on proposed residential land bordering this part of the site;
- Shooting range - the elevated lead concentration in the vicinity of the shooting range exceeds the NES SCS for residential (10% produce consumption), but complies with the NES SCS for recreational land use. Further sampling may be required to investigate lead concentrations on proposed residential land in this part of the site. Where necessary soil will be removed and disposed of to an approved landfill facility as part of the redevelopment;
- Flood bank – the arsenic concentration in the composite soil sample from Lake Waikare stop bank (SS41 and SS43) marginally exceeded the NES SCS for residential (10% produce consumption) land use. However, no further action is required as the arsenic concentration complies with the human health standard for the expected land use (recreational);
- Silage area - heavy metal concentrations exceed background levels in composite soil sample collected from the silage/old tyre areas but comply with human health standards for residential

land use. No further action is required for this area although some surface soils may be removed to an approved disposal facility as part of the proposed site redevelopment;

- Diesel storage tank – hydrocarbon concentration in the surface soil sample from this area exceeds the human health standard for residential land use. The hydrocarbon contamination is expected to be localised and the contaminated soil will be excavated, removed from the site and disposed of to an approved landfill; and
- Chemical storage shed – chemical concentrations in the surface soil sample from this area complies with human health standards for residential land use. No further action is required for this area although some surface soils may be removed to an approved disposal facility as part of the proposed site redevelopment.

12.0 References

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13.0 Limitations

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Lakeside Developments 2017 Limited, and others (not directly contracted by PDP for the work) including Waikato Regional Council, Waikato District Council and Contaminated Site Investigation Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

The information contained within this report applies to sampling undertaken on the dates staged in this report. With time, the site conditions and environmental standards could change so that the reported assessment and conclusions are no longer valid. Accordingly, the report should not be used to refer to site conditions and environmental standards applying at a later date without first confirming the validity of the report's information at that time.

This report has been prepared by PDP on the specific instructions of Lakeside Developments 2017 Limited for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

Yours faithfully

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SOURCE: i
1. AERIAL IMAGERY (FLOWN 2012-2013) SOURCED FROM THE LINZ DATA SERVICE
WWW.DATA.LINZ.GOVT.NZ/LAYER/1872 AND LICENCED FOR RE-USE UNDER THE CREATIVE COMMONS ATTRIBUTION 3.0 NEW ZEALAND LICENCE.
2. PARECL BOUNDARY OBTAINED FROM QUICKMAP (UPDATED 31/10/2016)
3. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.

FIGURE 1 : SITE LOCATION AND SAMPLING PLAN

SCALE: 1:7,500 (A3)

0 50 100 200
METRES

A03076100Z001_LocationPlan_Issue3.mxd 03/17 ISSUE 3

Table 1: Soil Analytical Results [1]

Soil Sample ID	Composite SS17, SS18, SS32, SS33 and SS37	Composite SS23-SS25, SS34 and SS40	Composite SS19-SS22 and SS31	Composite SS1-SS5	Composite SS6-SS10	Composite SS42,SS44-SS47	Composite SS11-SS12	Composite SS13-SS16	Composite SS41 and SS43	SS35 and SS36	Composite SS48 and SS49	Composite SS26,SS27,SS29 and SS30	SS39	SS38	SS28	**Background Elements in Waikato Region** [3]	Human Health Evaluation Criteria - NES SCS [4]		
Sample Depth (m)	0.15																Residential 10% produce	Commercial / industrial outdoor worker (unpaved)	Recreation
Lab ID	1663557.55	1663557.57	1663557.56	1663557.51	1663557.52	1663557.60	1663557.53	1663557.54	1663557.58	1663557.59	1663557.62	1663557.61	1663557.47	1663557.46	1663557.43				
Sample Location	Paddock (Property A West)	Paddock (Property A East)	Paddock (Property B)	Paddocks (Property C North)	Paddocks (Property C South)	Paddock (Property D)	Embankment (Settling Ponds)	Shooting Range	Embankment (Lake Waikare)	Stockpile	Silage/Old Tyres	Farm Dump	Diesel AST	Chemical Storage Shed	Toe of Farm Dump				
NZGS Soil type [2]	Sandy Silt																		
Heavy Metals																			
Arsenic	5	6	25	6	7	12	4	5	21	< 2	9	14	-	6	3	0.44 - 25.3	20	70	80
Cadmium	0.41	0.33	0.27	0.46	0.43	0.33	< 0.10	0.14	0.13	< 0.10	**0.52**	**0.54**	-	0.16	0.45	0.03 - 0.47	3	1300	400
Chromium (total)	6	6	6	11	10	6	3	4	9	3	15	15	-	9	4	0.16 - 27.8	460	6300	2,700
Copper	8	7	12	14	11	10	4	**29**	16	3	15	**33**	-	21	10	2.2 - 28	>10,000	>10,000	>10,000
Lead	16.8	15.4	13.8	21	28	15.8	13.2	**420**	18.0	11.1	**49**	**65**	-	19.5	13.7	2.57 - 32.1	210	3300	880
Nickel	3	3	4	3	3	3	< 2	2	4	< 2	5	7	-	7	2	0.56 - 14	400 [5]	-	-
Zinc	35	28	35	62	50	29	16	**67**	38	28	53	**840**	-	**135**	55	8.3 - 65	7,400 [5]	-	-
Total Petroleum Hydrocarbons (TPH)																			
C_7 - C_9	-	-	-	-	-	-	-	-	-	-	< 9	< 10	< 9	-	<16	-	(500) [6,7m,8]	500	-
C_{10} - C_{14}	-	-	-	-	-	-	-	-	-	-	< 20	< 20	2,000	-	<40	-	(510) [6,7x]	31,000	-
C_{15} - C_{36}	-	-	-	-	-	-	-	-	-	-	< 40	< 40	37,000	-	<70	-	NA [9]	NA [9]	-
Total (C_7 - C_{36})	-	-	-	-	-	-	-	-	-	-	< 70	< 70	39,000	-	<120	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAH)																			
Total PAH	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	12.9 [10]	-	ND	-	-	-	-
Organochlorine Pesticides (OCP)																			
Total OCPs	ND	ND	ND	ND	ND	ND	ND	-	ND	ND	ND	0.013 [11]	-	ND	ND	-	-	-	-
Acid Herbicides																			
Total Acid Herbicides	ND	ND	ND	ND	ND	ND	-	-	-	-	ND	ND	-	ND	ND	-	-	-	-

21	Values in bold exceed the backround element range for Waikato soils
78	Values underlined exceed the NES SCS Human Health Evaluation Criteria
ND	All values for individual compounds are below the laboratory limit of detection

Notes.
1. All results in mg/kg.
2. Soil descriptions are reported using the guidelines outlined in Field Descriptions of Soil and Rock (New Zealand Geotechnical Society Inc., 2005).
3. Values from 'Land and Soil Monitoring: A Guide for SoE and Regional Council Reporting'. Trace Element Monitoring Chapter 5. Kim and Taylor (2009).
4. NES Soil Contaminant Standards from "Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health" (MfE, 2011) - Residential 10% produce consumption and Commercial/Industrial Outdoor Worker (unpaved) land uses.
5. Criteria Guideline values from "Schedule B(1) Guideline on the Investigation Levels for Soils and Groundwater NEPC 1999 (Updated 2013) Schedule B Table 1A(1) Health Investigation Levels for Soil Contaminants HIL-A: Residential A and HIL-C: Recreational C.
6. Criteria from Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011. Ministry for the Environment. Tier 1 All Pathways Soil Criteria for residential land use or maintenance/excavation workers (Sandy Silt <1m).
7. The following notes indicate the limiting pathway for each criterion: m - maintenance/excavation, x - PAH surrogate.
8. Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons.
9. NA indicates estimated criterion exceeds 20,000 mg/kg. At 20,000 mg/kg residual separate phase is expected to have formed in soil matrix. Some aesthetic impact may be noted.
10. Value is a sum of Fluorene (0.6 kg/mg) and Pyrene (12.3mg/kg). The equivalent BaP concentration for this sample is ND.
11. Value is of detected concentrations of 4,4-DDT; all other OCPs reported below the limit of detection.

Table 2: Leachate Analytical Results [1]

Leachate Sample ID	LEACH 1	**ANZECC 80% Freshwater Species [2]**
Lab ID	1663557.48	
Sample Location	Farm Dump	
Heavy Metals		
Arsenic	0.049	0.5
Cadmium	**0.00136**	0.0008
Chromium (total)	0.024	0.04
Copper	**0.056**	0.0025
Lead	**0.083**	0.0094
Nickel	0.0078	0.017
Zinc	**0.57**	0.0031
Total Petroleum Hydrocarbons (TPH)		
C_7 - C_9	<0.10	-
C_{10} - C_{14}	<0.2	-
C_{15} - C_{36}	<0.4	-
Total hydrocarbons (C_7 - C_{36})	<0.7	-
Polycyclic Aromatic Hydrocarbons (PAH)		
Total PAH	ND	-
Organochlorine Pesticides (OCP)		
Total OCPs	ND	-
Acid Herbicides		
Total Acid Herbicides	ND	-

0.065	Value exceeds the ANZECC guidelines for 80% protection of freshwater species
ND	All values for individual compounds are below the laboratory limit of detection

Notes.

1. All results in mg/L.
2. Values from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC), 2000, for the protection of 80% of freshwater species.

APPENDIX A – LABORATORY TRANSCRIPT

Hill Laboratories
BETTER TESTING BETTER RESULTS

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ANALYSIS REPORT

Client:	Pattle Delamore Partners Limited	**Lab No:**	1663557	SPv5
Contact:	T Bellingham	**Date Received:**	13-Oct-2016	
	C/- Pattle Delamore Partners Limited	**Date Reported:**	04-Nov-2016	
	PO Box 9528	**Quote No:**	81087	
	Newmarket	**Order No:**		
	Auckland 1149	**Client Reference:**	A03076100	
		Submitted By:	Scott Nicol	

Amended Report

This report replaces an earlier report issued on the 27 Oct 2016 at 4:23 pm
Arsenic added to samples SS19, SS20, SS21, SS22 and SS31 as per clients request.

Sample Type: Soil

Sample Name:		SS19 11-Oct-2016	SS20 11-Oct-2016	SS21 11-Oct-2016	SS22 11-Oct-2016	SS31 11-Oct-2016
Lab Number:		1663557.22	1663557.23	1663557.24	1663557.25	1663557.26
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	33	22	46	42	9

Sample Name:		SS28 11-Oct-2016	SS38 11-Oct-2016	SS39 11-Oct-2016	Composite of SS1, SS2, SS3, SS4 & SS5	Composite of SS6, SS7, SS8, SS9 & SS10
Lab Number:		1663557.43	1663557.46	1663557.47	1663557.51	1663557.52
Individual Tests						
Dry Matter	g/100g as rcvd	41	78	83	74	75
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	6	-	6	7
Total Recoverable Cadmium	mg/kg dry wt	0.45	0.16	-	0.46	0.43
Total Recoverable Chromium	mg/kg dry wt	4	9	-	11	10
Total Recoverable Copper	mg/kg dry wt	10	21	-	14	11
Total Recoverable Lead	mg/kg dry wt	13.7	19.5	-	21	28
Total Recoverable Nickel	mg/kg dry wt	2	7	-	3	3
Total Recoverable Zinc	mg/kg dry wt	55	135	-	62	50
Acid Herbicides Screen in Soil by LCMSMS						
Acifluorfen	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Bentazone	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Bromoxynil	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Clopyralid	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Dicamba	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
2,4-Dichlorophenoxyacetic acid (24D)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
2,4-Dichlorophenoxybutyric acid (24DB)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Dichlorprop	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Fluazifop	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Fluroxypyr	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Haloxyfop	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
2-methyl-4-chlorophenoxyacetic acid (MCPA)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
2-methyl-4-chlorophenoxybutanoic acid (MCPB)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Mecoprop (MCPP; 2-methyl-4-chlorophenoxypropionic acid)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Oryzalin	mg/kg dry wt	< 0.4	< 0.4	-	< 0.4	< 0.4

ilac-MRA IANZ ACCREDITED LABORATORY

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Soil						
Sample Name:		SS28 11-Oct-2016	SS38 11-Oct-2016	SS39 11-Oct-2016	Composite of SS1, SS2, SS3, SS4 & SS5	Composite of SS6, SS7, SS8, SS9 & SS10
Lab Number:		1663557.43	1663557.46	1663557.47	1663557.51	1663557.52
Acid Herbicides Screen in Soil by LCMSMS						
Pentachlorophenol (PCP)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Picloram	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Quizalofop	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
2,3,4,6-Tetrachlorophenol (TCP)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
2,4,5-trichlorophenoxypropionic acid (245TP,Fenoprop, Silvex)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
2,4,5-Trichlorophenoxyacetic acid (245T)	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Triclopyr	mg/kg dry wt	< 0.2	< 0.2	-	< 0.2	< 0.2
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	-	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
4,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
4,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
2,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
4,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Total DDT Isomers	mg/kg dry wt	< 0.06	< 0.06	-	< 0.06	< 0.06
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Endrin aldehyde	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	-	< 0.010	< 0.010
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Anthracene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Chrysene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Fluoranthene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Fluorene	mg/kg dry wt	< 0.06	-	0.6	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Naphthalene	mg/kg dry wt	< 0.3	-	< 1.4	< 0.15	< 0.15
Phenanthrene	mg/kg dry wt	< 0.06	-	< 0.3	< 0.03	< 0.03
Pyrene	mg/kg dry wt	< 0.06	-	12.3	< 0.03	< 0.03

Sample Type: Soil						
Sample Name:		SS28 11-Oct-2016	SS38 11-Oct-2016	SS39 11-Oct-2016	Composite of SS1, SS2, SS3, SS4 & SS5	Composite of SS6, SS7, SS8, SS9 & SS10
Lab Number:		1663557.43	1663557.46	1663557.47	1663557.51	1663557.52
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 16	-	< 9	-	-
C10 - C14	mg/kg dry wt	< 40	-	2,000	-	-
C15 - C36	mg/kg dry wt	< 70	-	37,000	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 120	-	39,000	-	-

Sample Name:		Composite of SS11 & SS12	Composite of SS13, SS14, SS15 & SS16	Composite of SS17, SS18, SS32, SS33 & SS37	Composite of SS19, SS20, SS21, SS22 & SS31	Composite of SS23, SS24, SS25, SS34 & SS40
Lab Number:		1663557.53	1663557.54	1663557.55	1663557.56	1663557.57
Individual Tests						
Dry Matter	g/100g as rcvd	71	-	70	54	66
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	5	5	25	6
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.14	0.41	0.27	0.33
Total Recoverable Chromium	mg/kg dry wt	3	4	6	6	6
Total Recoverable Copper	mg/kg dry wt	4	29	8	12	7
Total Recoverable Lead	mg/kg dry wt	13.2	420	16.8	13.8	15.4
Total Recoverable Nickel	mg/kg dry wt	< 2	2	3	4	3
Total Recoverable Zinc	mg/kg dry wt	16	67	35	35	28
Acid Herbicides Screen in Soil by LCMSMS						
Acifluorfen	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Bentazone	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Bromoxynil	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Clopyralid	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Dicamba	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4-Dichlorophenoxyacetic acid (24D)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4-Dichlorophenoxybutyric acid (24DB)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Dichlorprop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Fluazifop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Fluroxypyr	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Haloxyfop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2-methyl-4-chlorophenoxyacetic acid (MCPA)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2-methyl-4-chlorophenoxybutanoic acid (MCPB)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Mecoprop (MCPP; 2-methyl-4-chlorophenoxypropionic acid)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Oryzalin	mg/kg dry wt	-	-	< 0.4	< 0.4	< 0.4
Pentachlorophenol (PCP)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Picloram	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Quizalofop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,3,4,6-Tetrachlorophenol (TCP)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4,5-trichlorophenoxypropionic acid (245TP,Fenoprop, Silvex)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4,5-Trichlorophenoxyacetic acid (245T)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Triclopyr	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010

Sample Type: Soil						
Sample Name:		Composite of SS11 & SS12	Composite of SS13, SS14, SS15 & SS16	Composite of SS17, SS18, SS32, SS33 & SS37	Composite of SS19, SS20, SS21, SS22 & SS31	Composite of SS23, SS24, SS25, SS34 & SS40
Lab Number:		1663557.53	1663557.54	1663557.55	1663557.56	1663557.57
Organochlorine Pesticides Screening in Soil						
trans-Chlordane	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
4,4'-DDD	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
2,4'-DDE	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
4,4'-DDE	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
2,4'-DDT	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
4,4'-DDT	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Total DDT Isomers	mg/kg dry wt	< 0.06	-	< 0.06	< 0.06	< 0.06
Dieldrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endrin aldehyde	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Hexachlorobenzene	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Acenaphthylene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Anthracene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Benzo[a]anthracene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Benzo[k]fluoranthene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Chrysene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Fluoranthene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Fluorene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Naphthalene	mg/kg dry wt	< 0.16	-	< 0.16	< 0.2	< 0.17
Phenanthrene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
Pyrene	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04

Sample Name:		Composite of SS41 & SS43	Composite of SS35 & SS36	Composite of SS42, SS44, SS45, SS46 & SS47	Composite of SS26, SS27, SS29 & SS30	Composite of SS48 & SS49
Lab Number:		1663557.58	1663557.59	1663557.60	1663557.61	1663557.62
Individual Tests						
Dry Matter	g/100g as rcvd	58	79	56	65	76
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	21	< 2	12	14	9
Total Recoverable Cadmium	mg/kg dry wt	0.13	< 0.10	0.33	0.54	0.52
Total Recoverable Chromium	mg/kg dry wt	9	3	6	15	15
Total Recoverable Copper	mg/kg dry wt	16	3	10	33	15
Total Recoverable Lead	mg/kg dry wt	18.0	11.1	15.8	65	49
Total Recoverable Nickel	mg/kg dry wt	4	< 2	3	7	5
Total Recoverable Zinc	mg/kg dry wt	38	28	29	840	53

Sample Type: Soil						
Sample Name:		Composite of SS41 & SS43	Composite of SS35 & SS36	Composite of SS42, SS44, SS45, SS46 & SS47	Composite of SS26, SS27, SS29 & SS30	Composite of SS48 & SS49
Lab Number:		1663557.58	1663557.59	1663557.60	1663557.61	1663557.62
Acid Herbicides Screen in Soil by LCMSMS						
Acifluorfen	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Bentazone	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Bromoxynil	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Clopyralid	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Dicamba	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4-Dichlorophenoxyacetic acid (24D)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4-Dichlorophenoxybutyric acid (24DB)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Dichlorprop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Fluazifop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Fluroxypyr	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Haloxyfop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2-methyl-4-chlorophenoxyacetic acid (MCPA)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2-methyl-4-chlorophenoxybutanoic acid (MCPB)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Mecoprop (MCPP; 2-methyl-4-chlorophenoxypropionic acid)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Oryzalin	mg/kg dry wt	-	-	< 0.4	< 0.4	< 0.4
Pentachlorophenol (PCP)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Picloram	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Quizalofop	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,3,4,6-Tetrachlorophenol (TCP)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4,5-trichlorophenoxypropionic acid (245TP,Fenoprop, Silvex)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
2,4,5-Trichlorophenoxyacetic acid (245T)	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Triclopyr	mg/kg dry wt	-	-	< 0.2	< 0.2	< 0.2
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
4,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
4,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
2,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
4,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	< 0.010	0.013	< 0.010
Total DDT Isomers	mg/kg dry wt	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin aldehyde	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

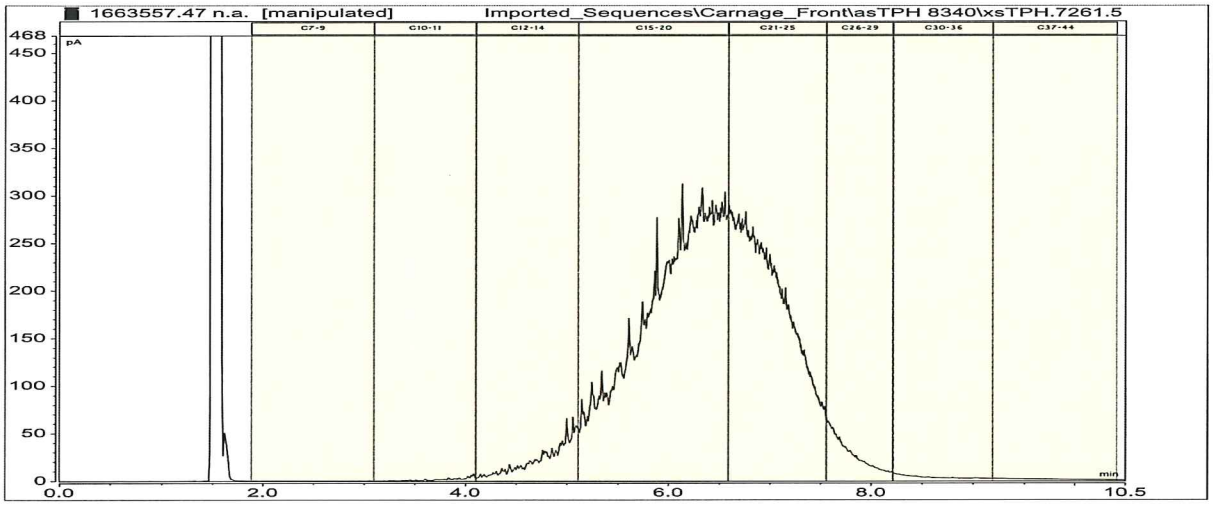
Sample Type: Soil						
Sample Name:		Composite of SS41 & SS43	Composite of SS35 & SS36	Composite of SS42, SS44, SS45, SS46 & SS47	Composite of SS26, SS27, SS29 & SS30	Composite of SS48 & SS49
Lab Number:		1663557.58	1663557.59	1663557.60	1663557.61	1663557.62
Organochlorine Pesticides Screening in Soil						
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Acenaphthene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Acenaphthylene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Anthracene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Benzo[a]anthracene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Benzo[a]pyrene (BAP)	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Benzo[g,h,i]perylene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Benzo[k]fluoranthene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Chrysene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Fluoranthene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Fluorene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Naphthalene	mg/kg dry wt	< 0.19	< 0.15	< 0.19	< 0.17	< 0.15
Phenanthrene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Pyrene	mg/kg dry wt	< 0.04	< 0.03	< 0.04	< 0.04	< 0.03
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	-	-	< 10	< 9
C10 - C14	mg/kg dry wt	-	-	-	< 20	< 20
C15 - C36	mg/kg dry wt	-	-	-	< 40	< 40
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	-	< 70	< 70

Sample Type: Aqueous						
Sample Name:		LEACH 1 11-Oct-2016				
Lab Number:		1663557.48				
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m³	0.049	-	-	-	-
Total Cadmium	g/m³	0.00136	-	-	-	-
Total Chromium	g/m³	0.024	-	-	-	-
Total Copper	g/m³	0.056	-	-	-	-
Total Lead	g/m³	0.083	-	-	-	-
Total Nickel	g/m³	0.0078	-	-	-	-
Total Zinc	g/m³	0.57	-	-	-	-
Acid Herbicides Trace in Water by LCMSMS						
Acifluorfen	g/m³	< 0.0004	-	-	-	-
Bentazone	g/m³	< 0.0004	-	-	-	-
Bromoxynil	g/m³	< 0.0004	-	-	-	-
Clopyralid	g/m³	< 0.0006	-	-	-	-
2,4-Dichlorophenoxyacetic acid (24D)	g/m³	< 0.0004	-	-	-	-
2,4-Dichlorophenoxybutyric acid (24DB)	g/m³	< 0.0004	-	-	-	-
Dicamba	g/m³	< 0.0004	-	-	-	-
Dichlorprop	g/m³	< 0.0004	-	-	-	-
Fluazifop	g/m³	< 0.0004	-	-	-	-
Fluroxypyr	g/m³	< 0.0004	-	-	-	-
Haloxyfop	g/m³	< 0.0004	-	-	-	-
2-methyl-4-chlorophenoxyacetic acid (MCPA)	g/m³	< 0.0004	-	-	-	-
2-methyl-4-chlorophenoxybutanoic acid (MCPB)	g/m³	< 0.0004	-	-	-	-
Mecoprop	g/m³	< 0.0004	-	-	-	-

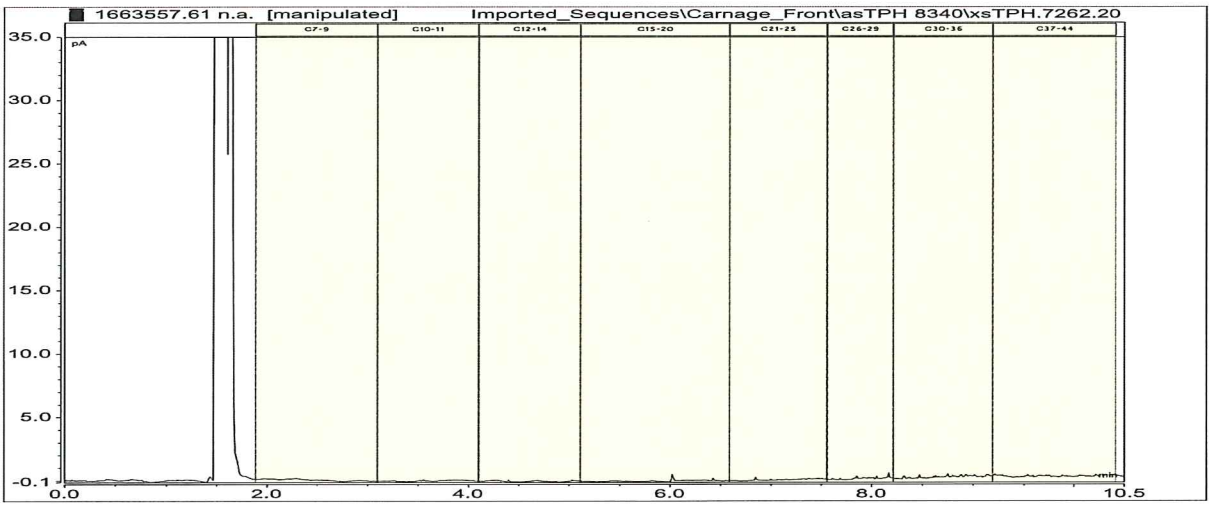
Sample Type: Aqueous						
Sample Name:		LEACH 1 11-Oct-2016				
Lab Number:		1663557.48				
Acid Herbicides Trace in Water by LCMSMS						
Oryzalin	g/m³	< 0.0011	-	-	-	-
2,3,4,6-Tetrachlorophenol (TCP)	g/m³	< 0.0004	-	-	-	-
2,4,5-trichlorophenoxypropionic acid (245TP,Fenoprop, Silvex)	g/m³	< 0.0004	-	-	-	-
2,4,5-Trichlorophenoxyacetic acid (245T)	g/m³	< 0.0004	-	-	-	-
Pentachlorophenol (PCP)	g/m³	< 0.0004	-	-	-	-
Picloram	g/m³	< 0.0006	-	-	-	-
Quizalofop	g/m³	< 0.0004	-	-	-	-
Triclopyr	g/m³	< 0.0004	-	-	-	-
Organochlorine Pesticides Screening in Water, By Liq/Liq						
Aldrin	g/m³	< 0.00010	-	-	-	-
alpha-BHC	g/m³	< 0.0002	-	-	-	-
beta-BHC	g/m³	< 0.0002	-	-	-	-
delta-BHC	g/m³	< 0.0002	-	-	-	-
gamma-BHC (Lindane)	g/m³	< 0.0002	-	-	-	-
cis-Chlordane	g/m³	< 0.00010	-	-	-	-
trans-Chlordane	g/m³	< 0.00010	-	-	-	-
2,4'-DDD	g/m³	< 0.0002	-	-	-	-
4,4'-DDD	g/m³	< 0.0002	-	-	-	-
2,4'-DDE	g/m³	< 0.0002	-	-	-	-
4,4'-DDE	g/m³	< 0.0002	-	-	-	-
2,4'-DDT	g/m³	< 0.0002	-	-	-	-
4,4'-DDT	g/m³	< 0.0002	-	-	-	-
Dieldrin	g/m³	< 0.00010	-	-	-	-
Endosulfan I	g/m³	< 0.0002	-	-	-	-
Endosulfan II	g/m³	< 0.0002	-	-	-	-
Endosulfan sulfate	g/m³	< 0.0002	-	-	-	-
Endrin	g/m³	< 0.00010	-	-	-	-
Endrin aldehyde	g/m³	< 0.00010	-	-	-	-
Endrin ketone	g/m³	< 0.0002	-	-	-	-
Heptachlor	g/m³	< 0.00010	-	-	-	-
Heptachlor epoxide	g/m³	< 0.00010	-	-	-	-
Hexachlorobenzene	g/m³	< 0.0008	-	-	-	-
Methoxychlor	g/m³	< 0.00010	-	-	-	-
Total Chlordane [(cis+trans)*100/42]	g/m³	< 0.0004	-	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Water, By Liq/Liq						
Acenaphthene	g/m³	< 0.00010	-	-	-	-
Acenaphthylene	g/m³	< 0.00010	-	-	-	-
Anthracene	g/m³	< 0.00010	-	-	-	-
Benzo[a]anthracene	g/m³	< 0.00010	-	-	-	-
Benzo[a]pyrene (BAP)	g/m³	< 0.00010	-	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	g/m³	< 0.00010	-	-	-	-
Benzo[g,h,i]perylene	g/m³	< 0.00010	-	-	-	-
Benzo[k]fluoranthene	g/m³	< 0.00010	-	-	-	-
Chrysene	g/m³	< 0.00010	-	-	-	-
Dibenzo[a,h]anthracene	g/m³	< 0.00010	-	-	-	-
Fluoranthene	g/m³	< 0.00010	-	-	-	-
Fluorene	g/m³	< 0.0002	-	-	-	-
Indeno(1,2,3-c,d)pyrene	g/m³	< 0.00010	-	-	-	-
Naphthalene	g/m³	< 0.0005	-	-	-	-
Phenanthrene	g/m³	< 0.0004	-	-	-	-
Pyrene	g/m³	< 0.0002	-	-	-	-

Sample Type: Aqueous						
Sample Name:		LEACH 1 11-Oct-2016				
Lab Number:		1663557.48				
Total Petroleum Hydrocarbons in Water						
C7 - C9	g/m³	< 0.10	-	-	-	-
C10 - C14	g/m³	< 0.2	-	-	-	-
C15 - C36	g/m³	< 0.4	-	-	-	-
Total hydrocarbons (C7 - C36)	g/m³	< 0.7	-	-	-	-

1663557.47
SS39 11-Oct-2016
Client Chromatogram for TPH by FID



1663557.61
Composite of SS26, SS27, SS29 & SS30
Client Chromatogram for TPH by FID



Analyst's Comments

Due to high interference found in the chromatography for the PAH analysis on sample 1663557.47 , the extract was diluted and re-analysed. Hence the higher detection limits reported.

Due to the matrix type of sample 1663557.48, the sample was diluted for the Acidic Herbicide analysis. Hence the higher detection limits reported.

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	22-26
TPH Oil Industry Profile + PAHscreen	Sonication in DCM extraction, SPE cleanup, GC-FID & GC-MS analysis. Tested on as received sample. US EPA 8015B/MfE Petroleum Industry Guidelines [KBIs:5786,2805,10734;2695]	0.010 - 60 mg/kg dry wt	43, 47, 61-62
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	43, 46, 51-62
Acid Herbicides Screen in Soil by LCMSMS	Solvent extraction with sonication, dilution, analysis by LCMSMS with online SPE. Tested on dried sample	0.2 - 0.4 mg/kg dry wt	43, 46, 51-52, 55-57, 60-62
Organochlorine Pesticides Screening in Soil	Sonication extraction, SPE cleanup, dual column GC-ECD analysis (modified US EPA 8082).. Tested on dried sample	0.010 - 0.06 mg/kg dry wt	43, 46, 51-53, 55-62
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	0.010 - 0.05 mg/kg dry wt	51-53, 55-60
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	43, 46-47, 51-53, 55-62
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	22-26
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-42, 44-45, 49-50
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	22-26

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8	0.000053 - 0.0011 g/m³	48
Acid Herbicides Trace in Water by LCMSMS	Acid Herbicides in water, trace level	0.00003 - 0.00004 g/m³	48
Organochlorine Pesticides Screening in Water, By Liq/Liq	Liquid / liquid extraction, SPE (if required), dual column GC-ECD analysis	0.00010 - 0.0008 g/m³	48
Polycyclic Aromatic Hydrocarbons Screening in Water, By Liq/Liq	Liquid / liquid extraction, SPE (if required), GC-MS SIM analysis [KBIs:4736,2695]	0.00010 - 0.0005 g/m³	48
Total Petroleum Hydrocarbons in Water	Hexane extraction, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines [KBIs:2803,10734]	0.10 - 0.7 g/m³	48
Total Digestion	Nitric acid digestion. APHA 3030 E 22nd ed. 2012 (modified).	-	48

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

APPENDIX B – HISTORICAL REPORTS

23 September 2016

Department of Conservation
Te Papa Atawhai

Landowner or Occupier
94A Scott Road,
RD 2,
Te Kauwhata 3781

Dear Sir or Madam,

Notice of discharge of herbicide over land and water for the control of pest plants under Resource Consent No. 124871 – Waikato District

This letter is to advise you that the Department of Conservation will be carrying out herbicide control of the following weeds: Alligator Weed (*Alternanthera philoxeroides*) and Yellow Flag Iris (*Iris pseudacorus*). These are aquatic and terrestrial plant pests and pose a serious threat to waterways, conservation and agricultural land in the Waikato region.

The Department of Conservation will undertake weed control on the following areas between November 2016 and February 2017:

1. Lake Waikare – from Te Onetea Stream along the Northern and Eastern shorelines
2. Opuatia Wetland Reserve – Churchill Road, North of Rangiriri
3. Whangamarino Wetland Reserve – between Te Kauwhata and Meremere, includes the Whangamarino River, Maramarua, Kopuera and Pungarehu streams
4. Takupu Island Reserve – the Waikato River parallel to Te Ohaki Road, north of Huntly
5. Lake Hakanoa (East Huntly) and Lake Ohinewai (Tahuna Road)

Metsulfuron-methyl (Haz. Class. 6.1D, 6.4A, 9.1B, withholding period 5 days) will be applied at a rate of 5g/10L water. The operation may take place any time during daylight hours, subject to suitable weather conditions. Spraying will be undertaken by way of Knapsack by hand, C-Dax (gun and hose) or aerial spraying by helicopter using low drift nozzles. It is likely that one or two follow-up applications may occur over the next 12 months. You will be advised of further spray operations after this time.

If you would like 24-hour notification of when herbicide control will be carried out, or if you have a consented water take or take water for domestic purposes in the above area, please fill in the attached form and return to the Department of Conservation in the enclosed envelope within **10 working days**.

Please note that all livestock should be fenced off to prevent access to the waterway and areas of pest plant control.

If you have any questions, please contact Lucy Roberts, Supervisor – Biodiversity on lmroberts@doc.govt.nz or 07 858 1000

Yours faithfully,
Ray Scrimgeour

PRELIMINARY SITE INVESTIGATION
94A SCOTT ROAD
TE KAUWHATA

80 Cook Street
Hamilton

Ph: 07 859 1481
Fax: 07 859 1481
Mob: 021 072 5617

contaminatedsite@xtra.co.nz

PREPARED FOR:
NORTHLAND PROPERTY CONCEPTS LIMITED

MARCH 2016

CSI
Contaminated Site Investigation

Document Set ID: 1494681
Version: 1, Version Date: 11/04/2016

REPORT: 94A SCOTT ROAD, TE KAUWHATA	
Prepared by: GUY SOWRY	Date:
	27.03.2016.
DIRECTOR	
Reviewed by: GUY SOWRY	Date:
	02.04.2014.
DIRECTOR	

CSI

CONTAMINATED SITE INVESTIGATION

Document Set ID: 1494681
Version: 1, Version Date: 11/04/2016

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Document Set ID: 1494681
Version: 1, Version Date: 11/04/2016

0.0 Executive Summary

Purpose	Undertake a PSI on a piece of land at 94A Scott Road, Te Kauwhata.
Aim	Evaluate ground conditions to determine if a HAIL has occurred or is occurring and if it has then establish the risk to human health and the environment.
Current and Proposed Site Status	The piece of land is currently 14 ha of pastoral land with a building in the southwest, two streams in the south and a pond in the central east. The intention is to develop the piece of land into a 24 lot rural subdivision with an access road.
Site History	Anecdotal information from the current owner shows that the piece of land has been pastoral since at least 1948. The current owner has applied superphosphate to the land and used facial eczema remedies on cattle. To his knowledge the site has never been used for horticultural purposes; chemical storage; sheep or livestock dipping; farm dumping or offal pitting. Aerial photos from 1952, 1975, 1983, 1986 and 2002 document the piece of land as pastoral with a building in the central north and a building in the southeast.
Geology **Hydrogeology** **Hydrology**	The soil on site is clay. A shallow groundwater system is present beneath the site. The nearest surface water is two streams and a pond all located on site.
Site Investigation	**Site Walkover** Undertaken by Guy Sowry on 8 March 2016. The piece of land was pastoral with no soil staining, vegetation stress, odour, sheep/livestock dipping structures or landfills/offal pits and or chemical storage noted. **History** Pastoral land since the 1940's. **Potential Hazards and HAIL** ▪ cadmium – HAIL I. ▪ DDT – HAIL A 10. ▪ zinc – HAIL I. **Intrusive investigation** An intrusive site investigation was undertaken by Guy Sowry of CSI on 8 March 2016 and comprised the following: ▪ the collection of 14 representative surface soil samples each comprising 10 cores analysed for arsenic, cadmium, zinc and DDT; and ▪ the collection of one surface soil sample analysed for pH.
Results	All concentrations are well below NES values, Candian Values, ARC ecological values and within the WRC background range.
HAIL Assessment	It is considered that HAIL I and A:10 have not occurred on this site. As a result a risk assessemnt is not required.
Recommendation	1. No further contaminated land investigations are required. 2. The site shall not be listed on WDC or WRC Selected (Contaminated) Land Register.
This sheet is intended to provide a summary only of the assessment study of the site. This sheet does not provide a definitive scientific analysis.	

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1.0 INTRODUCTION

1.1 Contaminated Site Investigations (CSI) has been appointed by Mr. Kenneth Vincent to undertake a Preliminary Site Investigation (PSI) of a piece of land (hereafter referred to as the site) located at 94A Scott Road, Te Kauwhata. An investigation is required as the Waikato District Council considered a Hazardous Activity or Industry (HAIL) may have occurred on the piece of land (site).

1.2 The aim of the PSI is to provide Mr. Kenneth Vincent with an evaluation of ground conditions to determine if a HAIL has occurred on site and if yes:

- the potential risk to human health; and
- the potential risk to the environment.

1.3 The PSI has been completed in general accordance with: the Resource Management Act 1991 (RMA) and the Resource Management Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011(NES).

1.4 This report is based on a review of historical photos, consultation, a visual site walkover and soil sampling undertaken by Guy Sowry of CSI on 8 March 2016. The report has been prepared by Guy Sowry in accordance with the NES in particular:

- *Contaminated Land Management Guidelines No 1 - Reporting on Contaminated Land*; and
- *Contaminated Land Management Guidelines No 2 - Hierarchy and Application in New Zealand of Environmental Guideline Values*.

1.5 As per the NES User Guide Suitably Qualified and Experienced Practitioner requirements Guy Sowry holds a postgraduate diploma in 'Environmental Health Science' and over 20 years experience investigating and reporting on contaminated land.

1.6 The following limitation's should be noted:

- a representative sample comprising 10 sub cores does not meet the NES, in particular - *Contaminated Land Management Guidelines No 5 – Site Investigation and Analysis of Soils*. However, the Waikato Regional Council and Waikato District Council accepts this methodology and it is understood that this methodology will be approved in the next review of the NES; and
- analytical analysis has only been undertaken on those hazardous substances considered to be the 'limiting factors'. Should contamination be detected well in excess of recommend guideline values then further analysis may be required.

1.7 Attention is drawn to the report conditions shown in Appendix A.

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2.0 CURRENT AND PROPOSED SITE STATUS

2.1 Site Identification

2.1.1 The site is located at 94A Scott Road, Te Kauwhata approximately 700 metres south of Te Kauwhata town centre as shown in Figure 1.

2.1.2 Site details are provided for in Table 1: Site Details.

Table 1: Site Details

OWNERSHIP	SIZE	LEGAL DESCRIPTION	VRN
Lakeside Farms (1993) Ltd	14.1225 ha	Lot 1 DPS 85308	04390/328/07

2.1.3 The site is located on the eastern side of Scott Road, above, below and east of residential properties 67 and 75 Scott Road and is irregular in shape.

2.1.4 The site is zoned in the Waikato District Council Operative District Plan as 'Country Living - Rural'.

2.2 Site Description

2.2.1 The site is currently comprised of multiple grass paddocks used for the grazing of diary cows with a farm track running from south to north roughly through the sites centre as shown in Figure 2.

2.2.2 The site is part of the larger Lakeside Farms. The western and northern boundaries are fenced with wire and batten farm fences. The eastern and southern boundaries are open as they are large pastoral paddocks. A farm shed is present in the southeastern corner and multiple concrete water troughs are scattered across the site. Two small streams are present in the southern part of the site. Both of these streams connect to a farm drain in the central east. A small pond is located to the north of this drain

2.2.3 Beyond the Western boundary is either Scott Road or two rural residential properties numbered 67 and 75 Scott Road. Beyond the northern boundary is a farm drain with pastoral land beyond. Beyond the southern boundary is a small stream, which flows into the site. Further beyond are Lakeside Farms pastoral land. To the east are Lakeside Farm pastoral paddocks.

2.2.4 The site slopes gently from the west to the east or northeast becoming flat roughly in the centre of the site and in the north.

2.3 Surrounding Environment

2.3.1 The site is situated in an area typified by pastoral land used for dairy farming and rural residential properties. Pastoral land is present beyond the northern, eastern and southern boundaries and beyond Scott Road in the west. Rural residential properties are located beyond Scott Road in the west and approximately 40 metres to the north. Residential properties associated with Te Kauwhata are located approximately 180 metres to the north of the site.

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2.3.2 The main north south railway line is located approximately 130 metres to the west with pastoral land beyond. A further 1.4 km to the west is State Highway One.

2.3.3 Lake Waikare is located approximately 500 metres to the east and Lake Kopuera is located approximately 1.1 km to the southwest.

2.4 Proposed Development

2.4.1 Northern Property Concepts Limited have a legal contract with Lakeside Farms Ltd to purchase the site. Northern Property Concepts Limited intend developing the land into a 24 Lot rural residential subdivision with an access road as shown in Figure 3. Of the 24 lots three are between 6,700 m^2 to 6,800 m^2, 20 lots are between 5,000 m^2 to 6,000 m^2 and one lot is 3,361 m^2.

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3.0 CONSULTATION

3.1 Waikato Regional Council

3.1.1 The following information was requested from the Waikato Regional Council.

- HAIL status;
- consents or permits issued to the landowners or occupiers of the site;
- soil type;
- groundwater takes within 500 metres;
- pollution incidents.

3.2 Mr. Brendon White, Current Owner and Lakeside Farm's Manager

3.2.1 Mr. Brendon White stated that he is the current farm manager and a part owner. His family owns the land and has done since 1948. His grandfather brought the land as a dairy farm in 1948 and it has been a family run dairy farm ever since. Mr. White stated that he was born on the farm and raised on the farm at 94A Scott Road, which is still owned by his father. Mr. White brought the house he is currently living in, 65 Scott Road, from his grandfather who fived in it from 1948.

3.2.2 Mr. White stated that he has been the farm manager for approximately the last 20 years and he took over from his dad who in turn took over from his father.

3.2.3 Mr. White state that during his time and his father's time no chemicals have been stored on the site. Chemicals are stored in a shed located in a building to the south, which is part of the wider farm. His grandfather may have stored chemicals on site but he doubts it as the structures on site are hay barns with no sides. Mr. White stated that he recently pulled down what was remaining of the northern hay barn as it was very dilapidated.

3.2.4 Mr. White stated that the site is 'topdressed' as and when required but has not been for at least the last five years, as he has not needed too as the nitrogen levels are excellent for grass growth. Mr. White stated that the cattle are treated every year at this tome of the year for facial eczema.

3.2.5 Mr. White stated that the site has always been a dairy farm and that his family have never grown any crops. Mr. White also stated that he has never used the land for farming dumping or offal pitting. He cannot recall a farm landfill or offal pit on this site as the land and is too low and in winter the groundwater is too high.

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4.0 HISTORICAL REVIEW

4.1 Aerial Photo Review

4.1.1 Reproductions of aerial photos are included in this report as SK01 (1961) to SK06 (2012) and are located in Appendix B.

4.1.2 The **1952** reproduction (SK01) shows the site as predominantly pastoral land. A large structure is visible in the central north and a smaller structure is visible in the southeast. Lines, which are possibly streams, are visible in the south and a pond is visible in the east. Lines are also present in the sites centre and are considered to be hedgerows. The surrounding landuse is a mixture of pastoral paddocks, housing including the house at 65 Scott Road, and vegetation associated with the lake in the east.

4.1.3 The **1975** reproduction (SK02) only shows the central and northern parts of the site, which is predominately pastoral land. A large structure is visible in the central north. A stream with associated vegetation is visible in the south however, the pond in the east is no longer present. A stream is also visible on the northern boundary. Lines are also present in the sites centre and are considered to be hedgerows. The surrounding landuse is predominantly pastoral with housing including the house at 65 Scott Road is present.

4.1.4 The **1983** reproduction (SK03) shows similar on site conditions to the 1952 and 1975 reproductions. The only real difference being an increase in vegetation around the streams in the south and a farm track running from the south to the central east and then to the central north. The surrounding land uses conditions are also similar to the 1952 and 1975 reproductions.

4.1.5 The **1986** reproduction (SK04) shows the same on site conditions to the 1983 reproduction. The surrounding land uses conditions also remain similar.

4.1.6 The **2002** reproduction (SK05) shows very similar on site conditions to the 1986 reproduction. The surrounding land uses conditions also remain pretty much the same.

4.1.7 The **2015** reproduction (SK06) shows similar conditions to the 2002 reproduction with the only changes of note being the presence of a pond in the central east, the farm track continuing north and the removal of the structure in the north. The surrounding land uses remains predominantly pastoral with an increase in 'lifestyle blocks'.

4.2 Waikato Regional Council Consents and/or Permits

4.2.1 No current consents or permits are held for this site, however a number are held for the wider Lakeside Farms which are documented in Table Two: Current Consents/Permits.

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Table 2: Current Consents/Permits

NUMBER	AUTHORISATION	TYPE
126665	To take groundwater	Water Permit
103307	Construct a well for domestic and stock watering purposes	Land Use Consent
953056	Farm dairy effluent discharge to land	Discharge Permit
122126	Discharge stock effluent and wash water to land in a manner that it may enter water	Discharge Permit

4.2.2 No pollution incidents have been recorded for this site.

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5.0 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

5.1 Geology

5.1.1 Information from Waikato Regional Council Authorisation 103307 documents the soil type on the wider Lakeside Farms as clay.

5.2 Hydrogeology

5.2.1 Information from the Waikato Regional Council Authorisation 126665 indicates a probable shallow groundwater system beneath the site at approximately 8 metres.

5.3 Hydrology

5.3.1 Two streams are located in the southern and central parts of the site. These stream's intercept and become a farm drain in the central east of the site. A pond is also located in the central east of the site, north of the drain. A drain is also located immediately adjacent to the northern boundary. All of these drains discharge into Lake Waikare which, is located approximately 500 metres to the east.

5.3.2 Lake Kopuera is located approximately 1.1 km to the southwest.

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6.0 SITE INVESTIGATION

6.1 Site Walkover

6.1.1 A site walkover was undertaken by Guy Sowry, a Director of CSI, on 8 March 2016.

6.1.2 The walkover documented:

- an area of building rubble in the central north;
- no soil staining on site;
- no vegetation stress;
- no odour;
- no structures or foundations present to indicate buildings, or livestock dip and/or spray booth; and
- no unnatural land indentations or hummocks to suggest farm landfilling or offal pitting.

6.2 History

6.2.1 Anecdotal information from Mr. White the current owner/farm manager and farm occupant since birth 40 years ago documents that:

- the farm has been a dairy farm since the 1940's;
- no chemicals have been stored on site;
- both structure have always been hay barns;
- that the site has never been used for horticultural activities;
- farm landfilling or offal pitting has not occurred on site;
- that superphosphate has been applied to the site; and
- facial eczema remedies have been used.

6.2.2 Aerial photos from 1963 to 2013 document the site as pastoral land with a structure in the central north and a structure in the southeast.

6.2.3 Information from the Waikato Regional Council indicates that no consents or permits have been issued for this site and no pollutions incidents have occurred.

6.3 Potential Ground Contamination and Potential HAIL

6.3.1 Superphosphate has been applied to the land.

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6.3.2 It is not known if DDT has been applied to the land. Historically DDT was applied to pastoral land in New Zealand to control grass grub and Porina caterpillars from the early 1940's to the early 1980's. The Pesticides Board deregistered DDT in December 1989. Other organochlorines were also used in pastoral farming practices but nowhere near to the extent of DDT.

6.3.3 Facial eczema remedies have been applied to stock that graze the site. Therefore, zinc from facial eczema remedies such as boluses or fortified feed, may have been passively released by the cattle onto the land.

6.3.4 Based on the above information the potential likely contaminants on site are considered to be:

- Cadmium - superphosphate;
- DDT – grass grubs; and
- Zinc – facial eczema.

6.3.5 The application of superphosphate to land is not specifically listed as a HAIL. Therefore, it would be considered as HAIL: I - any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.

6.3.6 DDT is considered to be a persistent pesticide. Therefore, the application of DDT is HAIL A 10 - persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds.

6.3.7 Facial eczema remedies passive release to land is not specifically listed as a HAIL. Therefore, it would be considered as HAIL: I - any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.

6.4 Sampling Method

6.4.1 An intrusive investigation was completed on the 8 March 2016 by Guy Sowry, a director of CSI with 20 years experience in contaminated land investigations, to determine if the above hazardous activities have or are occurring on site.

6.4.2 The details of the investigation are provided for in Table 2: Investigation Details, with the exception of sample locations which are provided for in Figure 4: Sampling Plan. In summary, the investigation was designed for 'homogenous' contamination (the uniform application of superphosphate and DDT) and comprised:

- the collection of 14 composite surface sample comprising 10 sub cores analysed for arsenic, cadmium, zinc and DDT; and
- the collection of one discrete background surface sample analysed for pH.

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Table 2: Investigation Details

PROCEDURES	SAMPLE NAME	
	A - N	Back
Location	Across the site.	Lawn of 65 Scott Road.
Reason	Pastoral land that has had superphosphate applied and potentially DDT and zinc.	
Sample Depth	Surface.	
Type	Representative. The representative sample comprised 10 sub samples collected from the site (less than one hectare) in a 'W' pattern.	Discrete – five dice within $1m^2$.
Collection Method	Collected with a plot sampler – 30 mm depth. Each core sample was placed into one Hill's Laboratory plastic bag. The plastic bag was sealed immediately after the last sample was collected.	
Field Quality Control	The sample bag's were placed directly into a chilly bin and kept in cool storage until dispatched to Hills Laboratories. A chain of custody was not required as Guy Sowry took the samples to Hills Laboratories.	
Analysis	Arsenic, cadmium, zinc and DDT. Note: Arsenic has only been included for economies of scale (cost to sample for three metals is not much more than two) and it is considered to be a 'limiting factor' for human health.	pH.
	Other hazard substances may have been applied to the land. Therefore, the parameters sampled are only indicators and should contamination be detected well in excess of recommend guideline values then further analysis of other metals and organochlorines will be required.	
Decontamination	Prior to sampling the plot sampler was washed in water, then washed in a solution of water and Decon 90 (a zero residue analytical detergent) and then rinsed in deionised water.	
	As per Guideline Five for the collection of a representative sample the plot sampler did not need to be decontaminated between each core.	
Hot Spot Detection	As per Guideline Five - not relevant for homogenous contamination.	N/A

Notes:

1. Sample - all samples were preceded with SR which, denotes Scott Road and Back denotes Background. However for ease of reading the samples are referred to as per the table; and
2. Representative sample - there are currently no Ministry for the Environment sampling guidelines for 'homogenous' contamination'. The sampling methodology is based on the ex Auckland Regional Council's Horticultural Sampling Guideline of one representative sample per hectare. A draft Ministry for the Environment Guideline Five released for council comment in 2010 included this methodology. The Waikato Regional Council approves this methodology for 'homogenous' contamination.

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7.0 RESULTS

7.1 Human Health Assessment Criteria

7.1.1 A **National Environment Standard** (NES) for Contaminated Land was gazetted into New Zealand law on 13 October 2011. The standard includes Soil Guideline values for arsenic, cadmium and DDT for a rural residential land-use exposure scenario (25% of home grown produce consumed on site). The values are risk based threshold concentrations and can either be used to: determine the risk to human health at the given landuse; or as a remediation limit for a given landuse.

7.1.2 The NES states that for excluded values the principles outlined in The Ministry for the Environments Contaminated Site Management Guideline Two, *Hierarchy and Application in New Zealand of Environmental Guideline Values* must be followed. That is NZ risk based guideline values should be compared to first with international risk based guidelines values second. Below is the guideline that has been used in this assessment for zinc with the proposed landuse setting of residential:

- The **Canadian Environmental Quality Guidelines** (CAN).

7.2 Environmental Assessment Criteria

7.2.1 The ex Auckland Regional Council commissioned Jo Cavanagh of Landcare Research to develop a guideline for the protection of ecological receptors - from a number of common contaminants including arsenic, cadmium, zinc and DDT - **Auckland Regional Council's Protection of Ecological Receptors Guideline** (ARC). This is a risk-based approach based on a review of international and national literature considering the ecological receptors of microbial processes, soil invertebrates, plants and wildlife. The values referenced in this assessment are the higher 'serious risk' levels, in keeping with the fact that the Resource Management Acts definition of *contaminated land* requires a reasonable likelihood of **significant** adverse effects.

7.2.2 The Waikato Regional Council (WRC) has established a background range for pastoral land in the Waikato Region.

7.3 Analytical Soil Results

7.3.1 The analytical soil results are summarised in Table 3: Analytical Soil Results, with the actual analytical laboratory report reproduced in full in Appendix C.

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Table 3: Analytical Soil Results

SAMPLE	PARAMETER				
	Arsenic	Cadmium	Zinc	DDT	pH
A	4	0.58	59	<0.03	
B	3	0.55	58	<0.03	
C	4	0.56	72	<0.03	
D	5	0.63	80	<0.03	
E	3	0.47	48	<0.03	
F	4	0.60	57	<0.03	
G	6	0.81	122	<0.03	
H	5	0.59	76	<0.03	
I	4	0.50	44	<0.03	
J	4	0.38	39	<0.03	
K	4	0.57	110	<0.03	
L	4	0.58	71	<0.03	
M	4	0.38	73	<0.03	
N	4	0.41	50	<0.03	
Back					5.5
GUIDELINE	**VALUE**				
NES	17	1.4		45	
CAN			200		
ARC	22	12	200	13	
WRC	0.7 – 24	0.03 – 1.2	8 - 140		

Notes:

1. All concentrations in ppm and are on a dry weight basis; and
2. NES cadmium – the value of 1.4 is derived as a result of a background pH reading of 5.5 as outlined in the Ministry for the Environments Methodology for deriving Standards for Contaminants in Soil to Protect Human Health, Appendix One Health-based cadmium soil guideline values page 118.

7.3.2 No arsenic, cadmium or DDT concentrations exceed the NES values.

7.3.3 No zinc concentrations exceed the Canadian value.

7.3.4 No concentrations exceed the Auckland Regional Council's protection of ecological values.

7.3.5 All metal concentrations fall within the WRC background range.

7.4 Geology and Hydrogeology

7.4.1 The encountered ground conditions confirmed the local geology as outlined in section 5.1. The surface soil is clay.

7.4.2 Groundwater was not encountered on the site.

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8.0 HAIL ASSESSMENT

8.1 Superphosphate HAIL I

8.1.1 Section 7.0 documents cadmium concentrations associated with the application of superphosphate at concentrations below the NES value and in the middle range of the background level.

8.1.2 Therefore, it is considered that cadmium associated with superphosphate application has not accumulated on this site.

8.1.3 Superphosphate HAIL I has not occurred at this site (piece of land).

8.2 DDT HAIL A:10

8.2.1 Section 7.0 clearly documents DDT concentrations well below the NES. In fact the concentrations documented are considered to be at a trace level.

8.2.2 Therefore, it is considered that DDT has not accumulated on this site.

8.2.3 DDT HAIL A:10 has not occurred on this site (piece of land).

8.3 Facial Eczema Remedies HAIL I

8.3.1 Section 7.0 clearly documents zinc concentrations well below the Canadian value and within the middle to high background range.

8.3.2 Therefore, it is considered that zinc associated with facial eczema remedies has not accumulated on this site.

8.3.3 Facial eczema remedies HAIL I has not occurred on this site (piece of land).

8.4 Risk Assessment

8.4.1 A risk assessment is not required as a HAIL has not occurred or is not occurring at this site. The concentrations are considered to be background.

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9.0 CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

9.1.1 The purpose of this investigation was to determine if a Hazardous Activity or Industry has occurred or is occurring at 94A Scott Road, Te Kauwhata. The land is to be to develop into 24 rural residential lots.

9.1.2 A desk top investigation by Guy Sowry of CSI comprising a review of historical photos, consultation, and a site walkover on 8 March 2016, documents that the following hazard sources and HAIL may have occurred at this site:

- cadmium HAIL I - intentional release of a hazardous substance;
- DDT HAIL A10 - persistent pesticide use; and
- zinc HAIL I – accidental release of a hazardous substance.

9.1.3 To validate or invalidate the presence of the above an intrusive investigation was undertaken by Guy Sowry of CSI on 8 March 2016. The investigation was completed in general accordance with the Ministry for the Environment's National Environmental Standard for Contaminated Land and essentially comprised:

- the collection of 14 representative surface soil sample analysed for arsenic, cadmium, zinc and DDT; and
- the collection of 1 background surface soil sample analysed for pH.

9.1.4 The levels were compared to levels provided for in the Ministry for the Environment's National Environmental Standard for Contaminated Land.

9.1.5 No concentrations were found to exceed the values in the Ministry for the Environment's National Environmental Standard. The concentration detected on site are considered to be background

9.1.6 Therefore, it is considered that Cadmium HAIL I, Zinc HAIL I and DDT HAIL A10 have not occurred or are not occurring at this site.

9.1.7 It is considered that the NES is not applicable to this site.

9.2 Recommendation

9.2.1 That a copy of the report is provided to the Waikato District Council and the Waikato Regional Council.

9.2.2 No further contaminated land investigations are required.

9.2.3 That the site is not recorded on the Landuse Information Register.

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	FIGURE 1
	SITE LOCATION

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	FIGURE 2
	SITE PLAN

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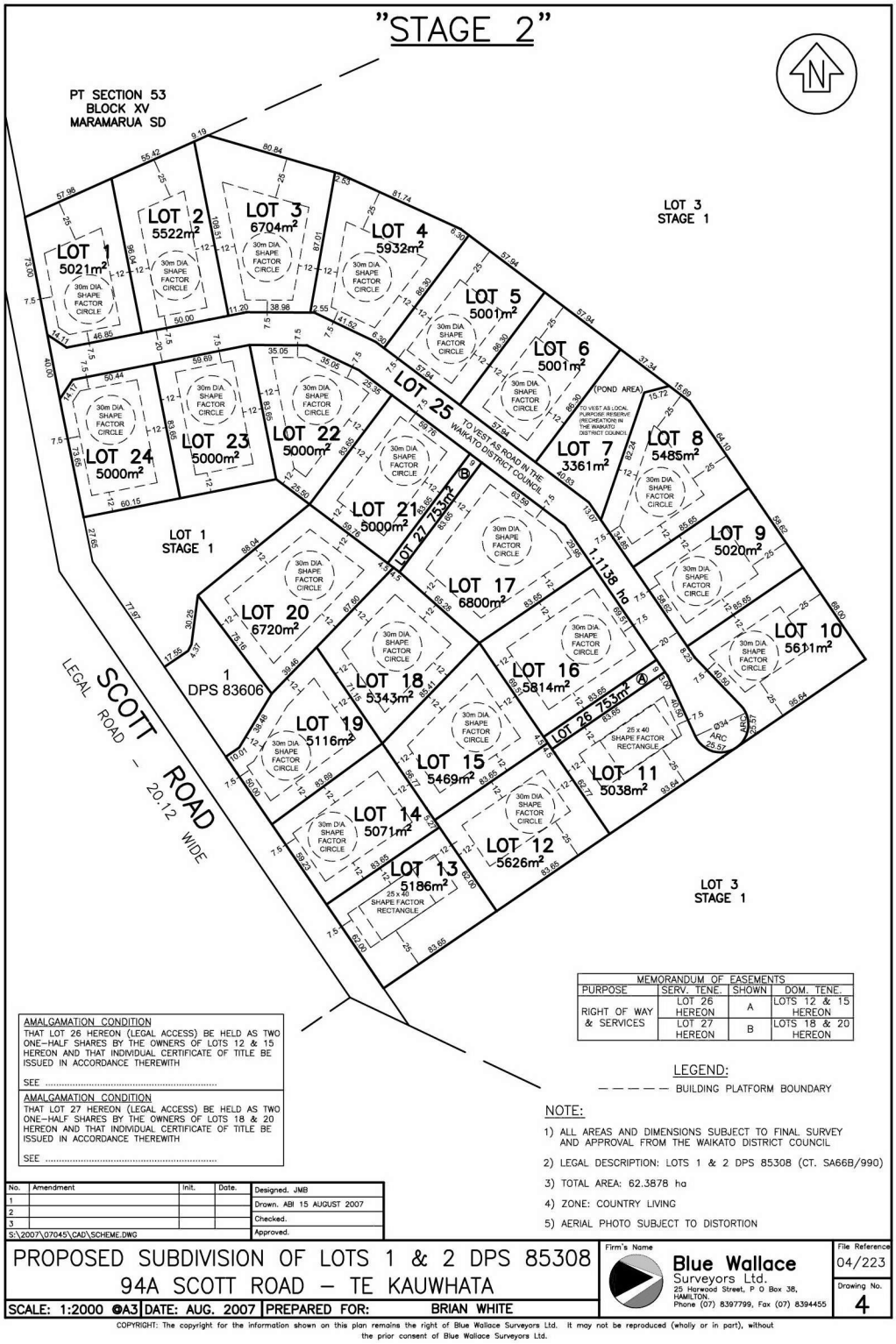

MEMORANDUM OF EASEMENTS			
PURPOSE	SERV. TENE.	SHOWN	DOM. TENE.
RIGHT OF WAY & SERVICES	LOT 26 HEREON	A	LOTS 12 & 15 HEREON
	LOT 27 HEREON	B	LOTS 18 & 20 HEREON

AMALGAMATION CONDITION
THAT LOT 26 HEREON (LEGAL ACCESS) BE HELD AS TWO ONE-HALF SHARES BY THE OWNERS OF LOTS 12 & 15 HEREON AND THAT INDIVIDUAL CERTIFICATE OF TITLE BE ISSUED IN ACCORDANCE THEREWITH

SEE .....

AMALGAMATION CONDITION
THAT LOT 27 HEREON (LEGAL ACCESS) BE HELD AS TWO ONE-HALF SHARES BY THE OWNERS OF LOTS 18 & 20 HEREON AND THAT INDIVIDUAL CERTIFICATE OF TITLE BE ISSUED IN ACCORDANCE THEREWITH

SEE .....

LEGEND:

— — — — BUILDING PLATFORM BOUNDARY

NOTE:

1) ALL AREAS AND DIMENSIONS SUBJECT TO FINAL SURVEY AND APPROVAL FROM THE WAIKATO DISTRICT COUNCIL
2) LEGAL DESCRIPTION: LOTS 1 & 2 DPS 85308 (CT. SA66B/990)
3) TOTAL AREA: 62.3878 ha
4) ZONE: COUNTRY LIVING
5) AERIAL PHOTO SUBJECT TO DISTORTION

No.	Amendment	Init.	Date.
1			
2			
3			

S:\2007\07045\CAD\SCHEME.DWG

Designed. JMB
Drawn. ABI 15 AUGUST 2007
Checked.
Approved.

PROPOSED SUBDIVISION OF LOTS 1 & 2 DPS 85308
94A SCOTT ROAD – TE KAUWHATA

SCALE: 1:2000 @A3 | DATE: AUG. 2007 | PREPARED FOR: BRIAN WHITE

Firm's Name
Blue Wallace Surveyors Ltd.
25 Harwood Street, P O Box 38, HAMILTON.
Phone (07) 8397799, Fax (07) 8394455

File Reference 04/223
Drawing No. 4

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CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	FIGURE 3
	PROPOSED DEVELOPMENT

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	FIGURE 4
	SAMPLING PLAN
	NOT TO SCALE

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APPENDIX A

REPORT CONDITIONS

This report is prepared solely for the benefit of Mr. Kenneth Vincent and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, with the limitations stated, to the conditions of site at the time of the investigation. No warranty is given as to the possibility of future changes in the condition of the site.

This report is based on aerial photos, anecdotal information and a site investigation comprising a site walkover and the collection of soil samples. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. The samples collected have been undertaken in accordance with recognised guidelines however, the possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

Whilst the findings detailed in this report reflect our best assessment, we are unable to give categoric assurances that they will be accepted by regulatory authorities without questions as such authorities may have unpublished more stringent objectives. This report is prepared and written for the proposed uses stated in the report and should not be used in a different context without reference to CSI. In time approved practices or amended legislation may necessitate a re-assessment.

The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspects especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contaminants (past or present) exists further research will be required before the effects can be better determined.

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APPENDIX B

AERIAL PHOTOS

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	SK01
	1952

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	SK02
	1975

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	SK03
	1983

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	SK04
	1986

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NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	SK05
	2002

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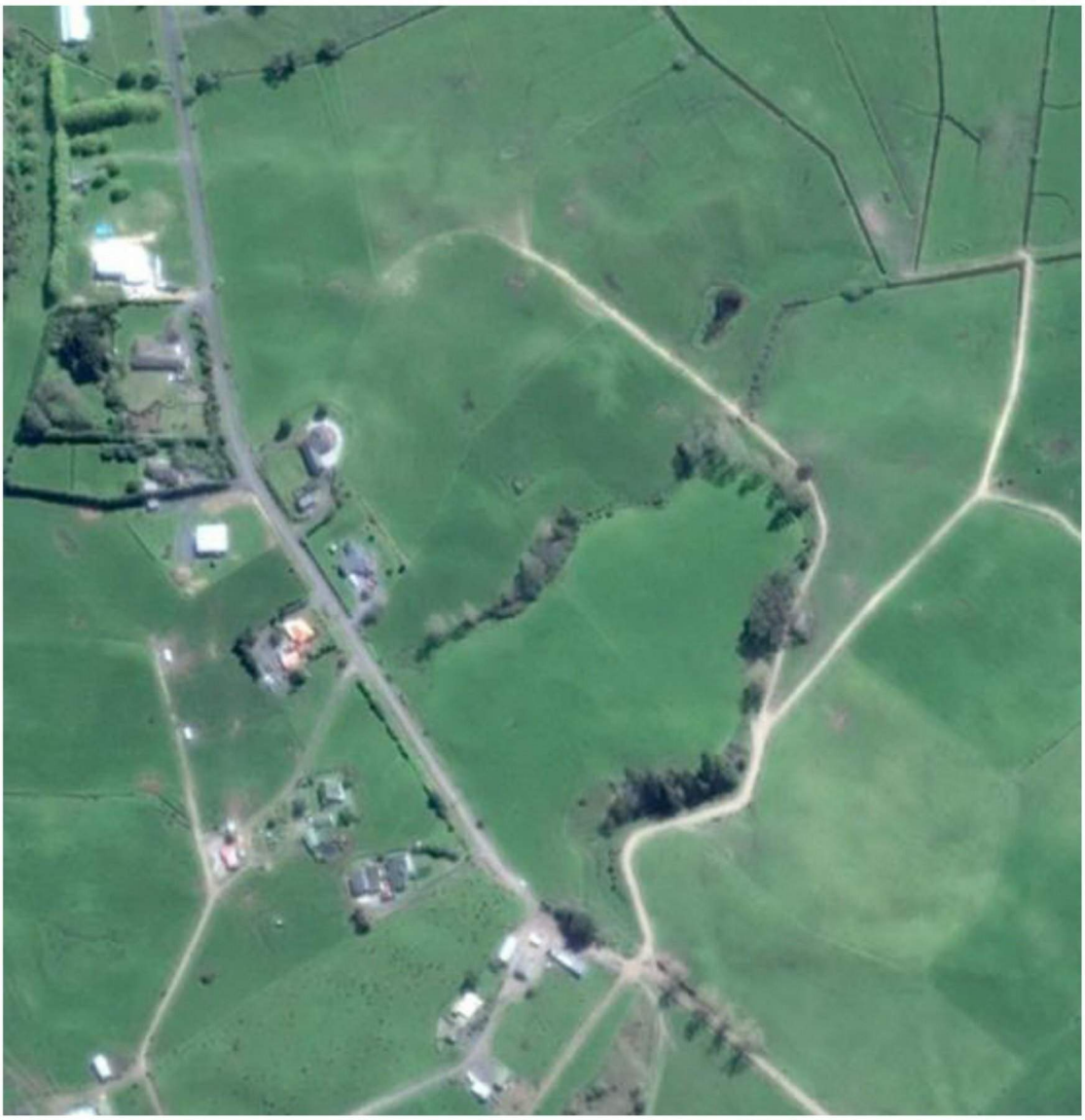

NORTH

CSI **Contaminated Site Investigations** **80 Cook Street** **Hamilton**	94A SCOTT ROAD TE KAUWHATA
	SK06
	2012

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APPENDIX C

LABORATORY RESULTS

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Version: 1, Version Date: 11/04/2016

Hill Laboratories
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited
1 Clyde Street
Private Bag 3205
Hamilton 3240, New Zealand

Tel +64 7 858 2000
Fax +64 7 858 2001
Email mail@hill-labs.co.nz
Web www.hill-labs.co.nz

ANALYSIS REPORT

Client:	CSI Limited	**Lab No:**	1557163	SPv1
Contact:	G Sowry	**Date Registered:**	24-Mar-2016	
	C/- CSI Limited	**Date Reported:**	01-Apr-2016	
	80 Cook Street	**Quote No:**	75593	
	Hamilton 3216	**Order No:**		
		Client Reference:		
		Submitted By:	G Sowry	

Sample Type: Soil

	Sample Name:	SR.A 15-Mar-2016	SR.B 15-Mar-2016	SR.C 15-Mar-2016	SR.D 15-Mar-2016	SR.E 15-Mar-2016
	Lab Number:	1557163.1	1557163.2	1557163.3	1557163.4	1557163.5
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	4	3	4	5	3
Total Recoverable Cadmium	mg/kg dry wt	0.58	0.55	0.56	0.63	0.47
Total Recoverable Zinc	mg/kg dry wt	59	58	72	80	48
DDT Screening in Soil						
2,4'-DDD	mg/kg dry wt	0.005	0.005	< 0.005	< 0.005	< 0.005
4,4'-DDD	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2,4'-DDE	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDE	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2,4'-DDT	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDT	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total DDT Isomers	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03

	Sample Name:	SR.F 15-Mar-2016	SR.G 15-Mar-2016	SR.H 15-Mar-2016	SR.I 15-Mar-2016	SR.J 15-Mar-2016
	Lab Number:	1557163.6	1557163.7	1557163.8	1557163.9	1557163.10
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	4	6	5	4	4
Total Recoverable Cadmium	mg/kg dry wt	0.60	0.81	0.59	0.50	0.38
Total Recoverable Zinc	mg/kg dry wt	57	122	76	44	39
DDT Screening in Soil						
2,4'-DDD	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDD	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2,4'-DDE	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDE	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2,4'-DDT	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDT	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total DDT Isomers	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03

	Sample Name:	SR.K 15-Mar-2016	SR.L 15-Mar-2016	SR.M 15-Mar-2016	SR.N 15-Mar-2016	SR.BACK 15-Mar-2016
	Lab Number:	1557163.11	1557163.12	1557163.13	1557163.14	1557163.15
Individual Tests						
Total Recoverable Arsenic	mg/kg dry wt	4	4	4	4	-
Total Recoverable Cadmium	mg/kg dry wt	0.57	0.58	0.38	0.41	-
Total Recoverable Zinc	mg/kg dry wt	110	71	73	50	-
pH*	pH Units	-	-	-	-	5.5
DDT Screening in Soil						
2,4'-DDD	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	-
4,4'-DDD	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	-

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

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Version: 1, Version Date: 11/04/2016

Sample Type: Soil						
Sample Name:		SR.K 15-Mar-2016	SR.L 15-Mar-2016	SR.M 15-Mar-2016	SR.N 15-Mar-2016	SR.BACK 15-Mar-2016
Lab Number:		1557163.11	1557163.12	1557163.13	1557163.14	1557163.15
DDT Screening in Soil						
2,4'-DDE	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	-
4,4'-DDE	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	-
2,4'-DDT	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	-
4,4'-DDT	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	-
Total DDT Isomers	mg/kg dry wt	< 0.03	< 0.03	< 0.03	< 0.03	-

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-14
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	15
DDT Screening in Soil*	Sonication extraction, Florisil cleanup, GC-ECD analysis. Tested on dried sample	0.005 - 0.03 mg/kg dry wt	1-14
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-14
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	1-14
Total Recoverable Cadmium	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.10 mg/kg dry wt	1-14
Total Recoverable Zinc	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	4 mg/kg dry wt	1-14
pH*	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH.	0.1 pH Units	15

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This report must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

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APPENDIX D

SITE PHOTOS

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THE SITE - NORTH

THE SITE - SOUTH

Document Set ID: 1494681
Version: 1, Version Date: 11/04/2016

THE SITE - EAST

SHED RUBBLE

Document Set ID: 1494681
Version: 1, Version Date: 11/04/2016

SHED

SHED

Document Set ID: 1494681
Version: 1, Version Date: 11/04/2016

EARTHTECH CONSULTING LTD

WAIKATO DISTRICT COUNCIL

TE KAUWHATA
HEAVY VEHICLE BYPASS

Preliminary Geotechnical Report

FEBRUARY 2010

Report prepared for:
BLOXAM BURNETT & OLLIVER LTD

Report prepared by:
EARTHTECH CONSULTING LIMITED
P O Box 721, Pukekohe
Phone: 64-9-232 8500

Ref : R2760-1
Date : 25 February 2010

WAIKATO DISTRICT COUNCIL

TE KAUWHATA

HEAVY VEHICLE BYPASS

Preliminary Geotechnical Report

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APPENDIX B	HAND AUGER LOGS HA201 TO HA212
APPENDIX C	SITE MEETING NOTES WITH MR STANLEY WALKER, TE KAUWHATA CONTRACTORS

WAIKATO DISTRICT COUNCIL
TE KAUWHATA
HEAVY VEHICLE BYPASS

Preliminary Geotechnical Report

1. INTRODUCTION

Waikato District Council (WDC) is designating a heavy vehicle bypass around the southern side of Te Kauwhata township. Bloxam Burnett and Olliver (BBO) have provided an alignment as shown on the aerial photograph (BBO drawing 135420/P09, Rev D), together with preliminary long sections (three sheets) and cross sections (seven sheets).

