# McCrae Landslide - Evacuation Order Area

Geotechnical Factual Report

PSM5665-GFR REV0 9 April 2025

PRIVILEGED AND CONFIDENTIAL



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# 1. Introduction

This report presents the results of the geotechnical site investigation ('Investigation') carried out by PSM in response to two landslides that occurred on 5 January 2025 and 14 January 2025 between properties located at 10-12 View Point Road and 3 Penny Lane, McCrae, Victoria. Collectively, these are referred to as the 'McCrae Landslide' and the "Site" and highlighted with red shading in Inset 1. The Investigation was carried out within and outside of an Evacuation Order (EO) area impacting 19 properties around the McCrae Landslide. This was part of an EO issued on 14 January 2025 by the State Emergency Service (SES) and Mornington Peninsula Shire Council (MPSC) on 17 January 2025 and updated on the 14 and 20 February 2025, Inset 1.

The Investigation was carried out in accordance with Australian Standard (AS) AS 1726:2017 and the PSM proposal (PSM5665-017L, 6 February 2025).



Inset 1: EO area established in response to the McCrae Landslide.

# 1.1 Site Description

The McCrae Landslide occurred on the escarpment located between Point Nepean Road and View Point Road. This escarpment is a part of the broader escarpment that spans from McCrae to Dromana.

The term escarpment refers to a steep slope or cliff found at the margin of a flat or gently sloping area<sup>1</sup> that may have formed as a result of faulting and/or erosion.

# 1.2 Purpose

The purpose of the Investigation is to assess sub surface ground conditions including but not limited to the soil types and extent, rock depth and character, and to investigate the groundwater regime in and around the escarpment.



<sup>&</sup>lt;sup>1</sup> Allaby, M (ed.) 2020, A dictionary of geology and earth sciences Fifth edition., Oxford University Press, Oxford.

The information will be used to separately develop a ground and groundwater model for the Site to infer landslide mechanisms, slope stability and landslide risk.

A list of abbreviations and definitions of terms used throughout the report is shown in Table 1.

Table 1 - List of definitions and acronyms

Acronym	Abbreviation			
AHD	Australian Height Datum			
As	Arsenic			
ВН	Borehole			
BYDA	Before You Dig Australia			
Ca	Calcium			
CaCO3	Calcium Carbonate			
Cd	Cadmium			
Cl	Chlorine			
CO3	Carbonate			
CPT	Cone Penetration Testing			
Cr	Chromium			
Cu	Copper			
DO	Dissolved Oxygen			
EC	Electrical Conductivity			
F	Fluorine			
GNSS RTK	Global Navigation Satellite System Real Time Kinematic			
GPS	Global Positioning System			
HCO3	Hydrogen Carbonate			
Hg	Mercury			
К	Potassium			
Mg	Magnesium			
MPSC	Mornington Peninsula Shire Council			
N	Nitrogen			
Na	Sodium			
NDT	Non-Destructive Testing			
NH3	Ammonia			
Ni	Nickel			
NO3	Nitrate			
Pb	Lead			
рH	Potential of Hydrogen			
PLT	Point Load Strength Index Testing			
SES	State Emergency Services			
SO4	Sulphate			
TDS	Total Dissolved Solids			
VWP	Vibrating Wire Piezometer			
Zn	Zinc			



# 2. Site Conditions

# 2.1 Access

Site access is constrained by the escarpment and urban development.

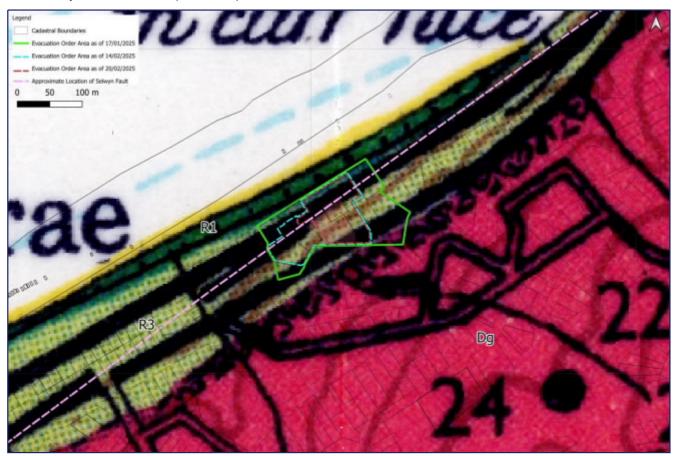
The Site has been progressively occupied since the early 20<sup>th</sup> century and is now significantly developed with numerous buildings and underground/overhead utilities. Further, access to the escarpment itself to carry out conventional site investigations is difficult due to the very steep slopes. The Investigation was therefore planned around these constraints.

# 2.2 Geology

The Sorrento 1:63,360 geological map is shown in Inset 2. This indicates the Site is underlain by:

- Quaternary raised coastal deposits comprising siliceous and calcareous sand, shell beds, guano (Mud Islands) at the base of the escarpment (shown as R3 in Inset 2)
- Palaeozoic granodiorite and granite comprising the elevated terrain of and behind the escarpment (shown as Dg in Inset 2).

A major regional thrust fault, the Selwyn Faut is mapped at a scale of 1:250,000 to strike WSW-ENE and crossing immediately north of the Site (ref Inset 2).



Inset 2: Mapped geology from the published Sorrento 1:63,360 geological map.



# 3. Geotechnical Investigation

#### 3.1 Introduction

The Investigation was carried out between 21 January 2025 to 3 March 2025 comprising:

- Site walk over
- Geotechnical drilling
- Non-destructive testing
- Cone penetration testing
- Laboratory soil testing
- Groundwater monitoring which is ongoing.

The area covered by the investigations including the individual site investigation and sampling locations are shown in Figure 1.

A literature review was carried out for the Site by review of existing records such as:

- Geological maps
- Previous site investigations
- Topographic information
- Historical photographs
- Aerial photography
- Geohazards maps
- Construction records
- Historical newspaper articles.

The above information and a Site inspection were used to plan the Investigation including the type, location, depth and instrumentation.

# 3.2 Health and Safety

A Safe Work Method Statement was developed and implemented for the Investigation. All locations involving subsurface investigations were cleared of utilities by carrying out BYDA and a physical services search by Precision Pipe and Cable Locations prior to the works.

# 3.3 Survey

All investigation locations were set out by handheld GPS. All as built collar locations were measured using a GNSS RTK (GPS) by a registered surveyor to an approximate accuracy of ±20 mm. The exception to this is the two hand auger locations, RD1 and RD2, Figure 1, which were measured off known and recently surveyed features and boreholes.

The coordinate system and datum adopted for the Investigation is GDA2020 MGA zone 55 and AHD.

# 4. Site Walk Over

Site walkovers were carried out by Mr Dane Pope of PSM between 15 to 17 January 2025 and 24 January 2025 to inspect the landslide and surrounding terrain. A further inspection was carried out over two days by Mr Tim Nash of PSM between 21 and 22 January 2025 to inspect the landslide and surrounding escarpment. The results of the inspections were used to plan the Investigation and to record the landslide characteristics. The latter will be reported separately.



# 5. Geotechnical Drilling

#### 5.1 Detail

Eight vertical boreholes were drilled using a track mounted Geoprobe 7822 DT drilling rig.

BH01 to BH05 used a direct push DT22 continuous sampling method to collect soil samples from the collar up to depths of approximately 14 m below ground level (**bgl**) followed by triple tube HQ coring methods to a maximum depth of 30 m bgl. The remaining boreholes BH01A, BH03A and BH04A were drilled adjacent to the continuous sampled and cored boreholes using augering methods to drill to the target depth as these were intended for groundwater monitoring and sampling.

Rock and soil samples were collected at various depths for laboratory testing and point load strength index testing (PLT).

Geotechnical logs for the eight boreholes are presented in Appendix A.

Point load strength index tests were performed on some of the recovered rock samples, and these results are presented in Appendix B.

# 5.2 Groundwater

All eight boreholes were completed by installing either VWPs or standpipe piezometers. Standpipe piezometer and VWP construction records including VWP calibration sheets are presented in Appendix C and summarised in Table 2.

The VWP data at BH01, BH02 and BH03 are recorded via five-channel dataloggers at a frequency of three hours.

Hobo data loggers were installed within the standpipes at BH03A and BH04 recording at a frequency of three hours.

All standpipe piezometers were constructed under the groundwater bore construction licence ID WLE089520 in the Victorian Water Register with the following Works ID:

- WRK147484
- WRK147485
- WRK147486
- WRK147487
- WRK147709.

Water observed in the boreholes following drilling completion are presented where applicable on each geotechnical log, Appendix A. Note that these observations may not reflect actual groundwater levels as they are likely to have been influenced by the fluids introduced during drilling.

Table 2 - Borehole summary

ID	Location	Easting	Northing	Collar RL	Drilled depth (m)	Standpipe piezometer/VWP summary
BH01	Carport of 10-12 View Point Road	319565.8	5753704.4	31.57	30.0	Nested VWP1A, VWP1B and VWP1C installed 4.5 m, 14.5 m and 29 m bgl.
BH01A	Adjacent to BH01	319565.7	5753703.3	31.69	6.0	Standpipe STP1A screened between 3 m and 6 m bgl.
BH02	Verge in front of 5 View Point Road	319562.3	5753681.9	31.87	30.0	Nested VWP2A, VWP2B and VWP2C installed at 6.5 m, 14.5 m and 28.5 m bgl.
BH03	10-12 View Point Road Front Lawn	319533.0	5753715.6	28.62	29.5	VWPs VWP3A and VWP3B installed 13 m and 28 m bgl.
вноза	Adjacent to BH03	319533.7	5753716.7	28.70	6.0	Standpipe STP3A screened between 1.5 m and 6 m bgl with a hobo data



ID	Location	Easting	Northing	Collar RL	Drilled depth (m)	Standpipe piezometer/VWP summary
						logger installed at 6 m bgl. VWP VWP3C installed 6 m bgl, connected to BH03 datalogger.
BH04	Middle of View Point Road Cul-de-sac	319498.1	5753665.8	26.82	30.0	Standpipe STP4 screened between 14.7 m and 29.7 m bgl with a hobo data logger installed at 29.7 m bgl.
BH04A	Adjacent to BH04	319499.2	5753666.0	26.86	6.0	Standpipe STP4A screened between 1 m and 6 m bgl.
BH05	3 Penny Lane Driveway	319500.7	5753775.2	1.98	5.0	VWP VWP5A installed 4.8 m bgl.

# 6. Non-Destructive Testing

# 6.1 Detail

#### 6.1.1 NDT

Two Non-Destructive Testing (**NDT**) holes (NDT01 and NDT02) were excavated to a depth between 3.5 and 5.0 m bgl to investigate sewer trench backfill. NDT01 was excavated to 5.0 m bgl, or approximately 1.8 m below the sewer trench invert. NDT02 was excavated to 3.2 m bgl. This hole terminated prior to the target depth due to excavation difficulty and inferred cave in, this being approximately 0.5 m above the design sewer trench invert level.

Both NDTs were excavated using a vacuum excavation truck with a hydrojet. The exception is with NDT01, which had the final 1.0 m excavated using a continuous flight auger.

A downhole video was taken using a GoPro to view the soil profile and identify any groundwater table / water seepage within the hole. Geotechnical logs were prepared to record the hole detail for both, but insufficient information was available from the video to provide material descriptions other than basic observations, Appendix A.

#### 6.1.2 RD

Two hand auger holes (RD1 and RD2) were excavated to a depth of 0.7 to 0.9 m bgl to identify the Reln Drains (**RD**) located in the front lawn of 10-12 View Point Road, and were excavated 0.4 m below the base of the Reln Drain.

Both RDTs were excavated using a 100 mm diameter hand auger.

Geotechnical logs are presented in Appendix A.

Table 3 - NDT and RD summary

Borehole	Location	Easting	Northing	Collar RL	Total drilled depth bgl (m)
NDT01	Front yard of 6 View Point Road	319571.8	5753700.6	32.3	5
NDT02	Verge in front of 6 View Point Road	319575.4	5753696.0	32.7	3.2
RD1	10-12 View Point Road Front Lawn	319531.9	5753714.4	28.6	0.9
RD2	10-12 View Point Road Front Lawn	319534.8	5753717.7	28.8	0.7



#### 6.2 **Groundwater**

#### 6.2.1 **NDT**

Groundwater was not observed in both NDT holes however, water introduced from the NDT process made it difficult to distinguish between groundwater and introduced water.

The NDTs were subjected to dye tracing using red and green plumber's tracing dye to identify downstream seepage from the water source. Note that water mixed with dye was added to each NDT. The results of the dye tracing will be reported separately.

Both NDTs had standpipe piezometers installed to monitor long term groundwater levels:

#### NDT01

- 50 mm diameter PVC standpipe installed to 5.0 m depth
- Screened between 1.5 m and 5 m below ground level
- Backfilling comprised gravel pack to 1 m below ground level, bentonite seal to the surface and flush mounted concrete encased gatic cover installed.

#### NDT02

- VWP installed 3.2 m below ground level
- the instrument was enveloped in 0.4 m of sand with gravel pack to 0.9 m below ground level, then a bentonite plug to around 50-100 mm below the surface, then topped with gravel and topsoil.

Appendix C presents the standpipe piezometer and VWP construction records.

#### 6.2.2 **RD**

Groundwater was not observed in both RD holes. No piezometers were installed within these holes.

Upon completion of excavation, both holes were backfilled with a bentonite plug and topped with site won materials.

#### 7. Cone Penetration Testing (CPT)

Seven CPTs were pushed to approximately 15 m depth bgl using a track mounted drilling rig ('The Pagani') and a truck mounted drilling rig ('The Trakker'), Table 4.

All CPTs included pore pressure readings (CPTu) and were performed adjacent to the boreholes from Section 5.

Predrilling was undertaken using the track mounted drilling rig at CPT01B, CPT04, CPT04A, and CPT05.

Five CPTs terminated prior to the target depth on inferred dense gravels or cobbles/boulders due to refusal of the CPT rod. Two of these (CPT01 and CPT04) were relocated and retested within a few metres of the refused location, to reach target depths.

Dissipation testing (DT) was performed for CPT01B, CPT03, CPT04A and CPT05 at various depths.

CPT03, CPT04 and CPT04A were located at the same location as their corresponding boreholes (BH03A, BH04 and BH04A, respectively) and were converted to standpipes. The other CPTs were backfilled with spoil to the surface and only CPT05 was capped with a concrete plug.

Appendix D presents data from the CPT testing. It also includes the interpreted normalised soil behaviour types in accordance with Robertson & Cabal (2022)<sup>2</sup> assuming an N<sub>kt</sub> of 14.

<sup>&</sup>lt;sup>2</sup> Robertson, P. K., and K. Cabal. 2022, Guide to Cone Penetration Testing Seventh edition.





Table 4 - CPT summary

СРТ	Location	Easting	Northing	Collar RL	Tested depth bgl (m) <sup>(1)</sup>	Dissipation testing depths (m)
CPT01	Carport of 10-12 View Point Road	319564.8	5753703.8	31.63	2.78 (t)	N/A
CPT01A	Adjacent to CPT01	319565.0	5753702.3	31.69	3.39 (t)	N/A
CPT01B	Adjacent to CPT01A	319565.7	5753702.1	31.70	15.53	6.35 m and 12 m
CPT03	Backyard of 10- 12 View Point Road	319533.7	5753716.7	28.70	3.03 (t)	3.03 m
CPT04	Middle of View	240400.0	F7F0000 4	00.00	1.89 (t)	N/A
CPT04A	Point Road Cul- de-sac	319499.2	5753666.1	26.86	13.91	9.1 m and 13.9 m
CPT05	3 Penny Lane Driveway	319501.3	5753776.9	1.91	2.27 (t)	2.26 m

<sup>(1) (</sup>t) terminated early due to refusal

# 8. Laboratory Testing

#### 8.1.1 Soil

Soil samples were collected during the Site walkover on 24 January 2025 from the escarpment and flanks of the McCrae Landslide, Figure 1. Soil samples were also taken from boreholes BH01 to BH05 during the February 2025 site investigations. All were tested in a NATA accredited laboratory for moisture content, particle size distribution and Atterberg limits, Table 5. Laboratory testing certificates are presented in Appendix E.

Table 5 - Laboratory testing summary

				Testing	
Sample ID	Sample depth (m)	Location	Natural moisture content	Particle size distribution	Atterberg limits
S1	At surface	Rill/consolidated waste on slope	Х	Х	
S2	At surface	LHS/NE slope	Х	Х	
S3	At surface	Lower flank of rill on RHS/SW slope	Х	Х	
S4	At surface	Upper RHS/SW slope, gum tree/scarp	Х	Х	Х
S5	At surface	S4 upper	Х	Х	
S6	At surface	SW flank 2022 landslide	Х	Х	Х
BH01	1.4 - 2.3	BH01	X <sup>(1)</sup>	Х	
BH01	7.2 - 8.0	BH01	X <sup>(1)</sup>	X	Х
BH01	17.8 - 17.9	BH01	Х		
BH01	22.9 - 23.0	BH01	Х		
BH02	1.6 - 2.6	BH02	X <sup>(1)</sup>	Х	
BH02	4.2 - 5.0	BH02	X <sup>(1)</sup>	Х	Х
BH02	6.7 – 7.5	BH02	X <sup>(1)</sup>	Х	Х
BH03	2.7 - 4.0	BH03	X <sup>(1)</sup>	Х	
BH03	7.2 - 8.0	BH03	X <sup>(1)</sup>	Х	Х



			Testing				
Sample ID	Sample depth (m)	Location	Natural moisture content	Particle size distribution	Atterberg limits		
BH03	10.8 - 11.5	BH03	X <sup>(1)</sup>	Х	Х		
BH03	14.75 - 14.85	BH03	Х	Х			
BH03	15.5 - 15.6	BH03	Х				
BH03	21.4 - 21.55	BH03	Х	Х			
BH03	23.3 - 23.4	BH03	Х	Х			
BH04	3.1 - 3.6	BH04			Х		
BH04	5.0 - 5.8	BH04			Х		
BH04	15.0 - 15.1	BH04	Х				
BH05	1.6 - 2.3	BH05	X <sup>(1)</sup>				
BH05	2.6 - 3.6	BH05	X <sup>(1)</sup>	Х			

<sup>(1)</sup> Sample was tested for moisture content in error. Moisture content not to be relied upon.

#### 8.1.2 Surface Water

Surface water was sampled on 20 January 2025 by JBS&G in the presence of PSM staff. The sampling was conducted at five locations for field water quality testing and laboratory testing, Figure 1. A calibrated water quality meter was used in the field to measure pH, temperature, dissolved oxygen (DO), electrical conductivity (EC) and redox potential, Table 6. Each of these samples were then tested in a NATA accredited laboratory for the following:

- Cations & Anions [Alkali Metals (Na, K, Ca, Mg), Alkalinity (CO3, HCO3) (as CaCO3), Cl, SO4]
- Ionic Balance [pH, EC]
- Total Dissolved Solids (TDS)
- Non-Metallic Inorganics [NH3 (as N), F, NO3 (as N)]
- Metals [As, Cd, Cr, Cu, Ni, Pb, Zn, Hg].

Appendix F presents the results of the water sample laboratory testing.

Table 6 - Surface water testing summary

ID	Location	Sample Date and Time	рН	Temp (°C)	DO (mg/L)	EC (us/cm)	Redox Potential (mV)	Comment
SW01	Flowing water from 5 Prospect Hill Road into gutter	20/01/2025 9:30am	7.47	22.7	5.92	125.0	91.7	No odour, no sheen, clear, no colour
SW02	Flowing water from 7 Prospect Hill Road into private stormwater pit	20/01/2025 9:55am	6.50	20.6	7.26	332.5	99.0	No odour, no sheen, high turbidity, brown
SW03	Flowing drain around 4 View Point Road	20/01/2025 10:20am	7.19	21.7	6.48	359.5	80.9	No odour, no sheen, high turbidity, brown
SW04	Flowing drain at View Point Road Cul-de-sac	20/01/2025 10:40am	7.74	22.9	8.91	360.6	75.8	No odour, no sheen, high turbidity, brown
SW05	Flowing water along east side of Penny Lane	20/01/2025 1:05pm	7.97	24.2	6.30	1051.0	79.3	No odour, no sheen, very high turbidity, brown



# 9. Groundwater Monitoring

Piezometric monitoring data for the following VWPs and hobo data loggers are presented in the hydrographs in Appendix G:

- BH01: VWP1A to VWP1C between 20 February 2025 to 25 March 2025
- BH02: VWP2A to VWP2C between 24 February 2025 to 25 March 2025
- BH03: VWP3A to VWP3B between 18 February 2025 to 7 March 2025
- BH03A:
  - VWP3C between 25 February 2025 to 25 March 2025
  - Hobo data logger on 20 March 2025
- BH04: Hobo data logger between 20 March 2025 to 25 March 2025
- BH05: VWP5A on 26 February 2025 and 20 March 2025
- NDT02: VWP2D between 3 March 2025 to 25 March 2025.

# **Yours Sincerely**

Irrelevant & Sensitive

DANE POPE PRINCIPAL



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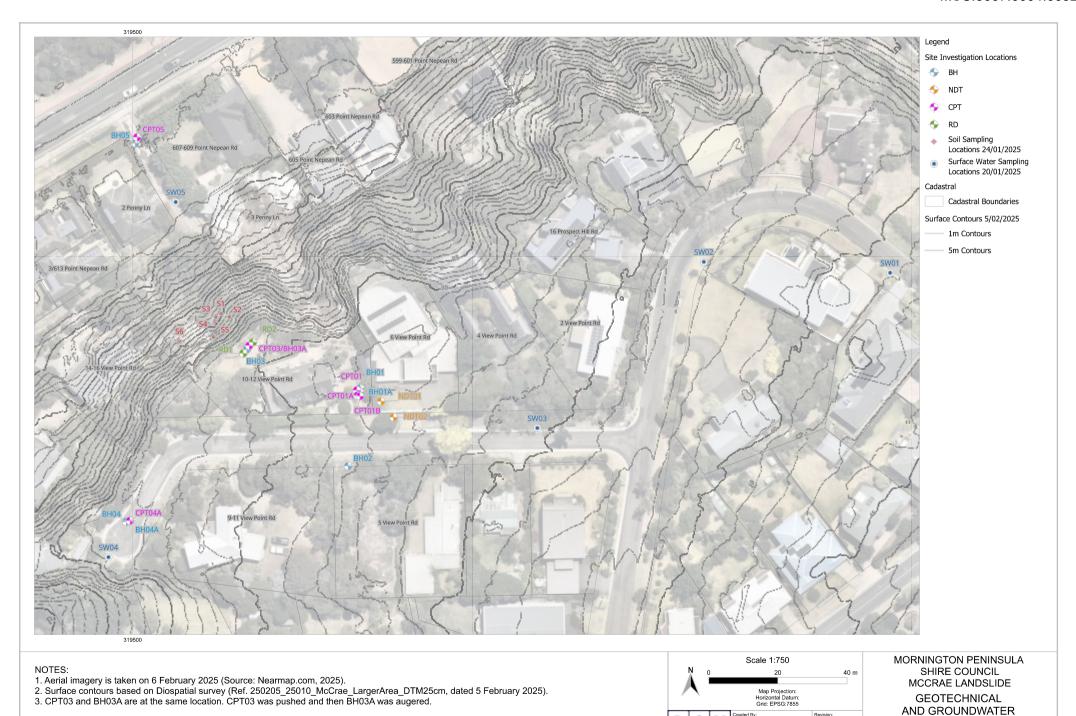
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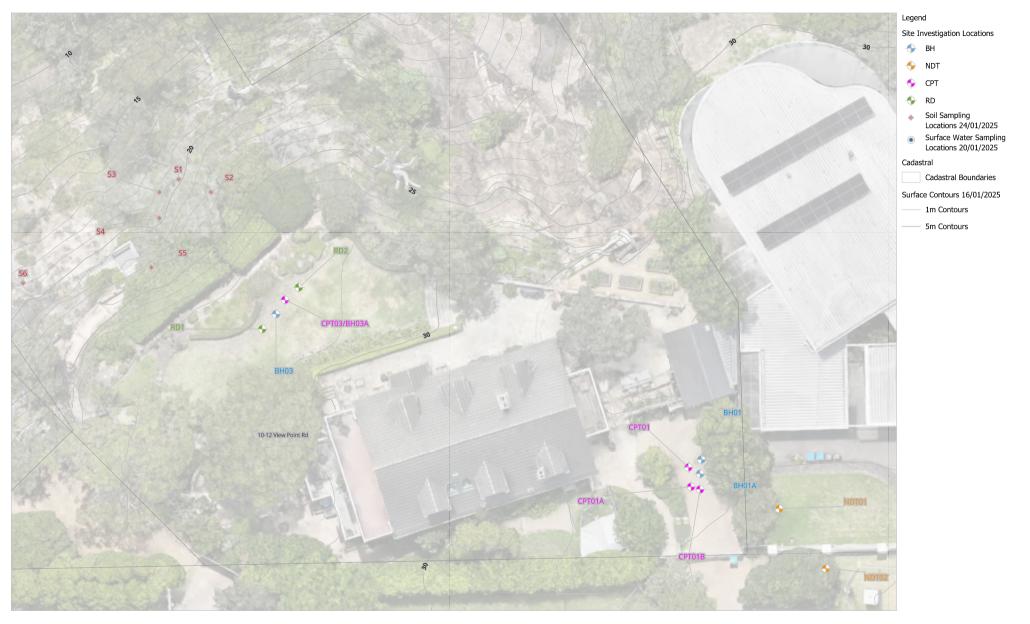
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27 Mar 2025

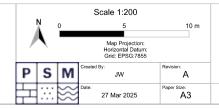
INVESTIGATION PLAN

FIGURE 1

PSM5665-GFR



- 1. Aerial imagery is based on Diospatial survey undertaken on 16 January 2025 (Ref. 250116\_25010\_McCrae Landslip\_Ortho2cm)
  2. Surface contours based on Diospatial survey (Ref. 250116\_25010\_McCrae Landslip\_Ortho2cm, dated 16 January 2025).
  3. CPT03 and BH03A are at the same location. CPT03 was pushed and then BH03A was augered.



MORNINGTON PENINSULA SHIRE COUNCIL MCCRAE LANDSLIDE **GEOTECHNICAL** AND GROUNDWATER INVESTIGATION PLAN (ZOOMED) PSM5665-GFR FIGURE 2

# **Appendix A Geotechnical Logs**



# GEOTECHNICAL LOGGING EXPLANATION SHEET



This explanation document presents the definitions and details used on PSM borehole logs. It is not intended to replace the details in AS 1726: 2017.

Geotechnical logs are shown as either non-cored, for the soil component, or cored for the rock interval.

The document is divided into three parts: drilling information, soil logging and rock logging.

#### **Drilling Information**

#### General

Method	AD/T	Auger drilling TC bit
	AD/V	Auger drilling V bit
	WB	Washbore
	PT	Push tube
	DT	Diatube
	Е	Excavator
	CS	Continuoussampling
	NQ3	Wireline triple tube core (45.1 mm)
	HQ3	Wireline triple tube core (61.1 mm)
	NMLC	Triple barrel large core (51.2mm)
Core Quality	RQD	Rock Quality Designation (%)
Water	Inflow	Indicates inflow of groundwater through the base of the borehole observed as net excess drilling fluid return.
	Partial loss	Indicates an outflow of drilling fluid from the closed drilling system through the base of the borehole observed as net loss of drilling fluid return.
	Complete	Indicates zero drilling fluid return from the borehole. Losses into the soil or rock mass through the base of the borehole.

#### Penetration

Penetration is a qualitative measure of how easily the auger advances. This varies from no resistance to refusal.



#### Support

Borehole wall support during drilling will either be listed as casing (C) or where no casing as was required no support (N) or left blank.

#### Water

Observations of water down the borehole as observed, not observed, not encountered or return as a percentage of the drilling fluid. If not noted then return was 100%.

#### Sampling and Field Testing

	diliping and rield resting					
	Abbreviation	Description				
Sample	U	Undisturbed tube sample				
	D	Disturbed sample				
	ES	Environmental sample				
	TW	Thin walled				
	LB	Large disturbed sample				
	В	Bulk disturbed sample				
Test	Is(50) – a	Axial point load test result (MPa)				
	Is(50) – d	Diametral point load test result (MPa)				
	SPT	Standard penetration test				
	RW	Rod Weight				
	HW	Hammer Weight				
	НВ	Hammer Bouncing				

#### **Hole Positioning**

The following geodetic conventions are adopted.

- Map Grid of Australia 1994 (MGA94)
- Geocentric Datum of Australia 1994 (GDA94)
- Australian Height Datum (AHD)
- Bearings relate to magnetic north. Where required, magnetic values have been converted from grid using a magnetic declination of -12°.

Hole location relates to the street or project area the borehole was drilled on.

Depth is the downhole depth in metres below the borehole collar (i.e. surface level).

RL shows the elevation relative to AHD.

# WPT (Lugeon)

The Water Pressure Test (usually using packers) measures water pressure and flow rate over time to assess the Lugeon value - an empirical measure of the hydraulic conductivity.

#### RQD

Rock quality designation is a measure of the quality of cored rock. The sum of intact intervals more than 100 mm in length are given as a percentage of the total drill run recovered.

#### **Termination Details**

Hole terminated means the hole was discontinued at a depth that corresponds to the downhole depth in metres. How the borehole was completed is also stated. This includes the following main categories:

- Grouted to surface using a cement grout mix.
- Instrumented by construction of groundwater (open standpipe, screened piezometer, grout in place vibrating wire piezometer (VWP)) or geotechnical (inclinometer, extensometer).
- Any other details such as if a hole was abandoned.

#### **Soil Logging**

#### General

In engineering terms, soil includes every type of uncemented, or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms

#### **Classification Symbol**

Soil name is described in accordance with the Unified Soil Classification System (USCS) with the following prefix

O organic soils

C inorganic fine-grained soils behaving as clays
M inorganic fine-grained soils behaving as silts
G coarse grained soils behaving as gravel
S coarse grained soils behaving as sand

These are defined by the particle size limits shown in the grading table below.

The above group symbols are appended with minor component modifiers, for coarse grained soils.

W well graded, little or no finesP poorly graded, little or no fines

G gap graded
M silty mixtures
C clayey mixtures

For fine grained soils, with plasticity or liquid limit

L low plasticity or liquid limit
I medium plasticity or liquid limit
H high plasticity or liquid limit.

#### **Material Description**

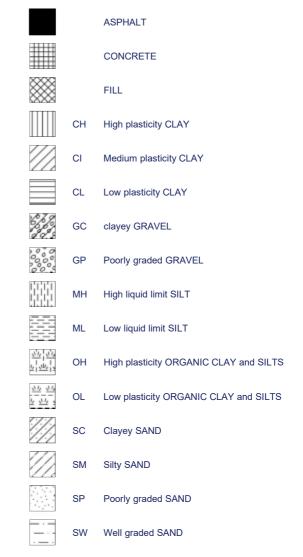
#### Soil Name

Soil name is based on the identifiable primary component of the soil and is given in block letters, thereafter is a description based on secondary components.

#### **Plasticity**

Non- plastic	3 mm thread cannot be rolled at any moisture content (cannot conduct toughness or dry strength tactile tests), slow to rapid dilatancy.
Low plasticity silt/clay mixtures	A 3 mm thread can barely be rolled; lump cannot be formed when drier than plastic limit (PL); low to medium dry strength, medium toughness; none to slow dilatant behaviour
Medium plasticity silt/clay mixtures	3 mm thread is easy to roll, little time required to reach PL; thread cannot be rerolled after reaching PL; lump crumbles when drier than PL; medium to high dry strength, medium toughness; no to slow dilatant behaviour; slightly tacky feel when wet
High plasticity clays	It takes considerable time rolling and kneading to reach PL; thread can be rolled several times after reaching PL; high toughness, high to very high dry strength; non-dilatant; tacky/sticky feel when moisture content >PL.