This report provides the results of geotechnical investigations undertaken to identify key constraints on the road corridor. Information has been compiled from published maps, aerial photographs, walkover surveys of part of the route, discussions with residents and council staff and site specific investigations of selected portions.

2. LANDFORMS

2.1 Ch0 to Ch780*m*, Te Kauwhata Road to North Island Main Trunk Line

No access was available to this section of the route. The alignment crosses gently sloping paddocks with proposed cut and fill depths of less than 1.5*m*.

A new roundabout may be located at Ch630*m*.

2.2 Ch780 to Ch880*m*, Main Trunk Line to Scott Road

Between the railway line and Scott Road, the proposed centerline of the bypass follows a natural low-lying gully. A small stream, approximately 1.5*m* wide, follows and crosses the proposed centerline. There is evidence that the land immediately to the south of the stream and along the proposed centerline of the bypass has been very wet during winter. The land on either side of the proposed centerline rises gently to both the north and the south. This area is fenced and well grassed.

2.3 Ch880 to Ch1700*m*, Scott Road to Treatment Ponds

Between Scott Road and the treatment ponds, there is a very gentle downward gradient towards the treatment ponds. The small stream, after passing under Scott Road, continues to approximately follow the proposed centerline of the bypass, and crosses it in two places. In this area, the stream widens to 2.5*m* in some places and becomes slow moving and stagnant with large amounts of weed and Carp fish. The bypass crosses Scott Road to the north of, and immediately next to, the stream. In this area the ground is gently undulating and rises gradually to the north. To the south of the stream, the ground is flat and was planted with crops at the time of the site walkover.

The bypass crosses the stream at station distances 1280*m* and 1440*m* approximately. In these areas to the north of the stream, the ground is very low-lying and swampy with water pooling on the surface. The stream is also enclosed by stop banks and appears to have been straightened in the past. To the south of the stream, along the centerline of the bypass, the ground is very wet. These paddocks have drainage channels and appear to be drained to the south. These areas are fenced and well grassed.

2.4 Ch1700 to Ch2020*m*, Treatment Ponds to Old Landfill

In the area between the treatment ponds and Rata Street, the ground is low-lying and swampy except where material has been placed to build-up access ways. Along the centerline of the bypass the land is covered with dense scrub and swamp vegetation.

To the south of Roto Street the land rises gently towards the east. This area is covered with scrub, small trees, blackberries and grass. It was planted with production pine until logged in the past five years. Old tree stumps can be found at regular intervals. The ground surface is very uneven, presumably from when heavy trucks were brought in to remove the trees. A man-made ditch, approximately 0.75*m* deep runs north to south from Roto Street, approximately 20*m* away from the gravel access road that exits off Roto Street. There was no water in the bottom of the ditch at the time of the site walkover, however it appears to have been wet during the winter months. The excavated material has been disposed of to either side of the ditch.

2.5 Ch2020 to Ch2050*m*, Old Landfill Area

This section crosses the old trench landfill area operated in the 1950's and 1960's. Details are discussed in Section 6.0 with site meeting notes about the landfilled area included in Appendix C.

2.6 Ch2050 to Ch2600m, Old Landfill to Waerenga Road

At the end of Roto Street, the ground dips moderately steeply towards the east where there is a small stream. At the time of the site walkover the stream was very shallow and contained a lot of swamp vegetation and grasses. The gully containing this stream runs north along the residential property boundaries. From its intersection with the bypass, the stream curves towards the east. To the north and east of the stream, the ground rises moderately steeply to where the centerline of the bypass follows a short ridge northward, before dipping down again to where it intersects another small stream. There is evidence of the land immediately to the south of the stream having been very wet during the winter months. From this stream, the ground again rises gradually towards Waerenga Road with a small gully to the east of the proposed bypass. All of these areas from the eastern end of Roto Street, up to Waerenga Road are fenced and well grassed. A collapsed tomo was identified on the road alignment near HA211.

3. HISTORIC AERIAL PHOTOGRAPHS

The following historic aerial photographs have been viewed:

- 1942–SN192 No. 287/43 – 1:16,000 dated February 1942

The 1942 photographs show vegetation extending from Lake Waikare to approximately half way between Scott Road and what are now the treatment ponds. This area corresponds to the length of stream where stop banks have been constructed; indicating that the lower half of the stream was formed after 1942, probably when the vegetation was cleared and the land drained.

The vegetation continues around the shores of Lake Waikare encompassing the area that is now the treatment ponds.

The aerial photographs also show that the area beginning at the stream south of the intersection of Waerenga Road and Swan Road was also covered with vegetation at the time of the 1942 photograph.

The 1942 aerial photographs show the positions of the railway line and Scott Road are unchanged since 1942.

There is no sign of either the trench landfill or the newer closed landfill on the 1943 photographs. This is consistent with verbal reports on filling dates.

4. GROUND CONDITIONS

4.1 Published Geologic Information

Local geology has been described on the Te Kauwhata Geology Sheet prepared by Kear and Schofield (1961).

The areas from Te Kauwhata Road extending to the railway line and including Scott Road are mapped as being Whangamarino Formation. This is typically described as:

> *"Mainly clay, lignite and some gravels and pumice sands."*

The area to the east of Scott Road extending to Lake Waikare and encompassing the treatment ponds is mapped as being alluvium. These areas roughly correspond to the areas shown as vegetated swamp on the 1942 historic aerial photograph.

The area immediately to the south and east of Roto Street, extending northward to Waerenga Road is mapped as being undifferentiated. This includes formations of the Walton Sub-group, as well as younger sediments.

The named formations of the Walton Sub-group include:

- Karapiro Formation
- Waerenga Gravels
- Whangamarino Formation (described above)
- Puketoka Formation.

Puketoka Formation is typically described as:

> *"Predominantly highly pumiceous silts and sands interbedded with peats."*

In the field, these formations were closely interbedded and characteristics of each were observed within the same layer.

4.2 Ground Conditions

Shallow ground conditions on the site are described in terms of the following units:

i. Topsoil
ii. Unit A (stiff silts)
iii. Unit B (alluvium)
iv. Unit C (brown ash)

i. Topsoil

Topsoil was intercepted in all hand auger investigations. Topsoil depths ranged between 0.1 to 0.5*m*.

ii. Unit A (stiff silts)

Unit A was intercepted in all the hand auger investigations conducted on site. Unit A can typically be described as:

> *"Very stiff, coarse pumiceous sandy SILT, SILT with some coarse pumiceous sand, and CLAY with some coarse pumiceous sand. Containing interbedded organics."*

Unit A is typically very stiff, with undrained shear strengths that average S_u = 141*kPa* and range between 78 and >200*kPa*.

Unit A was also observed in an outcrop within 10*m* of CPT108, and also in road cuttings near the intersection of Waerenga and Swan Roads. Both locations are shown on the site map.

In HA202 and HA204, Unit A can be described as firm with measured undrained shear strengths that average S_u = 41.5*kPa* and range between 37 and 46*kPa*. These strengths were atypical of the strengths encountered in other hand auger investigations.

iii. Unit B (alluvium)

Alluvium was intercepted in HA202 and HA204. The alluvium consists of a sequence of:

> *Very soft to stiff, ORGANIC SILT, coarse pumiceous sandy SILT, and SILT with some coarse pumiceous sand.*

Containing wood fragments and other organic matter. S_u range = 37 to 93kPa.

Stiff CLAY, with some coarse pumiceous sand and organics. S_u = 78kPa.

The alluvial soils were overlain by firm Unit A in both instances.

iv. Unit C (brown ash)

Brown ash was intercepted in HA206, 207, 208, 209 and 212. The ash can typically be described as:

"Very stiff, dark orange brown, sandy SILT."

The ash is very strong, with measured undrained shear strengths that average S_u = 182*kPa* and range between 152 and >200*kPa*.

The brown ash was also observed in road cuttings on the corner of Roto Street and Waerenga Road, and near the intersection of Waerenga Road and Swan Road where it was overlying Unit A.

In all instances, the brown ash overlaid formations of the Walton Sub-group.

Deeper ground conditions have been investigated with the cone penetrometer up to refusal depths to 30*m*. Interpretation of the CPT data is based on published correlations and experience from other sites in the Waikato area.

5. Groundwater Conditions

Groundwater levels were observed within open hand auger bores and CPT bores. For the majority of these bores, groundwater levels were recorded approximately 24 hours following augering and drilling to allow equilibrium conditions to be reached. Groundwater levels are presented on the attached field logs. The following groundwater levels were observed:

- Area between Railway Line and Scott Road:
  - Groundwater table at the exiting ground level (EGL) to 0.6*m* below the EGL.

- Area east of Scott Road and west of Treatment Ponds:
  - Groundwater at 0.82 to 1.35*m* below EGL.

- Area around Water Treatment Ponds (CPT's 104, 105, 106A):
  - Groundwater at 0.35 to 0.5*m* below EGL.

- Area south of Roto Street:
  - Groundwater at 0.4 to 0.8*m* below EGL (in HA205 and HA207).
  - No groundwater was encountered in HA206.

- Area east of Roto Street to intersection of Waerenga Road and Swan Road:
  - Groundwater at 0.1 to 3.1*m* below EGL.
  - No groundwater was encountered in HA209, 210 and 212.

6. ROAD CONSTRUCTION CONSTRAINTS AND DETAILS

6.1 Cut and Fill Batter Slopes

Cuts up to 2*m* deep are only expected in the stronger ash or Unit A soils. Cut batters should be designed for 1 on 2 (vertical on horizontal), or 1 on 3 if grassed and mowed.

Fill batters should be designed for 1 on 3 on the undulating and higher ground areas. In swampy areas and especially in the old lake bed areas, fill batters may need to be as flat as 1 on 6 unless reinforced. Refer typical details discussed in Section 6.4.

6.2 Railway Underpass to Scott Road (Figure 2)

CPT's 101, 102 and 103 provide ground condition information in this area. The stream will need to be culverted and diverted. As the railway embankment is in fill, the underpass only requires a further 2*m* cut – this removes most of the organic silts and a further 1*m* undercut would provide reasonable founding conditions on the stiff silts identified in CPT101 at 3.2*m*.

The underpass could be constructed as a bridge or large diameter culvert. If shallow footings are not considered adequate, friction piles may be driven into the stiff silts. Groundwater controls will be required during construction and longer term.

CPT103 indicates weak soils to a depth of 6*m* and preloading of the roundabout on Scott Road is recommended.

6.3 Scott Road to Treatment Plant

The alignment is largely in fill up to 2.5*m* deep and will require diversion of the existing stream. Deeper investigations than the present 2*m* hand auger bores will be required for detailed design, however the conditions appear significantly stronger than the sewage treatment plant areas. Staged filling ahead of road construction should remove any major settlement effects.

6.4 Swamp Crossing at Sewage Treatment Plant (Figure 3)

The low-lying area past the present sewage treatment plant crosses the perimeter margins of the lakebed. The area is low-lying and swampy. CPT's 104, 105 and 106 indicate soft organic silts to approximately 3*m* depth, overlying firm silts to 20*m*+.

Undercutting is not practical and the road formation will need to be "floated" over the top. Two options are sketched on Figure 4.

Option 1 provides a conventional solution with a 400*mm* thick hardfill layer placed on top of a geotextile separation layer (Bidim A44 or similar). This is followed by compacted fill placed in two or more lifts. Stability along the edges will need to be checked and lift heights limited to avoid causing slumping of the side slopes. Two or more lifts are likely to be required to achieve the fill depth of approximately 2.5*m*. A 1*m* preload should be placed for a minimum period of six months prior to sealing to reduce ongoing settlements.

Total applied loads for this option have been estimated as follows:

• 0.4*m* hardfill	= 0.4 x 22*kN*/*m*³	=	8.8
• 2.5*m* fill	= 2.5 x 20	=	50.0
• 0.2*m* fill settlement	= 0.2 x 20	=	4.0
• 1*m* preload	= 1.0 x 20	=	20.0
			82.8 say 80*kPa*

Settlements have been estimated for each of the three CPT locations for an applied load of 80*kPa*.

CPT	Calculated Settlement (*mm*)	Notes
104	100	-
105	110	CPT did not penetrate the lower silts identified in CPT104
106	75	CPT did not penetrate the lower silts identified in CPT104

Secondary settlements are likely to be in the order of 100*mm* over 20 years.

Option 2 allows for steeper side slopes with 1 on 3 for grassed slopes and 1 on 1.5 for planted slopes. This option includes a geogrid reinforcing layer across the base and on either side to provide stable slopes at all stages. Filling in more than one stage may still be required. Total settlements are expected to be similar to Option 1 with up to 200*mm* predicted.

6.5. Old Landfill Section (Figure 3)

From Ch2030 to Ch2050 the alignment crosses part of the old landfill. Filling details have been identified as far as possible from a walkover survey, WDC records and a site meeting with Mr Stanley Walker of Te Kauwhata Contractors. Mr Walker worked on the site throughout the various stages and his information is consistent with other observations and records. Notes of this meeting are attached in Appendix C.

It is reasonably certain that the road alignment only crosses the original "trench fill" area. Trenches were reported to be about 2*m* deep (excavated with a dragline, not a digger) and 3*m* to 4*m* wide. The preferred option would be to over-excavate and remove the old refuse (placing it on top of the newer landfill which would benefit from surface mounding).

Alternatively the clay cover could be stripped and the old refuse recompacted using a heavy roller, followed by placement of a geotextile separation layer, 400*mm* of GAP100 hardfill and replacement of the clay fill. If the road alignment is in cut, limited over-excavation may be required along the side slopes to ensure a minimum clean soil cover depth of 0.6*m* (plus 100*mm* topsoil) is replaced over any exposed refuse. Refuse is stable at steep cut slopes but a maximum cut slope of 1 on 3 is recommended to allow for mowing of the final cut batter. A subsoil drain should be included at the toe of the slope – designed as a leachate drain with discharge to the leachate sewer or to a soakaway in the newer landfill area.

6.6 Roto Street to Waerenga Road

The road crosses undulating country with two gullies which are likely to include weak organic soils similar to those identified at the sewage treatment plant. CPT107 indicates particularly weak soils to a depth of 2.8*m*.

Construction of fills across these gullies would be similar to the options shown on Figure 4.

Cuts and fills of limited depths on the higher ground are expected to be straightforward.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 The road is not expected to be constructed for many years. Preliminary investigations have identified the key constraints which include:

a. Railway underpass – weak organic soils over stiff silts.
b. Railway underpass to sewage treatment plant – weak organic soils in lakebed areas.
c. Old landfill area – trenches filled with refuse to 2*m* deep.
d. Gully crossings – weak organic soils in lakebed areas.

7.2 Groundwater is typically at or very close to the surface in the old lakebed areas.

7.3 Construction options are available to deal with the difficult ground condition areas. Reinforcing geotextiles and preloading is recommended for fills in the weak ground areas.

7.4 Cut areas are likely to be limited to short lengths on higher ground. Where cuts are in brown ash, the material should provide excellent fill materials.

7.5 There is likely to be a shortage of fill materials and additional fill will need to be imported. Sources include quarry overburden and rotten rock.

7.6 Given the time till construction, it would be feasible to prepare some of the swamp crossing areas and to place cleanfill over the next 10 to 20 years, instead of importing fill at the time of road construction.

7.7 Detailed design will require further investigations but sufficient work has been done at this stage to identify the key constraints and provide preliminary design details for structures and fill embankments.

Report prepared by:

M WILLIS Ref: R2760-1
Geotechnical Engineer Date: 25 February 2010

A H NELSON
Senior Geotechnical Engineer
EARTHTECH CONSULTING LTD

This report has been prepared solely for the benefit of you as our client with respect to the particular brief given to us, and data or opinions contained in it may not be used in other contexts or for any other purpose without our prior review and agreement.

N

LEGEND

- Cone Penetrometer Test
- Hand Auger
- Outcrop
- Watercourse
- Flood Contour (RL 7.37m)
- Heavy Vehicle Bypass

Note: Site investigation locations drawn approximately.

Scale 1:5000

0m 100m 200m

TE KAUWHATA TOWNSHIP

Waerenga Road

Mahi Road

Rata Street

Roto Street

Swan Road

Road Cutting:
Unit C (to 0.4m) overlying Unit A
Cutting approx. 1.7m deep

Road Cutting: Unit C
Cutting approx. 0.5m deep

Road Cutting: Unit C
Cutting approx. 1.2m deep

CPT109
HA212
HA211
HA210
HA209
CPT107
HA208
HA207
HA205
HA206
CPT106
CPT106a
CPT105
CPT104
CPT108
Outcrop: Unit A

Disused pumping bore

Collapsed tomo
Approx 1m wide by 6m long

Old trench Landfill area
1950's to 1960's

Closed Landfill
1970's to 1990's

Closed Abaitoir
Sediment Ponds

Treatment Ponds

Stock banks

Lake Waikare

North Is. Main Trunk Line

Scott Road

HA204
HA203
HA202

New Roundabout

Pumping shed

CPT101
CPT103
CPT102 HA201

Concrete Culvert
0.7m diameter

Overhead Power Line

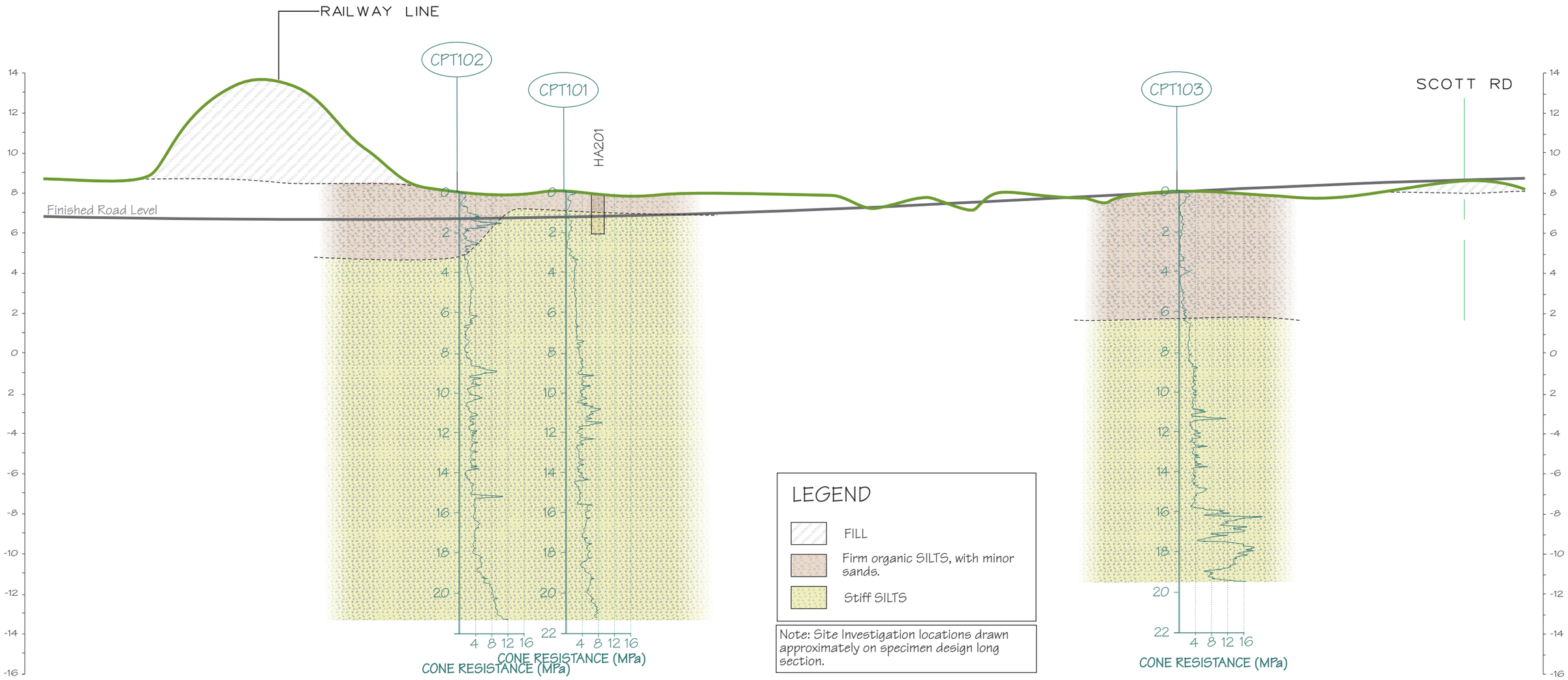
EARTHTECH

Earthtech Consulting Ltd.
P.O. Box 721
Pukekohe
Phone: 09 232 8500
Fax: 09 232 8500

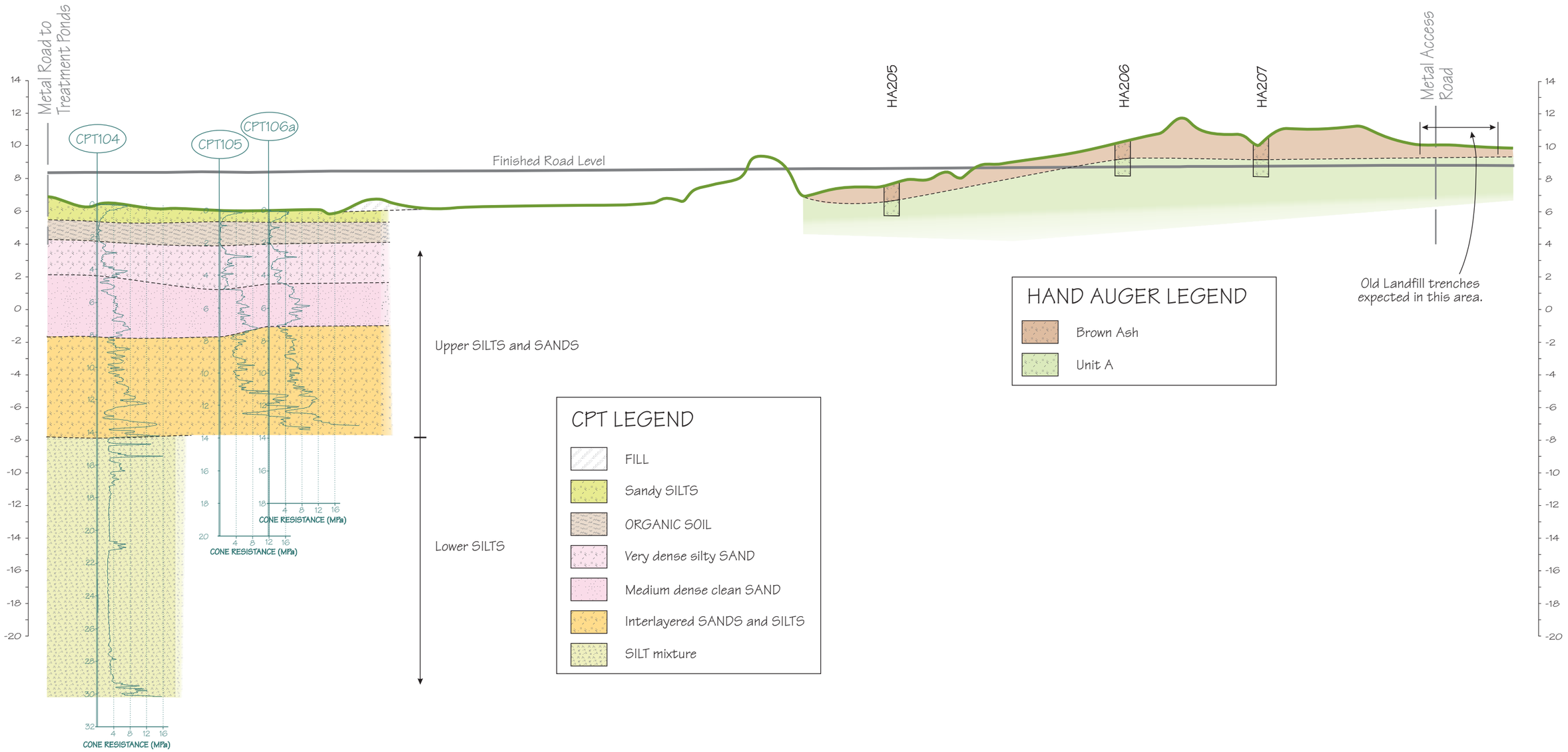
TE KAUWHATA HEAVY VEHICLE BYPASS

Bloxam Burnett & Olliver

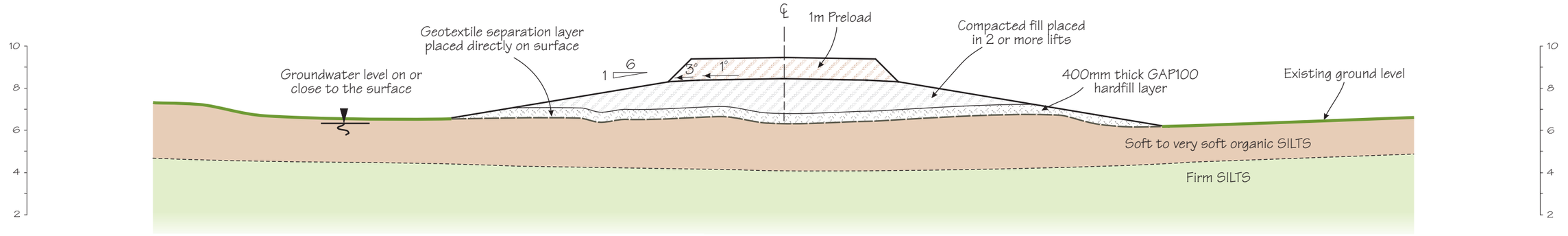
Te Kauwhata Heavy Vehicle Bypass Site Investigation Plan				SHEET	FIG. 1
DRAWN	MW	CHECKED	AHN	SCALE 1:5000	VERSION A
TRACED	MW	DATE	7 Dec. 2009		REF 2760


RAILWAY LINE
CPT102
CPT101
HA201
CPT103
SCOTT RD
Finished Road Level
CONE RESISTANCE (MPa)
CONE RESISTANCE (MPa)
CONE RESISTANCE (MPa)
LEGEND
FILL
Firm organic SILTS, with minor sands.
Stiff SILTS
Note: Site Investigation locations drawn approximately on specimen design long section.

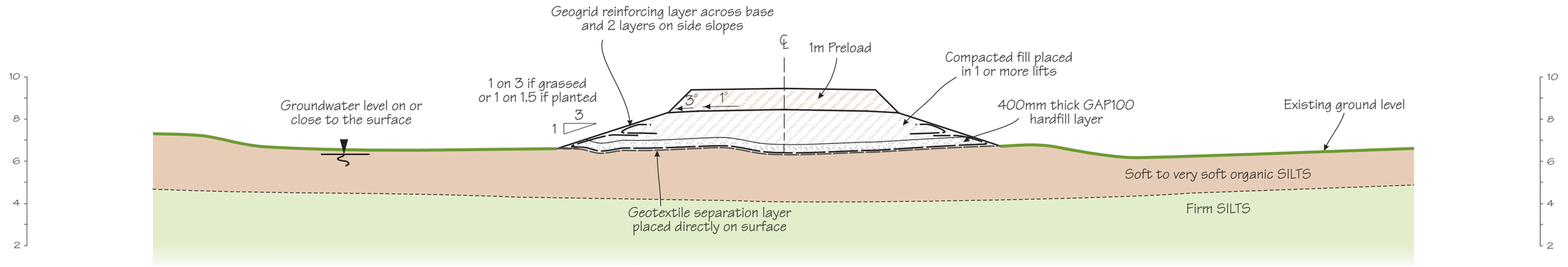
| | | |


Metal Road to Treatment Ponds
CPT104
CPT105
CPT106a
Finished Road Level
HA205
HA206
HA207
Metal Access Road
Old Landfill trenches expected in this area.
Upper SILTS and SANDS
Lower SILTS
CONE RESISTANCE (MPa)
CONE RESISTANCE (MPa)
CONE RESISTANCE (MPa)
HAND AUGER LEGEND
Brown Ash
Unit A
CPT LEGEND
FILL
Sandy SILTS
ORGANIC SOIL
Very dense silty SAND
Medium dense clean SAND
Interlayered SANDS and SILTS
SILT mixture

| | | |



OPTION 1 - WITHOUT REINFORCED LAYER

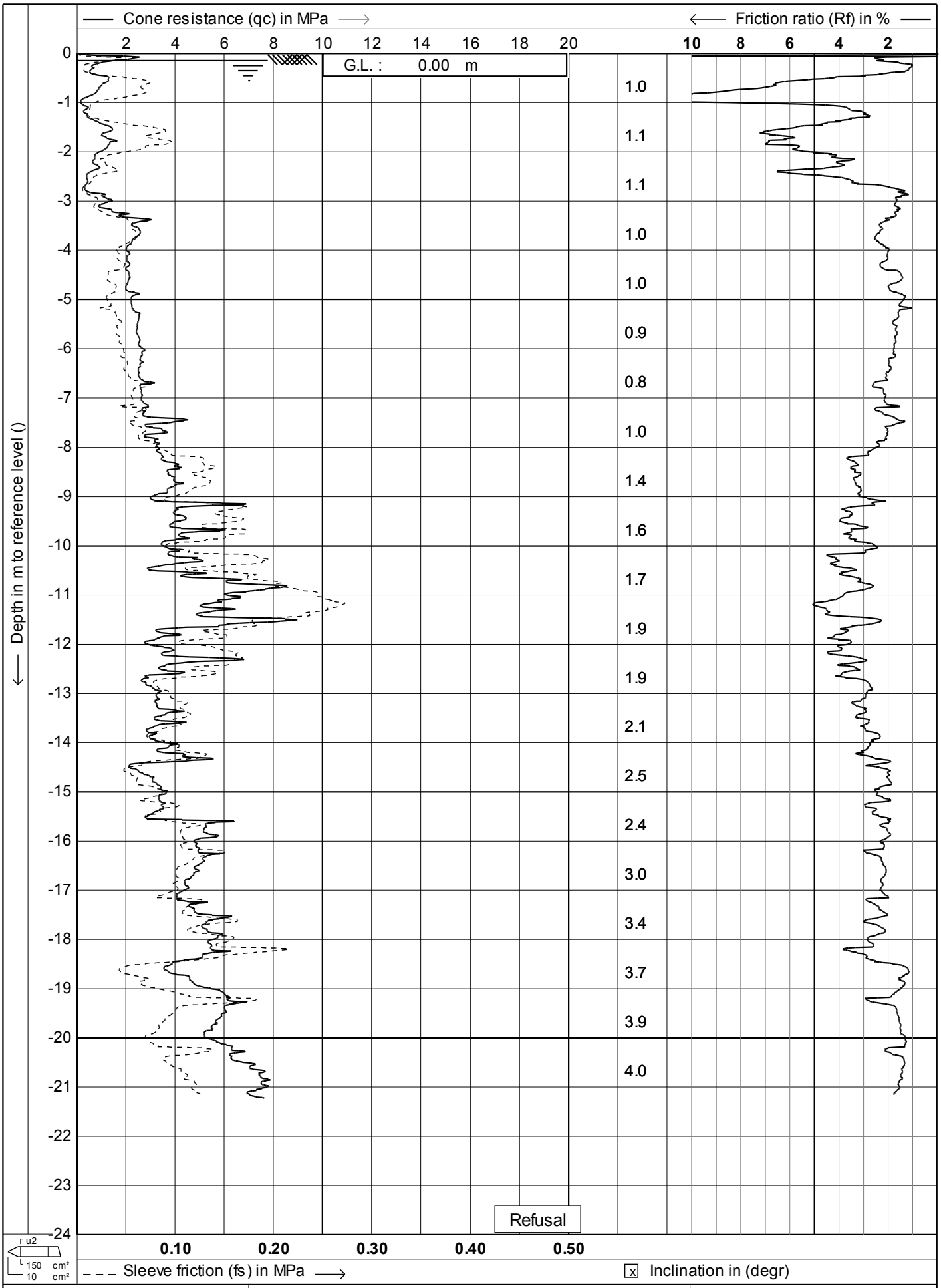


OPTION 2 - WITH GEOGRID REINFORCEMENT LAYER

| | | |

APPENDIX A

CONE PENETROMETER TEST PROFILES
CPT101 TO 109



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Scott Road - Te Kauwhata**

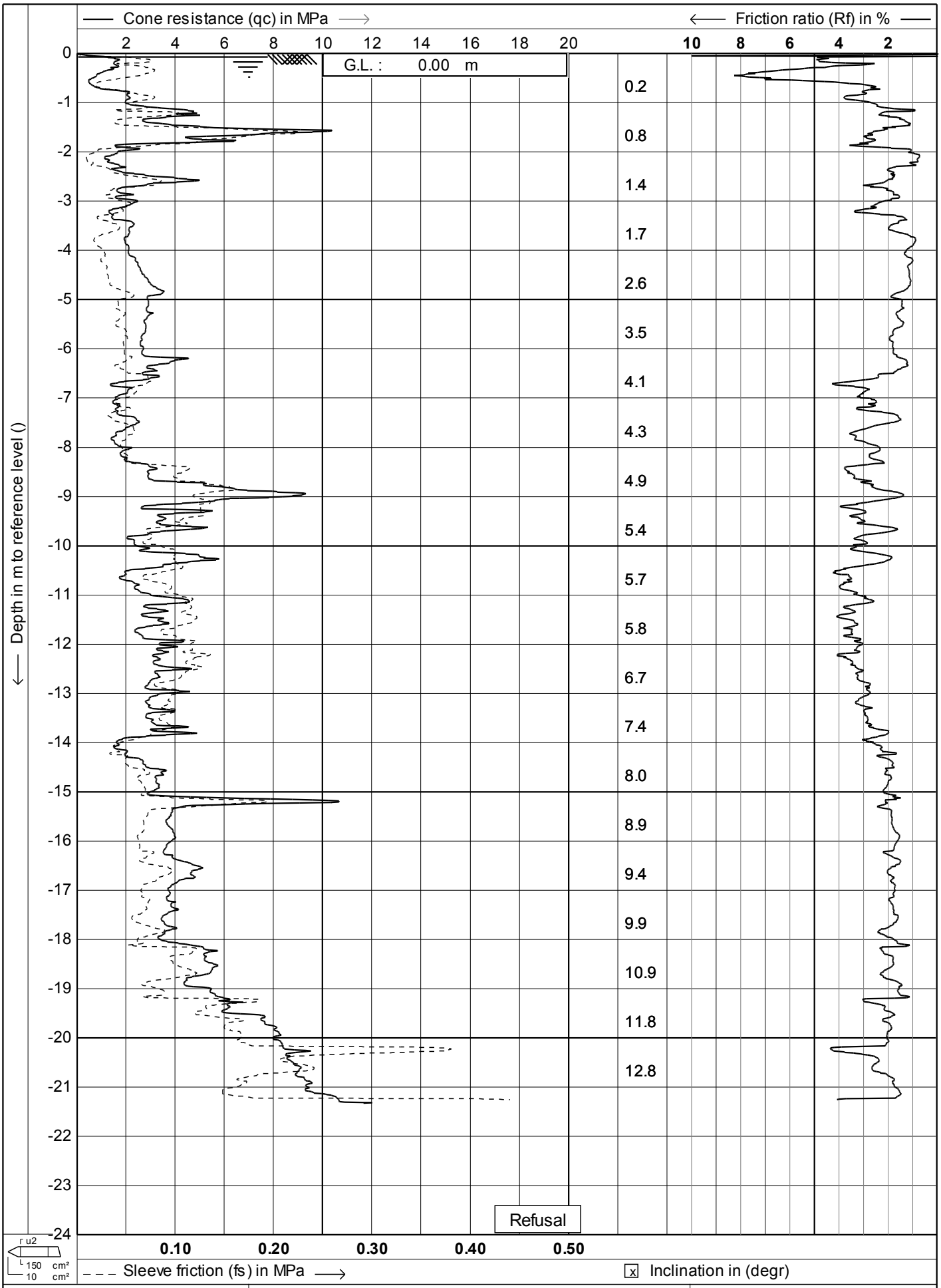
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **101**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Scott Road - Te Kauwhata**

Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

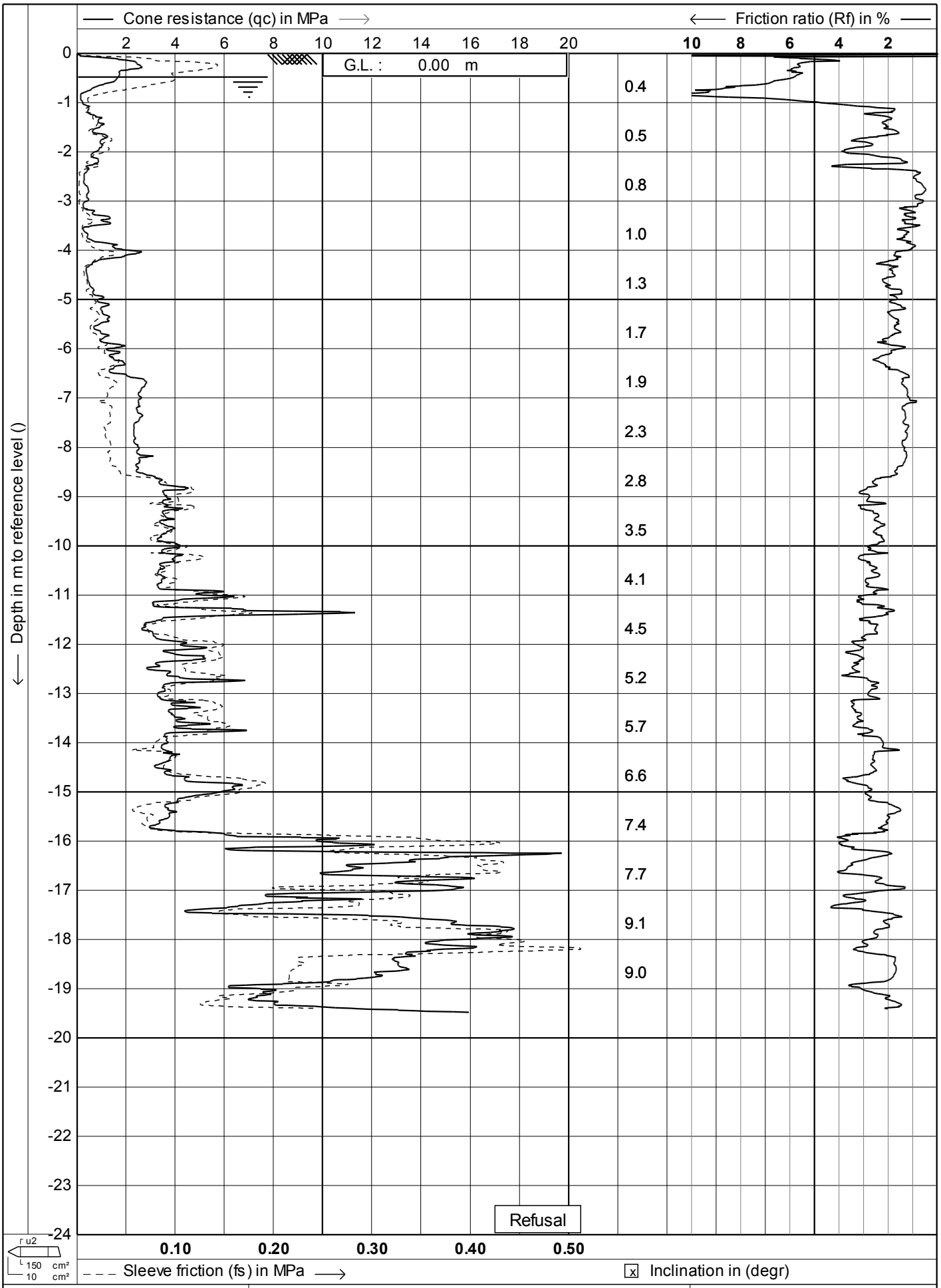
Project no. : **02ET3**

CPT no. : **102**

1/14

Penny Drilling GeoProbe — Ground Drilling and Environmental Specialists

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Scott Road - Te Kauwhata**

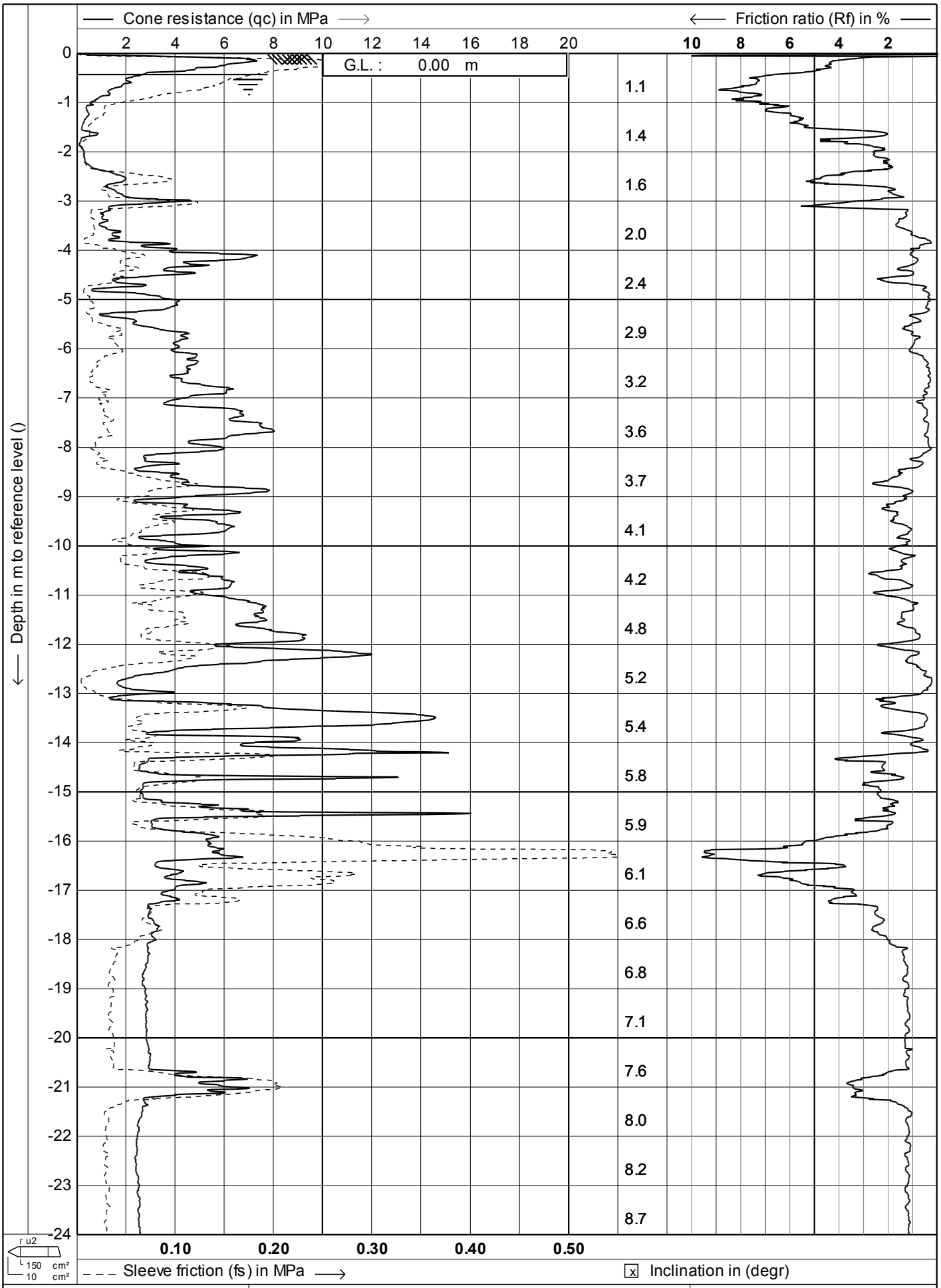
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **103**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

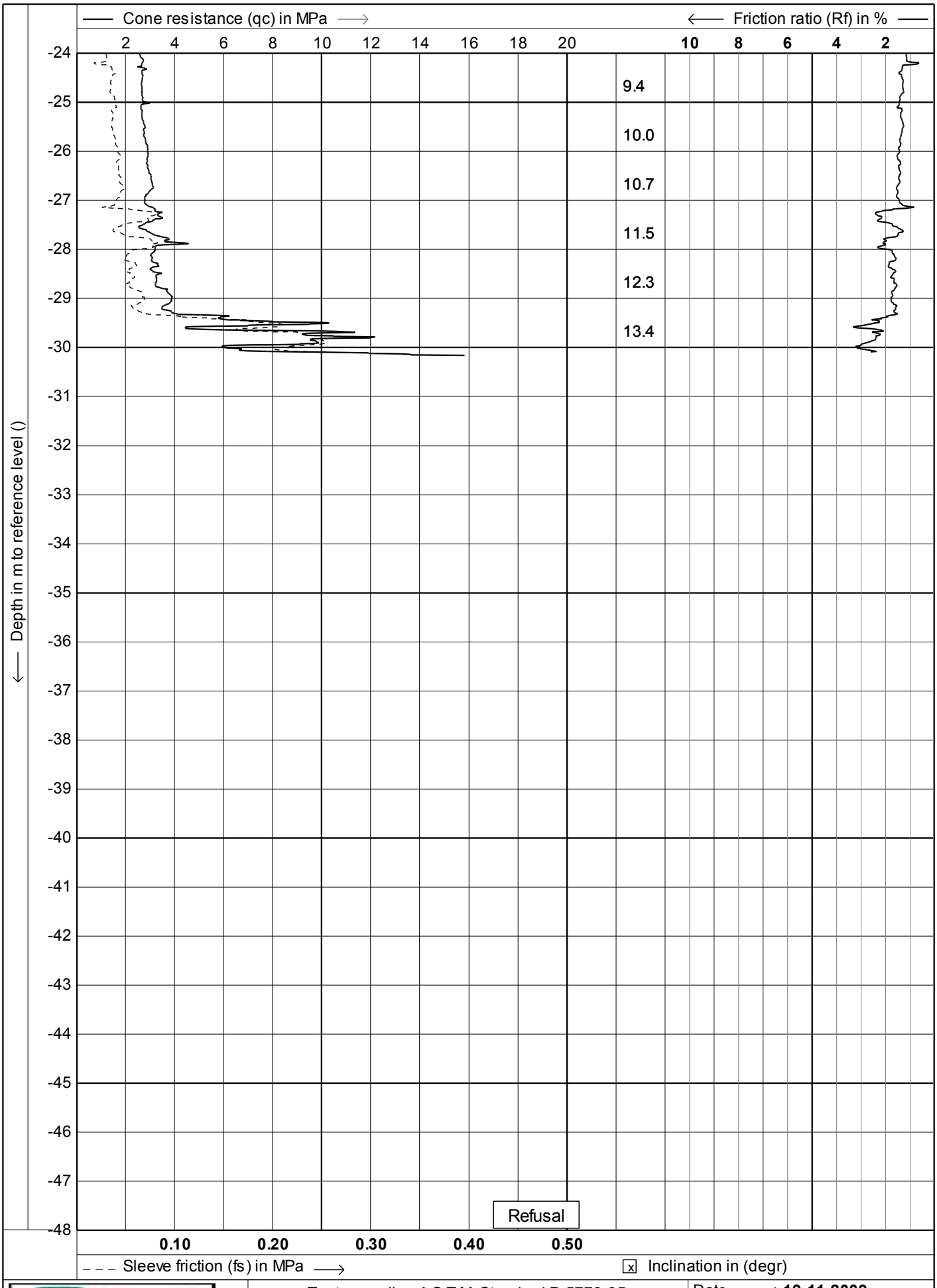
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **104**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

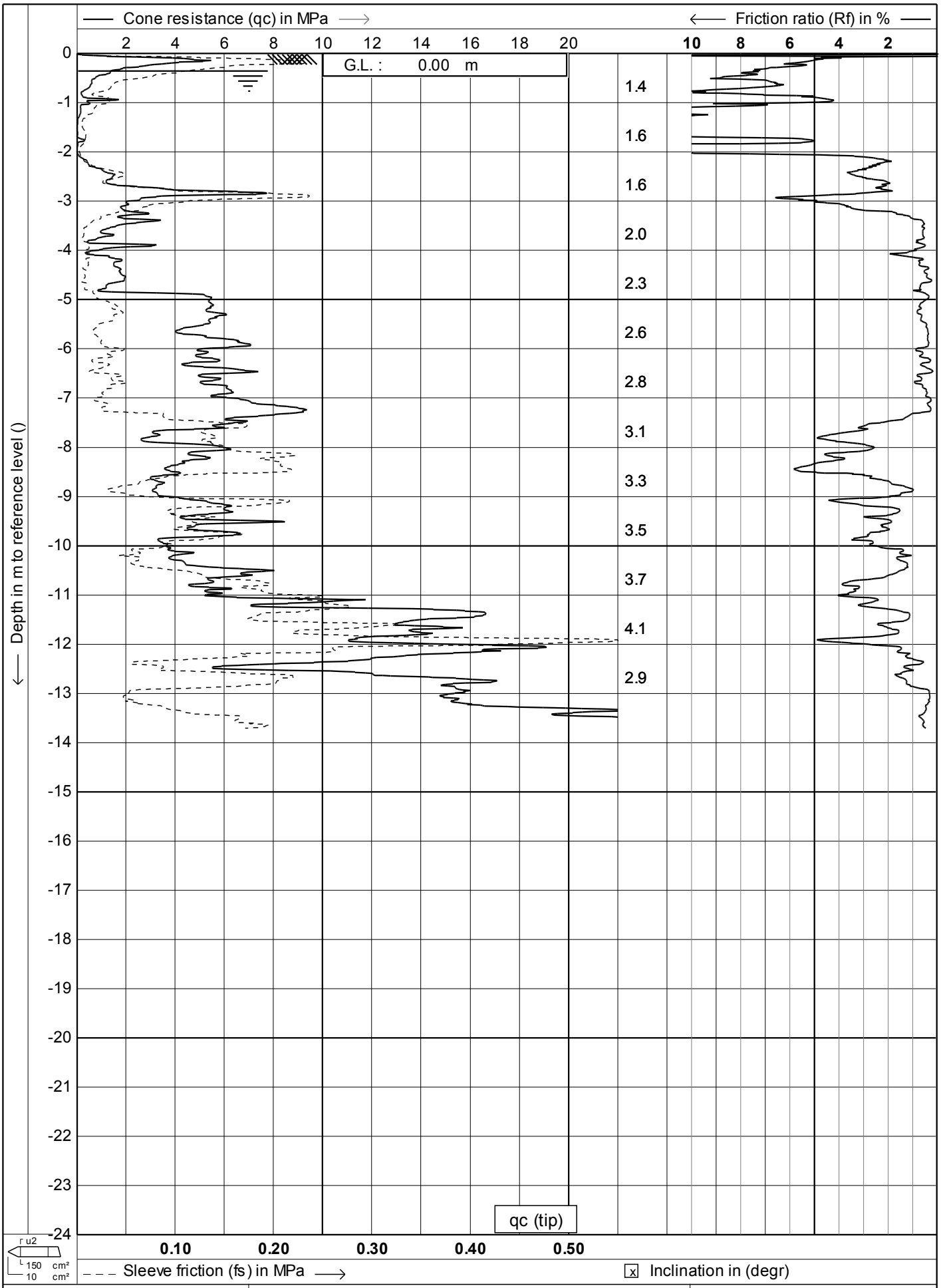
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **104**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

Date : **19-11-2009**

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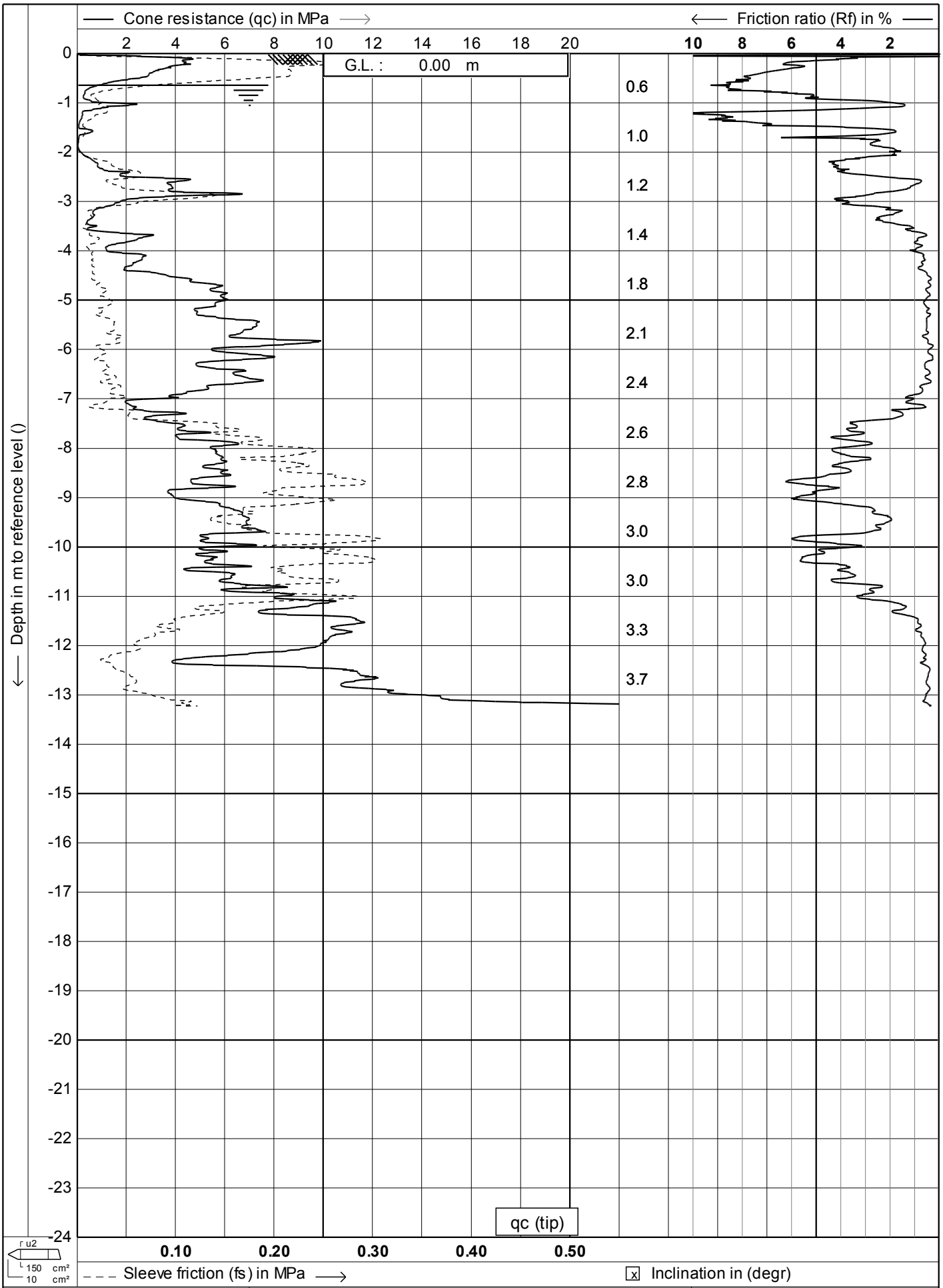
Project no. : **02ET3**

CPT no. : **105**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

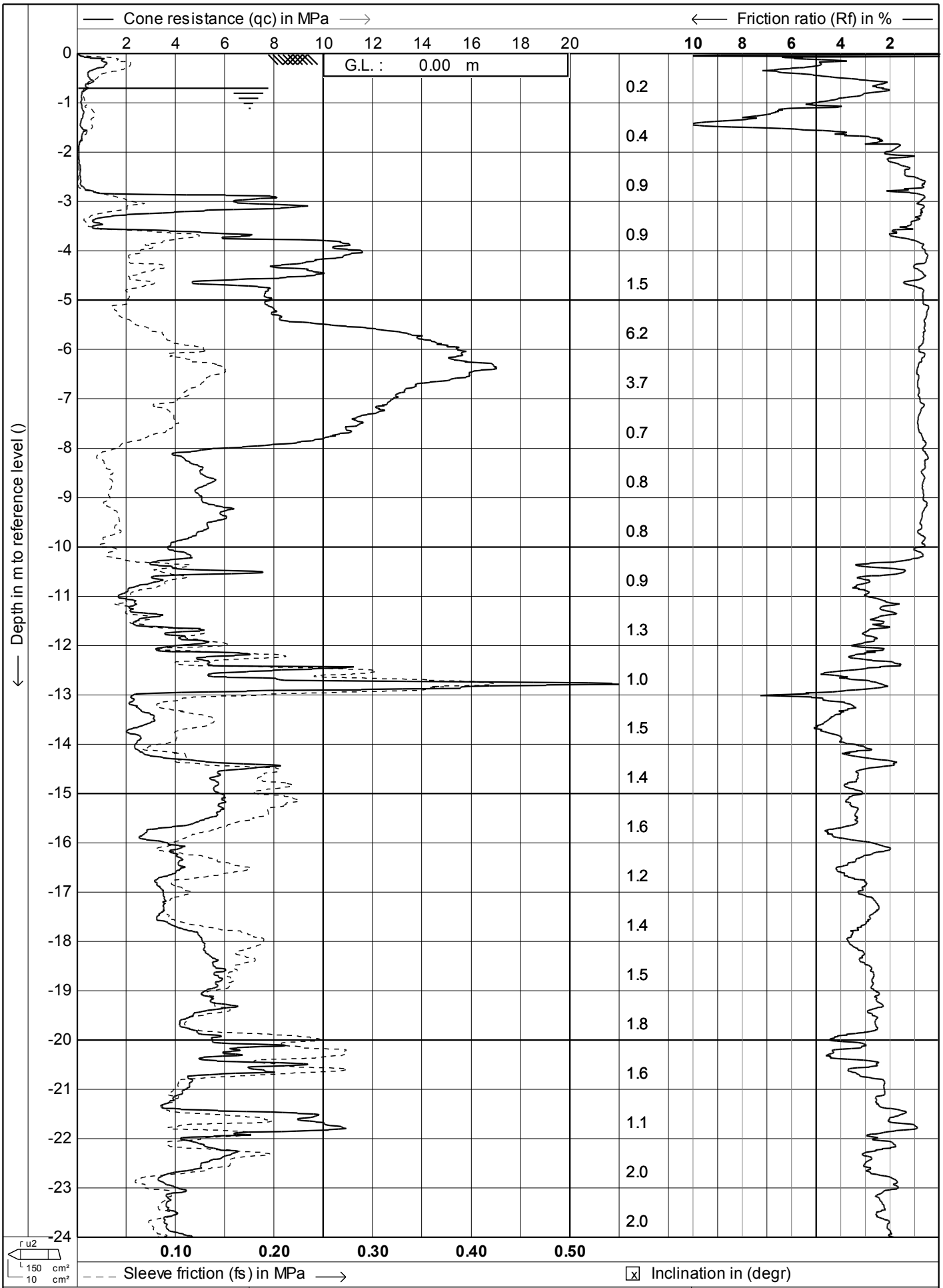
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **106a**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

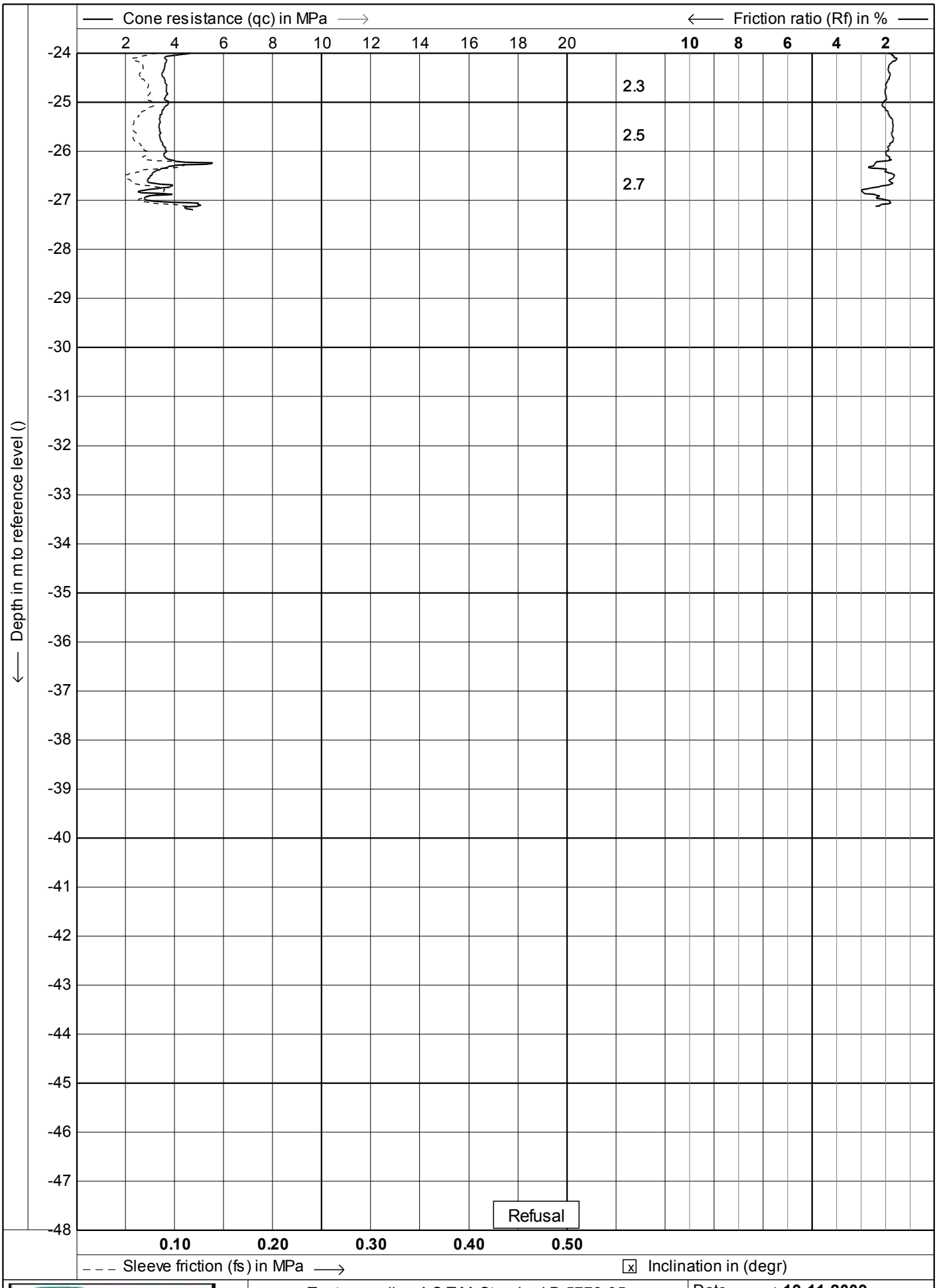
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **107**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

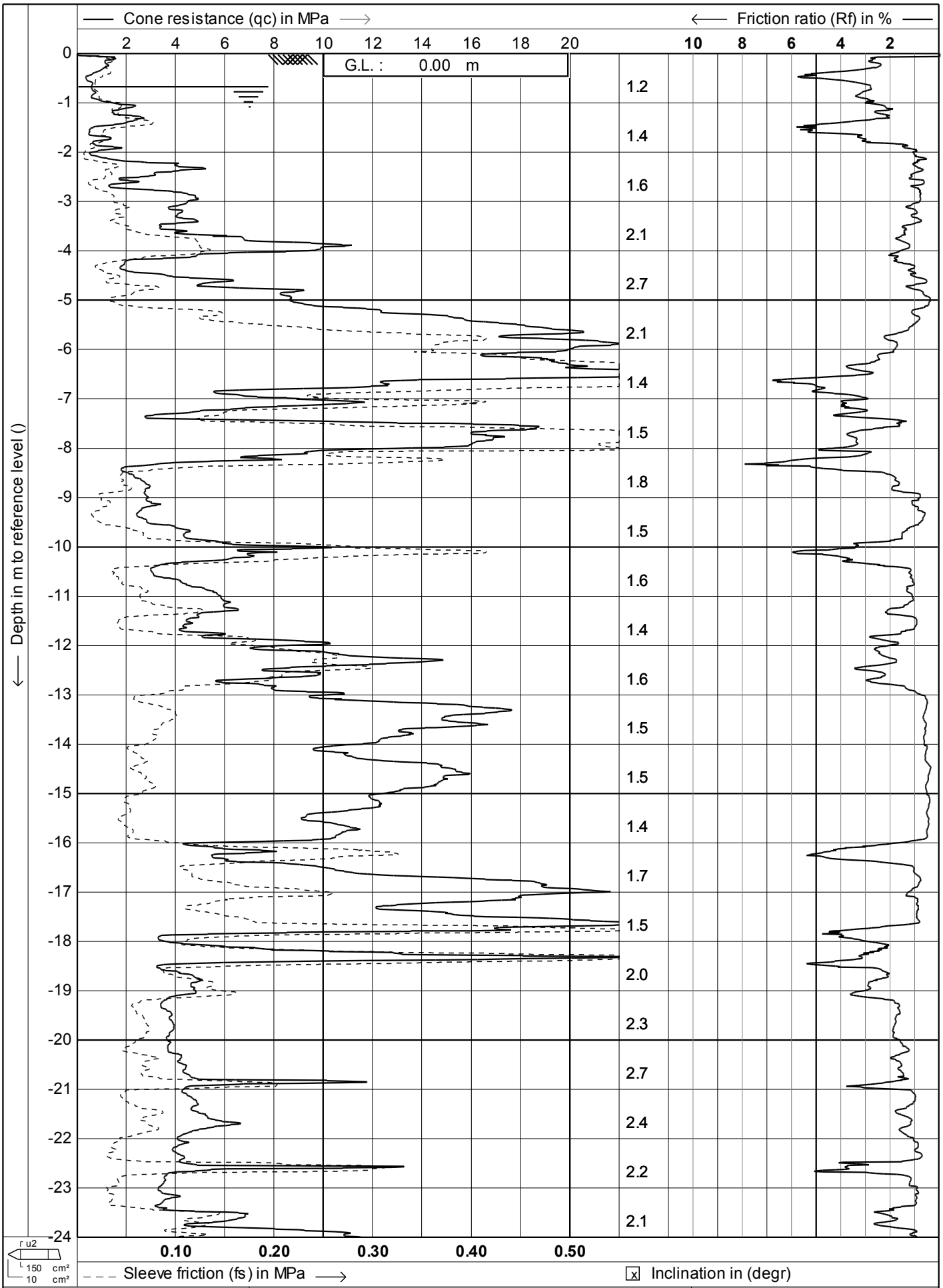
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **107**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

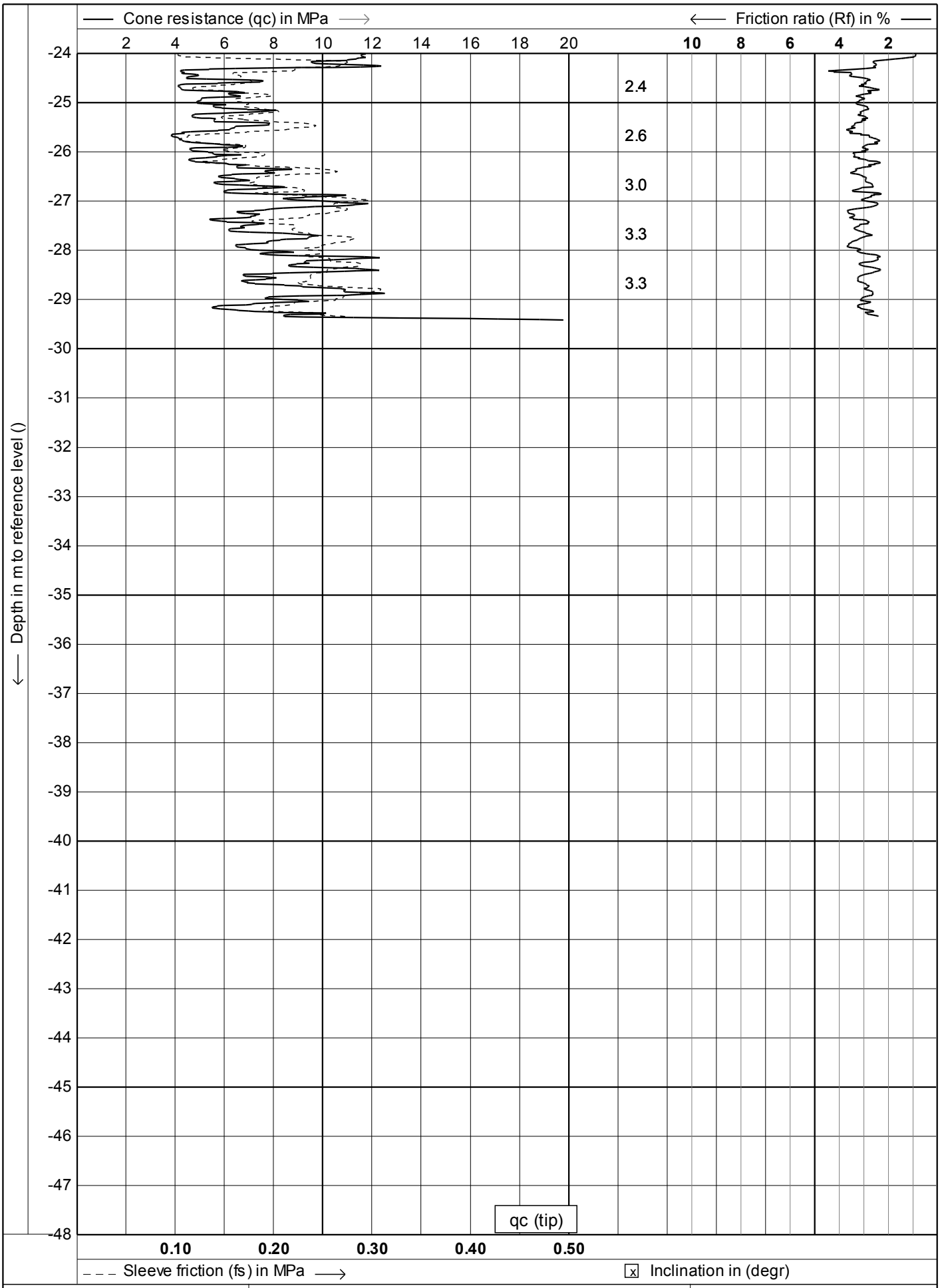
Project no. : **02ET3**

CPT no. : **108**

1/28

Penny Drilling GEOPROBE — Ground Drilling and Environmental Specialists

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

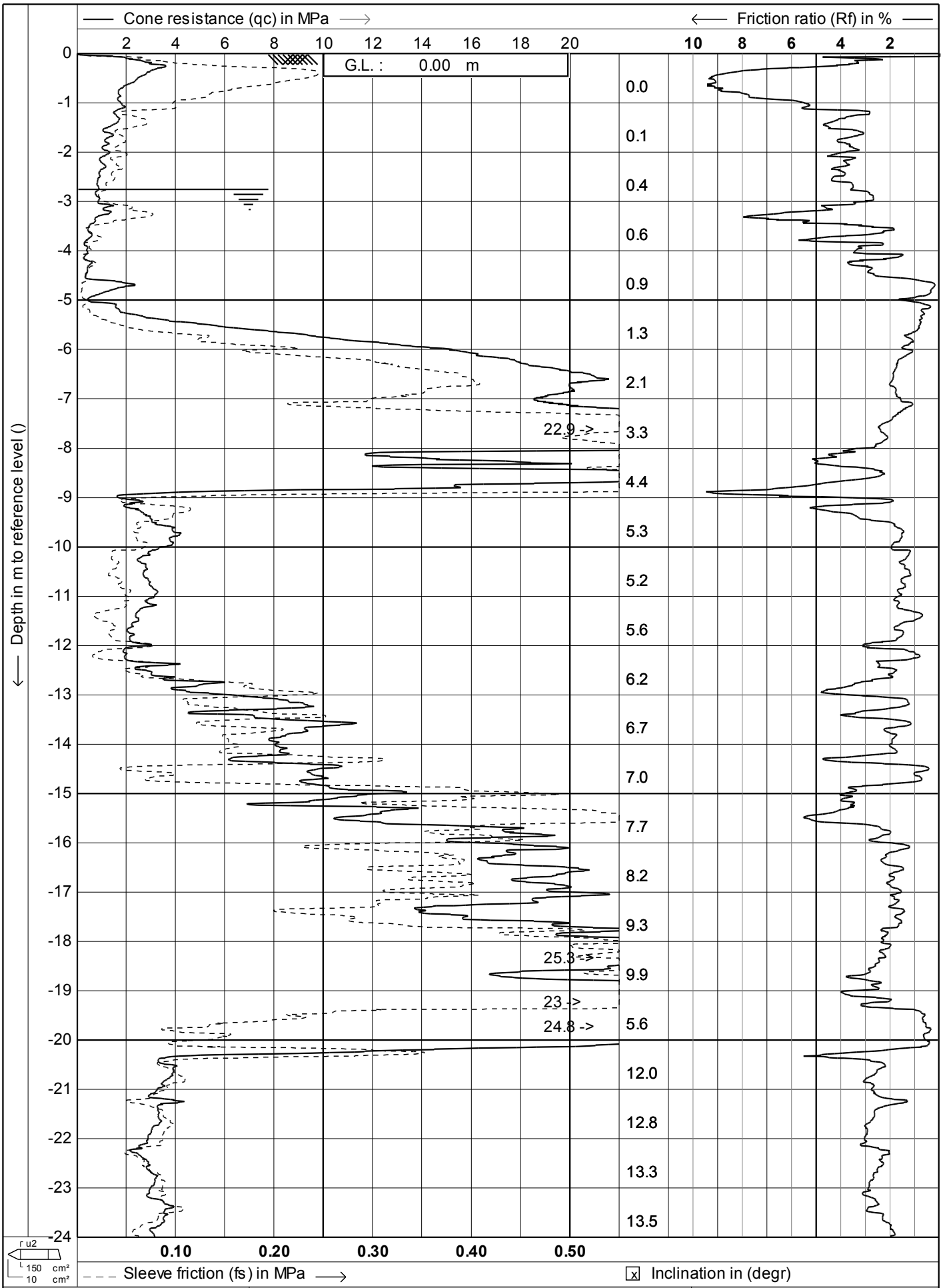
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

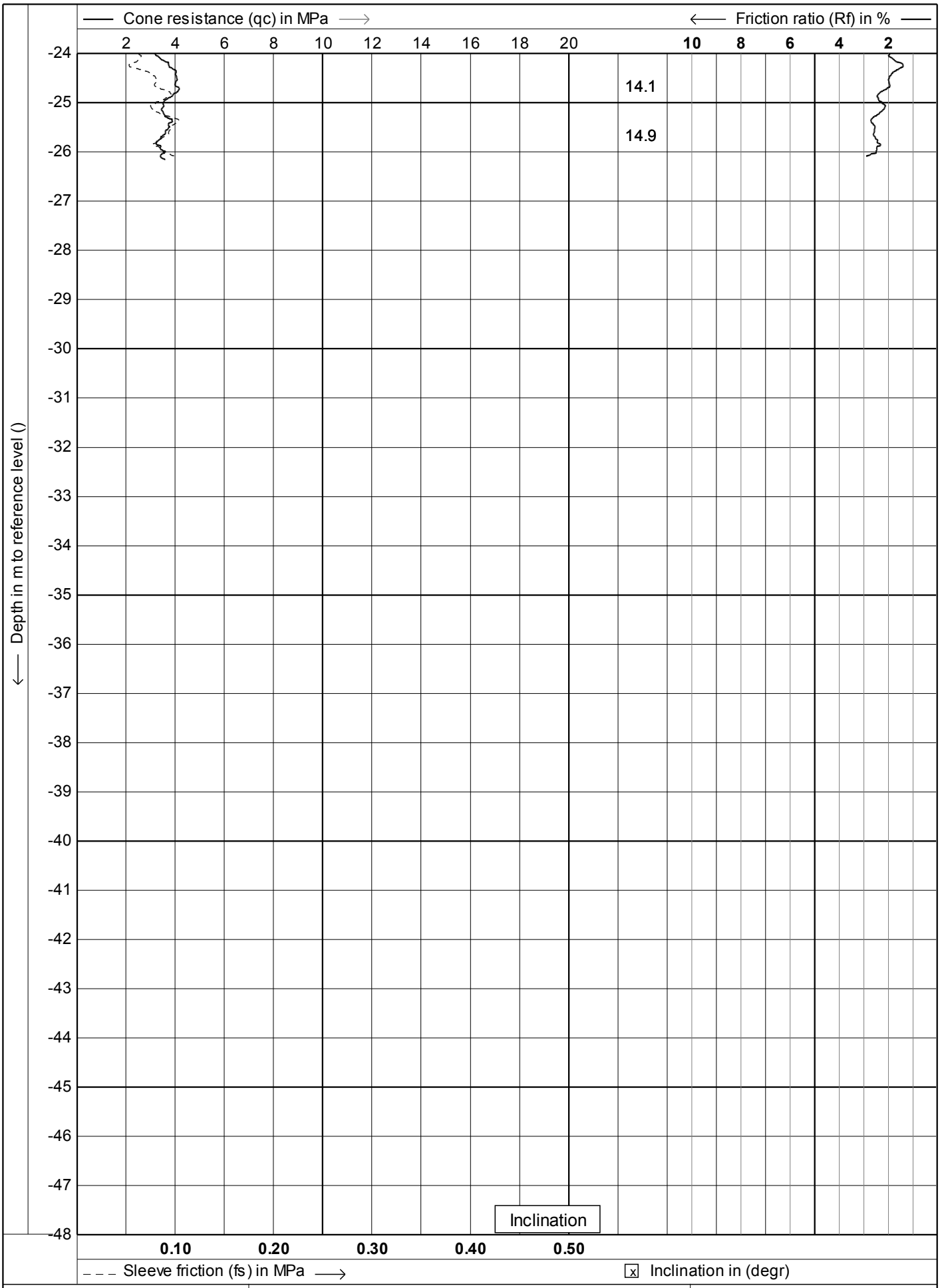
CPT no. : **108**

CPTask V1.14a



Penny DRILLING GEO PROBE Ground Drilling and Environmental Specialists	Test according A.S.T.M. Standard D 5778-95	Date	: **19-11-2009**
		Cone no.	: **C10CFIIP.F57**
	Project : **Te Kauwhata Bypass**	Project no.	: **02ET3**
	Location: **Roto Road - Te Kauwhata**	CPT no.	: **109** 1/28

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **109**

Penny Drilling GEOPROBE Ground Drilling and Environmental Specialists

CPTask V1.14a

APPENDIX B

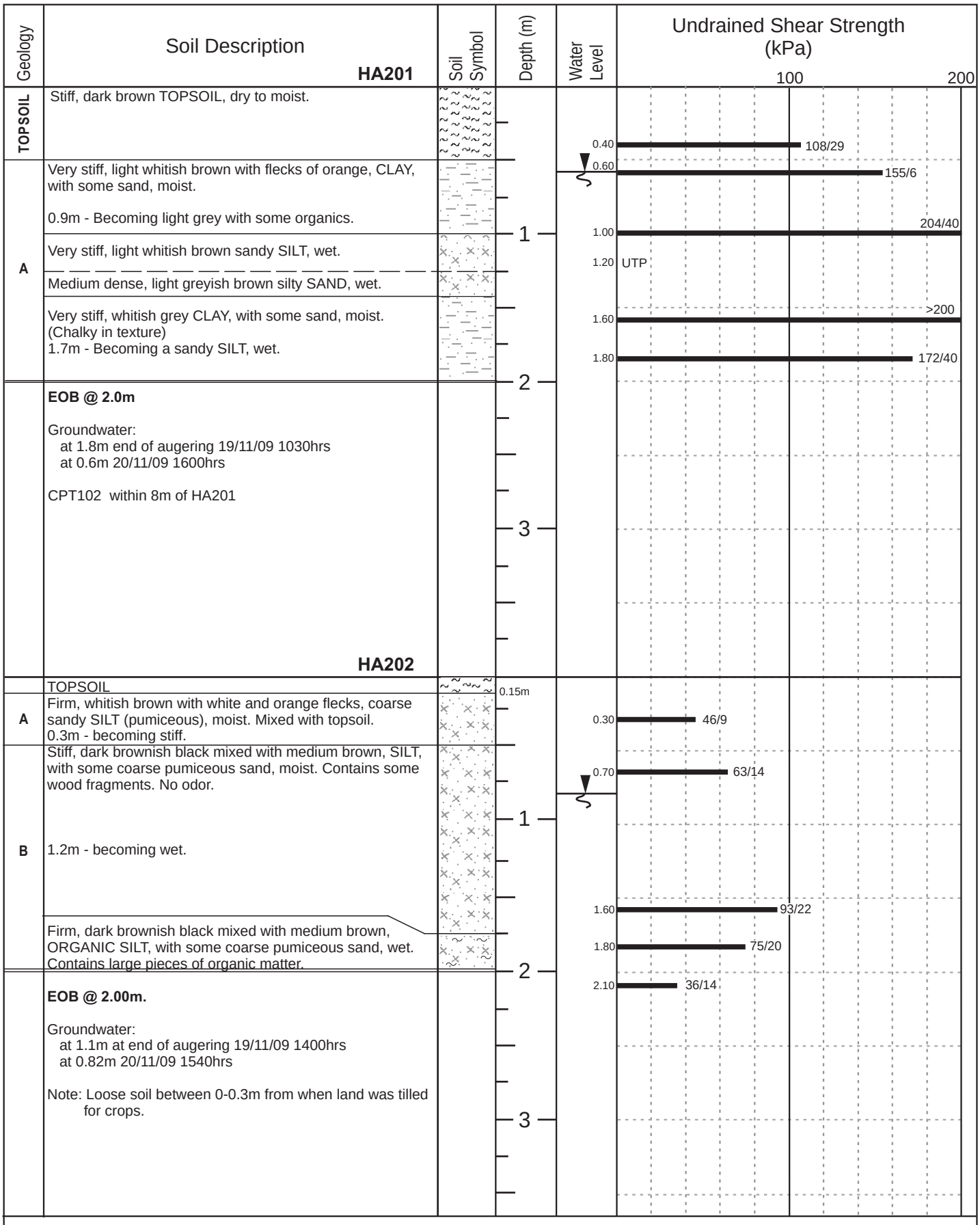
HAND AUGER LOGS
HA201 TO 212

HAND-AUGER LOG

Bore No.: **HA201 and HA202**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: 19.11.09



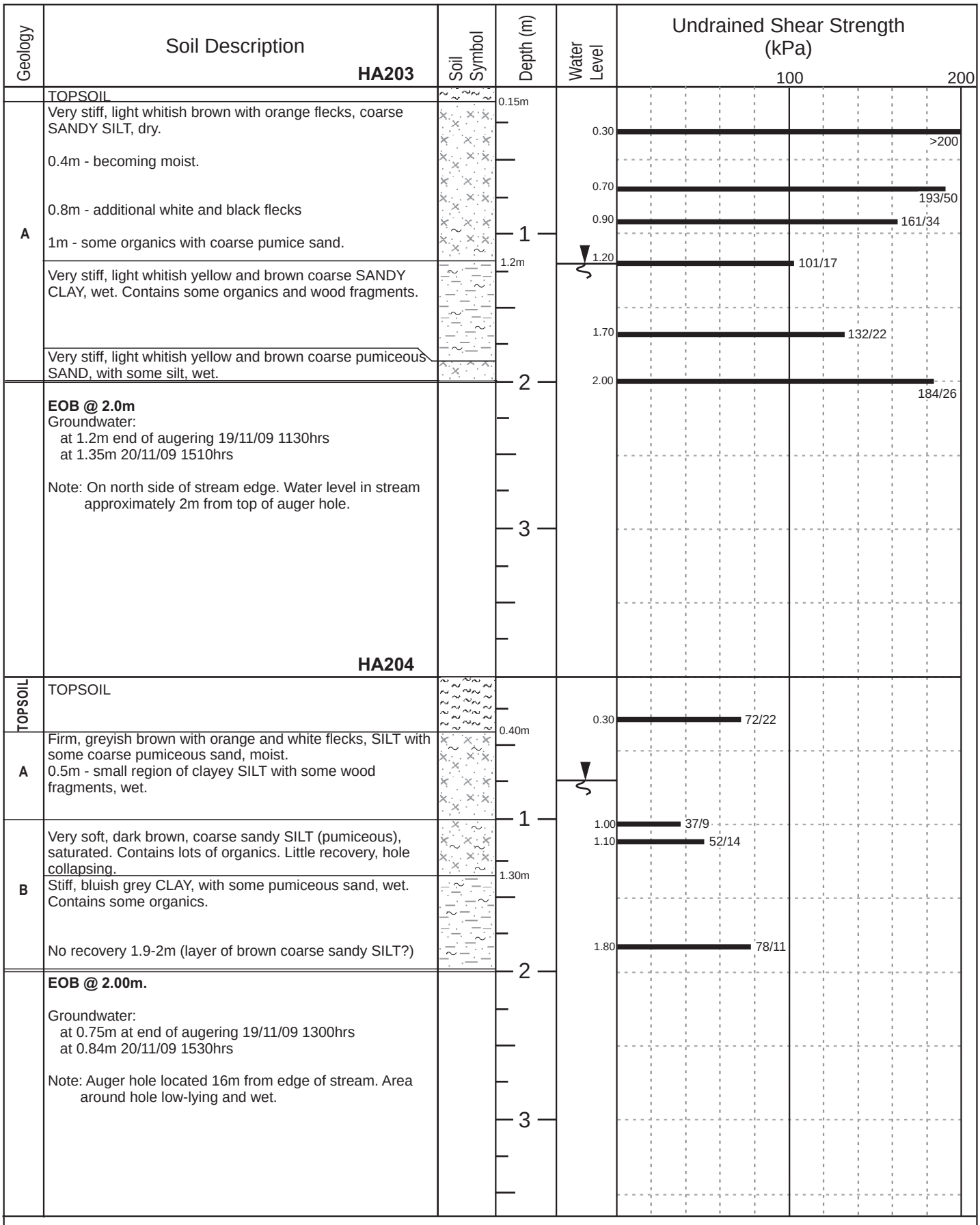
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA203 and HA204**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: 19.11.09



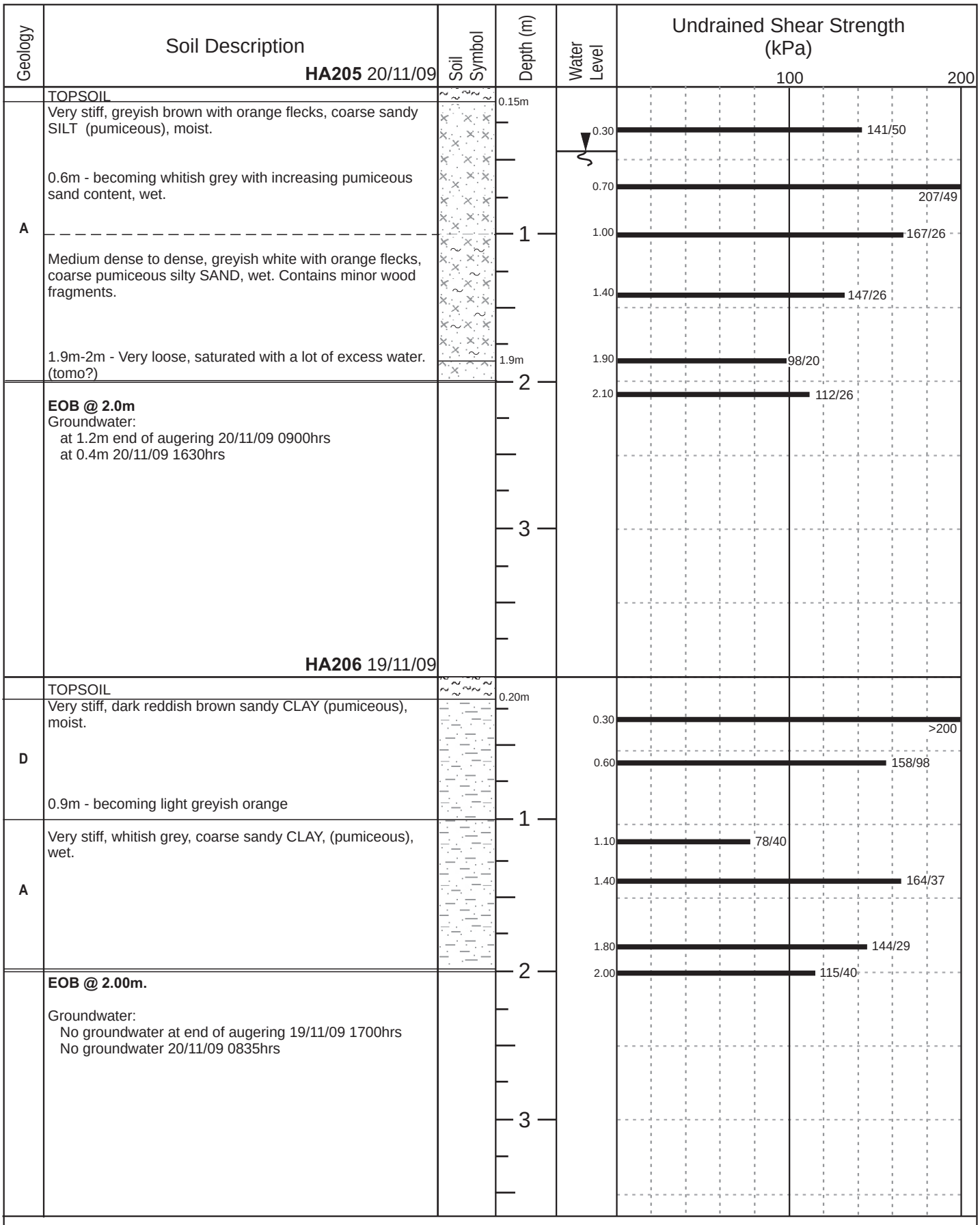
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA205 and HA206**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: as shown



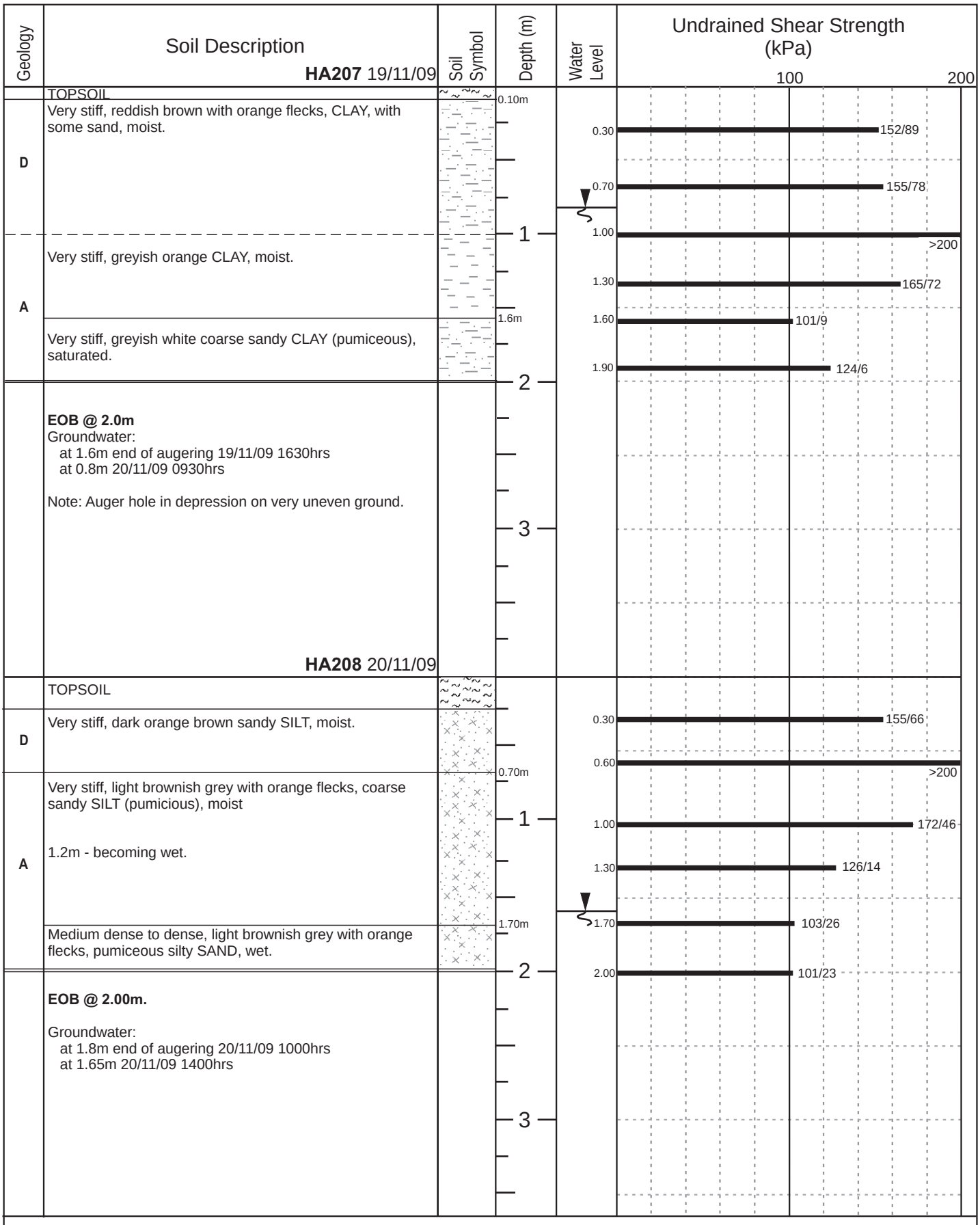
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA207 and HA208**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: as shown



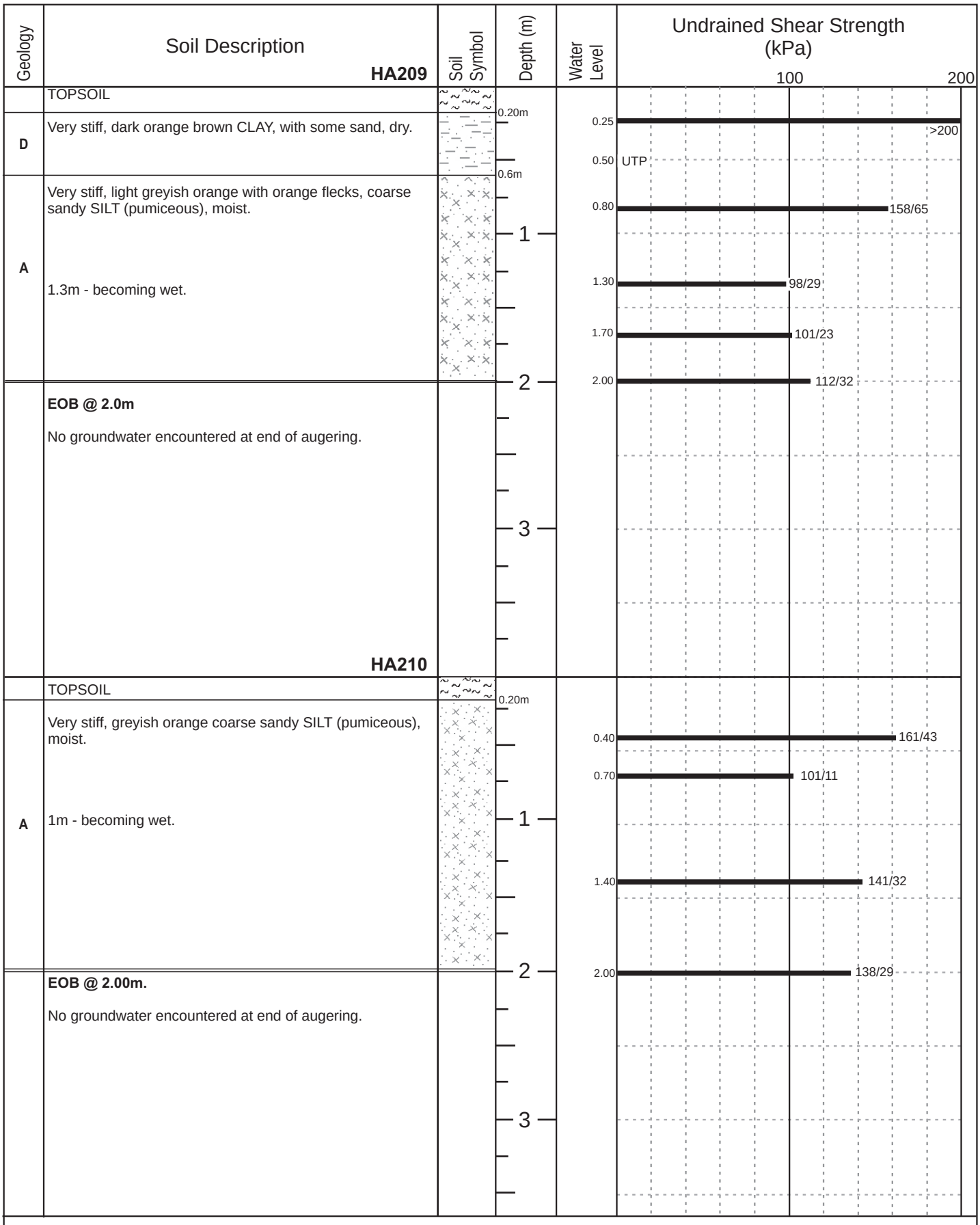
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA209 and HA210**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: 20.11.09



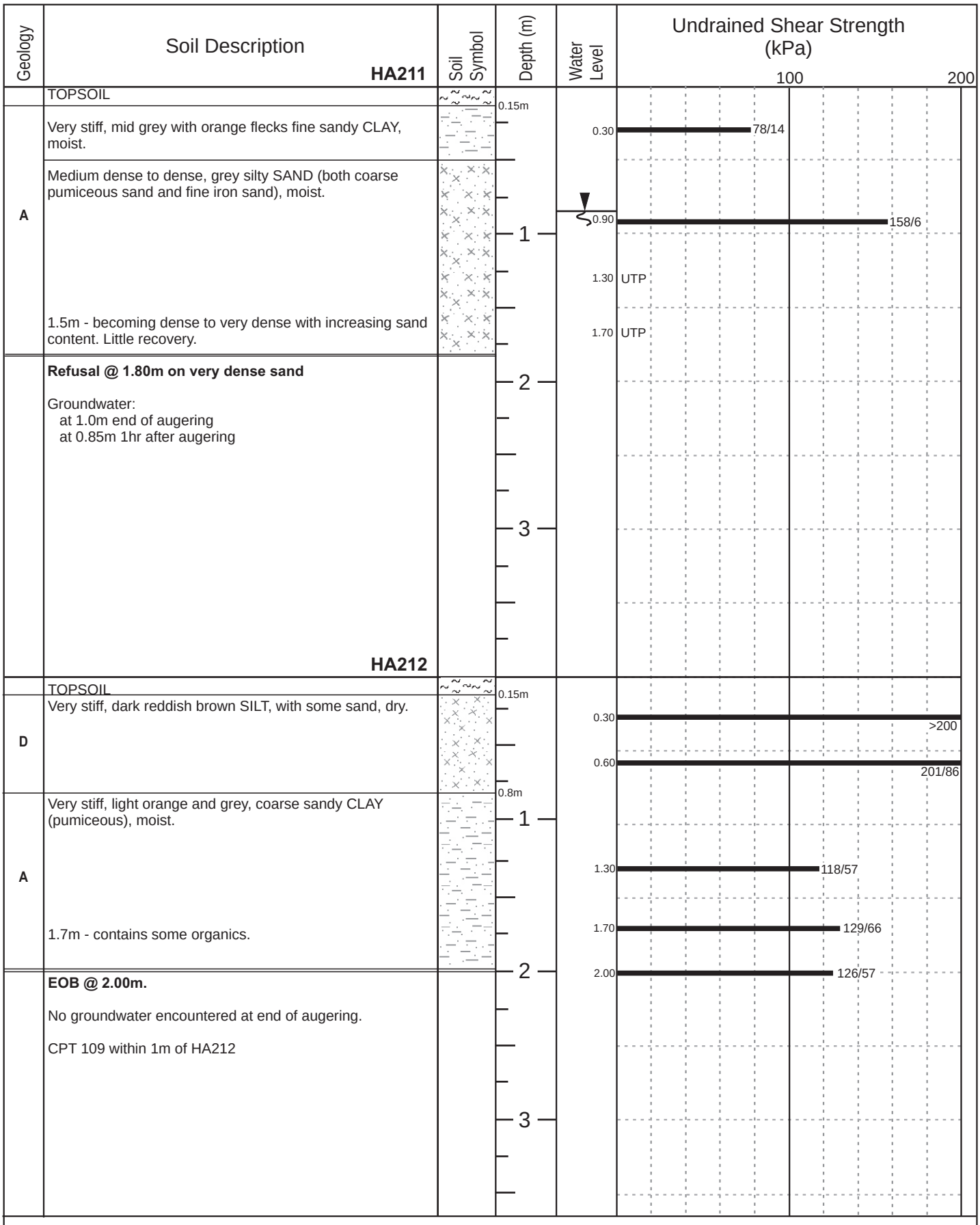
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA211 and HA212**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: 20.11.09



EARTHTECH CONSULTING LTD

APPENDIX C

SITE MEETING NOTES
WITH MR STANLEY WALKER,
TE KAUWHATA CONTRACTORS

EARTHTECH

MEETING NOTES

Project:	**Te Kauwhata Heavy Vehicle Bypass**
Venue:	On Site
Date/Time:	12 November 2009 at 10.00am
Present:	Mr Stanley Walker – Te Kauwhata Contractors A Nelson – Earthtech Consulting (ET)

M2760-1

Mr Stanley Walker (SW) has lived in the area all his life – used to own farmland adjacent to the landfill. Refer notes of key features on photograph.

Tip started on road reserve land in 1950's on a small ridge of higher ground that headed south towards the current boat ramp. Left turnaround area at the entrance near present gate and then progressively excavated three lines of trenches. Used drag line till first digger arrived on-site in 1969. Trenches approximately 2*m* deep by 3 to 4*m* wide. Leachate drained out into swamp at southern end. End tipped and spread with tractor. Covered with clay. Refuse spilled out on east side of road reserve onto adjacent farmland at times.

In about 1965, trenches were full and tip continued south over swampland. Then filled around to the west and north to create the current landfilled profile.

Leachate controls (two collector lines, pumping manhole and power cable) installed after closure – about 1998. Site capped with clay from local quarry. Power cable to pump station runs across causeway from sewage treatment plant and then around southern perimeter of the landfill – should have power cable markers as no longer visible as an old trench. Check WDC for landfill records with plan of monitoring bores, etc.

Landfill cap is flat and poorly drained – should top up and dome with cleanfill.

Area between Rata Street and landfill is natural ground. Had 25 year pines felled a few years ago, leaving thinings and rough looking ground.

Aerial photographs dated 09/02/1942 from NZ Aerial Mapping confirm no tip in 1942. Trench tip area and northern half of current landfill in grass. Wetland scrub to east and south. One house off current Roto Street. No sewage works or other industrial development along lake edge.

Other:

1. Maori canoes used to be pulled up on eastern side of trench tip site – now swampy farmland.
2. When haymaking, workers used to take a short cut by walking across lake with clothes on their heads – now too deep. SW thinks outlet has silted up.

3. Wattles date from early 1900's when planted for tannin for hide processing. Locals would heat the seeds in the oven over breakfast, then follow plough, planting a seed every 3*m*. Payment was in form of any Kauri gum exposed by the plough.
4. Shallow well in gully east of end of Moki Road. Dried up when DC installed new town supply bores.
5. Brown ash overlying white silts overlying permeable gravels.

Notes prepared by:
A H NELSON
Senior Geotechnical Engineer
Earthtech Consulting Ltd

EARTHTECH

HYDROGEOLOGY • GEOTECHNICAL ENGINEERING • ENGINEERING GEOLOGY

SCOTT ROAD, TE KAUWHATA

Preliminary Geotechnical Assessment

OCTOBER 2016

Report prepared for:
WINTON PARTNERS

Report prepared by:
EARTHTECH CONSULTING LIMITED
P O Box 721, Pukekohe
Phone: 64-9-238 3669

Ref : R4036-1
Date : 27 October 2016

SCOTT ROAD, TE KAUWHATA

Preliminary Geotechnical Assessment

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   - 3.1 ACCESS 1
   - 3.2 SITE DESCRIPTION 2
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SCOTT ROAD, TE KAUWHATA

Preliminary Geotechnical Assessment

1. INTRODUCTION

A 179*ha* block of land located off Scott Road to the south of Te Kauwhata is being considered for residential subdivision purposes. This report describes the geological, ground and groundwater conditions and identifies any major geotechnical constraints in regard to the proposed development.

This report has been prepared for due diligence purposes and should not be used for detailed design.

2. PROPERTY INFORMATION

Information provided includes:

a. LINZ GIS data prepared by Survey Worx at a scale of 1:5000, Rev 0, undated. This includes 10*m* contours and an indicative flood line. This plan was used to locate the preliminary CPT investigation positions.

b. Topographical site survey by Survey Worx at a scale of 1:2500, Rev 0, dated 6 September 2016. Topographical survey showing 1*m* contours.

c. A Candor 3 drawing indicating more detailed contours (1*m* intervals) and a more accurate definition of the flood line, 1:8000 at A3, no date, received 6 October 2016.

d. A Baxter Design drawing indicating a proposed road and section layout, ref 2674, 1:8000 at A3, dated 6 October 2016. This drawing excludes any intensive development of the northern portion (proposed Lot 2).

3. SITE DESCRIPTION

3.1 Access

Access to the site is via Scott Road which is formed and sealed as far as number 94.

3.2 Site Description

Site features are shown on Figures 1A and 1B. The site is currently run as a dairy farm. The site has been subdivided by fencing into multiple paddocks, accessed by a network of metalled raceways.

The majority of the site extends over gently rolling hill country with slope angles of <15º (to the horizontal). Within this elevated topography is a prominent broad ridge which extends to RL35*m* in the west and a broad knoll extending to RL30*m* to the east. Some isolated areas of steeper slopes are present, generally associated with gully heads with slope angles ranging between 15º to 30º.

Bounding the eastern and southern margins of the rolling hill country are extensive alluvial flats.

Lake Waikare forms the eastern boundary. Along the lake edge is a 1*m* to 1.5*m* high stopbank which allows drainage and grazing of the former lake bed located on the property. Lake Waikare was artificially lowered by approximately 1*m* in the 1960's (?) and forms part of the Lower Waikato River Flood Protection Scheme. These alluvial flats are low-lying and rely on a pumped drainage system. The area is prone to flooding under a major event up to the flood line shown on Figures 1A and 1B.

The northern boundary includes a stopbank and stream diversion and borders the south side of the Waikato District Council's proposed Heavy Truck Bypass Route.

The southern boundary also includes a stopbank which borders on the Waikato River/Rangiriri Spillway flood channel.

The western boundary runs along the main trunk railway line which runs through a number of cuttings. Two main areas of cuttings were observed as follows (Figures 1A and 1B):

i. Rail Cutting A – 2*m* to 6*m* high cut slopes
ii. Rail Cutting B – up to 20*m* high cut slope.

Lake Kopuera is located to the west of the rail line.

3.3 Slope Instability Features

Existing slope instability features on the site are restricted in extent. A site walkover by a Senior Engineering Geologist identified the following (see Figure 1B):

i. Landslide Ls1 – small rotational failure estimated at 20*m* long x 10*m* wide x 3*m* depth. Instability triggered by past gully erosion at toe.

ii. Landslide Ls2 – identified on basis of subdued irregular topography. Estimated dimensions of 100*m* long x 40*m* wide x 10*m* depth. Possibly a terrace erosion feature.

iii. Landslide Ls3 – small rotational failure estimated at 15*m* long x 10*m* wide x 2*m* depth.

iv. Landslide Ls4 – identified on basis of subdued irregular topography. Estimated dimensions of 80*m* long x 40*m* wide x 6*m* depth. Possibly a terrace erosion feature.

v. Landslide Ls5 – large rotational failure with well developed headscarp, debris mounds and pull-apart zone in toe. Estimated dimensions of 100*m* long x 100*m* wide x 10*m* depth. Instability triggered by steep slope and high groundwater levels (zones of groundwater seepage observed).

To the north of Ls5 are a number of small rotational landslides on the adjacent steep 25º to 30º slopes.

vi. Landslide Ls6 – identified on basis of subdued irregular topography. Estimated dimensions of 70*m* long x 90*m* wide x 8*m* depth. Possibly a terrace erosion feature.

vii. Shallow soil creep <1*m* depth was also observed on slopes >20º.

3.4 Vegetation Cover

The majority of the site is grassed and used for grazing.

A number of gullies and steeper areas include planted pine, poplar and other trees. There is very little native vegetation on the site.

3.5 Existing Buildings

The site includes numerous sheds, yards and wash down areas associated with current and previous dairying activities. It also includes at least three dwellings.

3.6 Other Features

A small farm dump is centrally located on the site. Wash down ponds, settlement ponds, silage areas and offal holes are also present. These have not been mapped or recorded in detail as a "site contamination assessment" is being prepared by others.

4. PREVIOUS GEOTECHNICAL REPORTS

Information reviewed prior to undertaking further site investigations included:

a. Te Kauwhata Heavy Vehicle Bypass, Preliminary Geotechnical Report, prepared by Earthtech Consulting Limited, ref R2760-1, dated 25 February 2010. The report includes cone penetrometer (CPT) profiles and hand auger bores located on or near the northern boundary of the site. Relevant CPT's and hand auger bores have been shown on Figure 1A.

b. Proposed Lakeside Farm Subdivision, Te Kauwhata, Geotechnical Suitability Assessment, prepared by Maunsell Limited, dated 30 October 2008.

   This report addresses a proposed 24 lot life-style block subdivision to the east of Scott Road. This area has been excluded from the intensive subdivision shown in the Baxter plan.

   Relevant investigation locations have been shown on Figure 1A.

5. HISTORIC AERIAL PHOTOGRAPHS

The following historic aerial photographs have been viewed:

- 1942–SN192 No. 287/43 – 1:16,000 dated February 1942 (covers the northern half of the site).

The elevated portion of the site is in farmland with the alluvial flats vegetated.

The 1942 photographs show vegetation extending from Lake Waikare to approximately half way between Scott Road and what are now the treatment ponds. This area corresponds to the length of stream where stop banks have been constructed; indicating that the lower half of the stream was formed after 1942, probably when the vegetation was cleared and the land drained.

The vegetation continues around the shores of Lake Waikare encompassing the area that is now the treatment ponds.

The historic 1942 aerial photographs show the positions of the railway line and Scott Road are unchanged since 1942.

6. GROUND CONDITIONS

6.1 Published Geological Data and Water Bore Logs

Local geology has been described on the Te Kauwhata Geology Sheet N52 at a scale of 1:63360, prepared by DSIR (1968).

The low-lying area to the east of Scott Road extending to Lake Waikare and around the southern perimeter of the site is mapped as being alluvium of Holocene age. These areas roughly correspond to the areas shown as vegetated swamp on the 1942 historic aerial photograph. There are also small pockets of Taupo Pumice Alluvium.

The elevated areas from Te Kauwhata Road extending to the railway line and including Scott Road are mapped as being underlain by the Whangamarino Formation of Pliocene age. This is typically described as:

"Mainly clay, lignite and some gravels and pumice sands."

The entire area is underlain at depth by calcareous siltstone of the Te Kuiti Group with basement rock (greywacke) beneath the siltstone. The siltstone includes coal measures.

A geological interpretation of the site area indicates that the ancestral Waikato River flowed around the southern and eastern perimeters. These areas became blocked and the river was diverted to its current location. The low-lying areas have subsequently been filled with weak alluvial and swamp deposits. Site topography also indicates the presence of an old river erosion channel forming an area of low relief between the western ridge and adjacent knoll (Figure 1B).

During site mapping, outcrops of layered pumiceous sands and silts interpreted as Puketoka Formation were observed along the western site margins. On the basis of the site mapping and published geology, both the Puketoka and the older Whangamarino Formations are expected to be present on site. The Puketoka Formation is Pleistocene in age.

A search of the Environment Waikato database provided two drill logs associated with farm bores for the property. Both logs indicated a layered sequence of pumiceous sand and silt with minor gravels and organics to depths of 41*m* to 59*m*.

Therefore, the combined thickness of the Puketoka and Whangamarino Formation is expected to be >40*m*.

6.2 Site Specific Investigations

In order to define the ground conditions on the site, further investigations were undertaken in October 2016.

These included 21 CPT profiles and seven hand auger boreholes.

The CPT (Cone Penetrometer Test) involves pushing a 50*mm* diameter steel cone into the ground to depths of up to 15*m*. The cone measures tip resistance, sleeve friction and soil pore pressures. From these readings and correlations with borehole data, the CPT provides an indication of ground type and ground strength. The CPT is very useful in alluvial and/or soft ground conditions (published geology for this site) but does need to be calibrated with borehole data. For this preliminary investigation, hand auger bores have been used to check the upper 3*m* soil profile. Where CPT refusal was encountered at depths of less than 6*m*, the test was repeated to confirm that refusal was not simply due to an isolated log or other obstruction (for example CPT01, CPT01a).

For residential subdivision purposes the top 2*m* to 3*m* of the ground profile is the most important unless substantial earthworks are envisaged.

6.3 Ground Conditions

6.3.1 Rolling Hill Country

Under the elevated topography, the following ground conditions are expected:

- Swampy alluvium – soft saturated clays and silts, commonly organic. Restricted in extent to swampy gully floors shown on Figures 1A and 1B. Estimated to be 0*m* to 3*m* thick.
- Topsoil – organic silt 0.2*m* to 0.3*m* thick.
- Brown ash – very stiff silt 0.1*m* to 2.5*m* + thick.

- Puketoka Formation – interlayered sequence of medium dense pumiceous sand and stiff to hard clay. Sequence primarily alluvial with some sensitive white tephra ("distal ignimbrite") layers.

- Whangamarino Formation – interlayered sequence of very stiff to hard clay and silt, stiff to hard lignite with minor pumice sands. Lignite was identified at depths of 2*m* to 3*m* in some of the hand auger bores and is assumed to be present at deeper depths in some of the CPT profiles.

Note that combined thickness of the Puketoka and Whangamarino Formations is expected to be >40*m* deep based on the CPT investigations and local water bore logs.

6.3.1 Alluvial Flats

The CPT investigations on the alluvial flats area indicates the presence of soft peat and silt with some loose sands. At CPT04, the weak alluvial soils extend to 9*m* depth.

7. GROUNDWATER CONDITIONS

Simple standpipe piezometers were installed in six of the CPT holes to obtain an indication of groundwater levels. Groundwater depths were recorded as follows:

CPT	Date	Date	Notes
	07/10/16	11/10/16	
1	2.70*m*	2.40*m*	Higher ground
2	3.90*m*	3.80*m*	Higher ground
3	0.15*m*	0.50*m*	On alluvial flats
4	0.00*m*	-	No standpipe, groundwater on surface
5	0.00*m*	-	No standpipe, groundwater on surface
6	0.10*m*	0.30*m*	On alluvial flats
7	2.40*m*	2.50*m*	Higher ground

Note: At locations 3, 4, 5 and 6 natural groundwater level would follow Lake Waikare flood levels and be up to 1*m* above existing ground level if flood control pumps were switched off.

High groundwater levels in localised areas are also indicated by the presence of seepage zones in the swampy gully floors and in the lower portions of Landslide Ls5.

8. RESIDENTIAL SUBDIVISION DEVELOPMENT

8.1 General

If the land is to be subdivided for residential purposes, each site needs to provide a safe and stable building platform that is suitable for standard residential type buildings and services. Key geotechnical requirements include:

- Site stability
- Foundation conditions
- Earthworks
- Stormwater controls
- Other hazards, for example; flooding, faults, seismic effects, etc.

The following sections apply to the preliminary road layout and section plan prepared by Baxter Design on 6 October 2016 and excludes any residential development in the flood prone areas (described as alluvial flats).

8.2 Site Stability

Overall, the elevated ground on which the residential development is proposed is characterised by favourable stability. The favourable stability is due to low slope angles at <15º and strong ground conditions. Therefore, the site is suitable for residential development with minimal earthworks and reshaping. Large scale slope instability is restricted to Landslide Ls5. Development solutions for Ls5 include stabilisation with groundwater drainage and reworking or avoiding and leaving as a reserve area. The remaining landslides identified are of the scale which can be readily stabilised with subdivision earthworks. All landslide areas will need to be investigated further as part of detailed designs.

A number of steeper slopes at >20º are present in gully heads and along terrace edges. These steeper slopes are prone to soil creep movement and small scale landslides. For the steeper slopes, building set-backs are required to be defined. In this type of geology, set-backs of about 10*m* are typically applied. The set-backs need to be assessed with further investigations. For narrow gully heads, these areas can be drained and filled removing the slope constraint. These detailed geotechnical investigations would normally be undertaken prior to development of each stage.

Railway Cuttings A (2*m* to 6*m* high) and B (up to 20*m* high) were cut steeply at about 1(v):1(h) prior to the 1940's. Site inspections indicated no large slope instability associated with these areas due to the presence of strong ground conditions. Building set-backs will need to be defined for both cutting areas.

Slope instability areas requiring further investigations are outlined in Section 9.

8.3 Foundation Conditions

"Good ground" is defined by NZ3604 as ground that is suitable for residential foundations designed for an allowable bearing capacity of 100*kPa* (ultimate bearing capacity of 300*kPa*).

The higher ground will generally meet this definition due to the stiff to hard and medium dense to dense soil strengths associated with the brown ash, Puketoka and Whangamarino Formations.

The Whangamarino Formation clays are highly plastic and are expected to have moderate expansion potential with respect to seasonal moisture variability. The Puketoka Formation silts are expected to have low expansion potential.

Conventional foundations are anticipated for the proposed development with some specific requirements (additional reinforcing and embedment depth) where required to address potential soil expansion.

A small area of old railway fill is present on the western boundary (Figure 1A). This appears to be located within the existing rail reserve and does not affect the proposed development.

Road foundation conditions are expected to be reasonable with undercutting limited to the wet, swampy gullies. Road subgrades in the stiff clay soils or silty sands are expected to lie in the CBR 3 to 6 range.

8.4 Watercourses, Gullies and Stormwater Controls

Infilling of gullies and minor reshaping is typically undertaken for residential subdivisions. It is now becoming more common and better practice for stream health to retain the springs, seeps and gullies and where possible, enhance the condition of the watercourses with planting and reinstatement of meanders. The Baxter site development plan indicates this option is being proposed in some areas.

This will require careful mapping of gullies and seeps and definition of appropriate setback distances. Intensive subdivision will require a piped stormwater outlet for each lot.

In other areas, undercutting of weak soils, groundwater drainage and infilling of gully areas will be required.

8.5 Earthworks

Intensive residential subdivision inevitably includes moderate to large scale earthworks. These include topsoil stripping, reshaping, filling low points and removal or treatment of any unstable areas.

The brown ash materials are generally reworked with only limited drying. The pumiceous sands will provide good earthworks material. The pumiceous silts and clays could be problematic if sensitive tephra (distal ignimbrite) layers are present. These tephra layers have high water contents and typically break down to a very weak soil on reworking. The tephra layers should be avoided for earthworks and if encountered in excavation areas, should be cut to waste.

To investigate the presence of the tephra layers and assess the suitability of site soils, earthworks testing is proposed as part of the Stage 2 due diligence investigations outlined in Section 9.

A key constraint identified on this site is the shallow depth of the lignite associated with the Whangamarino Formation. Foundations may be founded on or in the lignite but earthworks should avoid disturbing and reworking the lignite as it breaks down to a weak organic material with a low pH.

More detailed investigations will be required in all earthworks areas but a rework depth of 1*m to* 2*m* is considered feasible over the majority of the site.

8.6 Other Natural Hazards

8.6.1 Flooding

The flood level is defined by the 100-year flood line on the Candor 3 "Flood Line" which is presented on Figures 1A and 1B. All residential sections are to have a minimum floor level of at least 0.5*m* above the 100 year flood level. No filling over flood prone areas is anticipated, other than possible access roads.

8.6.2 Climate Change

The Regional Council is likely to require consideration of climate change effects as these relate to the Waikato River Flood Levels. An additional allowance of 1*m* to 2*m* may be required in all areas affected by the Waikato River Flood Levels.

8.6.3 Seismic Hazard and Subsoil Category

The site is in a relatively low seismicity area.

The NZ Earthquake Loading Standard (AS/NZS 1170.5) defines the hazard factor at 0.15. Ground conditions on the higher ground are interpreted as subsoil Category C for structural design purposes.

Access bridges across the low-lying ground (if required) will require design for subsoil Category D.

8.6.4 Active Faults

There are no mapped active faults in the vicinity of the site.

The nearest confirmed active faults are the Wairoa South Fault at a distance of 25*km* and the Kerepehi Fault at a distance of 35*km*. Neither is expected to affect the design of the residential housing but they should be considered for any major structures such as bridges (if required).

8.6.5 Liquefaction

Liquefaction is generally confined to Holocene loose saturated sands and silts. Therefore, the low-lying alluvial flats are likely to be prone to liquefaction. No housing development is proposed on the alluvial flats.

On the elevated ground, the Whangamarino Formation is not susceptible to liquefaction due to the overall clay rich nature and moderate strength of the interlayered sand layers. The overlying Puketoka Formation pumiceous sands and silts are considered to have a low liquefaction potential. No evidence of widespread liquefaction was observed (block slides and lateral spread type slope instability) in either the Whangamarino or Puketoka Formation soils during the site walkover.

To determine the liquefaction potential of the Puketoka Formation soils, it is recommended that three geotechnical investigation bores with soil testing be carried out as part of the Stage 2 due diligence investigations. The bores are required to retrieve samples of the various soil layers and to allow calibration of the CPT data below the 3*m* hand auger bore limits.

Overall, the liquefaction potential under the proposed housing area is considered to be low. Further investigations are required to confirm liquefaction potential for the Puketoka Formation areas.

8.7 Man-Made Hazards

Offal pits, silage pits and old farm drains can cause problems but this is more likely on rural/residential land where minimal earthworks are undertaken.

Stripping of topsoil for roads and services and when forming residential platforms, should include an inspection of the exposed subsoil to identify any areas of man-made disturbance. Pits will need to be excavated and reworked with well compacted soil.

9. FURTHER INVESTIGATIONS

The following further geotechnical investigations are recommended:

A. Stage 2 Due Diligence Investigations

i. Earthworks
- Six test pits spread over the site in potential borrow areas
- Sampling in-situ soil moisture contents at 0.5*m* depth intervals
- Representative bulk samples (two samples per pit)
- Laboratory testing for standard compaction curves and moisture contents
- Assessment of soil suitability for earthworks

ii. Liquefaction
- Three geotechnical machine drilled bores to 30*m* depth within Puketoka geology
- Piezometer construction
- Soil sampling
- Grain size analysis
- CPT correlation and analysis

B. Geotechnical Investigations for Detailed Design

- Investigations prior to specific stages of subdivision development
- Investigations required for (Figures 1A and 1B):
  - Landslides Ls1 to Ls6
  - Old river erosion channel (to check for presence of weak soils)
  - Steep slope areas (>20º)
  - General investigations for earthworks areas and to confirm house and road foundation conditions
  - Specific investigations for culvert and/or bridge structures

10. CONCLUSIONS AND RECOMMENDATIONS

The higher ground is located on gently to moderately sloping relief on relatively old geological foundations. Areas of active instability are restricted to well-defined gully zones and the Ls5 area. These can be remedied in reworking, drainage or avoidance by placing in reserves.

Earthworks on the scale of 1*m* to 2*m* are anticipated for intensive residential development. Earthworks in the clay soils will be restricted to summer months. Some of the silts may prove to be problematic and further investigations aimed at identifying compaction characteristics are recommended.

The higher ground is expected to be a very low liquefaction risk but this potential constraint does need to be thoroughly addressed.

The elevated ground is considered to be suitable for residential development.

The low-lying alluvial flats are prone to flooding, liquefaction and settlement. No residential development is proposed or recommended for these areas.

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27 October 2016

This report has been prepared solely for the benefit of you as our client with respect to the particular brief given to us, and data or opinions contained in it may not be used in other contexts or for any other purpose without our prior review and agreement.

11. REFERENCES

Kear, D. & Schofield, J.C. (1968) *Te Kauwhata geology*. [Sheet N52, 1:63,360]. Wellington, New Zealand: Department of Scientific and Industrial Research.

N

HA204
HA203
HA202
CPT101
CPT103
CPT102
HA201
3(s)
4
FLOOD LINE
MA5
P4
HA2
MA4
2(s)
HA1
farm dam
5
MA6
HA3
6(s)
HA4
1(s)
MA7
MA3
MA8
HA5
P3
7(s)
HA6
P2
MA2
GENTLY ROLLING GROUND
MA1
P1
LAKE WAIKARE
8
9
10
ALLUVIAL FLATS
Pt
Pt
92 Scott Road
21
RAILWAY CUTTING A
2m to 6m cut slopes
SCOTT ROAD SUBDIVISION
20
19
LS5
12
FLAT TO GENTLY ROLLING
11
old river channel
13
GENTLY ROLLING
farm dam
22
18
SIDE SLOPES <15°
old farm tip
14
17
LS4
farm dam
GENTLY ROLLING SIDE SLOPES <15°
22°
NOT FOR CONSTRUCTION

LEGEND

Geology

- swampy ground
- 28° slope angles
- steep ground
- creep
- headscarp / debris — landslide
- old fill
- Pt × — Puketoka Formation outcrop
- Hn × — Hinuera Formation outcrop
- Flood line from Candor 3 (2016)

LEGEND

Investigations

Maunsell (2008)
- MA5 - Machine Borehole
- HA3 - Hand Auguer
- P4 - Hand Auger and Percolation

Te Kauwhata Bypass (2009)
- CPT102 - CPT
- HA201 - Hand Auger

20 CPT's (Oct 2016)
(s) Standpipe

Note: Previous investigation locations and contours are approximate.

0m 50 100 150 200 250m
Scale 1:5000

4036-AHN-Base Plan-Fig1-A

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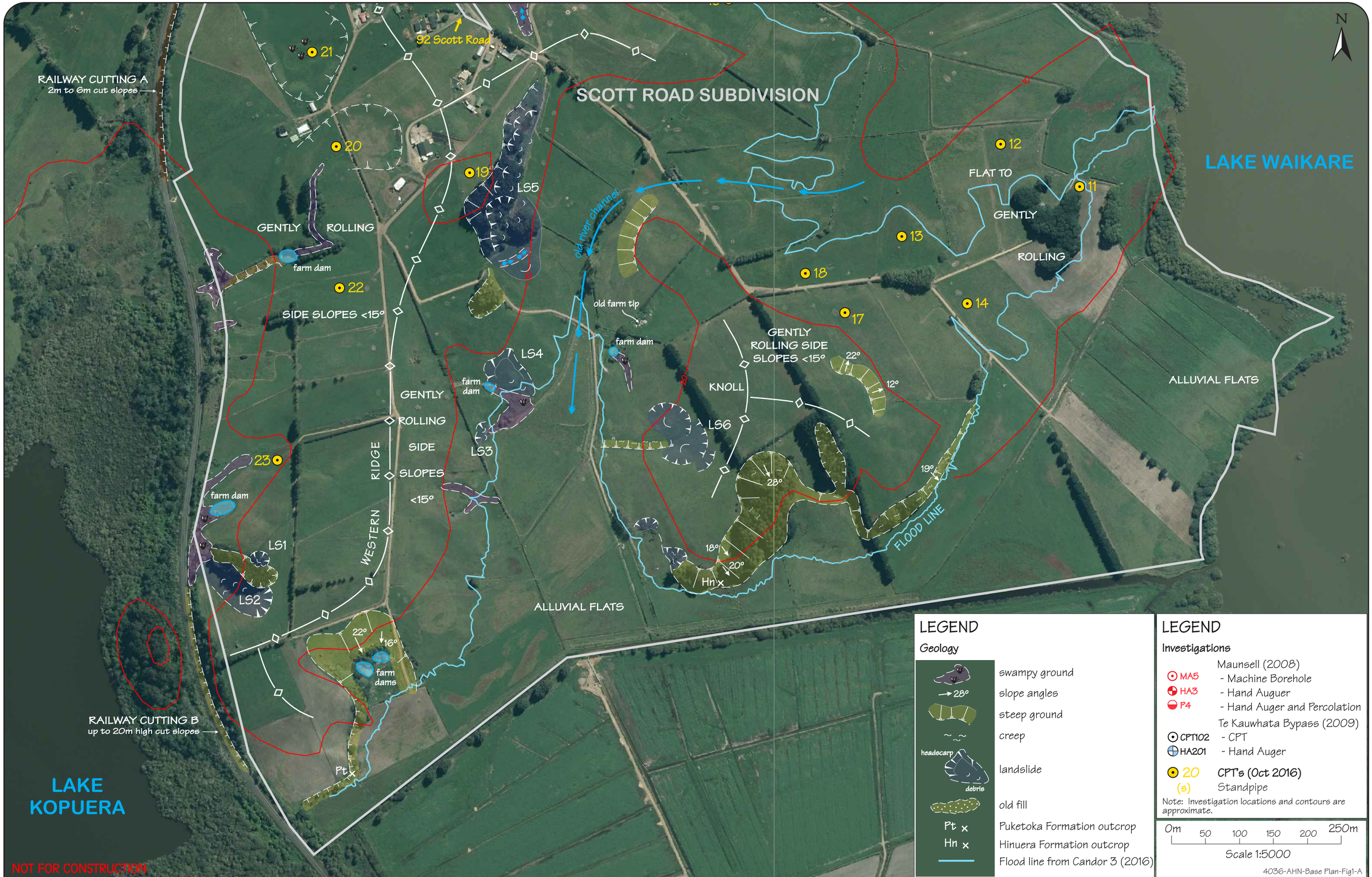
SCOTT ROAD, TE KAUWHATA
Winton Partners

Site Plan - North

DRAWING NO.: FIG. 1A

DRAWN:	A.N	CHECKED:	A.N	SCALE (A3):	1:5000
TRACED:	C.M	DATE:	26/10/16	VERSION:	A
				REF:	4036



LEGEND

Geology

- swampy ground
- 28° slope angles
- steep ground
- creep
- headscarp / debris — landslide
- old fill
- Pt × Puketoka Formation outcrop
- Hn × Hinuera Formation outcrop
- Flood line from Candor 3 (2016)

LEGEND

Investigations

Maunsell (2008)
- MA5 - Machine Borehole
- HA3 - Hand Auger
- P4 - Hand Auger and Percolation

Te Kauwhata Bypass (2009)
- CPT102 - CPT
- HA201 - Hand Auger

20 CPT's (Oct 2016)
(s) Standpipe

Note: Investigation locations and contours are approximate.