#### **Graphic Log**



# Grading (coarse grained soils)

Where possible for coarse grained soils, include particle shape: equidimensional - rounded, sub-rounded, sub-angular, angular; two- dimensional - flaky/ platy; one dimensional - elongated.

Well graded	Having good representation of all particle sizes from largest to smallest
Poorly graded	One or more intermediate sizes poorly represented
Gap graded	Absence of one or more intermediate sizes
Uniform	Most particles are about the same size

# **Particle Size Descriptive Terms**

	Coarse-Grained					Fine-gra	ined	Organic			
Fraction			Grave	1		Sand					
Fraction	Boulders	Cobbles	Coarse	Medium	Fine	Coarse	Medium	Fine	Silt	Clay	Organic soils
Particle size limits [mm]	2	00 60			.0 2	.0 0.6		0	.06 0.00	02	
AS Sieve equivalent [mm]		- 63	3	19 6	3.7 2.3	86 0.6	0.15	0.0	)75	-	

#### Colour

Described in a moist condition, using simple colour terms such as green, red, orange, etc. These may have been modified using 'pale', 'dark' or 'mottled'. 'Light' is avoided as it can be confused with mass

#### **Secondary Component Modifiers**

	Coar	se grained soil	Fine grained soil
Term	Percentage of fines in a granular soil	Percentage of coarse in a granular soil (i.e. other than the primary component)	Percentage of coarse grained component (sand or gravel) in a fine- grained soil
Add trace	≤5	≤ 15	≤ 15
Add with	> 5 and ≤ 12	> 15 and ≤ 30	> 15 and ≤ 30
Add prefix to name	> 12	> 30	> 30

#### **Moisture Condition**

Coarse grain	Coarse grained soil				
Dry (D)	Looks and feels dry; dusty; dry to the touch, non-cohesive, free running				
Moist (M)	Soil feels cool; soil tends to stick together; damp but no visible water, darkened in colour				
Wet (W)	Visible free water when handled, soil feels cool, darkened in colour				

# Fine grained soil

Judge based on the soil's moisture condition relative to the plastic limit or liquid limit for soils with high moisture contents, refer to plasticity table above

#### **Consistency/Relative Density**

# Consistency - Cohesive soils (fine grained)

Consistency	Field Guide to Consistency	Indicative Undrained Shear Strength (Su, kPa)	
Very soft (VS)	Exudes between the fingers when squeezed in hand	≤ 12	
Soft (S)	Moulded by light finger pressure	> 12 & ≤ 25	
Firm (F)	Moulded by strong finger pressure	>25 & ≤ 50	
Stiff (St)	Cannot be moulded by fingers	>50 & ≤ 100	
Very stiff (VSt)	Readily indented by thumb nail	>100 & ≤ 200	
Hard (H)	Indented with difficulty by thumbnail	>200	
Friable (Fr)	Easily crumbled by hand	-	
Weakly Cemented (WCe)	Material easily disaggregatedby hand in air or water	-	
Moderately Cemented (MCe)	Material requires effort to disaggregate by hand in air or water	-	

# Relative density - Non-cohesive soils (coarse grained)

Term	Symbol	Density Index %
Very Loose	VL	<15
Loose	L	>15 & ≤ 35
Medium Dense	MD	>35 & ≤ 65
Dense	D	>65 & ≤ 85
Very Dense	VD	>85

The relative density of coarse-grained soils is inherently difficult to assess by visual or tactile means. Relative density assessment should be carried out using penetration test procedures.

## **Hand Penetrometer**

Refers to pocket penetrometer tests, results shown in kPa.

#### Structure, Zoning

Soil *in situ* or in samples may consist of separate zones differing in colour, grain size or other properties.

Zoning <sup>1</sup>		Cementi	ng²
Layer	Continuous across exposure or sample	Weakly	Soil fractured by hand in air/water
Lens	Discontinuous layer with lenticular shape	Strongly	Difficulty fracturing by hand in air/water
Pocket	Irregular inclusion		
Homogenous	Same colour/texture/ structure throughout		

- Record the orientation, contact character (sharp regular/ irregular, gradual/ gradational). Use interlaminated or inter- bedded if too thin to describe individually
- $^2\,\,$  If unable to be disaggregated, treat as rock. Note cementing agent by appearance, strength or reaction to water/acid .

# Origin, Additional Observations

Where there is doubt, the terms 'possibly' or 'probably' are used (as per AS1726:2017).

	<i>)</i> ·	
Origin		
Anthorpogenic	Fill	placed by human activity (controlled versus uncontrolled)
Formed in place	Topsoil	upper surface layer of soil with high proportion of organic material
	Alluvial	deposited by streams and rivers
Transported	Colluvial	deposited on slopes chiefly by gravity
	Aeolian	deposited by wind
	Lacustrine	deposited in lakes/still bodies of water
	Marine	deposited in oceans, bays, beaches & estuaries
Formed in	Residual soils	structure and fabric of parent rock not visible
place	Extremely weathered	structure and fabric of parent rock visible

#### **Rock Logging**

#### General

Rock Substance is defined in engineering terms as any naturally occurring aggregate of minerals and organic material which cannot be disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms. Effectively homogenous material may be isotropic or anisotropic.

Defects are defined as discontinuities or breaks in the continuity of a substance or substances

Rock mass is defined as a body of material that is not effectively homogeneous. It can consist of two or more substances without defects, or one or more substances with one or more defects

Rock substance and mass characteristics are shown on the logs as rock substance and rock mass defect categories and are presented in this document in the same order

#### **Rock substance**

# **Graphic Log**

Δ	Δ
Δ	Δ

BRECCIA



CONCRETE



CONGLOMERATE



NO CORE



DOLERITE





INTERBEDDED SILTSTONE & SANDSTONE



SANDSTONE



SHALE



SHALE BRECCIA



SILTSTONE

## **Material Description**

Rock Name	Simple rock names are used rather than precise geological classification		
Particle/grain Characteristics	Grains of rock described in terms of type, size and shape;		
	sedimentary	Coarse	0.6 - 2 mm
	rocks:	Medium	0.2 - 0.6 mm
		Fine	0.06 - 0.2 mm
	igneous	Coarse	>2 mm
	rocks	Medium	0.06 – 2 mm
		Fine	<0.06 mm (just visible)
Colour	Simple terms such as white, red, orange etc. modify using pale of sark; describe in moist condition; use combinations of these when necessary		
Inclusions/ Minor components	Record isolated inclusions within the rock substance such as vesicles, nodules, phenocrysts, concretions, veins, ironstone bands; Indicate proportion – trace or minor (include thickness)		

#### Texture/Fabric

Term	Description	Spacing	
Massive	No stratification visible	-	
Bedded	Very thickly bedded	>2 m	
	Thickly bedded	0.6 m to 2 m	
	Medium bedded	0.2 m to 0.6 m	
	Thinly bedded	60 mm to 200 mm	
	Very thinly bedded	20 mm to 60 mm	
Laminated	Laminated	6 mm to 20 mm	
	Thinly laminated	<6 mm	

#### **Bedding Development**

Term	Description									
Massive / poorly	No obvious development; rock homogeneous									
Developed	Barely obvious; faint mineralogical layering or banding; planes poorly defined									
Well developed	Apparent in outcrops or drill core as distinct layers/lines marked by mineralogical or grain-size layering									
Very well developed	Often marked by distinct colour banding or mineralogical /grain size layering									

#### Weathering

Weathering											
Term		Description									
Residual So	oil (RS)	Soil derived from insitu weathering of rock; structure and substance fabric of parent rock no longer evident; soil has not been transported; log using soil descriptive terms									
Extremely Weathered	(XW)	Rock exhibits soil properties; mass texture/structure of original rock still visible; log using soil descriptive terms									
Highly weathered (HW)	(DW) <sup>1</sup>	Iron staining or bleaching affects the entire rock substance and parent rock colour no longer recognisable; porosity may be increased or less than original rock substance by leaching or deposition of minerals; substance strength altered by weathering. Primary minerals may have weathered to clay									
Moderately weathered (MW)		Iron staining or bleaching extends throughout the entire rock substance; original rock colour of fresh rock no longer recognisable									
Slightly wea	Partial staining or bleaching along joints; colour and texture of fresh rock is recognisable; little or no change of stren from fresh rock										
Fresh (FR)		No sign of mineral decomposition or colour change									

The terms Highly weathered (HW) or Moderately weathered (MW) are preferred to Distinctly weathered (DW).

#### Strength

Rock strength is based on UCS (MPa), point load strength index testing (Is(50) in MPa) and field estimated strengths. Is(50) values from axial and/or diametral point load tests and field estimated strengths are plotted in the strength column.

Term / Abbreviati	on	Point load index, Is(50) (UCS (MPa))	Field guide to strength							
Very low	VL	0.03 to ≤0.1; (0.6-2)	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm thick can be broken by finger pressure.							
Low	L	>0.1 to ≤0.3; (2-6)	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150 mm long 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.							
Medium	М	>0.3 to ≤1.0; (6-20)	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.							
High	Н	>1 to ≤3; (20-60)	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.							
Very high	VH	>3 to ≤10 (60-200)	Hand specimen breaks with pick after more than one blow; rock rings under hammer.							
Extremely high	EH	> 10 (>200)	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.							

# **Rock Mass Defects**

# General

Sequence of terms: defect type, orientation, shape, roughness, infill type/width, number, spacing/length/aperture.

# **Defect Description**

Symbol	Description										
BF	bedding fabric										
BP	Bedding parting – surface crack across which there is little to no tensile strength, parallel to bedding fabric, maybe open or closed										
BSH	Bedding Shear										
CO	Contact – surface between two lithologies										
CZ	Crushed Zone – zone with roughly parallel, planar boundaries (commonly slickensided) containing disoriented usually angular rock fragments of variable size often in a soil matrix										
DB	Drilling Break – breaks caused by the drilling process, including handling breaks when boxing core										
FL	Foliation										
FT	Fault – fracture along which displacement is recognisable, may be open or closed										
FZ	Fractured Zone – a zone of closely spaced defects comprising core lengths < 50 mm										

Symbol	Description										
IS	Infilled Seam – seam of soil substance formed by migration of soil into an open cavity or defect										
JT	Joint – a single fracture across which rock has little or no tensile strength, is not obviously related to rock fabric and no shearing, maybe open or closed										
SM	XW seam of soil material formed by weathering of the parent rock material in situ										
SS	Sheared seam– fracture along which movement has taken place; no displacement recognisable; slickensides, polishing and/or clay gouge may suggest movement										
SZ	Sheared Zone – zone of multiple closely spaced shears										
VN	Vein – intrusion of tabular or sheet-like minerals										
VO	void										

#### Orientation

Field mapping: defect dip/dip direction recorded in degrees, noting datum.

#### Infill

CN	Clean	RF	Rock fragments				
CA	Calcite	G	Gravel				
X	Carbonaceous	S	Sand				
FE	Iron	Z	Silt				
QZ	Quartz	CL	Clay				

#### For infills <1 mm thick:

Stained (SN) – no visible coating but defect surfaces are discoloured  $% \left( \mathbf{S}_{\mathbf{N}}\right) =\mathbf{S}_{\mathbf{N}}$ 

Veneer (VR) – visible uniform or patchy coating too thin to measure  $\label{eq:coating} \mbox{Coating (CO)}$ 

#### Shape

Planar (PR)	No variation in orientation
Curved (CU)	Gradual change in orientation
Undulating (UN)	Wavy surface shape
Stepped (ST)	One or more well defined steps
Irregular (IR)	Many sharp changes of orientation

#### Surface Roughness

Slickensided (SL)	Grooved or striated surface, usually polished						
Polished (POL)	Shiny smooth surface						
Smooth (S)	Smooth to touch, few or no surface irregularities						
Rough (RF)	Many small surface irregularities (ampl. <1mm) feels like fine to coarse sandpaper						
Very rough (VR)	Many large mall surface irregularities (ampl. >1mm) feels like (or coarser than) very coarse sandpaper						



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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 19/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/02/2025 Hole Location: 10-12 View Point Road Driveway Logged By: JW/LL

Project No.:

PSM5665

Hole I Hole I			10-12 V 319565.					-	Logged A2020 / MGA Zone 55 Checked	-		JV TN	V/LL		
Drill M Hole I			I Mounting: CS - 57		•				Inclination: -90° RL Surfa Bearing: - Datum:	ace:	31 AF	.57 ID	m	0	perator: SW Drilling
Drilling Information								Soil Description						Observations	
Method Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Pen	Hand etron UCS (kPa)	nete ; )	er Structure, Zoning, Origin, Additional Observations
						-		OL SM	FILL: Gravelly SAND: fine to coarse  \[ \] \text{grained; gravel fine to medium grained.} \] TOPSOIL: Sandy SILT: low plasticity, \[ \] \text{brown; sand fine grained.} \] FILL: Silty SAND: fine to medium grained,	D D					0.00: Roadbase 0.10: Topsoil 0.30: Possibly Fill
			PP 0.70 m >600 kPa		30.6	1-		CL	CLAY trace sand: low plasticity, brown; sand fine grained.	w> PL	Н				0.70: Possibly Colluvium or Fill to 5.75
	i I I					-			No recovery.						
			D 1.40-2.30 m			-		SM	Silty SAND trace gravel: fine to coarse grained, brown; silt low plasticity; gravel fine to medium grained.	)					
					29.6	2-				M					
S	     z					-	<u>///</u>	sw /	Gravelly SAND: fine to coarse grained, brown gravel fine grained.	М					
						-	· _	SW	No recovery.  Gravelly SAND: fine to coarse grained, brown gravel fine grained.	М			<b>*</b>		
			PP 2.90 m =280 - 320 kPa	0	28.6	3-		CL	CLAY with sand: low plasticity, grey mottled orange; sand fine grained.  SAND with gravel trace clay: fine to coarse	w < PL	VSt				
	[					-		sc	grained, brown; gravel subangular, fine to coarse grained.  Clayey SAND: fine to medium grained, brown;	M					
		bgl.			27.6	4			claý lów plasticity.	М					
		Vater encountered dat 4.5m bg				-		SM	Silty SAND: fine grained, grey; silt low plasticity.	W					
AD/T - AD/V - WB -W SPT -S PT - F AS - A CS - C NDD - CC - C HA - H	Auger Standa Push t Auger Contin Non Concretand	er dril er dril ore ube screv uous destre ete co	sampling (DT2: ructive drilling oring	2)		stance efusal		>> Inflo <  Par	ater  Samples and Tests  W - Undisturbed Sample tial Loss SPT - Standard Penetration Tes SPT - Standard Penetration Tes ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample		M	re C - [ - N / - V	Ory Moist	tion	Consistency/Relative Densit  VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact

Logged in accordance with AS 1726:2017 Geotechnical site investigations



**BH01** 

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# **Geotechnical Log**

Client: Commenced: 19/02/2025 Mornington Peninsula Shire Council 20/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: Logged By: Hole Location: 10-12 View Point Road Driveway JW/LL

Project No.:

PSM5665

Drilling Information										Soil Description							Observations
5000	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Per 001	Har netro UC (kPa	ome S a)	eter	r Structure, Zoning, Origir Additional Observations
							-		SM	Silty SAND: fine grained, grey; silt low plasticity. (continued)	w						
							-		SP	Gravelly SAND: fine to coarse grained, grey; gravel fine to coarse grained.	w		-				
				PP 5.75 m =260 kPa PP 5.85 m =340 kPa		 25.6	6-		CL	(RS/XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to medium grained; gravel medium grained.				× >	< *	×	5.75: Possibly Residual or Extreme Weathered Granite
				PP 5.95 m =520 kPa PP 6.05 m =380 kPa PP 6.15 m			-							*			
				=300 kPa			-					VSt					
				D 7.20-8.00 m	77.	24.6	7-					to H					
		z		D 7.20-8.00 III			-										
						23.6	8-				w > PL						
						23	-			Varies from Sandy CLAY to Clayey SAND.							
							-										
				PP 8.80 m =380 kPa PP 8.95 m =550 kPa		22.6	9-					н			×	×,	· *
				PP 9.00 m >600 kPa			-										
							-										
1		etho		TO ! "	Pe	netra	tion			ter Samples and Tests	/	loistu	ıre C	Conc	litic	on	Consistency/Relative Del
W	D/T - / D/V - / B -Wa	Aug Aug ashb	er dri er dri ore	illing TC bit illing V bit enetration test			tion stance		⊳ Infl ⊲ Pa			Moistu D N W	ire C	Dry Mois Wet	ditio	on	Consistency/Relative D  VS - Very soft S - Soft F - Firm St - Stiff

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Ce - Cemented C - Compact



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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 19/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/02/2025 10-12 View Point Road Driveway Logged By: .IW/I I

Project No.:

PSM5665

		Loca Posit		10-12 \ 319565					•	Logged By: JW/LL DA2020 / MGA Zone 55 Checked By: TN
		/lode		Mounting: CS - 5		•				Inclination: -90° RL Surface: 31.57 m  Bearing: - Datum: AHD Operator: SW Drilling
			Drilli	ing Informat	ion					Soil Description Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations
SS		z					-		CL	(RS/XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to medium grained; gravel medium grained. (continued)
							-		SW	(RS/XW GRANITE) SAND trace gravel: fine to coarse grained, brown; gravel fine grained.
	 					20.6	11-	. — .	CL	(XW GRANITE) Sandy CLAY: low plasticity, grey; sand fine to medium grained.  W > PL H   10.80: Extremely Weathered Granite to EOH
						20	-		SC	(XW GRANITE) Clayey SAND trace gravel: fine to coarse grained, grey mottled orange; clay low plasticity; gravel subangular, fine grained.
			NOT ENCOUNTERED			19.6	- 12 -			
HQ3		         	NOT ENC			18.6	13-		SP	(XW GRANITE) Gravelly SAND trace clay: medium to coarse grained, yellow brown; gravel fine to medium; clay low plasticity.
	                         						-		SC	(XW GRANITE) Clayey SAND: medium to coarse grained, grey mottled brown; clay low plasticity.
						17.6	14-	<u> </u>		Becomes gravelly; fine to medium gravels at \( \frac{13.90 \text{ m}}{13.90 \text{ m}} \)  NO CORE: 14.0 - 14.4 \text{ m}
							-		CL	(XW GRANITE) Sandy CLAY with gravel: low plasticity, grey mottled orange; sand medium to coarse grained; gravel fine grained.  M H
VSF	AD/T - AD/V - VB -V SPT - F AS - / CS - ( NDD -	Metho Aug Aug Washl Stand Stand Auger Contir	er dril er dril oore ard pe ube screv uous destr ete co	ling TC bit ling V bit enetration test ving sampling (DT2 uctive drilling oring			tion stance efusal		່ Infl ⊲ Pai	Water Samples and Tests Moisture Condition flow U - Undisturbed Sample D - Dry VS - Very soft Sample artial Loss SPT - Standard Penetration Test ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample Sample Semples

HA - Hand Auger



# **BH01**

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 19/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/02/2025

Project No.:

PSM5665

		_ocat							•	A2020 / MGA Zone 55	Logged B Checked	-		JW TN	//LL I		
		lodel Diam		d Mounting: 0		•				Inclination: -90° Bearing: -	RL Surfac	ce:	31 AF	.57 r	n	Оре	erator: SW Drilling
			Drill	ing Informatio	on					Soil Descrip	tion						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behave particle characteristics of promponent, colour, secondary or additional observations	viour or imary omponents,	Moisture Condition	Consistency / Relative Density	Pene I (	Hand etrom UCS kPa)	neter	Structure, Zoning, Origin, Additional Observations
		         					- - -		SC	(XW GRANITE) Clayey SAND: fincoarse grained, yellow mottled greplasticity. MW granite inclusions a 15.5 m.  Becomes brown at 15.7 m.	y; clay low	M M	H 				
						15.6	16		SW-SC	(XW GRANITE) SAND with clay tr fine to coarse grained, brown grey plasticity; gravel fine grained.	ace gravel: ; clay low	M					
HQ3			NOT ENCOUNTERED			14.6	17		SW-SC	NO CORE: 17.0 - 17.1 m  (XW GRANITE) SAND with clay tr fine to coarse grained, brown grey plasticity; gravel fine grained. FELDSPAR inclusions at 17.25 m.	ace gravel: r; clay low	M					
			TON	Is(50): 4.6 MPa C 17.80-17.90 m		13.6	- 18 -		SW-SC	(XW GRANITE) SAND with clay tr fine to coarse grained, brown; clay plasticity; gravel fine grained. (XW GRANITE) Sandy CLAY trace	/ low	M			*	ξ	
D.				=400 KPa PP 18.55 m =300 KPa PP 18.65 m =300 KPa PP 18.75 m =420 kPa PP 18.85 m =400 kPa		12.6	19-		92	low plasticity, grey; sand fine grain gravel fine grained.	ned;	w > PL	Н		* * *	1 1	
		       		PP 19.60 m =500 kPa PP 19.70 m =700 kPa PP 19.80 m			-		CL	(XW GRANITE) CLAY trace sand: plasticity, grey; sand fine grained.		w > PL			×	* >>x >>x >>x	
AI AI W SI SI C	D/T - D/V - /B -W PT -S T - P S - A S - C DD - C - C A - Ha	Vashb tanda Vush t uger Contin Non Concre and A	er dri er dri ore ird p ube scre uous dest ete c	enetration test wing s sampling (DT22 ructive drilling oring	) (2)		efusal		>> Inflo <□ Par	Ater  In the second sec	Sample mple letration Test al Sample	M	l <b>oistu</b> D M W	re Co - D - N - V	ry loist	tion	Consistency/Relative Density   VS

Logged in accordance with AS 1726:2017 Geotechnical site investigations



**BH01** 

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 19/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/02/2025 Hole Location: 10-12 View Point Road Driveway Logged By: JW/LL  $319565.8 \text{ m} \to 5753704.4 \text{ m} \text{ N} \text{ GDA2020} / \text{MGA Zone } 55$ Hole Position: Checked By: TN

Project No.:

PSM5665

	Drilling Information								Soil Description					Observations	
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa)	Structure, Zoning, Origin Additional Observations	
				>700 kPa PP 19.95 m =380 - 500 kPa			- - -		CL	(XW GRANITE) Sandy CLAY: low plasticity, grey; sand fine to coarse grained. (continued) Coarse grained MW granite gravel clast at 20.15 m.					
						10.6	21-		SP-SC	(XW GRANITE) SAND with clay trace gravel: fine to coarse grained, grey; clay low plasticity; gravel angular, fine grained.	M				
			JNTERED			9.6	22-			NO CORE: 21.5 - 22.6 m					
			NOT ENCOUNTERED	ls(50): 0.1 MPa C	<u>Z</u>	8.6	- 23-		SW	(XW GRANITE) Gravelly SAND with clay: fine to coarse grained, brown; gravel fine grained; clay low plasticity.	M			23.00: DLT carried out as an inelete	
				22.90-23.00 m		_ w				NO CORE: 23.05 - 23.2 m				23.00: PLT carried out on an isolate granite clast. 50 mm diameter	
HQ3							-		SP	(XW GRANITE) SAND: medium to coarse grained, brown.	М				
						7.6	24-	7.7.7	SP	(XW GRANITE) Gravelly SAND trace clay: fine to coarse grained, grey brown; gravel subangular to angular, fine grained; clay low	M			23.75: Coarse grained angular grar gravel	
							-		SC	Diasticity. (XW GRANITE) Clayey SAND: fine to medium grained, grey; clay low plasticity.	м				
							-			NO CORE: 24.5 - 24.85 m					
									SP		М				

/////// Refusal

ASP1-Standard penetration test
PT - Push tube
AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

TW - Thin Walled LB - Large Disturbed Sample

VSt - Very stiff
H - Hard
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense
Ce - Cemented
C - Compact



**BH01** 

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 19/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/02/2025 Logged By: 10-12 View Point Road Driveway Hole Location: JW/LL

Project No.:

PSM5665

	Hole Position: 319565.8 m E 5753704.							753704	4.4 m	N GDA	A2020 / MGA Zone 55 Checked By: TN
Ī		Drill Model and Mounting: Geoprobe 782 Hole Diameter: CS - 57 mm, HQ3 - 90									Inclination: -90° RL Surface: 31.57 m  Bearing: - Datum: AHD Operator: SW Drilling
Ī		Drilling Information									Soil Description Observations
	Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  Solic Name: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Additional Observations  Structure, Zoning, Origin, Additional Observations
					DD 26.05 m		5.6	26		SP	(XW GRANITE) Gravelly SAND with clay: medium to coarse grained, brown; gravel fine grained; clay low plasticity. (continued)  M
PSM AU NONCORE BH NZ AU PSME665 GPJ <-DrawingFile>> 28/03/2025 22:40 10:03:00:09 Datgel Fennos and Map Tool   Lbc. PSM 3.02.12019-03:05 Ptf: PSM 3.02.12019-03:06 Ptf: PSM 3.0					PP 26.05 m =500 - 600 kPa		4.6	27		CL	(XW GRANITE) CLAY with sand: low plasticity, grey; sand fine to medium grained.  M H
	חקה		         z 	NOT ENCOUNTERED			3.6				NO CORE: 27.0 - 28.3 m
							2.6	29-		SP CL SP-SC	(XW GRANITE) SAND: fine to medium
PSM 3.02.2 LIB - MOD FOR 5665.GLB Log PSM AU NONCORE BH NZ	AI AI W SF P AS CS NI	D/T - D/V - YB - SS - C C - C C - C C - C C - C C C - C	Metho Auge Auge /ashb tanda bush tauger Contin	er dril er dril ore Ird po ube screv uous destre ete co	s sampling (DT22 ructive drilling oring	N	enetra:	stance		>> Inflo <  Par	(XW GRANITE) Sandy GRAVEL: fine grained brown; sand fine to coarse grained granite. (XW GRANITE) SAND: fine grained, brown.    XW GRANITE   SAND: fine grained, brown.   M



**BH01** 

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 19/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/02/2025 Hole Location: 10-12 View Point Road Driveway Logged By: JW/LL  $319565.8 \text{ m} \to 5753704.4 \text{ m} \text{ N} \text{ GDA2020} / \text{MGA Zone } 55$ Checked By: Hole Position: TN

Project No.:

PSM5665

	Drill Model and Mounting: Geoprobe 7822 D Hole Diameter: CS - 57 mm, HQ3 - 96 mm										Inclination: -90° RL Surface: 31.57 m  Bearing: - Datum: AHD Operator: SW Drilling
İ		Drilling Information									Soil Description Observations
	Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations
6865 GLB Log PSMAU NONCORE BH NZ AU PSW6865 GPJ <-CDawlingFies> 2803202522.22.40 10.03.00.09 Dalgai Fennes and Map Tool I Lb: PSMA 3.02.12019-03-06			letho	d	ling TC hit	Pe					Hole Terminated at 30.00 m Target depth. Nested VWPs grouted and sand packed in place at various depths.
AD/T - Auger drilling TC bit AD/V - Auger drilling V bit WB - Washbore SPT-Standard penetration test PT - Push tube						1 N	lo resis	stance efusal	-	✓ Par	Inflow         U         - Undisturbed Sample         D         - Dry         VS         - Very soft           Partial Loss         D         - Disturbed Sample         M         - Moist         S         - Soft           Complete Loss         SPT - Standard Penetration Test         W         - Wet         F         - F irm           Complete Loss         ES - Environmental Sample         St         - Stiff         VSt         - Very stiff           TW - Thin Walled         H         - H ard         H         H - Hard

/////// Refusal

ASP1-Standard penetration test
PT - Push tube
AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

TW - Thin Walled LB - Large Disturbed Sample

VSt - Very stiff
H - Hard
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense
Ce - Cemented
C - Compact

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM5665 DATE: 19/2/25 BOREHOLE ID: BHO1 DEPTH: C.Cm - 4.0m PointID: BH01 Depth Range: 0.00 - 4.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH01: 0.00 m - 4.00 m PROJECT No FIGURE No PSM5665 1/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM 5665 DATE: 19/2/25 BOREHOLE ID: 8Ho1 DEPTH: 4.0m- 8.0m PointID: BH01 Depth Range: 4.00 - 8.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH01: 4.00 m - 8.00 m PROJECT No FIGURE No PSM5665 2/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: P5M5665 DATE: 19/2/25 BOREHOLE ID: PHI 1 DEPTH: 8.0m - 12.0m PointID: BH01 Depth Range: 8.00 - 12.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH01: 8.00 m - 12.00 m PROJECT No FIGURE No PSM5665 3/8

PSM5665

4/8

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricTbl. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM 5665 GPJ. << Drawing File>> 06/03/2025 14:31 10 03 00 09. Datget Ferce and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 02 PROJECT: MC(RAE LANDSLIDE PROJECT No: P5M5665 DATE: 19/2/25 BOREHOLE ID: B#01 12.0m - 16.0m DEPTH: NO CORE 14.0 - 14.4m PointID: BH01 Depth Range: 12.00 - 16.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH01: 12.00 m - 16.00 m PROJECT No FIGURE No

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM 5665 DATE: 19/2/25 BOREHOLE ID: BHO1 16.0m- 20.0m DEPTH: 20.0 PointID: BH01 Depth Range: 16.00 - 20.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH01: 16.00 m - 20.00 m PROJECT No FIGURE No PSM5665 5/8

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricTbl. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM 5665 GPJ. << Drawing File>> 06/03/2025 14:31 10 03 00 09. Datget Ferce and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 02 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE:20/2/25 BOREHOLE ID: BHO 1 DEPTH: 20.0 m - 24.0 m (ORE 21.5m-22.6m PointID: BH01 Depth Range: 20.00 - 24.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH01: 20.00 m - 24.00 m PROJECT No FIGURE No PSM5665 6/8

PSM 3 02 2 LIR - MOD FOR 5665 GLR. GricTbi. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM5665 GP.I. << Drawing File>> 06/03/2025 14:31 10 03 00 09. Dated Ferre and Man Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 02 1 2019-03-06



PointID: BH01 Depth Range: 24.00 - 28.00 m



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Mornington Peninsula Shire Council McCrae Landslide Geotechnical Investigation Core Photo - BH01: 24.00 m - 28.00 m

DRAWN         BTA         DATE 6/03/2025           CHECKED         TN         DATE 6/03/2025           SCALE         Not To Scale         A4           PROJECT No PSM 5665         FIGURE No 7/8							
CHECKED         TN         DATE         6/03/2025           SCALE         Not To Scale         A4           PROJECT No         FIGURE No	DRAWN						
TN         6/03/2025           SCALE         Not To Scale         A4           PROJECT No         FIGURE No	BTA	6/03/2025					
Not To Scale         A4           PROJECT No         FIGURE No							
Not To Scale  PROJECT No FIGURE No	TN	6/03/202	5				
PROJECT No FIGURE No		cale	A4				
	1101 10 0	cale					
PSM5665   7/8							
1 01010000	PSM5665	7/8					

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricTbl. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM 5665 GPJ. << Drawing File>> 06/03/2025 14:31 10 03 00 09. Datget Ferce and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 02 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE:20/2/25 BOREHOLE ID: BHO! DEPTH: 28.0n - 30.0n 24.0 NO CORE 29.2m -29.7m END OF HOLE 30.0 m PointID: BH01 Depth Range: 28.00 - 30.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH01: 28.00 m - 30.00 m PROJECT No FIGURE No PSM5665 8/8