0m 50 100 150 200 250m

Scale 1:5000

4036-AHN-Base Plan-Fig1-A

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SCOTT ROAD, TE KAUWHATA

Winton Partners

Site Plan - South

DRAWING NO.: FIG. 1B

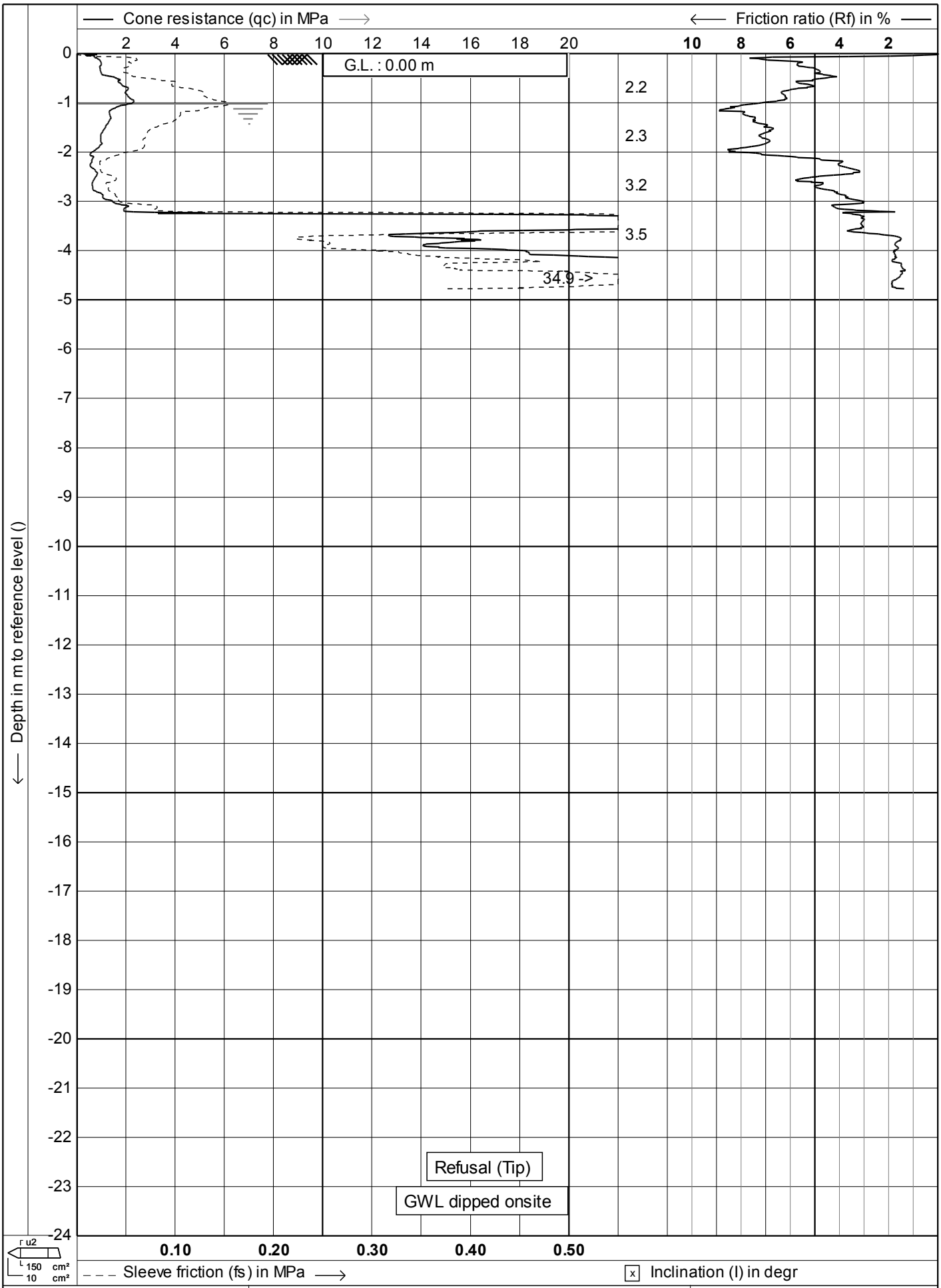
DRAWN:	A.N	CHECKED:	A.N	SCALE (A3):	VERSION: A
TRACED:	C.M	DATE:	26/10/16	1:5000	REF: 4036

APPENDIX A

2016 SITE INVESTIGATION DATA

CPT Profiles and Hand Auger Logs

Note that CPT ad HA numbering refers to the same locations



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

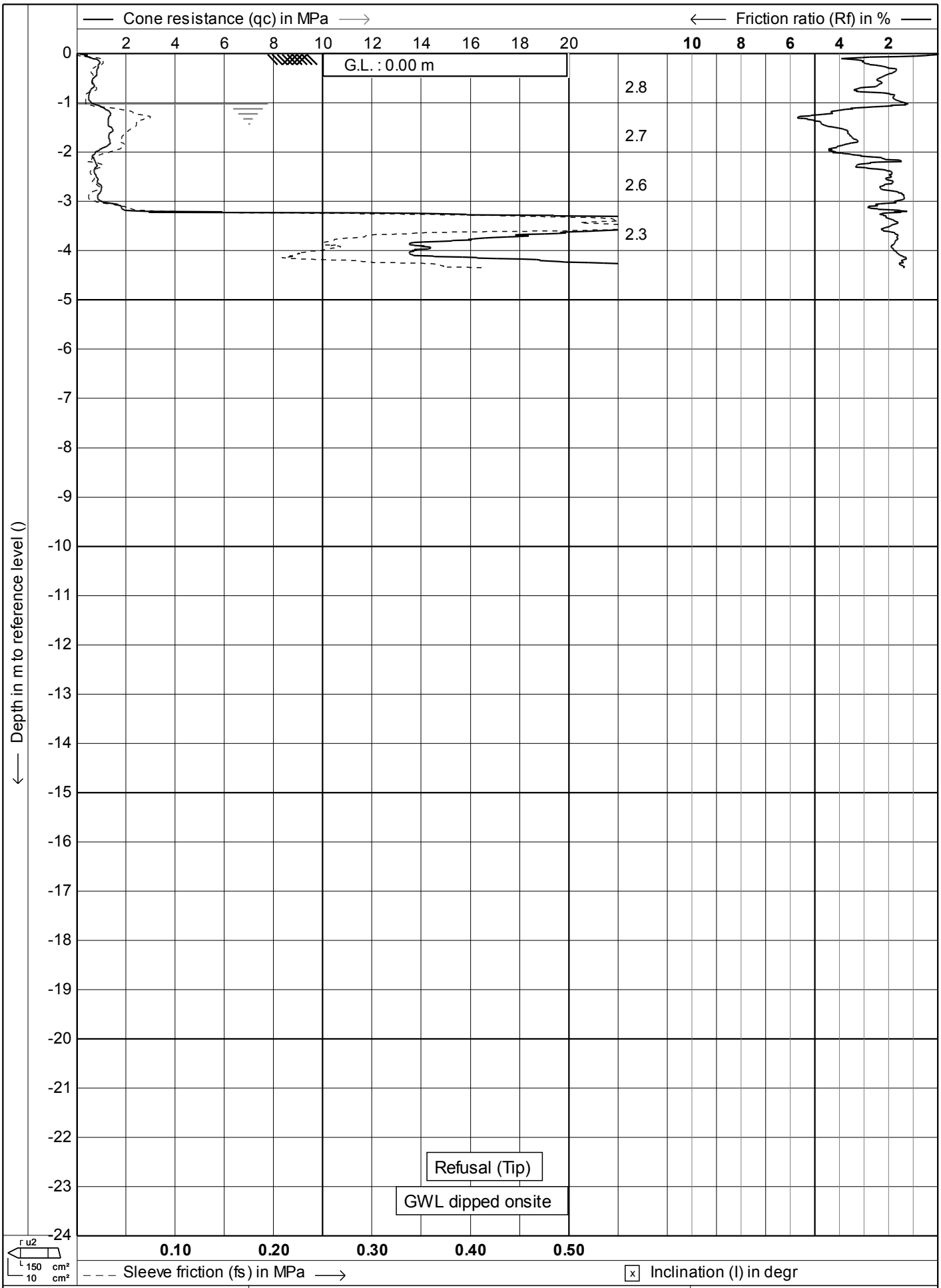
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **01**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

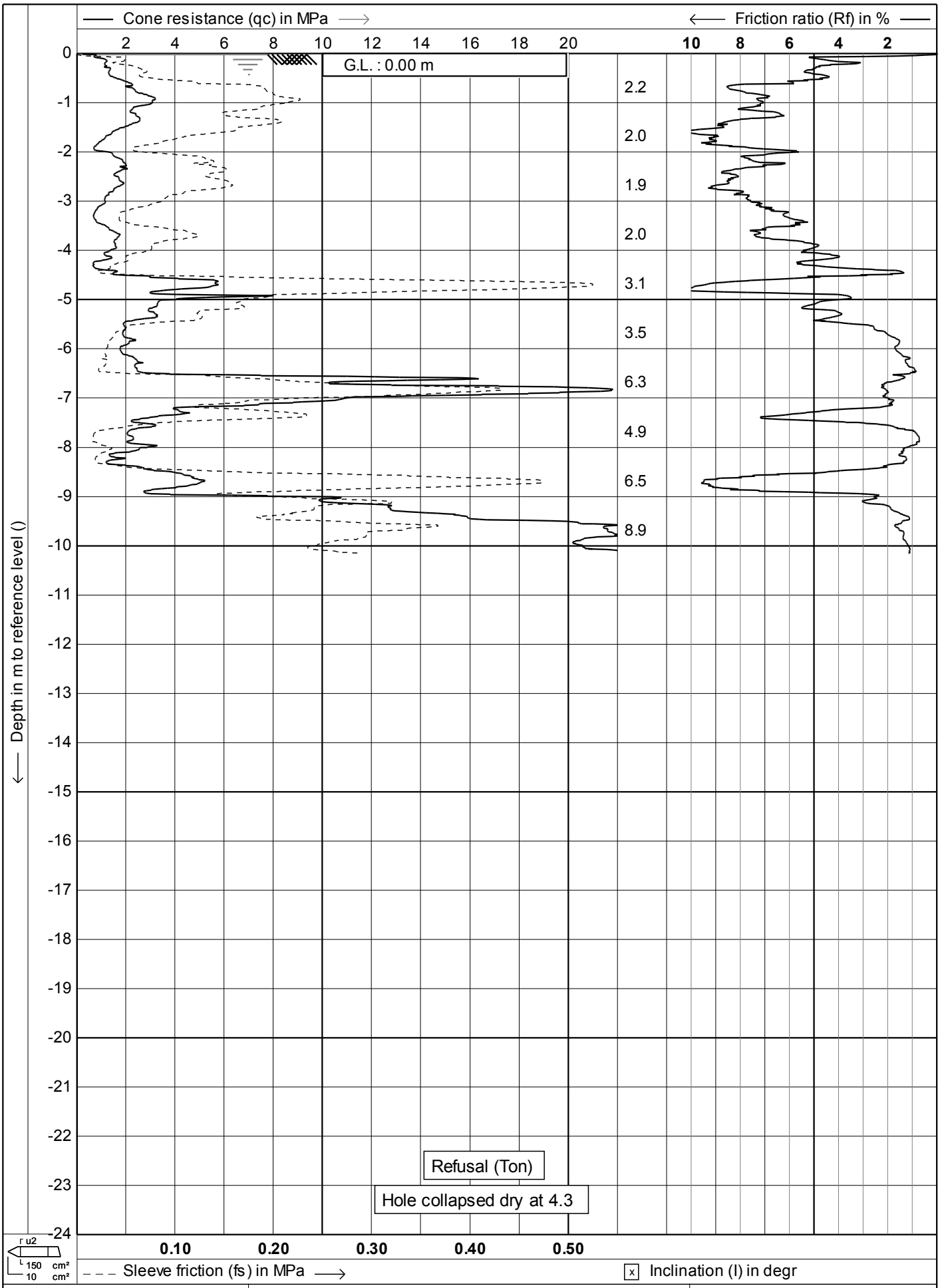
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **01a**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

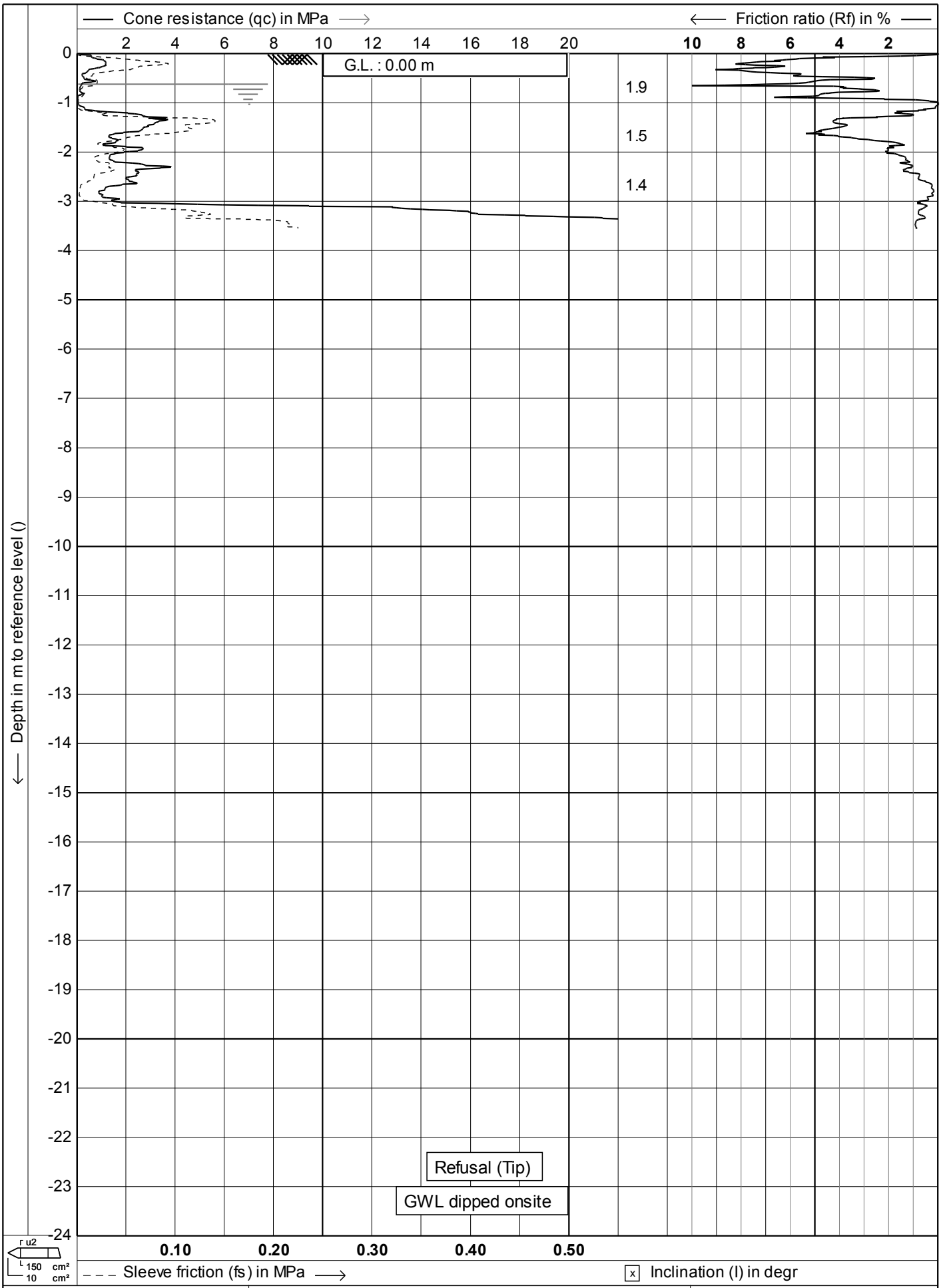
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **02**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

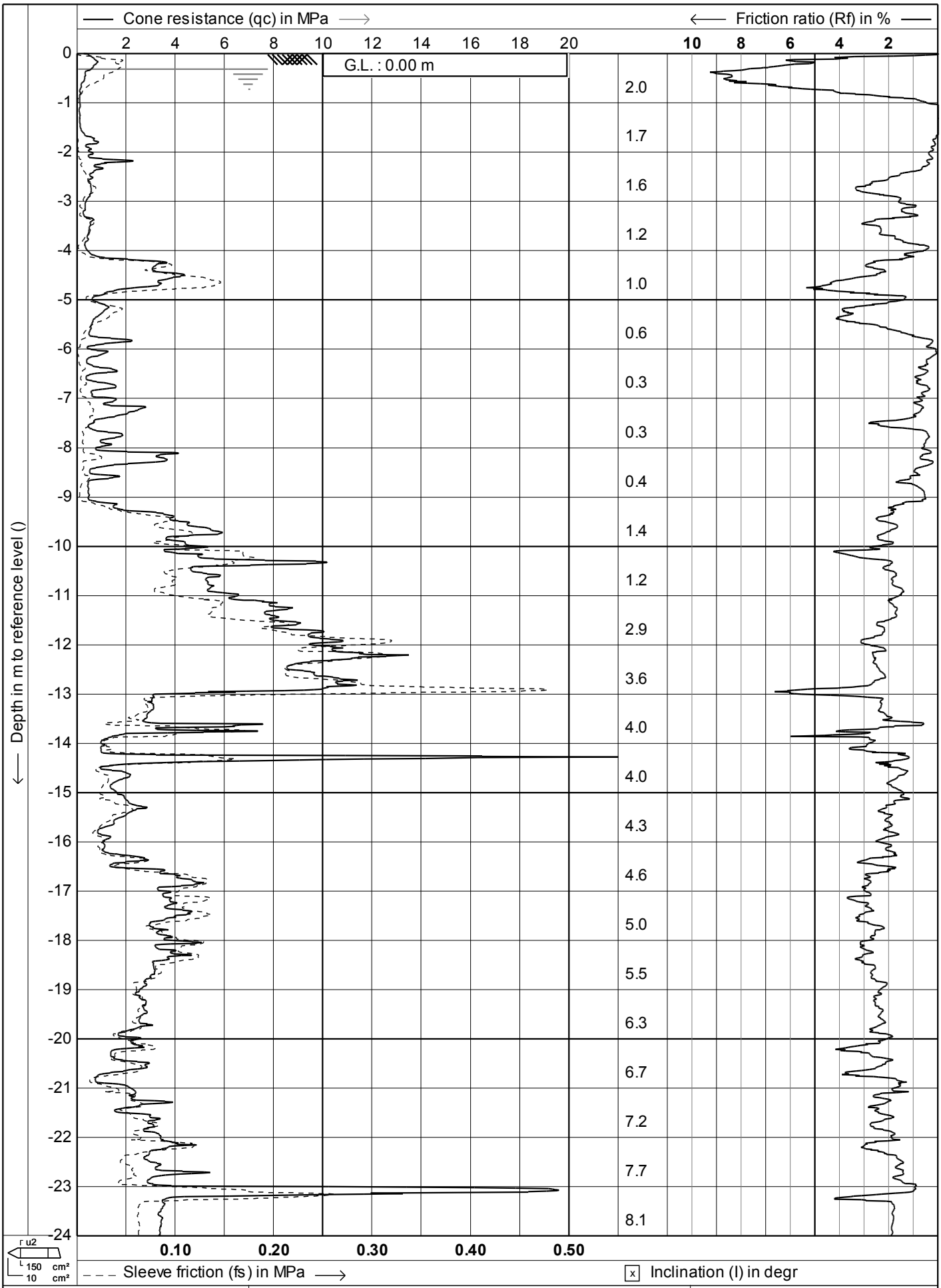
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **03**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

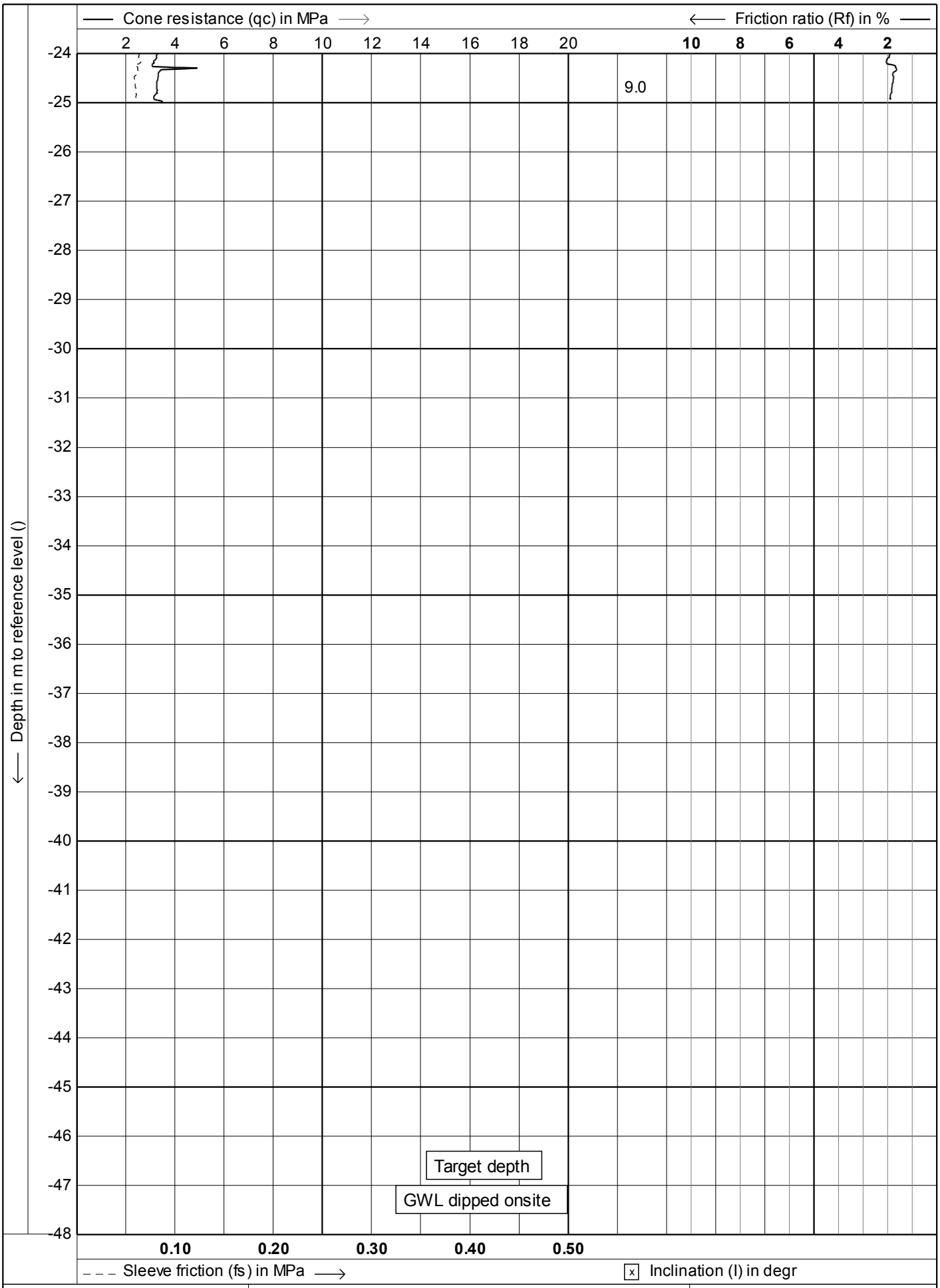
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **04**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

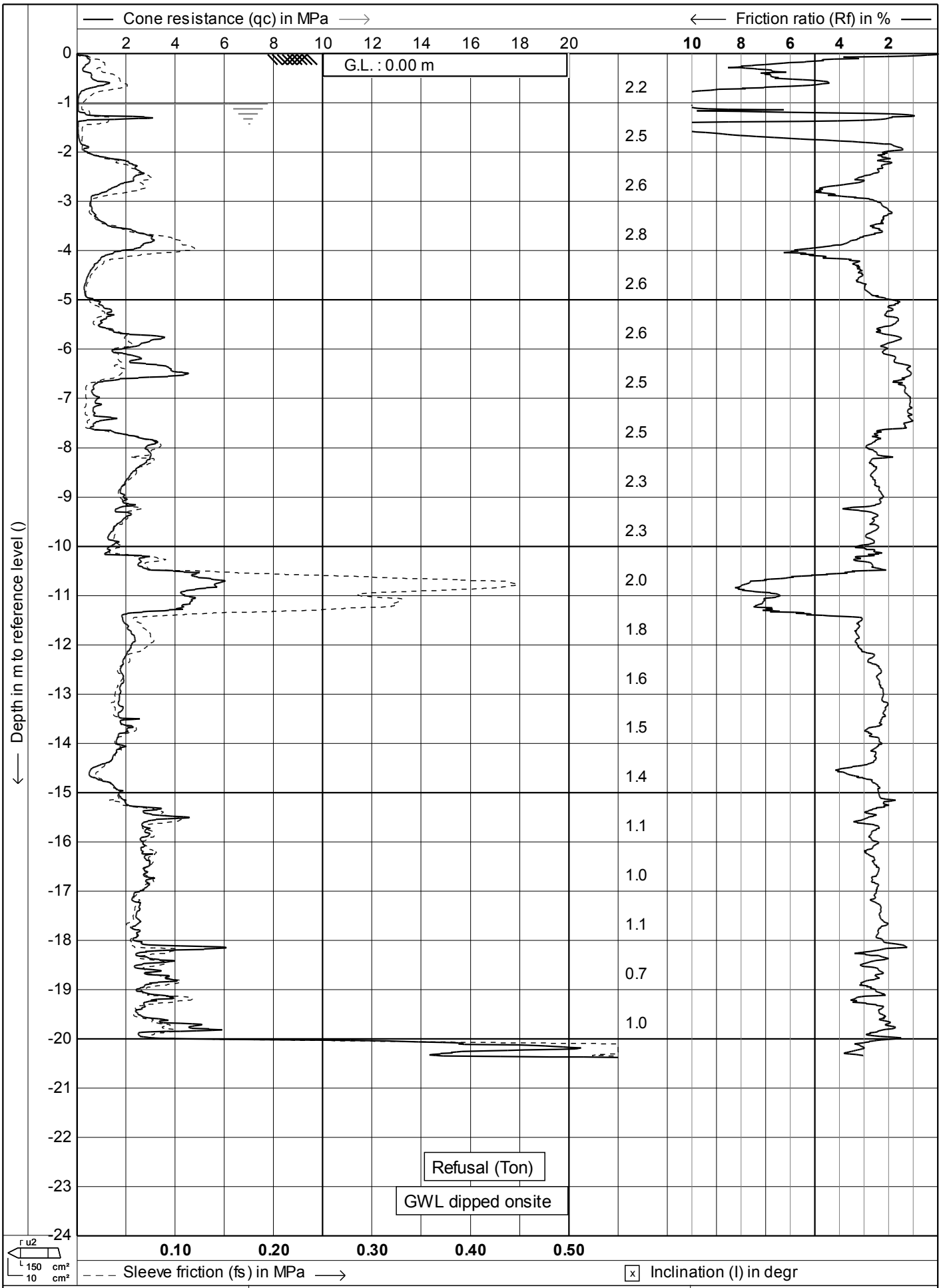
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **04**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

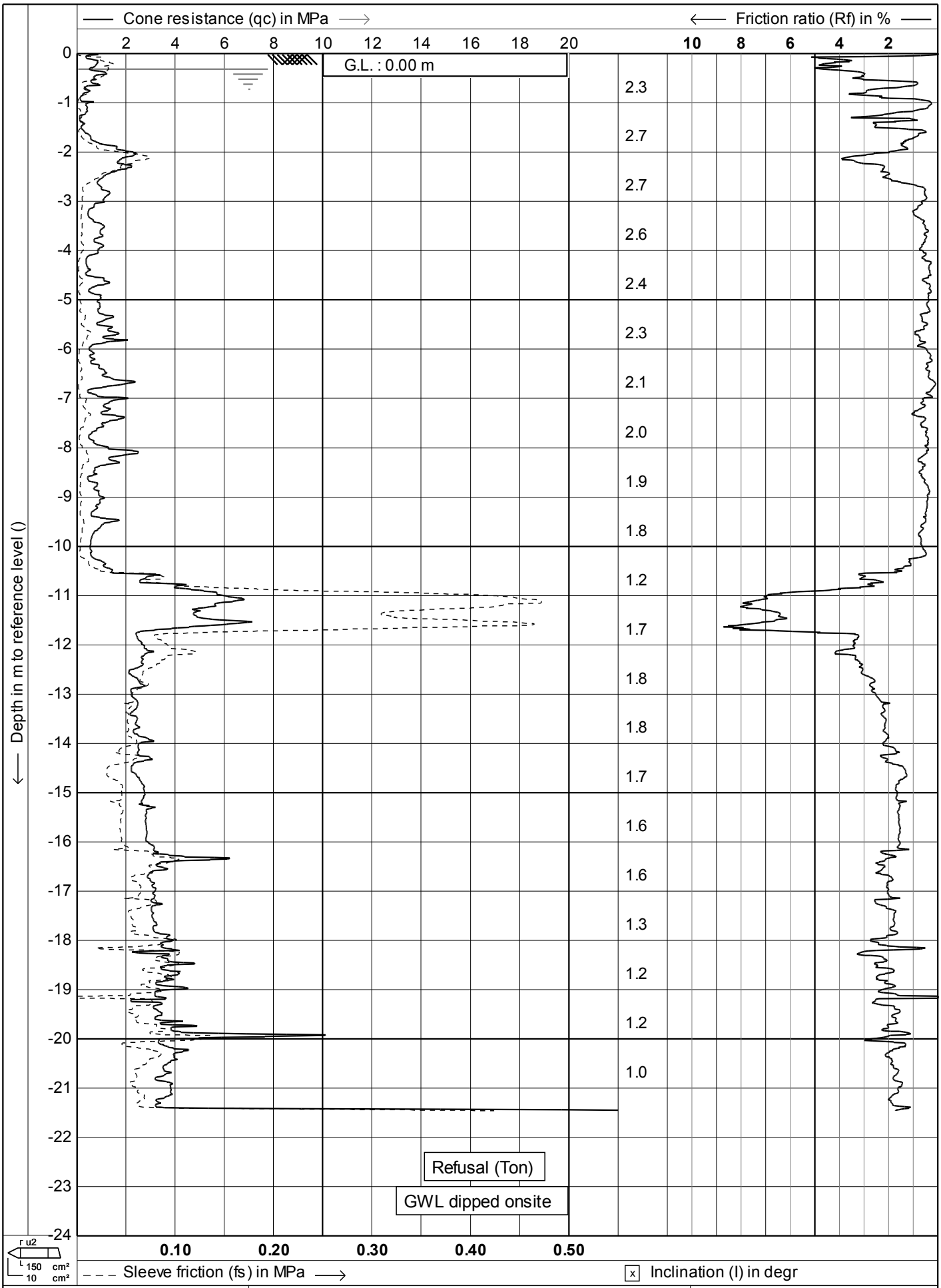
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **05**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

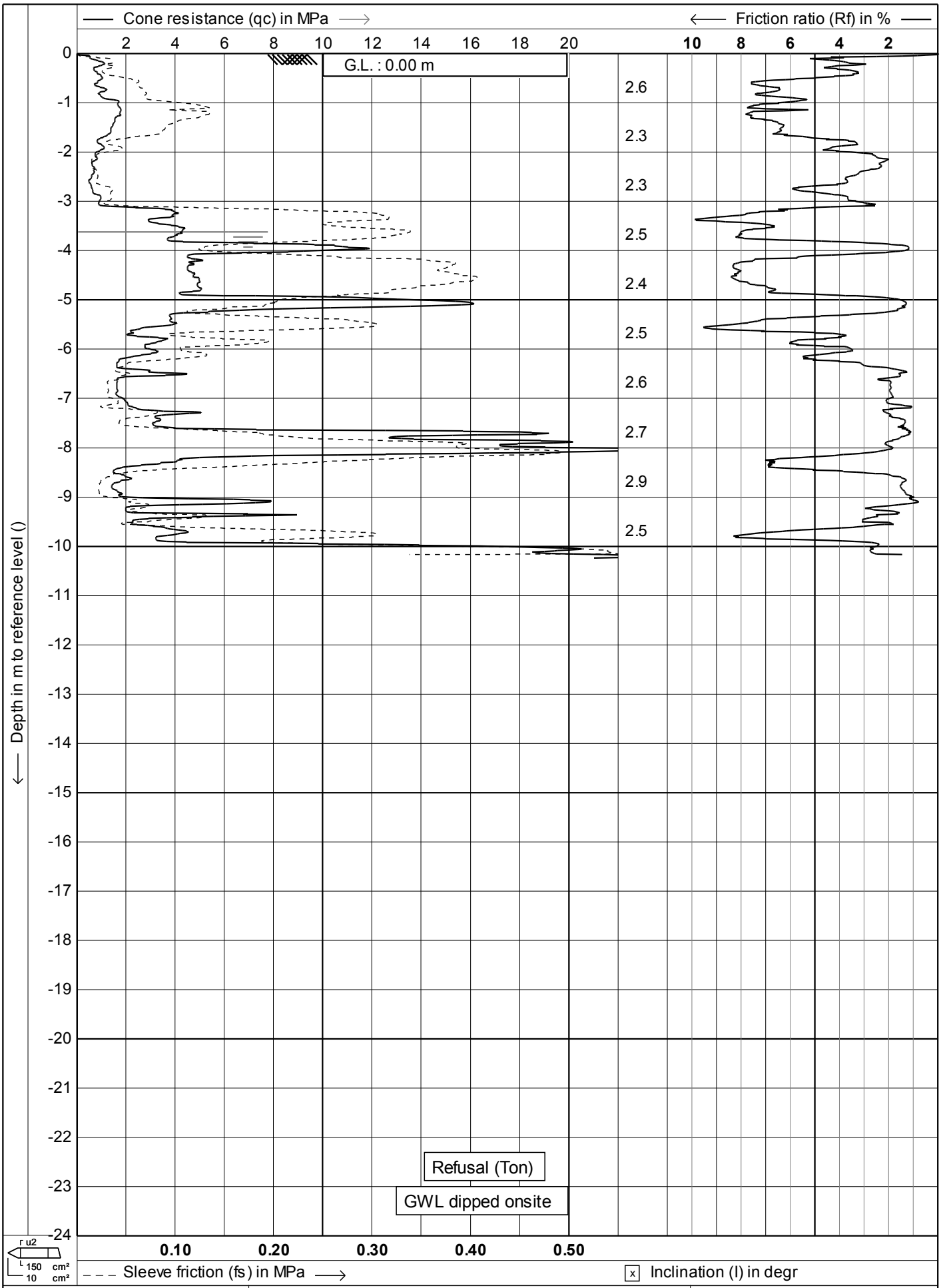
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **06**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **6-10-2016**

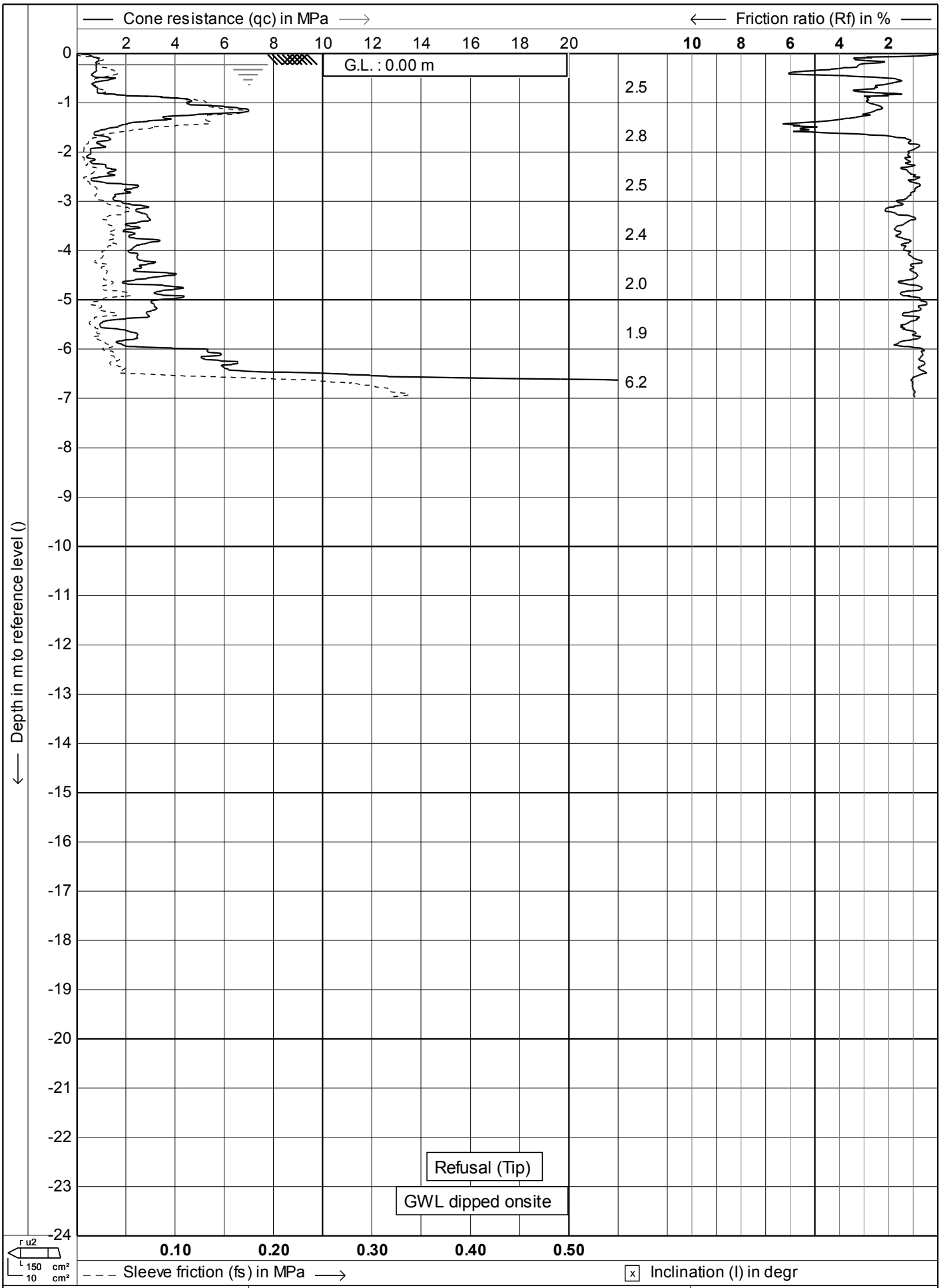
Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **07**

1/14

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

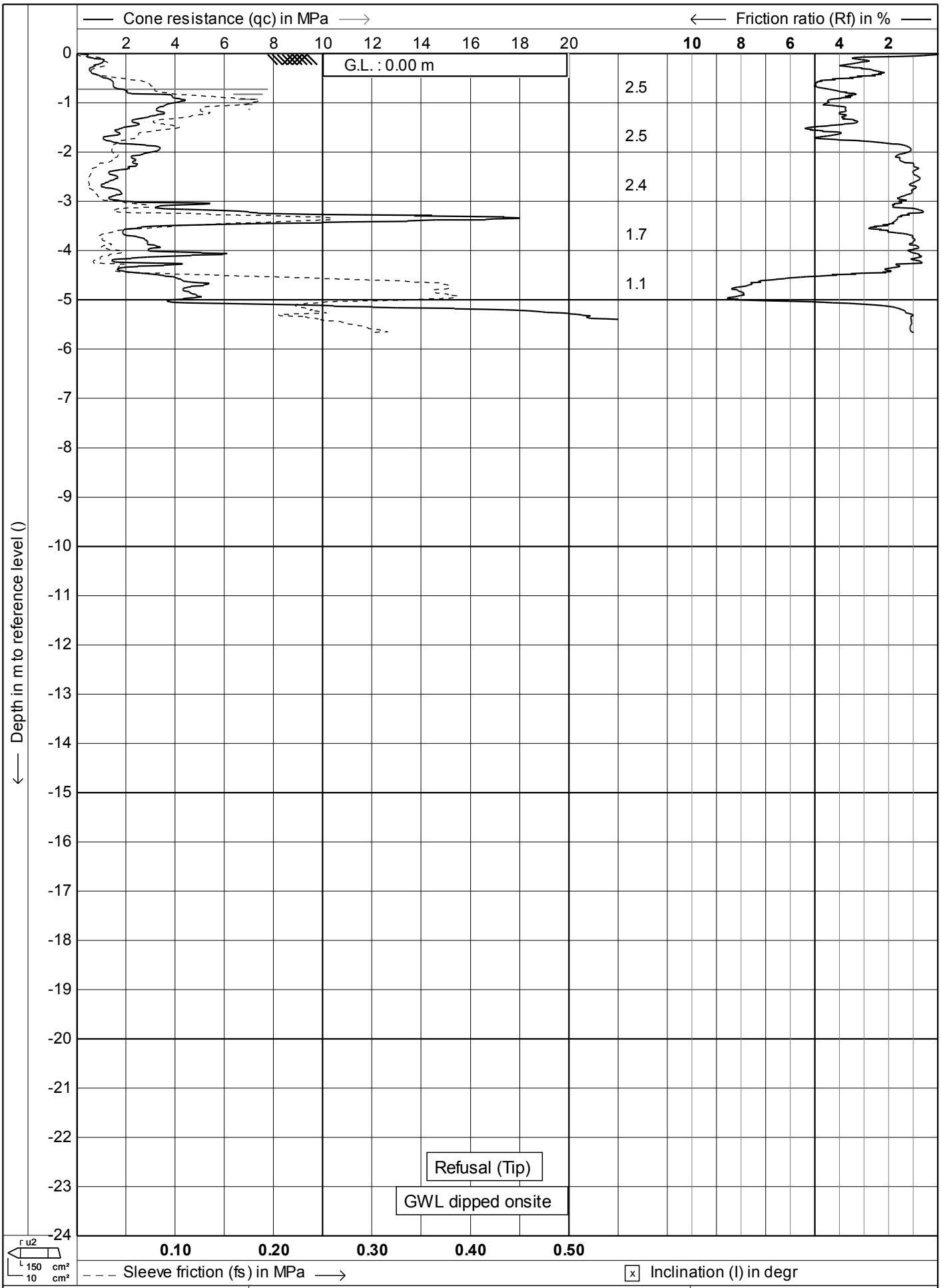
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **08**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

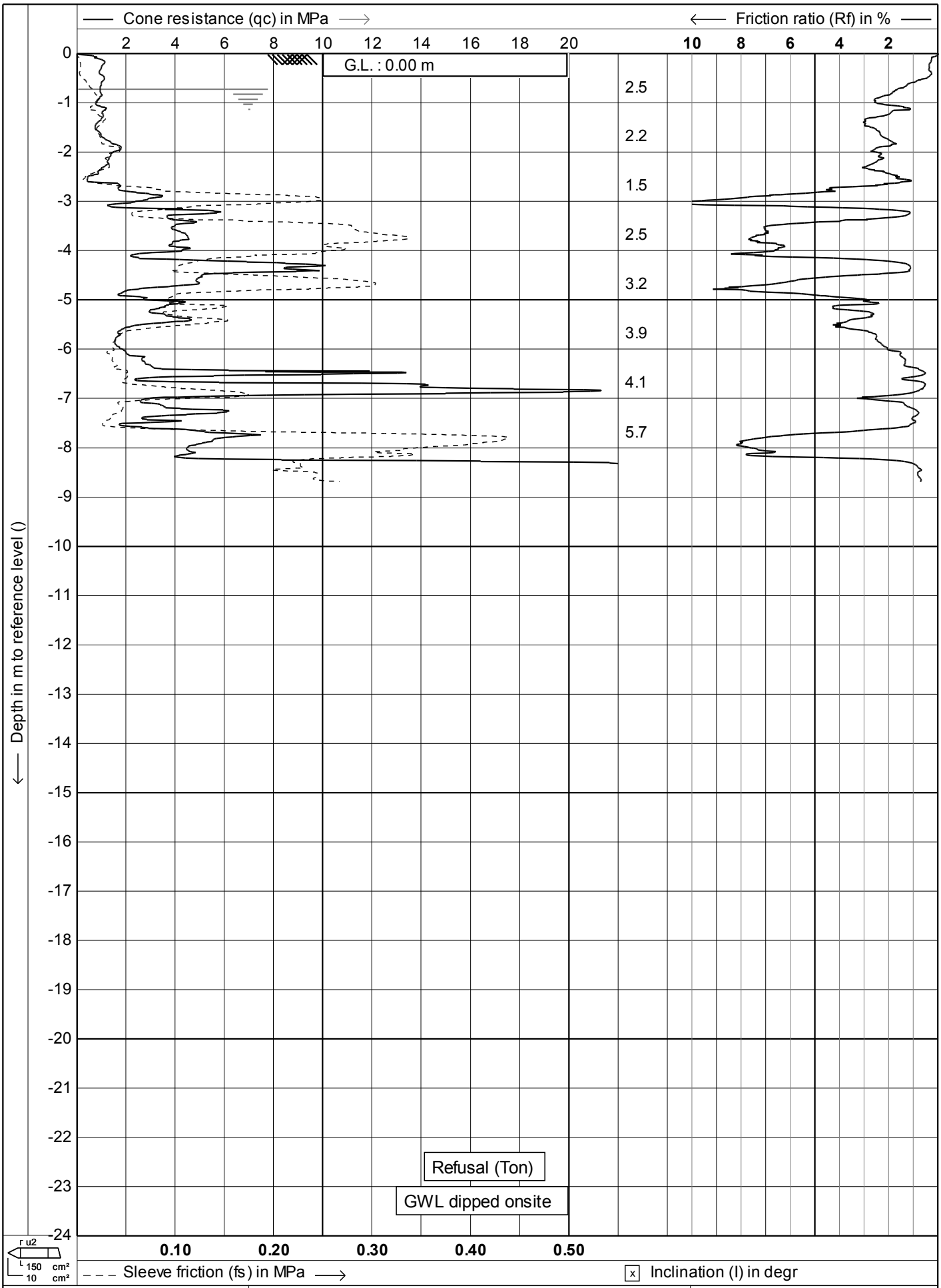
Date : **6-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **09**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **6-10-2016**

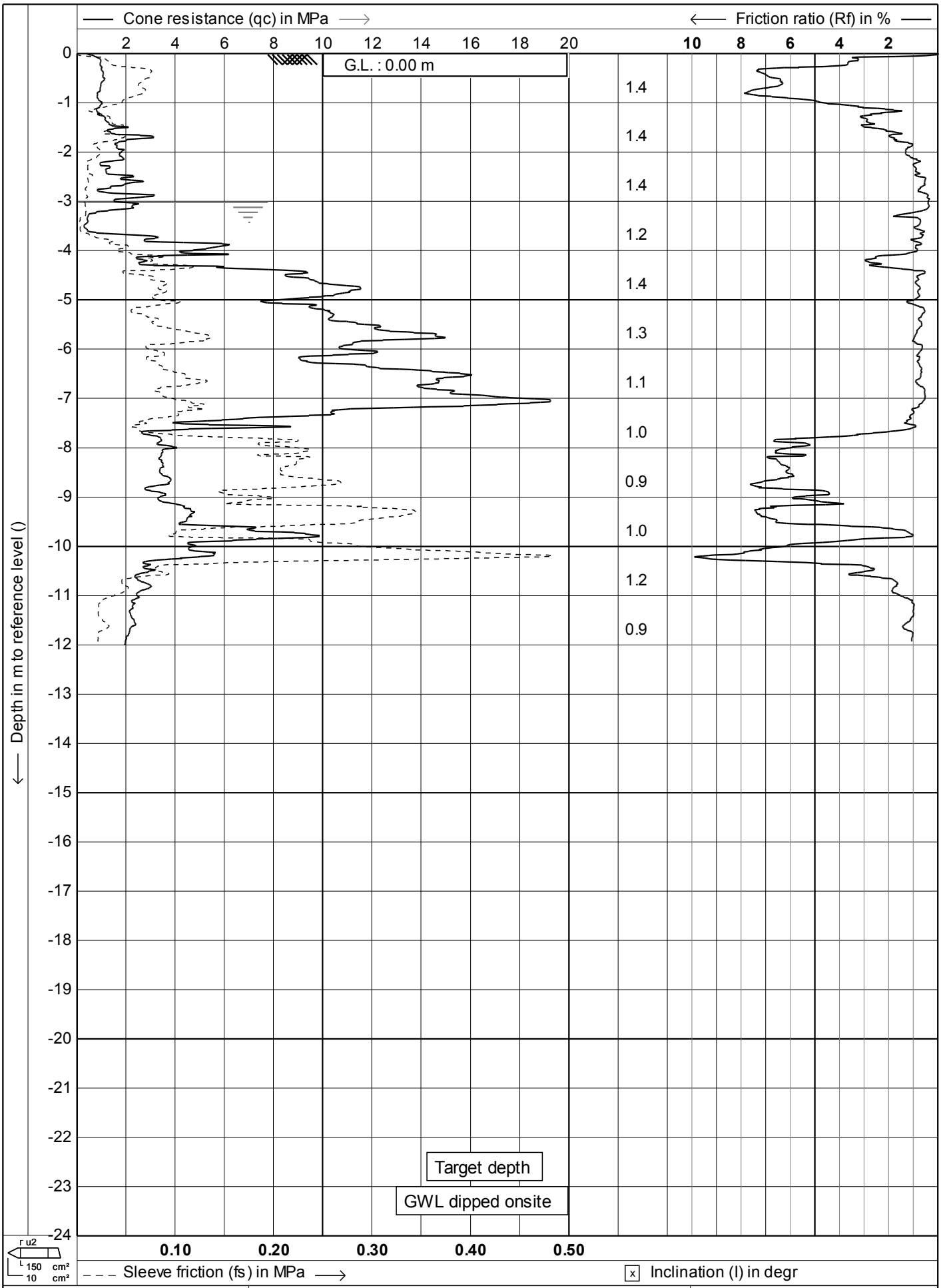
Cone no. : **C10CFIIP.C14432**

Project no. : **02ET01**

CPT no. : **10**

1/14

CPTask V1.33



Test according A.S.T.M. Standard D 5778-12

PERRY GEOTECH

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

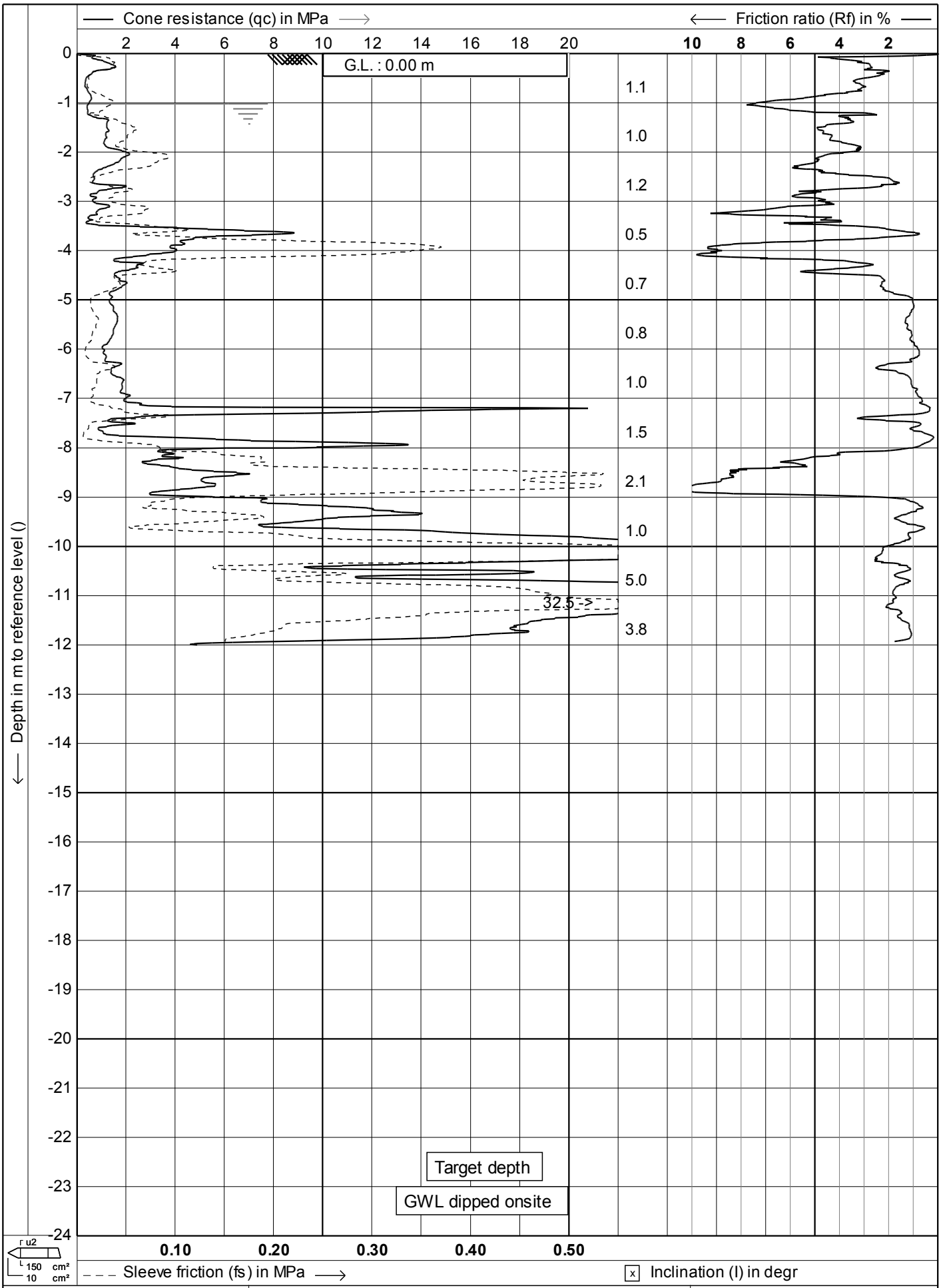
Date : **7-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

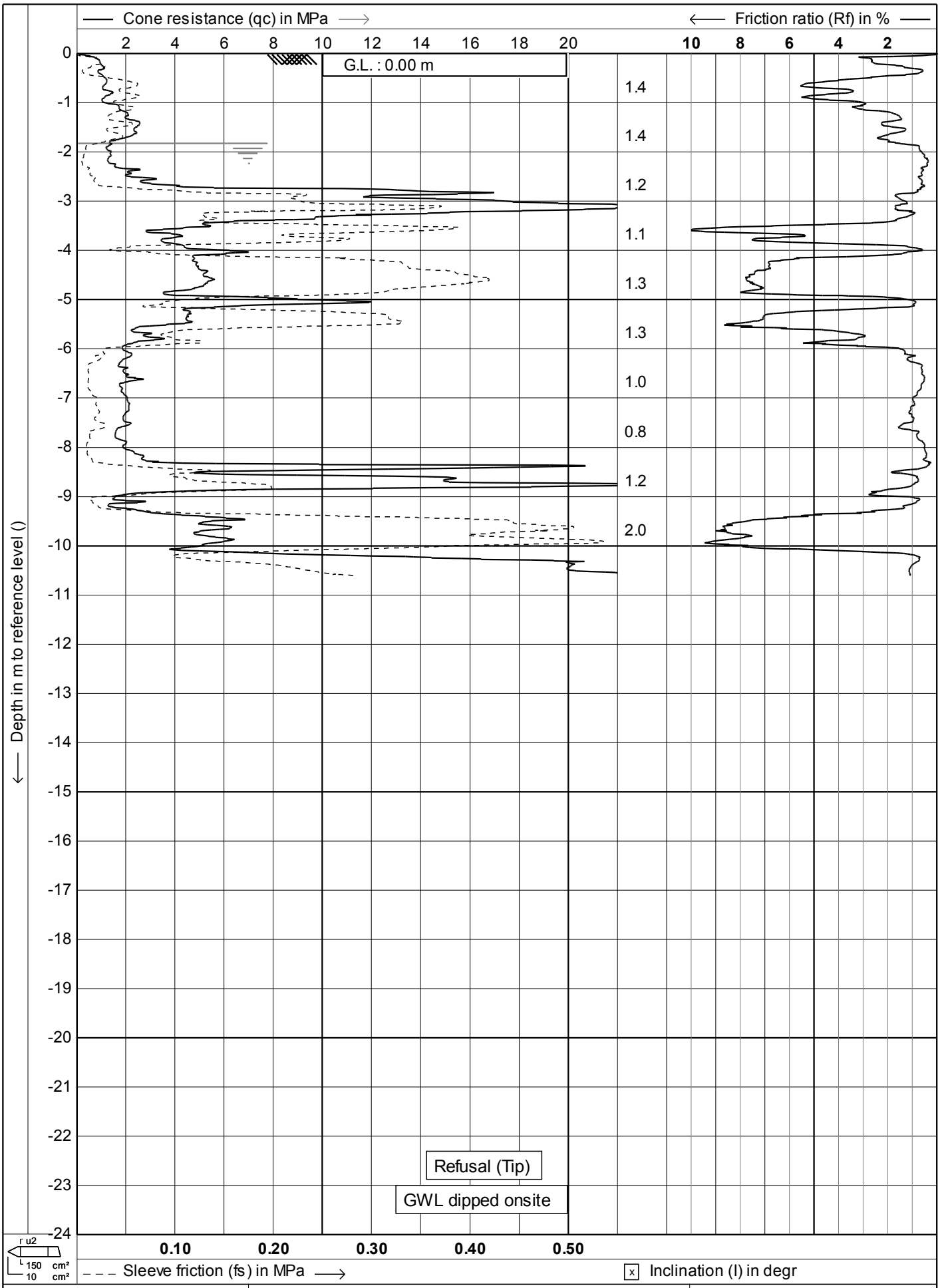
CPT no. : **11**

CPTask V1.33



PERRY GEOTECH	Test according A.S.T.M. Standard D 5778-12	Date : **7-10-2016**
	Project : **Site Investigation**	Cone no. : **C10CFIIP.C14432**
	Location: **94 Scott rd - Te Kauwhata**	Project no. : **02ET02**
		CPT no. : **12** 1/14

CPTask V1.33



Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

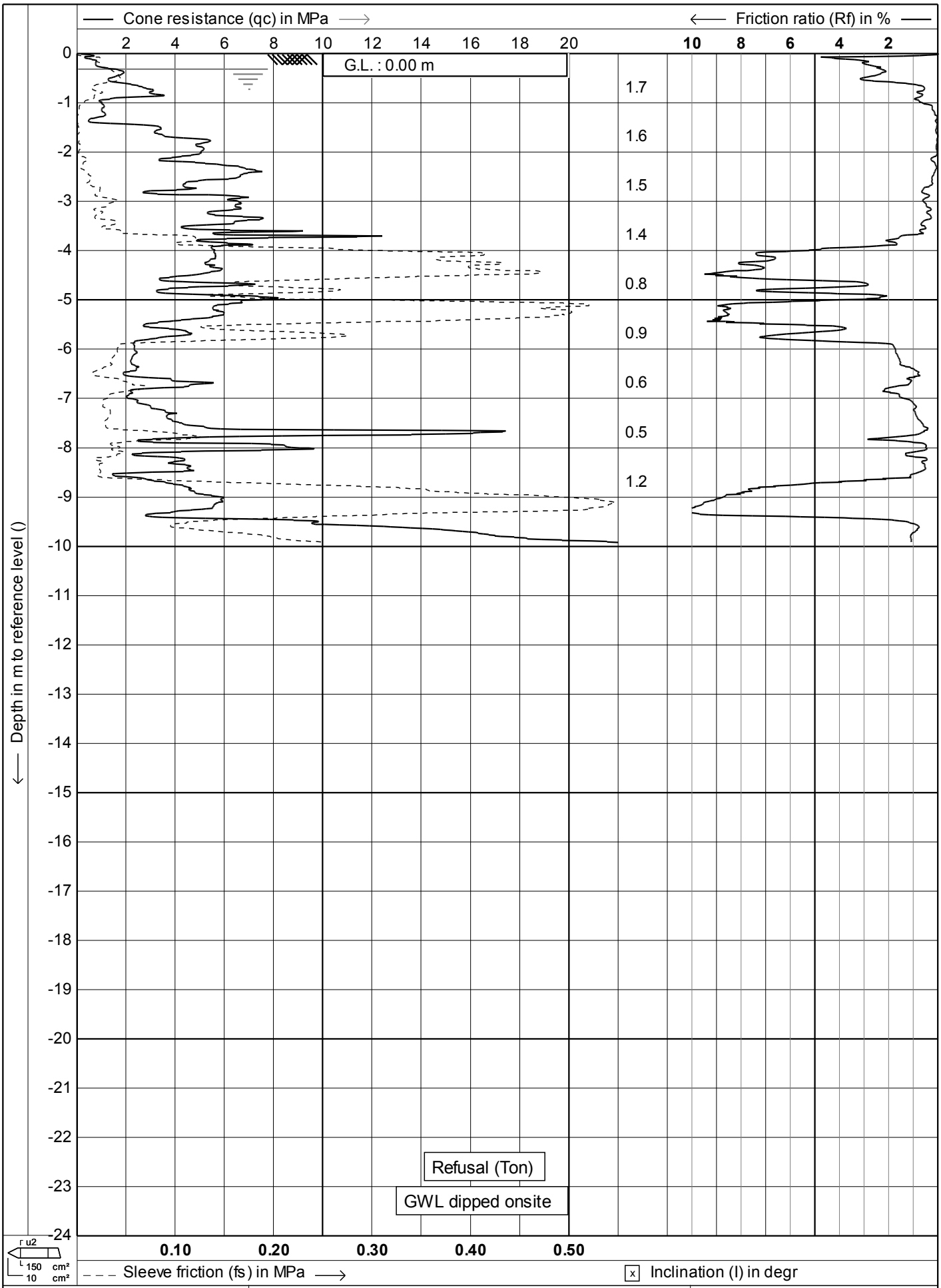
Date : **7-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **13**

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

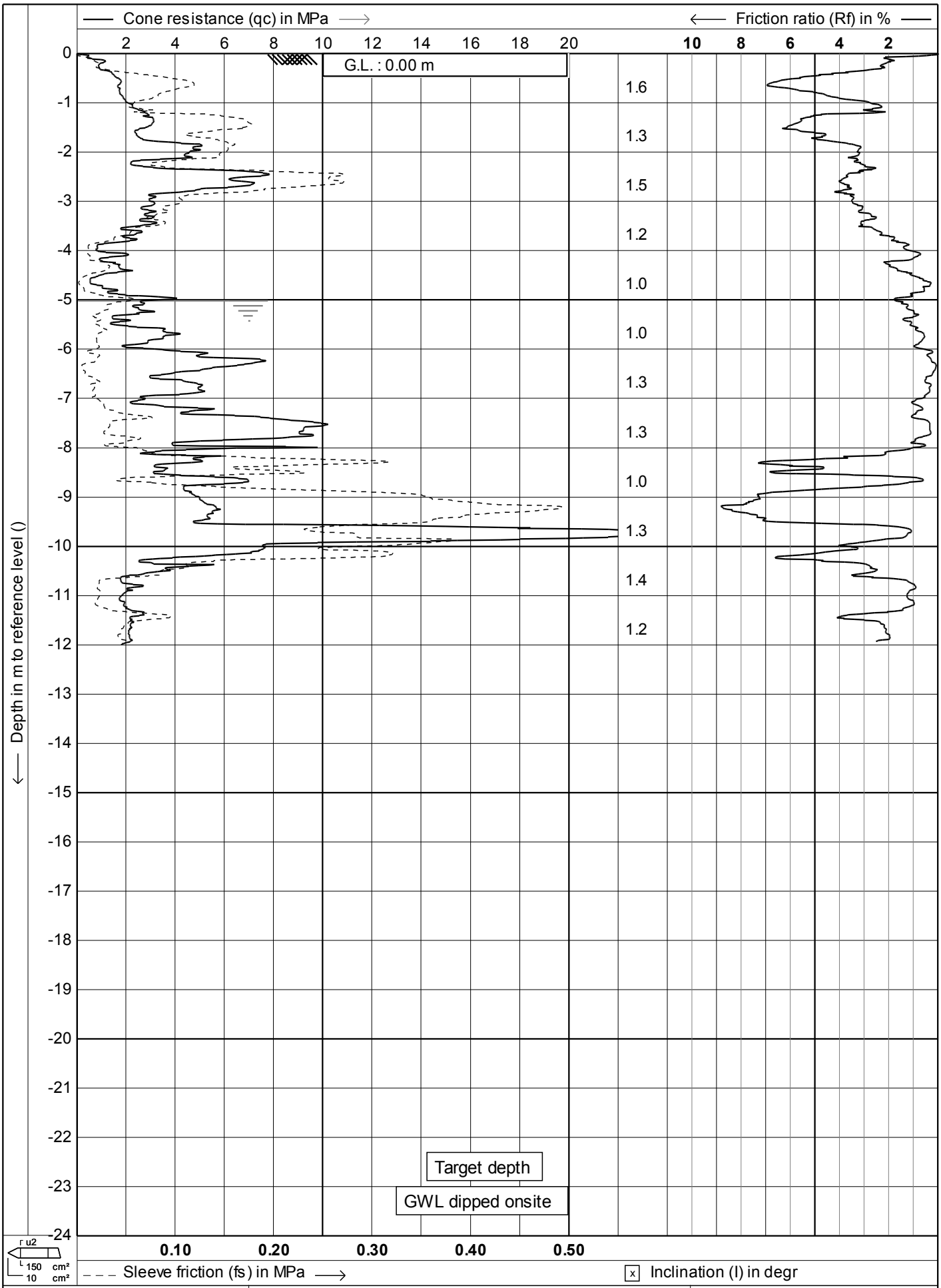
Date : **7-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **14** **1/14**

CPTask V1.33



Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **7-10-2016**

Cone no. : **C10CFIIP.C14432**

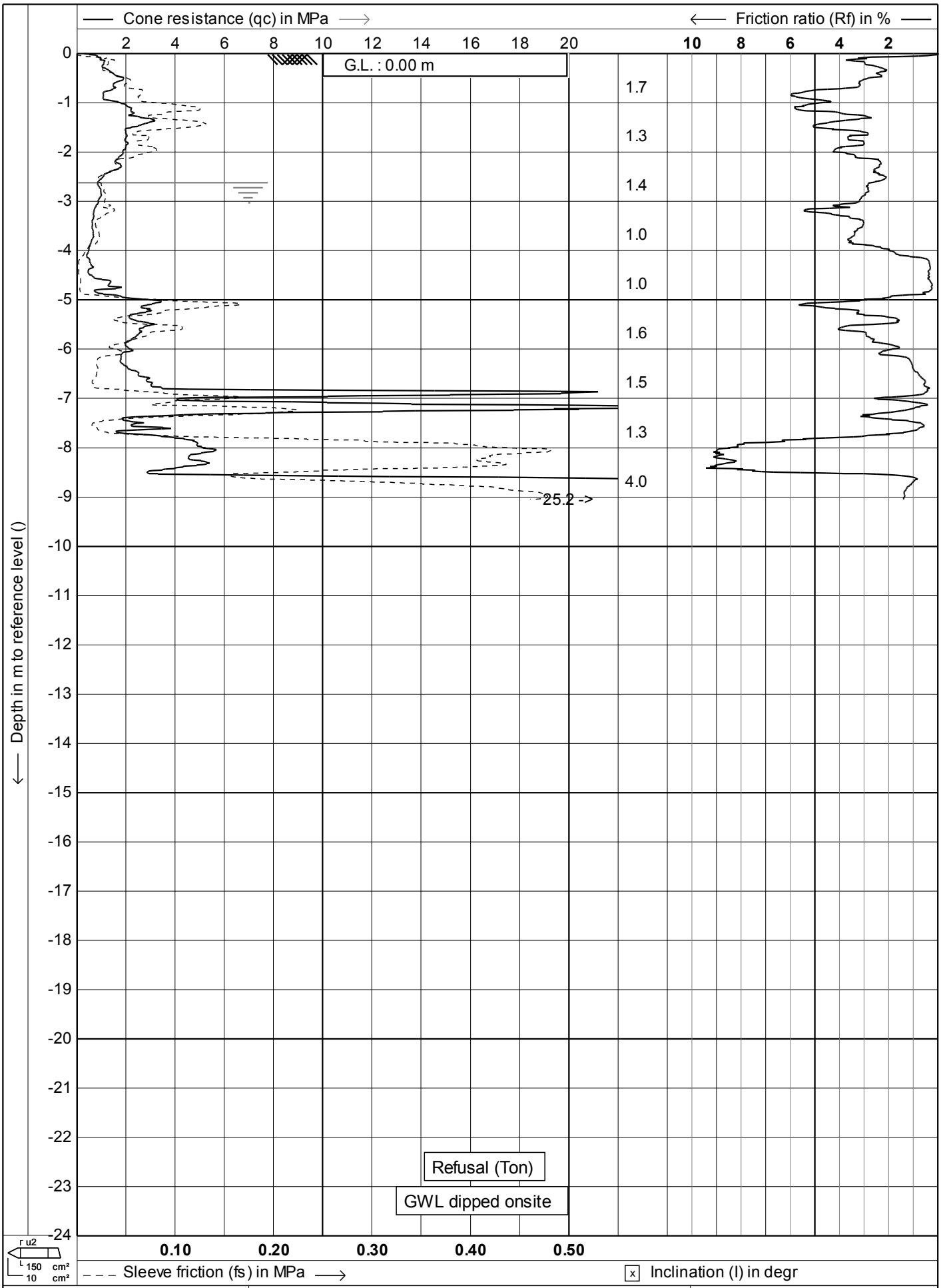
Project no. : **02ET02**

CPT no. : **17**

1/14

PERRY GEOTECH

CPTask V1.33



Test according A.S.T.M. Standard D 5778-12

PERRY GEOTECH

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **7-10-2016**

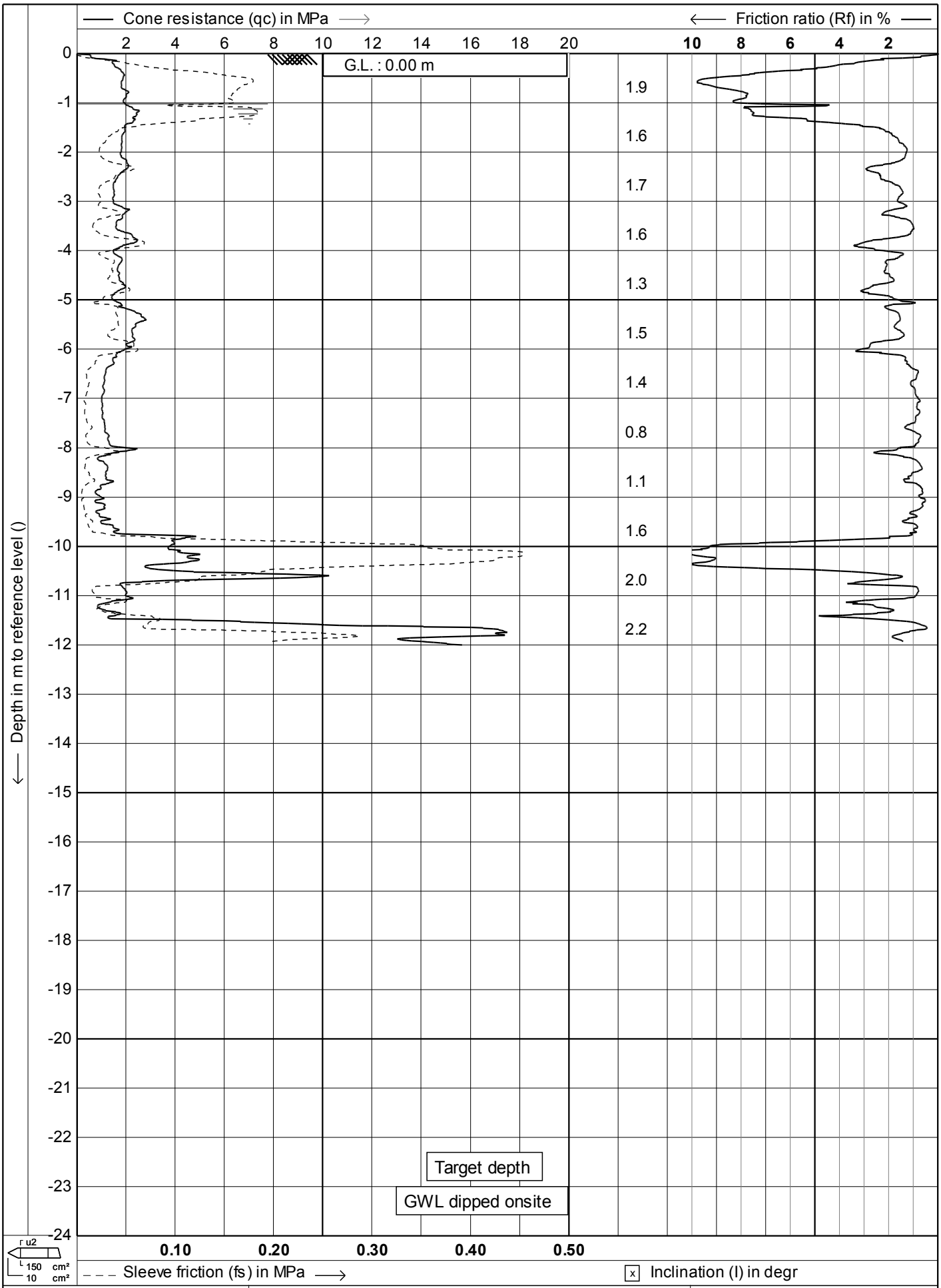
Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **18**

1/14

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **7-10-2016**

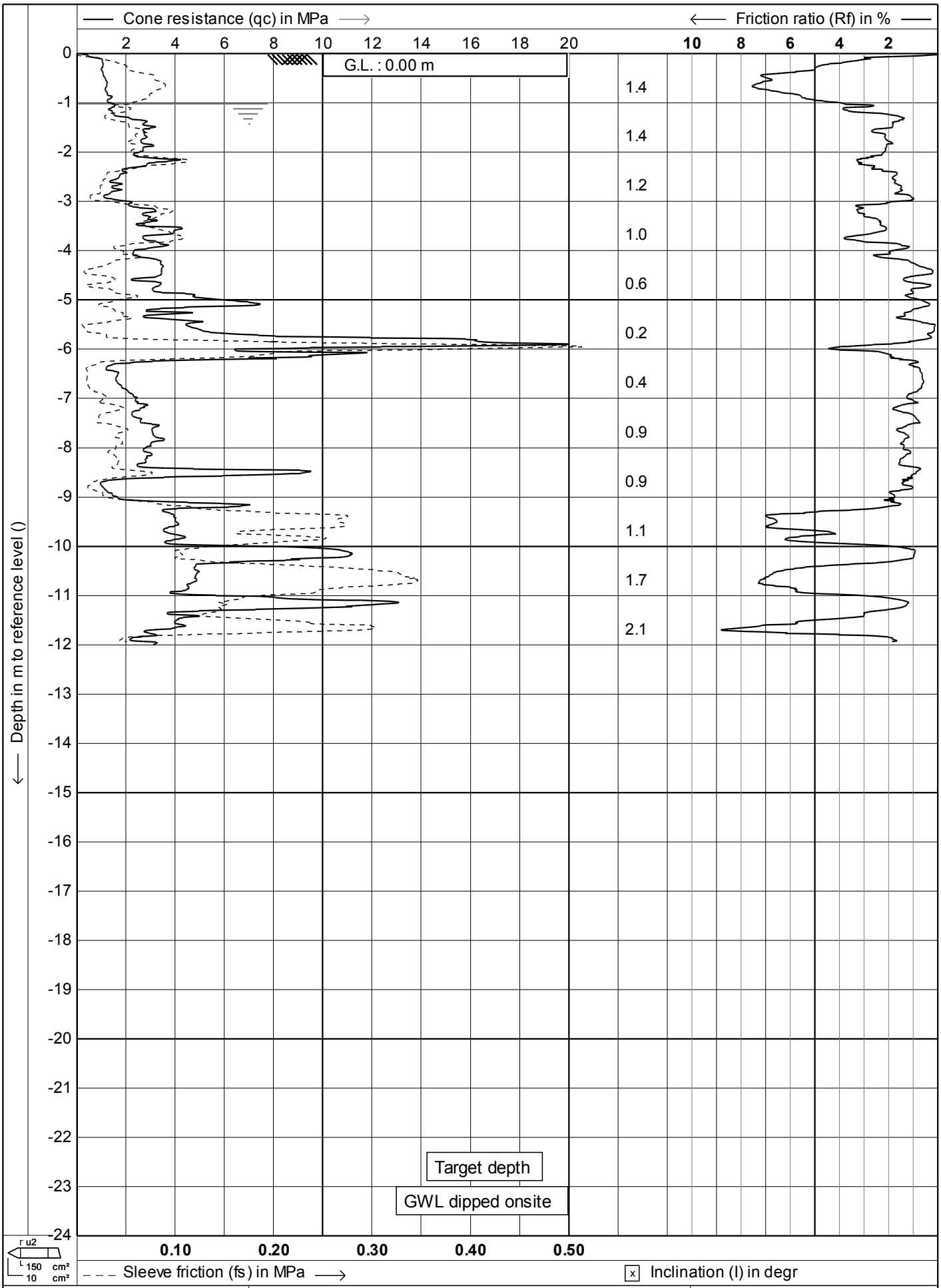
Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **19**

1/14

CPTask V1.33



Test according A.S.T.M. Standard D 5778-12

PERRY GEOTECH

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **7-10-2016**

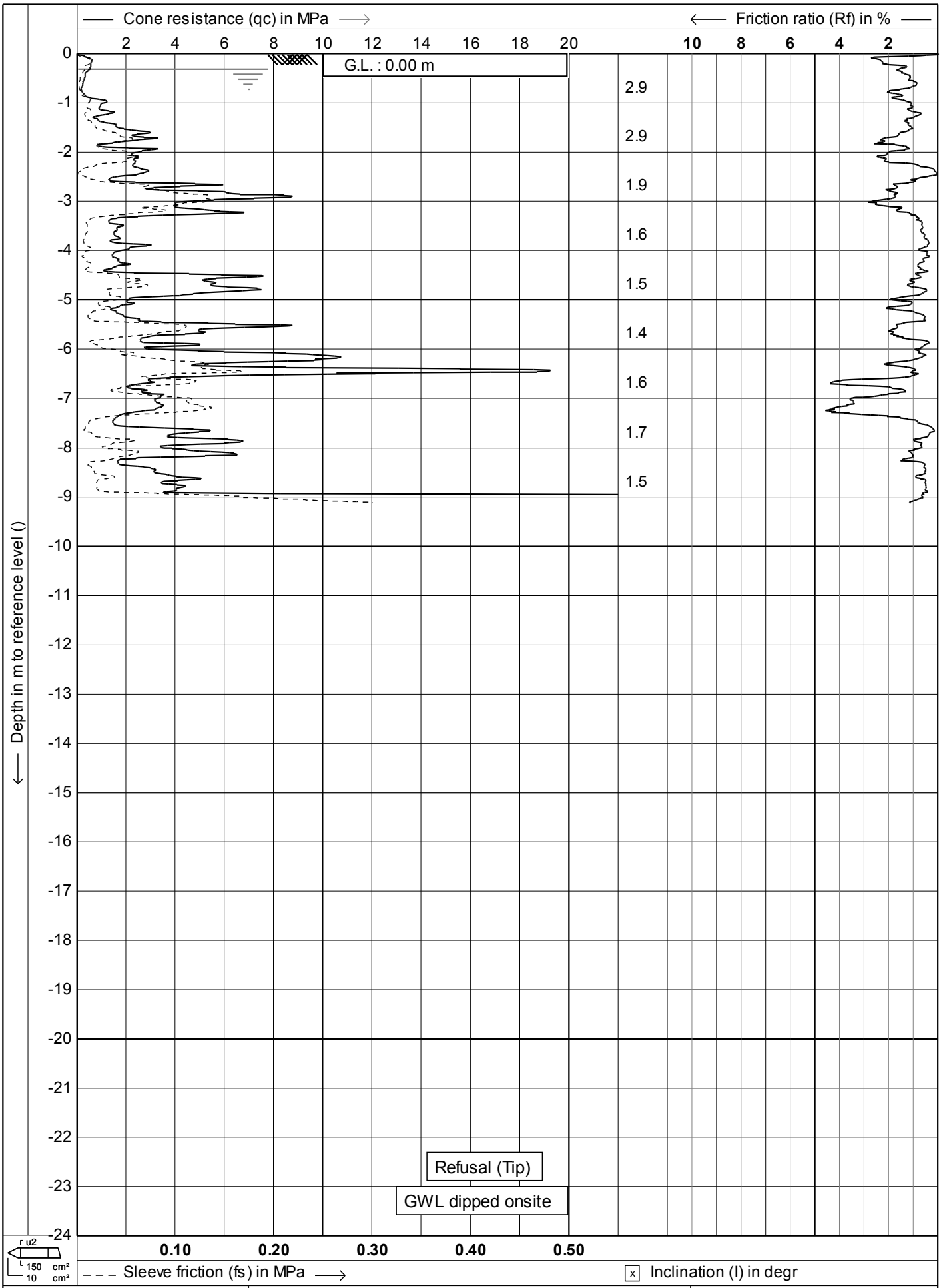
Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **20**

1/14

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **7-10-2016**

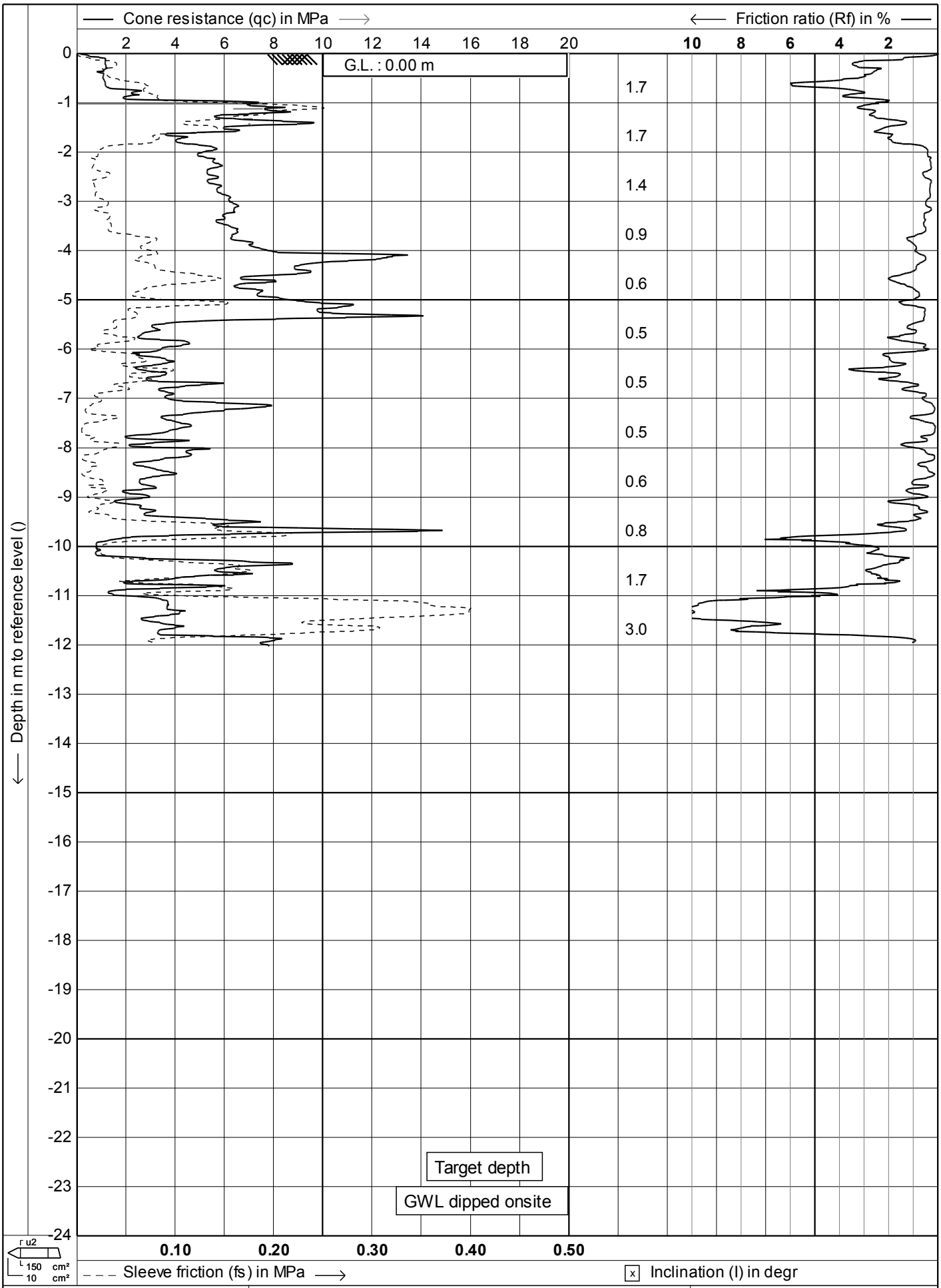
Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **21**

1/14

CPTask V1.33



PERRY GEOTECH

Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **7-10-2016**

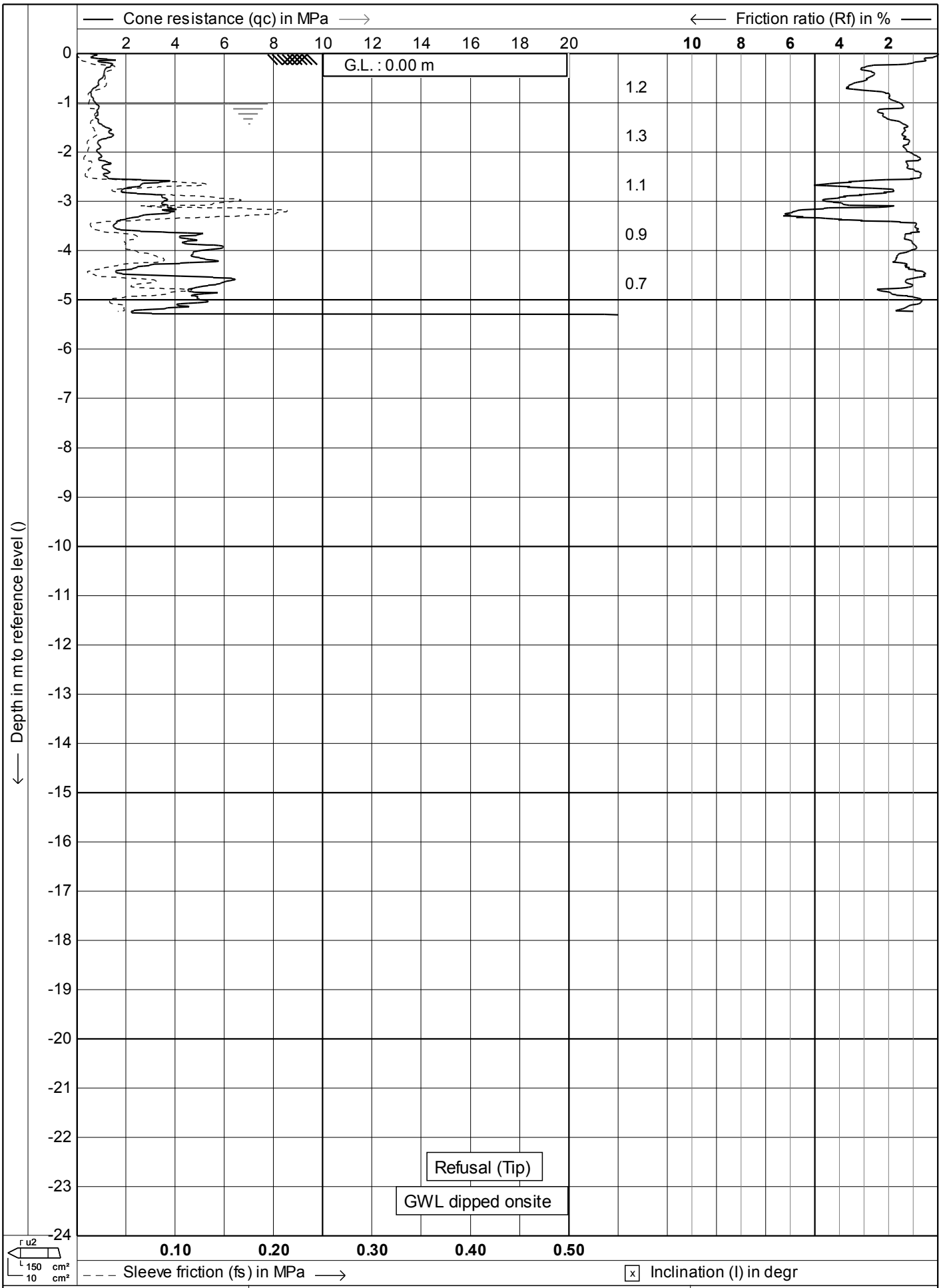
Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **22**

1/14

CPTask V1.33



Test according A.S.T.M. Standard D 5778-12

Project : **Site Investigation**

Location: **94 Scott rd - Te Kauwhata**

Date : **7-10-2016**

Cone no. : **C10CFIIP.C14432**

Project no. : **02ET02**

CPT no. : **23**

PERRY GEOTECH

CPTask V1.33

HAND-AUGER LOG

Bore No.: **HA01**

Project: Scott Road, Te Kauwhata

Augered by: MW/SLH | Checked by: MW

Date: 12/10/2016 Ref: 4036

Geology	Soil Description	Depth (m)
TOP SOIL	SILT with minor sand; brown. Stiff; moist. Minor live rootlets.	
BROWN ASH	SILT with trace pumice sand and black organic fragments; brown. Very stiff; moist. 0.6m: Pumice sand content increasing	0.5
WHANGAMARINO	CLAY with trace pumice sand; mottled orange and grey. Very stiff; moist; highly plastic. 1.3m: Becoming mostly grey with some orange mottles. No pumice sand below 1.3m.	1.0 1.5
	CLAY with minor pumice sand; greyish white. Very stiff; wet; highly plastic.	2.0
	CLAY; bluish grey. Very stiff; saturated; highly plastic.	2.5
	Organic SILT; dark brown. Stiff; saturated.	3.0
	Organic LIGNITE; black. Hard; saturated.	
	EOH = 3.1m bgl Target depth reached. Groundwater encountered at 2.1m. PK Shear Vane.	3.5 4.0 4.5 5.0

Water Level

Undrained Shear Strength (kPa)

0 100 200

169/59kPa
202/71kPa
184/62kPa
195/44kPa
>219kPa
>219/57kPa
>219kPa
UTP
169/59kPa
169/59kPa
149/53kPa
169/44kPa
149/57kPa
153/56kPa
157/47kPa
157/44kPa
100/18kPa
109/18kPa
184/44kPa
118/41kPa
165/53kPa
169/53kPa
184/29kPa
115/18kPa
136/18kPa
112/26kPa
UTP

Scala Penetrometer Blows/100mm

0 1 2 3 4 5 6 7 8 9 10 11 12 13

0 2 4 6 8 10 13 16 18 20 23 26 28 30

Inferred CBR 10%

HAND-AUGER LOG

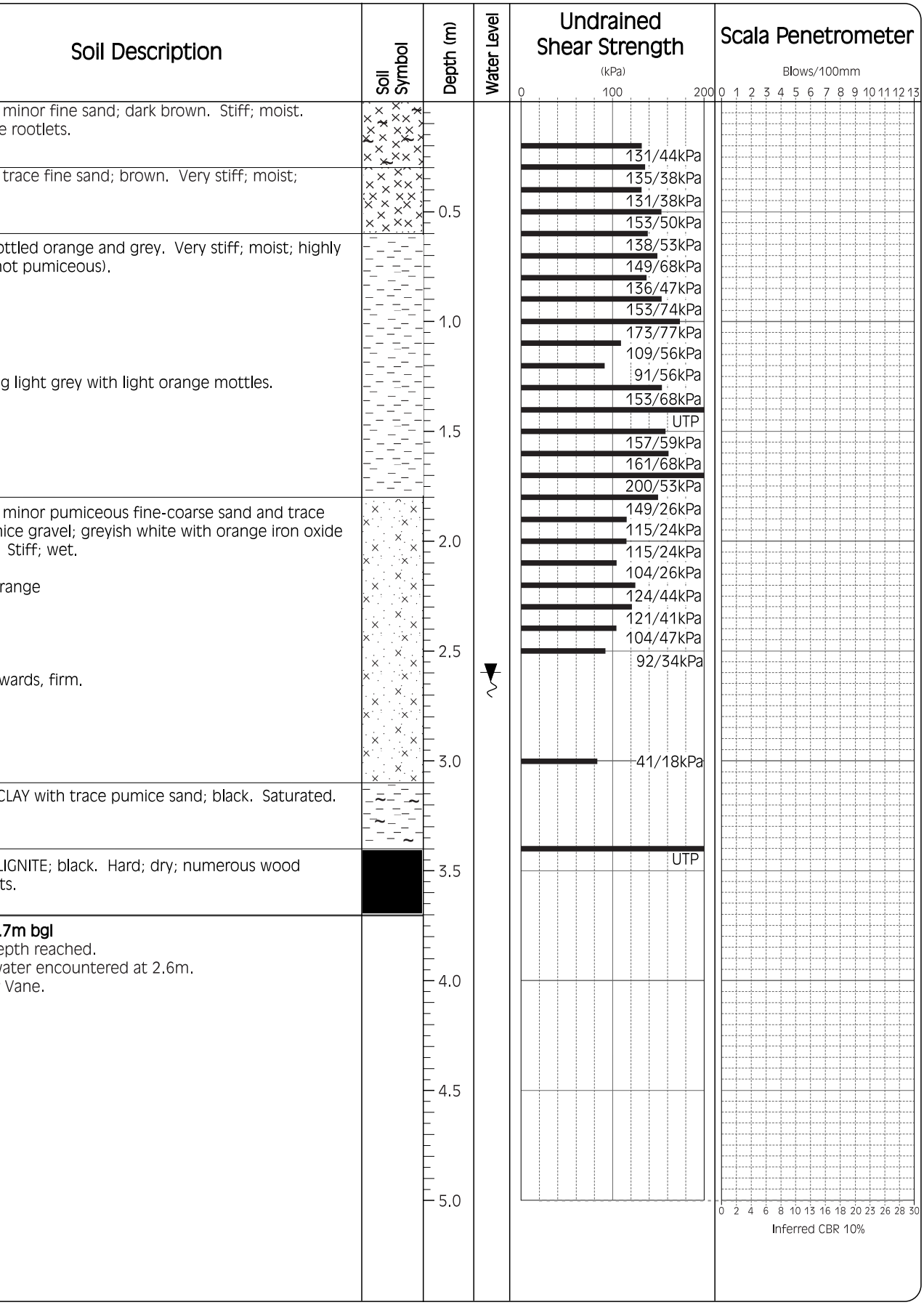
Bore No.: **HA07**

Project: Scott Road, Te Kauwhata

Augered by: MW/SLH | Checked by: MW

Date: 11/10/2016 Ref: 4036

Geology	Soil Description	Depth (m)
TOP SOIL	SILT with minor fine sand; dark brown. Stiff; moist. Minor live rootlets.	0
BROWN ASH	SILT with trace fine sand; brown. Very stiff; moist;	0.5
	CLAY; mottled orange and grey. Very stiff; moist; highly plastic (not pumiceous).	1.0
	Becoming light grey with light orange mottles.	1.5
WHANGAMARINO	SILT with minor pumiceous fine-coarse sand and trace fine pumice gravel; greyish white with orange iron oxide staining. Stiff; wet.	2.0
	2.2m: Orange	
	2.6m onwards, firm.	2.5
	Organic CLAY with trace pumice sand; black. Saturated.	3.0
	Organic LIGNITE; black. Hard; dry; numerous wood fragments.	3.5
	EOH = 3.7m bgl Target depth reached. Groundwater encountered at 2.6m. PK Shear Vane.	4.0
		4.5
		5.0



EARTHTECH CONSULTING LIMITED

HAND-AUGER LOG

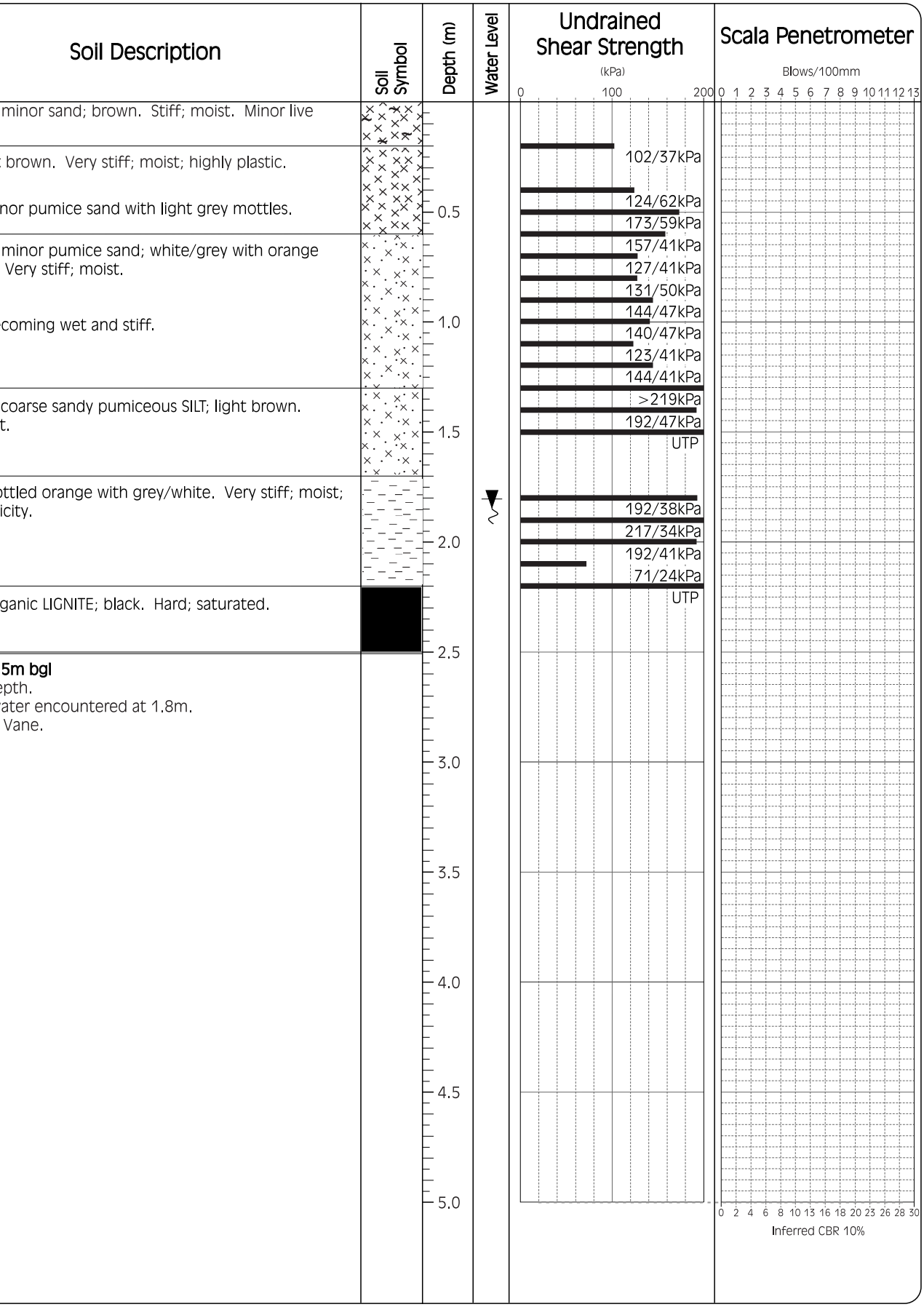
Bore No.: **HA10**

Project: Scott Road, Te Kauwhata

Augered by: MW/SLH | Checked by: MW

Date: 12/10/2016 Ref: 4036

Geology	Soil Description
TOP SOIL	SILT with minor sand; brown. Stiff; moist. Minor live rootlets.
BROWN ASH	SILT; light brown. Very stiff; moist; highly plastic. 0.5m: Minor pumice sand with light grey mottles.
WHANGAMARINO	SILT with minor pumice sand; white/grey with orange mottles. Very stiff; moist. 1.0m: Becoming wet and stiff.
	Medium-coarse sandy pumiceous SILT; light brown. Hard; wet.
	CLAY; mottled orange with grey/white. Very stiff; moist; low plasticity.
	Highly organic LIGNITE; black. Hard; saturated.
	EOH = 2.5m bgl Target depth. Groundwater encountered at 1.8m. PK Shear Vane.



EARTHTECH CONSULTING LIMITED

HAND-AUGER LOG

Bore No.: **HA13**

Project: Scott Road, Te Kauwhata

Augered by: MW/SLH | Checked by: MW

Date: 12/10/2016 Ref: 4036

Geology	Soil Description
TOP SOIL	SILT with minor sand; brown. Stiff; moist. Minor live rootlets.
ASH	SILT with trace pumice sand; brown. Very stiff; moist.
PUKETOKA	SILT with minor fine-coarse pumice sand; mottled orange and grey. Very stiff; moist.
	CLAY; mottled orange and grey. Very stiff; moist; highly plastic.
	SILT with some pumice sand and trace fine pumice gravel; grey with orange mottles. Hard; moist. Sand content increasing with depth.
	1.4m: Becoming wet.
	Medium-coarse pumiceous SAND with minor silt and fine pumice gravel; grey. Medium dense; wet.
	EOH = 2.2m bgl Hole collapsing and poor recovery. Groundwater encountered at 1.9m. PK Shear Vane.

Soil Symbol

Depth (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

Water Level

Undrained Shear Strength (kPa) 0 100 200

135/34kPa
165/41kPa
153/37kPa
202/48kPa
206/59kPa
157/41kPa
>219/38kPa
>219kPa
UTP
UTP
UTP
>219/44kPa
161/29kPa
195/47kPa
UTP
UTP
UTP
109/13kPa
UTP
UTP
UTP

Scala Penetrometer Blows/100mm 0 1 2 3 4 5 6 7 8 9 10 11 12 13

0 2 4 6 8 10 13 16 18 20 23 26 28 30
Inferred CBR 10%

HAND-AUGER LOG

Bore No.: **HA17**

Project: Scott Road, Te Kauwhata

Augered by: MW/SLH | Checked by: MW

Date: 12/10/2016 Ref: 4036

Geology	Soil Description	Soil Symbol	Depth (m)	Water Level	Undrained Shear Strength (kPa)	Scala Penetrometer Blows/100mm
TOP SOIL	SILT with minor sand; brown. Stiff; moist. Minor live rootlets.					
ASH	SILT; brown. Very stiff; moist.					
PUKETOKA	CLAY with trace pumice sand; light brown with orange mottles. Hard; moist; highly plastic.		0.5			
	1.0m: Some manganese and iron oxide staining.		1.0			
			1.5			
	Medium-coarse pumice SAND with minor silt and fine pumice gravel; light orange brown. Medium dense; moist.		2.0			
	CLAY with trace pumice sand; light brown with orange mottles. Hard; moist; highly plastic.					
	Medium-coarse pumice SAND with minor silt and fine pumice gravel; light orangey brown. Medium dense; moist.		2.5			
	2.75m: Becoming wet.					
			3.0			
	EOH = 3.0m bgl Target depth reached. Groundwater not encountered. PK Shear Vane.		3.5			
			4.0			
			4.5			
			5.0			

Undrained Shear Strength (kPa): 0 | 100 | 200

192/51kPa
163/51kPa
157/50kPa
210/71kPa
>219/77kPa
>219kPa
UTP
UTP
>219/68kPa
UTP
UTP
UTP
UTP
>219kPa
>219kPa
>219kPa
UTP
UTP
>219/38kPa
UTP
UTP
UTP

Scala Penetrometer Blows/100mm: 0 1 2 3 4 5 6 7 8 9 10 11 12 13

0 2 4 6 8 10 13 16 18 20 23 26 28 30

Inferred CBR 10%

HAND-AUGER LOG

Bore No.: **HA19**

Project: Scott Road, Te Kauwhata

Augered by: MW/SLH | Checked by: MW

Date: 11/10/2016 Ref: 4036

Geology	Soil Description
TOP SOIL	SILT; dark brown. Stiff; moist. Minor live rootlets.
BROWN ASH	CLAY with trace rootlets; brown. Hard; moist; highly plastic. 0.5m onwards, no rootlets. 0.9m onwards, includes orange mottling. 2.1m: becoming more silty, less plastic, moist-wet. Includes trace pumice sand.
	EOH = 2.6m bgl Difficult augering. Groundwater not encountered. PK Shear Vane.

Soil Symbol

Depth (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

Water Level

Undrained Shear Strength (kPa)

0 100 200

181/80kPa
UTP
UTP
UTP
UTP
149/77kPa
153/86kPa
UTP
UTP
UTP
UTP
192/93kPa
210/101kPa
192/95kPa
192/109kPa
206/104kPa
206/74kPa
213/121kPa
213/136kPa
>219/131kPa
181/112kPa

Scala Penetrometer

Blows/100mm

0 1 2 3 4 5 6 7 8 9 10 11 12 13

0 2 4 6 8 10 13 16 18 20 23 26 28 30

Inferred CBR 10%

HAND-AUGER LOG

Bore No.: **HA22**

Project: Scott Road, Te Kauwhata

Augered by: MW/SLH | Checked by: MW

Date: 11/10/2016 Ref: 4036

Geology	Soil Description
TOP SOIL	SILT with minor sand; dark brown. Stiff; moist. Minor live rootlets.
BROWN ASH	SILT with trace fine sand; orange brown. Very stiff; moist. 0.6m: grading to a SILT with minor fine-coarse pumice sand; mottled grey and orange. Very stiff; moist.
PUKETOKA	Pumice SAND with minor silt and trace organics; light orange brown. Medium dense; wet. Silt content decreasing with depth. 1.1m: dark orange with manganese and iron oxide staining.
	Pumice SAND with trace silt; orange brown and light grey/reddish orange in places. Medium dense; moist. Includes manganese and iron oxide staining. 1.9m: becoming medium-coarse SAND with trace pumice gravel.
	EOH = 3.0m bgl Target depth reached. Groundwater not encountered. PK Shear Vane.

Soil Symbol

Depth (m): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

Water Level

Undrained Shear Strength (kPa)

0 100 200

101/29kPa
131/41kPa
157/60kPa
192/65kPa
167/65kPa
213/63kPa
UTP
UTP
UTP
UTP

Scala Penetrometer Blows/100mm

0 1 2 3 4 5 6 7 8 9 10 11 12 13

0 2 4 6 8 10 13 16 18 20 23 26 28 30

Inferred CBR 10%

EARTHTECH CONSULTING LIMITED

APPENDIX B

2008 SITE INVESTIGATION DATA

Augerhole Logs from 'Proposed Lakeside Farm Subdivision, Te Kauwhata, Geotechnical Suitability Assessment', prepared by Maunsell Limited, dated 30 October 2008

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 1

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		-	
0.3m	Brownish Yellow SILTY CLAY, slightly plastic, moist, stiff.	195+kPa 0.5m	-	
		UTP* 1.0m	-	
1.0		195+kPa 1.5m	-	
	- Light Grey, highly plastic and slightly dilatant from 1.8m.	142 kPa 2.0m	-	
2.0	- firm from 2.0m.		-	
	- mottled Brownish Yellow from 2.3m.	137 kPa 2.5m	-	
	- Brownish Yellow from 2.7m.	124 kPa 3.0m	-	
3.0			-	
3.5m	Light Grey streaked Brownish Yellow CLAYEY SILT, moderately plastic & dilatant, slightly moist to wet, firm.	140 kPa 3.5m	-	
4.0			-	
	- mottled Grey with a slight organic odour from 4.8m.		-	
5.0	End of Log at 5.0m.		-	
6.0			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: pp Dennis Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 2

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.1m	Light Grey mottled Orange SILTY CLAY with trace fine SAND, moderately dilatant, moist, stiff.		-	
		UTP*	-	
	- Light Greyish Brown with no SAND from 0.5m.	0.5m		
			-	
		195+kPa		
1.0		1.0m	-	▽
1.2m	Dark Blackish Brown organic SILT, moist, firm.		-	
		179 kPa		
1.5m	Grey CLAYEY SILT with minor fine SAND, moist to wet, firm to stiff.	1.5m		
1.6m	Light Greyish Blue SILTY CLAY, moist to wet, firm to stiff.		-	
		173 kPa	-	
2.0		2.0m		
	- Blueish Green from 2.2m.		-	
		UTP		
		2.5m	-	
			-	
		UTP		
3.0	- slight organic odour from 3.0m.	3.0m	-	
			-	
		UTP		
	- trace interbedded Dark Brown organic SILT and hard to obtain sample from 3.5m.	3.5m		
			-	
4.0	- Greyish Brown from 4.0m.		-	
			-	
			-	
	- mottled Dark Brown from 4.6m.			
4.7m	Dark Greyish Brown SILTY CLAY, moist, firm to stiff.		-	
5.0	End of Log at 5.0m.		-	
			-	
			-	
			-	
6.0			-	
			-	
			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 3

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		-	
0.3m	Brownish Yellow SILTY CLAY, moderately plastic, moist, firm to stiff.	161 kPa 0.5m	-	
	- mottled Orange from 0.8m.	189 kPa 1.0m	-	
1.0		UTP* 1.5m	-	
2.0		UTP 2.0m	-	
		UTP 2.5m	-	
	- Light Brownish Grey from 2.8m.	UTP 3.0m	-	
3.0		UTP 3.5m	-	
	- Brownish Yellow from 3.5m.		-	
4.0	- Light Grey mottled Orange and slightly moist to wet from 4.0m.		-	
	- Light Brownish Yellow from 4.2m.		-	
4.7m	Dark Blackish Brown organic SILT, slight organic odour, moist, firm.		-	
5.0			-	
5.6m	Brown SILTY CLAY, moist, firm to stiff.		-	
	- Blueish Green from 5.8m.		-	
6.0	End of Log at 6.0m.		-	
			-	
			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: pp Daniel Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 4

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, soft to firm. (Topsoil)		-	
0.3m	Brownish Orange SILTY CLAY, moist, firm.	107 kPa 0.5m	-	
	- mottled Reddish Orange from 0.6m.		-	
1.0	- Brown and stiff from 1.0m.	189 kPa 1.0m	-	
		UTP 1.5m	-	
2.0		UTP 2.0m	-	
	- mottled Light Greyish Brown from 2.5m.	UTP 2.5m	-	
3.0		189 kPa 3.0m	-	
	- Brownish Yellow mottled Dark Brown from 3.2m.	166 kPa 3.5m	-	
4.0	- Dark Grey mottled Brownish Yellow from 4.0m.		-	
4.3m	Blackish Brown organic SILT, moderately organic odour, moist, firm.		-	
5.0			-	
5.3m	Light Brown SILTY CLAY, moist, firm.		-	
5.5m	End of Log at 5.5m.		-	
6.0			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: Daniel Wright
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 5

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Brownish Yellow SILTY CLAY, moist, firm.	UTP* 0.5m		
1.0	- Light Grey mottled Orange and moderately plastic from 1.0m.	173 kPa 1.0m		
	- moderately dilatant, soft to firm and no mottling from 1.6m.	156 kPa 1.5m		
2.0	- soft to firm from 2.0m.	116 kPa 2.0m		
	- Light Greyish White, highly dilatant, moist to wet and firm from 2.2m.			▽
2.4m	Light Greyish White CLAYEY SILT with minor fine SAND, highly dilatant, wet, firm to stiff.	UTP 2.5m		
3.0		UTP 3.0m		
		UTP 3.5m		
3.8m	Light Greyish White SILT with some CLAY, highly dilatant, wet, firm.			
4.0				
5.0	End of Log at 5.0m.			
6.0				
7.0				

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.
Water Table rose to 1.7m when testing.

LOGGED BY: Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 6

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm.		-	
0.3m	Brownish Orange SILTY CLAY, moist, stiff.	UTP* 0.5m	-	
			-	
		173 kPa	-	
1.0		1.0m	-	
	- Light Brown and highly plastic from 1.2m.	UTP	-	
		2 kPa	-	
		156 kPa	-	
2.0		2.0m	-	
		129 kPa	-	
	- soft to firm from 2.5m.	2.5m	-	
	- trace intermixed Dark Brown SILT from 2.8m.		-	
		156 kPa	-	
3.0	- firm from 3.0m.	3.0m	-	
3.2m	Dark Blackish Brown organic SILT with a very strong organic odour, well consolidated, moist, firm.		-	
		142 kPa	-	
3.6m	Light Greyish Brown SILTY CLAY, moist, firm.	3.5m	-	
4.0			-	
	- Greenish Grey from 4.3m.		-	
			-	
			-	
5.0	End of Log at 5.0m.		-	
6.0			-	
			-	
			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 7

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Brownish Yellow SILTY CLAY, slightly plastic, moist, firm.	148 kPa 0.5m		
	- mottled Orange from 0.6m.			
1.0	- soft to firm from 1.0m.	129 kPa 1.0m		▽
	- soft and moist to wet from 1.3m.	93 kPa 1.5m		
1.8m	Dark Blackish Brown organic SILT, moist to wet, soft.	* 2.0m		
2.0				
2.3m	Grey SILT, moist to wet, soft.	UTP 2.5m		
2.8m	Dark Blackish Brown organic SILT, moist to wet, soft.	* 3.0m		
3.0				
3.8m	Greyish Green SILT, moist to wet, soft.			
4.0				
	- Blueish Grey with trace fine pumiceous SAND from 4.5m			
5.0	End of Log at 5.0m.			
6.0				
7.0				

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.
* Unable to obtain reading.

LOGGED BY: PP Daniel Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 8

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		-	
0.3m	Brownish Orange SILTY CLAY, moist, stiff.	195+kPa 0.5m	-	
	- moderately plastic from 0.6m.		-	
1.0	- firm to stiff from 1.0m.	173 kPa 1.0m	-	
	- Light Pinkish Orange mottled Brownish Yellow from 1.2m.		-	
		168 kPa 1.5m	-	
2.0	- Light Grey mottled Brownish Yellow from 2.0m.	195+kPa 2.0m	-	
		173 kPa 2.5m	-	
		195+kPa 3.0m	-	
3.0	- Light Grey and moderately dilatant from 3.2m.		-	
3.5m	Light Greyish White fine to medium SANDY SILT with minor CLAY, moist to wet, firm to stiff.	195+kPa 3.5m	-	
3.8m	Light Greyish Brown streaked Orange SILTY CLAY, moist, firm.		-	
4.0	Dark Blackish Brown organic SILT, moist, soft to firm.		-	
4.4m	Grey SILTY CLAY, moderately dilatant, moist, firm.		-	
	- Dark Greyish Brown with intermixed Dark Brown SILT from 4.8m.		-	
5.0	- Dark Blackish Brown and fragments of decomposed wood at 5.5m.		-	
			-	
6.0			-	
6.2m	Light Grey SILTY CLAY, slightly dilatant, moist, firm.		-	
6.5m	End of Log at 6.5m.		-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected

LOGGED BY: pp Daniel Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 1

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Dark Brown SILTY CLAY, moist, soft to firm.	0.3m 138 kPa		
		0.6m		
	- firm from 0.6m. - Light Brown from 0.65m. - Light Brown mottled Orange with minor fine pumiceous particles from 0.7m.	190 kPa		
		0.9m		
	- minor fine to medium SAND from 0.9m.	177 kPa		
1.0				
		1.2m		
1.2m	End of Log at 1.2m.	222 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 2

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
		0.3m		
0.3m	Dark Brown SILTY CLAY, moist, soft.	94 kPa		
		0.6m		
	- trace rootlets and firm from 0.6m.	170 kPa		
	- Light Grey mottled Brownish Orange and moist to wet from 0.8m.	0.9m		▽
		174 kPa		
1.0		1.2m		
1.2m	End of Log at 1.2m.	202kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 3

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.2m	Light Brown SILTY CLAY, slightly plastic, moist, firm.	0.3m 186 kPa		
	- trace rootlets from 0.5m.	0.6m		
	- soft to firm from 0.6m.	135 kPa		
	- mottled Orange and moist to wet from 0.8m.	0.9m 113 kPa		▽
1.0				
1.1m	Light Grey mottled Orange fine SANDY SILT with trace fine pumiceous particles, moist to wet, soft to firm.	1.2m		
1.2m	End of Log at 1.2m.	110 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 4

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Brownish Orange SILTY CLAY, moderately plastic, moist, firm to stiff.	0.3m 222 kPa		
	- mottled Red from 0.6m.	0.6m 174 kPa		
1.0		0.9m 174 kPa		
1.2m	End of Log at 1.2m.	1.2m 222 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 5

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Dark Brown SILTY CLAY, moist, soft.	0.3m 74 kPa		
	- Light Brownish Grey and slightly plastic from 0.5m.	0.6m		
	- soft to firm from 0.6m.	142 kPa		
	- mottled Red and firm from 0.8m.	0.9m 170 kPa		
1.0		1.2m		
1.2m	End of Log at 1.2m.	174 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 6

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILt, moist, firm. (Topsoil)			
		0.3m		
0.3m	Brownish Orange SILTY CLAY, slightly plastic, moist, firm.	170 kPa		
		0.6m		
		145 kPa		
		0.9m		
		183 kPa		
1.0		1.2m		
1.2m	End of Log at 1.2m.	193 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Perc 1

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		
0.3m	Light Greyish Brown streaked Light Grey SILTY CLAY, moist, firm to stiff. (Poor Drainage)		
	- Light Brownish Yellow from 0.7m.		
1.0			
	- Light Grey with trace fine SAND & pumiceous particles, slightly dilatant and moderately plastic from 1.3m.		
1.7m	Light Grey CLAYEY SILT, highly dilatant, moist to wet, soft to firm. (Poor Drainage)		
2.0	End of Log at 2.0m.		
3.0			

COMMENTS:

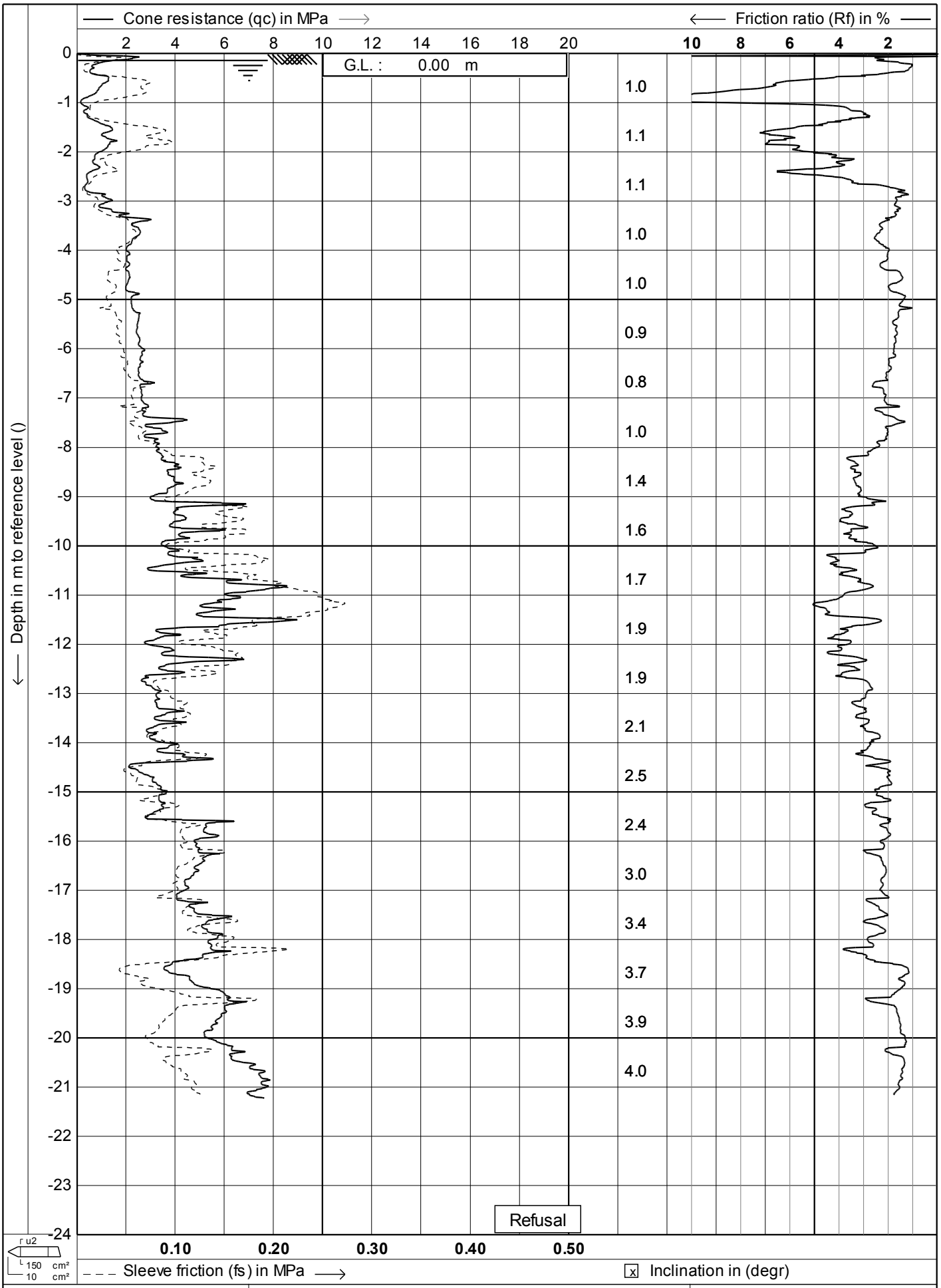
LOGGED BY: pp Daniel Wyatt
Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

APPENDIX C

2010 SITE INVESTIGATION DATA

CPT Profiles and Hand-Auger Logs from 'Te Kauwhata Heavy Vehicle Bypass, Preliminary Geotechnical Report', prepared by Earthtech Consulting Limited, ref R2760-1, dated 25 February 2010



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Scott Road - Te Kauwhata**

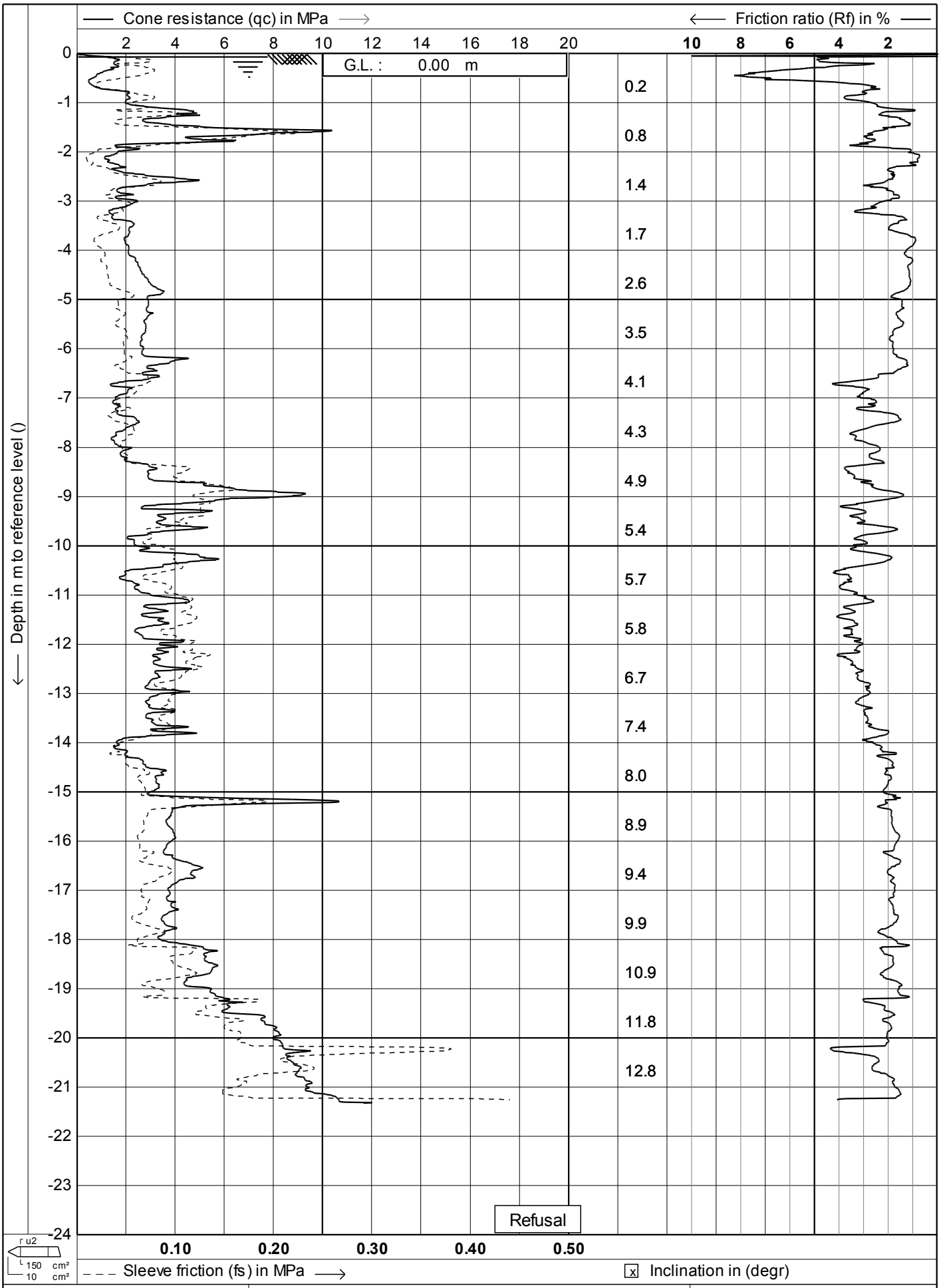
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **101**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Scott Road - Te Kauwhata**

Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

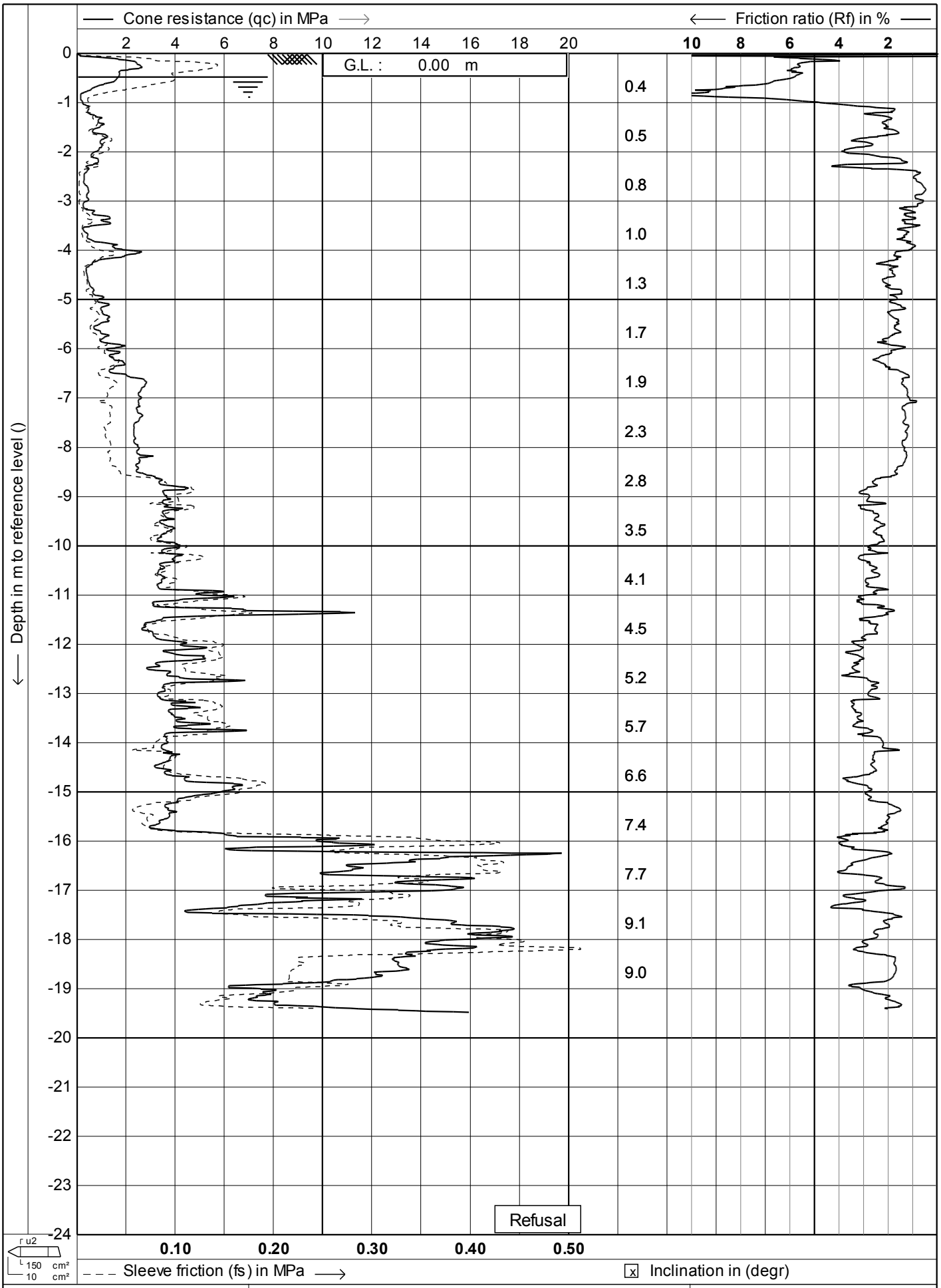
Project no. : **02ET3**

CPT no. : **102**

1/14

Penny Drilling GEOPROBE — Ground Drilling and Environmental Specialists

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Scott Road - Te Kauwhata**

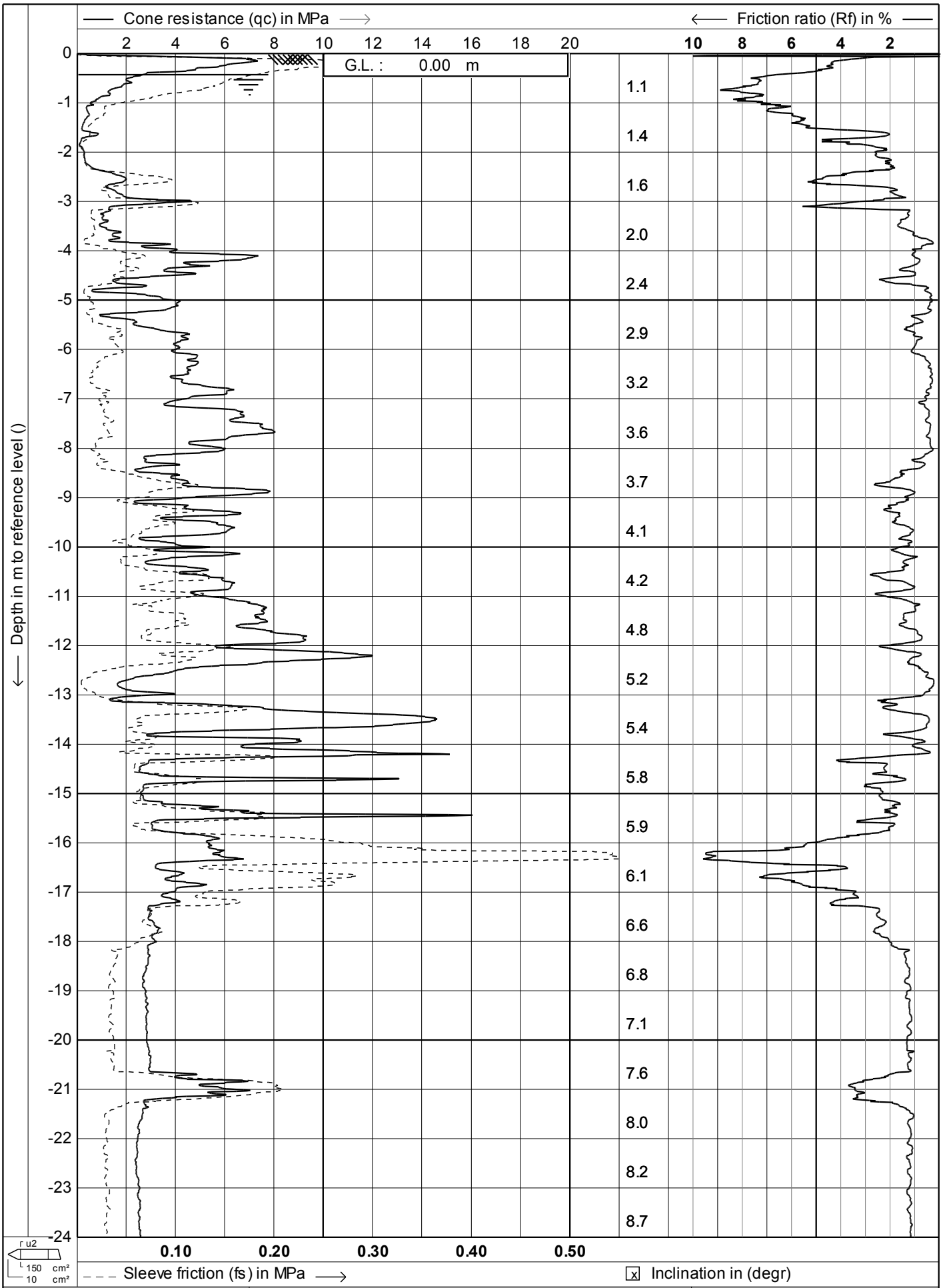
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **103**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

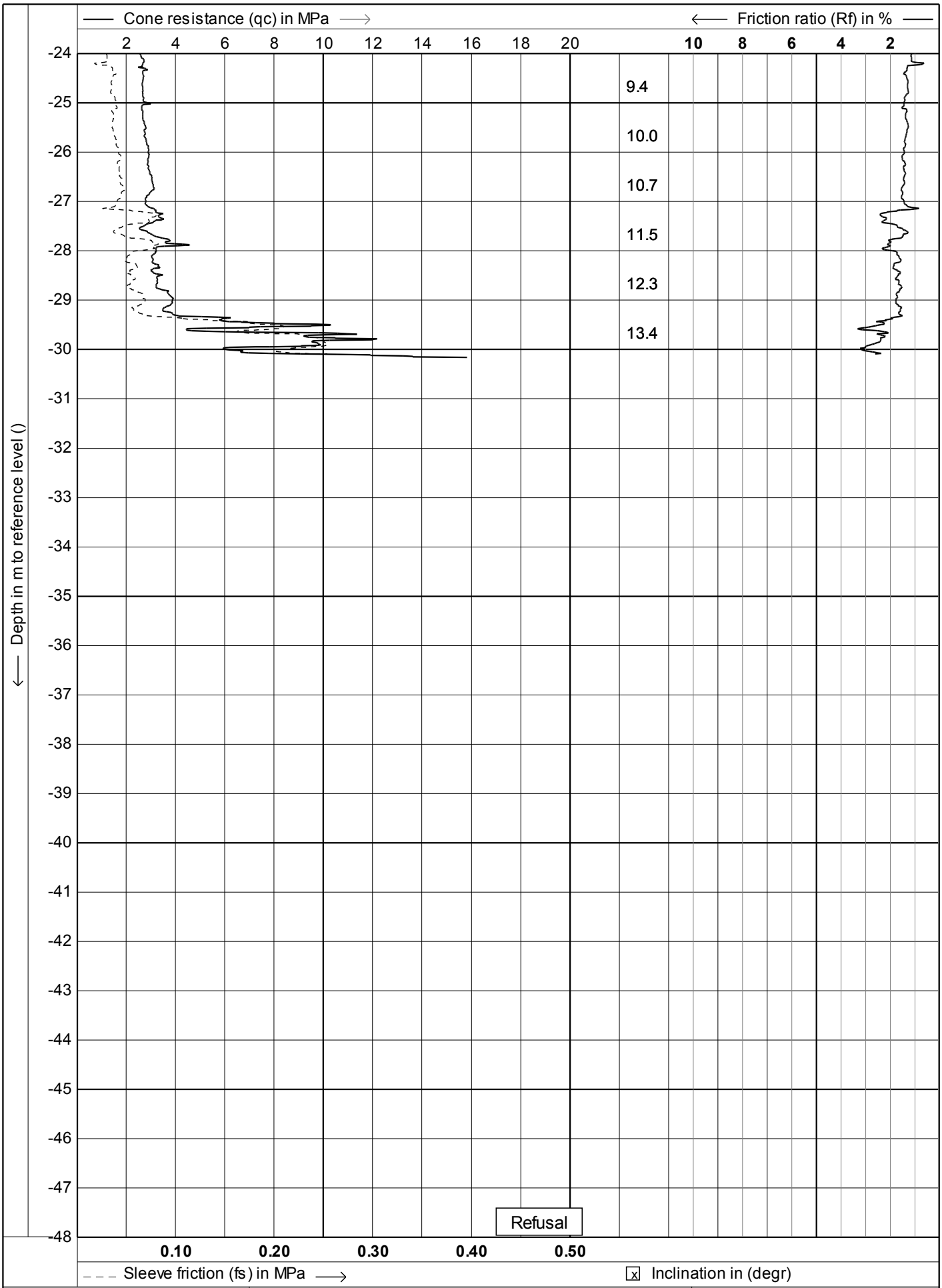
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **104**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

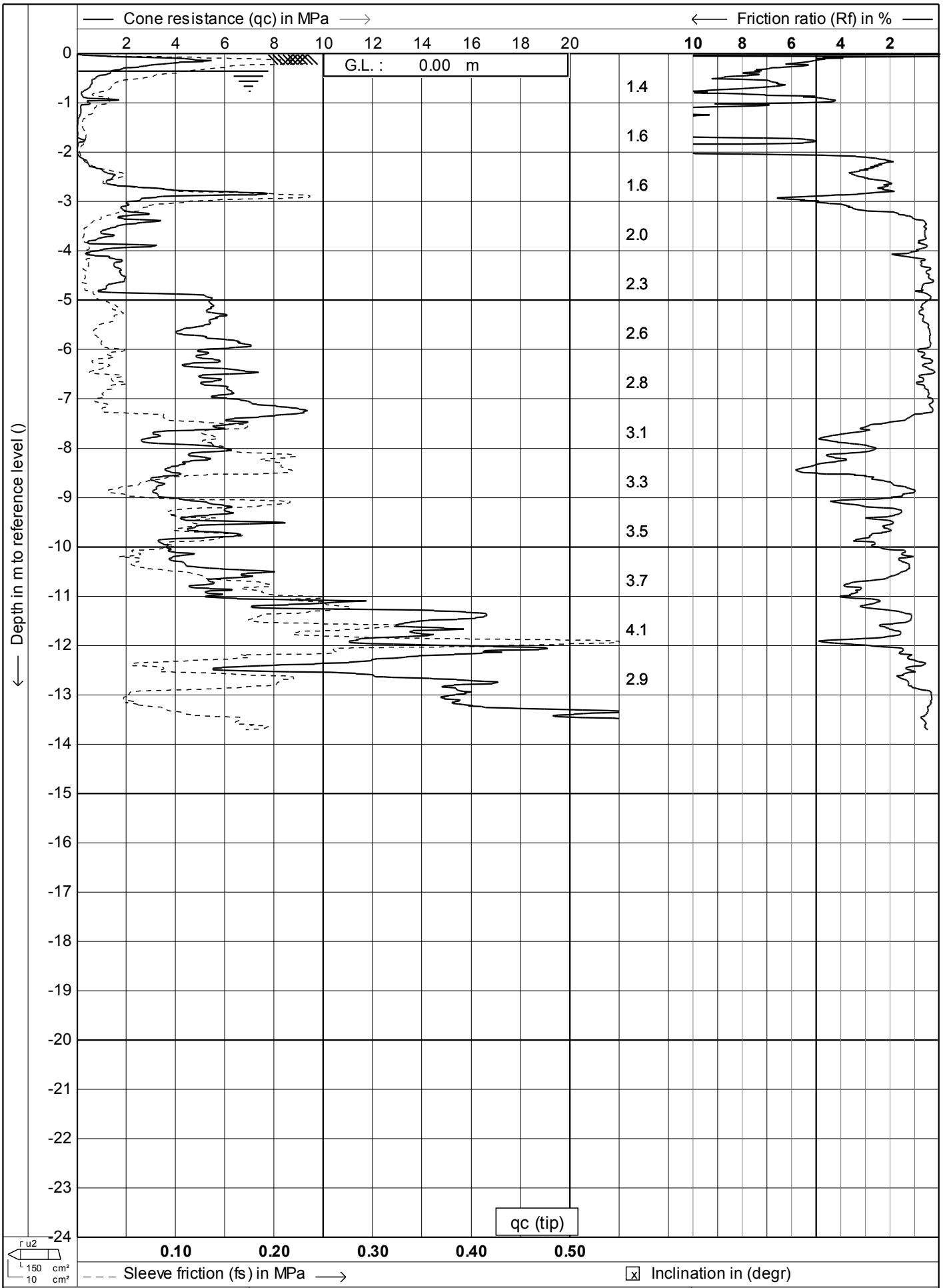
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **104**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

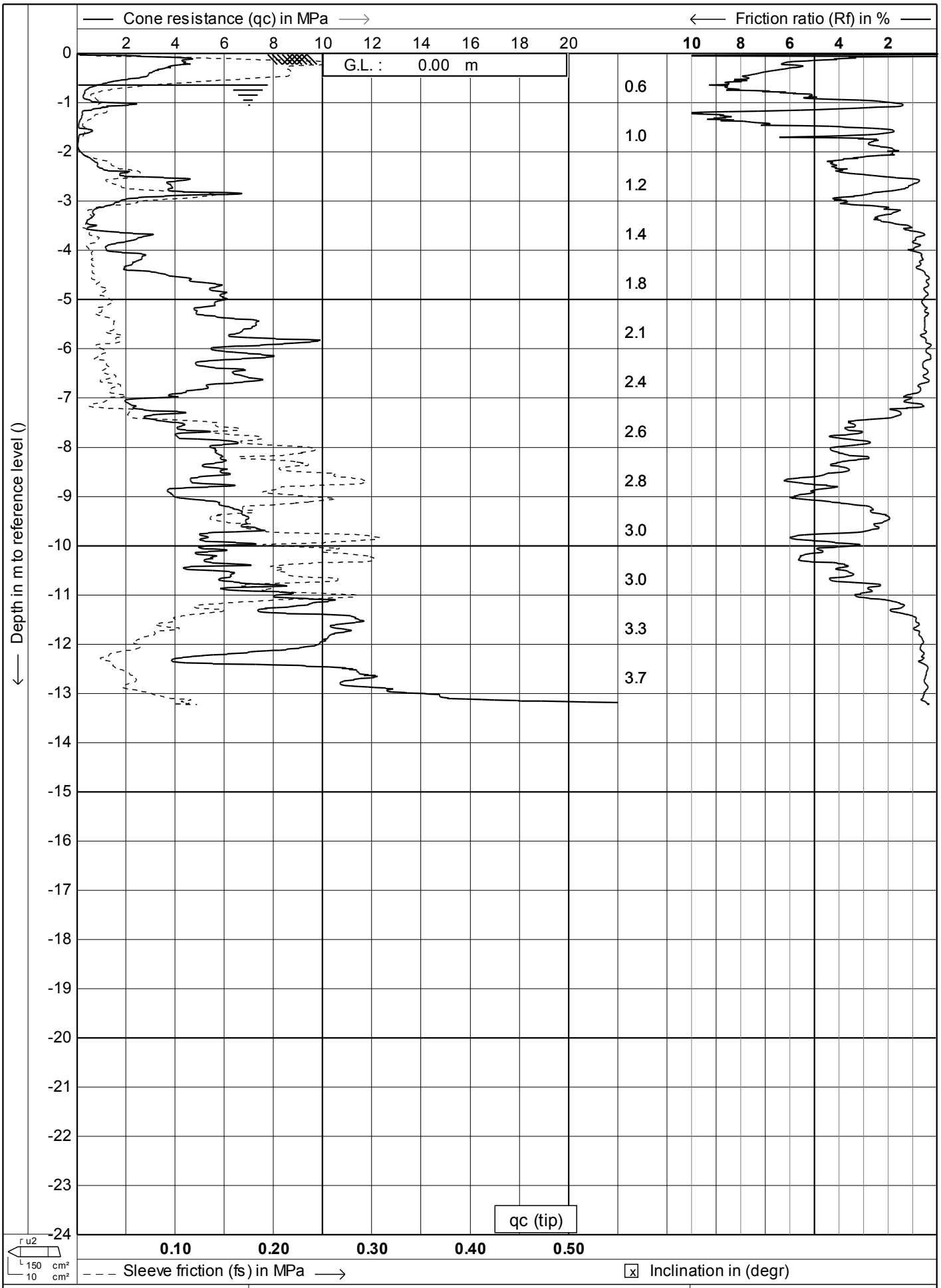
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **105**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Rimu Road - Te Kauwhata**

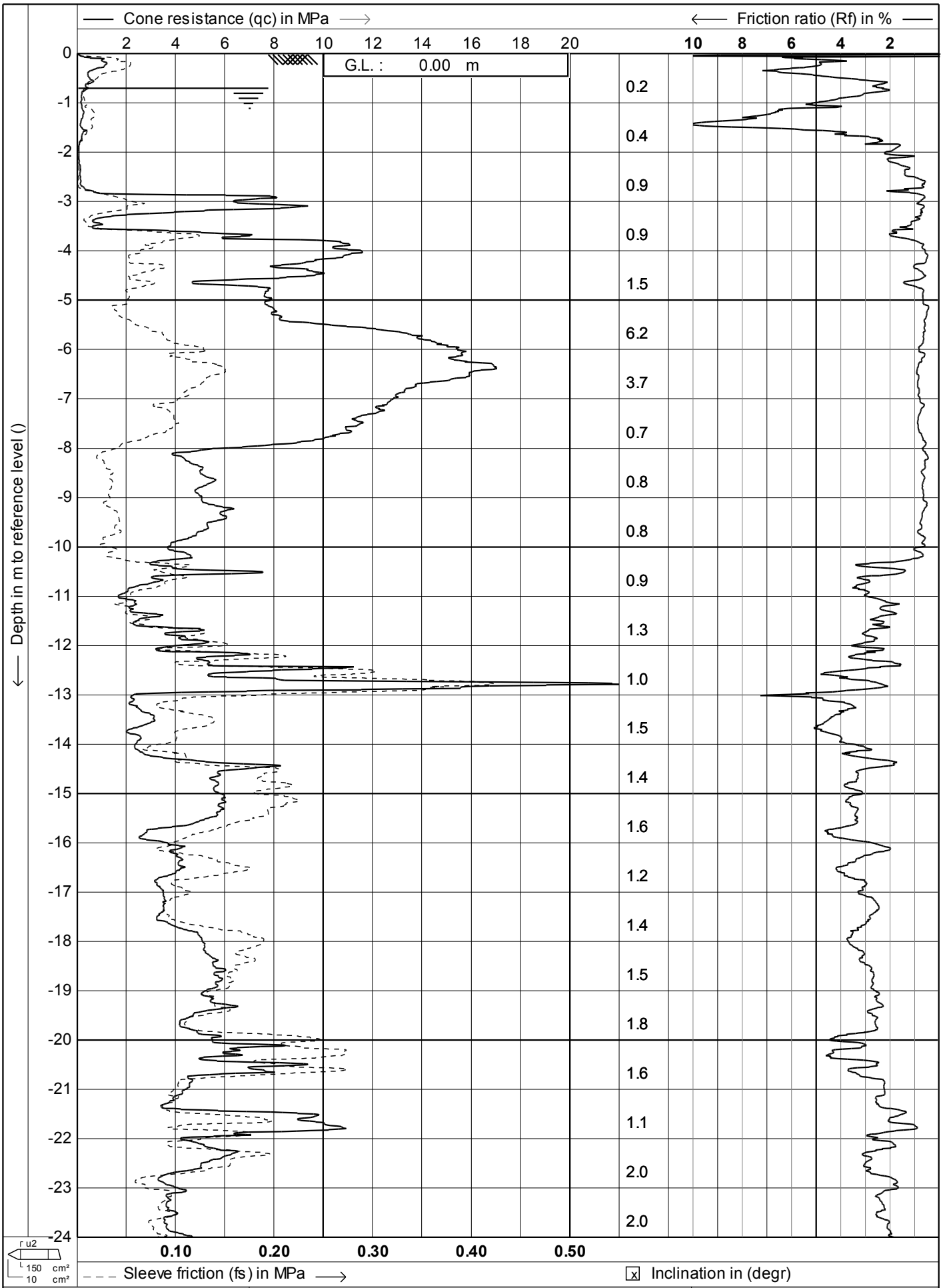
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **106a**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

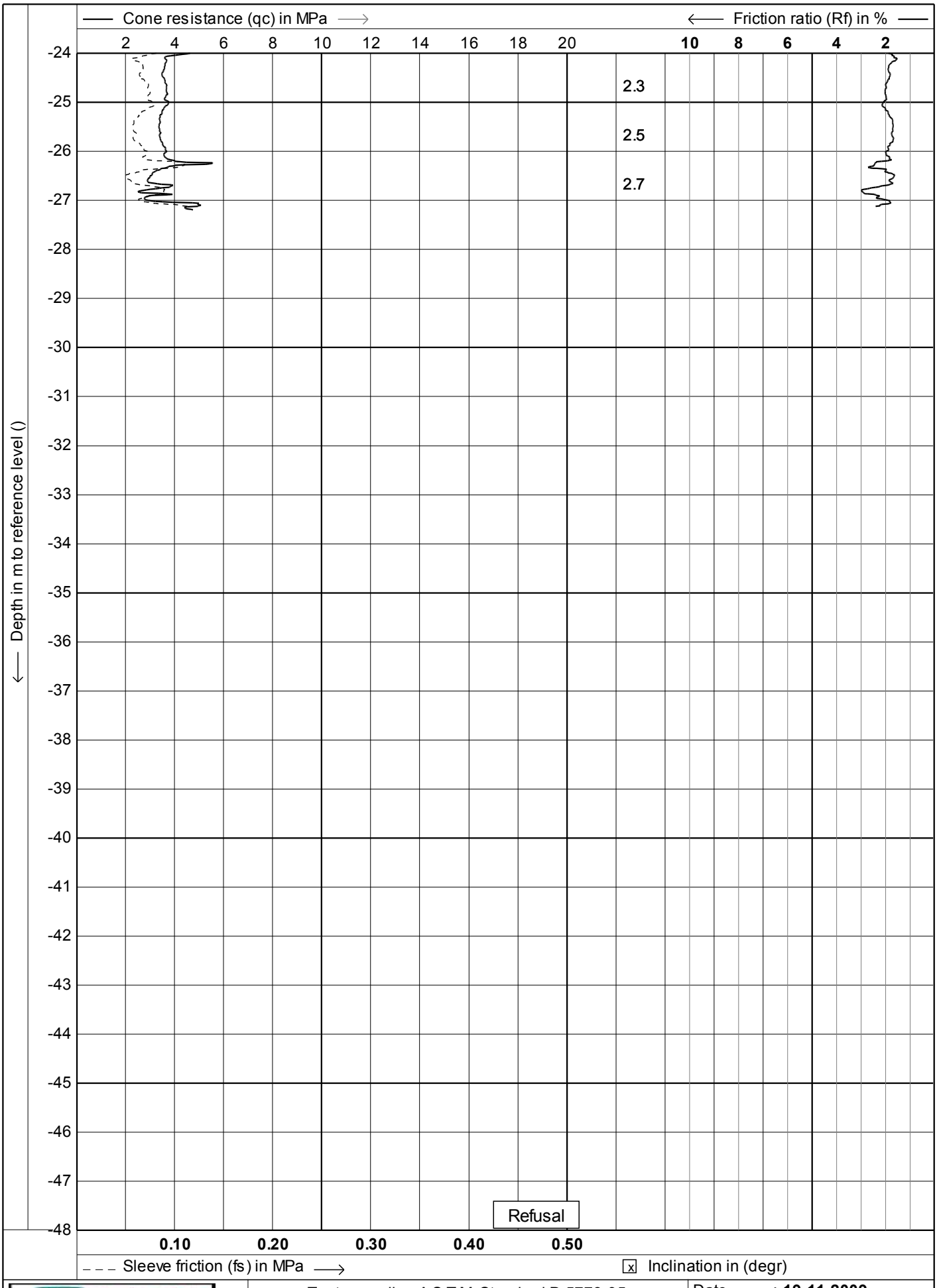
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **107**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