BH01A

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PSM5665

Project No.:

## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 25/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 25/02/2025

Hole Location: 10-12 View Point Road Driveway Logged By: LL  $319565.7 \text{ m} \to 5753703.3 \text{ m} \text{ N} \text{ GDA2020 / MGA Zone } 55$ Hole Position: Checked By: TN

Drill Mo Hole Dia		and Mounting: eter:		oprob 0 mm	e 782	2 DT		Inclina Beari		-90° -	RL Surfa Datum:	ace:		.69 HD	m	C	Operator: SW Drilling	
	D	Drilling Informa	ation						Sc	oil Descr	iption						Observations	
	Support	Samples Tests Remarks	/er/	RL (m)	Depth (m)	Graphic Log	Classification Symbol	partic component	IAME: Pla le charact t, colour, s	Description asticity, beh teristics of secondary observatio	aviour or primary components,	Moisture Condition	Consistency / Relative Density	Per 001	Han netro UC (kPa	mete S a)	Additional Observa	
V	Z			27.7 28.7 29.7 30.7	1— 2— 3— 4—			Refer to BHI										
AD/T - AAD/V - AWB -Was SPT -Sta PT - Pus AS - Aug	ındar sh tu	r drilling TC bit r drilling V bit ore rd penetration tes ube	1	enetra lo resi:	stance		>> Inflo <  Par	ater ow tial Loss mplete Loss	U - U D - D SPT - S ES - E TW - T	hin Walled	l Sample ample enetration Tes Ital Sample		<b>Moistu</b> D W W	ire C   -   -   -	Dry Mois	litior	n	Densit

AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

\text{VSt} - Very stiff H - Hard \text{VL} - Very loose L - Loose D - Medium dense D - Dense \text{VD} - Very dense Ce - Cemented C - Compact



#### BH01A

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#### **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 25/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 25/02/2025

Project No.:

PSM5665

Hole Location: 10-12 View Point Road Driveway Logged By: LL 319565.7 m E 5753703.3 m N GDA2020 / MGA Zone 55 Hole Position: Checked By: TN

Drill Model and Mounting: Geoprobe 7822 DT RL Surface: Inclination: 31 60 m

Drill Model and Mounting: Hole Diameter:	Geoprobe 7822 DT 150 mm	Inclination: -90° RL Surfa Bearing: - Datum:		erator: SW Drilling
Drilling Informa	ntion	Soil Description		Observations
Method Support Support Water Water Water	Recovery  (a) TA  (b) Habad  Graphic Log  Classification  Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Consistency / Consistency / Consistency / Relative Density 200 / SON 400 (e.d.x) 500 / SON 500 /	Structure, Zoning, Origin, Additional Observations
NOA ADV	25.7			
		Hole Terminated at 6.00 m Target depth. Standpipe Installed, and sand, gravel and bentonite packed in place.		
	7-			
	23.7			
	- 25. 9-			
Method  AD/T - Auger drilling TC bit AD/V - Auger drilling V bit WB -Washbore	No resistance	Fater Samples and Tests ow U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test mplete Loss FS - Environmental Sample	Moisture Condition D - Dry M - Moist W - Wet	Consistency/Relative Density VS - Very soft S - Soft F - Firm St - Stiff

WB -Washbore
SPT -Standard penetration test
PT - Push tube
AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

ZZ Refusal

Complete Loss

ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

F - Firm St - Stiff VSt - Very stiff H - Hard UL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense C - Cemented C - Compact



BH02

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 20/02/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 21/02/2025
Hole Location: 5 View Point Road Verge Logged By: JW/LL

Project No.:

Hole Hole								N GD	Logged By: JW/LL  A2020 / MGA Zone 55 Checked By: TN
Drill N Hole			Mounting: : CS - 57		•				Inclination: -90° RL Surface: 31.87 m Bearing: - Datum: AHD Operator: SW Drilling
		Drill	ing Information	on					Soil Description Observations
Method Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations  SOIL NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations  Solic NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations
					30.9	- - - 1-		SM	TOPSOIL: Sandy SILT: low plasticity, brown; sand fine.  FILL: Silty SAND: fine grained, grey; silt low plasticity.  D
ADIV \$PT CS	Z	Not Encountered	D 1.60-2.60 m		29.9	- - 2-		SC	No recovery.  Clayey SAND trace gravel: fine to coarse grained, grey; clay low to medium plasticity; gravel subangular, fine to medium grained.  D
ADIV \$PT	Z	Not E	SPT 2.80-2.87 m 25/70mm N=R SPT01 2.80m 25 N=25 70/150mm		28.9	3-			D to VD
SPT			SPT02 3.50-3.95m 9,15,16 N=31 400/450mm		27.9	4-			
CS SPECIAL SEPTIMENTS OF SEPTI	       Z   		D 4.20-5.00 m			-		CL	Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; gravel fine grained.  W < PL H
AD/T - AD/V - WB -V SPT - S CS - C CC - C HA - H	- Auge Washb Standa Push t Auger Contin - Non Concre Hand A	er dril er dril eore ard pe ube screv uous destre ete co	enetration test wing s sampling (DT2: ructive drilling oring	2)	R	stance efusal		>> Infl⊲ <  Pai	Vater low U - Undisturbed Sample D - Dry WS - Very soft Surplete Loss D - Disturbed Sample B - Environmental Sample LB - Large Disturbed Sample LB - Compact Surplete Cost C - Compact Surplete C - C - C - C - C - C - C - C - C - C



BH02

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 20/02/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 21/02/2025
Hole Location: 5 View Point Road Verge Logged By: JW/LL

Project No.:

Hole I Hole I							-	N GD	Logged A2020 / MGA Zone 55 Checket	-		JW/ TN	LL		
Drill M Hole I			d Mounting: CS - 57						Inclination: -90° RL Surfa Bearing: - Datum:	ace:		.87 m HD		0	perator: SW Drilling
		Dril	ling Information	on					Soil Description						Observations
Method Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Ha Penetr U (kl	CS Pa)	ete	r Structure, Zoning, Origin, Additional Observations
						-		CL	Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; gravel fine grained. (continued)	w < PL	Н	-			5.40: Descibly Desidual Soil or Extreme
			PP 6.30 m >450 kPa		25.9	6		CL-CI	(RS/XW GRANITE) Sandy CLAY: low to medium plasticity, mottled grey brown; sand fine to coarse grained.  As above but no sand at 6.5 m.	w > PL	н		3	×	5.40: Possibly Residual Soil or Extreme Weathered Granite
cs		Not Encountered	D 6.70-7.50 m PP 6.70 m >450 kPa		24.9	7-		CL	As above but with pale grey, fine grained sand at 7.1 m.  (RS/XW GRANITE) Sandy CLAY: low	d			:	×	
		οN N	PP 8.10 m >500 kPa		23.9	8-		CL	plasticity, red brown; sand fine grained.  (RS/XW GRANITE) CLAY trace sand: low	w > PL	н			×	
			PP 9.10 m >500 kPa		22.9	9			plasticity, grey brown; sand fine grained.	w > PL	н			*	
AD/T - AD/V - WB -W SPT -S PT - F AS - A CS - C NDD - CC - C HA - H	Aug Vashl Stand Stand Oush Nuger Non Non Concr	er dr er dr oore ard p ube scre scre uous dest ete o	enetration test wing s sampling (DT2: ructive drilling oring	2)	R	stance		>> Inflo <□ Par	ater Samples and Tests  U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Tes ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample		D N	re Cor - Dry - Md - Md - We	y ist	ion	Consistency/Relative Densite VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact



BH02

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 20/02/2025

Project Name: McCrae Landslide Geotechnical Investigation Completed: 21/02/2025

Hole Location: 5 View Point Road Verge Logged By: JW/LL

Project No.:

,		,	Drill	ing Informati	on		ı		ı	Soil Description	ı					Observations
Metrod	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Pene	Hand etror UCS kPa	nete 3 )	Additional Observations
				PP 10.10 m >500 kPa			- - -		CL	(RS/XW GRANITE) CLAY trace sand trace gravel: low plasticity, brown; sand fine grained; gravel fine grained.		Н			*	
20		z		PP 11.10 m >500 kPa		20.9	11-			No recovery.					×	
,						19.9	12-		CL	(XW GRANITE) Sandy CLAY: low plasticity, grey brown; sand fine grained.	w > PL	н				11.80: Extremely Weathered Gran
			Not Encountered	PP 12.50 m >500 kPa		- 18.9	- - - -		CL	(XW GRANITE) Sandy CLAY trace gravel: low plasticity, brown; sand fine to coarse grained; gravel fine to medium grained. Gravels becomes angular, coarse grained at 12.15 m.	w > PL	Н			*	
						17.9	- - - 14—		CL	(XW GRANITE) Sandy CLAY trace gravel trace cobbles: low plasticity, brown; sand fine to medium grained; gravel angular, fine to medium grained; cobbles granite, coarse grained, red brown, angular, high strength.	w> PL	VSt to H				
		z				_	- - -		SP	(XW GRANITE) Gravelly SAND: medium to coarse grained, yellow brown; gravel fine to medium grained.  (XW GRANITE) Clayey SAND: fine to coarse grained, brown; clay low plasticity.	M					
A S P	D/T - 1 D/V - 1 /B -Wa	Auge ashb anda ish t	er dri er dri ore ard p ube	lling TC bit lling V bit enetration test	_	2_	cion stance		Infl ✓ Pa	ater  Samples and Tests  D  U  U  U  U  U  U  U  U  U  U  U  U		Moistu D W W	re C	)ry 1oist		Consistency/Relative Der  VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard



**BH02** 

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## **Geotechnical Log**

Client: 20/02/2025 Mornington Peninsula Shire Council Commenced: Project Name: McCrae Landslide Geotechnical Investigation Completed: 21/02/2025 Hole Location: 5 View Point Road Verge Logged By: JW/LL

Project No.:

PSM5665

			Dril	ling Informati	on					Soil Description					Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Condition	Relative Density	Hand netron UCS (kPa)	neter )	Structure, Zoning, Origin Additional Observations
							-		CL	(XW GRANITE) Sandy CLAY: low plasticity, grey; sand angular, fine to coarse grained.	M v > >L	н			
						15.9	16-			NO CORE: 15.70 - 16.20 m					
							-		SC	(XW GRANITE) Clayey SAND with gravel: fine to medium grained, brown; clay low plasticity; gravel fine to medium grained.	M				
			Not Encountered			14.9	17-			NO CORE: 17.0 - 18.20 m					
			z			13.9	18-			AM CRANTEVOLAY I I I I I I I					
							-		CL	(XW GRANITE) Sandy CLAY trace gravel:	ᄓ	S to F S to F			
				PP 18.90 m =110 kPa PP 19.10 m =110 kPa		12.9	19-		SW	(XW GRANITE) Sandy CLAY: low plasticity, grey brown; sand fine to medium grained.  W GRANITE) SAND trace gravel: fine to	y > PL	St *			
				TION U			-			coarse grained, grey brown; gravel fine grained.	M				
       	D/T - D/V - 'B -W	Auge Auge Auge /ashb	er dri er dri ore	illing TC bit illing V bit enetration test		l enetrat lo resis			>> Infl⊲ <  Pai	Ater Samples and Tests  D - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test ES - Environmental Sample	Мо	isture C D - M - W -	Dry Moist	tion	Consistency/Relative Den  VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff

HA - Hand Auger



BH02

Page 5 of 6

## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 20/02/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 21/02/2025
Hole Location: 5 View Point Road Verge Logged By: JW/LL
Hole Position: 319562.3 m F. 5753681.9 m N. GDA2020 / MGA Zone 55 Checked By: TN

Project No.:

	HO	le Po	ositi	on:	319562.	3 n	n E 57	75368°	1.9 m	N GD	A2020 / MGA Zone 55 Checked	d By:		TN	l		
					d Mounting:		•				Inclination: -90° RL Surfa	ace:		.87 r	n		
	Ho	le D	iam	eter	: CS - 57	mı	m, HC	23 - 96	mm		Bearing: - Datum:		Al	HD		С	Operator: SW Drilling
			1	Drill	ing Information	on					Soil Description						Observations
Method		Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Pene	UCS kPa	nete 3 )	Additional Observations
SQ SACTOR OF WALL NAVIOURE BY NZ AL POMPORO SAT SCHORING FIRS 2003/2023 ZZAU 1003/00/09 Datger refine and map foot Libra SACTOR FIX PSM 3.0Z. LZU SACSON ZZAU SACTOR FIX PSM 3.0Z. LZU SACTOR FIX			N		PP 21.10 m =300 kPa ls(50): 3.12 MPa C 21.30-21.40 m		7.9 8.9 9.9 10.9	21		SP-SC	(XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; gravel fine to medium grained, granite source.  (XW GRANITE) Clayey SAND with gravel: fine to coarse grained, grey brown; clay low plasticity; gravel fine to medium grained.  (XW GRANITE) Gravelly SAND with clay: medium to coarse grained, grey brown; gravel subangular to angular, fine to medium grained; clay low plasticity.  Gravel 40mm diameter, angular, high strength. Becomes trace Clay at 24.5 m.	M M	VSt		×		21.30: PLT carried out on an granite cobble clast
	AD/ WB SPT AS CS NDI CC	T - A V - A -Wa I -Sta - Pu - Au - Co D - N	Auge ashb anda sh to ger ontin Non oncre	er dri er dri ore ird poube screv uous desti ete co	enetration test wing s sampling (DT22 ructive drilling pring		2	tion stance efusal	-	>> Inflo <  Par	Ater  WW U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Tes ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample		M	- D - D - M - W	ry loist		Consistency/Relative Density  VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact



BH02

Page 6 of 6

## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 20/02/2025

Project Name: McCrae Landslide Geotechnical Investigation Completed: 21/02/2025

Hole Location: 5 View Point Road Verge Logged By: JW/LL

Project No.:

F	Hole [			: CS - 57		n, HQ	3 - 96	3 mm		Bearing: - Datum:  Soil Description		Al	HD		Oper	observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Penet U	CS (Pa)	eter	Structure, Zoning, Origin, Additional Observations
			Intered	PP 25.90 m =300 kPa PP 26.40 m =310 kPa PP 26.80 m =320 kPa		4.9	26— - - - - 27—		SP-SC CL CL	(XW GRANITE) CLAY: low plasticity, mottled grey, brown and white.  (XW GRANITE) CLAY trace gravel trace sand: low plasticity, grey; gravel fine to medium grained; sand fine grained.  (XW GRANITE) Sandy CLAY: low plasticity, grey; sand fine to coarse grained.	M W>PL PL	VSt VSt		*		
HQ3		Z	Not Encountered	PP 28.80 m		3.9	28-		CL	NO CORE: 27.50 - 28.45 m  (XW GRANITE) Sandy CLAY with gravel trace cobbles: low plasticity, brown; sand coarse grained; gravel fine grained; cobbles isolated, angular, high strength, slightly weathered granite, >70 mm diameter.	w> PL	St	×			
				=180 kPa PP 29.50 m >500 kPa		-2.9	29 —		SC	NO CORE: 29.00 - 29.37 m  (XW GRANITE) Clayey SAND with gravel: medium to coarse grained, brown; clay low plasticity; gravel fine grained.  Hole Terminated at 30.00 m Target depth. Nested VWPs grouted in place at various depths.	M			m eli-	*	Consistency/Delative Con-
SFACNO	AD/T - AD/V - WB -W SPT - SI PT - PI AS - A CS - C	tanda ush to uger ontin Non oncre	er dri er dri ore ird p ube scre uous dest	enetration test wing s sampling (DT2: ructive drilling	No	1_	ion stance efusal	-	> Inflo ⊲ Par	ater Samples and Tests  bw U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Tes ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample		D M W	re Co. - Dr - Mo / - W	n <b>ait</b> Ty Dist et	ion	Consistency/Relative Dens  VS - Very soft  S - Soft  F - Firm  St - Stiff  VSt - Very stiff  H - Hard  VL - Very loose  L - Loose  MD - Medium dense  D - Dense  VD - Very dense

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM 5665 DATE: 21 /2/25 BOREHOLE ID: BHO2 0.0m - 4.0m DEPTH: PointID: BH02 Depth Range: 0.00 - 4.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH02: 0.00 m - 4.00 m PROJECT No FIGURE No PSM5665 1/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MC(RAE LANDSLIDE PROJECT No: PSM 5665 DATE: 21 /2/25 BOREHOLE ID: BHOZ 4.0 m - 8.0 m DEPTH: PointID: BH02 Depth Range: 4.00 - 8.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH02: 4.00 m - 8.00 m PROJECT No FIGURE No 2/8 PSM5665

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTbl DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE: 21 /2/25 BOREHOLE ID: BHO2 8.0m - 12.0 m DEPTH: PointID: BH02 Depth Range: 8.00 - 12.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH02: 8.00 m - 12.00 m PROJECT No FIGURE No PSM5665 3/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GricTbl DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-



PointID: BH02 Depth Range: 12.00 - 16.00 m



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Mornington Peninsula Shire Council McCrae Landslide Geotechnical Investigation Core Photo - BH02: 12.00 m - 16.00 m

DRAWN BTA	6/03/202	5
51/1	0,00,202	<u> </u>
CHECKED TN	6/03/202	5
SCALE Not To S	Scale	A4
PROJECT No PSM5665	FIGURE No 4/8	

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricTbl. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM 5665 GPJ. << Drawing File>> 06/03/2025 14:31 10 03 00 09. Datget Ferce and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 02 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM 5665 DATE: 24/2/25 BOREHOLE ID: BHO2 16.0 m - 20.0 m DEPTH: NO (ORE 17.0 m - 18.2 m 12.0 PointID: BH02 Depth Range: 16.00 - 20.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH02: 16.00 m - 20.00 m PROJECT No FIGURE No PSM5665 5/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE: 24/2/25 BOREHOLE ID: 8HO2 20.0m - 24.0m DEPTH: NO CORE 20.0m - 21.15 m PointID: BH02 Depth Range: 20.00 - 24.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH02: 20.00 m - 24.00 m PROJECT No FIGURE No PSM5665 6/8

A4

Not To Scale

FIGURE No

7/8

PROJECT No

PSM5665

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM 5665 DATE: 24/2/25 BOREHOLE ID: BHO2 24.0m - 28.0m DEPTH: 240 NO CORE 27.5 m - 28.45 m PointID: BH02 Depth Range: 24.00 - 28.00 m DRAWN DATE 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE

McCrae Landslide Geotechnical Investigation

Core Photo - BH02: 24.00 m - 28.00 m

PSM 3.02.2 LIB - MOD FOR 5665.GLB GricTbi DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ < DrawingFile>> 06/03/2025 14:31 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06



PointID: BH02 Depth Range: 28.00 - 30.00 m



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Mornington Peninsula Shire Council McCrae Landslide Geotechnical Investigation Core Photo - BH02: 28.00 m - 30.00 m

DRAWN	DATE	
BTA	6/03/202	5
CHECKED	DATE	
TN	6/03/202	5
SCALE		Λ 4
Not To S	Scale	A4
PROJECT No	FIGURE No	
PSM5665	8/8	



**BH03** 

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# **Geotechnical Log**

Client: 17/02/2025 Mornington Peninsula Shire Council Commenced: Project Name: McCrae Landslide Geotechnical Investigation Completed: 18/02/2025 Logged By: Hole Location: 10-12 View Point Road Front Lawn JW/LL

Project No.:

-			Orill	ing Informati	on					Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	onsist	Ha Penetr U( kF (kF	omete S a)	er Structure, Zoning, Origin, Additional Observations
								77 77 77 77	OL	TOPSOIL: Sandy SILT: low plasticity, brown; sand fine grained.	w < PL				0.00: Topsoil
							-		SP-SM	FILL: SAND with silt trace gravel: fine to medium grained, poorly graded, pale brown gravel fine to medium grained, subangular gravel.	D				0.20: Possibly Fill 0.30: Rootlets observed down to 0.3
						27.6	1-	× × × ×		No recovery.					
						 26.6	- 2-		SP	SAND with gravel trace silt: fine to medium grained, poorly graded, pale brown; gravel fine to coarse grained, subangular gravel.	D				1.60: Possibly Colluvium
							-		SW	SAND trace silt: fine to coarse grained, well graded, yellow brown; silt low plasticity.	 M				
3			bgl.∑				_			No recovery.					2.50: Water level inferred based on s becoming wet
			Water level observed at 2.5m bgl.	D 2.70-4.00 m		 25.6	3-		SM	Silty SAND trace gravel: fine to coarse grained, well graded, yellow brown; silt low plasticity; gravel fine grained.  Becomes dark brown with granite gravels at 3 m.					
			Wa			 24.6	-			Becomes yellow brown at 3.5 m.	M				
				DD 4 70 m		2.	-		SC	(RS/XW GRANITE) Clayey SAND: fine to coarse grained, well graded, sub-angular to angular, mottled brown and pale brown; clay low plasticity.	 M			×	4.30: Probably Residual Soil or Extremely Weathered Granite
				PP 4.70 m =420 kPa			-	7.7.7.		No recovery.					
SI P A C N	D/T D/V /B -W: PT - St T - Pu S - Au S - Co	asnb anda ush t uger ontin Non	er dril er dril ore Ird pe ube screv uous destr	sampling (DT2) ructive drilling	N	netrat o resis		-	> Inflo ⊲ Par	tater  DW  U  U  U  U  U  U  U  U  U  U  U  U  U		M	e Con - Dry - Mo - We	st	Consistency/Relative Dens  VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense



#### **BH03**

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 17/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 18/02/2025 Logged By: Hole Location: 10-12 View Point Road Front Lawn JW/LL

Project No.:

	Нс	le P	ositi	on:	319533	3.0 n	n E 57	75371	5.6 m	N GD	A2020 / MGA Zone 55 Checked By: TN	
		ill Mo ole D			ū		•	e 782 Q3 - 96			Inclination: -90° RL Surface: 28.62 m  Bearing: - Datum: AHD Operator: SW Dril	ling
Ī			1	Drill	ing Informati	ion					Soil Description Observa	tions
Mothod	Metriod	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations  Additional Office of the provided Hand Penetrometer UCS (kPa)  Solution Office of the provided Hand Penetrometer UCS (kPa)  Solution Office of the provided Hand Penetrometer UCS (kPa)  Solution Office of the provided Hand Penetrometer UCS (kPa)	oning, Origin, bservations
T											No recovery. (continued)	
					PP 5.30 m >400 kPa			-		SC	(RS/XW GRANITE) Clayey SAND: fine to coarse grained, well graded, mottled brown and pale brown; clay low plasticity.	
3-06							22.6	6	///	SP	(RS/XW GRANITE) SAND trace clay: medium to coarse grained, well graded, sub-angular, grey brown; clay low plasticity.	
>> 26/03/2025 22:40 10.03 00.09 Datgel Fence and Map Tool   Lib: PSM 3.02.12019-03-06 Prj: PSM 3.02.12019-03-06	23				PP 6.50 m =280 kPa			-			Becomes fine to medium grained sand at 6.5 M	
2019-03-0							21.6	7-				
d Map Tool   Lib: PSM 3.02.1				T ENCOUNTERED	D 7.20-8.00 m PP 7.20 m =20 - 220 kPa PP 7.50 m =500 kPa			-		CL	(XW GRANITE) Sandy CLAY: low plasticity, grey brown; sand fine to coarse grained.	ered Granite to
0.03.00.09 Datgel Fence an				NOT	PP 7.70 m =500 kPa		20.6	8-			w> VSt PL to H	
04:7767								-			NO CORE: 8.4 - 10.0 m	
707/2007								-				
	TG3						19.6	9-				
PSM AU NONCORE BH NZ AU PSMB665.GPJ < <ur>     LO3</ur>								-				
M 3.02.2 LIB - MOD FOR 3003.GLB L0g	AD WE SP PT AS CS NE CC HA	0/T - 7 0/V - 7 3 -Wa T - Sta - Pu 5 - Au 6 - Co DD - I C - Co	Auge ashb anda ish ti iger ontin Von oncre nd A	er dril er dril ore ird pe ube screv uous desti ete co	sampling (DT2 ructive drilling oring	22)	R	stance efusal		> Infl⊲ ⊲ Pai		soft  stiff  cose e mr dense e dense ented



BH03

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 17/02/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 18/02/2025
Hole Location: 10-12 View Point Road Front Lawn Logged By: JW/LL
Hole Position: 319533.0 m F 5753715.6 m N GDA2020 / MGA Zone 55 Checked By: TN

Project No.:

Ho	ole Lo ole Po	ocat	on:	10-12 Vi	ew	Point	t Road	l Fron	t Lawr	Logged A2020 / MGA Zone 55 Checke	Ву:				8/02 N/L N		<u></u>	' 
	ill Mo ole Di			Mounting: 0 : CS - 57						Inclination: -90° RL Surf Bearing: - Datum:	ace	:		3.62 HD	m		Ор	erator: SW Drilling
		L	Drill	ing Informatio	n					Soil Description								Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture	Condition	Consistency / Relative Density	Pen	Har etro UC (kP:	me S a)		Structure, Zoning, Origin, Additional Observations
							-		SW-SC	(XW GRANITE) SAND with clay: fine to coarse grained, grey; clay low plasticity.	N	Л						
				D 10.80-11.50 m		17.6	11		CL	(XW GRANITE) Sandy CLAY trace gravel: low plasticity, dark grey; sand fine to coarse grained; gravel fine grained, subangular gravel.	w P		н					
						 16.6	12-		SW	(XW GRANITE) SAND trace clay trace gravel: fine to coarse grained, brown mottled orange; clay low plasticity; gravel fine grained, subangular gravel.  NO CORE: 12.00 - 13.8 m		Л		-				
HQ3			NOT ENCOUNTERED	SPT01		15.6	13-											
				13.35m-13.8m 11,15,20 N=25 0/450mm			-		CL	(XW GRANITE) Sandy CLAY trace gravel:								
				PP 14.00 m >400 kPa		14.6	14		OL.	low plasticity, grey brown to brown; sand fine to coarse grained; no structure; gravel fine grained.			VSt			*		
-       				PP 14.55 m =320 kPa Is(50): 0.02 MPa C	7		- -				P		to H		×	:		
SP PT AS CS ND CC HA	0/T - A 0/V - A 3 -Wa 1T -Sta - Pu 5 - Au 5 - Co 0D - N C - Co	ashbanda ush tu uger s ontini Non o oncre nd A	r dril r dril ore rd pe ibe screv ious desti te co	Iling TC bit Iling V bit enetration test wing s sampling (DT22 ructive drilling	) N	R	efusal		່ Infl ⊲ Pai	ater Samples and Tests DW U - Undisturbed Sample D - Disturbed Sample SPT- Standard Penetration Te ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample	st	M	oistu D W W	-     -     -	Dry Mois	st	on	VS - Very soft   S - Soft   F - Firm   St - Stiff   VSt - Very stiff   H - Hard   VL - Very loose   L - Loose   MD - Medium dense   D - Dense   VD - Very dense   Ce - Cemented   C - Compact   Compact   Compact   Ce   Cemented   C - Compact   Compact   Ce   Cemented   Ce   Cemented



**BH03** 

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 17/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 18/02/2025 Logged By: Hole Location: 10-12 View Point Road Front Lawn JW/LL

Project No.:

	Н	lole	Po	siti	on:	319533.0	0 m	n E 57	75371	5.6 m	N GD	A2020 / MGA Zone 55 Checked	By:		TN	
			Mo Dia			Mounting: (		•				Inclination: -90° RL Surfa Bearing: - Datum:	ice:	28 Al-	.62 m	perator: SW Drilling
ŀ		1010				ing Information		11, 110	20 - 30			Soil Description		7 (1	1B 0F	Observations
ŀ	_			_	<i></i>	ing imormatic	,,,							ξ		Observations
	Method	Denetration		Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa)	Structure, Zoning, Origin, Additional Observations
						14.75-14.85 m			-		CL	(XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey brown to brown; sand fine to coarse grained; no structure; gravel fine grained. (continued)	w> PL	VSt to H		
			             			Is(50): 0.02 MPa C 15.50-15.60 m	<u> </u>		-		SW	(XW GRANITE) SAND trace clay: fine to coarse grained, yellow brown; clay low plasticity.				
								12.6	16-				M			
019-03-06						PP 16.40 m =320 kPa			-		CL SW-SC	(XW GRANITE) Gravelly Sandy CLAY: low plasticity, grey; sand fine to coarse grained; gravel fine to medium grained subangular.	w > PL	VSt	×	
6 Prj: PSM 3.02.1 20									-		5VV-5C	(XW GRANITE) SAND with clay trace gravel: fine to coarse grained, brown; clay low plasticity; gravel fine grained, subangular gravel.				
M 3.02.1 2019-03-0					ERED			11.6	17-				М			
nd Map Tool   Lib: PS	HQ3				NOT ENCOUNTERED				-	1/2		NO CORE: 17.45 - 19.0 m				
28/03/2025 22:40 10.03:00.09 Datgel Fence and Map Tool   Lib: PSM 3:02.1 2019-03-06 Prj: PSM 3:02.1 2019-03-06					NO			10.6	18-							
								9.6	- 19—							
M5665.GPJ <									_		SP	(XW GRANITE) SAND trace gravel: medium to coarse grained, brown; gravel fine grained, subangular gravel.	M		×	
PSM AU NONCORE BH NZ AU PSM5665.GPJ < <drawingfile>&gt;</drawingfile>			       			PP 19.30 m =280 kPa PP 19.40 m =400 kPa			-		CL	(XW GRANITE) Sandy CLAY: low plasticity, brown; sand fine grained.  NO CORE: 19.50 - 20.15 m	w > PL	VSt	*	
				44-	d		_	moá	-		144	Samulas and Tests		foict:	ro Conditio	Consistency/Polatics Descrit
PSM 3.02.2 LIB - MOD FOR 5665.GLB Log	NS P AC N C H	VB PT - S - S - IDD C - IA -	- A /- A -Wa: -Sta Pus Aug Coi - N Cor Han	shbo nda sh tu ger s ntinu on o ncre id A	r dril r dril ore rd pe ibe screv uous desti te co	lling TC bit lling V bit enetration test wing s sampling (DT22 uctive drilling pring AS 1726:2017 Geoteo	) ()	R	stance efusal		>> Inflo <  Par	ater Samples and Tests ow U - Undisturbed Sample bital Loss SpT - Standard Penetration Tes spT - Standard Penetration Tes ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample		D M	re Condition - Dry - Moist - Wet	VS - Very soft   S - Soft   F - Firm   St - Suff   F - Firm   St - Suff   Very stiff   H - Hard   VL - Very loose   L - Loose   MD - Medium dense   D - Dense   VD - Very dense   Ce - Cemented   C - Compact   Compac



**BH03** 

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 17/02/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 18/02/2025
Hole Location: 10-12 View Point Road Front Lawn Logged By: JW/LL
Hole Position: 319533.0 m E 5753715.6 m N GDA2020 / MGA Zone 55 Checked By: TN