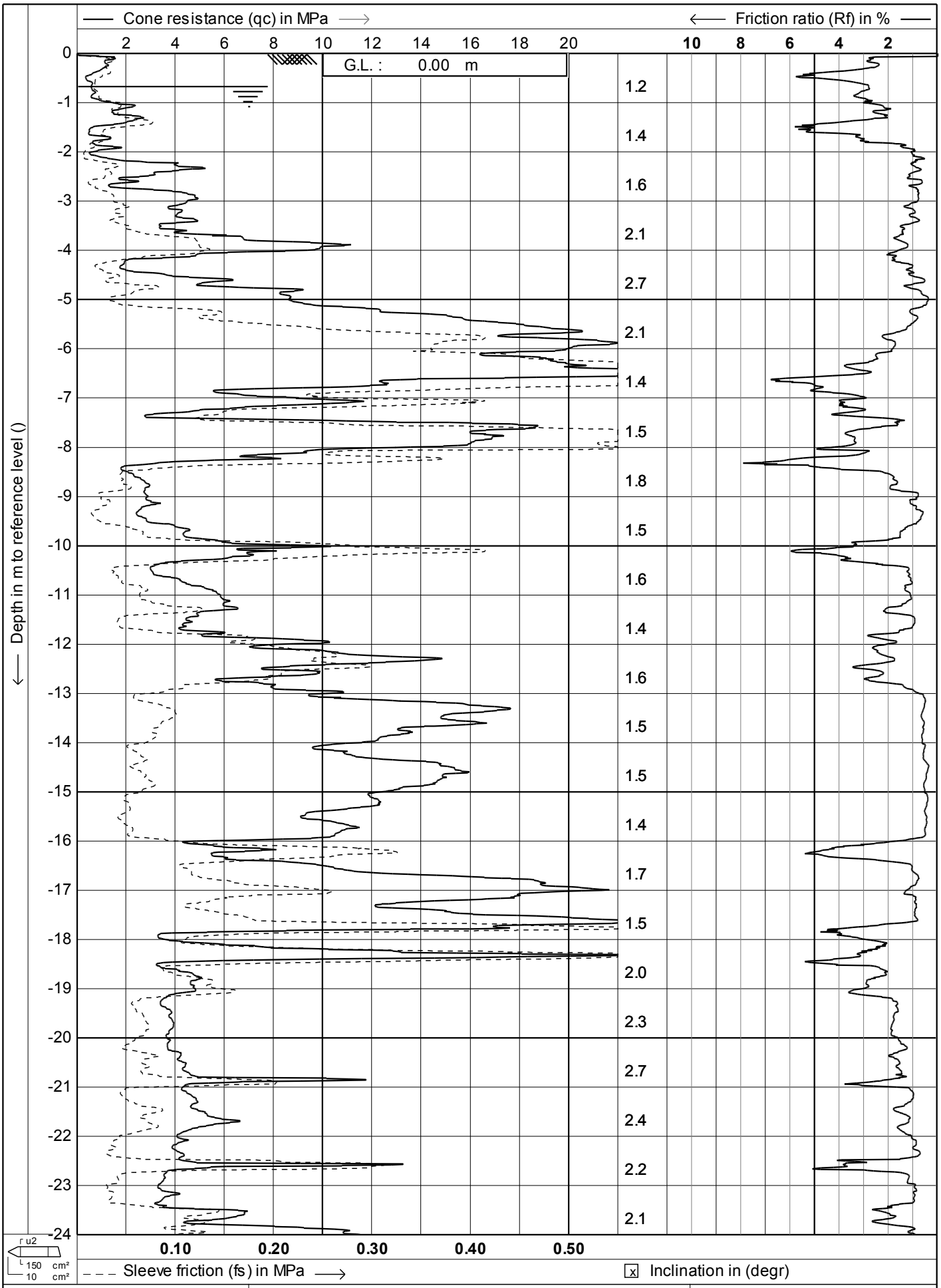
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **107**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

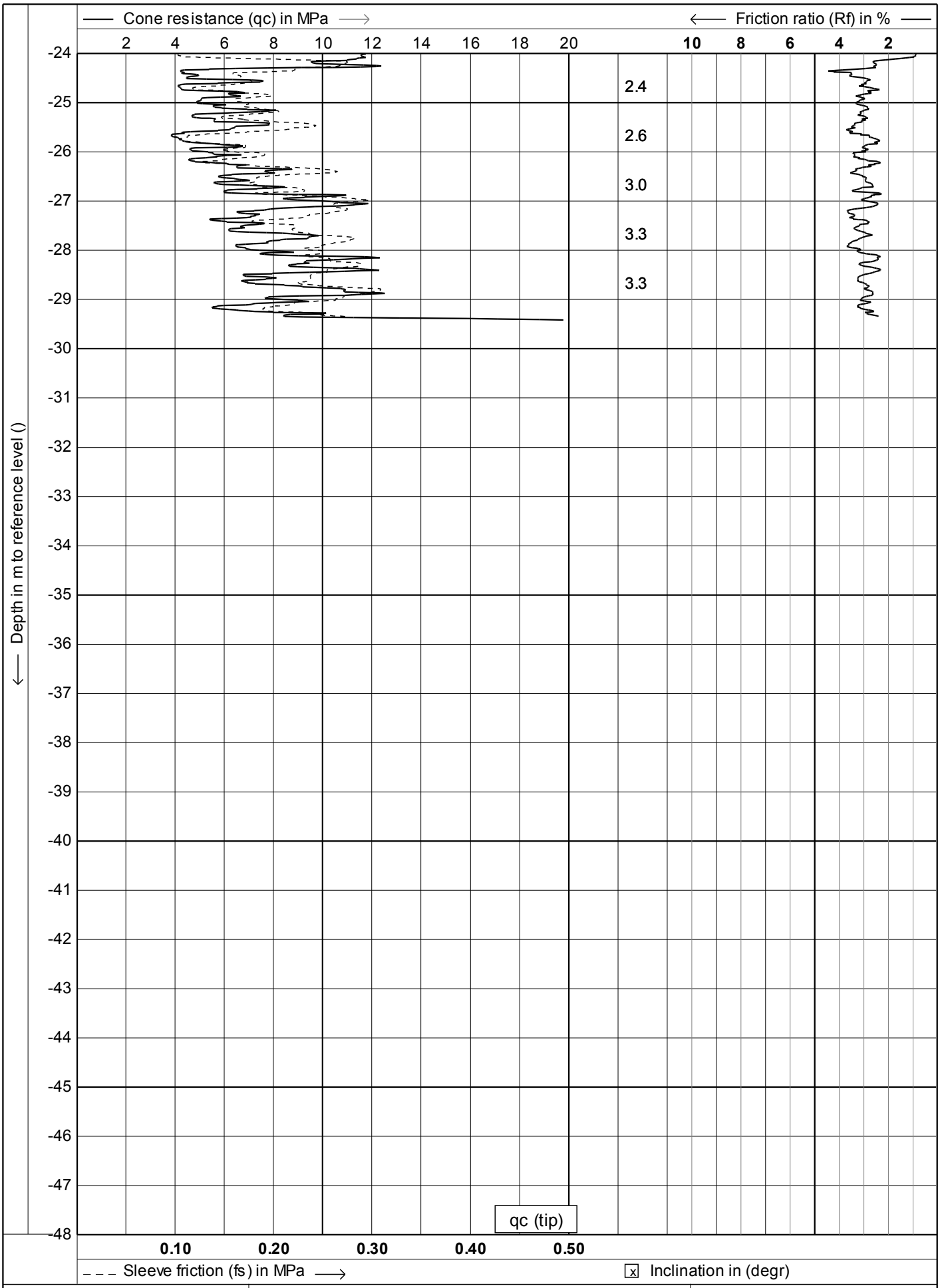
Project no. : **02ET3**

CPT no. : **108**

1/28

Penny Drilling GEO PROBE Ground Drilling and Environmental Specialists

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

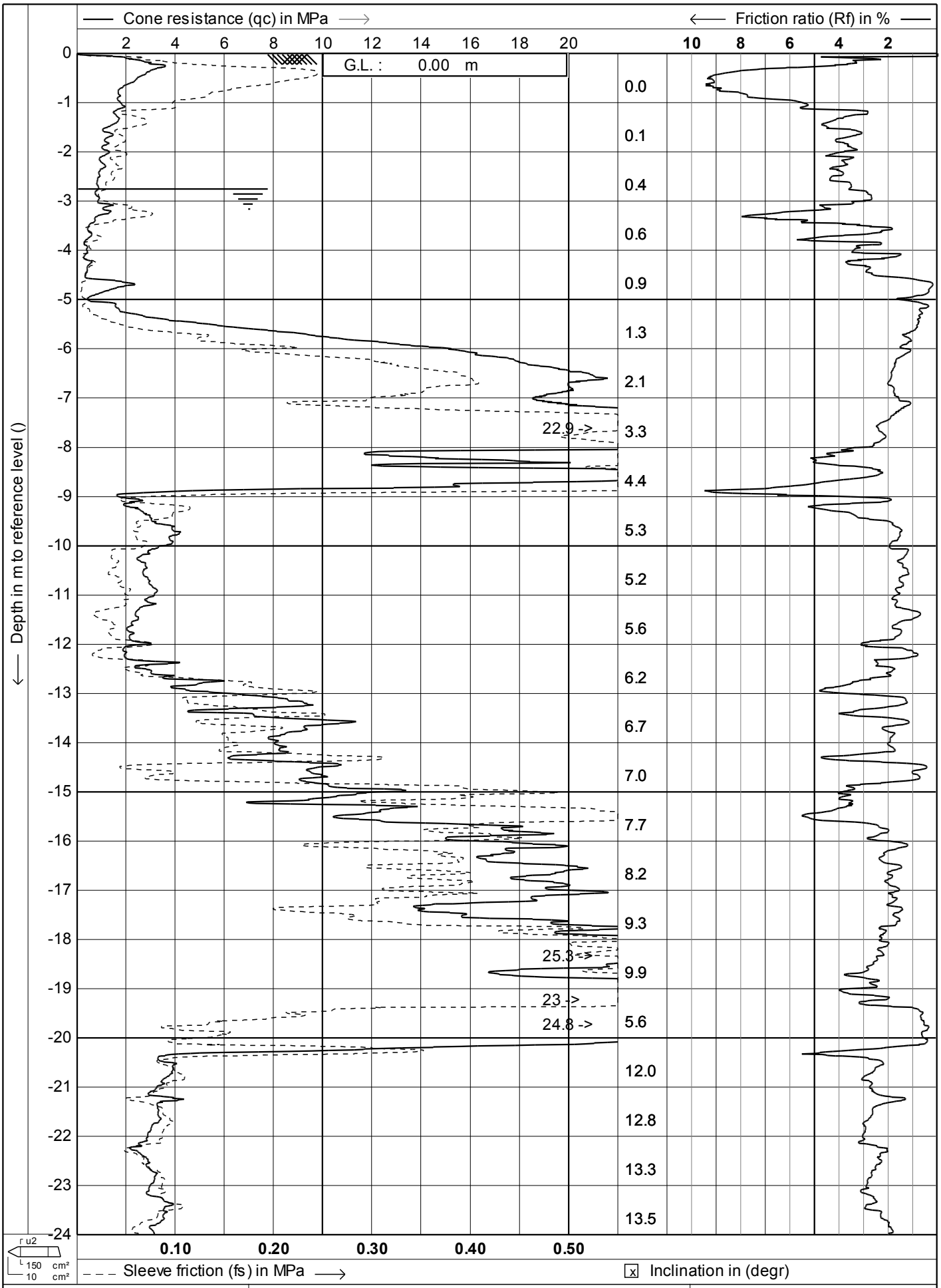
Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

Project no. : **02ET3**

CPT no. : **108**

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

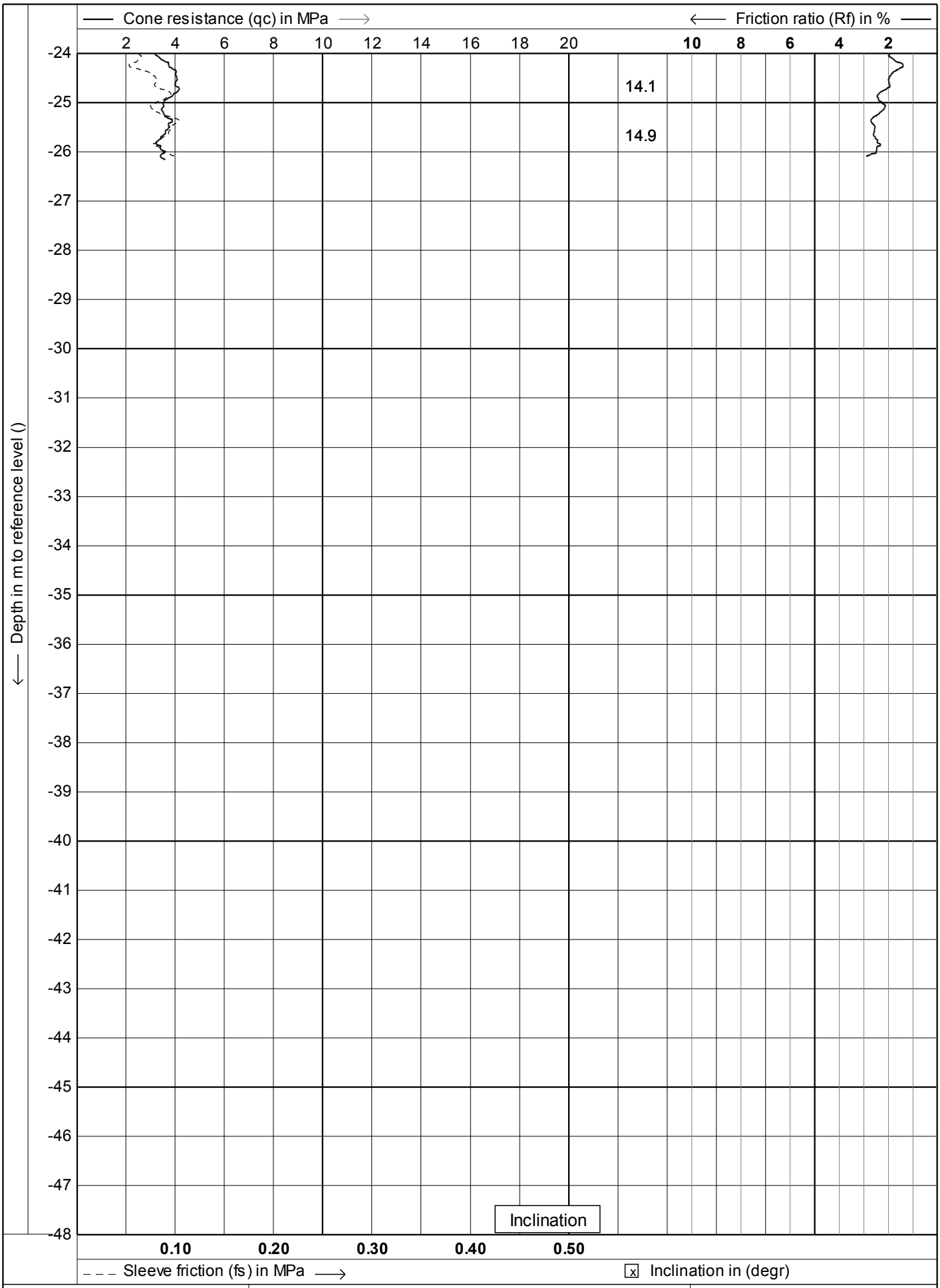
Project no. : **02ET3**

CPT no. : **109**

1/28

Penny Drilling GEOPROBE — Ground Drilling and Environmental Specialists

CPTask V1.14a



Test according A.S.T.M. Standard D 5778-95

Project : **Te Kauwhata Bypass**

Location: **Roto Road - Te Kauwhata**

Date : **19-11-2009**

Cone no. : **C10CFIIP.F57**

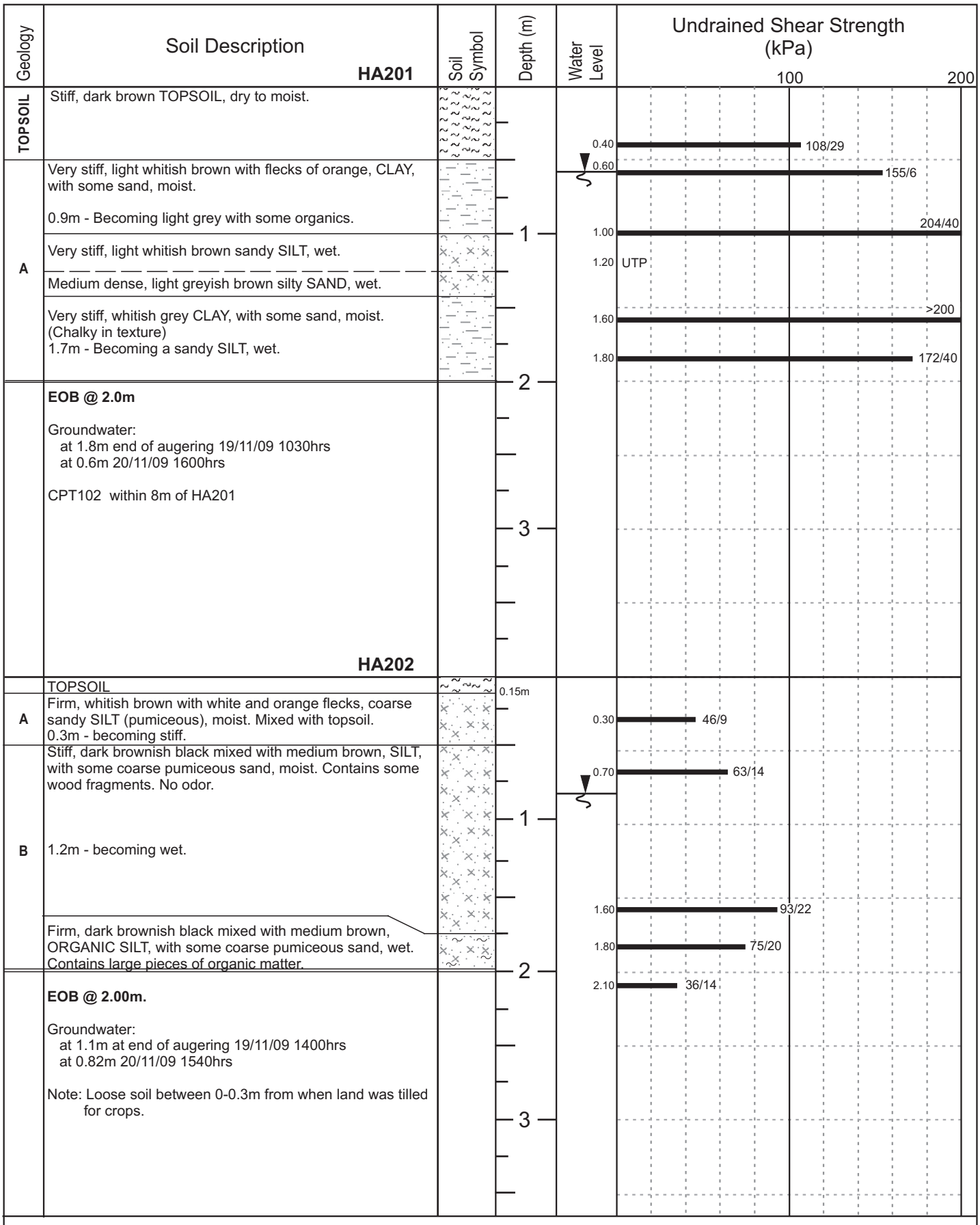
Project no. : **02ET3**

CPT no. : **109**

CPTask V1.14a

HAND-AUGER LOG

Bore No.:	**HA201 and HA202**
Project:	2760 - Te Kauwhata Heavy Vehicle Bypass
Augered by: MW & D. Tracey of Waikato D.C. / Checked by: MW	Date: 19.11.09



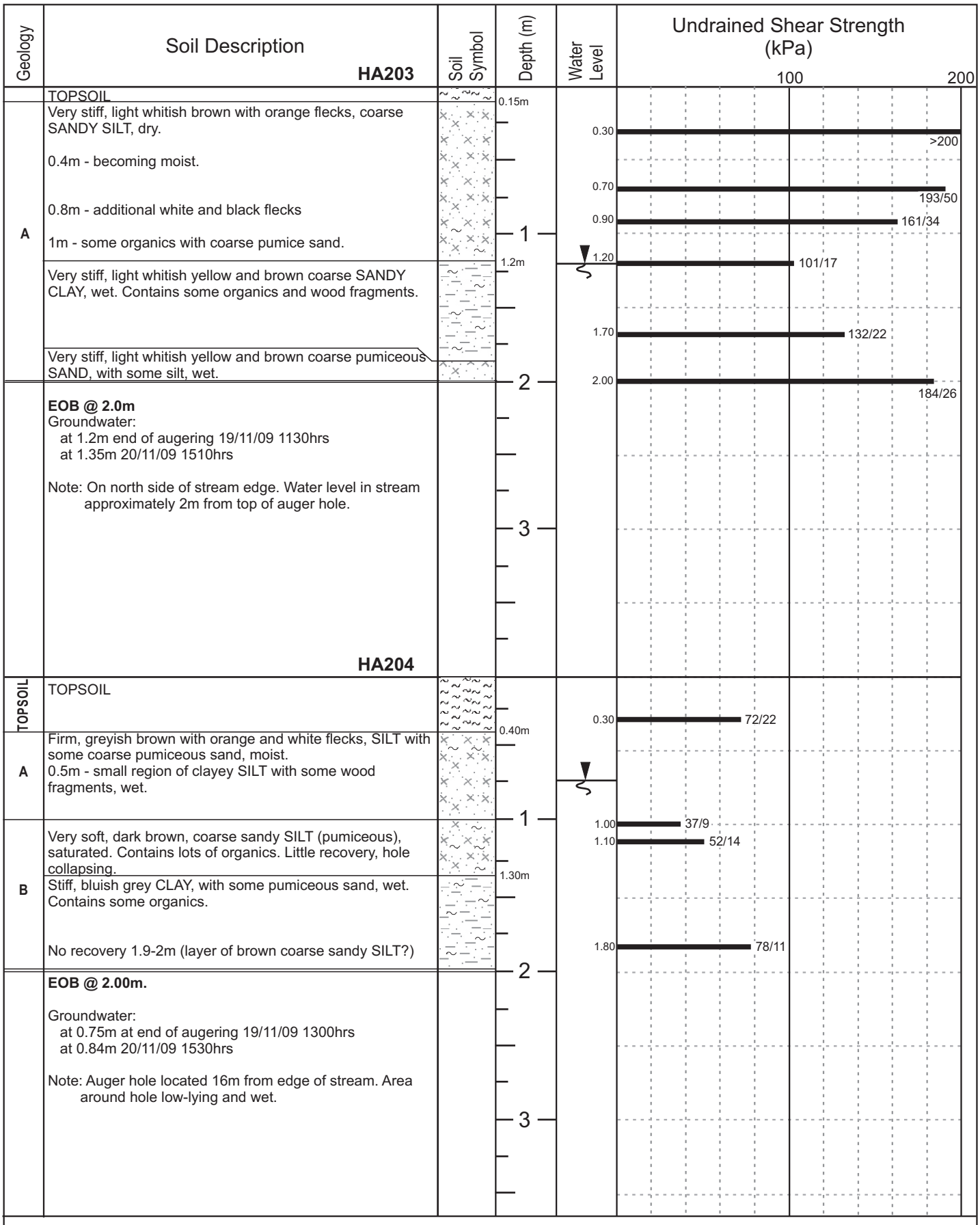
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA203 and HA204**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: 19.11.09



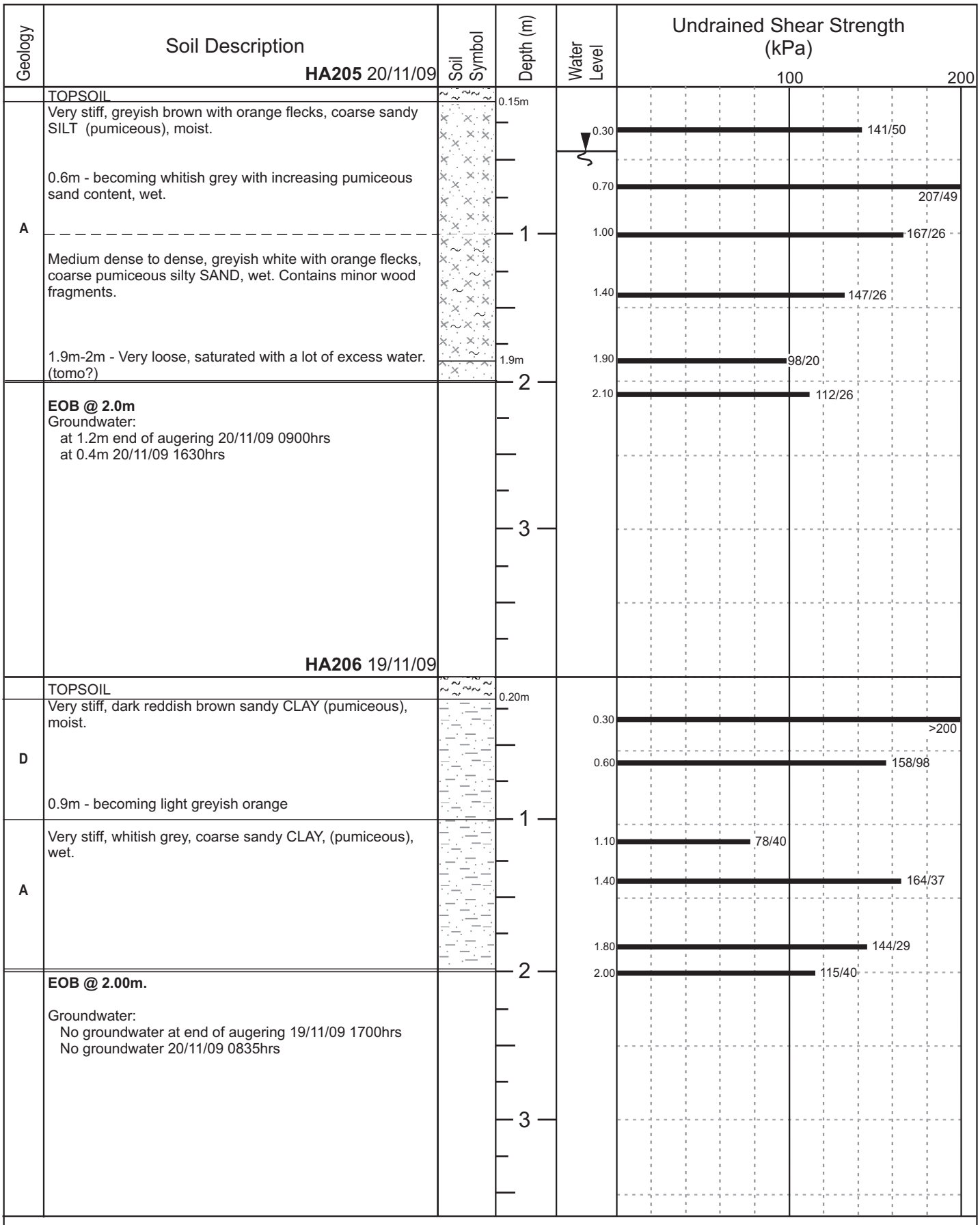
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA205 and HA206**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: as shown



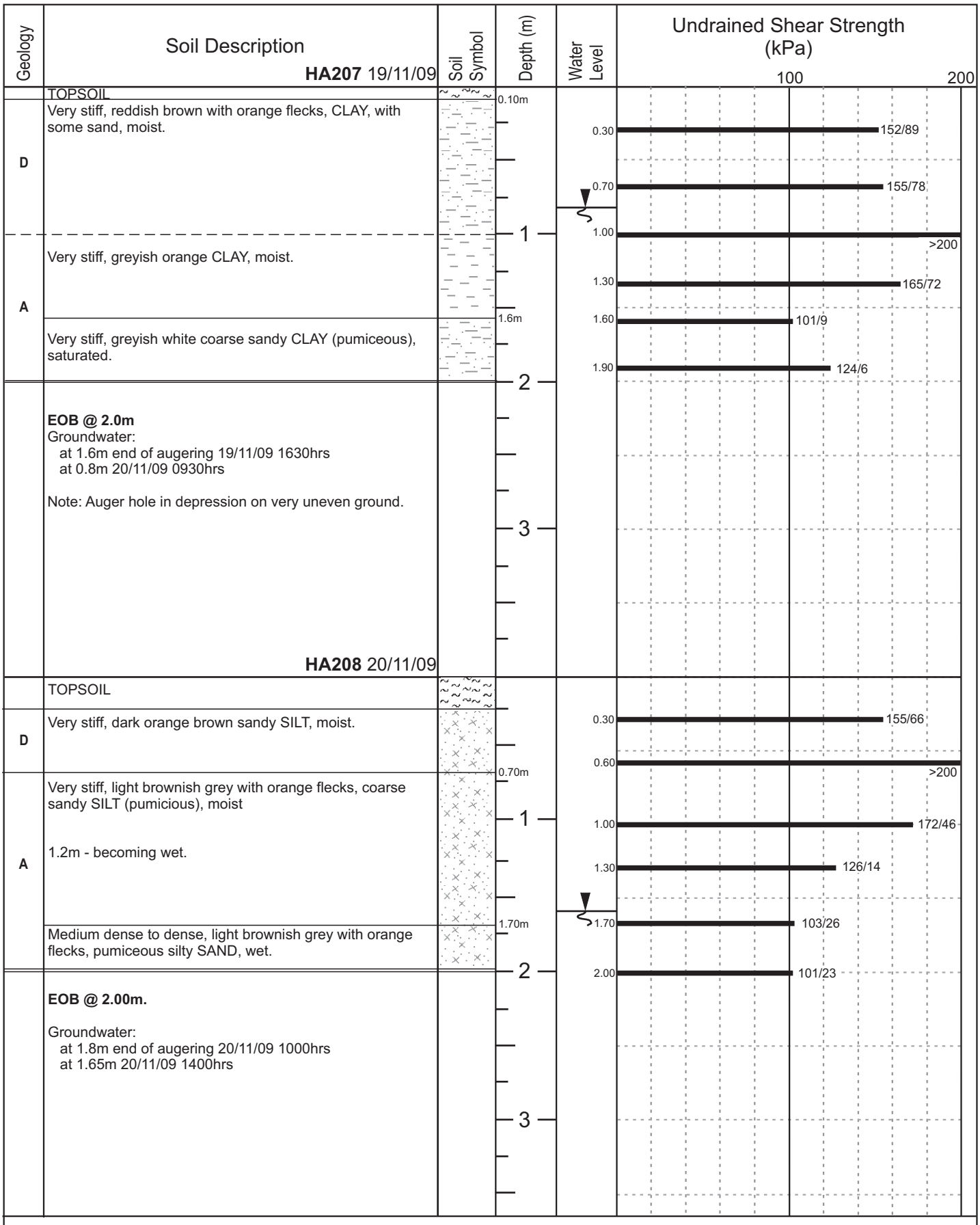
EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.: **HA207 and HA208**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

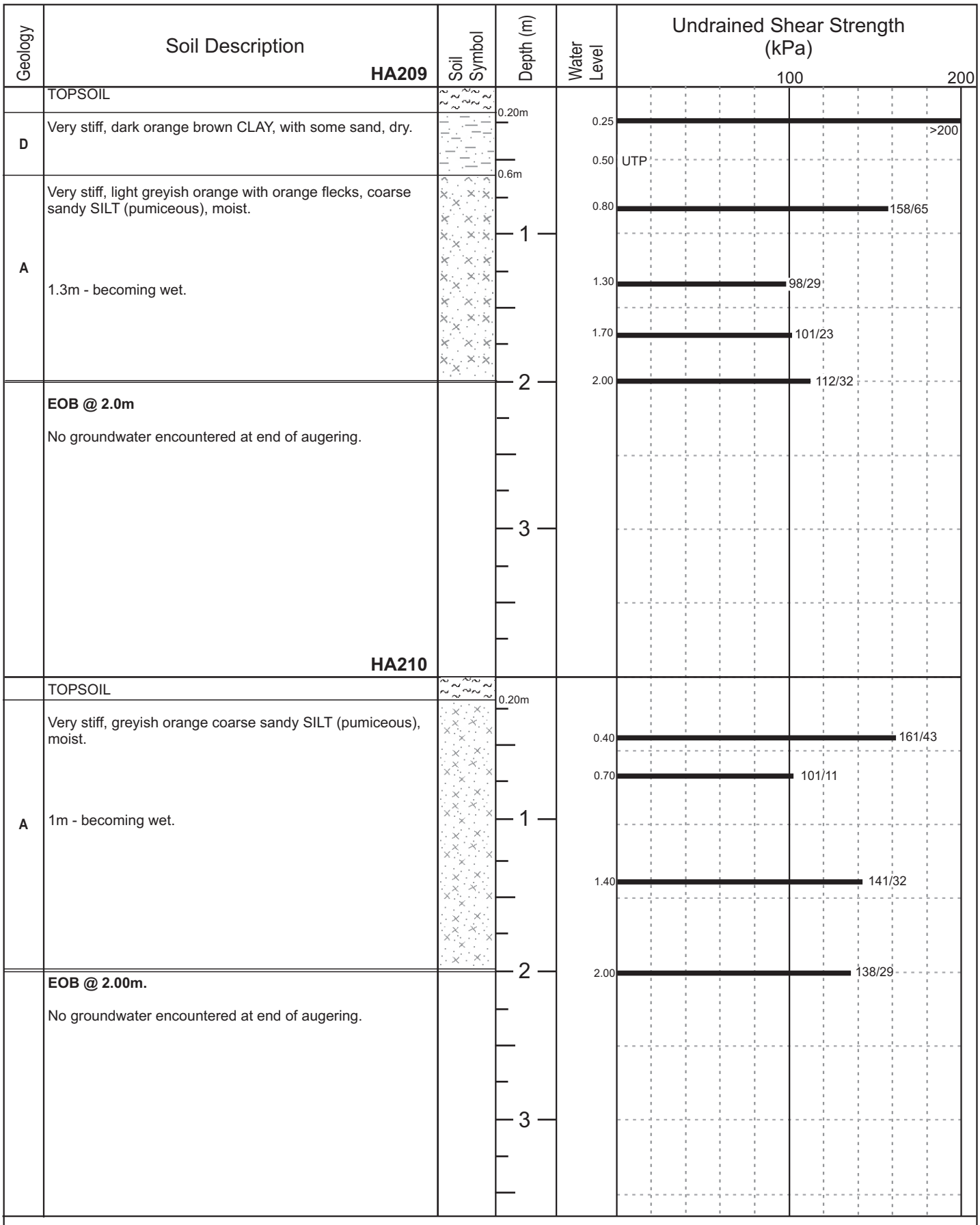
Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW | Date: as shown



EARTHTECH CONSULTING LTD

HAND-AUGER LOG

Bore No.:	**HA209 and HA210**
Project:	2760 - Te Kauwhata Heavy Vehicle Bypass
Augered by: MW & D. Tracey of Waikato D.C. / Checked by: MW	Date: 20.11.09



EARTHTECH CONSULTING LTD

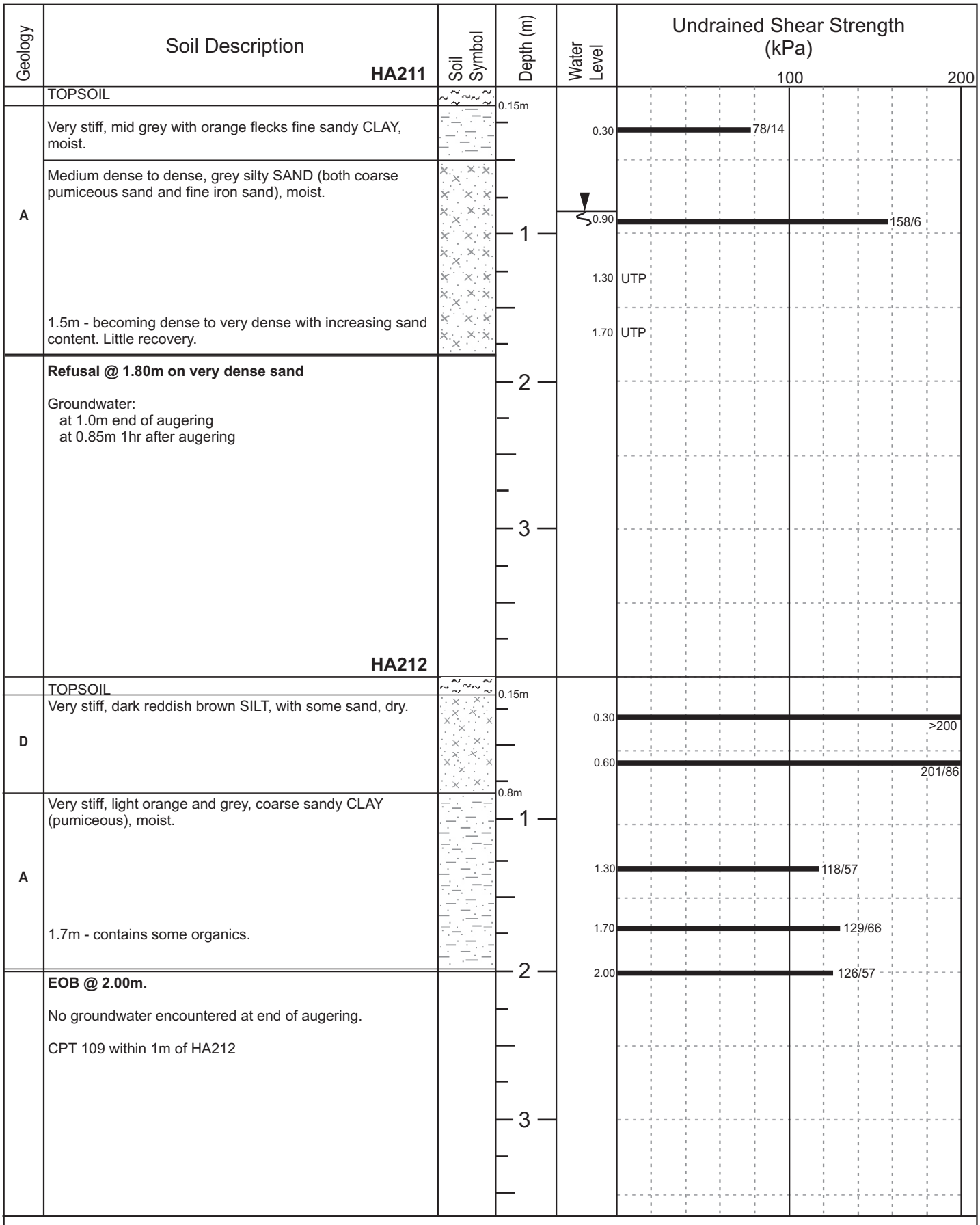
HAND-AUGER LOG

Bore No.: **HA211 and HA212**

Project: 2760 - Te Kauwhata Heavy Vehicle Bypass

Augered by: MW & D. Tracey of Waikato D.C. | Checked by: MW

Date: 20.11.09



EARTHTECH CONSULTING LTD

APPENDIX C – COUNCIL PROPERTY FILES

Land Information

Memorandum

In reply please quote: LIM0289/17
If calling, please ask for: Susan Marr

LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987

The information supplied in this Land Information Memorandum is based on existing Waikato District Council records that may not be complete. The property has not been inspected or surveyed by the Council. It is the purchaser's responsibility to check the boundaries of the property.

It is assumed that any purchaser will search the certificate of title that is not held by the Council and will personally inspect the property and its surrounds. This information deals solely with the property named below, and does not disclose any relevant information that may affect adjacent properties.

It is the sole responsibility of any purchaser to ensure that the land is suitable for a particular purpose.

▶ Property Details:

Valuation Reference:	04390/328.07
Legal Description:	LOT 1-2 DPS 85308 LOT 1 DP 35516 LOT 1 DPS 85309 SEC 52 90 BLK XV MARAMARUA SD
Area:	193.8712 hectares more or less
Property Location:	65 Scott Road TE KAUWHATA
Owners:	Lakeside Farms (1993) Ltd

▶ Property Location:

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

Information regarding –
44A(2)
(c) information relating to any rates owing in relation to the land

▶ Rates & Rating Valuation:

Information regarding –
44A(2)(c) information relating to any rates owing in relation to the land

Annual rates for 2016/2017	$15,903.84 Balance Owing: $0.00 *(Balance of 1st instalment due 23 September 2016)*
Value of Improvements	$ 1,050,000.00
Land Value	$ 5,225,000.00
Capital Value	$ 6,275,000.00
Date of Valuation	1 July 2014

Valuation

Properties in the Waikato District are re-valued every three years in accordance with the Rating and Valuations Act 1988.

Rates and 2011 and 2014 valuations can be viewed online using the Rating Information Database (RID) available on the Waikato District Council website at www.waikatodc.govt.nz

Current Rates

A copy of the current 2016/2017 rates assessment is attached. The 2016/2017 rates are based on the new valuations dated 1 July 2014, which are shown in the table above.

For further information regarding future rates, please contact the Rates Team at the Waikato District Council.

Rates Capital Value

Please note that the rates reflected on this LIM were calculated based on the capital value of the property as at 1 July of the current rating year. Any changes to the capital value of the property that have taken place since 1 July will be reflected in the rating charges for this property in the next rating year. Please contact a member of the rating team on 0800 492 452 if you require further clarification or have any questions.

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Information regarding –
44A(2)
(f) information relating to the use to which that land may be put and conditions attached to that use:
(g) information which, in terms of any other Act, has been notified to the territorial authority by any statutory organisation having the power to classify land or buildings for any purpose:
(h) any information which has been notified to the territorial authority by any network utility operator pursuant to the Building Act 1991 or the Building Act 2004

Under the Waikato District Plan the property is within the:

- Country Living Zone
- Rural Zone
- Designation Policy Area - M104
- Designation Policy Area - L1
- Designation Policy Area - M14
- Flood Limit Policy Area
- Landscape Policy Area
- Structure Plan Boundary Policy Area - Te Kauwhata
- Walkway Cycleway Bridleway Policy Area
- Waikato River Catchment Policy Area

Please refer to the Waikato District Plan or speak to a duty planner regarding specific requirements for development on properties within these areas.

The site is designated for a particular purpose identified in the district plan. Further reference should be made to the Planning Maps, schedules and the authority responsible for the designation. In most cases designated sites carry the same zoning as the surrounding land.

Designations
This property is within close proximity (500m) to land that is designated for a particular purpose:

- *B7 - Lake Kopuera Wildlife Refuge (Government Purpose Reserve)*
- *L1 - North Island Main Trunk Railway*
- *M14 - Wastewater treatment/Landfill*
- *M104 - Te Kauwhata Bypass*

For further information please refer to the planning maps attached and the Waikato District Plan, which is available to view on our website: www.waikatodc.govt.nz <http://www.waikatodc.govt.nz>

Monitoring
This property is subject to a resource consent that requires monitoring by the Waikato District Council. Charges will be made for any monitoring of the consent that takes place. Charges are applied in accordance with Section 36 of the Resource Management Act 1991.

For further information please contact Councils Monitoring Team

Resource Consent decision yet to be made:
An application for Subdivision Consent (*SUB0133/16 - to create 22 new lots*) has been submitted to Council. The consent has not yet had a decision made.

As a decision has not yet been made, Council will not release the information/plans without written approval from the consent applicant.

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Version: 1, Version Date: 15/09/2016

Information regarding –
44A(2)

(f) information relating to the use to which that land may be put and conditions attached to that use:
(g) information which, in terms of any other Act, has been notified to the territorial authority by any statutory organisation having the power to classify land or buildings for any purpose:
(h) any information which has been notified to the territorial authority by any network utility operator pursuant to the Building Act 1991 or the Building Act 2004

For any restrictions of the use of the property please refer to the Certificate of Title.

▶ Resource Consents:

Application No	Description	Decision
	SUBDIVISION CONSENT	**GRANTED**
142/1/1106	- Boundary relocation	17 February 1987
70/98/164	- To create 6 lots and boundary relocation	24 September 1998
SUB0156/07	- To undertake a 2 Stage subdivision	03 August 2010
	- Stage 1 - Separate Land Zoned from Land Zoned Country Living	
	- Stage 2 - Create 22 Lots and 2 Access lots in the Country Living	
	LAND USE CONSENT	**GRANTED**
LUC1076/11	Boundary encroachment relating to proposed shed	18 May 2011
LUC1076/11.01	S127 RMA 1991 - Change to conditions	14 June 2011

Requisitions: No known planning requisitions to date.

Planning rules relating to this property are contained in the Waikato District Plan and are not outlined in this LIM report. The Waikato District Plan is available to view on Council's website at www.waikatodc.govt.nz.

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Information regarding –

44A(2)

(d) information concerning any consent, certificate, notice, order, or requisition affecting the land or any building on the land previously issued by the territorial authority (whether under the Building Act 1991, the Building Act 2004, or any other Act):

(e) information concerning any certificate issued by a building certifier pursuant to the Building Act 1991 or the Building Act 2004:

(ea) information notified to the territorial authority under section 124 of the Weathertight Homes Resolution Services Act 2006:

It is recommended that a potential purchaser engage a building consultant to complete a pre-purchase inspection of buildings. Irrespective of code of compliance, structures are subject to deterioration over time and works may have been undertaken without building consent. If requested and supplied, a copy of this may be filed on council records for future references and Land Information Memoranda.

Architects and designers require wind & earthquake information to establish bracing requirements for building development.

▶ Building Consents/Permits:

Number	Description	Consent/Permit issued date	CCC Issued/ Completed Date
1663A	Erect	09 September 1957	*
1997	Extend dwelling	31 March 1958	*
73708	Hay barn	21 July 1964	*
E025321	Garage/worker accommodation/workshop	24 February 1987	*
E025312	Transportation of dwelling	16 February 1987	*
F003196	Conservatory	25 March 1988	*
F040245	Replace existing shed	09 June 1988	*
90600	Storage shed	21 July 1998	21 October 1998
94100	Septic tank	25 May 2001	11 July 2001
97021	Heater	05 June 2003	17 October 2003
FAST0161/04	Heater	08 June 2004	29 June 2004
BLD1013/07	Cow shed	15 February 2007	15 October 2007
BLD1892/07	Heater with wet back	25 June 2007	17 July 2007
BLD1135/11	Shed	24 May 2011	18 November 2011
BLD0012/14	Replacing garage	05 July 2013	15 August 2013

Requisitions: No known building requisitions to date.

** No completed date recorded on historic County records.*

Please note that Council has no authority to issue Code of Compliance Certificates on Permits issued prior to the 1991 Building Act.

- *Please find attached Site Plan for addition of carport dated 31 May 1973 no Building Consent held on file.*
- *Please note that if there are buildings on this land that were erected prior to 1953, the Council records may not indicate if they had a building permit or not.*

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Version: 1, Version Date: 15/09/2016

■ Water Supply

Information regarding –
44A(2)

(ba) any information that has been notified to the territorial authority by a drinking-water supplier under section 69ZH of the Health Act 1956:

(bb) information on—

(i) whether the land is supplied with drinking water and if so, whether the supplier is the owner of the land or a networked supplier:

(ii) if the land is supplied with drinking water by a networked supplier, any conditions that are applicable to that supply:

(iii) if the land is supplied with water by the owner of the land, any information the territorial authority has about the supply:

The property is located outside an area currently served by a community water supply administered by Waikato District Council.

Development Contributions for subdivison application not yet complete

This property has an incomplete subdivision lodged against it. There are outstanding development contributions payable before issue of the 224 certificate.

Further information on development contributions can be obtained online at https://www.waikatodistrict.govt.nz/your-council/fees-and-charges/development-contributions

■ Drinking Water (potable water supply)

The property is not connected to a community water supply. It is the property owner's responsibility to ensure suitable drinking water is supplied on-site.

The construction of a bore for the taking of ground water requires consent from the Waikato Regional Council, for further information contact Waikato Regional Council.

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Version: 1, Version Date: 15/09/2016

Information regarding –
44A(2)
(b) information on private and public stormwater and sewerage drains as shown in the territorial authority's records:

■ Wastewater

The property is located outside an area currently served by a community system for wastewater disposal.

Existing System
The property has an existing on-site wastewater disposal system. Wastewater disposal systems are sized in relation to the number of bedrooms of a dwelling and the potential occupancy.

Future building works that include additional bedrooms will require an assessment from an engineer or other suitably qualified person approved by the Council, of whether the existing on-site effluent treatment system is capable of adequately treating and disposing of the increased loadings. If upgrades are required, these shall be designed, supervised and certified by an engineer or other suitably qualified person to comply with AS/NZS 1547:2012 and the Waikato Regional Plan.

It is recommended that potential purchasers engage a contractor to inspect the septic tank prior to settlement. The Waikato District Council does not maintain or monitor private wastewater disposal systems and NZ standards indicate a septic tank should be cleaned / emptied every 3 years.

■ Stormwater

The property is located outside an area currently served by a community system for stormwater or land drainage disposal.

For any new development, Onsite Stormwater Disposal will be required under the Waikato District Plan & Waikato Regional Plan prior to connection to any public stormwater network or drains.

For further Information please contact a Project Information Officer at the Waikato District Council.

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Version: 1, Version Date: 15/09/2016

Information regarding –
44A(2)
(a) information identifying each (if any) special feature or characteristic of the land concerned, including but not limited to potential erosion, avulsion, falling debris, subsidence, slippage, alluvion, or inundation, or likely presence of hazardous contaminants, being a feature or characteristic that—
(i) is known to the territorial authority; but
(ii) is not apparent from the district scheme under the Town and Country Planning Act 1977 or a district plan under the Resource Management Act 1991:

LRI (Peat and Slope)
New Zealand Land Resource Inventory Maps indicate that the soils in this area may have poor bearing capacity for building foundations due to Peat and Natural Sloping Topography.

Peat soils may be subject to settlement/expansion with fluctuating ground water levels.

A geotechnical engineer may be required to investigate ground or sub-soil conditions to establish any specific requirements for building development.

Geotech Available
Attached for your information is a copy of the Geotechnical Suitability Assessment Report by Maunsell Ltd, dated 30 October 2008; this was prepared as part of the subdivision application (SUB0156/07).

Flood risk area (WRC)
Under the Waikato District Plan, this property has been identified as being in a flood risk area.
Part of the land or site may be subject to flooding or inundation. A potential flooding hazard has been identified for this site from the attached Waikato Regional Council map at a scale of 1:50,000.

- *Where a proposed building is not above the identified flood level, Land Use Consent may be required under the Resource Management Act. To establish the ground level in relation to the design flood level in terms of Moturiki datum (sea level), it is recommended to engage a registered surveyor. Council holds no records relating to the ground level for this property.*

For further information relating to flooding or land drainage schemes, and to find out more specific information relating to your property, please contact the Waikato Regional Council.

Stormwater Catchment Management Area
The property is located in the Te Kauwhata Stormwater Catchment Management Area. Surface water ponding may occur on some properties during high rainfall events, and in some cases mitigation measures may be required when developing the land. For further Information please refer to Council's website www.waikatodistrict.govt.nz

HAZARD REGISTER
Council's Hazards Register identifies that the land may be subject to Flood risk (Wetland Margins)

For further information please refer to Council's website.

https://www.waikatodistrict.govt.nz/search/2?indexCatalogue=primary&searchQuery=structure plan Te Kauwhata Variation 13&wordsMode=AllWords&orderBy=Relevance

Under section 71-74 of the Building Act 2004, upon application for a building consent applicants must demonstrate that any proposed building work will be protected from hazards.

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Version: 1, Version Date: 15/09/2016

Information regarding –
44A(3) In addition to the information provided for under subsection (2), a territorial authority may provide in the memorandum such other information concerning the land as the authority considers, at its discretion, to be relevant.

■ Health

There are no outstanding Notices or Orders under the Health Act 1956 and related legislation in respect of the property.

■ Refuse

Waikato District Council's goal is to work towards a 'zero waste' target, so from 1 July 2016 we will introduce a pre-paid service to our refuse and recycling to help Waikato residents reduce the volume of waste they send to landfill. Less waste will save us all more in the long-run.

For further information please see https://www.waikatodistrict.govt.nz/services-facilities/refuse-and-recycling

The collection day for domestic rubbish and recycling for the property will be ***Friday*** weekly.

The property is on a domestic refuse collection route. For further information please contact the Council's Community Assets Operations Manager.

■ Utilities

The Waikato District Council does not hold records concerning utility systems it does not administer. For information concerning state highways (administered by NZ Transport Agency), electricity, telephone or gas, the relevant network operator should be contacted.

Yours faithfully

Susan Marr
Land Information Officer

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

Waikato County Council

POSTAL ADDRESS: PRIVATE BAG, HAMILTON, NEW ZEALAND
OFFICE: 1 CLYDE STREET HAMILTON EAST
PHONE (071) 63-199

Your Ref 3050

Our Ref 142/1/1106

G B BURTON
M.I.P.A. N.Z.I.M.M.
County Manager

K Tisch

RT:rm3640K

17 February 1967

Harrison Grierson Consultants Ltd
P O Box 172
HUNTLY

Attention: D C Ison

Dear Sir/Madam

SCHEME PLAN OF SUBDIVISION FOR K B AND J C WHITE, TE KAUWHATA

You are advised that pursuant to a delegated authority, the following is the decision on scheme plan 1106

"Pursuant to Section 279(1)(d) 2(a) and (h) of the Local Government Act 1974 the Waikato County Council grants its approval to the subdivision of land shown on scheme plan 142/1/1106.

Approval is subject to the following conditions:

i) That Lot 1 hereon be transferred to the owners of Part Section 53 (C.T. 35A/295), and that one certificate of title be issued to include both parcels.

ii) That the potable water supply to the dwelling on Lot 1 be independent of Part Section 66.

iii) That any part of the farm shed shown on the Scheme Plan within 90cm of the rear boundary of proposed Lot 1 be upgraded to provide a half hour fire resistance rating in accordance with NZS 1900 Chapter 5.

The reason for this decision is that no new titles will be created, boundaries are practicable and the lots are more suitable for permitted uses."

This decision has been made under the authority delegated to staff by Council. You are advised that you have a right to apply for a review of this decision by the Council, within one month of the receipt of this decision, if you are in any way dissatisfied with this decision.

Should you wish for a review of this decision please fill in the attached form and return it to this office no later than one month from the receipt of this decision.

Yours faithfully
G B Burton
COUNTY MANAGER
Per:

G Cockerell
PLANNING OFFICER

Document Set ID: 1482709
Version: 1, Version Date: 29/03/2016
Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

4.0 Planning Evaluation

4.1 Additional farm dwelling

The applicants state that an additional farm worker is required to help with milking activities on the White Family Trust property. This is partly due to the decreasing involvement of the elderly owner in farming activities.

4.2 Subdivision

4.2.1 No additional titles will be created by this subdivision. The District Land Registrar has given his consent to the proposed amalgamation and has provided an appropriately worded condition.

4.2.2 Boundaries

Boundaries are practical given that they largely follow existing fencelines and encompass the existing area of residential development.

The proposed rear boundary is located between 0.4 - 0.6m from an existing farm shed. Such a farm accessory building is normally required under the district scheme to be located 12m from a boundary. A dispensation has been sought from this requirement and given the existing restrictive arrangement of buildings and minimal effect on amenities and minimal planning significance this could be granted.

Under the Building Bylaws a wall located less than 900 mm from a boundary must be constructed to a 1/2 hour fire rating. A suitably worded condition is recommended to cover this situation. The applicants have indicated verbally that the shed will be altered or possibly removed, to meet bylaw requirements.

4.2.3 Servicing

The existing septic tank disposal system is contained within the proposed boundaries. The dwelling will need to be provided with a water supply independent of Pt Section 66.

4.2.4 Suitability for Permitted Uses

The proposed subdivision will provide a solution to the accommodation problem on each of the affected properties. The proposal will have no adverse effect on farming activities.

5.0 Recommendation:

5.1 " Pursuant to Section 67 and 88 of the Town and Country Planning Act 1977 the Waikato County Council grants its consent to the establishment of a third farm dwelling on proposed Lot 1 shown on scheme plan 142/1/1106, amalgamated with Pt Section 53 Blk XV Maramarua SD.

The reason for this decision is that due to the nature and scale of the existing dairy farming and the decreasing involvement of the owner in farm activities additional permanent labour is required. "

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5.2 " Pursuant to Section 76(2) and 88 of the Town and Country Planning Act 1977 the Waikato County Council grants its consent to allow an existing shed to be located no closer than 0.4m from the proposed rear boundary of Proposed Lot 1 shown on scheme plan 142/1/1107.

The reason for this decision is that it is not practicable in this case to enforce the usual 12m yard standard due to the location of existing buildings, the dispensation will not detract from neighbourhood amenities and will have minimal town and country planning significance. "

5.3 " Purusant to Section 279(1)(b) 2(a) and (n) of the Local Government Act 1974 the Waikato County Council grants its approval to the subdivision of land shown on scheme plan 142/1/1107.

Approval is subject to the following conditions:

i) That Lot 1 hereon be transferred to the owners of Part Section 53 (C.T. 35A/295), and that one certificate of title be issued to include both parcels.

ii) That the potable water supply to the dwelling on Lot 1 be independent of Part Section 66.

iii) That any part of the farm shed shown on the Scheme Plan within 900mm of the rear boundary of proposed Lot 1 be upgraded to provide a half hour fire resistance rating in accordance with NZS 1900 Chapter 5.

The reason for this decision is that no new titles will be created, boundaries are practicable and the lots are more suitable for permitted uses. "

C B Batchelar
Assistant Planning Officer
12 February 1987

Approved/~~Declined~~ pursuant to Delegated Authority

.....
COUNTY MANAGER

.....
CHIEF PLANNING OFFICER

482D

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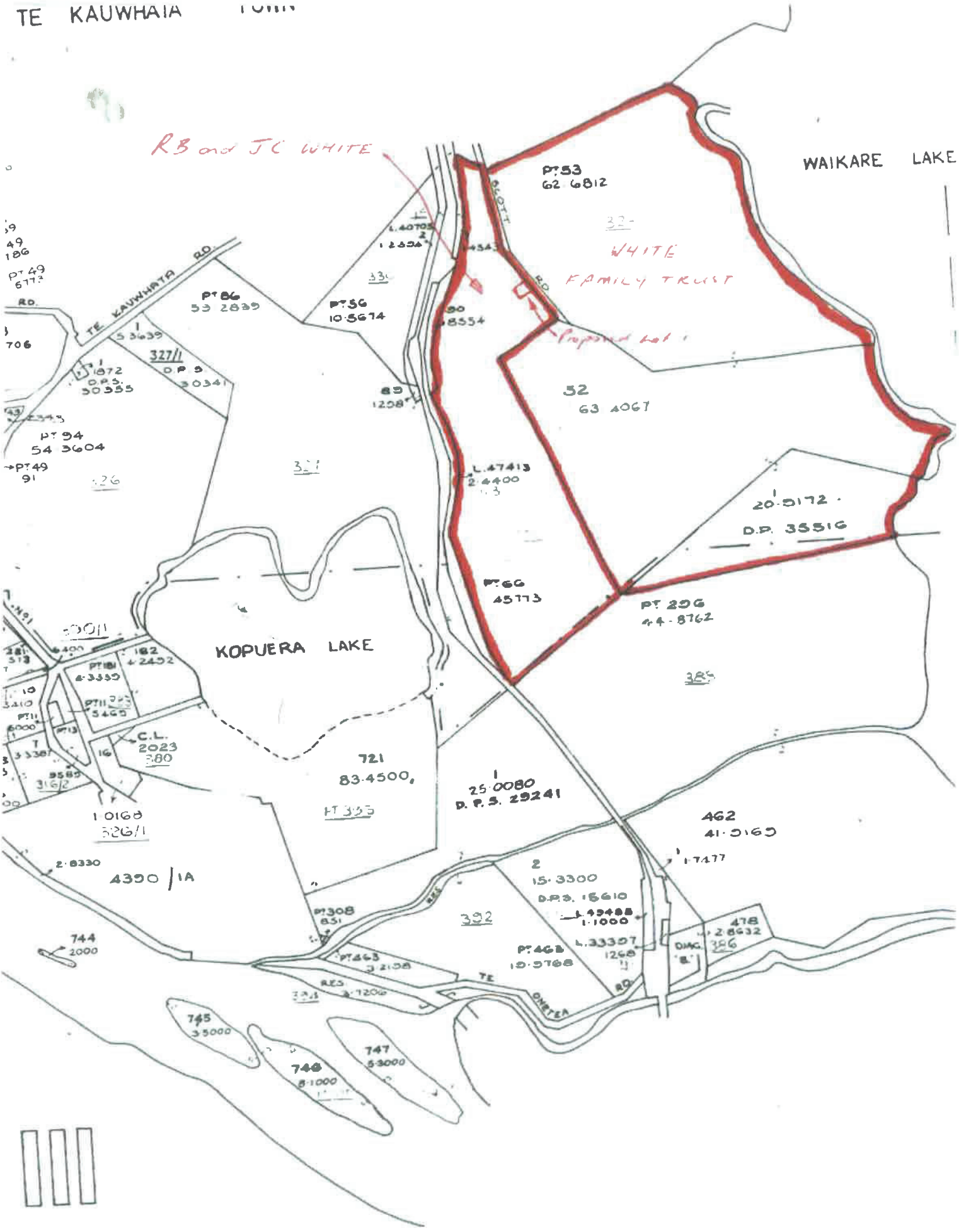

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WAIKATO DISTRICT COUNCIL

15 Galileo Street
Private Bag 544
NGARUAWAHIA

Telephone: 0-7-824 8633
Facsimile: 0-7-824 8091

Your Ref:
1924
In reply please quote:
70 98 164
If calling, please ask for:
Rajiv Raman

24 September 1998

Faxed 24/9/98 GLM

FILE

Thomson and Farrer
P O Box 376
HAMILTON

Dear Sir/Madam

APPLICATION FOR RESOURCE CONSENT: R AND J WHITE, 65 AND 94A SCOTT ROAD, TE KAUWHATA

You are advised of the following decision on your application, which has been made pursuant to a delegated authority by the Development Planner.

"That pursuant to sections 34(4), 105(1)(a), (b) and (c), 108 and 220 of the Resource Management Act 1991 the Waikato District Council under delegated authority grants its consent to an application for a subdivision consent for a controlled activity to create a Boundary Relocation Lot and to adjust a boundary, and a discretionary activity to create a Rural House Lot, a Surplus House Lot, and a two Rural Residential Lots, and a non-complying activity to create a Rural House Lot, under the Waikato District Plan on sites legally described as Part Section 53 Block XV Maramarua Survey District, Part Section 66 Block XV Maramarua Survey District and Section 90 Block XV Maramarua Survey District, comprised in Certificate of Title 40C/296, Certificate of Title 40C/297 and Certificate of Title 1404/48 respectively, South Auckland Registry, subject to the following conditions:

1 That the Land Transfer plan to give effect to this Resource Consent shall be generally consistent with the proposal shown on Thomson & Farrer plan (Reference: 97/2/37B, F1924, approved copy attached) submitted for application No.7098164, and received by Council on 10 August 1998 subject to amendment by conditions of this consent.

2 That a Building Restriction Covenant Area be created on that part of Lot 2, which is within 40m of Lot 5.

That no Building(s) (as "Building" is defined under the Building Act 1991) be erected within the Building Restriction Covenant Area of Lot 2 provided that this shall not apply to Exempt Buildings and Building Work as listed under the Third Schedule to the Building Act 1991.

3 That the area of Lot 3 be amended to accommodate a suitable building platform of either a 30 metre diameter circle or a rectangle of 1,000m^2 of which one dimension shall be at least 25.0 metres, exclusive of yard requirements.

FINANCIAL CONTRIBUTION

4 That pursuant to section 108 of the Resource Management Act 1991, a reserve contribution of $4,500.00 incl. GST (Four thousand five hundred dollars) be paid to the Council in lieu of vesting land.

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ROADING

5 That Lot 1 be provided with a sealed standard residential vehicle entrance located as indicated on the scheme plan, and constructed in accordance with WDC plan No. TSG-E3 to the satisfaction of Council.

6 That Lot 2 be provided with a sealed standard residential vehicle entrance located as indicated on the scheme plan and constructed in accordance with WDC plan No. TSG-E3 to the satisfaction of Council.

7 That the existing entrance to Lot 3 be upgraded to a sealed standard residential vehicle entrance located as indicated on the scheme plan and constructed in accordance with WDC plan No. TSG-E3 to the satisfaction of Council. The entrance shall be sealed from the edge of the road, to the power pole located 16 metres from the road edge.

8 That Lot 4 be provided with a sealed standard residential vehicle entrance located as indicated on the scheme plan and constructed in accordance with WDC plan No. TSG-E3 to the satisfaction of Council.

9 That Lot 5 be provided with a sealed standard residential vehicle entrance located as indicated on the scheme plan, and constructed in accordance with WDC plan No. TSG-E3 to the satisfaction of Council.

10 That Lot 6 be provided with a sealed standard residential vehicle entrance located within 30metres of the southern boundary, and constructed in accordance with WDC plan No. TSG-E3 to the satisfaction of Council.

11 That the existing cowshed and dwellinghouse entrance on the western side of Scott Road, located at Rural Address Property Identification number 78, be upgraded to a sealed standard heavy commercial vehicle entrance, located as indicated on the scheme plan, and constructed in accordance with WDC plan No. TSG-E1 to the satisfaction of Council.

12 That the existing dwellinghouse entrance on the eastern side of Scott Road, located at Rural Address Property Identification number 65, be upgraded to a sealed standard residential vehicle entrance located as indicated on the scheme plan and constructed in accordance with WDC plan No. TSG-E3 to the satisfaction of Council.

13 That the existing entrance on the eastern side of Scott Road, adjacent to the northern boundary of Lot 1, be upgraded to a sealed standard commercial vehicle entrance located as indicated on the scheme plan and constructed in accordance with WDC plan No. TSG-E2 to the satisfaction of Council.

14 The surface of the sealed entrances, shall be two coat chip seal, constructed with 180/200 grade bitumen and G3 and G5 chip, and not less than 5 metres from the edge of seal, or to the property boundary if that is more than 5 metres.

15 That pursuant to section 108(2)(a) of the Resource Management Act 1991, a roading fee of $17,920.00 (Seventeen thousand nine hundred and twenty dollars) inclusive GST be paid to Council for Lots 1, 2, 3, 5 and 6. This is based on a Uniform Roading Fee of $3,584.00 (Three thousand five hundred and eighty four dollars) inclusive of GST for the five additional lots created by the subdivision. Should the Roading Fee not be paid within 12 months from the date of the issue this consent the quantum shall be adjusted by the Cost Construction Index on an annual basis.

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UTILITY CONDITIONS

16 That pursuant to section 108(2)(a) of the Resource Management Act 1991, a capital contribution of $13,200.00 (Thirteen thousand two hundred dollars) inclusive of GST be paid to Council towards provision of a trickle-feed water supply to Lots 1, 2, 3, 4, 5 and 6.

17 That $300.00 per Lot be paid to Council for provision of connection to the water supply.

LEGAL

18 That owner(s) and all subsequent owner(s) of Lot 3 (Surplus House Lot) and Rural Residential Lot 5 be advised that:

(a) The dwellinghouse on Lot 3 is located within the 150 metre buffer zone of effluent treatment ponds located on part Lot 66 Block XV Maramarua SD (residue CT 40C/297); and

(b) That Lot 5 (Rural Residential Lot) is located within the 300 metre buffer zone of effluent treatment ponds located on part Lot 66 Block XV Maramarua SD (residue CT 40C/297).

19 That pursuant to section 221 of the Resource Management Act 1991 the:

(a) Existing and future owner(s) of proposed Lots 3 and 5 be advised of condition 20 by way of a Consent Notice; and

(b) Existing and future owner(s) of proposed Lot 2 be advised of condition 2 by way of a Consent Notice.

The Consent Notice shall be prepared by the Council's solicitors at the applicant's expense prior to the Council signing the 224(c) certificate for this subdivision application.

AMALGAMATION CONDITION

20 That section 90 Block XV Maramarua Survey District (CT 1404/48) be held in the same Certificate of Title as part Lot 66 Block XV Maramarua SD (residue CT 40C/297).
See B.470711

POWER AND TELEPHONE

21 That the network utility operators responsible for the provision of electricity and telephone services provide written confirmation that the connections and reticulations have been undergrounded to the boundary of Lots 5 and 6.

Advisory Note:

1 The cost of providing water supply and sewer connections to each lot is additional to capital contributions referred to in Condition 16 of this consent.

2 When Building Consents are applied for the following matters will need to be addressed in any application:

i The northern part of Lot 6 is low lying and contains an area of fill. This area is unsuitable for building and the disposal of effluent.

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The reasons for this decision are:

a) The proposal satisfies the requirements of Rules 9S2.3, 9S2.6, 9S2.7, 42.5.6, 42.5.8 and 42.5.9 of the Waikato District Plan as they relate to the creation of Rural House Lots, Surplus House Lots, Boundary Relocations and Boundary Adjustments.

b) The actual and potential adverse effects on the environment of granting consent to subdivide will be able to be avoided, remedied, or mitigated by the imposition of the above conditions.

c) The Reserve Contribution is a financial contribution, which would assist in off-setting the effects of increased demand for facilities and land generated by the subdivision. The reserve contribution is made necessary by the additional demand generated by new residents and would help pay for additional reserve areas or facilities and the future development of existing facilities. Reserve Contributions are imposed at the flat rate of $1,125 inclusive of GST for each lot created by subdivision upon which a dwelling or dwellinghouse are authorised by this District Plan. Four additional Lots are being created by this subdivision on which there are no existing dwellinghouses, therefore four Reserve Contributions are applicable.

d) The Uniform Roading Fee is a financial contribution, which allows the developer to contribute a fair share of the cost of providing services, which are necessary to serve new developments. The Roading Fee would also contribute financially towards any capital improvements to Council's roading infrastructure in the District, which the subdivision will use. This would also assist in ensuring that roads in the District are able to safely and efficiently accommodate additional traffic arising from the subdivision. The maximum uniform roading fee per Lot is $3,584.00 inclusive of GST for the 1998 /1999 financial year. The maximum uniform roading fee is adjusted on an annual basis by the change in the Cost Construction Index. Five additional Lots are being created by this subdivision therefore five roading fees are applicable.

e) The requirement that a consent notice be registered against the Certificates of Title for Lots 3 and 5 would ensure that all present and future owner(s) and occupier(s) of the sites are aware of the existence of effluent treatment ponds within 150m of the dwellinghouse on Lot 3 and within 300 metres of the Rural Residential Zone boundary. Maintenance of an in-adequate separation distance between effluent disposal systems and rural residential activities may reduce amenity values due to odour and potential health risk from the presence of the effluent treatment ponds.

f) It is considered more practicable to have Lot 2 within 40m of Lot 5 and to impose a building restriction along the northern boundary of Rural House Lot 2 than to have an awkward shaped area on the balance Rural Lot area, which would be unprotected in terms of potential for building, and which would result in an awkward shape for farm management purposes.

g) The requirement that area of Lot 3 be amended is a reiteration of the requirement that every lot other than one created for reserve, road, utility or designation requires to be provided with a suitable building platform.

h) The proposal will not be contrary to the relevant Objectives and Policies of the Waikato District Plan and meets the threshold test in section 105(2A) of the Resource Management Act 1991 for granting consent to non-complying activities. The effect of granting consent would not create a conflict with the relevant Objectives and Policies of the Waikato District Plan or adversely affect the public perception to its consistent administration."

This decision has been made under the authority delegated to staff by Council.

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A Lapsing of Consents

Your attention is drawn to section 125 of the Resource Management Act 1991. A summary of that section is that subject to sections 357 and 358 a resource consent lapses on the expiry of 2 years after the date of commencement of the consent, or after the expiry of such shorter or longer period as is expressly provided for in the consent, unless

(a) The consent is given effect to, before the end of that period:
or
(b) An application is made to Council up to 3 months after the expiry of that period which meets the criteria specified in section 125.

B Review of Decision on non-notified application

Your attention is drawn to section 357(2) of the Resource Management Act 1991. This section provides that there is a right of objection to Council in respect of this decision. Section 357(5) requires:

Any such objection shall be made by notice in writing to the Council, setting out the reasons for the objection, within 15 working days after the decision or requirement being notified to that person, or within such further time as may in any case be allowed by the consent of the Council.

C Right of Appeal

Your attention is drawn to the Resource Management Act 1991 Sections 120 and 121 and also Resource Management Regulations 1991/170 Clause 10 and Part VI. Some key provisions to note are as follows:

i You may appeal against the decision of the Council by lodging a Notice of Appeal in the prescribed form with the Registrar of the Environment Court within 15 working days of the receipt by you, or the person who filed the application on your behalf, of the Council's decision. The address of the Environment Court is as follows:

The Registrar
Environment Court
P O Box 5027
Wellington

ii The appeal must be in the form prescribed by the Resource Management (Forms) Regulations 1991/170 or to like effect. The regulations may be purchased from the Government Printing Office. The form is identified as Form '7' in the regulations.

iii A filing fee of $55.00 GST inclusive must accompany every document by which appeal proceedings are commenced.

iv Regulation 11 of the Resource Management (Forms) Regulations 1991/170 sets out important information as to the persons upon whom the appeal must be served and the time when service must take place. It is essential that these provisions be adhered to. Failure to do so may result in your appeal being struck out.

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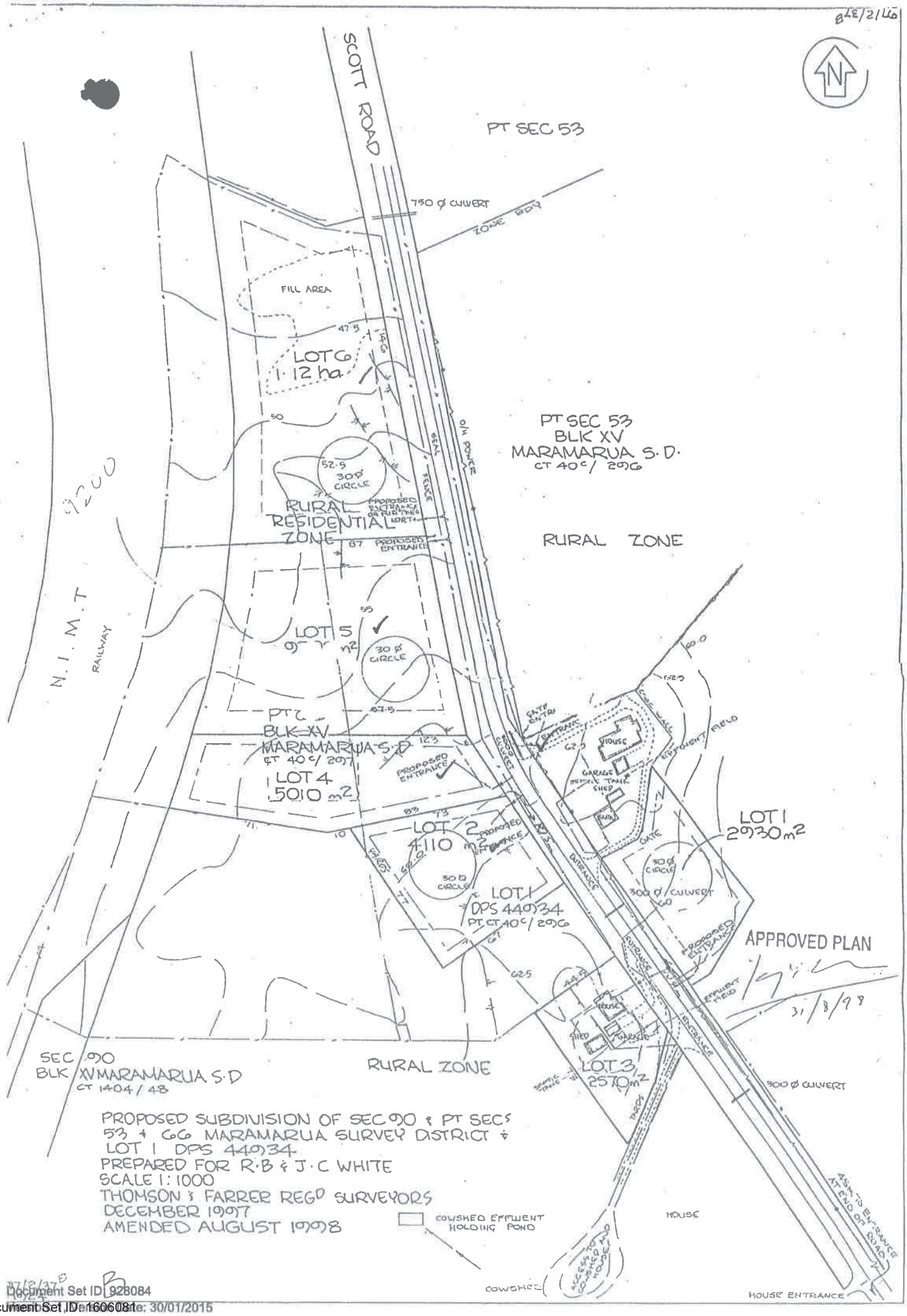

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If you are in any doubt as to the procedures to be followed it is strongly recommended that you consult a lawyer.

Yours faithfully
M Buttimore
MANAGER

Marie Radford
PLANNING CONSENTS OFFICER SUPERVISOR
POLICY AND CORPORATE SERVICES

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Resource Consent

(Resource Management Act 1991)

DECISION ON APPLICATION SUB0156/07

Pursuant to Sections 34A(1), Section 104, 104C, 108 and 220 of the Resource Management Act 1991, the Waikato District Council, under delegated authority, grants Subdivision Consent for a Restricted Discretionary Activity to:

Activity:	Undertake a 2 Stage Subdivision: *Stage 1:* Separate Land Zoned Rural from Land Zoned Country Living *Stage 2:* Create 22 Lots and 2 Access lots in the Country Living Zone
Consent Holder:	Lakeside Farms Ltd
Location Address:	94A Scott Road, Te Kauwhata
Legal Description:	Lot 1 DPS 85308 as comprised in SA66B/990

This consent is subject to the conditions detailed in the attached Schedule 1.

The reasons for this decision are detailed in the attached Schedule 2.

Dated at Ngaruawahia this 3rd day of August 2010

For and on behalf of Waikato District Council

Nath Pritchard
GENERAL MANAGER REGULATORY

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Schedule 1

Conditions of Consent

Resource Consent No: SUB0156/07

STAGE 1 (LOTS 1 – 3)

Planning Conditions

PC1 The Land Transfer Plan to give effect to this Resource Consent shall be generally consistent with the approved plan prepared by Blue Wallace Surveyors, reference 04/223 including Drawing #2 (drawn 19 April 2010), submitted in support of application SUB0156/10 which was received by Council on 7th December 2006. A copy of the approved plan is attached.

PC2 The consent holder shall ensure that, should any human remains or archaeological items be exposed while undertaking works to give effect to conditions of this consent, works in that area will cease immediately. The Police, New Zealand Historic Places Trust, and Kaumatua representing the local Tangata Whenua shall be contacted and work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

PC3 The consent holder shall notify the Waikato District council Monitoring Department in writing two weeks prior to the commencement of site activities associated with this consent.

PC4 Written confirmation shall be provided from network utility operators for telecommunication and energy supply confirming that the connections and reticulations have been placed underground to the boundaries of Lots 1- 3 prior to the section 224 certificate being signed by Council.

Financial Contributions - Reserves

FC1 Pursuant to Section 108(2)(a) of the Resource Management Act 1991, a reserve contribution of $3,432.00 (Three Thousand Four Hundred and Thirty Two Dollars) GST inclusive, shall be paid to Waikato District Council for the 2 additional lots created in Stage 1.

Advisory Notes:

A reserve contribution is required for each lot created by subdivision upon which a dwellinghouse or dwellinghouses are authorised by the Waikato District Plan. Stage 1 of the subdivision will result in the creation of 2 additional titles. The quantum of financial contribution is based on $1,716.00 (One Thousand Seven Hundred & Sixteen Dollars) for each lot.

Financial Contributions - Roading

FC2 Pursuant to section 108(2)(a) of the Resource Management Act 1991 a roading fee of $18,478.00 (Eighteen Thousand Four Hundred and Seventy Eight Dollars), GST Inclusive shall be paid to the Waikato District Council for the 2 additional lots created in Stage 1.

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Advisory Notes:

The quantum of the financial contribution is based on $9,239.00 (Nine Thousand Two Hundred and Thirty Nine Dollars) for each lot.

Development Contributions – Community Facilities

DC1 Pursuant to the Resource Management Act 1991 the s.224 Certificate will not be issued until such time as the consent holder has paid to Council the Development Contributions as prescribed in the advisory note set out below.

Development Contributions - Advisory Note:
Pursuant to Section 106(2) of the Local Government Act 2002 a District Wide Community Facilities Development Contribution of $610.86 (Six Hundred and Ten Dollars and Eighty Six Cents) GST inclusive shall be paid to Council for the two additional lots. This is based on a Development Contribution of $305.43 (Three Hundred and Five Dollars and Forty Three Cents) per lot for Community Facilities.

Please note: If the contributions are not paid within the financial year of issuing the Resource Consent, the amounts due will be adjusted on July of each year in accordance with the fees and charges prevailing at the time of payment.

Development Contributions – Water Supply

DC2 Pursuant to the Resource Management Act 1991 the s.224 Certificate will not be issued until such time as the consent holder has paid to Council the Development Contributions as prescribed in the advisory note set out below.

Development Contributions - Advisory Note:
Pursuant to Section 106(2) of the Local Government Act 2002 a Water Supply Development Contribution of $8,501.84 (Eight Thousand, Five Hundred and One Dollars And Eighty Four Cents) GST inclusive shall be paid to Council for the two additional lots. This is based on a Development Contribution of $4,250.92 (Four Thousand, Two Hundred and Fifty Dollars and Ninety Two Cents) per lot for Water Supply.

Please note: If the contributions are not paid within the financial year of issuing the Resource Consent, the amounts due will be adjusted on July of each year in accordance with the fees and charges prevailing at the time of payment.

Roading Conditions

RC1 If at the time of survey it is found that the existing farm access to Proposed Lot 3 is over other land (ie land not the subject of this subdivision), then the consent holder shall undertake either of the following to the satisfaction of Council prior to the approval of the 223 survey plan:

Either

(a) Relocate the access to a position within Lot 3 and form to the appropriate standard specified in the District Plan, or

(b) Establish appropriate easements to protect the ongoing use of the existing access.

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Utility Conditions

UC1 *Lot 1 Effluent Disposal System*

At the time of application for survey plan approval, the consent holder shall provide a plan identifying the location of the existing domestic effluent treatment and disposal system on Proposed Lot 1. If any part of the existing system is located outside the proposed boundaries of the lot then the system shall be relocated so that it is wholly within the boundaries.

UC2 *Consent Notice – Lot 1 Reticulated Sewer Connection*

The current and future owners of Proposed Lot 1 shall be advised that at the time of commissioning of the reticulated sewer system required in terms of Stage 2 of this consent, they shall be responsible for ensuring that :

(a) the existing effluent disposal system on Lot 1 is decommissioned; and

(b) the sewer drainage for Lot 1 is appropriately modified; and

(c) a connection is established to the new reticulated sewer system within Scott Road.

UC3 *Consent Notice - Geotechnical Report*

The current and future owners of Proposed Lot 2 shall be informed that any building/ stormwater disposal system shall be designed and constructed in accordance with the recommendations of the Maunsell/AECOM Geotechnical Report submitted in support of the application. (Ref : "*Proposed Lakeside Farm Subdivision, Te Kauwhata : Geotechnical Suitability Assessment*", dated 30 October 2008)

UC4 *Consent Notice – Building Platforms and Minimum Floor Level (MFL)*

The current and future owners of Lot 2 shall be informed that the minimum residential floor level for any habitable area of a dwelling or ancillary unit shall be a minimum of RL 8.31m (Moturiki Datum).

Legal Conditions

LC1 That Lot 2 DPS 85308 (Part CFR SA66B/990) and Lot 1 DPS 85309 (Part CFR SA66B/991) be held in the same computer freehold register. ***Refer Land Information NZ reference: 926877***

LC2 All easements shall be duly granted, reserved and shown on the Land Transfer Plan.

LC3 Pursuant to section 221 of the Resource Management Act 1991, consent notices shall be prepared by the Waikato District Council's solicitors at the consent holder's expense, to ensure compliance on a continuing basis by the subdividing land owner and subsequent owners of

(i) Lot 1 with Condition UC2.

(ii) Lot 2 with Conditions UC3 and UC4

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Upon the issue of a certificate pursuant to section 224(c) of the Resource Management Act 1991 or at such earlier time as may be required, the consent notices pursuant to section 221 of the Resource Management Act, will be issued.

STAGE 2 (LOTS 1 - 24)

Planning Conditions

PC6 The Land Transfer Plan to give effect to this Resource Consent shall be generally consistent with the approved plans prepared by Blue Wallace Surveyors, reference 04/223 including Drawing #V6 (drawn 10 June 2010), submitted in support of application SUB0156/10 which was received by Council on 7th December 2006. A copy of the approved plans are attached.

PC7 The consent holder shall ensure that, should any human remains or archaeological items be exposed while undertaking works to give effect to conditions of this consent, works in that area will cease immediately. The Police, New Zealand Historic Places Trust, and Kaumatua representing the local Tangata Whenua shall be contacted and work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

PC8 The consent holder shall notify the Waikato District council Monitoring Department in writing two weeks prior to the commencement of site activities associated with this consent.

PC9 Written confirmation shall be provided from network utility operators for telecommunication and energy supply confirming that the connections and reticulations have been placed underground to the boundaries of Lots 1 - 22 prior to the section 224 certificate being signed by Council.

PC10 Where earthworks activities are required as part of this consent, the consent holder shall submit an Earthworks Management Plan to Waikato District Council Monitoring Department. The Earthworks Management Plan shall be appropriate to the scale of the works and shall be submitted at least two weeks prior to physical works commencing. The Earthworks Management Plan shall include but not be limited to the following information:

i) Silt control measures to be installed prior to commencing earthworks and shall be maintained to prevent the offsite movement of sediment during the works.

ii) Dust control measures to be implemented to prevent the offsite movement of dust to neighbouring properties

iii) Details including volumes of any excavated materials to be removed from the subject property.

PC11 Pursuant to section 36 of the Resource Management Act 1991, the Consent Holder shall pay the actual and reasonable costs incurred by the Waikato District Council when monitoring the conditions of this consent.

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Te Kauwhata Bypass Alignment

PC12 The Survey Plan shall show the alignment of the Proposed Te Kauwhata Structure Plan and shall ensure all lots affected by the alignment, are adjusted as necessary to comply with the requirements of the District Plan.

Consent Notice – Te Kauwhata Bypass

PC13 The current and future owners of lots located immediately adjacent the alignment of the Proposed Te Kauwhata Bypass shall be informed that future dwellings shall be designed, constructed and maintained so as to be in accordance with the "satisfactory" sound levels for habitable rooms as defined by the AS/NZ2107:2000 acoustic standard. This will reduce the sensitivity of future dwellings to road noise generated by the proximity to the Te Kauwhata Bypass.

Financial Contributions - Reserves

FC3 Pursuant to Section 108(2)(a) of the Resource Management Act 1991, a reserve contribution of $36,036.00 (Thirty Six Thousand and Thirty Six Dollars) GST inclusive, shall be paid to Waikato District Council for the 21 additional lots created in Stage 1.

Advisory Notes:

A reserve contribution is required for each lot created by subdivision upon which a dwelling or dwellings are authorised by the Waikato District Plan. Stage 2 of the subdivision will result in the creation of 21 additional titles. The quantum of financial contribution is based on $1,716.00 (One Thousand Seven Hundred and Sixteen Dollars) for each lot.

Financial Contributions - Roading

FC4 Pursuant to section 108(2)(a) of the Resource Management Act 1991 a roading fee of $194,019.00 (One Hundred and Ninety Four Thousand and Nineteen Dollars), GST Inclusive shall be paid to the Waikato District Council for the 21 additional lots created in Stage 2.

Advisory Notes:

The quantum of the financial contribution is based on $9,239.00 (Nine Thousand Two Hundred and Thirty Nine Dollars) for each additional lot.

Development Contributions – Community Facilities

DC3 Pursuant to the Resource Management Act 1991 the s.224 Certificate will not be issued until such time as the consent holder has paid to Council the Development Contributions as prescribed in the advisory note set out below.

Development Contributions - Advisory Note:

Pursuant to Section 106(2) of the Local Government Act 2002 a District Wide Community Facilities Development Contribution of $6,414.03 (Six Thousand, Four Hundred and Fourteen Dollars And Three Cents) GST inclusive shall be paid to Council for the 21 additional lots. This is based on a Development Contribution of $305.43 (Three Hundred and Five Dollars And Forty Three Cents) per lot for Community Facilities.

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Please note: If the contributions are not paid within the financial year of issuing the Resource Consent, the amounts due will be adjusted on July of each year in accordance with the fees and charges prevailing at the time of payment.

Development Contributions – Water Supply

DC4 Pursuant to the Resource Management Act 1991 the s.224 Certificate will not be issued until such time as the consent holder has paid to Council the Development Contributions as prescribed in the advisory note set out below.

Development Contributions - Advisory Note:
Pursuant to Section 106(2) of the Local Government Act 2002 a Water Supply Development Contribution of $89,269.32 (Eighty Nine Thousand, Two Hundred and Sixty Nine Dollars And Thirty Two Cents) GST inclusive shall be paid to Council for the 21 additional lots. This is based on a Development Contribution of $4,250.92 (Four Thousand, Two Hundred and Fifty Dollars And Ninety Two Cents) per lot for Water Supply.

Please note: If the contributions are not paid within the financial year of issuing the Resource Consent, the amounts due will be adjusted on July of each year in accordance with the fees and charges prevailing at the time of payment.

Development Contributions – Wastewater

DC5 Pursuant to the Resource Management Act 1991 the s.224 Certificate will not be issued until such time as the consent holder has paid to Council the Development Contributions as prescribed in the advisory note set out below.

Development Contributions - Advisory Note:
Pursuant to Section 106(2) of the Local Government Act 2002 a Wastewater Development Contribution of $33,127.29 (Thirty Three Thousand, One Hundred and Twenty Seven Dollars and Twenty Nine Cents) GST inclusive shall be paid to Council for the 21 additional lots. This is based on a Development Contribution of $1577.49 (One Thousand, Five Hundred and Seventy Seven Dollars And Forty Nine Cents) per lot for Water Supply.

Please note: If the contributions are not paid within the financial year of issuing the Resource Consent, the amounts due will be adjusted on July of each year in accordance with the fees and charges prevailing at the time of payment.

Roading & Utilities (Engineering Conditions)

Engineering Design Plans

EC1 Prior to the signing of the survey plan Stage 2 of subdivision, pursuant to Section 223 of the Resource Management Act 1991, and to the commencement of any works on site, the consent holder shall provide design plans and specifications detailing the following works required in respect to this subdivision, in accordance with Hamilton City Council Development Manual, the Waikato District Plan and ARC TP124 ("*Low Impact Design Manual for the Auckland Region*") to the satisfaction of the Waikato District Council's general Manager Regulatory.

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Landscape Integration & Planting

i) Provide plans showing landscaping and planting to minimise the visual impact of the built aspects of the development. The proposal shall include but not be limited to streetscape design, riparian planting, enhancement of natural features and screen planting, and shall be guided by Appendix Oe (Urban Design Guidelines) of the Waikato District Plan.

Extension of Public Water Supply

ii) The extension of the public water supply network to provide a possible point of supply at the road frontage of each lot to be created by this subdivision. Extension of rider mains within rights of way shall also be provided as necessary.

iii) Separate water supply connections fitted with a manifold, (flow restrictor and backflow preventer shall be provided to the boundary of each lot to the satisfaction of Council. Any connection/s to existing Council main or ridermain shall be installed by Council.

Note: The point of connection is on the western side of Scott Rd approximately 100 m north of the subdivision, at the point where the existing main drops from 50 mm ID to 40 mm.

Sanitary Sewer Reticulation

iv) The construction of a low pressure sewer system to provide a point of connection for each lot in the subdivision together with Lot 1 from Stage 1. The point of connection to the existing sewer network shall be at the point where the existing rising main from Springhill Prison crosses Scott Road, approximately 200 m north of the subdivision.

The sewer system shall include proprietary connection boxes containing non-return and shut-off valves for each lot. A non-return and shut-off valve will also be required at the point of connection of the new main to the existing pressure main in Scott Rd. Care shall be taken in specification of pumps to ensure that the new system will have sufficient pressure to be able to pump into the existing pressure main.

Note: For reference, designers are encouraged to review proprietary systems currently available on the market.

Overland Flowpaths

v) Provide plans detailing the extent of any overland flowpath generated by 1% AEP storm. Any flowpath greater than 500 L/s shall be protected by an easement in gross in favour of Waikato District Council with those between 50 – 499 L/s being protected by consent notice.

vi) If additional flowpaths are identified that compromise indicative building sites then modified overland flowpaths or house positions shall be provided.

Easements

vii) All easements shown on the application plan shall be created as proposed together with those easements identified as necessary to protect overland flowpaths or utility services.

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Construction/Upgrade of Roads, Entrances and Associated Works

viii) The construction of the new road (Lot 23) and the upgrade of the Scott Rd frontage together with associated stormwater control necessary to provide a road frontage to each lot created by this subdivision.

Note: The design of the new road (Lot 23) shall ensure that stormwater is attenuated to prevent adverse effect on Scott Road and the proposed intersection with the Te Rapa Bypass, to the satisfaction of Waikato District Council .

Vehicle Entrances

ix) Each lot shall be provided with a sealed residential vehicle entrance constructed in accordance with Hamilton City Council Development Manual volume 5, Waikato District Council Addendum part 9.1 Plan No. TSG-E3 to the satisfaction of Council.

Traffic Management Plan

x) A traffic management plan, for works to be carried out in the road reserve, is to be provided in conjunction with the engineering plans.

Earthworks

xi) The nature, extent and detail of any earthworks proposed in relation to the subdivision including provision of erosion and sediment control.

Completion Conditions

EC2 Prior to the release of the 'Completion Certificate' pursuant to Section 224(c) of the Resource Management Act 1991 the Consent Holder shall carry out the following to the satisfaction of Waikato District Council.

Construction

i) Arrange for the construction of all the engineering works as detailed in the approved plans submitted in accordance with Condition E1 above.

RAMM Data

ii) The consent holder shall provide to the satisfaction of Council RAMM information for the proposed road to vest, in the correct format for data input. RAMM data is to be submitted by a suitably qualified RAMM Technician.

Road to Vest

iii) Lot 23 shall vest in Council as road (see also LC6)

As Built Plans & Quality Assurance

iv) As Built Plans and Quality assurance documents detailing all roading and infrastructure works completed shall be provided at a scale acceptable to Council and in accordance with Hamilton City Council Development Manual.

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Defects Liability

v) Water Supply, Sanitary Sewer and Roading works (including stormwater control) constructed during the subdivision development shall be subject to a Defects Liability period of up to 12 months at the discretion of Council. The Defects Liability period shall commence from the date of issue of the s224(c) Certificate.

vi) If, during the Defects Liability Period Council considers that any remedial works need to be carried out in respect of Water Supply, Sanitary Sewer or Roading the consent holder shall undertake at its own cost such remedial works to the satisfaction of Council. Engineering plans for any remedial works shall be submitted to and accepted by Council prior to construction.

Compliance Certificate

EC3 Provide a compliance certificate prepared by a suitably qualified and experienced registered engineer to confirm that all works in terms of the above engineering conditions have been carried out in accordance with the approved plans and appropriate standards. The standard format for Compliance Certificate shall be as shown in Schedule 1C of NZS4404:2004.

Final Geotechnical Report and Consent Notice

EC4 Provide a final Geotechnical Engineering Report by a Chartered Professional Engineer to confirm the suitability of the land for residential development including any special conditions required to be met as part of building consent. The report shall also include plans showing the location of any fill constructed in accordance with NZS 4431:1989 together with the location of any non engineered fill.

EC5 The current and future owners of lots 1 – 22 shall be informed that any building/ stormwater disposal system shall be designed and constructed in accordance with the recommendations of the Maunsell/AECOM Geotechnical Report submitted with the application and the final geotechnical report. The Council's Solicitor will prepare the Consent Notice at the consent holder's expense.

Consent Notice – Building Platforms and Minimum Floor Level (MFL)

EC6 The current and future owners of Lots 1 - 22 shall be informed that the minimum residential floor level for any habitable area of a dwelling or ancillary unit shall be a minimum of RL 8.31m (Moturiki Datum).

Consent Notice – Sanitary Sewer Connection

EC7 The current and future owners of Lots 1 - 22 shall be informed that sanitary sewer systems required for each lot shall comprise of a private pump station with a connection to the public rising main. The pump station used shall be a proprietary system meeting the specific pumping requirements of the public system.

Note: Actual details of the system required, including drawings shall be compatible with the design of the public system approved and installed in accordance with Condition EC1(iv) above.

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Contact Area Engineer

EC8 The Waikato District Council's Roading or Wastewater Engineer is to be contacted a minimum of two weeks prior to any works being carried out in the road reserve.

Road development to be in accordance with COP

EC9 It is expected that roading development be in accordance with the Hamilton City Council Development Manual. The developer's attention is directed to the following sections: Quality assurance schedules as per Hamilton City Council Development Manual volume 5, Waikato District Council Addendum part 9.1.

EC10 Design quality assurance records shall be completed and submitted by the designer prior to Council providing design approval. On completion of the roading work the construction supervisor shall submit all certified quality assurance records to the Roading Group Manager.

The RAMM update forms shall also be completed and submitted by a suitably qualified RAMM technician. Intersection Design shall be in accordance with Hamilton City Council Development Manual volume 5, Waikato District Council Addendum part 9.1 - Intersections."

Water Connection

EC11 An application form for water connection is attached and must be completed and returned to Council prior to the issuing of the section 224(c) certificate. Connection fees are in addition to the payment of a financial contribution.

Water Storage

EC12 Council's trickle feed potable water supply will deliver 1.8 cubic metres per day at a minimum water pressure of 200 kPa at the point of connection. The owner shall provide a minimum of 48 hours water storage capacity on site at a suitable location and elevation to receive water from the connection. The owner shall install a pumping system from his storage to deliver water from storage within the property as required

Rainwater Tanks

Pursuant to the Waikato District Council Water Supply Bylaw 2009 a rainwater tank is required for each property at the time of building. The tank required under this bylaw may also be used to meet the water storage requirements for properties connected to a rural water supply.

Legal Conditions

Amalgamation

LC4 That Lot 24 hereon (legal access) be held as to two undivided one-half shares by the owners of Lots 11 and 14 hereon as tenants in common in the said shares and that individual computer freehold registers be issued in accordance therewith. Refer Land Information NZ reference: 926877

Easements

LC5 All easements shall be duly granted, reserved an shown on the Land Transfer Plan and shall include those easements identified as necessary to protect overland flowpaths or utility services.

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Road to Vest

LC6 Lot 23 shall vest in Council as road.

Consent Notice Preparation

LC7 Pursuant to section 221 of the Resource Management Act 1991, consent notices shall be prepared by the Waikato District Council's solicitors at the consent holders expense, to ensure compliance on a continuing basis by the subdividing land owner and subsequent owners of

(i) Lots 1-22 (inclusive) with Conditions EC5, EC6 and EC7, and
(ii) Those lots immediately adjacent the proposed Te Kauwhata Bypass alignment, with Condition PC14.

Upon the issue of a certificate pursuant to section 224(c) of the Resource Management Act 1991 or at such earlier time as may be required, the consent notices pursuant to section 221 of the Resource Management Act, will be issued.

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Schedule 2

Reasons for Decision

Resource Consent No: SUB 0156/07

1 The proposal complies in all respects with the District Plan requirements with respect to density and lot size. Minor issues of non compliance relating to entranceway separation and a small infringement of a setback in the Country Living Zone, cause the application to be considered a Restricted Discretionary Activity.

2 Despite not being located within the identified Te Kauwhata Structure Plan area, the guidance provided by Appendix Oe (Variation 13) is relevant, and therefore it is considered appropriate to require that final design plans take into consideration the design guidelines provided within that document.

3 Initial issues raised in relation to the servicing of Stage 2 of this subdivision, have been investigated by Council's Consultant Engineer, who has determined that connections can be made to the reticulated water and waste water systems in Scott Road, and that provision can be made for on site stormwater disposal on each of the lots.

4 The alignment of the proposed Te Kauwhata Bypass will need to be incorporated into final design plans, however the subdivision will have no more than minor effect on the operation of this road. A condition is imposed to ensure that dwellings erected on the lots located alongside the route of the Bypass, are constructed with adequate noise attenuation measures in place, to lessen the impact of the road on the occupants of these lots.

5 The area is zoned for the density of development proposed by this subdivision, and therefore, subject to appropriate design considerations, it is considered that the proposal will meet with community expectations for the area and is an appropriate use of the site.

2 Overall it is considered that the adverse effects of the proposal will be no more than minor and that the proposal is consistent with the objectives and policies of the Proposed District Plan.

3 Furthermore the proposal has been found to uphold the sustainable management purpose of the Resource Management Act, adequately provide for Part 2 matters, and be consistent with both the Regional Policy Statement and Regional Plan.

4 The application was processed on a non-notified basis and was approved under delegated authority without the need for a Council hearing. No parties were considered to be affected in this case.

5 The Appeals version of the Proposed District Plan was released on the 31st of January 2007. In accordance with Section 86F of the Resource Management Act 1991 rules that are not under appeal are effectively operative. There are no rules under appeal that are relevant to this proposal therefore no weight has been given to the Operative District Plan.

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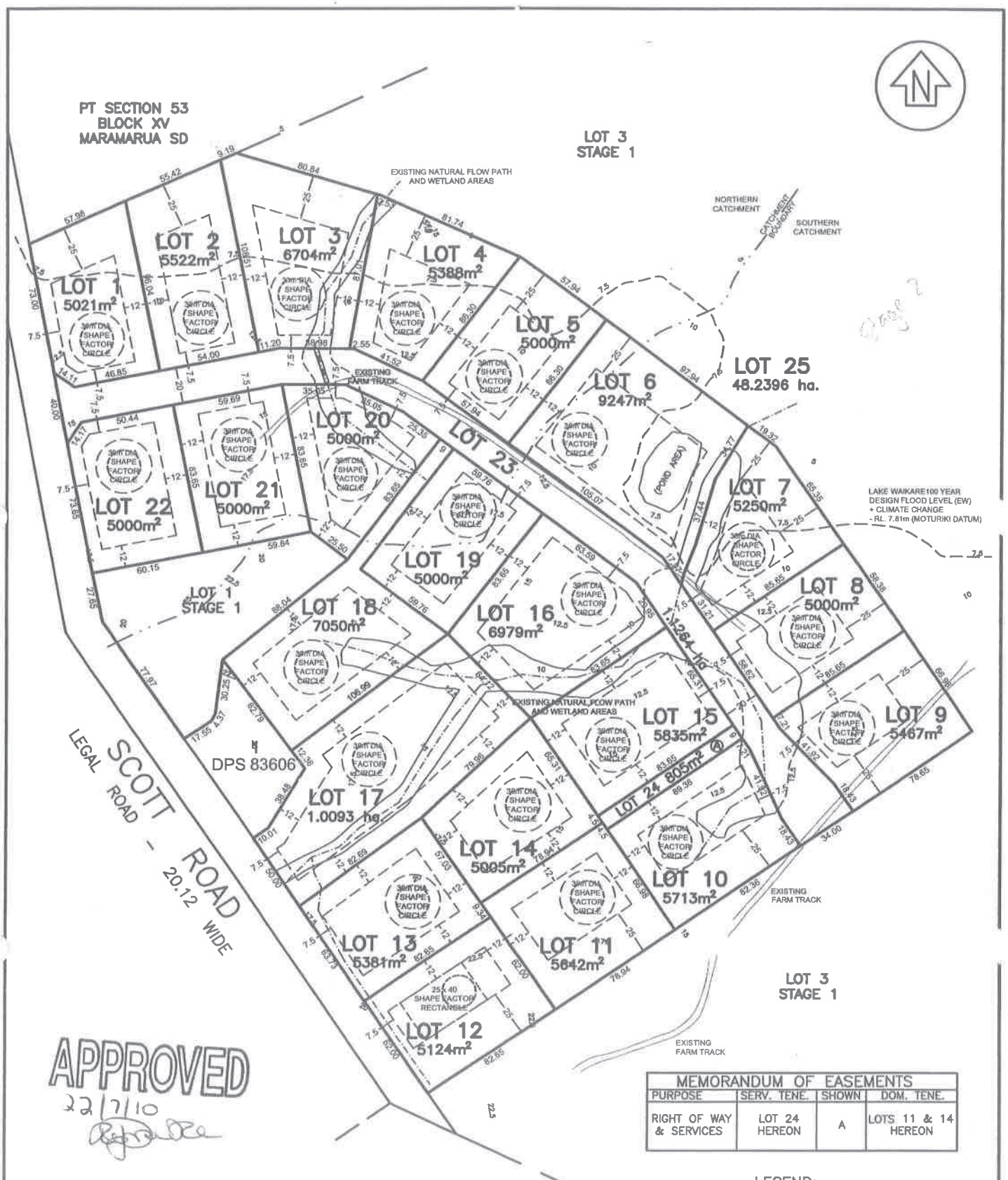

APPROVED
22/7/10

MEMORANDUM OF EASEMENTS			
PURPOSE	SERV. TENE.	SHOWN	DOM. TENE.
RIGHT OF WAY & SERVICES	LOT 24 HEREON	A	LOTS 11 & 14 HEREON

LEGEND:

– – – – – YARDS BOUNDARY

AMALGAMATION CONDITION

THAT LOT 24 HEREON (LEGAL ACCESS) BE HELD AS TWO ONE-HALF SHARES BY THE OWNERS OF LOTS 11 & 14 HEREON AND THAT INDIVIDUAL CERTIFICATE OF TITLE BE ISSUED IN ACCORDANCE THEREWITH

SEE .....

NOTE:

1) ALL AREAS AND DIMENSIONS SUBJECT TO FINAL SURVEY AND APPROVAL FROM THE WAIKATO DISTRICT COUNCIL
2) LEGAL DESCRIPTION: LOTS 1 & 2 DPS 85308 (CT. SA66B/990)
3) TOTAL AREA: 62.3878 ha
4) ZONE: COUNTRY LIVING
5) AERIAL PHOTO SUBJECT TO DISTORTION

No.	Amendment	Init.	Date.
1	SCHEME PLAN VERSION #5	WAB	06/10
2			
3			

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Designed. JMB
Drawn. WAB 10 JUNE 2010
Checked.
Approved.

PROPOSED SUBDIVISION OF LOTS 1 & 2 DPS 85308
94A SCOTT ROAD – TE KAUWHATA

SCALE: 1:2000 @A3 | DATE: JUNE 2010 | PREPARED FOR: BRIAN WHITE

Firm's Name
Blue Wallace Surveyors Ltd.
25 Harwood Street, P O Box 38, HAMILTON.
Phone (07) 8397799, Fax (07) 8394455

File Reference 04/223
Drawing No. V6

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BUD 1135/11
(FYI)

DECISION ON APPLICATION TO CHANGE OR CANCEL RESOURCE CONSENT CONDITION

(Section 127, Resource Management Act 1991)

Pursuant to Sections 34(A)(1) and 127 of the Resource Management Act 1991, the Waikato District Council, under delegated authority, gives approval for requested changes to conditions of an approved resource consent as follows:

Application Number:	LUC1076/11.01
Resource Consent Number:	LUC1076/11
Applicant:	Lakeside Farms (1993) Ltd
Subject:	S127 pursuant to Section 127 of the RMA to change of conditions of consent relating to a proposed shed encroachment of the 25m boundary setback in the Rural Zone
Location Address:	94 A Scott Road TE KAUWHATA
Legal Description:	Lot 1 DPS 85309 and Section 90 Block XV Maramararua Survey District comprised in Computer Freehold Register SA66B/991

The resource consent is now subject to the Amended Conditions detailed in the attached Schedule 1.

The Reasons for this decision are detailed in the attached Schedule 2.

DATED at Ngaruawahia this 14th day of June 2011

For and On Behalf of Waikato District Council

Nath Pritchard
GENERAL MANAGER REGULATORY

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Schedule 1

Conditions of Consent

Resource Consent No: LUC1076/11

Changes shown in Italics

Planning Conditions

PC1 The location, size and height of the *shed* shall be generally in accordance with the information and plans submitted by the consent holder in support of application number *LUC1076/11* and officially received by Council on *04 May 2011, except as changed by the information and plans submitted in relation to the change of consent conditions in support of application number LUC0131/11.01 and officially received by Council on the 03 June 2011.* Copies of the approved plans are attached.

PC2 The *shed* shall be located a minimum of *19m* from the closest point of the southern site boundary.

PC3 The consent holder shall notify the Waikato District Council Monitoring Department in writing two weeks prior to the commencement of activities associated with this consent.

PC4 Pursuant to Section 36 of the Resource Management Act 1991 the consent holder shall pay the actual and reasonable costs incurred by the Waikato District Council when monitoring the conditions of this consent.

PC5 The consent holder shall ensure that, should any human remains or archaeological items be exposed while undertaking works to give effect to conditions of this consent, works in that area will cease immediately. The Police, New Zealand Historic Places Trust, and Kaumatua representing the local Tangata Whenua shall be contacted and work shall not recommence in the affected area until any necessary statutory authorisations or consents have been obtained.

PC6 The shed shall not be used for habitable purposes.

PC7 The shed shall be used only for those activities permitted in the Rural Zone, and shall not be used for any commercial activity, unless a land use consent is obtained from Waikato District Council.

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Schedule 2

Reasons for Decision

Resource Consent No: LUC1076/11

1. In this case, the change relates to a minor increase in the distance of the shed from the boundary, originally it was proposed to be 20m, due to the angle of the boundary, it is now 19.1m (a change of 0.9m). The change is not considered to increase the effects on the environment above that which were considered in the original consent, and considered to be no more than minor.

2. Council is satisfied that the change to the degree of encroachment of the shed can be granted pursuant to section 127 of the Resource Management Act, on a non-notified basis, for the following reasons:

   a) That the change is minor such that potential adverse effects on the environment will be no more than minor in respect of amenity and reverse sensitivity effects;

   b) That there will be no person adversely affected by the change;

   c) That the change will not be contrary to relevant objectives and policies of the Waikato District Plan; and

   d) That the change is consistent with the purposes and principles of the Resource Management Act.

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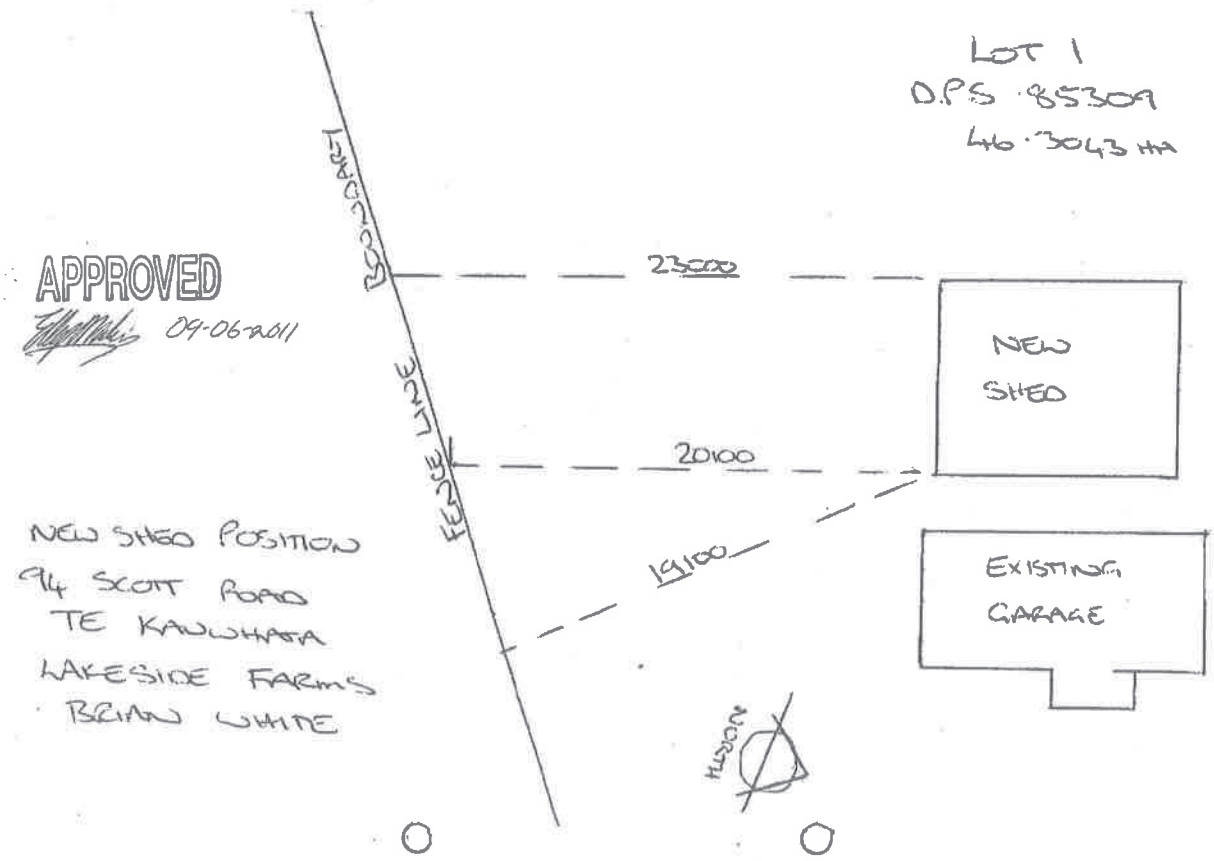

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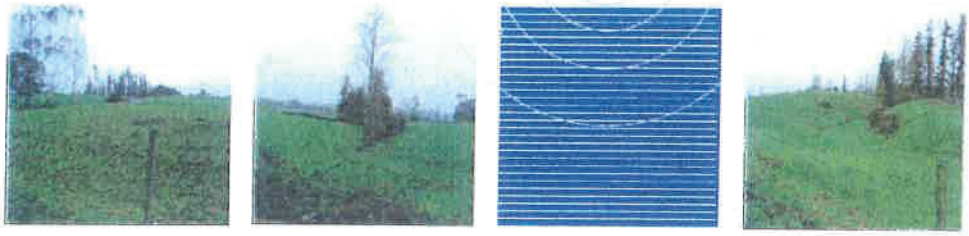
MAUNSELL

LUR0069/09

Waikato District Council
Mail Ref 81/0536
25 NOV 2008
Referred to:
MAIL



Proposed Lakeside Farm Subdivision, Te Kauwhata

Geotechnical Suitability Assessment

Lakeside Farms

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

Proposed Lakeside Farm Subdivision, Te Kauwhata

Prepared for

Lakeside Farms

Prepared by

Maunsell Limited
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P O Box 434, Waikato Mail Centre, Hamilton 3240, New Zealand
T +64 7 834 8980 F +64 7 834 8981 www.maunsell.com

30 October 2008

60046771/Geotech

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Quality Information

Document Proposed Lakeside Farm Subdivision, Te Kauwhata

Ref 60046771/Geotech

Date 30 October 2008

Prepared by Scott King

Reviewed by Craig Davidson

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
Final	30/10/2008	Information	Craig Davidson Associate Director - Geotechnical Engineering	

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1.0 Introduction

Maunsell Ltd has been engaged by Lakeside Farms to provide a geotechnical assessment of the suitability of Lots 1 & 2 DPS 85308, located off Scott Road, Te Kauwhata for a 24 lot subdivision (Figure 1). Surveyors for the project are Blue Wallace Surveyors Ltd.

The purpose of this report is to present the results of the geotechnical assessment and provide recommendations for development of the lots, including preliminary recommendation for pavement construction. It is understood the report will be submitted with the application for subdivision consent.

It is noted that issues associated with stormwater management and effluent disposal will be addressed in a separate report.

2.0 Scope of Assessment

The scope of this assessment comprised:

- A review of aerial photographs and published geological maps of the area,
- Walkover inspection of the site to identify landforms and features, such as slope instability, that may influence the development,
- 8 machine augerholes to depths of between 5m and 6.5m below ground level, with associated shear vane tests
- 6 hand augerholes along the proposed road alignment to a depth of 1.2m below ground level, with associated shear vane tests

3.0 Site Description

The approximately 62.4 ha site is located on the southern side of Te Kauwhata. The site is bounded by Scott Road to the west, Lake Waikare to the east and existing rural residential housing or farmland to the north and south.

The site is currently undulating 'greenfields' land which consists of elevated land to the west that generally falls to the east where the land flattens as it approaches Lake Waikare. The current land use is farmland, with grazing for stock.

The proposed development comprises 24 lots (ranging in area from 5,000m^2 to 7,381m^2) being developed on the western side of the site, with the remainder of the site (i.e. the central and eastern portions) being kept as a balance lot of approximately 47.5ha.

The majority of the new lots will be accessed by a vested road to be formed off Scott Road. Refer to the attached plan in Appendix A for an indicative site layout.

4.0 Results of Investigations

4.1 Ground Conditions

Investigation holes were drilled by hand and machine auger at the locations illustrated on the site plan in Appendix A. Logs of materials encountered in the investigation holes along with the results of in situ strength testing are in Appendix B.

The purpose of the holes was to assess the general characteristics of the near surface materials. The results from the subsurface investigations indicate that ground conditions are generally consistent across the proposed development area, typically comprising moist, stiff to very stiff silty clay to a depth of greater than 5.0m below ground level.

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Thin layers (generally less than 400mm) of firm organic silt were encountered in a number of the machine augerholes at depths of between 4m and 5m depth. A thicker layer of organic silt was encountered between 1.8m and 5m below ground level in Machine Auger 7.

A thin layer of organic silt was also encountered closer to the surface (1.2m to 1.5m depth) in Machine Auger 2.

4.2 Ground Water Conditions

Water levels were recorded at the time of the investigation between 0.9m and 2.4m depth in the following holes (MA2, MA5, MA7, HA2 and HA3). This corresponds to reduced levels of between RL 8m and RL12m (Levels are in Moturiki Datum). The recorded water levels indicate that groundwater levels dip in a broadly eastward direction toward Lake Waikare.

do they get closer towards toe of slope

5.0 Geotechnical Assessment

5.1 General

A preliminary geotechnical assessment of the study site has been undertaken to access the suitability of the site for future development. The following sections summarise the key geotechnical recommendations associated with the development.

5.2 Slope Stability

A preliminary slope stability assessment of the site was carried out. This assessment consisted of a walkover inspection of the site and a review of the sites slopes with reference to the topographic survey of the site undertaken by Blue Wallace surveyors.

The walkover inspection did not identify any signs of slope instability on the site. A review of the topographic plans established that the steepest slopes on and around the site are approximately 4H:1V (i.e. 14°).

Based the results of the walkover inspection, the gradient of the slopes and the results of the subsurface investigations, it is considered that the likelihood of instability adversely affecting the proposed development is low. However, it is noted that cutting or filling associated with site development may impact the stability of the slopes. It is recommended that any proposed cuts and fills greater than 1m depth be reviewed by a geotechnical engineer familiar with the site (prior to construction) to assess the impact on stability.

5.3 Foundation Recommendations

The results of the investigations indicate that subsurface conditions on most lots have an ultimate soil bearing capacity of greater than 300kPa which is the requirement for supporting house foundations designed in accordance with NZS 3604:1999

However, a number of the investigations encountered a layer of organic silt. The organic silt is generally weaker than the stiff to very stiff silty clay material that was typically encountered above and below this layer.

Areas where the organic silt is encountered within 2.5m of the 'cleared ground surface' are unlikely to be suitable for supporting house foundations designed in accordance with NZS 3604:1999. It is therefore recommended that a site specific investigation be undertaken on each lot once the location of the proposed dwelling known to determine the presence of the organic silt layer.

If the organic silt is encountered within 2.5m of the 'cleared ground surface it is likely that the foundation materials will require undercutting and replacement with compacted sand fill or alternatively the dwelling may require piling.

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5.4 Preliminary Pavement Design

5.4.1 General

Results of insitu strength testing carried out along the proposed vested road alignment indicate that subgrade soils (i.e. typically moist, stiff to very stiff silty clays) are generally capable of providing a **design soaked subgrade CBR of greater than 5%.**

Based on a design CBR of 5% and the following design criteria, preliminary pavement designs have been prepared for the main subdivision road and access ways:

- Pavement Life = 25 years
- Annual HCV Growth Factor = 3%
- Load Factor EDA/HCV = 0.6 (Local Road)
- % HCV = 2.5%
- Assumed 10 vehicle trips per lot per day

5.4.2 Main Vested Road

The main vested subdivision road will serve a maximum of 20 lots (4 lots will be accessed directly from Scott Road) and has therefore been calculated as having a design traffic loading of 2.0x104 ESA/lane.

We therefore recommend a pavement depth of 375mm with the following pavement structure would be suitable for the main vested road:

- 2 coat chip seal, grade 3 and 5 or 25mm Asphalt seal
- 150mm TNZ M4 basecourse compacted to CBR 80
- 225mm GAP 65 subbase compacted to CBR 40
- Existing subgrade proof rolled to achieve a minimum of CBR 5

5.4.3 Access Lots

Access lots will serve a maximum of 2 lots have therefore been calculated as having design traffic loadings of 4.0x103 ESA (based upon a single lane).

We therefore recommend a pavement depth of 250mm with the following pavement structure would be suitable for the access lots:

- 2 coat chip seal, grade 3 and 5 or 25mm Asphalt seal
- 125mm TNZ M4 basecourse compacted to CBR 80
- 125mm GAP 65 subbase compacted to CBR 40
- Existing subgrade proof rolled to achieve a minimum of CBR 5

5.5 Earthworks

It is expected that some minor earthworks will be required as part of the subdivision development. Results of the investigations indicate that the near surface materials (moist, stiff to very stiff silty clays) encountered across the site are likely to be suitable for use as Engineered Fill. It is however expected that these materials will require drying before compaction.

The layers of organic silts noted across the site were generally encountered at depths greater than 3m below the existing ground surface. Depending on the thickness of fill placed, these materials may consolidate. Consideration should be given during the detailed design phase of the project to the impact of consolidation settlements induced from site filling.

see page 2

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6.0 Limitations

The recommendations and opinions contained in this report are based upon data from the drillholes. Inferences about the nature and continuity of subsoil away from drillholes are made on sound geological principals and engineering judgement, however it is possible that ground conditions over the site may vary and therefore it is not possible to guarantee the continuity of ground conditions away from the investigation locations.

Should development proceed, it would be in the interest of all parties that Maunsell be retained to inspect excavations and to verify ground conditions. In any event, we should be notified if conditions differ from those described in this report.

This report has been prepared for the particular project described in the owner's brief to us and no responsibility is accepted for the use of any part of this report in other contexts or for any other purposes.

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

Appendix A Investigation Location Plan

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

Issue	Description	Date	Apd
A	Consenting	18.09.08	

The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the Maunsell sabcermate system certified to AS/NZS ISO 9001:200

	Checked	Date
Design: HJV		18 Feb 08
Drawn: HJV		
Approved:		

This drawing is confidential and shall only be used for the purposes of this project.

MAUNSELL

Maunsell Limited

LAKESIDE FARMS

Lakeside Farms Development
94a Scott Road
Te Kauwhata

Geotechnical Testing Layout

Scale: 1:2000 @ A3

Status: Consenting

Drawing No: 60046771 - F1

Issue: A

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Appendix B Augerhole Logs

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 1

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		-	
0.3m	Brownish Yellow SILTY CLAY, slightly plastic, moist, stiff.	195+kPa	-	
		0.5m	-	
		UTP*	-	
1.0		1.0m	-	
		195+kPa	-	
		1.5m	-	
	- Light Grey, highly plastic and slightly dilatant from 1.8m.	142 kPa	-	
2.0	- firm from 2.0m.	2.0m	-	
	- mottled Brownish Yellow from 2.3m.	137 kPa	-	
		2.5m	-	
	- Brownish Yellow from 2.7m.	124 kPa	-	
3.0		3.0m	-	
		140 kPa	-	
3.5m	Light Grey streaked Brownish Yellow CLAYEY SILT, moderately plastic & dilatant, slightly moist to wet, firm.	3.5m	-	
4.0			-	
			-	
	- mottled Grey with a slight organic odour from 4.8m.		-	
5.0	End of Log at 5.0m.		-	
			-	
			-	
6.0			-	
			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: pp Denver Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 2

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.1m	Light Grey mottled Orange SILTY CLAY with trace fine SAND, moderately dilatant, moist, stiff.		-	
		UTP*	-	
	- Light Greyish Brown with no SAND from 0.5m.	0.5m		
			-	
		195+kPa		
1.0		1.0m	-	▽
1.2m	Dark Blackish Brown organic SILT, moist, firm.		-	
		179 kPa		
1.5m	Grey CLAYEY SILT with minor fine SAND, moist to wet, firm to stiff.	1.5m		
1.6m	Light Greyish Blue SILTY CLAY, moist to wet, firm to stiff.		-	
		173 kPa	-	
2.0		2.0m		
	- Blueish Green from 2.2m.		-	
		UTP		
		2.5m	-	
			-	
		UTP		
3.0	- slight organic odour from 3.0m.	3.0m	-	
			-	
		UTP		
	- trace interbedded Dark Brown organic SILT and hard to obtain sample from 3.5m.	3.5m		
			-	
4.0	- Greyish Brown from 4.0m.		-	
			-	
			-	
	- mottled Dark Brown from 4.6m.			
4.7m	Dark Greyish Brown SILTY CLAY, moist, firm to stiff.		-	
5.0	End of Log at 5.0m.		-	
			-	
			-	
			-	
6.0			-	
			-	
			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 3

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Brownish Yellow SILTY CLAY, moderately plastic, moist, firm to stiff.	161 kPa 0.5m		
	- mottled Orange from 0.8m.	189 kPa 1.0m		
1.0		UTP* 1.5m		
2.0		UTP 2.0m		
		UTP 2.5m		
	- Light Brownish Grey from 2.8m.	UTP 3.0m		
3.0		UTP 3.5m		
	- Brownish Yellow from 3.5m.			
4.0	- Light Grey mottled Orange and slightly moist to wet from 4.0m.			
	- Light Brownish Yellow from 4.2m.			
4.7m	Dark Blackish Brown organic SILT, slight organic odour, moist, firm.			
5.0				
5.6m	Brown SILTY CLAY, moist, firm to stiff.			
	- Blueish Green from 5.8m.			
6.0	End of Log at 6.0m.			
7.0				

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: pp Daniel Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 4

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, soft to firm. (Topsoil)		-	
0.3m	Brownish Orange SILTY CLAY, moist, firm.	107 kPa 0.5m	-	
	- mottled Reddish Orange from 0.6m.		-	
1.0	- Brown and stiff from 1.0m.	189 kPa 1.0m	-	
		UTP 1.5m	-	
2.0		UTP 2.0m	-	
	- mottled Light Greyish Brown from 2.5m.	UTP 2.5m	-	
3.0		189 kPa 3.0m	-	
	- Brownish Yellow mottled Dark Brown from 3.2m.	166 kPa 3.5m	-	
4.0	- Dark Grey mottled Brownish Yellow from 4.0m.		-	
4.3m	Blackish Brown organic SILT, moderately organic odour, moist, firm.		-	
5.0			-	
5.3m	Light Brown SILTY CLAY, moist, firm.		-	
5.5m	End of Log at 5.5m.		-	
6.0			-	
7.0			-	

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

LOGGED BY: Daniel Wright
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 5

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Brownish Yellow SILTY CLAY, moist, firm.	UTP* 0.5m		
1.0	- Light Grey mottled Orange and moderately plastic from 1.0m.	173 kPa 1.0m		
	- moderately dilatant, soft to firm and no mottling from 1.6m.	156 kPa 1.5m		
2.0	- soft to firm from 2.0m.	116 kPa 2.0m		
	- Light Greyish White, highly dilatant, moist to wet and firm from 2.2m.			▽
2.4m	Light Greyish White CLAYEY SILT with minor fine SAND, highly dilatant, wet, firm to stiff.	UTP 2.5m		
3.0		UTP 3.0m		
		UTP 3.5m		
3.8m	Light Greyish White SILT with some CLAY, highly dilatant, wet, firm.			
4.0				
5.0	End of Log at 5.0m.			
6.0				
7.0				

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.
Water Table rose to 1.7m when testing.

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Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 6

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm.			
0.3m	Brownish Orange SILTY CLAY, moist, stiff.	UTP* 0.5m		
		173 kPa 1.0m		
1.0	- Light Brown and highly plastic from 1.2m.	UTP 2 kPa		
		156 kPa 2.0m		
2.0	- soft to firm from 2.5m.	129 kPa 2.5m		
	- trace intermixed Dark Brown SILT from 2.8m.	156 kPa		
3.0	- firm from 3.0m.	3.0m		
3.2m	Dark Blackish Brown organic SILT with a very strong organic odour, well consolidated, moist, firm.	142 kPa 3.5m		
3.6m	Light Greyish Brown SILTY CLAY, moist, firm.			
4.0	- Greenish Grey from 4.3m.			
5.0	End of Log at 5.0m.			
6.0				
7.0				

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.

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Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 7

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Brownish Yellow SILTY CLAY, slightly plastic, moist, firm.	148 kPa 0.5m		
	- mottled Orange from 0.6m.			
1.0	- soft to firm from 1.0m.	129 kPa 1.0m		▽
	- soft and moist to wet from 1.3m.	93 kPa 1.5m		
1.8m	Dark Blackish Brown organic SILT, moist to wet, soft.	* 2.0m		
2.0				
2.3m	Grey SILT, moist to wet, soft.	UTP 2.5m		
2.8m	Dark Blackish Brown organic SILT, moist to wet, soft.	* 3.0m		
3.0				
3.8m	Greyish Green SILT, moist to wet, soft.			
4.0				
	- Blueish Grey with trace fine pumiceous SAND from 4.5m			
5.0	End of Log at 5.0m.			
6.0				
7.0				

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected
UTP* represents Unable to Penetrate.
* Unable to obtain reading.

LOGGED BY: PP Daniel Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soil Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Machine Auger 8

PROJECT No. : 600 467 71
DATE : 6 August 2008

MAUNSELL | AECOM

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		-	
0.3m	Brownish Orange SILTY CLAY, moist, stiff.	195+kPa 0.5m	-	
	- moderately plastic from 0.6m.		-	
1.0	- firm to stiff from 1.0m.	173 kPa 1.0m	-	
	- Light Pinkish Orange mottled Brownish Yellow from 1.2m.		-	
		168 kPa 1.5m	-	
2.0	- Light Grey mottled Brownish Yellow from 2.0m.	195+kPa 2.0m	-	
		173 kPa 2.5m	-	
			-	
3.0		195+kPa 3.0m	-	
	- Light Grey and moderately dilatant from 3.2m.		-	
3.5m	Light Greyish White fine to medium SANDY SILT with minor CLAY, moist to wet, firm to stiff.	195+kPa 3.5m	-	
3.8m	Light Greyish Brown streaked Orange SILTY CLAY, moist, firm.		-	
4.0	Dark Blackish Brown organic SILT, moist, soft to firm.		-	
			-	
4.4m	Grey SILTY CLAY, moderately dilatant, moist, firm.		-	
	- Dark Greyish Brown with intermixed Dark Brown SILT from 4.8m.		-	
5.0			-	
	- Dark Blackish Brown and fragments of decomposed wood at 5.5m.		-	
			-	
6.0			-	
6.2m	Light Grey SILTY CLAY, slightly dilatant, moist, firm.		-	
6.5m	End of Log at 6.5m.		-	
7.0				

COMMENTS: Shear Vane: DR 1870
Correction factor: Reading x 1.63 - 6.75
These values are corrected

LOGGED BY: pp Daniel Wyatt
Geoff Painter

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 1

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Dark Brown SILTY CLAY, moist, soft to firm.	0.3m 138 kPa		
		0.6m		
	- firm from 0.6m. - Light Brown from 0.65m. - Light Brown mottled Orange with minor fine pumiceous particles from 0.7m.	190 kPa		
		0.9m		
	- minor fine to medium SAND from 0.9m.	177 kPa		
1.0				
		1.2m		
1.2m	End of Log at 1.2m.	222 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 2

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
		0.3m		
0.3m	Dark Brown SILTY CLAY, moist, soft.	94 kPa		
		0.6m		
	- trace rootlets and firm from 0.6m.	170 kPa		
	- Light Grey mottled Brownish Orange and moist to wet from 0.8m.	0.9m		▽
		174 kPa		
1.0				
		1.2m		
1.2m	End of Log at 1.2m.	202kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 3

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.2m	Light Brown SILTY CLAY, slightly plastic, moist, firm.	0.3m 186 kPa		
	- trace rootlets from 0.5m.	0.6m		
	- soft to firm from 0.6m.	135 kPa		
	- mottled Orange and moist to wet from 0.8m.	0.9m 113 kPa		▽
1.0				
1.1m	Light Grey mottled Orange fine SANDY SILT with trace fine pumiceous particles, moist to wet, soft to firm.	1.2m		
1.2m	End of Log at 1.2m.	110 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 4

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Brownish Orange SILTY CLAY, moderately plastic, moist, firm to stiff.	0.3m 222 kPa		
	- mottled Red from 0.6m.	0.6m 174 kPa		
1.0		0.9m 174 kPa		
1.2m	End of Log at 1.2m.	1.2m 222 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 5

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)			
0.3m	Dark Brown SILTY CLAY, moist, soft.	0.3m 74 kPa		
	- Light Brownish Grey and slightly plastic from 0.5m.	0.6m		
	- soft to firm from 0.6m.	142 kPa		
	- mottled Red and firm from 0.8m.	0.9m 170 kPa		
1.0		1.2m		
1.2m	End of Log at 1.2m.	174 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Hand Auger 6

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	Shear Strength	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILt, moist, firm. (Topsoil)			
		0.3m		
0.3m	Brownish Orange SILTY CLAY, slightly plastic, moist, firm.	170 kPa		
		0.6m		
		145 kPa		
		0.9m		
		183 kPa		
1.0		1.2m		
1.2m	End of Log at 1.2m.	193 kPa		
2.0				
3.0				

COMMENTS: Shear Vane: Geo
Correction factor: Reading x 1.60 -2.37
These values are corrected

LOGGED BY: Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Perc 1

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		
0.3m	Light Greyish Brown streaked Light Grey SILTY CLAY, moist, firm to stiff. (Poor Drainage)		
	- Light Brownish Yellow from 0.7m.		
1.0			
	- Light Grey with trace fine SAND & pumiceous particles, slightly dilatant and moderately plastic from 1.3m.		
1.7m	Light Grey CLAYEY SILT, highly dilatant, moist to wet, soft to firm. (Poor Drainage)		
2.0	End of Log at 2.0m.		
3.0			

COMMENTS:

LOGGED BY: pp Daniel Wyatt
Nicky Ries

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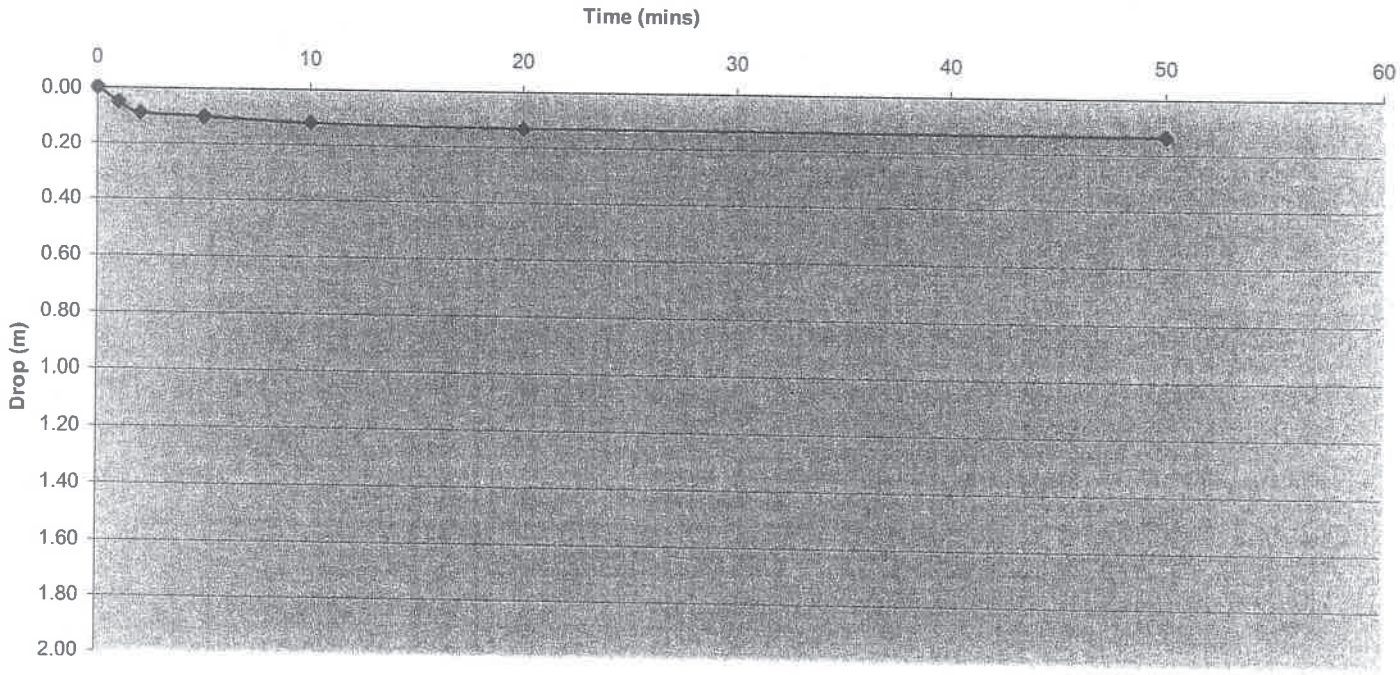
MAUNSELL AECOM

Perc Test Results

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
AUGER No. : Perc 1
File Name: I:\Projects\Engineering\60046771 HGT MISC 1059 Lakeside Farms, Scott Road\4. Tech work area\4.8 Geotech\[Perc 1.xls]Perc

PROJECT No. : 600 467 71
DATE : 7 August 2008

Source Table	
Time (mins)	Drop (m)
0	0.00
1	0.05
2	0.09
5	0.10
10	0.12
20	0.13
50	0.13



Percolation Rate Calculation:

Time (mins)	Drop (m)

Minimum Slope - Lower
Minimum Slope - Upper

Percolation Rate = #DIV/0! m/min = #DIV/0! mm/hr

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Perc 2

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		
0.3m	Light Greyish Brown mottled Orange SILTY CLAY, moderately plastic, moist, firm to stiff. (Poor Drainage)		
1.0	- Brownish Orange and firm from 1.2m.		
	- soft to firm from 1.7m.		
2.0	End of Log at 2.0m.		
3.0			

COMMENTS:

LOGGED BY: pp Daniel Wyatt
Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

PROJECT : Soils Investigation
CLIENT : Lakeside Farms Subdivision
LOCATION : Scott Road, Te Kauwhata
Auger No. : Perc 4

PROJECT No. : 600 467 71
DATE : 7 August 2008

DEPTH	MATERIAL DESCRIPTION	DCP (Scala) Penetrometer	Water Level
0.0	Dark Brown SILT, moist, firm. (Topsoil)		
0.3m	Light Grey SILTY CLAY, slightly plastic, moist, firm. (Poor Drainage)		
	- Grey with trace fine SAND from 0.8m.		
1.0			
	- trace rootlets from 1.5m.		
2.0	End of Log at 2.0m.		
3.0			

COMMENTS:

LOGGED BY: pp Daniel Wright
Nicky Ries

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

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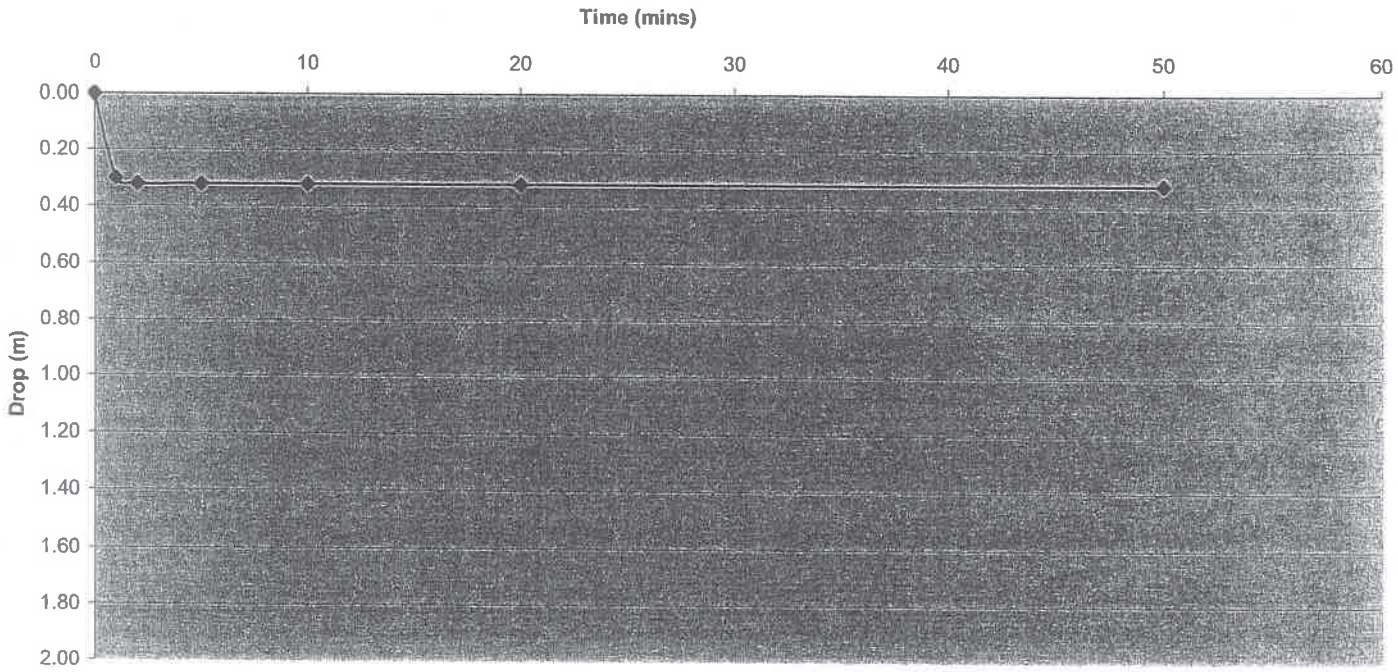
Perc Test Results

PROJECT :	Soils Investigation	**PROJECT No. :**	600 467 71
CLIENT :	Lakeside Farms Subdivision	**DATE :**	7 August 2008
LOCATION :	Scott Road, Te Kauwhata		
AUGER No. :	Perc 4		
File Name:	I:\Projects\Engineering\60046771 HGT MISC 1059 Lakeside Farms, Scott Road\4. Tech work area\4.8 Geotech\[Perc 4.xls]Perc		

Source Table	
Time (mins)	Drop (m)
0	0.00
1	0.30
2	0.32
5	0.32
10	0.32
20	0.32
50	0.32

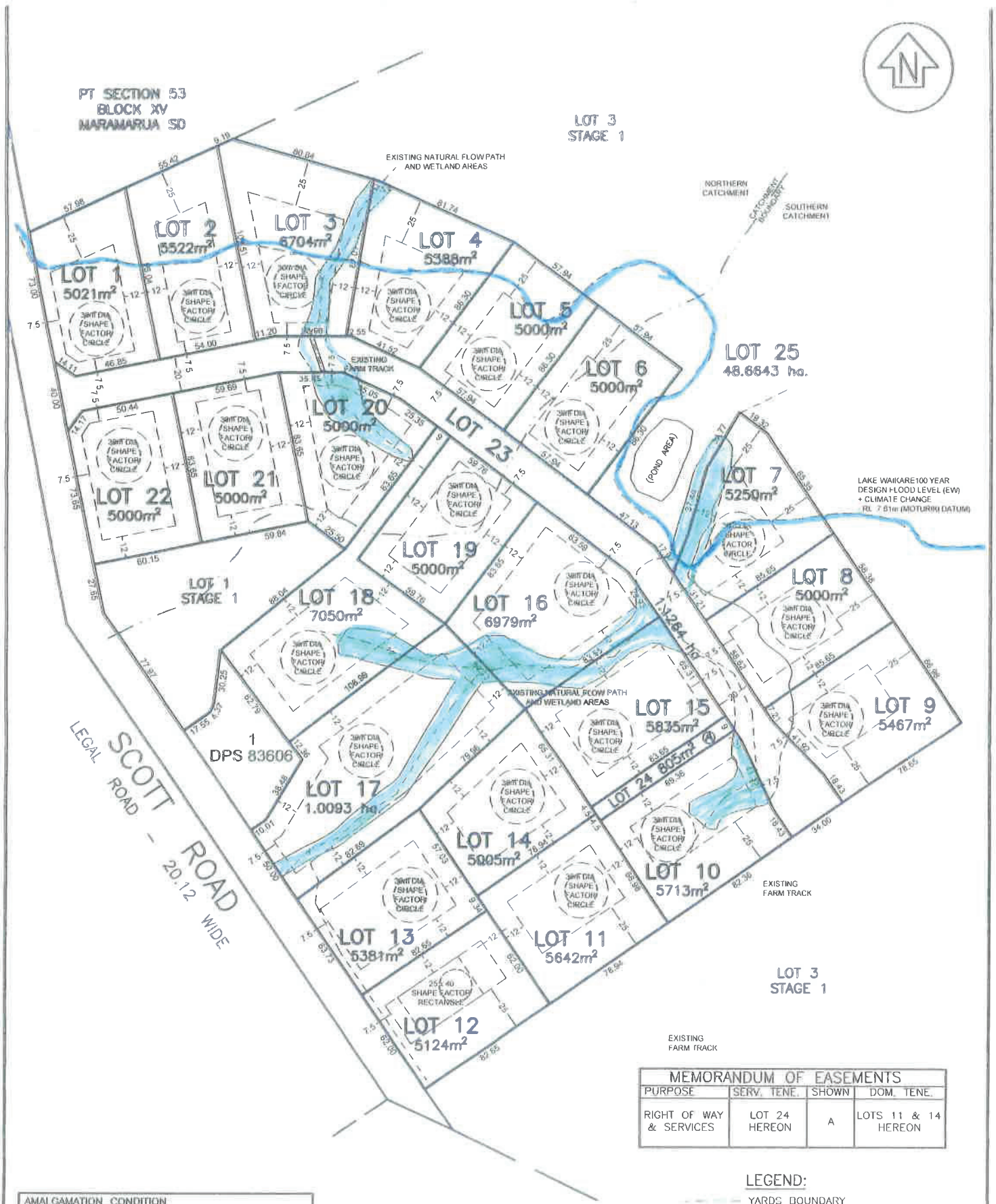


Percolation Rate Calculation:

Time (mins)	Drop (m)

Minimum Slope - Lower
Minimum Slope - Upper

Percolation Rate = #DIV/0! m/min = #DIV/0! mm/hr



MEMORANDUM OF EASEMENTS			
PURPOSE	SERV. TENE.	SHOWN	DOM. TENE.
RIGHT OF WAY & SERVICES	LOT 24 HEREON	A	LOTS 11 & 14 HEREON

AMALGAMATION CONDITION

THAT LOT 24 HEREON (LEGAL ACCESS) BE HELD AS TWO ONE-HALF SHARES BY THE OWNERS OF LOTS 11 & 14 HEREON AND THAT INDIVIDUAL CERTIFICATE OF TITLE BE ISSUED IN ACCORDANCE THEREWITH

SEE .....