Project No.:

	lole Lo lole P									n A2020 / MGA Zone 55	Logged B Checked	-		JW TN			
	Orill Mo			d Mounting: :: CS - 57						Inclination: -90° Bearing: -	RL Surface Datum:	ce:	28 Al-	.62 n	n	Oper	rator: SW Drilling
		1	Drill	ling Information	on					Soil Descrip	tion						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behav particle characteristics of pri component, colour, secondary coadditional observations	viour or imary omponents,	Moisture Condition	Consistency / Relative Density	Pene L	JCS (Pa)	eter	Structure, Zoning, Origin, Additional Observations
										NO CORE: 19.50 - 20.15 m(contin	ued)						
							-		CL	(XW GRANITE) Sandy CLAY: low plasticity, brown; sand fine grained		w > PL	VSt				
				PP 20.88 m =600 - 900 kPa PP 21.00 m =450 - 500 kPa Is(50): 0.02 MPa C 21.40-21.55 m		7.6	21-		CL-CI	(XW GRANITE) Sandy CLAY trace low to medium plasticity, grey; san coarse grained; gravel fine grained subangular gravel.	d fine to	w > PL	н			>> <b>x</b> <b>xx</b>	
3			JNTERED			9.9	22-	<u> </u>		NO CORE: 22.00 - 22.65 m							
HQ3			NOT ENCOUNTERED	Is(50): 0.02 MPa C 23.30-23.40 m		5.6	23-		SC	(XW GRANITE) Clayey SAND trac fine to coarse grained, grey; clay lo medium plasticity; gravel fine grair subangular gravel.	ow to	М					
						4.6	24-										
							-		SM	(XW GRANITE) Silty SAND: fine g brown; silt low plasticity.		M	L				
							_		SW-SC	(XW GRANITE) SAND with clay trace fine to coarse grained, grey; clay to plasticity; gravel fine grained, subagravel.	ow	M					
AVSPACACE	MAD/T - AD/V - A	Auge ashb anda ush to uger ontin Non oncre and A	er dri er dri erd p ube scre uous dest ete c		2)	R	efusal		⊳ Inflo ⊲ Par	ater Samples and Dw U - Undisturbed Samples and D - Disturbed Samplete Loss SPT - Standard Pen Plete Loss ES - Environmenta TW - Thin Walled LB - Large Disturbed	Sample nple etration Test I Sample		D M	re Co - Di - M - W	ry oist	ion	Consistency/Relative Densiivs - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact



**BH03** 

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# **Geotechnical Log**

Client: 17/02/2025 Mornington Peninsula Shire Council Commenced: Project Name: McCrae Landslide Geotechnical Investigation Completed: 18/02/2025 Logged By: Hole Location: 10-12 View Point Road Front Lawn JW/LL

Project No.:

PSM5665

	Но	le P	osit	on:	319533	.0 m	n E 57	75371	5.6 m	N GD	A2020 / MGA Zone 55 Checked	-		TN	١		
			odel )iam		d Mounting: : CS - 57						Inclination: -90° RL Surfa Bearing: - Datum:	ace:	28 Al-	.62	m	0	perator: SW Drilling
H	110	ie L					Π, Π	23 - 90	111111				AI	טו			<u> </u>
L	_			Jriii	ing Informati	on					Soil Description						Observations
Method		Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Pen	Hand etrom UCS (kPa)	nete )	r Structure, Zoning, Origin, Additional Observations
											NO CORE: 25.00 - 25.30 m					Ì	
					PP 25.35 m =540 kPa PP 25.45 m =700 kPa PP 25.55 m =420 kPa PP 25.65 m =500 kPa		 2.6	26-		CL	(XW GRANITE) Sandy CLAY: low plasticity, grey; sand fine grained.	w> PL	Н		3	× × ×	× 25.70: Possible Clay Seam, 700 mm thick
Ì		 						_			NO CORE: 26.50 - 26.95 m						
HO3				NOT ENCOUNTERED	PP 27.50 m =380 - 400 kPa	3	0.6 1.6	27—		CL SP-SC	(XW GRANITE) Gravelly Sandy CLAY: low plasticity, grey; sand fine to coarse grained; gravel fine grained; no structure.  (XW GRANITE) Gravelly SAND with clay: medium to coarse grained, grey; gravel fine grained, subangular gravel; clay low plasticity	w>PL	Н		*	<	
	ADA ADA WB	/T - /V - 5 -W T-St	letho Auge Auge ashb	er dri er dri ore rd p	lling TC bit lling V bit enetration test	N	netration resis	stance		່ Infl ⊲ Pai	Hole Terminated at 29.50 m Target depth. Nested VWPs grouted in place at various depths.   Samples and Tests  U - Undisturbed Sample D - Disturbed Sample SPT - Standard Penetration Test ES - Environmental Sample TW - Thin Walled		<b>foistu</b> D M W		Ory Moist	tion	Consistency/Relative Densi  VS - Very soft S - Soft F - Sirm St - Stiff VSt - Very stiff
	AS CS ND CC HA	- Au - Co D - - Co - Ha	ontin Non oncre and A	scre uous dest ete c	wing s sampling (DT2 ructive drilling oring r n AS 1726:2017 Geote	2)	Re		e		LB - Large Disturbed Sample						H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: M((RAE LANDSLIDE PROJECT No: \$5M5665 DATE: 17/2/25 BOREHOLE ID: BH03 DEPTH: 0.0 m - 4.0 m 0.9 0.6 BHOS START OF HOLE PointID: BH03 Depth Range: 0.00 - 4.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH03: 0.00 m - 4.00 m PROJECT No FIGURE No PSM5665 1/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM5665 DATE: 17/2/25 BOREHOLE ID: BH03 DEPTH: 4.0 m - 8.0 m 0.9 PointID: BH03 Depth Range: 4.00 - 8.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH03: 4.00 m - 8.00 m PROJECT No FIGURE No PSM5665 2/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIVE PROJECT No: PSM 5665 DATE: 17/2/25 BOREHOLE ID: BH03 DEPTH: 8.0 m - 12.0 m 00 NO CORE 8.4m-10.0m PointID: BH03 Depth Range: 8.00 - 12.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH03: 8.00 m - 12.00 m PROJECT No FIGURE No PSM5665 3/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTbi DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ < DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06



PointID: BH03 Depth Range: 12.00 - 16.00 m



....

Mornington Peninsula Shire Council McCrae Landslide Geotechnical Investigation Core Photo - BH03: 12.00 m - 16.00 m

DRAWN	DATE	
BTA	6/03/202	5
CHECKED	DATE	
TN	6/03/202	5
SCALE N4 T C		A4
Not To S	cale	7
PROJECT No	FIGURE No	
PSM5665	4/8	

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricTbl. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM 5665 GP.I. << Drawing File>> 06/03/2025 14:32 10 03 00 09. Datget Ferce and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 0 PROJECT: M((RAE LANDSLIDE PROJECT No: P5M5665 DATE: 18/2/25 BOREHOLE ID: BH03 DEPTH: 16.0m - 20.0m 0 (ORE 17.45 m - 19.0 m 19.0 NO CORE 19.5m - 20.15m PointID: BH03 Depth Range: 16.00 - 20.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH03: 16.00 m - 20.00 m PROJECT No FIGURE No PSM5665 5/8

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricTbl. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM 5665 GP.I. << Drawing File>> 06/03/2025 14:32 10 03 00 09. Datget Ferce and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 0 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM 5665 DATE: 18/2/25 BOREHOLE ID: BHO3. DEPTH: 24.0m - 28.0m 25.0 NO (ORE 25.0 - 25.3. NO CORE 26.5m-26.9m 27.C PointID: BH03 Depth Range: 24.00 - 28.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH03: 24.00 m - 28.00 m PROJECT No FIGURE No PSM5665 7/8

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricTbl. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM 5665 GP.I. << Drawing File>> 06/03/2025 14:32 10 03 00 09. Datget Ferce and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 0 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE: 18/2/25 BOREHOLE ID: BHO3 DEPTH: 28.0m - 29.5m (EOH) END OF HOLE 29.5m PointID: BH03 Depth Range: 28.00 - 29.50 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH03: 28.00 m - 29.50 m PROJECT No FIGURE No PSM5665 8/8



BH03A

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 25/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 25/02/2025

Project No.:

PSM5665

Hole Location: 10-12 View Point Road Front Lawn Logged By: LL Hole Position: 319533.7~m E 5753716.7~m N GDA2020 / MGA Zone 55Checked By: TN

Drill Model and Mounting: Geoprobe 7822 DT Inclination: RL Surface: 28.70 m

Drill Model and Mou Hole Diameter:	ng: Geoprobe 78	,22 51	Inclination: -90° Bearing: -	RL Surface: Datum:	28.70 m AHD Op	perator: SW Drilling
Drilling In	rmation		Soil Desc	-		Observations
	oles ts earks OO RL Dep	Graphic Log Classification Symbol	Material Descripti  SOIL NAME: Plasticity, be particle characteristics of component, colour, secondar additional observat	ehaviour or f primary y components, ons	Consistency / Relative Density / Relative Density / 100 (e.d.y) SOO (e.d.y) SO	Structure, Zoning, Origin Additional Observations
ADVA	24.7 25.7 26.7 27.7		Refer to BH03 for Lithology.			
Method AD/T - Auger drilling TO AD/V - Auger drilling V WB -Washbore	it No resistan	_ ⊳ Ir	Water         Samples           iflow         U - Undisturb           artial Loss         D - Disturbed           omplete Loss         SPT - Standard           ES - Environment	ed Sample	Moisture Condition  D - Dry  M - Moist  W - Wet	Consistency/Relative Dens  VS - Very soft  S - Soft  F - Firm  St - Stiff  VSt - Very stiff

WB -Washbore
SPT-Standard penetration test
PT - Push tube
AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample



BH03A

Page 2 of 2

#### **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 25/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 25/02/2025

Hole Location: 10-12 View Point Road Front Lawn Logged By: LL Hole Position: 319533.7 m E 5753716.7 m N GDA2020 / MGA Zone 55 Checked By: TN

Drill Model and Mounting: Geoprobe 7822 DT Inclination: RL Surface: 28.70 m

Project No.:

PSM5665

ı	Hole	e Di	am	eter:		150	) mm				Bearing: -	Datum:		AH	ID		Or	perator: SW Drilling
			L	Drilli	ing Informat	ion					Soil L	Description						Observations
Method		Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Des SOIL NAME: Plastici particle characteris component, colour, secc additional obs	ity, behaviour or tics of primary andary components,	Moisture Condition	Consistency / Relative Density	Pene l (	land trome JCS kPa)		Structure, Zoning, Origin, Additional Observations
AD/V			Z				7.	-										
							22	6 -			Hole Terminated at 6.00 r Target depth. Standpipe a and sand, gravel and ben place.	and VWP Installed,						
							21.7	7-										
							20.7	8										
							19.7	9-										
	11	             	etho Auge		ling TC bit ling V bit		enetra:	tion stance		Infle     Infle	ow U - Undis	<b>uples and Tests</b> sturbed Sample rbed Sample dard Penetration Tes		loistui D M	re Co - D - W - W	ry loist	on	Consistency/Relative Dens  VS - Very soft S - Soft F - Firm

////// Refusal

AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT-Standard penetration test
PT - Push tube
AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

Partial Loss Complete Loss

- Unustrated Sample
- Disturbed Sample
SPT - Standard Penetration Test
EST - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

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BH04

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# **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 26/02/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025
Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL

Project No.:

	Hole Lo Hole P									sac Logged A2020 / MGA Zone 55 Checked			LL TN			
	Drill Mo			d Mounting: : CS - 57		•				Inclination: -90° RL Surfa Bearing: - Datum:	ace:	26 AF	.82 ID	m	C	Operator: SW Drilling
		ı	Drill	ing Information	on					Soil Description						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Pen	Handetror UCS (kPa	mete S a)	Additional Observations
B: PSM 3.02.1.2019-03-06 Prj: PSM 3.02.1.2019-03-06 CC		Z	Not Encountered			24.8 25.8			SP-SM	Asphaltic Concrete: Black  No recovery.  SAND with silt trace gravel: fine grained, poorly graded, pale yellow; silt low plasticity; gravel fine grained, angular.  No recovery.  SAND trace gravel: fine to medium grained, yellow grey; gravel fine grained, angular.	D					0.00: Asphalt  0.50: Possibly Fill/Colluvium
PSM 3.0.2 LIB - MOD FOR 5665 G.B. Log. PSM AU NONCORE BH NZ. AU PSM 5665 GPJ <-Drawng-fle>> 2803/2025 22.41 10.03 00.09 Dargel Fenne and Map Tool   Lib. PSM 3.0.2 12019-03-06 Prj. PSM		Z	Not En	D 3.10-3.60 m  PP 3.50 m =300 kPa  PP 3.80 m =380 kPa  PP 4.10 m =400 kPa  PP 4.30 m >400 kPa		22.8	3—		ML	SILT: low plasticity, yellow grey.  (RS) Sandy CLAY: low plasticity, mottled	D to M	VSt VSt to H			× × ×	3.60: Possibly Residual
PSM 3.02.2 LIB - MOD FOR 5665.GLB Log PSM AU NOI	AD/T - /AD/V - /AD/V - /AD/V - /AD/V - AD/V	Auge ashb anda ush to uger ontin Non oncre and A	er dri er dri ore rd p ube scre uous dest ete c uge	enetration test wing s sampling (DT22 ructive drilling oring	2)	R	stance efusal		>> Inflo <  Par	Ater  D  U  U  D  D  D  D  D  D  D  D  D  D	A st	M	re C	Ory ∕loist		n Consistency/Relative Density  VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented C - Compact



**BH04** 

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# **Geotechnical Log**

Client: 26/02/2025 Mornington Peninsula Shire Council Commenced: Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025

Project No.:

Hole		atio	on:	Middle	of V	iew P	oint R	oad C	ul-de-	sac A2020 / MGA Zone 55	Logged E Checked			LL				
Drill Hole				Mounting: CS - 57						Inclination: -90° Bearing: -	RL Surfa Datum:	ice:	26 Al-	.82 ı ID	m	0	perator:	SW Drilling
		D	rilli	ing Informati	on					Soil Descript	ion							Observations
Method	Production	auphoir	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behavi particle characteristics of prir component, colour, secondary cor additional observations	nary	Moisture Condition	Consistency / Relative Density	Pene	UCS (kPa	nete 3 )	er St A	ructure, Zoning, Origin, dditional Observations
				D 5.00-5.80 m			-		CL	(RS) Sandy CLAY: low plasticity, mbrown and grey; sand fine to mediu (continued)	ottled m grained.	w≈ PL	VSt to H					
102.1.2019-us-us				PP 6.00 m >600 kPa		20.8	6		CL	(XW GRANITE) CLAY trace sa plasticity, grey mottled orange; s grained; rock fabric observed.							5.80: Poss Granite to	sibly Extremely Weathered EOH
1003.00.09 Dagge Fence and Map Tool Ltb. PSM 3.02, 1201943-06 Prg PSM 3.02, 1201943-56 CC	Z			PP 7.00 m >600 kPa		19.8	7					w > PL to w ≈ PL	н				*	
19/20/20/20/20				PP 8.00 m >600 kPa		18.8	8										*	
H NZ AJ PSW6665.GPJ < <p>CDrawing-lie&gt;&gt; 26/ HQ3 ——————————————————————————————————</p>	       			PP 9.00 m >600 kPa		17.8	9-										*	
PSM AU NONCORE BH N							-		CL	NO CORE: 9.50 - 9.60 m  (XW GRANITE) CLAY trace sand tr gravel: low plasticity, grey mottled c sand fine grained; rock fabric obser gravel fine grained, angular.	orange; ved;		Н					
AD/V WB - SPT - AS - CS - NDD - HA -	- Aug Wash Stand Push Auge Conti - No Cond Hand	ger ger dare dare tinue er se inue n de cret	drill re d pe be crew ous estr e co	sampling (DT2 uctive drilling pring	2)		efusal		່ Infl ⊲ Pai	ater Samples and Ow U - Undisturbed Sam SPT - Standard Pene ES - Environmental TW - Thin Walled LB - Large Disturbe	ample ple tration Tes Sample		loistu D M W	re Cc - D - N ' - V	)ry /loist	ition	S F S N H	



BH04

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 26/02/2025

Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025

Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL

Project No.:

PSM5665

Hole Location:Middle of View Point Road Cul-de-sacLogged By:LLHole Position:319498.1 m E 5753665.8 m N GDA2020 / MGA Zone 55Checked By:TN

	ole D	iui		rilli	CS - 57		.,				Bearing: - Datum:  Soil Description			HD	İ	perator: SW Drilling  Observations
Method	Penetration	Support		Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetror UCS (kPa	neter ; )	Structure, Zoning, Origin, Additional Observations
								-		CL	(XW GRANITE) CLAY trace sand trace gravel: low plasticity, grey mottled orange; sand fine grained; rock fabric observed; gravel fine grained, angular. (continued)	w> PL to w≈ PL		1 2 2 3	4 0	
								-		SW	(XW GRANITE) SAND with gravel: fine to coarse grained, orange; gravel fine grained. (XW GRANITE) CLAY: low plasticity, grey.	w >	Н			
							15.8	11-		SC	(XW GRANITE) Clayey SAND: fine to medium grained, grey yellow; clay low plasticity.	M				
3					PP 12.10 m =310 kPa		14.8	- 12- -		CL	(XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; gravel fine grained.	w> PL	VSt	×		
8		Z			PP 12.50 m =320 kPa PP 12.70 m =370 kPa		13.8	13-		SW	(XW GRANITE) Gravelly SAND: fine to coarse grained, yellow brown; gravel fine to medium grained.  (XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey yellow; sand fine to	M		, , , , , , , , , , , , , , , , , , ,		
							12.8	- 14			coarse grained; gravel fine to coarse grained, red brown angular moderately weathered granite clasts.  NO CORE: 14.00 - 14.52 m	w> PL				
								-		SP	(XW GRANITE) Gravelly SAND trace clay: fine to coarse grained, yellow brown; gravel fine to coarse grained red brown high to very high strength moderately weathered; clay low plasticity.					
A S P	D/T - / D/V - / /B -Wa PT-Sta T - Pu	Aug ash and ush	jer jer bo ard tul	dril dril re d pe	ling TC bit ling V bit enetration test ving sampling (DT2 uctive drilling		enetrat lo resis	stance		⊳ Infl ⊲ Paι	ater  D  U  U  U  U  U  U  U  U  U  U  U  U		D M	re Condi - Dry - Moist - Wet		Consistency/Relative Density



BH04

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## **Geotechnical Log**

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Client: Mornington Peninsula Shire Council Commenced: 26/02/2025

Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025

Hole Location: Middle of View Point Road Cul-de-sac Logged By: L1

Project No.:

PSM5665

Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL Hole Position: 319498.1 m E 5753665.8 m N GDA2020 / MGA Zone 55 Checked By: TN

	110	10 1	osit	OH.	319490.	1 11	11 E 37	3300	0.6 111	N GD/	A2020 / MGA Zone 55 Checked By: TN	
ı			ode iam		d Mounting: CS - 57		•				Inclination: -90° RL Surface: 26.82 m Bearing: - Datum: AHD Operator: SW Drilling	
				Drill	ing Informatio	on					Soil Description Observations	
Method		Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	1 4 4 8 4 2	ions
					Is(50) = 0.11 MPa C 15.00-15.10 m			-		CL	(XW GRANITE) CLAY trace gravel trace sand: low plasticity, red brown; gravel fine to medium grained; sand fine grained.  W > PL VSt	W grai
							10.8	16	20000	GP	(XW GRANITE) Sandy GRAVEL trace clay: fine to medium grained, brown; sand fine to coarse grained; clay low plasticity.  NO CORE: 16.30 - 17.50 m	
				untered			8. 8.	17-				
HO3			z	Not Encountered			8.8	- 18-		SC	(XW GRANITE) Clayey SAND trace gravel: fine to medium grained, grey brown; clay low plasticity; gravel fine grained, angular.	
							7.8	- - 19-			NO CORE: 18.50 - 20.50 m	
	AD/ AD/ WB SPT AS CS	   	Auge ashb anda ush t uger ontin	er dri er dri ore ird pe ube screv	lling TC bit lling V bit enetration test wing s sampling (DT22 ructive drilling		enetrati lo resis	stance	-	>> Inflo <  Par	Water	



**BH04** 

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## **Geotechnical Log**

26/02/2025 Client: Mornington Peninsula Shire Council Commenced: Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025 Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL

Project No.:

PSM5665

		ı	Drill	ing Informati	ion			Soil Description		Observations
	Penetration	Support	Water	Samples Tests Remarks	Recovery W B		Classification	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations  Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations	Hand Penetrometer UCS (kPa)	Structure, Zoning, Origin Additional Observations
HOX8		2	Not Encountered	PP 21.00 m =380 kPa PP 21.40 m =420 kPa PP 21.60 m =370 kPa		2 22	CL CL SP	(XW GRANITE) SAND trace gravel: fine to coarse grained, grey; gravel occasional granite gravels red brown, very low to low strength, moderately weathered.  NO CORE: 20.75 - 20.80 m  (XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; gravel fine to medium grained.  NO CORE: 22.50 - 22.95 m  (XW GRANITE) CLAY trace gravel trace sand: low plasticity, grey; gravel fine grained; sand coarse grained.  (XW GRANITE) CLAY trace gravel trace sand: low plasticity, grey; gravel fine grained; sand coarse grained.  M   (XW GRANITE) Gravelly SAND: coarse grained, grey; gravel fine grained.  M   NO CORE: 24.00 - 25.50 m		
AD/ AD/ WB SPT PT - AS -	T - A V - A -Wa -Sta - Pus - Aug	anda sh tu ger s intini	r dri r dri ore rd pe ibe screv	lling TC bit lling V bit enetration test wing sampling (DT2 uctive drilling pring	Penet		⊳ Inf ⊲ Pa	ow U - Undisturbed Sample E	ture Condition  D - Dry  M - Moist  W - Wet	Consistency/Relative Dens VS - Very soft S - Soff F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense

HA - Hand Auger



**BH04** 

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 26/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025

Project No.:

PSM5665

Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL  $319498.1 \text{ m} \to 5753665.8 \text{ m} \text{ N} \text{ GDA2020 / MGA Zone } 55$ Checked By: Hole Position: TN

			Drill	ing Informati	on		_			Soil Description				Observations
Metriod	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  NO CORE: 24.00 - 25.50 m(continued)	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa)	Structure, Zoning, Origin Additional Observations
						0.8	26 —		SW	(XW GRANITE) SAND trace gravel trace clay: fine to coarse grained, brown; gravel (quartz) fine grained; clay low plasticity.  NO CORE: 26.00 - 26.30 m  (XW GRANITE) Gravelly CLAY with sand:	M			
			Not Encountered	PP 27.10 m >450 kPa		-0.2	- 27-		CL	low plasticity, brown; gravel fine grained; sand fine to coarse grained.  NO CORE: 26.50 - 26.65 m  (XW GRANITE) Sandy CLAY trace gravel: low plasticity, brown; sand fine grained; gravel (quartz) fine grained.  (XW GRANITE) CLAY trace gravel: low plasticity, grey; gravel (quartz) fine grained, angular.	w> PL 	Н	×	
		Z	Not Enc	PP 27.40 m >450 kPa PP 27.80 m =380 kPa		-1.2	28-		CL	NO CORE: 27.50 - 27.65 m  (XW GRANITE) CLAY trace gravel: low plasticity, grey; gravel (quartz) fine grained, angular.  NO CORE: 28.00 - 28.75 m	w> PL	VSt	×	
						-2.2	29-			(XW GRANITE) CLAY with sand: low plasticity, grey brown; sand fine to coarse grained.  NO CORE: 29.00 - 29.35 m	PL	VSt to H		
		/letho		lling TC bit lling V bit	_	netra	tion		CL W	(XW GRANITE) CLAY with sand: low plasticity, grey brown; sand fine to coarse grained.  NO CORE: 29.50 - 29.95 m  ater  Samples and Tests by U - Undisturbed Sample tigl Loss D - Disturbed Sample	W > PL		re Condition - Dry, - Moist	Consistency/Relative Den VS - Very soft S - Soft F - Firm

AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

\text{VL} - \text{Very loose} \\
L - \text{Loose} \\
MD - \text{Medium dense} \\
D - \text{Dense} \\
VD - \text{Very dense} \\
Ce - \text{Cemented} \\
C - \text{Compact} \\
\text{Compact} \\
\text{Compact} \\
\text{Very loose} \\
\text{Loose} \\
\text{Very dense} \\
\text{Compact} 


**BH04** 

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 26/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025 Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL

Project No.:

PSM5665

319498.1 m E 5753665.8 m N GDA2020 / MGA Zone 55 Hole Position: Checked By: TN

		ı	Drilli	ing Informatio	on					Soil Description Observations
Melliod	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations  SOIL NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations  Solic NAME: Plasticity, behaviour or particle characteristics of primary components, additional observations
							-		CL /	(XW GRANITE) CLAY with sand: low plasticity grey brown; sand fine to coarse grained.  Hole Terminated at 30.00 m Target depth. Standpipe Installed, and sand, gravel and bentonite packed in place.
						-4.2	31 —			
						-5.2	32-			
						-6.2	33-			
						-7.2	34			
							-			

AD/V - Auger drilling V bit WB -Washbore SPT-Standard penetration test PT - Push tube AS - Auger screwing CS - Continuous sampling (DT22) NDD - Non destructive drilling CC - Concrete coring HA - Hand Auger

/ Refusal

SPT - Standard Penetration Test ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample Complete Loss

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE: 26/2/25 BOREHOLE ID: BHO 4 .0.0m - 4.0m DEPTH: 0.0 PointID: BH04 Depth Range: 0.00 - 4.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale

Core Photo - BH04: 0.00 m - 4.00 m

PROJECT No

PSM5665

FIGURE No

1/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE: 26/2/25 BOREHOLE ID: BHO4 4.0m - 8.0m DEPTH: PointID: BH04 Depth Range: 4.00 - 8.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH04: 4.00 m - 8.00 m PROJECT No FIGURE No PSM5665 2/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: P5M5665 DATE: 26/2/25 BOREHOLE ID: BHO4 8.0m - 12.0m DEPTH: PointID: BH04 Depth Range: 8.00 - 12.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH04: 8.00 m - 12.00 m PROJECT No FIGURE No PSM5665 3/8





PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: \$5M5665 DATE:27/2/25 BOREHOLE ID: BHO4 20.0m-24.0m DEPTH: NO (ORE 22.5m-22.95 m PointID: BH04 Depth Range: 20.00 - 24.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH04: 20.00 m - 24.00 m PROJECT No FIGURE No PSM5665 6/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: PSM 5665 DATE: 27/2/25 BOREHOLE ID: BHO4 24.0m-28.0m DEPTH: 0.9 NO (ORE 24.0m - 25.5m 25.0 26.0 (ORE NO NO CORE 26.0 - 26.3 -26.5 - 26.65 -NO CORE 27.5m-27.65m PointID: BH04 Depth Range: 24.00 - 28.00 m DRAWN DATE 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH04: 24.00 m - 28.00 m PROJECT No FIGURE No PSM5665 7/8

PSM 3.02.2 LIB - MOD FOR 5665.GLB GridTbi DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ << DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06



PointID: BH04 Depth Range: 28.00 - 30.00 m



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Mornington Peninsula Shire Council McCrae Landslide Geotechnical Investigation Core Photo - BH04: 28.00 m - 30.00 m

DRAWN BTA	6/03/202	5
אום	0/00/202	,
CHECKED TN	6/03/202	5
Not To S	cale	A4
PROJECT No PSM5665	FIGURE No 8/8	



BH04A Page 1 of 2

**Geotechnical Log** 

Client: Mornington Peninsula Shire Council Commenced: 27/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025

Project No.:

PSM5665

Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL 319499.2 m E 5753666.1 m N GDA2020 / MGA Zone 55 Hole Position: Checked By: TN

Drill Model and Mounting:	Geoprobe 7822 DT	Inclination: -90° RL Surfa		
Hole Diameter:	150 mm	Bearing: - Datum:	AHD Op	perator: SW Drilling
Drilling Informati	tion	Soil Description		Observations
Samples Tests Remarks Remarks	Recovery The state of the state	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations	Moisture Condition Consistency / Relative Density 100 200 (March Consistency / 100 (March Consis	Structure, Zoning, Origin, Additional Observations
Method  AD/T - Auger drilling TC bit AD/V - Auger drilling V bit WB - Washbore CDT - Charles and the state of	6:52 1—	Refer to BH04 for Lithology.  Samples and Tests	Moisture Condition	Consistency/Relative Densit
Method  AD/T - Auger drilling TC bit AD/V - Auger drilling V bit WB -Washbore SPT -Standard penetration test PT - Push tube	No resistance	w U - Undisturbed Sample	Moisture Condition D - Dry M - Moist W - Wet	Consistency/Relative Density VS - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard

//////// Refusal

SPT-Standard penetration test
PT - Push tube
AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

ogged in accordance with AS 1726:2017 Geotechnical site investigations

TW - Thin Walled
LB - Large Disturbed Sample

VSt - Very stiff
H - Hard
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense
Ce - Cemented
C - Compact



BH04A

Page 2 of 2

#### **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 27/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 27/02/2025 Hole Location: Middle of View Point Road Cul-de-sac Logged By: LL

319499.2 m E 5753666.1 m N GDA2020 / MGA Zone 55 Hole Position: Checked By: TN

Drill Model and Mounting: Geoprobe 7822 DT Inclination: RL Surface: 26.86 m

150 mm Hole Diameter: Bearing: Datum: AHD Operator: SW Drilling

Project No.:

PSM5665

_ '	поіє	וטו	ame	eter:		150	0 mm				Bearing: - Datum: AHD Operator: SW Drilling	
			L	Drilli	ing Informat	ion					Soil Description Observations	i
Method			Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  Solic Name: Plasticity, behaviour or particle characteristics of primary components, additional observations  Material Description  Solic Name: Plasticity, behaviour or particle characteristics of primary components, additional observations  Material Description  Solic Name: Plasticity, behaviour or particle characteristics of primary components, additional observations  Material Description  Solic Name: Plasticity, behaviour or particle characteristics of primary components, additional observations  Material Description  Solic Name: Plasticity, behaviour or particle characteristics of primary components, additional observations  National Name: Plasticity, behaviour or particle characteristics of primary components, additional observations	Origin, ations
AD/V			z					-				
							20.9	- - -			Hole Terminated at 6.00 m Target depth. Standpipe Installed, and sand and bentonite packed in place.	
							19.9	7				
							18.9	8-				
							17.9	9				
		ш	tho	4		D	enetrat	tion		14/	/ater Samples and Tests Moisture Condition Consistency/Relative	Don
,	AD/T AD/V				ling TC bit ling V bit		lo resis			Inflo		Dens

AD/T - Auger drilling TC bit AD/V - Auger drilling V bit WB - Washbore SPT - Standard penetration test PT - Push tube AS - Auger screwing CS - Continuous sampling (DT22) NDD - Non destructive drilling CC - Concrete coring HA - Hand Auger ∕/// Refusal

Partial Loss Complete Loss

U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample



**BH05** 

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## **Geotechnical Log**

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Client:Mornington Peninsula Shire CouncilCommenced:26/02/2025Project Name:McCrae Landslide Geotechnical InvestigationCompleted:26/02/2025Hole Location:3 Penny Lane DrivewayLogged By:LL

Project No.:

PSM5665

Hole Location: 3 Penny Lane Driveway Logged By: LL
Hole Position: 319500.7 m E 5753775.2 m N GDA2020 / MGA Zone 55 Checked By: TN