LEGEND:

YARDS BOUNDARY

NOTE:

1) ALL AREAS AND DIMENSIONS SUBJECT TO FINAL SURVEY AND APPROVAL FROM THE WAIKATO DISTRICT COUNCIL
2) LEGAL DESCRIPTION: LOTS 1 & 2 DPS 85308 (CT SA66B/990)
3) TOTAL AREA: 62.3878 ha
4) ZONE: COUNTRY LIVING
5) AERIAL PHOTO SUBJECT TO DISTORTION

No.	Amendment	Init.	Date
1			
2			
3			

S:\2004\04223\CAD\SCHEME20-11-08.DWG

Designed: JMB
Drawn: WAB 20 NOVEMBER 2008
Checked:
Approved:

PROPOSED SUBDIVISION OF LOTS 1 & 2 DPS 85308
94A SCOTT ROAD – TE KAUWHATA

SCALE: 1:2000 @A3 | DATE: NOVEMBER 2008 | PREPARED FOR: BRIAN WHITE

Firm's Name
Blue Wallace Surveyors Ltd.
25 Harwood Street, P O Box 38, HAMILTON
Phone (07) 8397799, Fax (07) 8394455

File Reference: 04/223
Drawing No.: 5

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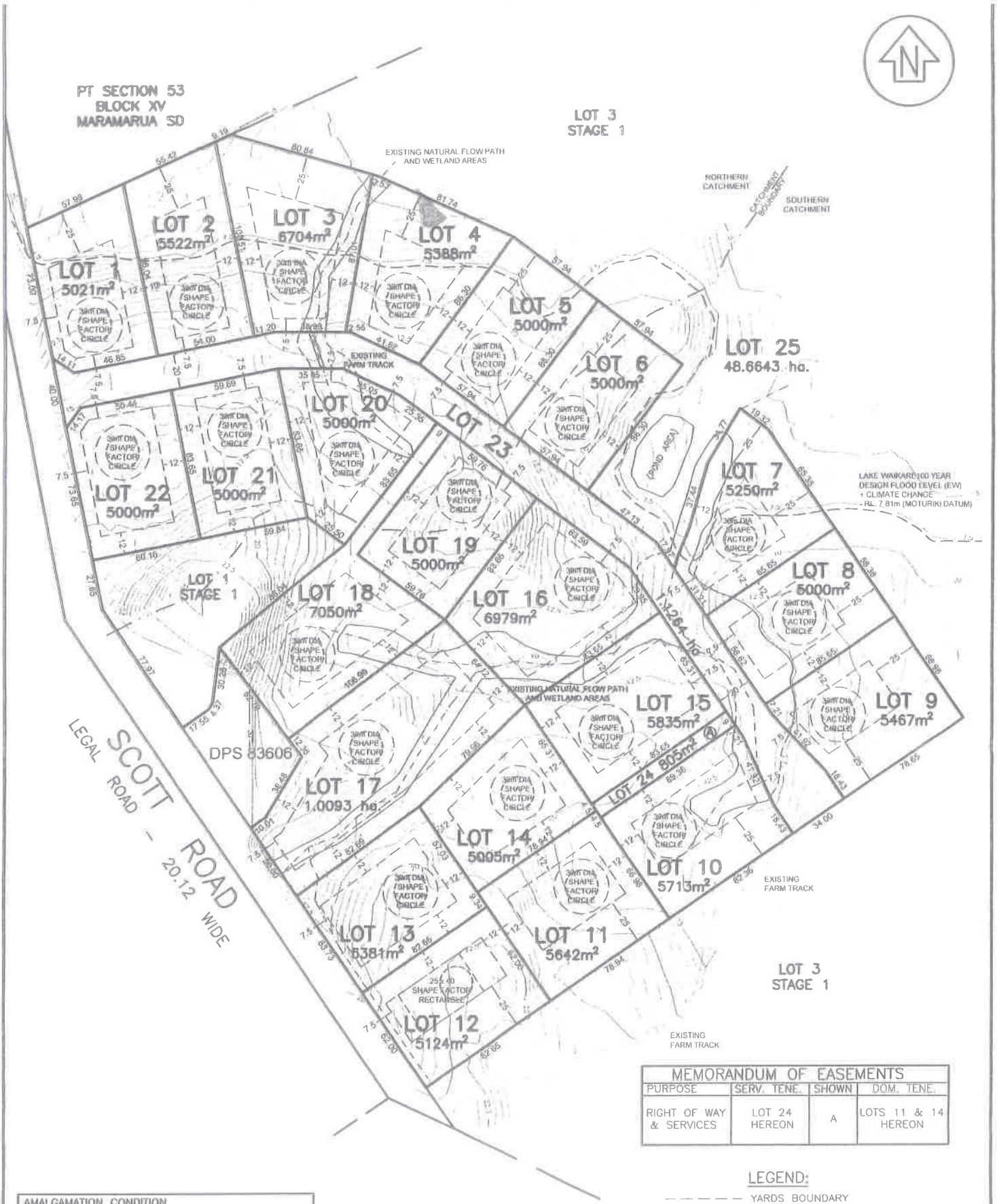
Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016



MEMORANDUM OF EASEMENTS			
PURPOSE	SERV. TENE.	SHOWN	DOM. TENE.
RIGHT OF WAY & SERVICES	LOT 24 HEREON	A	LOTS 11 & 14 HEREON

LEGEND:

— — — — YARDS BOUNDARY

AMALGAMATION CONDITION

THAT LOT 24 HEREON (LEGAL ACCESS) BE HELD AS TWO ONE-HALF SHARES BY THE OWNERS OF LOTS 11 & 14 HEREON AND THAT INDIVIDUAL CERTIFICATE OF TITLE BE ISSUED IN ACCORDANCE THEREWITH

SEE .....

NOTE:

1) ALL AREAS AND DIMENSIONS SUBJECT TO FINAL SURVEY AND APPROVAL FROM THE WAIKATO DISTRICT COUNCIL
2) LEGAL DESCRIPTION: LOTS 1 & 2 DPS 85308 (CT. SA66B/990)
3) TOTAL AREA: 62.3878 ha
4) ZONE: COUNTRY LIVING
5) AERIAL PHOTO SUBJECT TO DISTORTION

No.	Amendment	Init.	Date
1			
2			
3			

S:\2004\04223\CAD\SCHEME20-11-08.DWG

Designed. JMB
Drawn. WAB 20 NOVEMBER 2008
Checked.
Approved.

PROPOSED SUBDIVISION OF LOTS 1 & 2 DPS 85308
94A SCOTT ROAD – TE KAUWHATA

SCALE: 1:2000 @A3 | DATE: NOVEMBER 2008 | PREPARED FOR: BRIAN WHITE

Firm's Name
Blue Wallace Surveyors Ltd.
25 Harwood Street, P O Box 38,
HAMILTON,
Phone (07) 8397799, Fax (07) 8394455

File Reference 04/223

Drawing No. 5

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Document Set ID: 1606081
Version: 1, Version Date: 15/09/2016

APPENDIX D – AERIALS

65-94 Scott Road, Te Kauwhata

Aerial 1949 – Opus

Opus O/N: 31015

Survey Number: 192

Run and Frame: 288/41

Flying Date: 29/03/1949

65-94 Scott Road, Te Kauwhata

Aerial 1963 – Opus

Opus O/N: 301015

Survey Number: 1397

Run and Frame: 3258/27

Flying Date: 06/09/1963

65-94 Scott Road, Te Kauwhata

Aerial 1977 – Opus

Opus O/N: 31015

Survey Number: 5164

Run and Frame: J/6

Flying Date: 04/11/1977

65-94 Scott Road, Te Kauwhata

Aerial 2002 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2007 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2009 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2010 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2012 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2013 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2014 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2015 – Google Earth

65-94 Scott Road, Te Kauwhata

Aerial 2016 – Google Earth

APPENDIX E – CERTIFICATES OF TITLE

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**SA870/89**
Land Registration District	**South Auckland**
Date Issued	02 May 1947

Prior References
SAPR192/280 WA 4759

Estate	Fee Simple
Area	63.4067 hectares more or less
Legal Description	Section 52 Block XV Maramarua Survey District

Proprietors
Lakeside Farms (1993) Limited

Interests

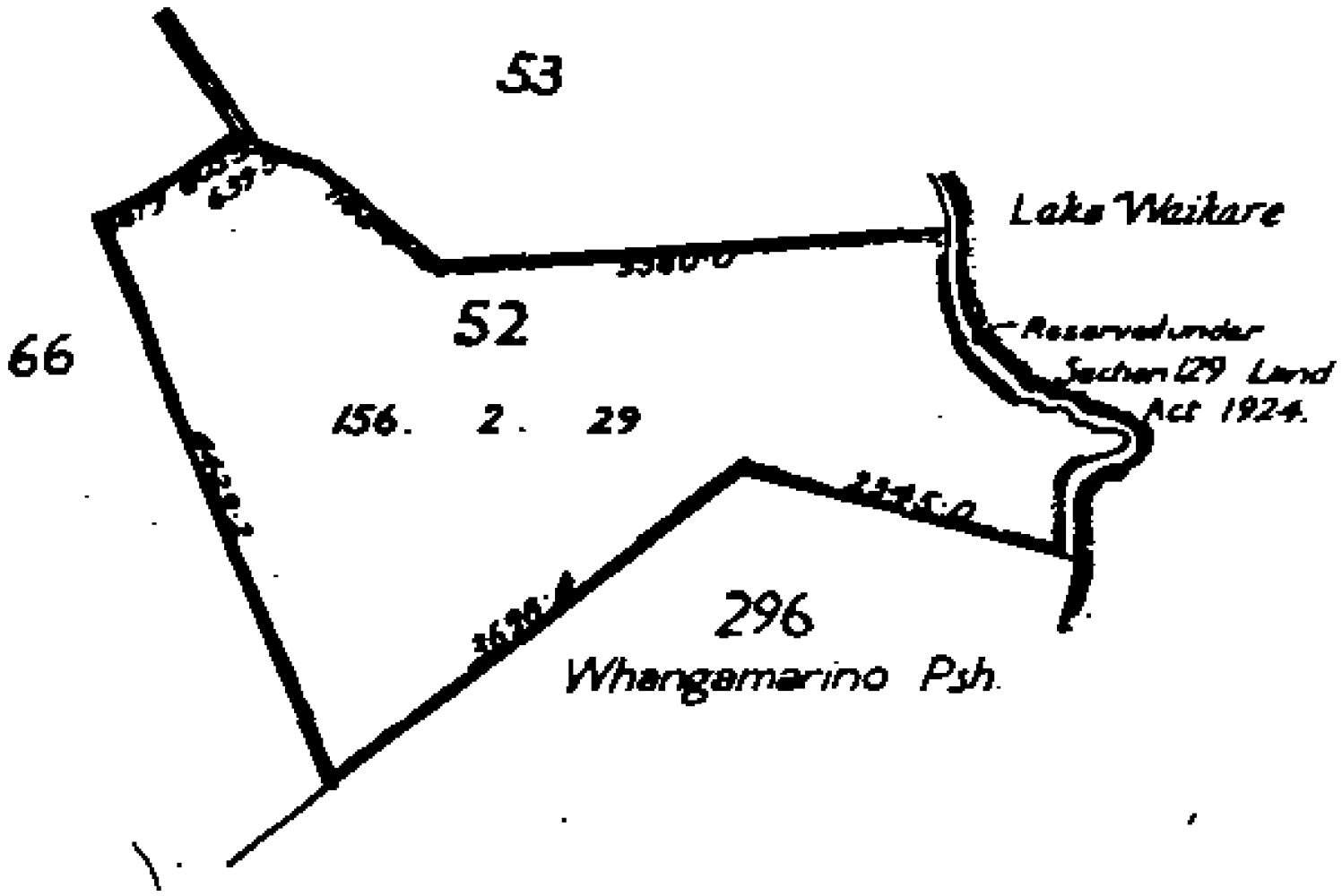
Saving and excepting all minerals within the meaning of the Land Act 1924 on or under the land and reserving always to Her Majesty the Queen and all persons lawfully entitled to work the said minerals a right of ingress egress and regress over the said land

B194666.4 Mortgage to (now) Michael Albert Boldero and Graham Clive Stevenson - 29.3.1994 at 2:10 pm

B628814.4 Mortgage to Rabobank New Zealand Limited - 4.10.2000 at 1.24 pm

5271122.1 Variation of Mortgage B628814.4 - 2.7.2002 at 3:35 pm

5271122.2 Variation of Mortgage B194666.4 - 2.7.2002 at 3:35 pm


53
Lake Waikare
52
Reserved under Section 129 Land Act 1924.
66
156. 2. 29
296
Whangamarino Psh.

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**SA922/186**
Land Registration District	**South Auckland**
Date Issued	17 March 1949

Prior References
SA832/120

Estate	Fee Simple
Area	20.9172 hectares more or less
Legal Description	Lot 1 Deposited Plan 35516

Proprietors
Lakeside Farms (1993) Limited

Interests

Subject to mining rights created by Transfer 91217

Excepting all coal clay and minerals in or under the said land

Fencing Agreement in Transfer 450866 - 17.3.1949

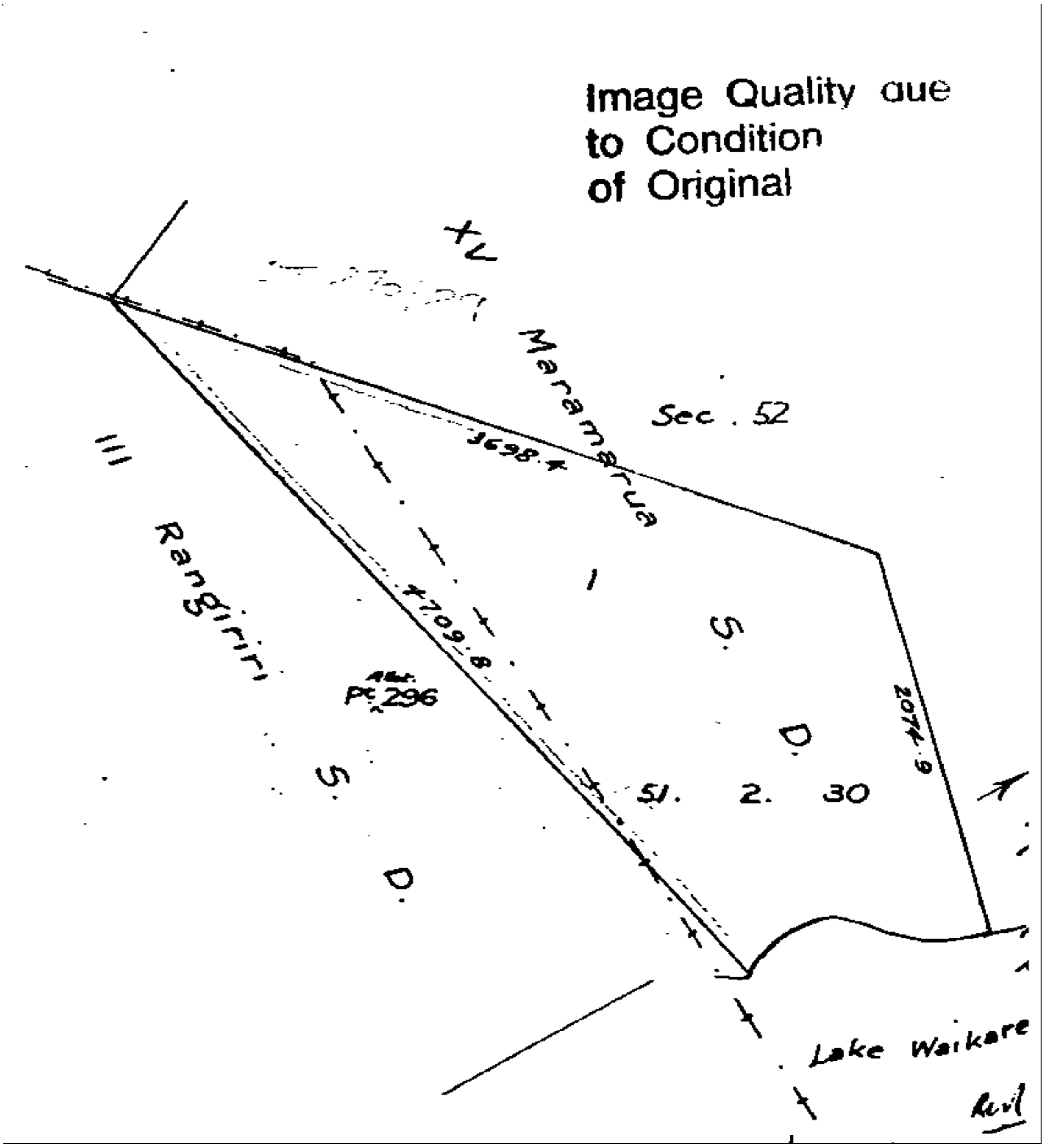
B194666.4 Mortgage to (now) Michael Albert Boldero and Graham Clive Stevenson - 29.3.1994 at 2:10 pm

B628814.4 Mortgage to Rabobank New Zealand Limited - 4.10.2000 at 1.24 pm

5271122.1 Variation of Mortgage B628814.4 - 2.7.2002 at 3:35 pm

5271122.2 Variation of Mortgage B194666.4 - 2.7.2002 at 3:35 pm

Identifier **SA922/186**



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**SA66B/991**
Land Registration District	**South Auckland**
Date Issued	18 May 1999

Prior References
SA1404/48 SA40C/297

Estate	Fee Simple
Area	47.1597 hectares more or less
Legal Description	Lot 1 Deposited Plan South Auckland 85309 and Section 90 Block XV Maramarua Survey District

Proprietors
Lakeside Farms (1993) Limited

Interests

Subject to Section 241(2) Resource Management Act 1991 (affects DPS 83606)

Subject to Section 8 Coal Mines Amendment Act 1950

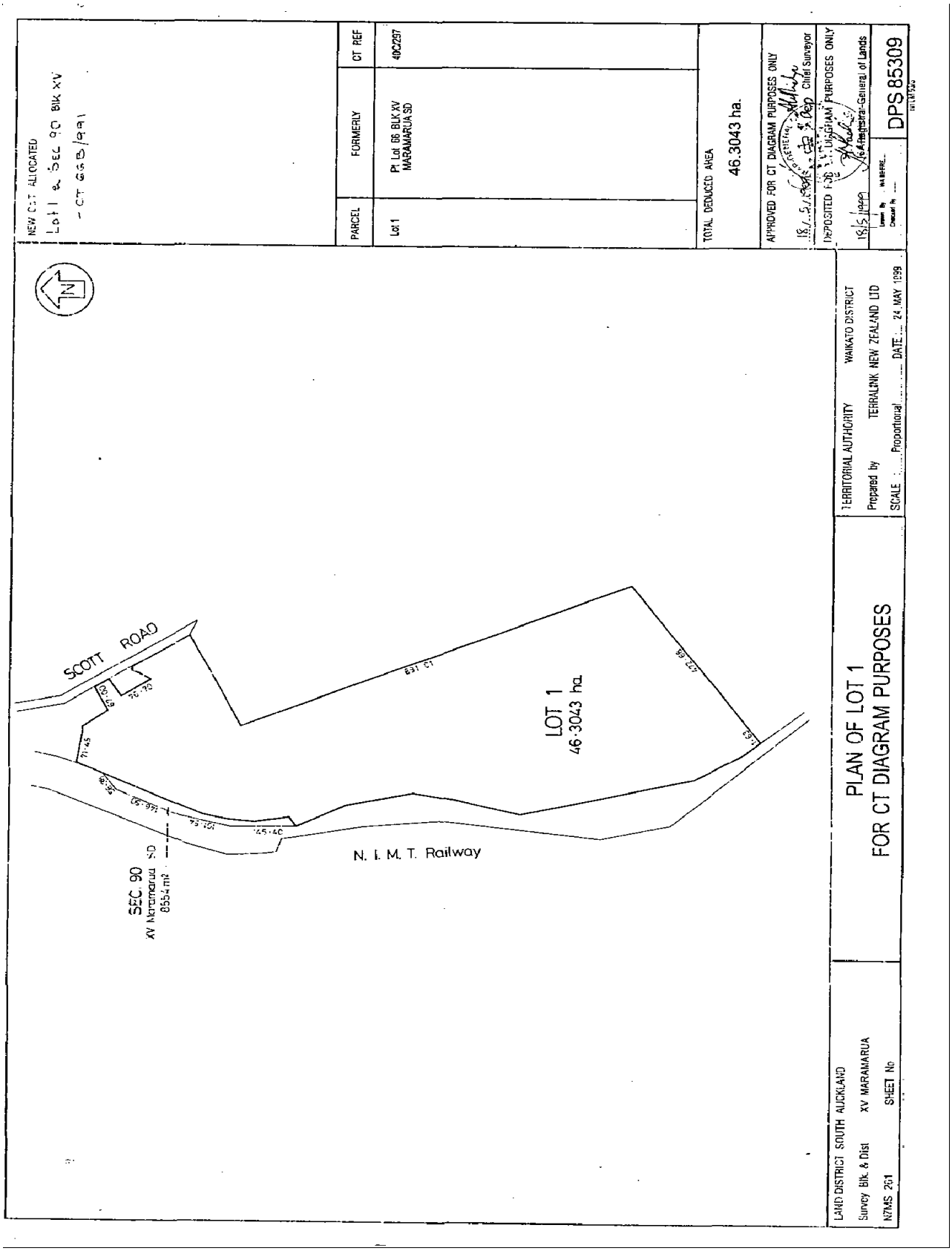
Subject to a telecom right (in gross) over part marked C on DPS 63461 in favour of (now) Chorus New Zealand Limited created by Transfer B271187 - 8.5.1995 at 1:58 pm

5262435.3 Mortgage to Rabobank New Zealand Limited - 24.6.2002 at 2:44 pm

5914946.1 Lease of Lot 1 Deposited Plan 304652 Term 6 years commencing on 1.10.1999 (right of renewal) CT 141316 issued - 1.3.2004 at 9:00 am

Subject to a right of way and telecommunications and electricity easements over part marked A on DP 304652 created by Lease 5914946.1 - 1.3.2004 at 9:00 am

Identifier **SA66B/991**



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Guaranteed Search Copy issued under Section 172A of the Land Transfer Act 1952

R.W. Muir
Registrar-General
of Land

Identifier	**705541**
Land Registration District	**South Auckland**
Date Issued	21 December 2016

Prior References
SA66B/990

Estate	Fee Simple
Area	7640 square metres more or less
Legal Description	Lot 1 Deposited Plan 489788

Proprietors
Lakeside Farms (1993) Limited

Interests

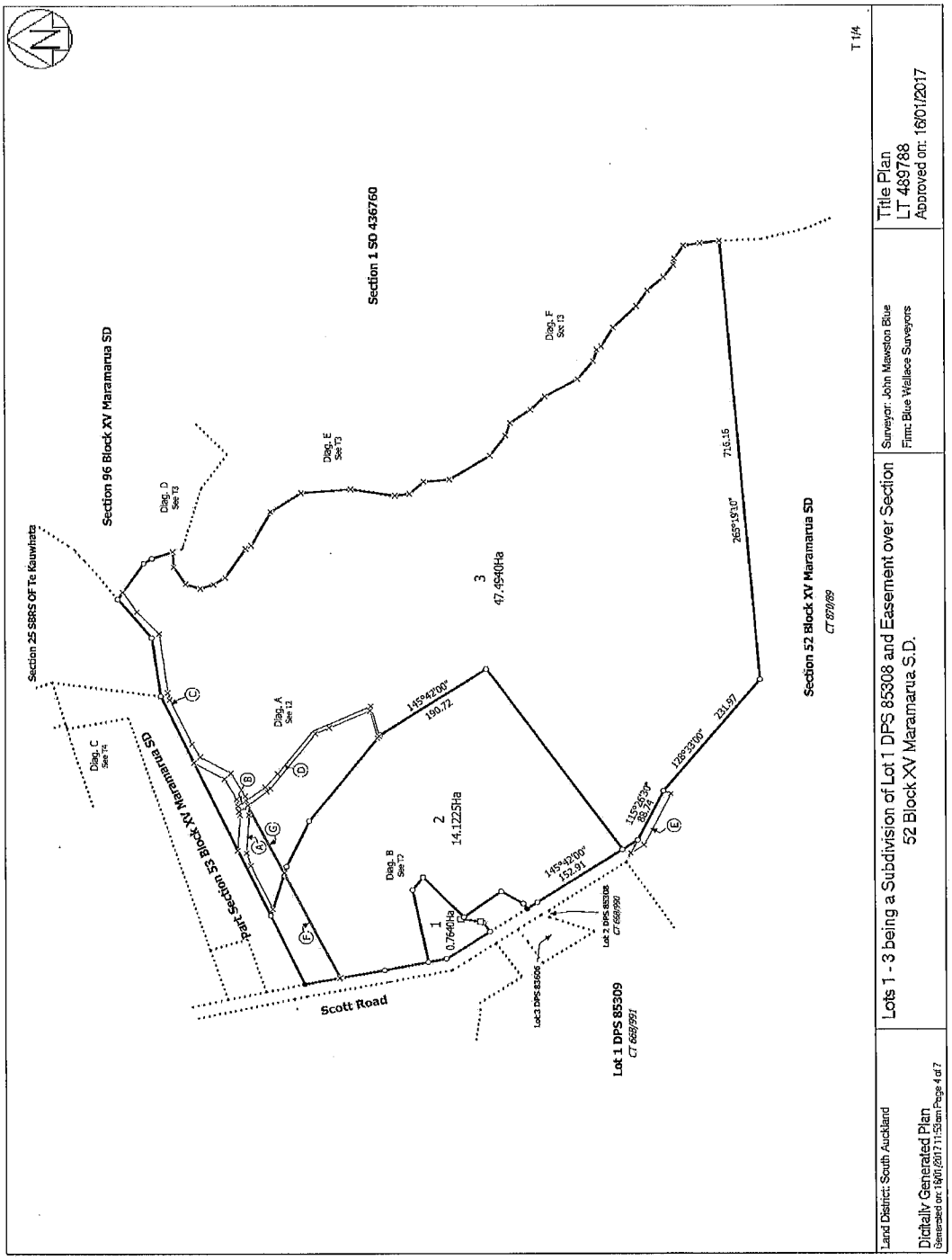
B194666.4 Mortgage to (now) Michael Albert Boldero and Graham Clive Stevenson - 29.3.1994 at 2:10 pm

B628814.4 Mortgage to Rabobank New Zealand Limited - 4.10.2000 at 1.24 pm

5271122.1 Variation of Mortgage B628814.4 - 2.7.2002 at 3:35 pm

5271122.2 Variation of Mortgage B194666.4 - 2.7.2002 at 3:35 pm

10663918.7 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 21.12.2016 at 12:10 pm


Section 1 SO 436760
Section 96 Block XV Maramarua SD
Section 25 SBRS OF Te Kauwhata
Part Section 53 Block XV Maramarua SD
Section 52 Block XV Maramarua SD
CT 87D/89
Lot 1 DPS 85309
CT 668/991
Scott Road
Diag_A See T2
Diag_B See T2
Diag_C See T4
Diag_D See T3
Diag_E See T3
Diag_F See T3
1 0.7640Ha
2 14.1225Ha
3 47.4540Ha
145°47'00" 190.72
145°47'00" 151.91
115°26'30" 88.74
128°53'00" 231.97
265°19'10" 716.16
T 1/4
Lots 1 - 3 being a Subdivision of Lot 1 DPS 85308 and Easement over Section 52 Block XV Maramarua S.D.
Land District: South Auckland
Digitally Generated Plan
Generated on 16/01/2017 11:53am Page 4 of 7
Surveyor: John Mawston Blue
Firm: Blue Wallace Surveyors
Title Plan
LT 489788
Approved on: 16/01/2017

COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Guaranteed Search Copy issued under Section 172A of the Land Transfer Act 1952

R.W. Muir
Registrar-General
of Land

Identifier	**705542**
Land Registration District	**South Auckland**
Date Issued	21 December 2016

Prior References
SA66B/990

Estate	Fee Simple
Area	14.1225 hectares more or less
Legal Description	Lot 2 Deposited Plan 489788

Proprietors
Lakeside Farms (1993) Limited

Interests

B194666.4 Mortgage to (now) Michael Albert Boldero and Graham Clive Stevenson - 29.3.1994 at 2:10 pm

B628814.4 Mortgage to Rabobank New Zealand Limited - 4.10.2000 at 1.24 pm

5271122.1 Variation of Mortgage B628814.4 - 2.7.2002 at 3:35 pm

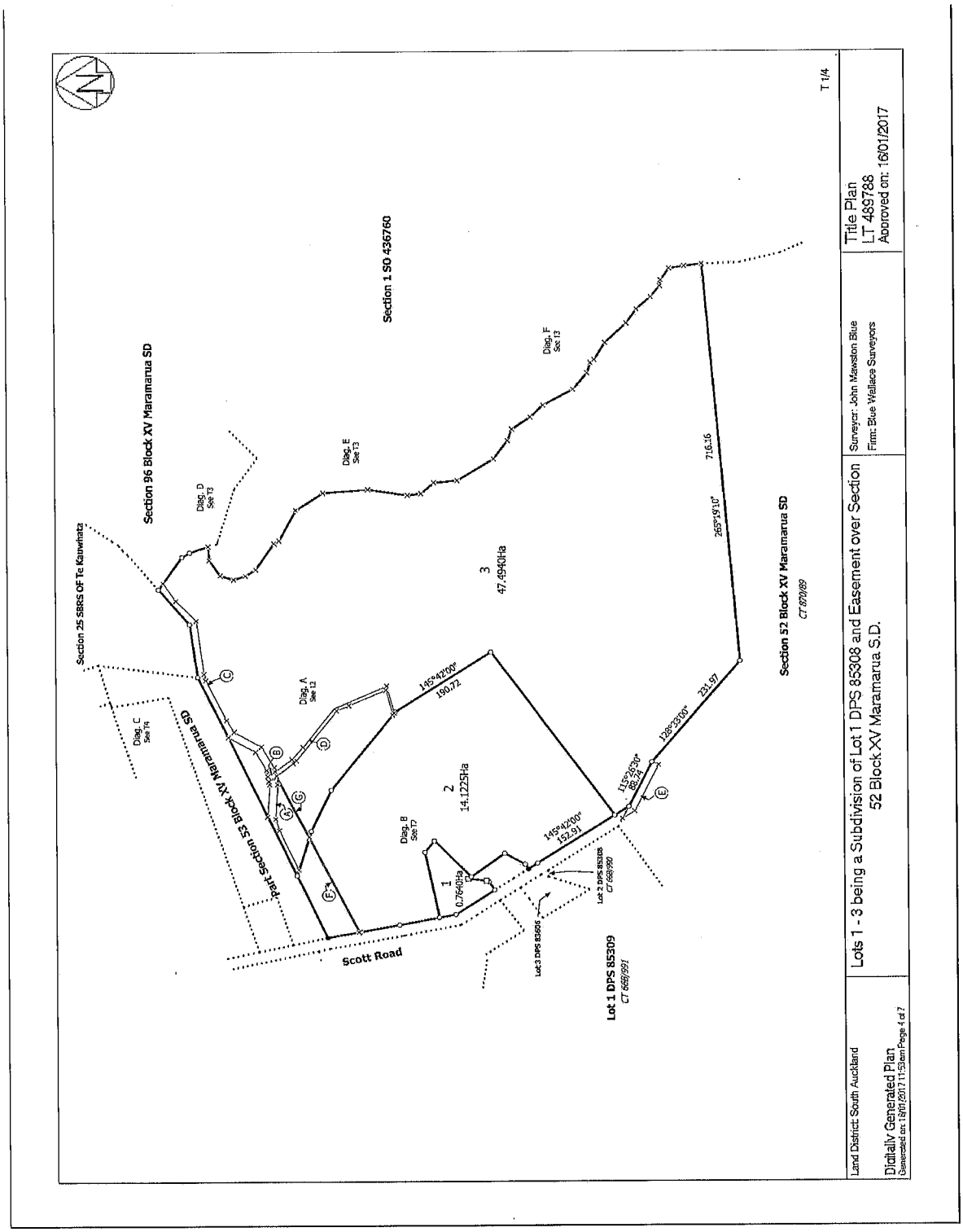
5271122.2 Variation of Mortgage B194666.4 - 2.7.2002 at 3:35 pm

10663918.7 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 21.12.2016 at 12:10 pm

Appurtenant hereto is a right to drain water created by Easement Instrument 10663918.10 - 21.12.2016 at 12:10 pm

The easements created by Easement Instrument 10663918.10 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to convey electricity, telecommunications and computer media over part marked F on DP 489788 in favour of WEL Networks Limited created by Easement Instrument 10663918.11 - 21.12.2016 at 12:10 pm


Section 96 Block XV Maramarua SD
Section 1 SO 436760
Section 25 SBRS OF Te Kauwhata
Part Section 53 Block XV Maramarua SD
Section 52 Block XV Maramarua SD
CT 87D/89
Scott Road
Lot 1 DPS 85309
CT 66B/991
Lot 2 DPS 85308
CT 66B/990
Lot 3 DPS 85606
Diag. A See T2
Diag. B See T7
Diag. C See T4
Diag. D See T3
Diag. E See T3
Diag. F See T3
1
0.7640Ha
2
14.1225Ha
3
47.4940Ha
145°42'00"
190.72
145°42'00"
157.91
115°26'30"
88.74
128°53'00"
234.97
265°39'10"
716.16
T 1/4
Land District South Auckland
Digitally Generated Plan
Generated on: 16/01/2017 11:53am Page 4 of 7
Lots 1 - 3 being a Subdivision of Lot 1 DPS 85308 and Easement over Section 52 Block XV Maramarua S.D.
Surveyor: John Mawston Blue
Firm: Blue Wallace Surveyors
Title Plan
LT 489788
Approved on: 16/01/2017

COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Guaranteed Search Copy issued under Section 172A of the Land Transfer Act 1952

R.W. Muir
Registrar-General of Land

Identifier	**705543**
Land Registration District	**South Auckland**
Date Issued	21 December 2016

Prior References
SA66B/990

Estate	Fee Simple
Area	47.4940 hectares more or less
Legal Description	Lot 3 Deposited Plan 489788

Proprietors
Lakeside Farms (1993) Limited

Interests

B194666.4 Mortgage to (now) Michael Albert Boldero and Graham Clive Stevenson - 29.3.1994 at 2:10 pm

B628814.4 Mortgage to Rabobank New Zealand Limited - 4.10.2000 at 1.24 pm

5271122.1 Variation of Mortgage B628814.4 - 2.7.2002 at 3:35 pm

5271122.2 Variation of Mortgage B194666.4 - 2.7.2002 at 3:35 pm

Subject to a right (in gross) to convey electricity, telecommunications and computer media over part marked A on DP 491957 in favour of WEL Networks Limited created by Easement Instrument 10341898.1 - 23.9.2016 at 4:56 pm

Subject to a right (in gross) to drain water over part marked A, B and C on DP 489788 in favour of Waikato Regional Council created by Easement Instrument 10663918.9 - 21.12.2016 at 12:10 pm

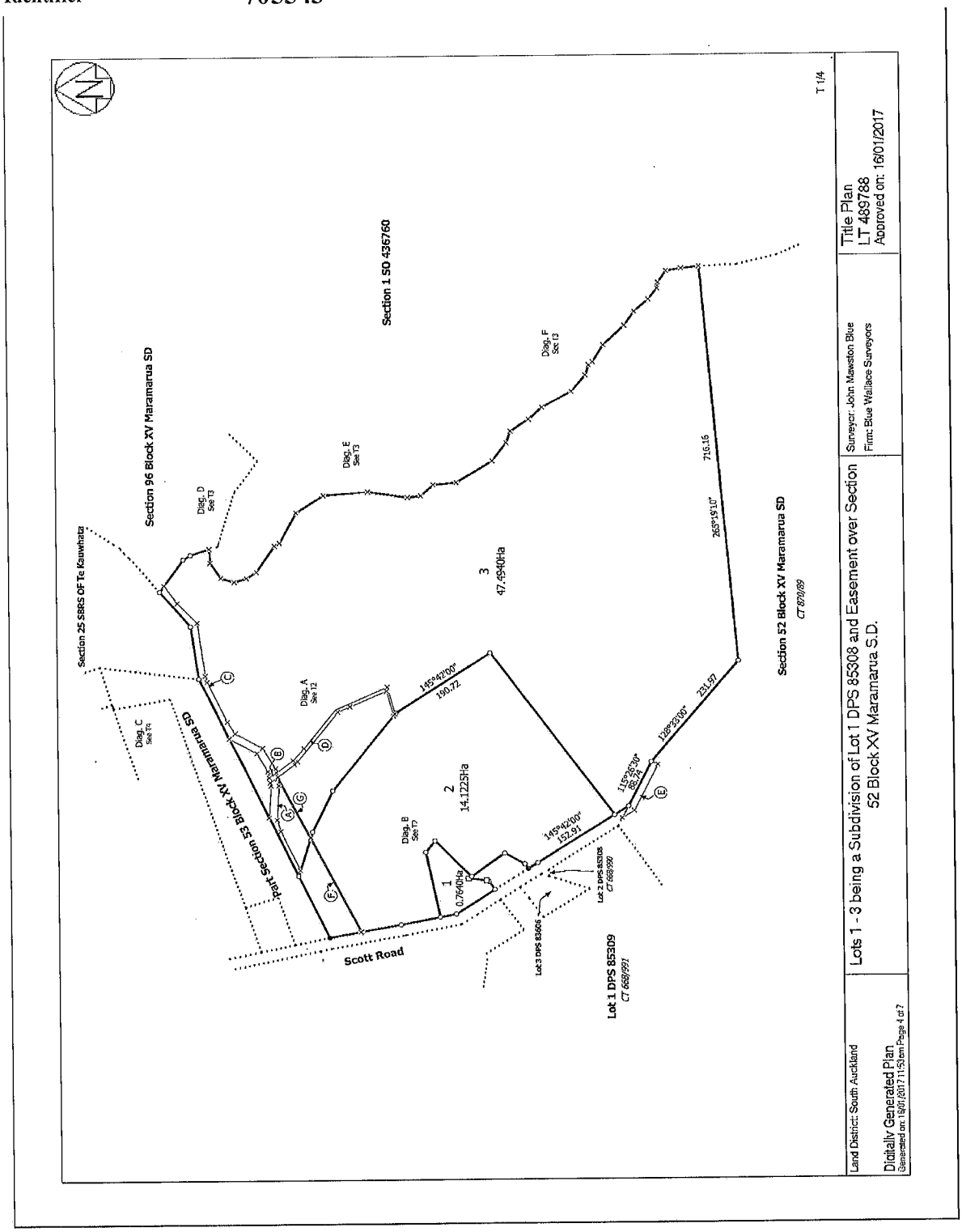
The easements created by Easement Instrument 10663918.9 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right to drain water over part marked B and D on DP 489788 created by Easement Instrument 10663918.10 - 21.12.2016 at 12:10 pm

Appurtenant hereto is a right of way created by Easement Instrument 10663918.10 - 21.12.2016 at 12:10 pm

The easements created by Easement Instrument 10663918.10 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to convey electricity, telecommunications and computer media over part marked G on DP 489788 in favour of WEL Networks Limited created by Easement Instrument 10663918.11 - 21.12.2016 at 12:10 pm


Section 1 SO 436760
Section 96 Block XV Maramarua SD
Section 25 SSRS OF Te Kauwhata
Part Section 53 Block XV Maramarua SD
Section 52 Block XV Maramarua SD
CT 870/89
Scott Road
Lot 1 DPS 85309
CT 668/991
Lot 2 DPS 85308
CT 668/990
Lot 3 DPS 85608
Diag. A Sec T2
Diag. B Sec T7
Diag. C Sec T6
Diag. D Sec T3
Diag. E Sec T3
Diag. F Sec T3
1
0.7640Ha
2
14.1225Ha
3
47.4940Ha
145°42'00"
190.72
145°42'00"
152.91
115°26'30"
88.74
128°28'00"
231.57
265°19'10"
716.16
T 1/4
Lots 1 - 3 being a Subdivision of Lot 1 DPS 85308 and Easement over Section 52 Block XV Maramarua S.D.
Surveyor: John Mawston Blue
Firm: Blue Wallace Surveyors
Title Plan
LT 489788
Approved on: 16/01/2017
Land District: South Auckland
Digitally Generated Plan
Generated on: 19/01/2017 11:53 am Page 4 of 7

APPENDIX F – CONTAMINATED SITE ENQUIRIES

Leena Khong

From: Michelle Begbie <Michelle.Begbie@waikatoregion.govt.nz>
Sent: Thursday, 13 October 2016 2:57 p.m.
To: Leena Khong
Subject: RE: Land Use Information Register enquiry: 65 Scott Road, Te Kauwhata and a 200m radius

Dear Leena,

Thank you for your enquiry regarding information the Waikato Regional Council may hold relating to potential contamination at the property indicated below:

65 Scott Road, Te Kauwhata: LOT 1 DP 35516 LOT 1 DPS 85308 LOT 1 DPS 85309 LOT 2 DPS 85308 SEC 52 BLK XV MARAMARUA SD SO 26644 SEC 90 BLK XV MARAMARUA SD SO 37136 (VRN 04390/328/07) **(shaded purple below)**

Background: The Waikato Regional Council maintains a register of properties known to be contaminated on the basis of chemical measurements, or potentially contaminated on the basis of past land use. This register (called the Land Use Information Register) is still under development and should not be regarded as comprehensive. The 'potentially contaminated' category is gradually being compiled with reference to past or present land uses that have a greater than average chance of causing contamination, as outlined in the Ministry for the Environment's Hazardous Activities and Industries List (HAIL): http://www.mfe.govt.nz/sites/default/files/hazards/contaminated-land/is-land-contaminated/hazardous-activities-industries-list.pdf

This property: I can confirm that 65 Scott Road, Te Kauwhata **does not** currently appear on the Land Use Information Register.

However, there are several HAIL sites within a 200m radius, as shaded orange in the map snip above.

WRC reference	Site name	Classification	HAIL activity	Close up map (overlaid on 2012 imagery)
LUI04008	Clyde Juices Limited/Te Kauwhata Viticultural Research Station/Rongopai Wines	Unverified HAIL	A10. Persistent pesticide storage or use	
LUI02348	Agrissentials NZ Limited/Richmond Abbatoir/Paramount Export/PPCS.	Verified HAIL - No Sampling	A17. Storage tanks or drums for fuel, chemicals or liquid waste A16. Skin or wool processing including a tannery or fellmongery A6. Fertiliser manufacture or bulk storage	

LUI03335	Carley's Transport	Verified HAIL - No Sampling	F8. Transport depots or yards A11. Pest control operators premises	
LUI02438	Ballance Agri/Carley's Transport Ltd Fertiliser Depot	Verified HAIL - No Sampling	A6. Fertiliser manufacture or bulk storage A17. Storage tanks or drums for fuel, chemicals or liquid waste	

District Councils: Our records are not integrated with those of territorial authorities, so it would also be worth contacting the Waikato District Council to complete your audit of Council records if you have not already done so. In general, information about known contaminated land will be included on a property LIM produced by the territorial authority.

Rural Land Considerations: Examples of sites that are "more likely than not" to have soil contamination (HAIL sites) include timber treatment activities, service stations and/or petroleum storage, panel beaters, spray painters, etc. Whilst pastoral farming is not included on this list, typical farming activities of horticulture, sheep dipping, chemical storage, petroleum storage and workshops are; but are more difficult to identify and may not be as well represented on the Land Use Information Register. Therefore, individuals interested in pastoral land may be interested in completing further investigations in accordance with Ministry for the Environment Guidelines prior to land purchase and/or development.

Additional Information: Please also note that significant use of lead-based paint on buildings can, in some cases, pose a contamination risk; the use of lead-based paint is not recorded on the Land Use Information Register. Likewise, the long term, frequent use of superphosphate fertilisers can potentially result in elevated levels of cadmium on some properties.

Please feel free to contact me if you have any further queries, or would like to discuss the matter further.

Regards,

Michelle.

Michelle Begbie | Scientist, Land and Soil | Science and Strategy
Waikato Regional Council
P: +64 7 859 0549
F: +64 7 859 0998
Private Bag 3038, Waikato Mail Centre, Hamilton 3240
Please consider the environment before printing this email

Please Note: Due to the large volume of enquiries being received, we may not be able to respond to your enquiry as quickly as previously. We are resourced to meet 20 day response times as per LGOIMA, but endeavour to respond more quickly when workload permits. If your enquiry is urgent, please mark it as such and we will do our best to assist.

From: Information Request - Info
Sent: Friday, 30 September 2016 10:59 a.m.
To: Michelle Begbie <Michelle.Begbie@waikatoregion.govt.nz>
Subject: FW: General enquiry

From: leena.khong@pdp.co.nz [mailto:leena.khong@pdp.co.nz]
Sent: Friday, 30 September 2016 10:56 a.m.
To: Information Request - Info <Info@waikatoregion.govt.nz>
Subject: General enquiry

General Enquiry

Name: Leena Khong
Email: leena.khong@pdp.co.nz
Phone: 09 523 6913
Address: PDP House, Level 4, 235 Broadway Newmarket, Auckland
Subject: Site Contamination Enquiry
Message: Hi,

We are after a site contamination enquiry search within 200m radius of 65-94 Scott Road, Te Kauwhata. Could the results of this search be forwarded to us.

Kind regards,
Leena
Referring URL: http://www.waikatoregion.govt.nz/

****
This email message and any attached files may contain confidential information, and may be subject to legal professional privilege. If you have received this message in error, please notify us immediately and destroy the original message. Any views expressed in this message are those of the individual sender and may not necessarily reflect the views of Waikato Regional Council. Waikato Regional Council makes reasonable efforts to ensure that its email has been scanned and is free of viruses, however can make no warranty that this email or any attachments to it are free from viruses.
Visit our website at http://www.waikatoregion.govt.nz
****

Your Ref

In reply please quote
HAIL0100/17

If calling, please ask for
Hollie Griffith

Waikato DISTRICT COUNCIL
Te Kaunihera aa Takiwaa o Waikato

20 September 2016

Postal Address
Private Bag 544
Ngaruawahia, 3742
New Zealand

0800 492 452
www.waikatodistrict.govt.nz

Winton Partners Investment Limited
PO Box 105526
Auckland City
Auckland 1143

Dear Sir/Madam

Property Enquiry - HAIL report

Further to your request for details of whether or not council records indicate that an activity or industry described in the Ministry for the Environment Hazardous Activities and Industries List (HAIL) is being, has been or is more likely than not to have been undertaken on a piece of land I can advise the following:

Property address: **65 Scott Road TE KAUWHATA**
VNZ Property ID: **04390/328.07**
Legal description: **LOT 1 DPS 85308**
LOT 1 DPS 85309
LOT 2 DPS 85308
LOT 1 DP 35516
SEC 52 BLK XV MARAMARUA SD SO 26644
SEC 90 BLK XV MARAMARUA SD SO 37136

The following HAIL activity or activities are or are likely to be associated with the property:

Unverified HAIL A2: Chemical manufacture, formulation or bulk storage

Sourced Documents:

Preliminary Site Investigation (PSI), Contaminated Site Investigation dated March 2016

Comments:

A PSI was undertaken by Contaminated Site Investigation, dated March 2016 in support of subdivision application (SUB0133/16). The PSI investigated 14.1225 ha of Lot 1 DPS 85308 and found no HAIL activity had occurred on site.

The PSI also stated that although no chemicals were being stored on the site in question (14.1225 ha of Lot 1 DPS 85308) "chemicals are stored in a shed located in a building to the south, which is part of a wider farm". Further information/ investigation will be required into the existence of chemical storage on site.

The following records (where applicable) were reviewed in this assessment:

Property file including any parent property file from which the property was developed
Waikato District Council Land Use Register
Waikato Regional Council Selected Land Use Register
Subdivision Consent files
Land Use Consent files
Building Consent files
Aerial Photography:

1963	site is pastoral, significant areas of wetland present
1977- 1979, 1993, 2002	site is pastoral, milking shed and farm buildings present

Disclaimer:

This information is based on records held by the Council and/or Waikato Regional Council and reflects the council's current understanding of the site. The council does not accept any liability for any inaccuracy of this information or liability for any loss or damage suffered by any person acting or refraining from acting on this information.

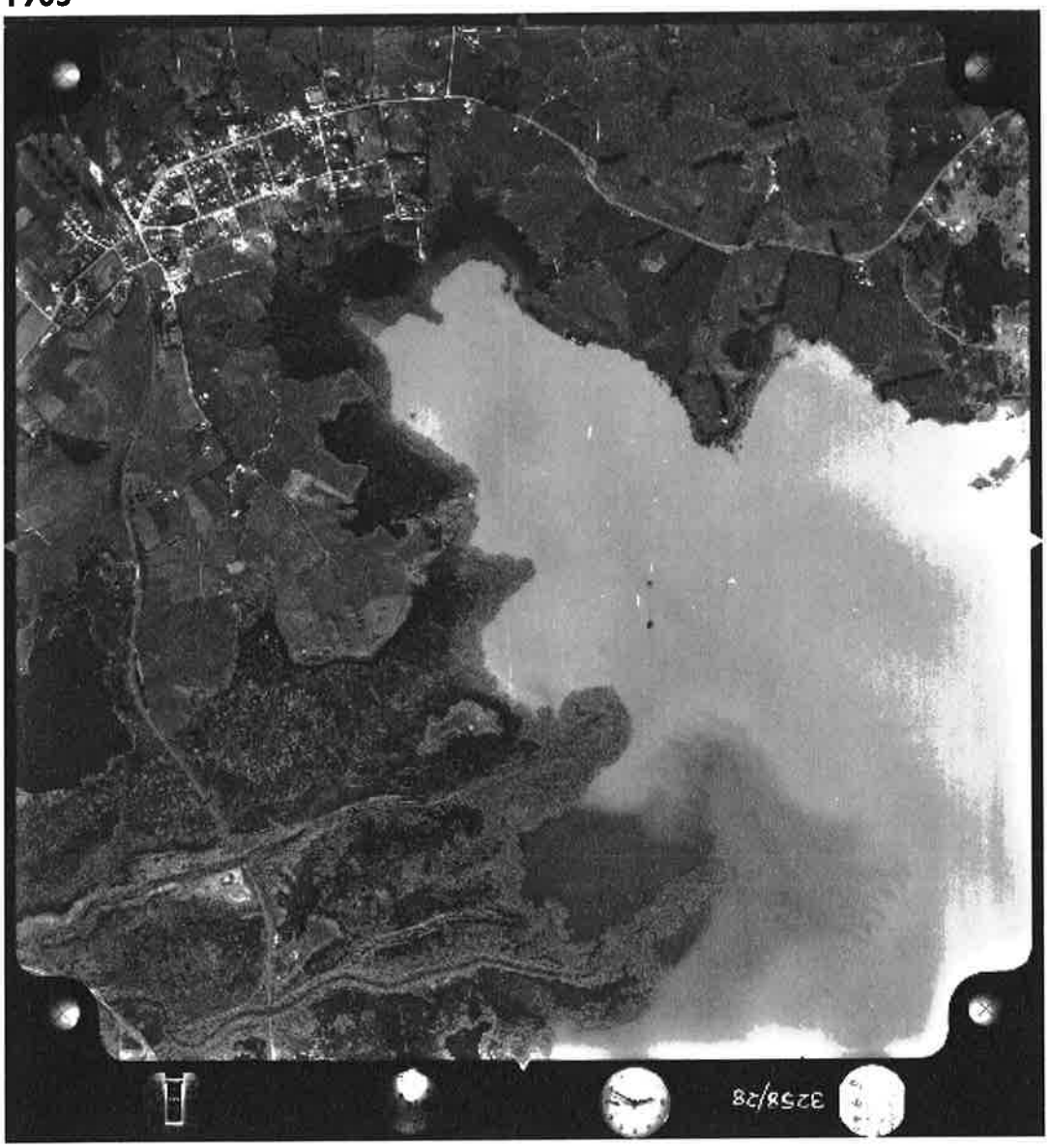
If this information indicates that no record of a HAIL activity has been identified on council records, this does not imply that no HAIL activity has been undertaken on the site. This simply means that the council holds no record of a HAIL activity being undertaken on the property at this point in time. However, council records may be incomplete. Similarly, if one HAIL activity is identified, this does not preclude another HAIL activity having been undertaken of which no record is held. If an activity is proposed to be undertaken on the site that is covered by the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES), council retains the right to seek further information on the site history of the subject property. Where pastoral farming activities have been identified, Council may seek information in respect of cadmium in soil resulting from application of superphosphate fertiliser if residential activities are proposed.

If you have any queries please feel free to call me.

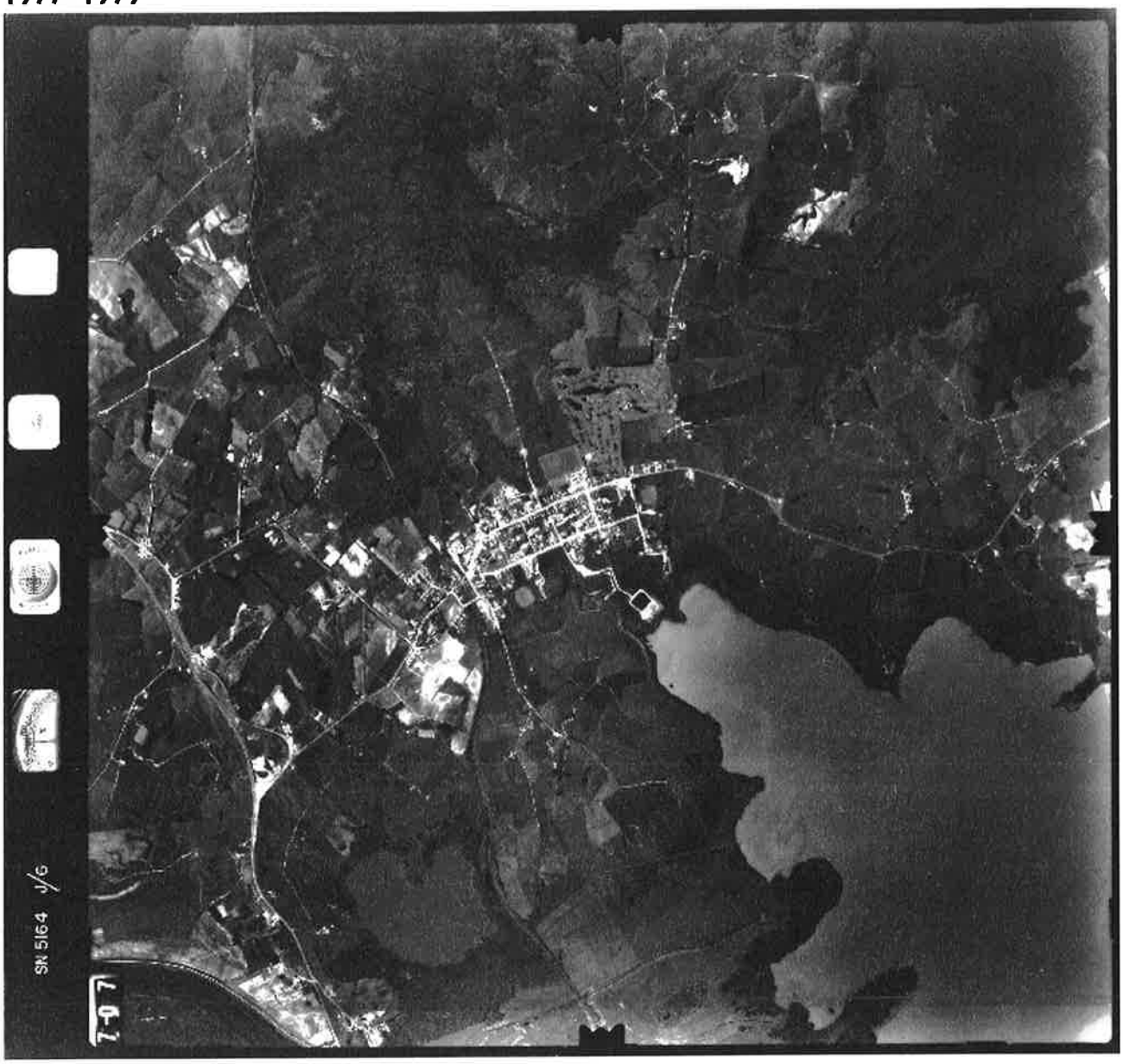
Yours faithfully

pp Hollie Griffith
Contaminated Land Specialist

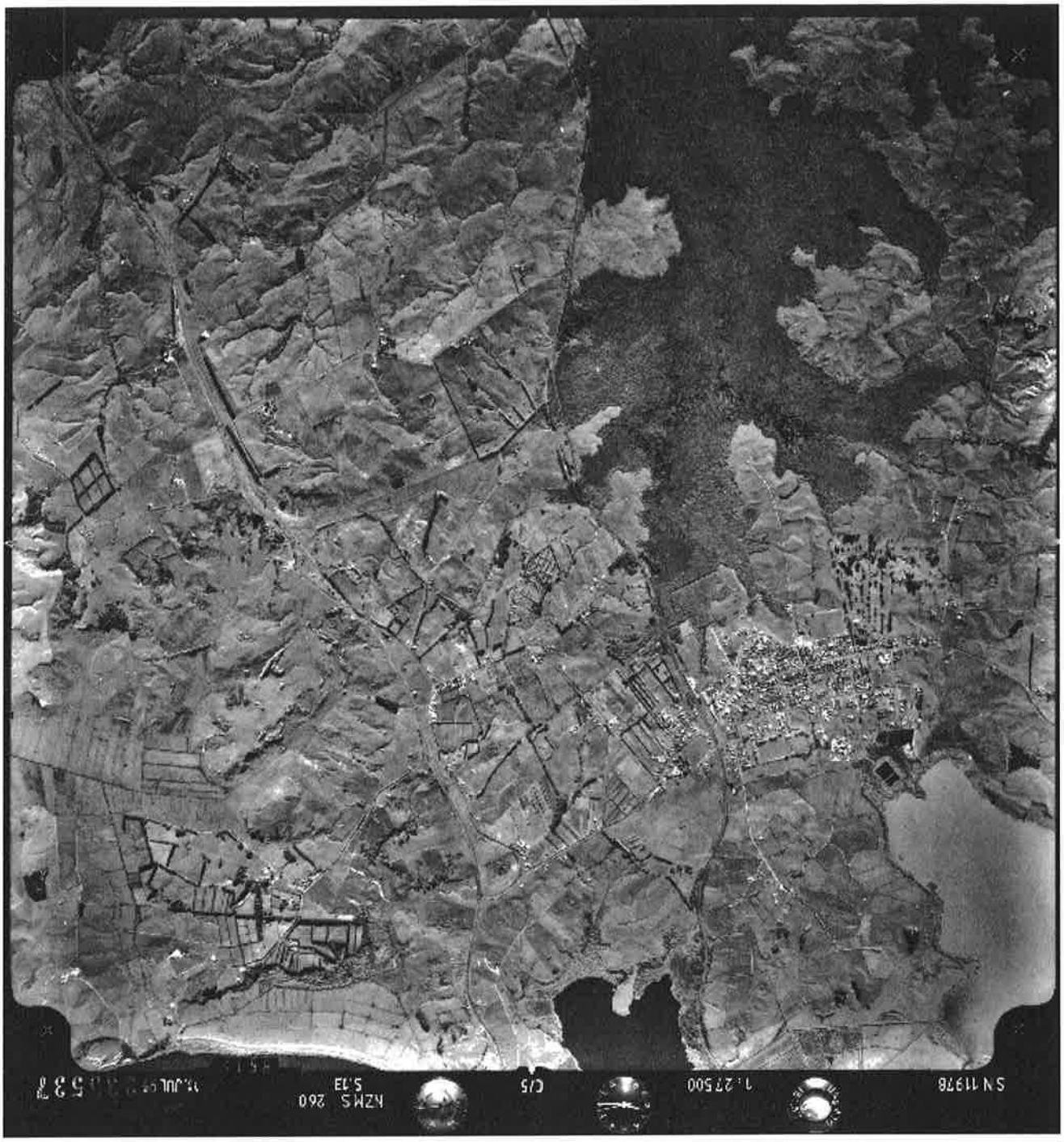
1963



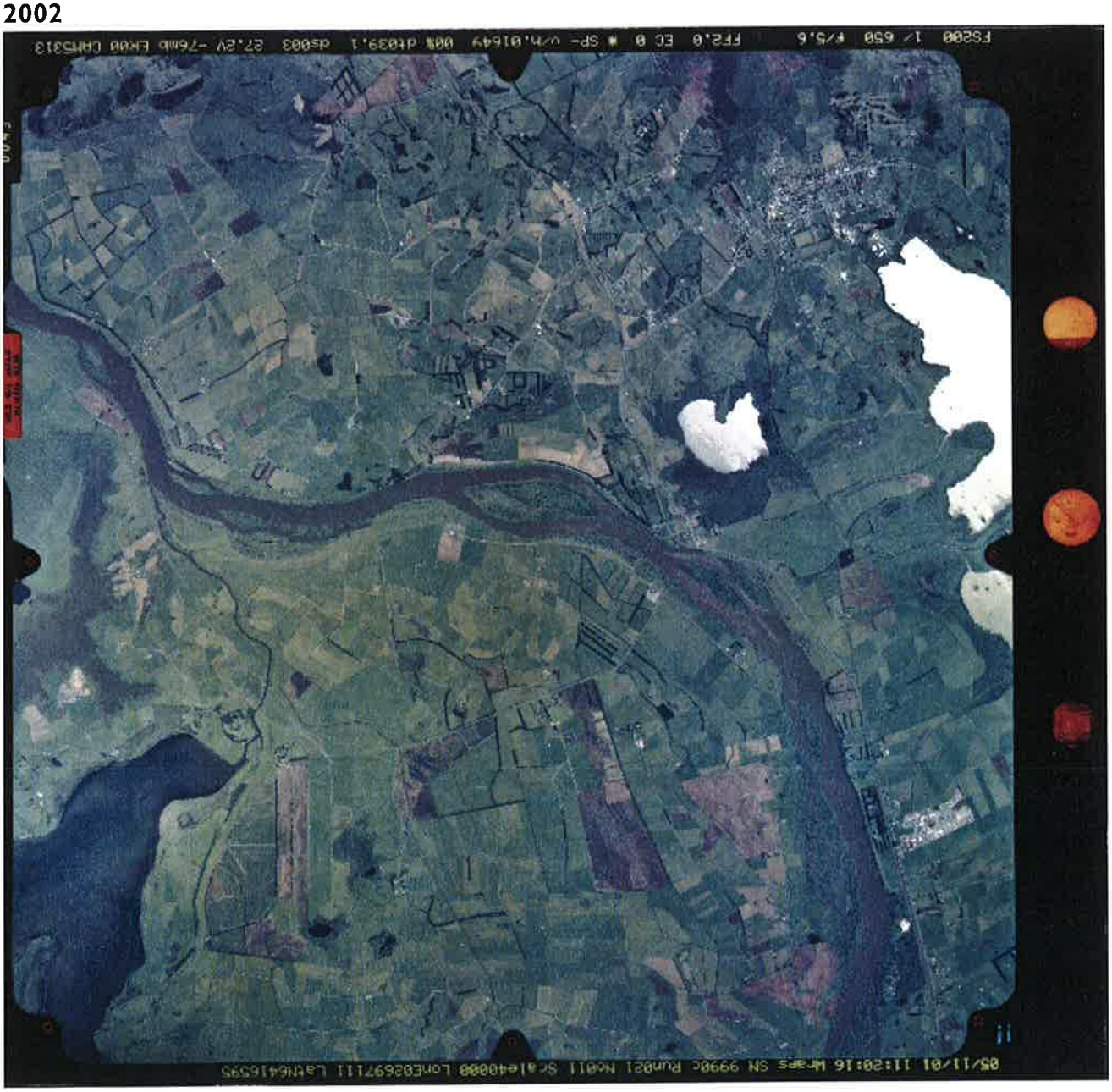
1977- 1979



1993



2002



APPENDIX G - PHOTOS

Photograph 1: Photograph looking east showing above ground diesel tank, note staining beneath.

Photograph 2: Photograph showing fertiliser mixing area.

Photograph 3: Close up of farm bore, note staining near pump.

Photograph 4: Photograph looking south west showing settling pond.

Photograph 5: Photograph looking west showing extent of farm dump area (taken 29/09/16).

Photograph 6: Close up of farm dump (facing west) (taken 29/09/16).

Photograph 7: Photograph showing former farm dump area (taken 01/03/17).

Photograph 8: Photograph showing former farm dump area (taken 01/03/17).

Photograph 9: Photograph showing targets at firing range near south end of the property.

Photograph 10: Photograph showing former farm dump area (provided by Simon Ash via email dated 21/02/17).

APPENDIX H – LANDFILL DOCKETS

EnviroWaste

Hampton Downs Landfill

Date:	08/02/2017
Customer No:	87781
Customer Name:	TDM Construction Limited
Vehicle Registration:	TIP4U2
Time In:	01:06 p.m.
Time Out:	01:27 p.m.
Weighing Docket No:	WES0208474
Purchase Order:	
Weigh Comments:	Irvines

Gross	Tare	Units
40.88	17.04	Tonnes

Product	Net	
Heavy Metal Ash	23.84	Tonnes

EnviroWaste

Hampton Downs Landfill

Date:	07/02/2017
Customer No:	87781
Customer Name:	TDM Construction Limited
Vehicle Registration:	TIPN4U
Time In:	11.53 a.m.
Time Out:	12:20 p.m.
Weighing Docket No:	WES0206245
Purchase Order:	
Weigh Comments:	Irvines

Gross	Tare	Units
32.00	15.74	Tonnes

Product	Net	
Heavy Metal Ash	16.26	Tonnes

EnviroWaste

Hampton Downs Landfill

Date:	07/02/2017
Customer No:	87781
Customer Name:	TDM Construction Limited
Vehicle Registration:	TIP 4 U 2
Time In:	02:09 p.m.
Time Out:	02:32 p.m.
Weighing Docket No:	WES0206738
Purchase Order:	
Weigh Comments:	Irvines

Gross	Tare	Units
38.60	17.12	Tonnes

Product	Net	
Heavy Metal Ash	21.48	Tonnes

EnviroWaste

Hampton Downs Landfill

Date:	08/02/2017
Customer No:	87781
Customer Name:	TDM Construction Limited
Vehicle Registration:	TIP4U2
Time In:	03:01 p.m.
Time Out:	03:21 p.m.
Weighing Docket No:	WES0208921
Purchase Order:	
Weigh Comments:	Irvines

Gross	Tare	Units
43.56	17.12	Tonnes

Product	Net	
Heavy Metal Ash	26.44	Tonnes

EnviroWaste

Hampton Downs Landfill

Date:	08/02/2017
Customer No:	87781
Customer Name:	TDM Construction Limited
Vehicle Registration:	TIP4U2
Time In:	09:08 a.m.
Time Out:	09:27 a.m.
Weighing Docket No:	WES0207626
Purchase Order:	
Weigh Comments:	Irvines

Gross	Tare	Units
35.34	17.06	Tonnes

Product	Net	
Heavy Metal Ash	18.28	Tonnes

EnviroWaste

Hampton Downs Landfill

Date:	08/02/2017
Customer No:	87781
Customer Name:	TDM Construction Limited
Vehicle Registration:	TIP4U2
Time In:	11:16 a.m.
Time Out:	11:37 a.m.
Weighing Docket No:	WES0208092
Purchase Order:	
Weigh Comments:	Irvines

Gross	Tare	Units
39.66	17.14	Tonnes

Product	Net	
'eavy Metal Ash	22.52	Tonnes

EnviroWaste

Hampton Downs Landfill

Date:	08/02/2017
Customer No:	87781
Customer Name:	TDM Construction Limited
Vehicle Registration:	TIP 4 U 2
Time In:	06:37 a.m.
Time Out:	07:16 a.m.
Weighing Docket No.	WES0207304
Purchase Order:	
Weigh Comments:	Irvines

Gross	Tare	Units
42.16	17.18	Tonnes

Product	Net	
Heavy Metal Ash	24.98	Tonnes