Drill	Posi Mode Dian	l an	d Mounting:	Ge	oprol				A2020 / MGA Zone 55 Checke  Inclination: -90° RL Surl  Bearing: - Datum:	ace:		 98 m ⊣D Op	perator: SW Drilling
			ling Information						Soil Description		74		Observations
Method	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components additional observations	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa)	Structure, Zoning, Origin, Additional Observations
3	z								Concrete No recovery.			-	0.00: Concrete
									No recovery.				
	             					_		SP	Gravelly SAND: fine to medium grained, grey brown; gravel angular, fine grained.	, W			0.50: Possibly Aeolian Dune or Mari
	             				_t.	1-		SP	SAND: medium to coarse grained, pale yellow.			-	
	i i   					-			No recovery.			-	
	             	O mbgl.	D 1.60-2.30 m			-	_ · _	SW	SAND: fine to coarse grained, grey.	D		_	
		26/02/25, Water observed at 1.60 mbgl.			0:0	2-				w	_		
		26/02/25, Wat	D 2.60-3.60 m		-1.0	3-		SC	No recovery.  Clayey SAND trace gravel: fine to coarse grained, grey; gravel fine grained.	w			
			PP 3.60 m		'	-		CI -CI	CLAY: low to medium plasticity, brown mottle			- ×	
			=180 kPa			-		SW	grey.	w> PL	St	-	
	i i   				-2.0	4-		SVV	SAND: fine to coarse grained, angular, grey.	w			
	             					-		SC	Clayey SAND: fine to medium grained, grey; clay low to medium plasticity.	w			
	Moss	1		Po	notre	tion	. /. /	CL	(RS) CLAY trace sand: low plasticity, brown;		St	ro Condition	4.90: Possibly Residual
AD/V WB SPT PT - AS - CS - NDD CC -	- Aug Wash Stand Push Auge Conti	er dr er dr oore ard p tube scre nuou des ete d	s sampling (D12) tructive drilling oring		enetra: lo resi:	stance	-	>> Inflo <□ Par	ater Samples and Tests by U - Undisturbed Sample tial Loss D - Disturbed Sample D - Disturbed Sample SPT - Standard Penetration Te ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample	st	D M	ure Condition - Dry 1 - Moist V - Wet	Consistency/Relative Dens  VS - Very soft  S - Soft  F - Firm  St - Stiff  VSt - Very stiff  H - Hard  VL - Very loose  L - Loose  MD - Medium dense  D - Dense  VD - Very dense



**BH05** 

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 26/02/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 26/02/2025

Project No.:

PSM5665

Hole Location: 3 Penny Lane Driveway Logged By: LL  $319500.7 \text{ m} \to 5753775.2 \text{ m} \text{ N} \text{ GDA2020 / MGA Zone } 55$ Hole Position: Checked By: TN

Drill Model and Mounting: Geoprobe 7822 DT Inclination: RL Surface: 1.98 m

Н	ole D	iam	eter:	CS - 57	mr	n				Bearing:	-	Datum:		Αŀ	ID		O	perator:	SW Drilling
		ı	Drilli	ing Informatio	on					s	oil Descrip	otion							Observations
Metriod	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	SOIL NAME: Planticle characteristics component, colour,	Description asticity, beha steristics of pr secondary co	omponents,		Consistency / Relative Density	Pen	Hand etron UCS (kPa)	neter	s Str Ac	ucture, Zoning, Origir Iditional Observations
						-5.0 -4.0				sand fine grained. Hole Terminated at 5 Target depth. VWP g bentonite packed in p	routed, and	sand and	N PL7						
						- -6.0	8-												
						0.7-	9												
Ш		letho		ling TC bit ling V bit		netrat	tion stance	1	<b>W</b> ∂ >> Inflo	ater bw U - I	Samples an Undisturbed Sai Disturbed Sai	<b>d Tests</b> Sample	N.	loistu D	re C - [	ondia Ory Moist	tion	Consi	stency/Relative Den S - Very soft - Soft - Firm t - Stiff

WB - Wasnobre
SPT - Standard penetration test
PT - Push tube
AS - Auger screwing
CS - Continuous sampling (DT22)
NDD - Non destructive drilling
CC - Concrete coring
HA - Hand Auger

ES - Environmental Sample TW - Thin Walled LB - Large Disturbed Sample

 St
 - Stiff

 VSt
 - Very stiff

 H
 - Hard

 VL
 - Very loose

 L
 - Loose

 MD
 - Medium dense

 D
 - Dense

 VD
 - Very dense

 Ce
 - Cemented

 C
 - Compact

PSM 3.02.2 LIB - MOD FOR 5665.GLB GrfcTb1 DG PHOTO CORE PHOTO 1 PER PAGE A4L PSM5665.GPJ <<DrawingFile>> 06/03/2025 14:32 10.03.00.09 Datgel Ferce and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 PROJECT: MCCRAE LANDSLIDE PROJECT No: P5M5665 DATE: 26/2/25 BOREHOLE ID: 8#05 0.0 m - 4.0 m DEPTH: PointID: BH05 Depth Range: 0.00 - 4.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH05: 0.00 m - 4.00 m PROJECT No FIGURE No PSM5665 1/2

PSM 3 02 2 LIB - MOD FOR 5665 GLB. GricThi. DG PHOTO CORE PHOTO 1 PER PAGE A4I. PSM5665 GPJ. < Drawing File>> 06/03/2025 14:32: 10.03.00.09. Dated Ferge and Map Tool II ib: PSM 3 02 1 2019-03-06 Pri: PSM 3 02 1 2019-03-06 PROJECT: MC(RAE LANDSLIDE PROJECT No: \$5M5665 DATE: 26/2/25 BOREHOLE ID: 8#05 DEPTH: END OF HOLE 5.0 m PointID: BH05 Depth Range: 4.00 - 5.00 m DRAWN 6/03/2025 **BTA** CHECKED TN 6/03/2025 Mornington Peninsula Shire Council SCALE McCrae Landslide Geotechnical Investigation A4 Not To Scale Core Photo - BH05: 4.00 m - 5.00 m FIGURE No PROJECT No PSM5665 2/2



#### NDT01

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 12/02/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 12/02/2025
Hole Location: Front Yard of 6 View Point Road Driveway Logged By: JW

Project No.:

PSM5665

	ole L ole F									-	Logged By: Checked By		JW TN		
			and eter:	Mounting:		cuum 0 mm	Truck	(			RL Surface: Datum:	: 32 Al-	34 m HD	0	perator: Fulton Hogan
			Drilli	ing Informat	ion					Soil Description	on				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behavior particle characteristics of prime component, colour, secondary compadditional observations	ary   ⋚	Condition Consistency / Relative Density	Hand Penetron UCS (kPa)	nete )	r Structure, Zoning, Origin, Additional Observations
									ML	TOPSOIL: Sandy SILT: low plasticity grey; sand fine grained.	, dark w P				0.00: Topsoil
						31.3	- 1- -			Insufficient information to provide a dimaterial description, but inferred to be sandy CLAY from observations of manear surface and video inspection.	e FILL				1.30: Obstruction in hole, possibly a cobble that could not be excavated by the vacuum truck     1.50: Rootlets observed down 1.5 m
QQN			Not Encountered			29.3	2								2.60: Horizontal dark grey band/contac possibly water level mark
						28.3	4-			Insufficient information to provide a d material description, but inferred to b gravelly clayey SAND below the fill be observed cuttings and video inspection	e natural ased on				3.20: Possibly Colluvium or Residual. Inferred to be insitu mateiral below sev invert level
							-			Hole Terminated at 5.00 m Target depth. Standpipe Installed, an gravel and bentonite packed in place					
SF P AS CS NI CS	D/T - D/V - B -W PT -S F - P S - C DD - C - C	lashb tanda ush t uger ontin Non	er driller driller driller ore ard peube screv uous	ling TC bit ling V bit enetration test ving sampling (DT uctive drilling oring		enetra lo resi: R	stance		>> Inflo <  Par	ater  bw U - Undisturbed Sar  ptial Loss D - Disturbed Sar  po D - Disturbed Sar  SPT - Standard Penetr  ES - Environmental S  TW - Thin Walled  LB - Large Disturbed	nple le ation Test ample	D M	re Condia - Dry - Moist / - Wet	tion	Consistency/Relative Densit  VS - Very soft S - Soff F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense Ce - Cemented

TA - nation Auger

Logged in accordance with AS 1726:2017 Geotechnical site investigations

D - Dense
VD - Very dense
Ce - Cemented
C - Compact



#### NDT02

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## **Geotechnical Log**

Client: Mornington Peninsula Shire Council Commenced: 03/03/2025 Project Name: McCrae Landslide Geotechnical Investigation Completed: 03/03/2025 Hole Location: Verge in front of 6 View Point Road Logged By: SD

Project No.:

PSM5665

	Н	lole	P	osit	on:	31957	5.4 n	n E 57	75369	6.0 m	N GD	A2020 / MGA Zone 55 Checked By: TN
Γ						Mounting:			Truck			Inclination: -90° RL Surface: 32.73 m
H	Н	1016	טפּ		eter:			0 mm				Bearing: - Datum: AHD Operator: Fulton Hogan
L					Drilli	ing Informat	ion					Soil Description Observations
NA - 41	Method	o to to to to to	רפוופוופווסוו	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  Hand Penetrometer UCS (kPa)  \$\frac{1}{2} \frac{1}{2}
T											ML	TOPSOIL: Sandy SILT: low plasticity, dark w >
								31.7	- - - 1-			Insufficient information to provide a detailed material description, but inferred to be FILL based on proximity to sewer trench.
5: PSM 3:02:1 Z019-03-06 Prj; PSM 3:02:1 Z019-03-06	QQN			z	Not Encountered			30.7	- - 2-			
41 10.03.00.09 Datgel Fence and Map Tool   Lib								29.7	3-			Hole Terminated at 3.20 m Target depth. VWP installed, and sand, gravel  ### Target depth. WWP installed, and sand, gravel  ### Target depth due to cave-in.  #### Measured depth was 3.2 m
PSM AU NONCORE BH NZ AU PSN5665 GPJ <-DrawingFile>> 0904/2025 13:41 10.03 00.09 Datgel Fence and Map Tool   Lb: PSM 3.02.12019-03-06 Pr; PSM 3.02.								28.7	4			and bentonite packed in place.
3.02.2 LIB - MOD FOR 5665.GLB Log PSM AU NONCC	AANSPACKC	D/T D/N VB PT - SS - IDC -	Me - Ma - Sta - Nu - Co	Auge ashb anda ish t iger ontin Non oncre	er dril er dril ore Ird pe ube screv uous	sampling (DT: uctive drilling oring			tion stance efusal		>> Infl <  Pai	Tater  Dividistribed Sample and Tests  Tow U - Undisturbed Sample Tital Loss SPT - Standard Penetration Test TW - Thin Walled LB - Large Disturbed Sample  D - Dry M - Moist W - Wet  W

HA - Hand Auger

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Ce - Cemented
C - Compact



RD1

Page 1 of 1

## **Geotechnical Log**

Logged in accordance with AS 1726:2017 Geotechnical site investigations

Client: Mornington Peninsula Shire Council Commenced: 20/03/2025
Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/03/2025
Hole Location: 10-12 View Point Road Front Lawn Logged By: DP

Project No.:

PSM5665

Hole Location: 10-12 View Point Road Front Lawn Logged By: DP
Hole Position: 319531.9 m E 5753714.4 m N GDA2020 / MGA Zone 55 Checked By: DP

ı	Drill M Hole D			Mounting:	На	nd Au 0 mm				Inclination: -90° Bearing: -	RL Surfa		28. AH	60 i		0	perator: N/A
		ı	Drill	ing Informat	ion					Soil Descri	otion						Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Plasticity, behr particle characteristics of p component, colour, secondary o additional observation		Moisture Condition	Consistency / Relative Density	Pene	Handetror UCS (kPa	nete 3 )	er Structure, Zoning, Origin, Additional Observations
				D 0.00-0.10 m			-		ML	TOPSOIL: Clayey SILT trace sar plasticity, brown; sand fine graine rootlets.	d: low ed; trace						0.00: Topsoil
					22		-		SM	FILL: Silty SAND: fine to medium	grained, grey	<b>'</b> .					0.10: Fill
				D 0.20-0.30 m		28.4	0.2-		GM	FILL: Silty GRAVEL with sand: m grained, sub-angular, brown; silt plasticity; sand fine grained.	edium low						
			ered			28.2											0.30: Top of Reln Drain
_		z	Not Encountered	D 0.50-0.70 m	. 77	28	-					D					0.50: Base of Reln Drain, Possibly
				D 0.30-0.70 II		28.0	0.6-		SM	Silty SAND trace gravel: fine to n grained, brown; silt low plasticity; medium grained, angular.	edium gravel						Colluvium
						27.8	-8-0.8										
_							-			Hole Terminated at 0.90 m Target depth. Reln drain backfille bentonite plug and topped with S materials.							
	AD/T - AD/V - WB -W SPT - St PT - PI AS - AI CS - C	Auge ashb anda ush t uger ontin Non	er dri er dri ore ird po ube screv uous desti	lling TC bit lling V bit enetration test wing sampling (DT: uctive drilling	1	enetrai No resis		-	>> Infl⊲ <  Pai	ater Samples at bw U - Undisturbed D - Disturbed Samplete Loss SPT - Standard Pe ES - Environment TW - Thin Walled LB - Large Distur	Sample ample netration Test al Sample		<b>loistur</b> D M W		Ory ∕loist		Consistency/Relative Density S - Very soft S - Soft F - Firm St - Stiff VSt - Very stiff H - Hard VL - Very loose L - Loose MD - Medium dense D - Dense VD - Very dense



RD1 - 1 Depth Range: 0.00 m - 0.90 m



RD1 - 2 Depth Range: 0.00 m - 0.90 m



TITLE

Mornington Peninsula Shire Council McCrae Landslide Geotechnical Investigation

Photo - RD1

	DP	DATE 21/	
n	Not To S	Scale	
	PROJECT No PSM5665	FIGURE No	

LL

21/03/2025

21/03/2025

1/1

PSM 3.02.2 LIB - MOD FOR 5665.GI



RD2

Page 1 of 1

## **Geotechnical Log**

20/03/2025 Client: Mornington Peninsula Shire Council Commenced: Project Name: McCrae Landslide Geotechnical Investigation Completed: 20/03/2025 Logged By: Hole Location: 10-12 View Point Road Front Lawn DP

Project No.:

PSM5665

Hole Position:  $319534.8 \text{ m} \to 5753717.7 \text{ m} \text{ N} \text{ GDA2020} / \text{MGA Zone } 55$ Checked By: DP

Hole Position: 319534.8 m E 57537									7.7 m	N GD/	DA2020 / MGA Zone 55 Checked By: DP
		Mod Dia			Mounting:		nd Au ) mm	iger			Inclination: -90° RL Surface: 28.80 m Bearing: - Datum: AHD Operator: N/A
			Di	illi	ng Informati	ion					Soil Description Observations
Method	Donatration	to de la	VA/-4	water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations  Material Description  SOIL NAME: Plasticity, behaviour or particle characteristics of primary component, colour, secondary components, additional observations
								-		ML	TOPSOIL: Clayey SILT trace sand: low plasticity, brown; sand fine grained; trace rootlets.
							<sub>G</sub>	-		SM	FILL: Silty SAND: fine to medium grained, grey; trace rootlets.
	AT N		7		D 0.20-0.30 m		28.6	0.2-		GM	FILL: Silty GRAVEL with sand: medium grained, sub-angular, brown; silt low plasticity; sand fine grained.
Ϋ́				Not Encounte			28.4				D 0.30: Top of Reln Drain
						77	58	-			
					D 0.50-0.70 m		28.2	0.6-		SW	SAND trace gravel: fine to medium grained, brown; gravel medium grained, angular.
								-			Hole Terminated at 0.70 m Target depth. Reln drain backfilled with bentonite plug and topped with Site won materials.
	                 	             					28.0	0.8-			
	             	             						-			
	AD/T AD/V WB SPT - AS - CS - NDD CC -	Meti - Au - Au - Wash - Stand Push Auge Cont	ger lbor lard tub r so nuc n de	drill e I pe rew ous estre	sampling (DT2 uctive drilling oring		enetra:	stance	-	>> Inflo <□ Par	Water Samples and Tests (Ifflow U - Undisturbed Sample artial Loss Omplete Loss Omp

Logged in accordance with AS 1726:2017 Geotechnical site investigations



RD2 - 1 Depth Range: 0.00 m - 0.70 m

TITLE

Mornington Peninsula Shire Council McCrae Landslide Geotechnical Investigation Photo - RD2

DRAWN LL	DATE 21/03/202	<u>25</u>			
CHECKED DP	21/03/2025				
Not To S	Scale	A4			
PROJECT No PSM5665	FIGURE No 1/1				

**Appendix B Point Load Strength Index Test Results** 





# **Pells Sullivan Meynink**

#### POINT LOAD STRENGTH INDEX TEST RESULTS

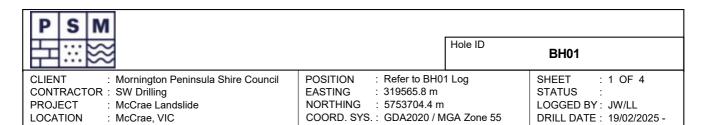
Job No.	PSM5665													Sheet	1	of	1
Project	McCrae La	ndslide															
Test Method  Test Machine  Calibration Date		n of point lo	ods of testing r ad strength ind		engineerin	ng purpose	s -	Sampling Technique Storage History Moisture Condition Loading Rate	HQ3 Geelong Natural < 30 sec	office stor	rage			Sampling Date 17-28/02/ Testing Date 3/03/2025 Tested By LL			
			D41			Dia	metral Te					Axial -	Tests				1.0 1700 0017
Rock T	ype	Location	Depth (m)	D (mm)	L (mm)	P (kN)	I <sub>s(50)</sub> (MPa)	Failure Mode	W (mm)	D (mm)	P (kN)	I <sub>s</sub> (MPa)	I <sub>s(50)</sub> (MPa)	Fa	ilure Mo	ode	AS 1726:2017 Strength Class
Granite Con Granite Con Granite Con XW Gra XW Gra XW Gra Granite Con	restone restone nite nite nite nite	BH01 BH02 BH03 BH03 BH03 BH04	17.8-17.9 22.9-23.0 21.3-21.4 23.3-23.4 15.5-15.6 14.75-14.85 21.4-21.55 15-15.1	70 70 70 70 70 70 55	50 90 50 110 100 110 190 100	11.51 0.61 7.80 0.17 0.16 0.14 0.38 0.49	2.73 0.14 1.85 0.04 0.03 0.09 0.17	Through substance Bad break Through substance Through substance Through substance Through substance Through substance Through substance Through substance	- - 70 70 70 70 55	- - 60 30 60 70 50	#N/A #N/A 0.2 0.1 0.3 0.2	#N/A #N/A 0.03 0.05 0.02 0.04 0.04	#N/A #N/A 0.04 0.05 0.03 0.06 0.05	Bad bath Through Through Through Through Through Through Through Bad Bad Bad Bad Bad Bad Bad Bad Bad Bad	gh subsreak gh subs gh subs gh subs gh subs gh subs gh subs	stance stance stance stance stance	H / #N/A L / #N/A H / #N/A VL VL VL VL VL / L
Ву:	LL			Checke	d:		JW	1						Date:		7/3/202	5

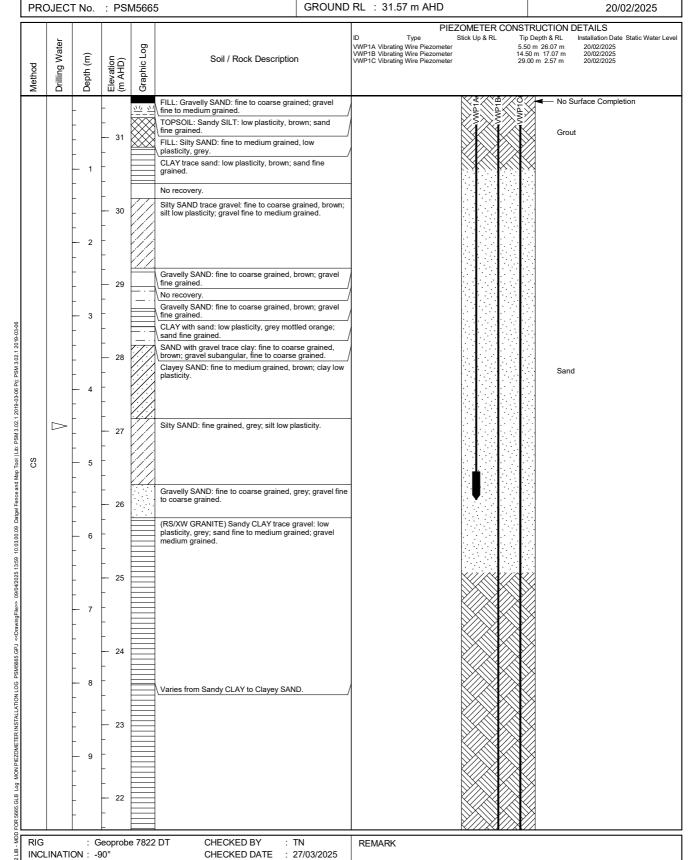
<sup>1. #</sup>N/A = axial test was not performed.

<sup>2.</sup> A conversion factor of 20 was adopted (UCS = 20  $l_{(50)}$ )

# **Appendix C Piezometer Construction Records**







AZIMUTH

HOLE DIA

APPROVED BY

CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025

: DP

PSM	_		
Ħ:::\ <b>≅</b>		Hole ID	BH01
CLIENT : Mornington Peninsula Shire Council	POSITION : Refer to BH01	Log	SHEET : 2 OF 4
CONTRACTOR: SW Drilling	EASTING : 319565.8 m		STATUS :
PROJECT : McCrae Landslide	NORTHING : 5753704.4 m		LOGGED BY: JW/LL
LOCATION : McCrae, VIC	COORD. SYS.: GDA2020 / MC	GA Zone 55	DRILL DATE: 19/02/2025 -
PROJECT No. : PSM5665	GROUND RL : 31.57 m AHD		20/02/2025

PROJECT No.	: PSI	M566	GROUNI	) RL : 31.57 m AHD	20/02/2025	
Method Drilling Water Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description	VWP1A Vibrating Wire Piezometer 5.5 VWP1B Vibrating Wire Piezometer 14.	TRUCTION DETAILS	
g - - - - - 11	- - - 21 -		(RS/XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to medium grained; gravel medium grained.  (RS/XW GRANITE) SAND trace gravel: fine to coarse grained, brown; gravel fine grained.  (XW GRANITE) Sandy CLAY: low plasticity, grey; sand fine to medium grained.			
- - - - 12 - - - - 13	- - - 19		(XW GRANITE) Clayey SAND trace gravel: fine to coarse grained, grey mottled orange; clay low plasticity; gravel subangular, fine grained.  (XW GRANITE) Gravelly SAND trace clay: medium to coarse grained, yellow brown; gravel fine to medium; clay low plasticity.  (XW GRANITE) Clayey SAND: medium to coarse			
HQ3 OT ENCOUNTERED	- - - 17		(XW GRANITE) Clayey SAND: medium to coarse grained, grey mottled brown; clay low plasticity.  Becomes gravelly; fine to medium gravels at 13.90 m.  NO CORE: 14.0 - 14.4 m  (XW GRANITE) Sandy CLAY with gravel: low plasticity, grey mottled orange; sand medium to  (XW GRANITE) Clayey SAND: fine to coarse grained, yellow mottled grey; clay low plasticity.  MW granite inclusions at 153 - 15.5 m.			
ÖH   ION   16	- - - 15		MW granite inclusions at 153 - 15.5 m.  Becomes brown at 15.7 m. coarse grained; gravel fine grained.  (XW GRANITE) SAND with clay trace gravel: fine to  NO CORE: 17.0 - 17.1 m  (XW GRANITE) SAND with clay trace gravel: fine to coarse grained, brown grey; clay low plasticity; gravel fine grained.			
- 18 19 19 19	- - - 13		(XW GRANITE) SAND with clay trace gravel: fine to  (XW GRANITE) Sandy CLAY trace gravel: low coarse grained, brown grey; clay low plasticity; gravel fine grained.  coarse grained, brown; clay low plasticity; gravel fine grained (XW GRANITE) CLAY trace sand: low plasticity, grey;		Grout	

PSM			
Ħ.::\ <b>\</b>		Hole ID	BH01
CLIENT : Mornington Peninsula Shire Council CONTRACTOR : SW Drilling	POSITION : Refer to BH01 EASTING : 319565.8 m	Log	SHEET : 3 OF 4 STATUS :
PROJECT : McCrae Landslide LOCATION : McCrae, VIC	NORTHING : 5753704.4 m COORD. SYS. : GDA2020 / M	GA Zone 55	LOGGED BY: JW/LL DRILL DATE: 19/02/2025 -

	OCATION : McCrae, VIC PROJECT No. : PSM5665						RL: 31.57 m	0 / MGA Zone 55 AHD	DRILL DATE: 19/02/2025 - 20/02/2025
Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description	1	ID Type VWP1A Vibrating Wire F VWP1B Vibrating Wire F VWP1C Vibrating Wire F	PIEZOMETER CONS' Stick Up & RL Ti Piezometer 5.5. Piezometer 14. Piezometer 29	TRUCTION DETAILS p Depth & RL
		-	- - - 11		(XW GRANITE) Sandy CLAY: low plastic sand fine to coarse grained. Coarse grained MW granite gravel clast a				
		- 21 -	_ _ _ _ 10		(XW GRANITE) SAND with clay trace gracoarse grained, grey; clay low plasticity; { angular, fine grained.	avel: fine to gravel			
		- - - 22	_ 10 _ _		NO CORE: 21.5 - 22.6 m				
-03-06		- - - 23	- 9 -		(XW GRANITE) Gravelly SAND with clay coarse grained, brown; gravel fine graine plasticity.  NO CORE: 23.05 - 23.2 m	ed; clay low			
2019-03-06 Prj: PSM 3.02.1 2019-03		- - - 24	- - 8 - -		(XW GRANITE) SAND: medium to coars  (XW GRANITE) Gravelly SAND trace cla coarse grained, grey brown; gravel subal angular, fine grained; clay low plasticity.  (XW GRANITE) Clayey SAND: fine to me grained, grey; clay low plasticity.	y: fine to ngular to			
FOR 6665 GLB Log MON PIEZOMETER INSTALLATION LOG PSM8665 GPJ < <drawngfile>&gt; 26/02/2025 23.29 10.03.00.09 Datgel Fence and Map Tool LLb: PSM 3.02.1 2019-03.06 Pg; PSM 3.02.1 2</drawngfile>	NOT ENCOUNTERED	- - - 25 -	- 7 - -		NO CORE: 24.5 - 24.85 m  (XW GRANITE) Gravelly SAND with clay to coarse grained, brown; gravel fine grailow plasticity.	: medium ined; clay			
23:29 10.03:00:09 Datgel Fend	)N	- - - 26 -	- 6 - -		NO CORE: 26.0 - 26.05 m (XW GRANITE) CLAY with sand: low plass sand fine to medium grained.	sticity, grey;			
< <drawingfile>&gt; 26/03/2025</drawingfile>		- - - 27 -	- 5 - -		NO CORE: 27.0 - 28.3 m				
ATION LOG PSM5665.GPJ		- - 28 -	- 4 - -		(VM CDANITE'S SAND, 6 4	rained brown			
AON PIEZOMETER INSTALL		- - - 29	_ 3 _ -		(XW GRANITE) SAND: fine to medium gr (XW GRANITE) Sandy CLAY: low plastic sand fine to medium grained. (XW GRANITE) SAND with clay trace gra medium grained, brown; clay low plasticit fine grained granite.	ity, brown;			
MOD FOR 5665.GLB Log M		- - -	- 2		(XW GRANITE) Sandy GRAVEL: fine grashed fine to coarse grained granite.		REMARK		

RIG INCLI AZIMI HOLE : Geoprobe 7822 DT CHECKED BY : TN INCLINATION: -90° CHECKED DATE : 27/03/2025 AZIMUTH APPROVED BY : DP : CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025HOLE DIA.

REMARK

PSM			
#:::₩		Hole ID	BH01
CLIENT : Mornington Peninsula Shire Council CONTRACTOR : SW Drilling PROJECT : McCrae Landslide	POSITION : Refer to BHO EASTING : 319565.8 m NORTHING : 5753704.4 m	J	SHEET : 4 OF 4 STATUS : LOGGED BY: JW/LL

	LOC	DJECT : McCrae Landslide CATION : McCrae, VIC DJECT No. : PSM5665			VIC	COORD.	IG : 5753704.4 m SYS.: GDA2020 / MGA Zone 55		LOGGED BY: JW/LL DRILL DATE: 19/02/2025 -		
Į	PRC	DJEC	ΓNo.	: PSI	И566	5	GROUND	RL : 31.57 m AHD			20/02/2025
	Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description	1	PIEZOMETER CC ID Stick Up & RL VWP1A Vibrating Wire Piezometer VWP1B Vibrating Wire Piezometer VWP1C Vibrating Wire Piezometer	Tip [ 5.50	RUCTION I Depth & RL m 26.07 m 0 m 17.07 m 0 m 2.57 m	DETAILS Installation Date Static Water Level 20/02/2025 20/02/2025 20/02/2025
İ						(XW GRANITE) SAND: fine grained, brov	wn.				
			- - - 31	- 1 -		Hole Terminated at 30.00 m Target depth. Nested VWPs grouted and in place at various depths.	d sand packed				
			- - - - - 32	- - - 0 -							
			-	- - 1 -							
SM 3.02.1 2019-03-06			- 33 - - -	- - 2							
SM 3.02.1 2019-03-06 Prj:			— 34 - -	- - 3							
Fence and Map Tool   Lib: F			- - 35 - -	- - - 4							
5 23:29 10:03:00:09 Datge			- — 36 -	- - -							
< <drawngfile>&gt; 26/03/202:</drawngfile>			- - - 37 -	5 - - -							
ON LOG PSM5665.GPJ <			- - - 38	6 - -							
IEZOMETER INSTALLATION			- - - - 39	- 7 -							
R 5665.GLB Log MON PI			- - -	- - 8							
8				-				1			

RIG : Geoprobe 7822 DT CHECKED BY : TN REMARK INCLINATION: -90° CHECKED DATE : 27/03/2025 : DP AZIMUTH APPROVED BY

CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025 HOLE DIA.



# PIEZOMETER INSTALLATION - FIELD SHEET

20/02	2/2025	Time 4:00pm										
aff <mark>l</mark>	_L/JW	Drillers	SW Drillin	ng	Others							
		Ins	strument									
eter mo	odel .350kPa HMA	Model 1200	Piezomete	r serial number	S18169							
gger m	odel RST 5CH DT	2055B	Data logge	r serial number	19076							
Instrument ID (e.g. CSH-123-INC-1) VWP1A												
		В	orehole									
Borehole ID BH01												
Easting (m)												
RL (m A	AHD)	Drilled depth (m)		Dipped depth prio	r to install (m)							
Installation												
epth of	instrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)						
	5.5	<b>⊠</b> Up □ D	own	С	olluvium/Fill							
Grout mix												
(	Cement	ı	Vater	Bent	onite							
unt	Unit	Amount		Unit	Amount	Unit						
		N/A		N/A								
		Co	omments									
			<b>g</b> (prior to	sand packing)								
ie	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C)	Pres	ssure (kPa)	Ren	narks						
25	8573.5	25.0	2	2.9	above	ground						
25	8590.7	22.3		1.3	0.4m above dippe	d depth at 1.4m						
25	8519.0	22.4		3.9	1.0m below dipped	d depth at 1.4m						
25	8105.2	20.5		53.3	at installation de	epth of 5.5m						
25	8503.1	18.1		10.9	at installation de	epth of 5.5m						
		First readin	igs (after	sand packing)								
е	Reading (kHz² x 10 <sup>-3</sup>	Temperature (°C)	Pres	ssure (kPa)	Rem	narks						
	eter more gger ment ID  e ID (m)  RL (m Are path of a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack atted we have a pack attended to the pack atten	eter model .350kPa HMA gger model .RST 5CH DT ent ID (e.g. CSH-123-INC-1)  e IDBH01 (m) .319565.8 RL (m AHD) .31.57  epth of instrument (m) 5.5  Cement unt Unit  d packed between 1m to 6. uted with 25:1:0.3 mix between e Reading (kHz² x 10⁻³² 25 8573.5 25 8590.7 25 8519.0 25 8105.2 26 8503.1	teter model .350kPa HMA Model 1200    Grand   RST 5CH DT2055B     ent ID (e.g. CSH-123-INC-1)   VWP1A     e ID	### Prillers   SW Drilling   Instrument	SW Drilling   Instrument   I	SW Drilling						



# PIEZOMETER INSTALLATION - FIELD SHEET

Da	te 20/02	2/2025	Time 4:00pm										
PS	SM staff	_L/JW	Drillers S	SW Drilli	ng	Others							
			Ins	strument									
Pie	Piezometer model 350kPa HMA Model 1200 Piezometer serial number S18170												
Da	Data logger model RST 5CH DT2055B Data logger serial number 19076												
Ins	Instrument ID (e.g. CSH-123-INC-1) VWP1B												
			В	orehole									
Во	Borehole ID BH01												
			Northing (m)	57537	'04.4								
Co	ollar RL (m <i>A</i>	AHD)	Drilled depth (m)		Dipped depth prio	r to install (m)	<u>!</u>						
	Installation												
	Depth of	instrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)						
	14.5 ☑ Up ☐ Down XW Granite												
Grout mix													
	Cement Water Bentonite												
	Amount	Unit	Amount		Unit	Amount	Unit						
	tch 1: 50 tch 2: 20	kg	Batch 1: 110 Batch 2: 50	)	L	Batch 1: 12 Batch 2: 1.5	kg						
			Co	mments									
		filled between ~12m		•	between 1m to 6 25:1:0.3 mix bet								
			Zero reading	g (prior to	grouting)								
	Time	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C)	Pres	ssure (kPa)	Ren	narks						
12: 20/	10pm 02/2025	8496.9	25.1	:	2.4	above	ground						
	0pm 02/2025	8505.5	22.0		1.8	0.4m above dippe	d depth at 1.4m						
20/	0pm 02/2025	8438.3	22.2		9.2	1.0m below dippe	d depth at 1.4m						
	5pm 02/2025	7227.6	19.4		143.1	at installation depth of 14.5m							
			First readin	<b>gs</b> (after	grouting)	<del>,</del>							
#	Time	Reading (kHz² x 10 <sup>-3</sup>	Temperature (°C)	Pres	ssure (kPa)	Remarks							
1	7:20am 21/02/2025	8511.8	17.8		1.5	Grout at 12m before	ore batch 2 placed						
2													
3													
C:\Us	ers\Jock Russel	I\Desktop\Appendix G\[Piezomet	ter installation field sheet.xlsx]Field	Results Sheet									



# PIEZOMETER INSTALLATION - FIELD SHEET

Da	te20/02	2/2025						
PS	M staff	_L/JW	Drillers SW Drilling Others					
Instrument								
Piezometer model 350kPa HMA Model 1200 Piezometer serial number S18180								
Da	Data logger model RST 5CH DT2055B Data logger serial number 19076							
Instrument ID (e.g. CSH-123-INC-1) VWP1C								
Borehole								
Borehole ID BH01								
Easting (m) 319565.8 Northing (m) 5753704.4								
Collar RL (m AHD)								
Installation								
Depth of instrument (m)			Tip direction		Screened rock mass unit (refer to borehole log)			
29			☑ Up ☐ Down		XW Granite			
Grout mix								
Cement			Water			Bentonite		
Amount		Unit	Amount		Unit	Amount	Unit	
Batch 1: 50 Batch 2: 20		kg	Batch 1: 110 Batch 2: 50		L	Batch 1: 12 Batch 2: 1.5	kg	
Comments								
Batch 1: filled between ~12m to 30m  Batch 2: filled between ~6.5m to 12m  Sand packed between 1m to 6.5m  Grouted with 25:1:0.3 mix between 0m to 1m								
Zero reading (prior to grouting)								
	Time	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C) Pres		ssure (kPa)	Remarks		
12:15pm 20/02/2025		8990.3	23.0		2.0	above ground		
4:00pm 20/02/2025		8987.9	21.3		2.3	0.4m above dipped depth at 1.4m		
4:00pm 20/02/2025		8933.1	21.6		8.3	1.0m below dipped depth at 1.4m		
4:45pm 20/02/2025		8105.2	20.5		99.1	at installation depth of 29m		
First readings (after grouting)								
#		Reading (kHz² x 10 <sup>-3</sup>	Temperature (°C)	Pressure (kPa)		Remarks		
1	7:20am 21/02/2025	8586.4	18.9	46.5		Grout at 12m before batch 2 placed		
2								
3								
1 2 3	7:20am 21/02/2025	8586.4			` ,			





CLIENT:

PSM HOLDINGS AUSTRALIA PTY LTD

SERIAL:

S18169

RATING:

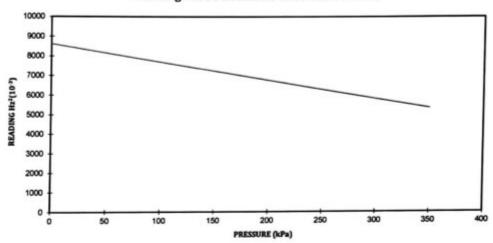
350 kPa

JOB No: GS0001602

DATE: 13/02/2025

SHEET: 1

#### **Vibrating Wire Piezometer Calibration Results**



FACTORY ZERO READING:

8599 Hz2(10-3)

PRESSURE COEFFICIENT:

0.10700 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ..... (C<sub>P</sub>)

AMBIENT TEMPERATURE:

27.6 °C

THERMAL COEFFICIENT:

-0.07005 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

**MAXIMUM PRESSURE:** 

525 kPa

BAROMETRIC PRESSURE:

992 hPa

OPERATING TEMPERATURE RANGE:

-20°C to +80°C

For installation help. scan the QR code to view our manual.



PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

www.hmagrp.com

Email: geotechnical@hmagrp.com Tel: +61 (0)3 8720 6700 Fax: +61 (0)3 8720 6799





CLIENT:

PSM HOLDINGS AUSTRALIA PTY LTD

SERIAL:

S18170

RATING:

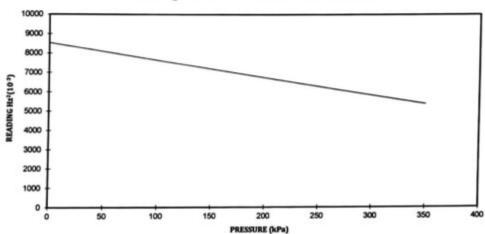
350 kPa

JOB No: GS0001602

DATE: 13/02/2025

SHEET: 2

#### **Vibrating Wire Piezometer Calibration Results**



**FACTORY ZERO READING:** 

8517 Hz2(10-3)

PRESSURE COEFFICIENT:

0.11040 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ..... (C<sub>p</sub>)

AMBIENT TEMPERATURE:

27.5 °C

THERMAL COEFFICIENT:

-0.09148 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

OPERATING TEMPERATURE RANGE:

-20°C to +80°C

For installation help, scan the QR code to view our manual.

PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

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Email: geotechnical@hmagrp.com Tel: +61 (0)3 8720 6700 Fax: +61 (0)3 8720 6799





PSM HOLDINGS AUSTRALIA PTY LTD

JOB No: GS0001602

SERIAL:

S18180

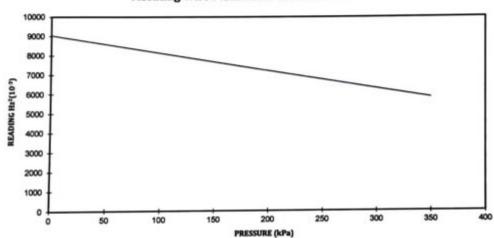
DATE: 13/02/2025

RATING:

350 kPa

SHEET: 12

## Vibrating Wire Piezometer Calibration Results



FACTORY ZERO READING:

9006 Hz2(10-3)

PRESSURE COEFFICIENT:

0.10960 kPa/Hz2(10-3) ..... (Cp)

AMBIENT TEMPERATURE:

27.6 °C

THERMAL COEFFICIENT:

-0.05550 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

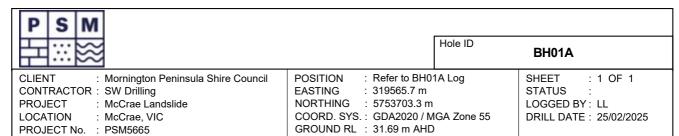
OPERATING TEMPERATURE RANGE:

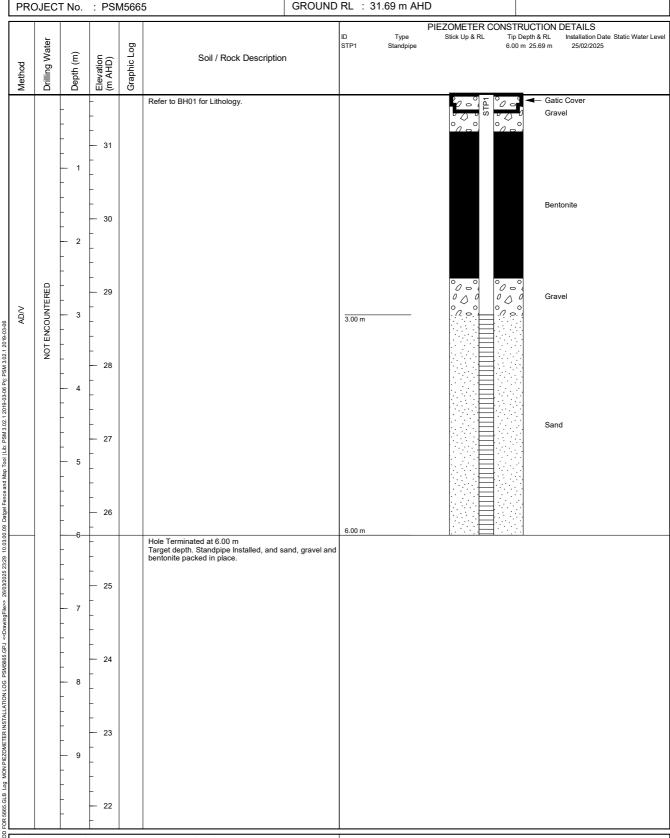
-20°C to +80°C

For installation help. scan the QR code to view our manual. PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

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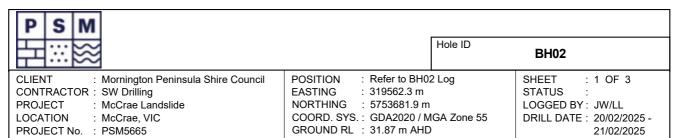
RIG : Geoprobe 7822 DT INCLINATION : -90° AZIMUTH : -

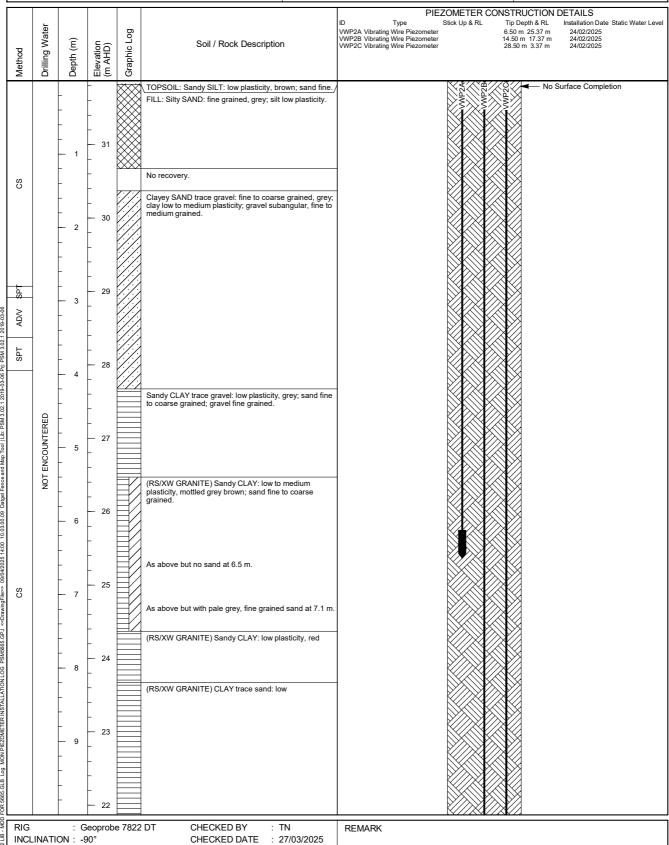
150 mm

HOLE DIA

CHECKED BY : TN
CHECKED DATE : 27/03/2025
APPROVED BY : DP
APPROVED DATE : 27/03/2025

REMARK





AZIMUTH

HOLE DIA

APPROVED BY

CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025

: DP

DRILL DATE: 20/02/2025 -

PSM			
#:::₩		Hole ID	BH02
CLIENT : Mornington Peninsula Shire Council CONTRACTOR : SW Drilling PROJECT : McCrae Landslide	POSITION : Refer to BH02 EASTING : 319562.3 m NORTHING : 5753681.9 m	? Log	SHEET : 2 OF 3 STATUS : LOGGED BY : JW/LL

COORD. SYS.: GDA2020 / MGA Zone 55

							YS.: GDA2020 RL : 31.87 m A		DRILL DATE: 20/02/2025 - 21/02/2025
Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description	,	D Type  D/WP2A Vibrating Wire Pie.  WP2B Vibrating Wire Pie.  WP2C Vibrating Wire Pie.	PIEZOMETER CONS Stick Up & RL Ti zometer 6.5 zometer 14. zometer 28	TRUCTION DETAILS   Depth & RL   On #25.7 m   24/02/2025
		- - - - - 11	- - - - 21 -		(RS/XW GRANITE) CLAY trace sand trace low plasticity, brown; sand fine grained; gra grained.				
SS		- - - 12 - -	- - 20 - -		No recovery.  (XW GRANITE) Sandy CLAY: low plasticity, brown; sand fine grained.  (XW GRANITE) Sandy CLAY trace gravel: I plasticity, brown; sand fine to coarse graine fine to medium grained.  Gravels becomes angular, coarse grained at	low ed; gravel			
00-00-00-00-00-00-00-00-00-00-00-00-00-		- - 13 - -	- 19 - - -		(XW GRANITE) Sandy CLAY trace gravel tr cobbles: low plasticity, brown; sand fine to r grained; gravel angular, fine to medium grai cobbles granite, coarse grained, red brown,	ined;			
	NOT ENCOUNTERED	- 14 _ - 14 _ 	- 18 - - -		high strength.  (XW GRANITE) Gravelly SAND: medium to grained, yellow brown; gravel fine to mediur (XW GRANITE) Clayey SAND: fine to coars grained, brown; clay low plasticity.	m grained.			
Total look days purposed to 6		- - 15 - -	   17 		(XW GRANITE) Sandy CLAY: low plasticity, sand angular, fine to coarse grained.	, grey;			Grout
НОЗ		- 16 - - -	— 16 - -		NO CORE: 15.70 - 16.20 m  (XW GRANITE) Clayey SAND with gravel: 1 medium grained, brown; clay low plasticity; to medium grained.	fine to gravel fine			
The second secon		NO CORE: 17.0 - 18.20 m							
FOR SOGISCED by MONTPELOMETER INSTREMENTATION FOR FORMSOGISMS TO SOGISMS SAZE TO SOGISMS TO SOGISMS TO SOGISMS TO SOGISMS SAZE TO SOGISMS TO SOGISMS SAZE TO SOCIETA SAZE TO S		- 18 - 18 	- 14 - 1 -		(XW GRANITE) CLAY: low plasticity, brown  (XW GRANITE) Sandy CLAY trace gravel: I plasticity brown; sand fine to coarse graine	low			
		- - - 19 -	- - 13 - -		plasticity, brown; sand fine to coarse graine fine to coarse grained, granite.  NO CORE: 18.50 - 18.65 m  (XW GRANITE) Sandy CLAY: low plasticity, brown; sand fine to medium grained.  (XW GRANITE) SAND trace gravel: fine to grained, grey brown; gravel fine grained.	, grey			
RIG		_	- 12 eoprob		DT CHECKED BY TN		REMARK		

LOCATION : McCrae, VIC

REMARK

LOGGED BY: JW/LL

DRILL DATE: 20/02/2025 -

PSM			
<b>₩</b>		Hole ID	BH02
CLIENT: Mornington Peninsula Shire Council	POSITION : Refer to E EASTING : 319562.3	•	SHEET : 3 OF 3 STATUS :

**PROJECT** 

LOCATION

: McCrae Landslide

: McCrae, VIC

NORTHING : 5753681.9 m

COORD. SYS.: GDA2020 / MGA Zone 55

GROUND RL : 31.87 m AHD PROJECT No. : PSM5665 21/02/2025 PIEZOMETER CONSTRUCTION DETAILS Tip Depth & RL 6.50 m 25.37 m 14.50 m 17.37 m 28.50 m 3.37 m Installation Date Static Water Level VWP2A Vibrating Wire Piezomel VWP2B Vibrating Wire Piezomel VWP2C Vibrating Wire Piezomel 24/02/2025 24/02/2025 24/02/2025 Drilling Water Depth (m) Soil / Rock Description Elevation (m AHD) Graphic L Method NO CORE: 20.00 - 21.15 m 21 (XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; gravel fine to medium grained, granite source. (XW GRANITE) Clayey SAND with gravel: fine to coarse grained, grey brown; clay low plasticity; gravel fine to medium grained. 22 23 (XW GRANITE) Gravelly SAND with clay: medium to coarse grained, grey brown; gravel subangular to angular, fine to medium grained; clay low plasticity. 8 24 Gravel 40mm diameter, angular, high strength. Becomes trace Clay at 24.5 m. NOT ENCOUNTERED HQ3 25 (XW GRANITE) CLAY: low plasticity, mottled grey, (XW GRANITE) CLAY trace gravel trace sand: low 6 26 brown and white. plasticity, grey; gravel fine to medium grained; sand  $% \left( 1\right) =\left( 1\right) \left( 1\right)$ 27 (XW GRANITE) Sandy CLAY: low plasticity, grey; fine grained. NO CORE: 27.50 - 28.45 m 28 sand fine to coarse grained. (XW GRANITE) Sandy CLAY with gravel trace cobbles: 3 29 NO CORE: 29.00 - 29.37 m (XW ନାର୍ଥିଣୀୟମ) ନିର୍ଦ୍ଦେଶ ବିଶ୍ୱରିତ ଅଧିକର୍ଷ ଅନ୍ତମନ୍ତ ସ୍ୱାର୍ଥନ୍ତ୍ର ଅନ୍ତମ୍ପର୍ଶ ବିଶ୍ୱର ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ ଅଧିକର୍ଷ Hole terminated at 30.00m Target depth. Nested VWPs grouted in place at various depths

 RIG
 : Geoprobe 7822 DT
 CHECKED BY
 : TN

 INCLINATION : 90°
 CHECKED DATE
 : 27/03/2025

 AZIMUTH
 : Sightly weatth RR RANGED DATE
 : 27/03/2025

 HOLE DIA.
 : CS - 57 mm, HQ3 - 96 mm
 APPROVED DATE
 : 27/03/2025

REMARK



Da	ate24/02	2/2025	Time 6:00pm						
PS	PSM staff LL/SD Drillers SW Drilling Others								
	Instrument								
Pi	Piezometer model 350kPa HMA Model 1200 Piezometer serial number S18173								
Da	ata logger m	odel RST 5CH DT	2055B	Data logge	er serial number	19070			
Ins	Instrument ID (e.g. CSH-123-INC-1) VWP2A								
	Borehole								
Вс	orehole ID	BH02							
			Northing (m)	57536	81.9				
Co	ollar RL (m <i>A</i>	AHD)	Drilled depth (m)		Dipped depth prior	r to install (m)	<u>.</u>		
			Ins	tallation					
	Depth of	instrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)		
		6.5	☑ Up □ Do	own	С	olluvium			
	Grout mix								
	(	Cement	ν	Vater		Ben	tonite		
	Amount	Unit	Amount		Unit	Amount	Unit		
Ва	atch 1: 8	kg	Batch 1: 18		L	Batch 1: 2	kg		
			Co	mments					
В	atch 1: fille	d between 0m to 9.2r	n						
			Zero reading	g (prior to	sand packing)				
	Time	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C)	Pres	ssure (kPa)	Ren	narks		
	0pm 02/2025	8680.7	33.9	4	4.7	above	ground		
	00pm /02/2025	6307.8	20.9		271.9	at installation	depth of 6.5m		
	First readings (after sand packing)								
#	# Time Reading (kHz² x 10 <sup>-3</sup> Temperature (°C) Pressure (kPa) Remarks								
1									
2									
3									
C:\Us	sers\Jock Russel	I\Desktop\Appendix G\[Piezome	ter installation field sheet.xlsx]Field	Results Shee					



Da	Date 24/02/2025 Time 6:00pm									
			Drillers S	SW Drillin	ng	Others				
	Instrument									
Pie	Piezometer model . 350kPa HMA Model 1200 Piezometer serial number . S18172									
Da	ta logger m	odel RST 5CH DT			r serial number					
Ins	Instrument ID (e.g. CSH-123-INC-1) VWP2B									
	Borehole									
Во	rehole ID	BH02								
Ea	sting (m)	319562.3	Northing (m)	57536	81.9					
Со	llar RL (m <i>l</i>	AHD)	Drilled depth (m)30		Dipped depth prior	r to install (m)2.4	·			
			Ins	tallation						
	Depth of	finstrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)			
		14.5	☑ Up □ Do	own	X	W Granite				
	Grout mix									
	(	Cement	ν	Vater		Bent	onite			
	Amount	Unit	Amount		Unit	Amount	Unit			
	tch 1: 45 tch 2: 13	kg	Batch 1: 120 Batch 2: 35	)	L	Batch 1: 10 Batch 2: 4	kg			
Ва	tch 3: 8		Batch 3: 18			Batch 3: 2				
			Co	mments						
		filled between ~14m filled between ~9.2m		atch 3: fille	ed between 0m to	9.2m				
			Zero reading	g (prior to	grouting)					
	Time	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C)	Pres	ssure (kPa)	Rem	narks			
	Opm 02/2025	9029.0	28.5	;	3.1	above	ground			
	First readings (after grouting)									
# Time Reading (kHz² x 10-3 Temperature (°C) Pressure (kPa) Remarks										
1	7:00pm 24/02/2025	8084.3	20.2		112.6	Grout at 14m befo	ore batch 2 placed			
2										
3										
:\Us	ers\Jock Russe	I\Desktop\Appendix G\[Piezomet	ter installation field sheet.xlsx]Field	d.Results Sheet						



Date	Date 24/02/2025 Time 6:00pm									
			Drillers S	SW Drillin	ng	Others				
	Instrument									
Piez	Piezometer model 350kPa HMA Model 1200 Piezometer serial number S18178									
Data	a logger m	odel RST 5CH DT			r serial number					
Insti	Instrument ID (e.g. CSH-123-INC-1) VWP2C									
	Borehole									
Bore	ehole ID	BH02								
			Northing (m)	57536	81.9					
Coll	ar RL (m <i>F</i>	AHD)31.87	Drilled depth (m)30		Dipped depth prior	r to install (m)				
			Ins	tallation						
	Depth of	instrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)			
		28.5	☑ Up □ Do	own	X	W Granite				
	Grout mix									
	(	Cement	ν	Vater		Bent	onite			
	mount	Unit	Amount		Unit	Amount	Unit			
	ch 1: 45 ch 2: 13	kg	Batch 1: 120 Batch 2: 35	)	L	Batch 1: 10 Batch 2: 4	kg			
Bate	ch 3: 8		Batch 3: 18			Batch 3: 2				
			Co	mments						
		filled between ~14m filled between ~9.2m		atch 3: fille	ed between 0m to	9.2m				
			Zero reading	g (prior to	grouting)					
-	Time	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C)	Pres	ssure (kPa)	Rem	narks			
6:00p	pm 2/2025	8925.3	28.3	;	3.2	above	ground			
	First readings (after grouting)									
# Time Reading (kHz² x 10 <sup>-3</sup> Temperature (°C) Pressure (kPa) Remarks										
	7:00pm 24/02/2025	8473.5	20.8		50.0	Grout at 14m befo	ore batch 2 placed			
2										
3										
:\User	rs\Jock Russel	I\Desktop\Appendix G\[Piezomet	ter installation field sheet.xlsx]Field	d.Results Sheet						





PSM HOLDINGS AUSTRALIA PTY LTD

JOB No: GS0001602

SERIAL:

S18173

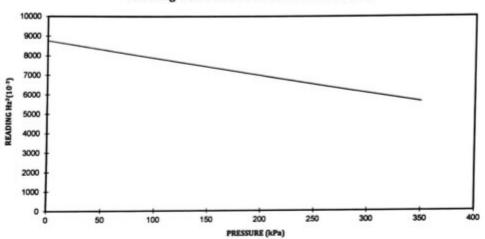
DATE: 13/02/2025

RATING:

350 kPa

SHEET: 5

#### **Vibrating Wire Piezometer Calibration Results**



FACTORY ZERO READING:

8729 Hz2(10-3)

PRESSURE COEFFICIENT:

0.11200 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ...... (C<sub>P</sub>)

AMBIENT TEMPERATURE:

27.5 °C

THERMAL COEFFICIENT:

-0.11440 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

**OPERATING TEMPERATURE RANGE:** 

-20°C to +80°C

For installation help, scan the QR code to view our manual.



PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

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PSM HOLDINGS AUSTRALIA PTY LTD

S18172

RATING:

SERIAL:

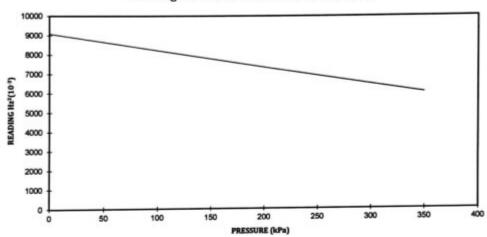
350 kPa

JOB No: GS0001602

DATE: 13/02/2025

SHEET: 4

## **Vibrating Wire Piezometer Calibration Results**



FACTORY ZERO READING:

9057 Hz2(10-3)

PRESSURE COEFFICIENT:

0.11510 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ..... (C<sub>P</sub>)

AMBIENT TEMPERATURE:

27.4 °C

THERMAL COEFFICIENT:

-0.09475 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

OPERATING TEMPERATURE RANGE:

-20°C to +80°C



PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

 $(F_0)$  &  $(T_0)$  TO BE ESTABLISHED DURING INSTALLATION

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PSM HOLDINGS AUSTRALIA PTY LTD

JOB No: GS0001602

SERIAL:

S18178

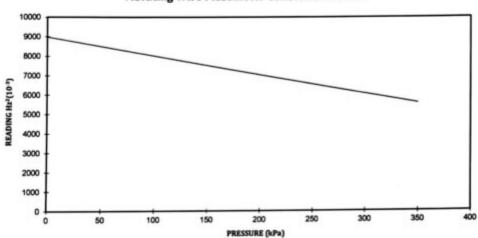
DATE: 13/02/2025

RATING:

350 kPa

SHEET: 10

#### **Vibrating Wire Piezometer Calibration Results**



FACTORY ZERO READING:

8957 Hz2(10-3)

PRESSURE COEFFICIENT:

0.10250 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ...... (C<sub>P</sub>)

AMBIENT TEMPERATURE:

27.5 °C

THERMAL COEFFICIENT:

-0.05987 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

OPERATING TEMPERATURE RANGE:

-20°C to +80°C

For installation help. scan the QR code to view our manual.



PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

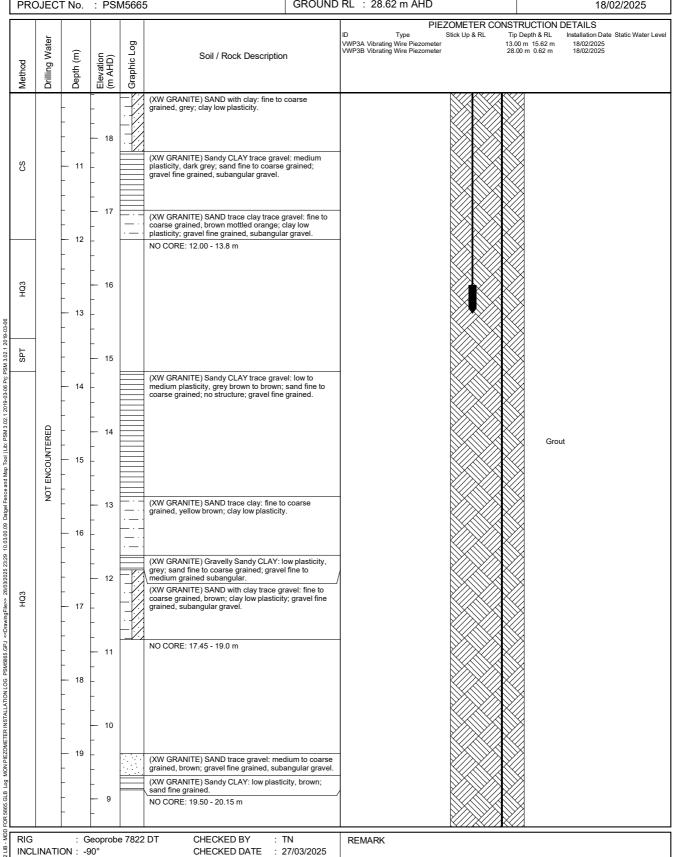
(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

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P S M		Hole ID	BH03
CLIENT: Mornington Peninsula Shire Council CONTRACTOR: SW Drilling PROJECT: McCrae Landslide LOCATION: McCrae, VIC PROJECT No.: PSM5665	POSITION : Refer to BH03 EASTING : 319533.0 m NORTHING : 5753715.6 m COORD. SYS. : GDA2020 / M GROUND RL : 28.62 m AHD	GA Zone 55	SHEET : 1 OF 3 STATUS : LOGGED BY : JW/LL DRILL DATE : 17/02/2025 - 18/02/2025

PRC	DJECT	ΓNo.	: PS	M5665	5	GROUND	RL : 28.62 m AHD			18/02/2025
Method	Drilling Water	Depth (m)	Elevation (m AHD)		Soil / Rock Description		PIE ID Type VWP3A Vibrating Wire Piezometer VWP3B Vibrating Wire Piezometer	r 13		ETAILS Installation Date Static Water Leve 18/02/2025 18/02/2025
HQ3 CS		- 1 1 - 1 - 2 - 3 4 5 6 7 8 8 8 8	- 28 - 27 - 26 - 27 - 26 - 27 - 27 - 27 - 27 - 27 - 27 - 27 - 27		TOPSOIL: Sandy SILT: low plasticity, brounding grained.  FILL: SAND with silt trace gravel: fine to magained, poorly graded, pale brown; grave medium grained, subangular gravel.  No recovery.  SAND with gravel trace silt: fine to medium poorly graded, pale brown; gravel fine to cograined, subangular gravel.  SAND trace silt: fine to coarse grained, we wellow brown; silt low plasticity.  No recovery.  Silty SAND trace gravel: fine to coarse gragaded, yellow brown; silt low plasticity; grained.  Becomes dark brown with granite gravels  Becomes yellow brown at 3.5 m.  (RS/XW GRANITE) Clayey SAND: fine to grained, well graded, sub-angular to angular to angular on any plasticity.  No recovery.  (RS/XW GRANITE) Clayey SAND: fine to grained, well graded, mottled brown and clay low plasticity.  (RS/XW GRANITE) SAND trace clay: mecoarse grained, well graded, mottled brown and clay low plasticity.  Becomes fine to medium grained sand at (XW GRANITE) Sandy CLAY: low plasticity brown; sand fine to coarse grained.	n grained, soarse sell graded, soarse sell graded, soarse to coarse lar, mottled to coarse lar, mottled to coarse sell brown;		REJINN PROJECTION OF THE PROJE	No St.	rface Completion
HQ3		— 9 - - -	- - - - 19							
RIG INCL AZIM	INATIONUTH E DIA.	: - : NC - :	90°	pe 7822 mm, H0	DT CHECKED BY : TN CHECKED DATE : 27 APPROVED BY : DI Q3 - 96 mm APPROVED DATE : 27	7/03/2025	REMARK		<u> </u>	

PSM			
#:::\₩		Hole ID	BH03
CLIENT : Mornington Peninsula Shire Council	POSITION : Refer to BH03	3 Log	SHEET : 2 OF 3
CONTRACTOR: SW Drilling	EASTING : 319533.0 m		STATUS :
PROJECT : McCrae Landslide	NORTHING : 5753715.6 m		LOGGED BY: JW/LL
LOCATION : McCrae, VIC	COORD. SYS.: GDA2020 / M	GA Zone 55	DRILL DATE: 17/02/2025 -
DPO IECT No : DSM5665	GROUND RI · 28 62 m AHD		19/02/2025



AZIMUTH

HOLE DIA

APPROVED BY

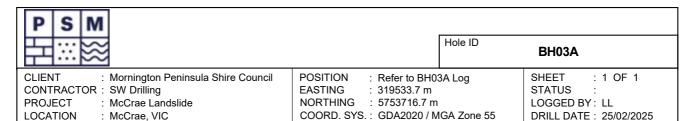
CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025

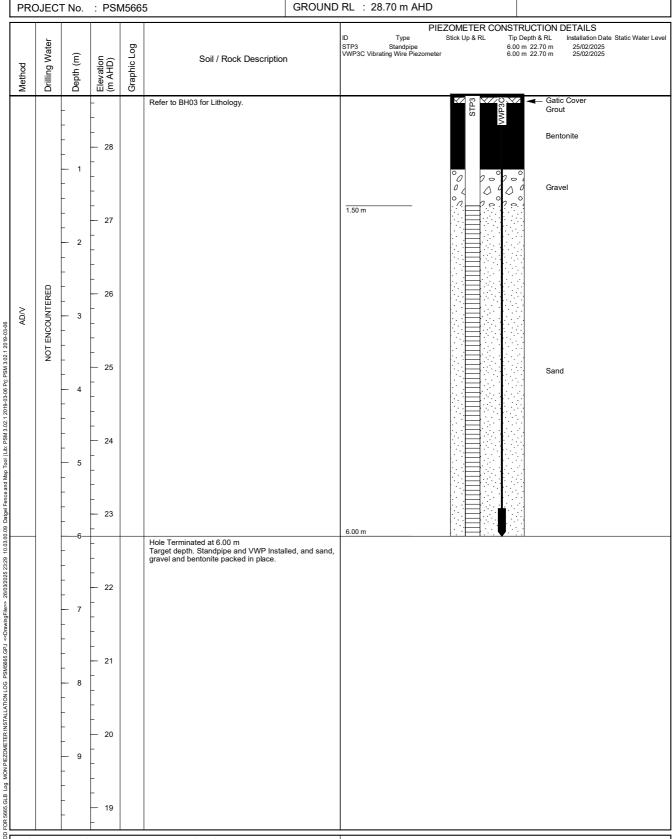
: DP

P S M → ::: ≋		Hole ID	BH03
CLIENT : Mornington Peninsula Shire Council CONTRACTOR : SW Drilling PROJECT : McCrae Landslide LOCATION : McCrae, VIC PROJECT No. : PSM5665	POSITION : Refer to BH03 EASTING : 319533.0 m NORTHING : 5753715.6 m COORD. SYS. : GDA2020 / M GROUND RL : 28.62 m AHD	GA Zone 55	SHEET : 3 OF 3 STATUS : LOGGED BY : JW/LL DRILL DATE : 17/02/2025 - 18/02/2025

				VI300C	J GROOME	PIEZOMETER CONSTRUCTION DETAILS  ID Type Stick Up & RL Tip Depth & RL Installation Date Static Water Level
Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description	WP3A Vibrating Wire Piezometer 13.00 m 15.62 m 18/02/2025 WP3B Vibrating Wire Piezometer 28.00 m 0.62 m 18/02/2025
		- - -	- - - 8		(XW GRANITE) Sandy CLAY: low plasticity, brown; sand fine grained.	
		- 21 - -	- - -		(XW GRANITE) Sandy CLAY trace gravel: low to medium plasticity, grey; sand fine to coarse grained; gravel fine grained, subangular gravel.	
		- - - 22 -	- 7 - -		NO CORE: 22.00 - 22.65 m	
00-00-		- - - - 23	- 6 - -		(XW GRANITE) Clayey SAND trace gravel: fine to coarse grained, grey; clay low to medium plasticity; gravel fine grained, subangular gravel.	
8-03-00 FIJ. PSM 3,02.1 Z0 IS		- - - - 24	- 5 			
p tool Ltb: Psin 3.02.1.201 HQ3	ENCOUNTERED	- - - - 25	- - 4 -		(XW GRANITE) Sitty SAND: fine grained, brown; sitt low plasticity.  (XW GRANITE) SAND with clay trace gravel: fine to coarse grained, grey; clay low plasticity; gravel fine grained, subangular gravel.  NO CORE: 25.00 - 25.30 m	
.uo.us Datgel Fence and Ma	NOT ENG	- - - - - 26	- - - 3 -		(XW GRANITE) Sandy CLAY: low plasticity, grey; sand fine grained.	
10.01 23.23 23.23 10.00 E. C. C. C. C. C. C. C. C. C. C. C. C. C.		- - - - - 27	- - - 2 -		NO CORE: 26.50 - 26.95 m	
THE DESIGNATION OF PROPERTY AND		- - -	- - - 1		(XW GRANITE) Gravelly Sandy CLAY: low plasticity, grey; sand fine to coarse grained; gravel fine grained; no structure.	
		— 28 - - -	- - - - 0		(XW GRANITE) Gravelly SAND with clay: medium to coarse grained, grey; gravel fine grained, subangular gravel; clay low plasticity.	
Log MON PIEZO		— 29 - -	-		Hole Terminated at 29.50 m	
RIC		-	eoprobe		Target depth. Nested VWPs grouted in place at various depths.	

: Geoprobe 7822 DT REMARK INCLINATION: -90° CHECKED DATE : 27/03/2025 AZIMUTH APPROVED BY : DP : CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025HOLE DIA.





RIG : Geoprobe 7822 DT INCLINATION : -90° AZIMUTH : -

150 mm

HOLE DIA

CHECKED BY : TN
CHECKED DATE : 27/03/2025
APPROVED BY : DP
APPROVED DATE : 27/03/2025

REMARK



Date 18/02/2025	Tim	ne 4:30pm							
PSM staffLL/JW		Drillers	SW Drillin	ıg	Others				
Instrument									
Piezometer model	Pa HMA M	odel 1200	Piezometer	serial number	S18171				
Data logger model RST	5CH DT20	55B	Data logge	r serial number	19071				
Instrument ID (e.g. CSH-12	Instrument ID (e.g. CSH-123-INC-1)								
Borehole									
Borehole ID BH03									
Easting (m) 319533.	0	Northing (m)	57537	15.6					
Collar RL (m AHD)	62 Dril	lled depth (m)29.	5	Dipped depth prio	r to install (m)				
		Ins	stallation						
Depth of instrument	(m)	Tip direction		Screened	rock mass unit (refer	to borehole log)			
13	×	Up 🗆 Do	own	X	W Granite				
Grout mix									
Cement		ν	Vater		Bent	tonite			
Amount Ur	nit	Amount		Unit	Amount	Unit			
Batch 1: 30 Batch 2: 40 kg	ı	Batch 1: 80 Batch 2: 80		L	Batch 1: 10 Batch 2: 5	kg			
	<u> </u>	Co	mments						
Batch 1: filled betwee Batch 2: filled betwee									
		Zero readin	g (prior to	grouting)					
Time Reading (k	Hz² x 10 <sup>-3</sup> ) 1	Геmperature (°С)	Pres	sure (kPa)	Ren	narks			
2:45pm 18/02/2025 8630	)	18.0	1	.2	above	ground			
First readings (after grouting)									
	# Time Reading (kHz² x 10 <sup>-3</sup> Temperature (°C) Pressure (kPa) Remarks								
1 7:20am 19/02/2025 7927	7.6	17.6	7	73.3	Grout at 5.5m bef	ore batch 2 placed			
2 8:10am 19/02/2025 7707	7.4	17.6	9	95.9	Grout at 0m after	batch 2 placed			
3 3:00pm 8210 19/02/2025 8210 C:\Users\Jock Russell\Desktop\Appen		17.4		14.3					



Date 18/02/2025 Time 4:30pm											
PSM staff	PSM staff LL/JW Drillers SW Drilling Others										
Instrument											
Piezometer model 350kPa HMA Model 1200 Piezometer serial number S18179											
Data logger m	Data logger model RST 5CH DT2055B Data logger serial number 19071										
Instrument ID (e.g. CSH-123-INC-1)VWP3B											
Borehole											
Borehole ID	BH03										
		Northing (m)	57537	'15.6							
Collar RL (m A	AHD)28.62	Drilled depth (m)29.	5	Dipped depth prio	r to install (m)						
		Ins	tallation								
Depth of	finstrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)					
	28     □ Down XW Granite										
Grout mix											
•	Cement	V	Vater		Bent	onite					
Amount	Unit	Amount		Unit	Amount	Unit					
Batch 1: 30 Batch 2: 40	kg	Batch 1: 80 Batch 2: 80		L	Batch 1: 10 Batch 2: 5	kg					
		Co	mments								
	filled between ~5.5m filled between 0m to										
		Zero reading	g (prior to	grouting)							
Time	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C)	Pres	ssure (kPa)	Rem	narks					
2:45pm 18/02/2025	8964.0	19.2	2	2.1	above ground						
4:40pm 18/02/2025	6420.3	18.4	2	285.6	at installation depth of 28m						
		First readin	<b>gs</b> (after	grouting)							
# Time	Reading (kHz² x 10⁻⁴	Temperature (°C)	Pres	ssure (kPa)	Rem	narks					
7:20am 19/02/2025	8541.5	17.8	4	49.4	Grout at 5.5m before	ore batch 2 placed					
2 8:10am 19/02/2025	8541.4	17.8		49.4	Grout at 0m after	batch 2 placed					
3:00pm 19/02/2025	8566.4	17.6 ter installation field sheet.xlsx]Field		46.6							



Date25/0	2/2025	Time 9:30am								
PSM staff	LL	Drillers	SW Drilli	ng	Others					
Instrument										
Piezometer model 350kPa HMA Model 1200 Piezometer serial number S18177										
Data logger model RST 5CH DT2055B Data logger serial number 19071										
Instrument ID (e.g. CSH-123-INC-1) VWP3C										
Borehole										
Borehole ID	BH03A									
Easting (m) .	319533.7	Northing (m)	57537	'16.7						
Collar RL (m	AHD)	Drilled depth (m)6		Dipped depth prior	r to install (m)	<u> </u>				
		Ins	stallation							
Depth o	f instrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)				
	6	☑ Up ☐ Down			Residual/XW Granite					
Grout mix										
	Cement	l	Vater		Bent	onite				
Amount	Unit	Amount		Unit	Amount	Unit				
N/A		N/A			N/A					
			mments							
		umference of Standpip m and bentonite sealed								
				standpipe install						
Time	Reading (kHz² x 10 <sup>-3</sup>	) Temperature (°C)	Pres	ssure (kPa)	Ren	narks				
2:00pm 25/02/2025	8989.1	20.1	:	2.6	above	ground				
First readings (after standpipe installation)										
# Time Reading (kHz² x 10 <sup>-3</sup> Temperature (°C) Pressure (kPa) Remarks										
1										
2										
3										
VII Ingral Ingle December	II/D I-t / A O/(D):	tanda ataliatian fialal alaa at dadifi al	- D Ob							





PSM HOLDINGS AUSTRALIA PTY LTD

JOB No: GS0001602

SERIAL:

S18171

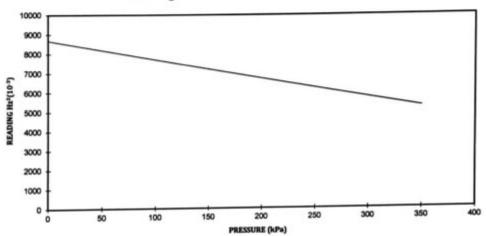
DATE: 13/02/2025

RATING:

350 kPa

SHEET: 3

## **Vibrating Wire Piezometer Calibration Results**



FACTORY ZERO READING:

8633 Hz2(10-3)

PRESSURE COEFFICIENT:

0.10260 kPa/Hz2(10<sup>-3</sup>) ..... (Cp)

AMBIENT TEMPERATURE:

27.4 °C

THERMAL COEFFICIENT:

-0.09803 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

OPERATING TEMPERATURE RANGE:

-20°C to +80°C



PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

 $(F_0)$  &  $(T_0)$  TO BE ESTABLISHED DURING INSTALLATION

www.hmagrp.com





PSM HOLDINGS AUSTRALIA PTY LTD

SERIAL:

S18179

RATING:

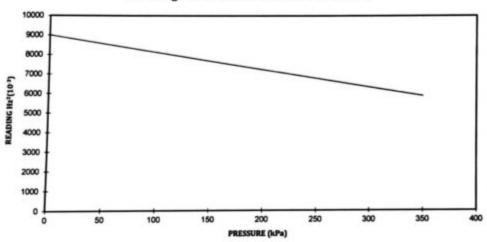
350 kPa

JOB No: GS0001602

DATE: 13/02/2025

SHEET: 11

## **Vibrating Wire Piezometer Calibration Results**



FACTORY ZERO READING:

8972 Hz2(10-3)

PRESSURE COEFFICIENT:

0.11140 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ...... (C<sub>P</sub>)

AMBIENT TEMPERATURE:

27.4 °C

THERMAL COEFFICIENT:

-0.14550 kPa/°C

 $(C_T)$ 

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

OPERATING TEMPERATURE RANGE:

-20°C to +80°C

For installation help, scan the QR code to view our manual.

PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

 $(F_0)$  &  $(T_0)$  TO BE ESTABLISHED DURING INSTALLATION

www.hmagrp.com





PSM HOLDINGS AUSTRALIA PTY LTD

SERIAL:

S18177

RATING:

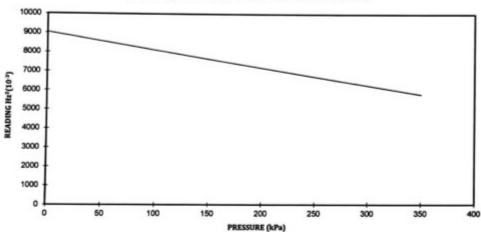
350 kPa

JOB No: GS0001602

DATE: 13/02/2025

SHEET: 9

## Vibrating Wire Piezometer Calibration Results



FACTORY ZERO READING:

9009 Hz2(10-3)

PRESSURE COEFFICIENT:

0.10770 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ..... (C<sub>P</sub>)

AMBIENT TEMPERATURE:

27.7 °C

THERMAL COEFFICIENT:

-0.05703 kPa/°C

-- (C<sub>T</sub>)

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

**OPERATING TEMPERATURE RANGE:** 

-20°C to +80°C

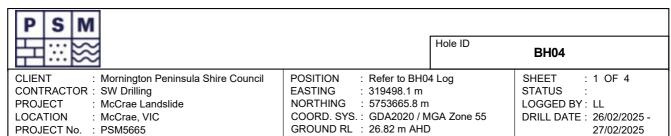
For installation help, scan the QR code to view our manual.

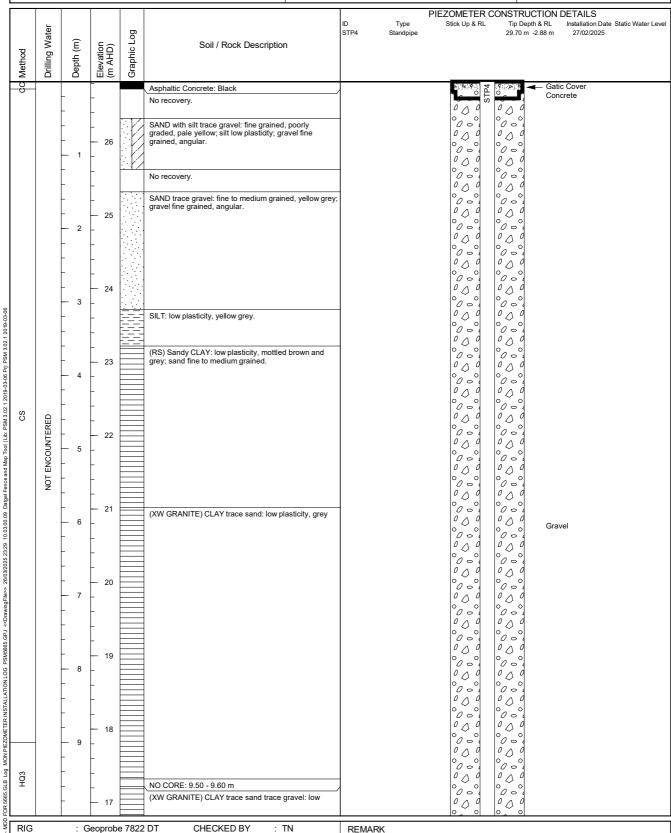


PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

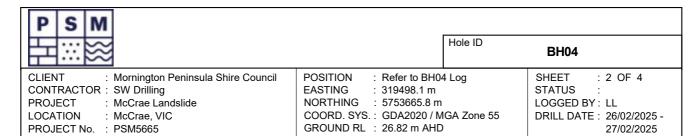
www.hmagrp.com





INCLINATION: -90° CHECKED BY : IN REN

AZIMUTH : - APPROVED BY : DP
HOLE DIA. : CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025



	LOCATION : McCrae, VIC PROJECT No. : PSM5665					.82 m AH		one 55		DRILL	DATE: 26 27	/02/2025 - /02/2025			
40,440,440	political	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description		ID STP4	Type Standpipe		METER (	Tip	RUCTION Depth & RL ) m -2.88 m	I DETAILS Installation Da 27/02/2025	te Static Water Level
DD FOR 5685 GLB Log MON PIEZOMETER INSTALLATION LOG PSM/5685 GPJ <-DawingFile>> 26/0/2/2025 2/3.29 10.03.00.09 Datgel Fence and May		NOT ENCOUNTERED	- 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 19 - 19 - 19 - 19 - 19 - 19	- 16 - 15 - 15 - 14 - 13 - 11 - 10 - 10 - 17 - 10 - 17 - 17 - 17 - 17 - 17 - 17 - 17 - 17		fabric observed; gravel fine grained, angular. (XW GRANITE) CLAY trace sand fine grained; rock fabric observed; gravel fine grained, angular. (XW GRANITE) SAND with gravel: fine to coarse grained, orange; gravel fine grained.  (XW GRANITE) CLAY: low plasticity, grey.  (XW GRANITE) Clayey SAND: fine to medium grained, grey yellow; clay low plasticity.  (XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained.  (XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; grave grained.  (XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey yellow; sand fine to coarse grained gravel fine to coarse grained red brown angular moderately weathered granite clasts.  NO CORE: 14.00 - 14.52 m  (XW GRANITE) Gravelly SAND trace clay: fine to coarse grained red brown high to very high strength moderately weathered; clay low plasticity.  (XW GRANITE) CLAY trace gravel trace sand: low plasticity, red brown; gravel fine to medium grained; sand fine grained.  (XW GRANITE) Sandy GRAVEL trace clay: fine to medium grained, brown; gravel fine to coarse grained; sand fine grained.	I fine	14.70 m		000000000000000000000000000000000000000			Bei	ntonite	
ĕ F	lIG		: G	eoprob	e 7822	DT CHECKED BY : TN		REMARK	(						

CHECKED DATE : 27/03/2025 : DP

APPROVED BY

: CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025

INCLINATION: -90°

AZIMUTH

HOLE DIA.

DRILL DATE: 26/02/2025 -

PSM			
#:::₩		Hole ID	BH04
CLIENT : Mornington Peninsula Shire Council CONTRACTOR : SW Drilling PROJECT : McCrae Landslide	POSITION : Refer to BH04 EASTING : 319498.1 m NORTHING : 5753665.8 m	1 Log	SHEET : 3 OF 4 STATUS : LOGGED BY: LL

COORD. SYS.: GDA2020 / MGA Zone 55

GROUND RL : 26.82 m AHD PROJECT No. : PSM5665 27/02/2025 PIEZOMETER CONSTRUCTION DETAILS ID STP4 Tip Depth & RL 29.70 m -2.88 m Туре Installation Date Static Water Level Drilling Water 27/02/2025 Standpipe Depth (m) Soil / Rock Description Elevation (m AHD) Graphic Method NO CORE: 18.50 - 20.50 m (XW GRANITE) SAND trace gravel: fine to coarse grained, grey; gravel occasional granite gravels red brown, very low to low strength, moderately weathered. 6 NO CORE: 20.75 - 20.80 m 21 (XW GRANITE) Sandy CLAY trace gravel: low plasticity, grey; sand fine to coarse grained; gravel fine to medium grained. 5 22 Sand NO CORE: 22.50 - 22.95 m 4 23 (XW GRANITE) CLAY trace gravel trace sand: low plasticity, grey; gravel fine grained; sand coarse grained. 10.03.00.09 Datgel Fence and Map Tool | Lib: PSM 3.02.1 2019-03-06 Prj: PSM 3.02.1 2019-03-06 (XW GRANITE) Gravelly SAND: coarse grained, grey; gravel fine grained. 3 24 NO CORE: 24.00 - 25.50 m 2 ENCOUNT HQ3 25 NOT (XW GRANITE) SAND trace gravel trace clay: fine to coarse grained, brown; gravel (quartz) fine grained; clay low plasticity. 1 26 NO CORE: 26.00 - 26.30 m (XW GRANITE) Gravelly CLAY with sand: low plasticity brown; gravel fine grained; sand fine to coarse grained. NO CORE: 26.50 - 26.65 m (XW GRANITE) Sandy CLAY trace gravel: low plasticity brown; sand fine grained; gravel (quartz) fine grained. 27 (XW GRANITE) CLAY trace gravel: low plasticity, grey; gravel (quartz) fine grained, angular. NO CORE: 27.50 - 27.65 m (XW GRANITE) CLAY trace gravel: low plasticity, grey; gravel (quartz) fine grained, angular. 28 NO CORE: 28.00 - 28.75 m -2 (XW GRANITE) CLAY with sand: low plasticity, grey brown; sand fine to coarse grained. 29 NO CORE: 29.00 - 29.35 m (XW GRANITE) CLAY with sand: low plasticity, grey brown; sand fine to coarse grained. 29.70 m NO CORE: 29.50 - 29.95 m -3 Cuttings

 RIG
 : Geoprobe 7822 DT
 CHECKED BY
 : TN
 REMARK

 INCLINATION : -90°
 CHECKED DATE
 : 27/03/2025

 AZIMUTH
 : APPROVED BY
 : DP

HOLE DIA. : CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025

LOCATION

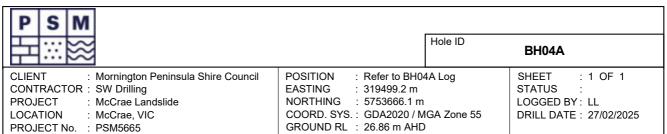
: McCrae, VIC

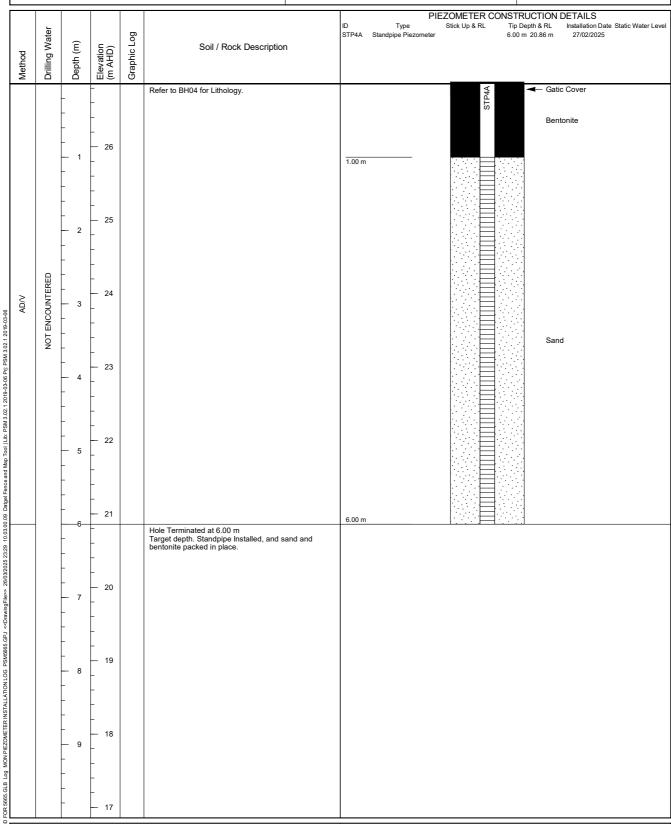
PSM			
<b>≒</b> :::\		Hole ID	BH04
CLIENT: Mornington Peninsula Shire Council CONTRACTOR: SW Drilling PROJECT: McCrae Landslide LOCATION: McCrae, VIC PROJECT No.: PSM5665	POSITION : Refer to BHO- EASTING : 319498.1 m NORTHING : 5753665.8 m COORD. SYS. : GDA2020 / M GROUND RL : 26.82 m AHD	GA Zone 55	SHEET : 4 OF 4 STATUS : LOGGED BY : LL DRILL DATE : 26/02/2025 - 27/02/2025

	OCATION : McCrae, VIC ROJECT No. : PSM5665				26.82 m AF	MGA Zone 55 ID	DRILL L	DATE: 26/02/2025 - 27/02/2025			
Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description	n	ID STP4	Type Standpipe	PIEZOMETER CO Stick Up & RL	DNSTRUCTION Tip Depth & RL 29.70 m -2.88 m	DETAILS Installation Date Static Water Level 27/02/2025
			- - - 4		(XW GRANITE) CLAY with sand: low pla brown; sand fine to coarse grained. Hole Terminated at 30.00 m Target depth. Standpipe Installed, and s bentonite packed in place.	asticity, grey					
		— 31 - -	- - -								
		- 32 -	5 - -								
:,1 2019-03-06		- - 33 -	- 6 - -								
02.1 2019-03-06 Prj; PSM 3.02		- - 34 	- 7 - -								
ce and Map Tool   Lib: PSM 3.9		- - - 35 - -	- 8 - -								
23.29 10.03.00.09 Datgel Fen		- - - 36 -	- 9 - -								
< <drawingfile>&gt; 26/03/2025;</drawingfile>		- - - 37 -	- 10 - -								
AOD FOR 6865 GLB Log MON PIEZOMETER INSTALLATION LOG PSM/6965.GPJ <- ChrawingFiles> 26/03/2025 23.29 10.03.00 09 Datgel Fence and Map Tool   Lb: PSM/3.02 1.2019-03-06 Pg; PSM/3.02.1.2019-03-06 PSM/9.02.1.2019-03-06	- - 38 -	- 11 -									
MON PIEZOMETER INSTAL		- - - - 39	- - 12 -								
DD FOR 5665.GLB Log		-	- - 13		DT CHECKED BY	TNI	DEM				

RIG INCL AZIM HOLI : Geoprobe 7822 DT CHECKED BY : TN REMARK INCLINATION: -90° CHECKED DATE : 27/03/2025

- APPROVED BY : DP CS - 57 mm, HQ3 - 96 mm APPROVED DATE : 27/03/2025 AZIMUTH HOLE DIA





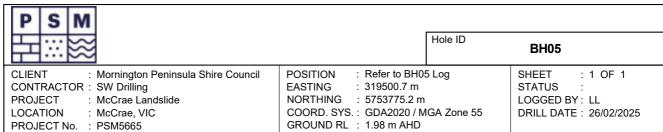
RIG : Geoprobe 7822 DT INCLINATION : -90° AZIMUTH : -

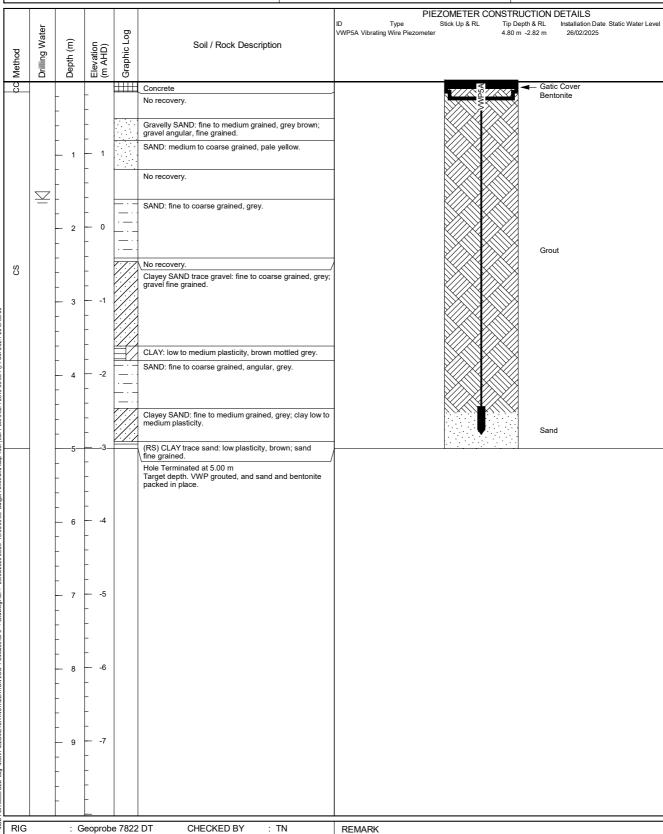
: 150 mm

HOLE DIA

CHECKED BY : TN
CHECKED DATE : 27/03/2025
APPROVED BY : DP
APPROVED DATE : 27/03/2025

REMARK





INCLINATION: -90°

CS - 57 mm

AZIMUTH

HOLE DIA

CHECKED DATE : 27/03/2025

APPROVED BY : DP APPROVED DATE : 27/03/2025



Da	ate 26/02	2/2025	<sub>Time</sub> 10:45am								
PS	SM staff	_L/SD	Drillers	SW Drilli	ng	Others					
	Instrument										
Pie	Piezometer model 350kPa HMA Model 1200 Piezometer serial number S18175										
Da	Data logger model N/A Data logger serial number N/A										
Ins	Instrument ID (e.g. CSH-123-INC-1) VWP5A										
	Borehole										
Вс	rehole ID	BH05									
			Northing (m)	57537	75.2						
Сс	ollar RL (m <i>A</i>	AHD)	Drilled depth (m)5.0	)	Dipped depth prior	r to install (m)	<u> </u>				
			Ins	stallation							
	Depth of	finstrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)				
		4.8	☑ Up □ De	own	А	eolian/Marine					
Grout mix											
	(	Cement	l	Vater		Bente	onite				
	Amount	Unit	Amount		Unit	Amount	Unit				
Ba	tch 1: 10	kg	Batch 1: 26		Batch 1: 3	kg					
			Co	mments							
		cked between 4.5m a uted between 0m to 4		ntonite sea	al at surface and	capped with a gatio	cover.				
			Zero reading	g (prior to	grouting)						
	Time	Reading (kHz² x 10 <sup>-3</sup>	) Temperature (°C)	Pres	ssure (kPa)	Rem	narks				
	30am 02/2025	8770.5	24.2	:	2.0	above ground					
	First readings (after grouting)										
# Time Reading (kHz² x 10 <sup>-3</sup> Temperature (°C) Pressure (kPa) Remarks											
1	11:15am 26/02/2025	8448.2	19.2		38.7						
2											
3											
$\mathbb{C} \cdot \setminus \mathbb{U}_{S}$	ers\.lock Russel	INDeckton Annandiy GIPiazoma	ter installation field sheet.xlsx1Field	Deculte Shoo							





PSM HOLDINGS AUSTRALIA PTY LTD

SERIAL:

S18175

RATING:

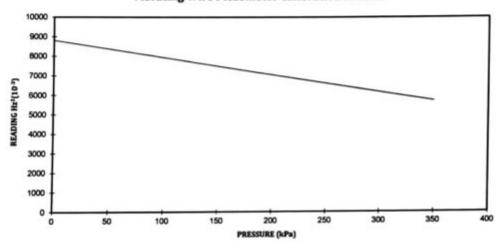
350 kPa

JOB No: GS0001602

DATE: 13/02/2025

SHEET: 7

## **Vibrating Wire Piezometer Calibration Results**



FACTORY ZERO READING:

8787 Hz2(10-3)

PRESSURE COEFFICIENT :

0.11330 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ..... (C<sub>r</sub>

AMBIENT TEMPERATURE:

27.4 °C

THERMAL COEFFICIENT:

-0.04262 kPa/°C

(C<sub>T</sub>)

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

MAXIMUM PRESSURE:

525 kPa

BAROMETRIC PRESSURE:

992 hPa

OPERATING TEMPERATURE RANGE:

-20°C to +80°C

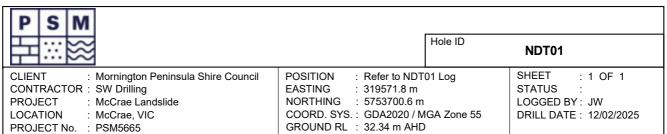
For installation help. Scan the QR code to view our manual.

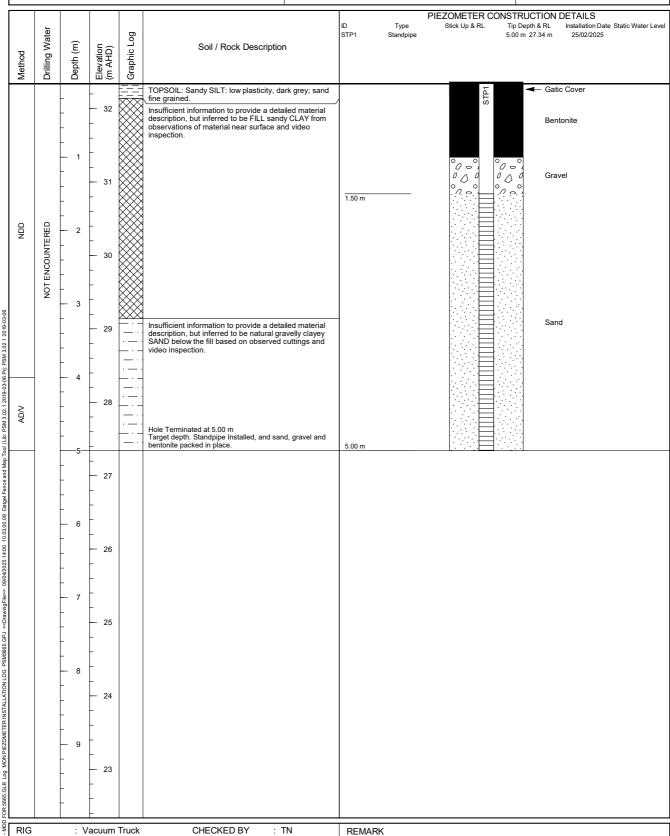


PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

www.hmagrp.com





INCLINATION: -90°

400 mm

AZIMUTH

HOLE DIA

CHECKED DATE

APPROVED BY

: 27/03/2025

: DP

APPROVED DATE : 27/03/2025

P S M → ::: ≋	Н	Hole ID NDT02
CLIENT: Mornington Peninsula Shire Council CONTRACTOR: SW Drilling PROJECT: McCrae Landslide LOCATION: McCrae, VIC PROJECT No.: PSM5665	POSITION : Refer to NDT02 EASTING : 319575.4 m NORTHING : 5753696.0 m COORD. SYS. : GDA2020 / MG/ GROUND RL : 32.73 m AHD	STATUS : LOGGED BY: SD

PR	OJEC <sup>-</sup>	ΓNo.	: PSN	M5665	5   G	ROUND	RL : 32.73 m AHD		
Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description			Stick Up & RL T	STRUCTION DETAILS  Tip Depth & RL Installation Date Static Water Level 1.10 m 29.63 m 03/03/2025
	ERED	- - - - 1	- - - 32 - -		TOPSOIL: Sandy SILT: low plasticity, dark gr fine grained. Insufficient information to provide a detailed r description, but inferred to be FILL based on to sewer trench.	material			Bentonite
NDD	NOT ENCOUNTERED	- - - 2 - -	- 31 30						Gravel
operators may inconduce degen ende and may not par i am star. I so terrorou is, om star. I so record		- 3  - - 4	- - - - 29 -		Hole Terminated at 3.20 m Target depth. VWP installed, and sand, grave bentonite packed in place.	el and			Sand
		- - - 5 -	- - 28 - - - - - 27						
		- 6 7	- - - - 26						
		- - - - 8 -	- - - 25 - -						
RIG		- - 9 - -	- 24 23						
RIG		. 1/	acuum	Truck	CHECKED BY : TN		REMARK		

RIG INCLII AZIMU HOLE : Vacuum Truck INCLINATION: -90° AZIMUTH : -

HOLE DIA.

: 200 mm

CHECKED BY : TN CHECKED DATE : 27/03/2025
APPROVED BY : DP
APPROVED DATE : 27/03/2025 REMARK



Da	ate 3/03/	2025	Time 1:00pm								
PS	SM staff	SD/DRP	Drillers	SW Drillin	ng	Others					
	Instrument										
Pie	ezometer m	odel .350kPa HMA	Model 1200	Piezomete	r serial number	S18176					
Da	Data logger model RST 1CH DT2011B Data logger serial number DT28683										
Ins	Instrument ID (e.g. CSH-123-INC-1)VWP2D										
	Borehole										
Во	rehole ID	NDT02									
			Northing (m)	57536	96.0						
Со	ollar RL (m <i>F</i>	AHD)32.73	Drilled depth (m)3.2		Dipped depth prior	r to install (m)1.8	3				
			Ins	tallation							
	Depth of	finstrument (m)	Tip direction		Screened	rock mass unit (refer	to borehole log)				
		3.1	☑ Up □ Do	own	Fi	II					
	Grout mix										
	(	Cement	V	Vater		Bent	tonite				
	Amount	Unit	Amount		Unit	Amount	Unit				
	N/A		N/A			N/A					
			Co	mments							
		reen between ~2.8m to		itonite plu	g to 50-100mm b	elow surface and t	opped with topsoil.				
				g (prior to	VWP installation						
	Time	Reading (kHz² x 10 <sup>-3</sup> )	Temperature (°C)	Pres	ssure (kPa)	Ren	narks				
	0pm 3/2025	8913.9	24.8	;	3.2	above	ground				
			First readin	<b>gs</b> (after	VWP installation,	)					
#											
1	1:50pm 3/03/2025	8734.5	21.1		25.1						
2											
3											
۱۱۰٬	ers\ lock Pusse	  \Desktop\Appendix G\[Piezome	tor installation field sheet visy1Field	Doculte Shoot							





PSM HOLDINGS AUSTRALIA PTY LTD

JOB No: GS0001602

SERIAL:

S18176

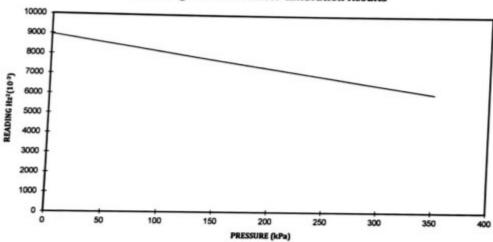
DATE: 13/02/2025

RATING:

350 kPa

SHEET: 8

## Vibrating Wire Piezometer Calibration Results



**FACTORY ZERO READING:** 

8938 Hz2(10-3)

PRESSURE COEFFICIENT:

0.11940 kPa/Hz<sup>2</sup>(10<sup>-3</sup>) ..... (C<sub>p</sub>)

AMBIENT TEMPERATURE:

27.6 °C

THERMAL COEFFICIENT:

-0.12890 kPa/°C

-- (C-

SEE INSTRUCTION MANUAL FOR STANDARD TEMPERATURE/THERMISTOR DATA

**MAXIMUM PRESSURE:** 

525 kPa

BAROMETRIC PRESSURE:

992 hPa

**OPERATING TEMPERATURE RANGE:** 

-20°C to +80°C





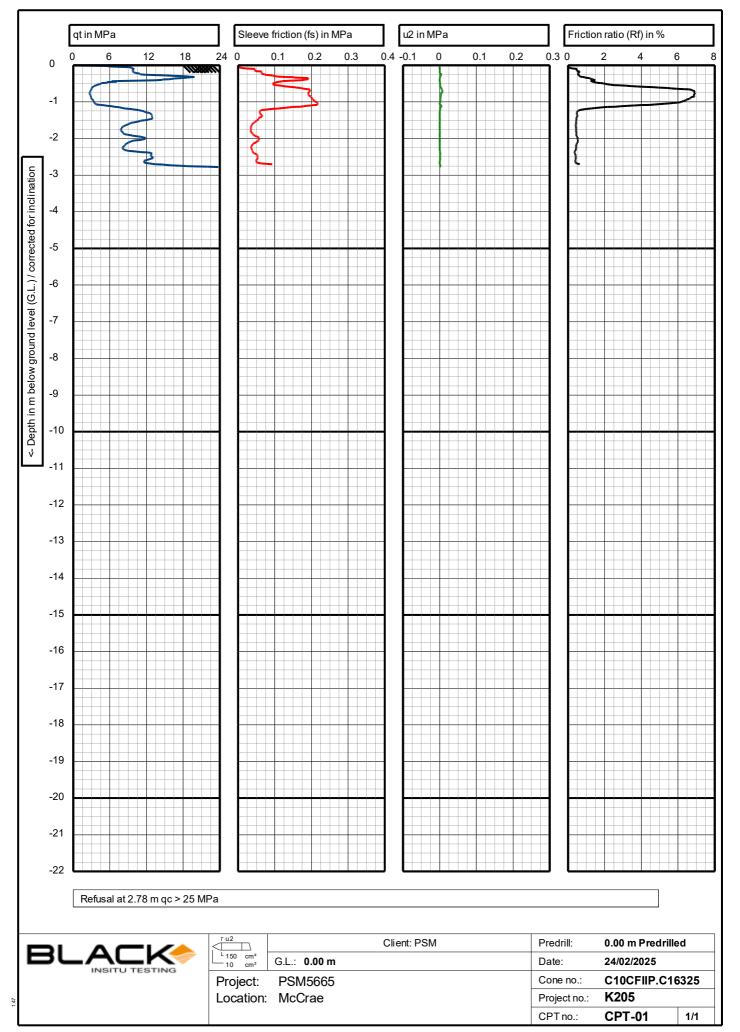
PORE PRESSURE =  $(F_0-F_1)C_P + (T_1-T_0)C_T$ 

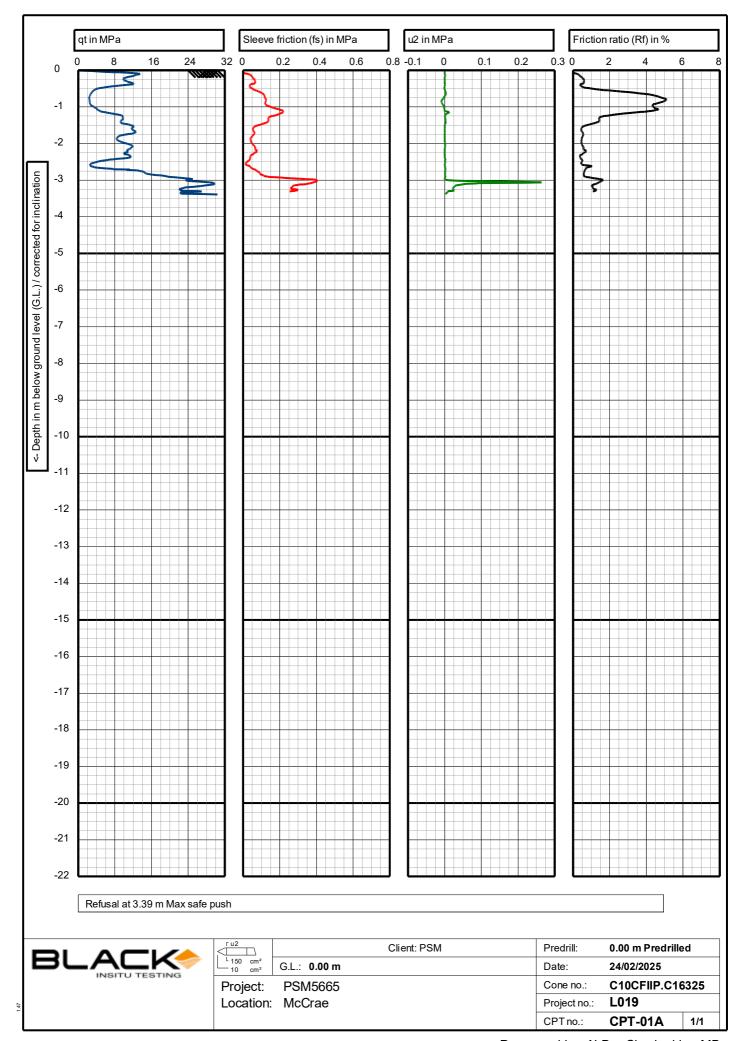
(F<sub>0</sub>) & (T<sub>0</sub>) TO BE ESTABLISHED DURING INSTALLATION

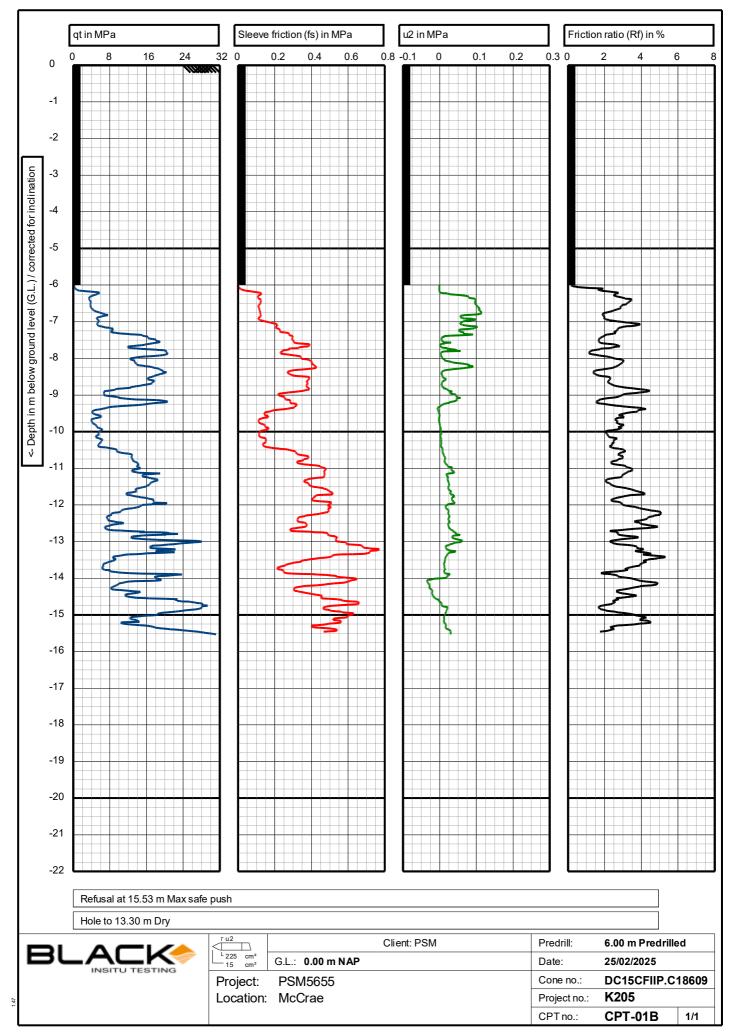
www.hmagrp.com

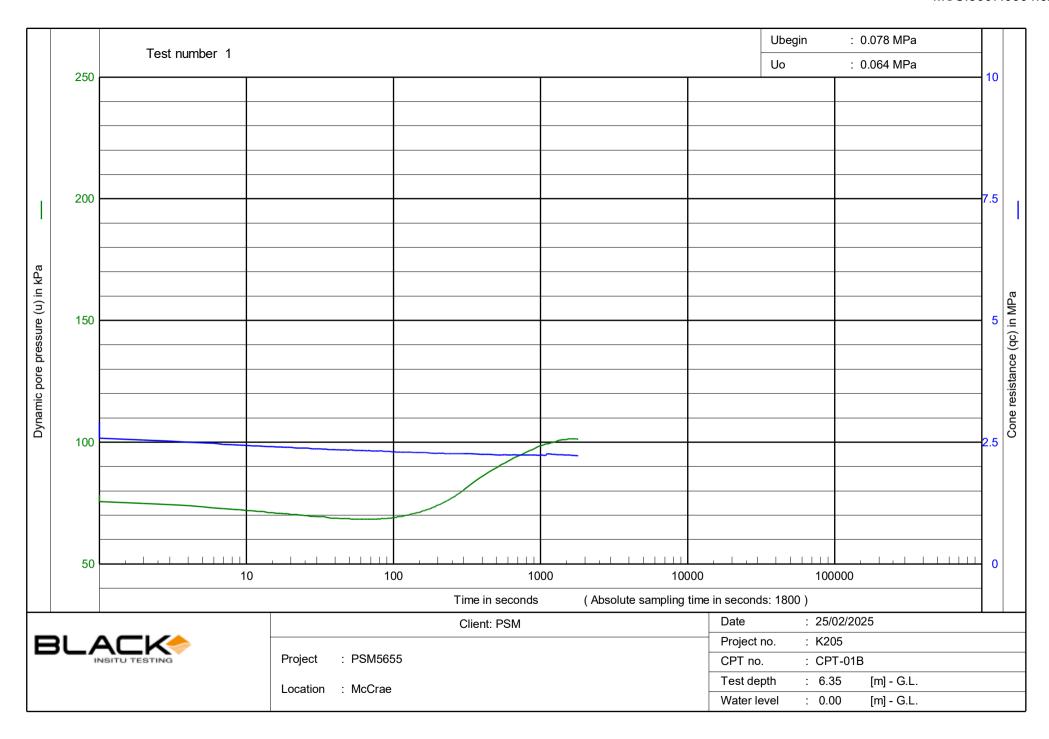
# **Appendix D CPT Results**

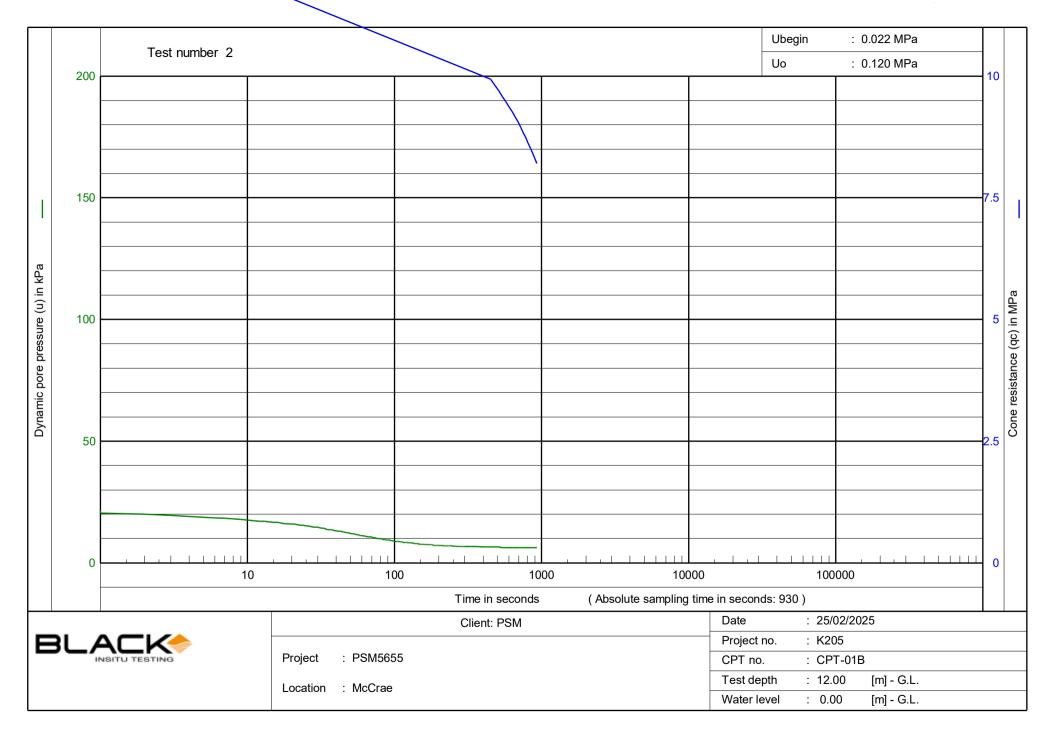


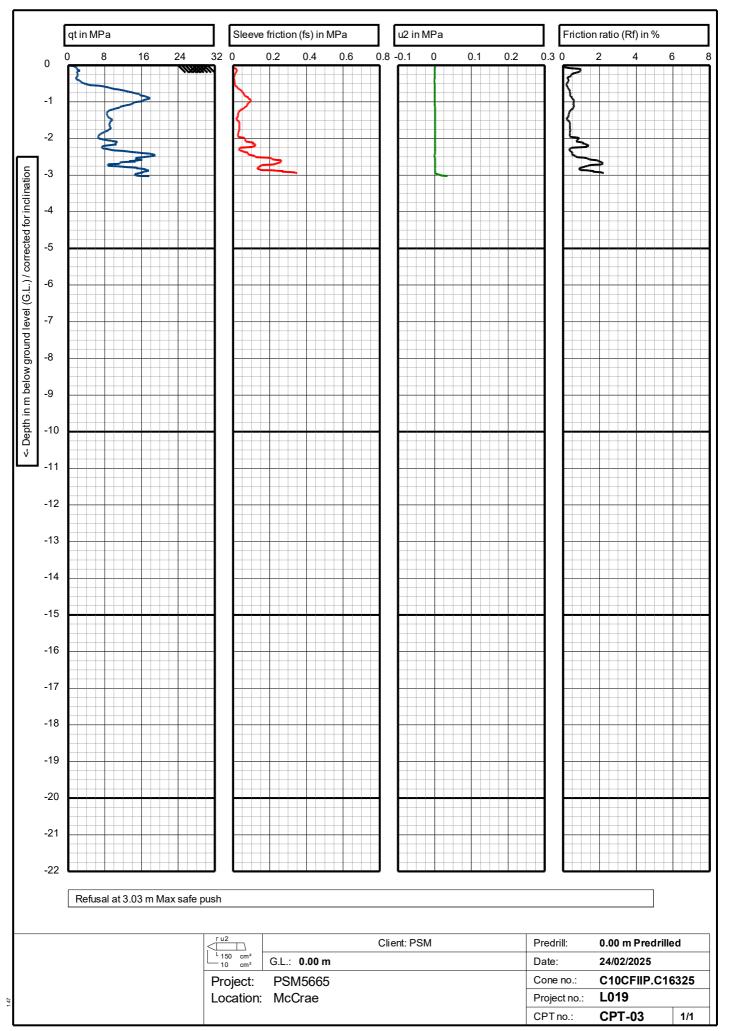


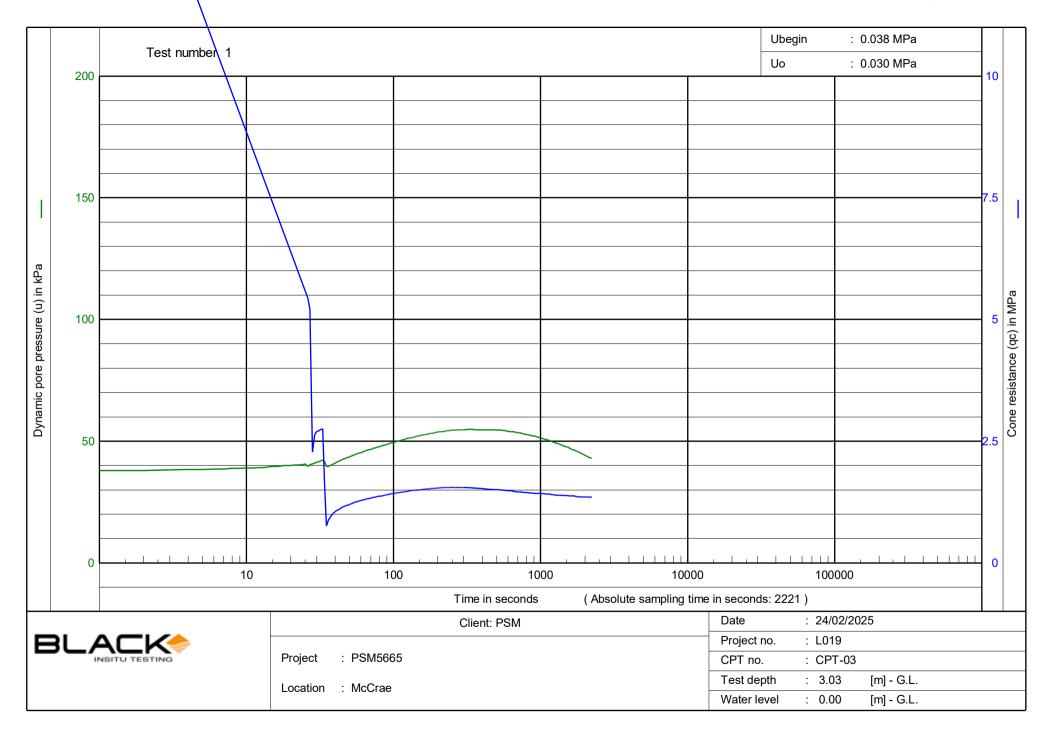


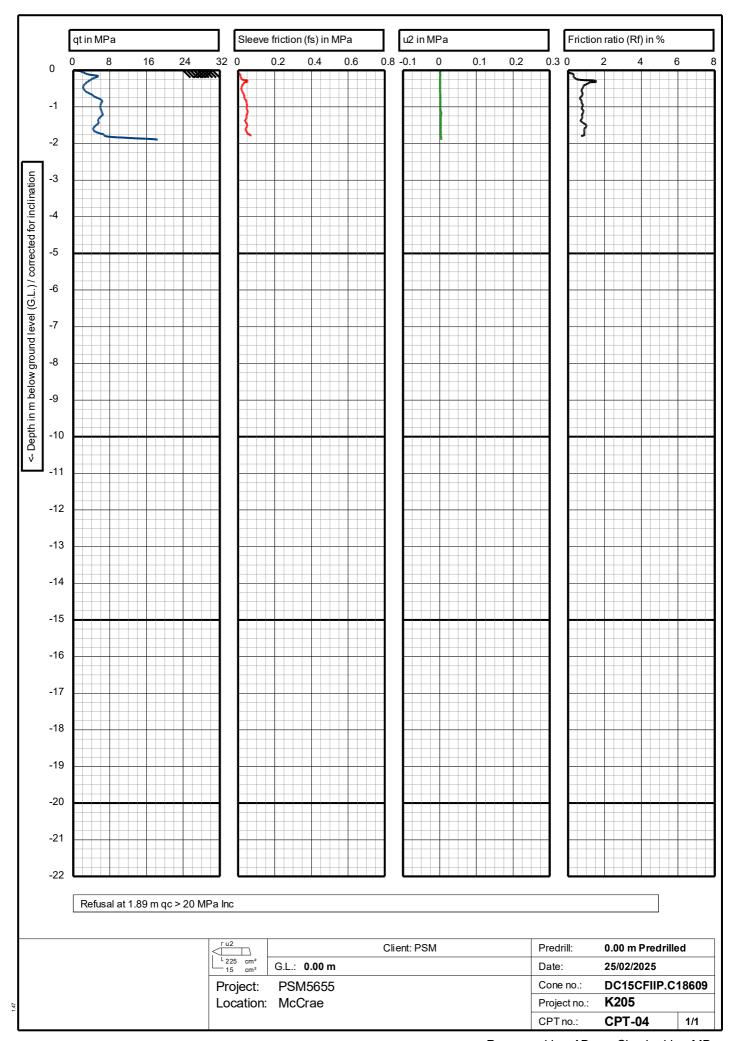


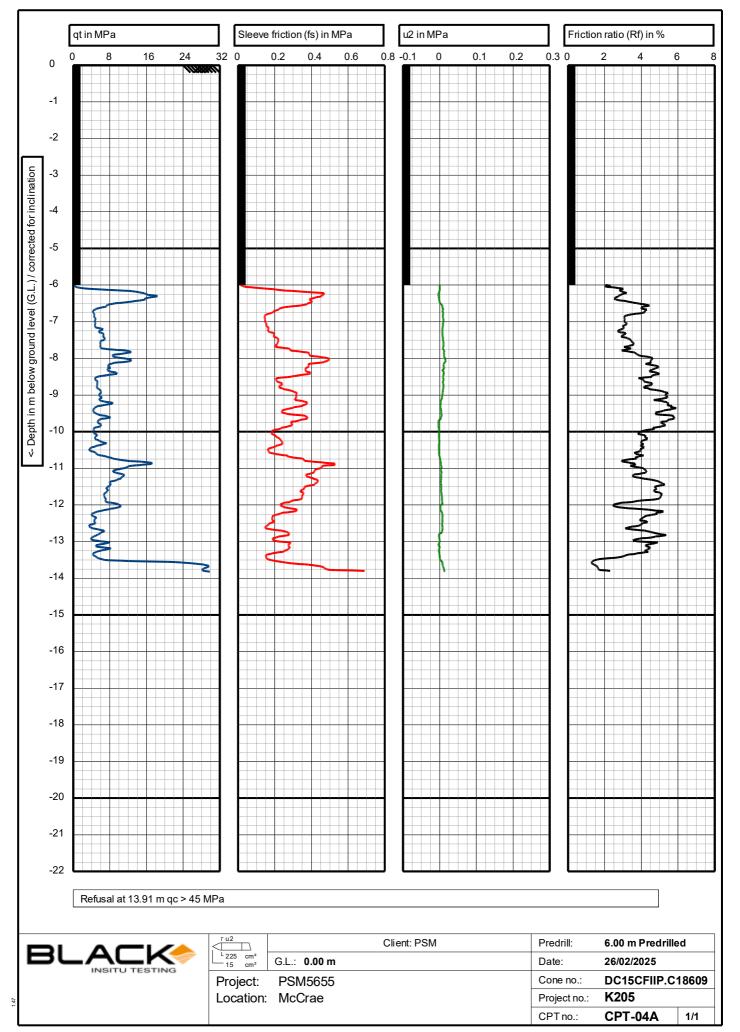


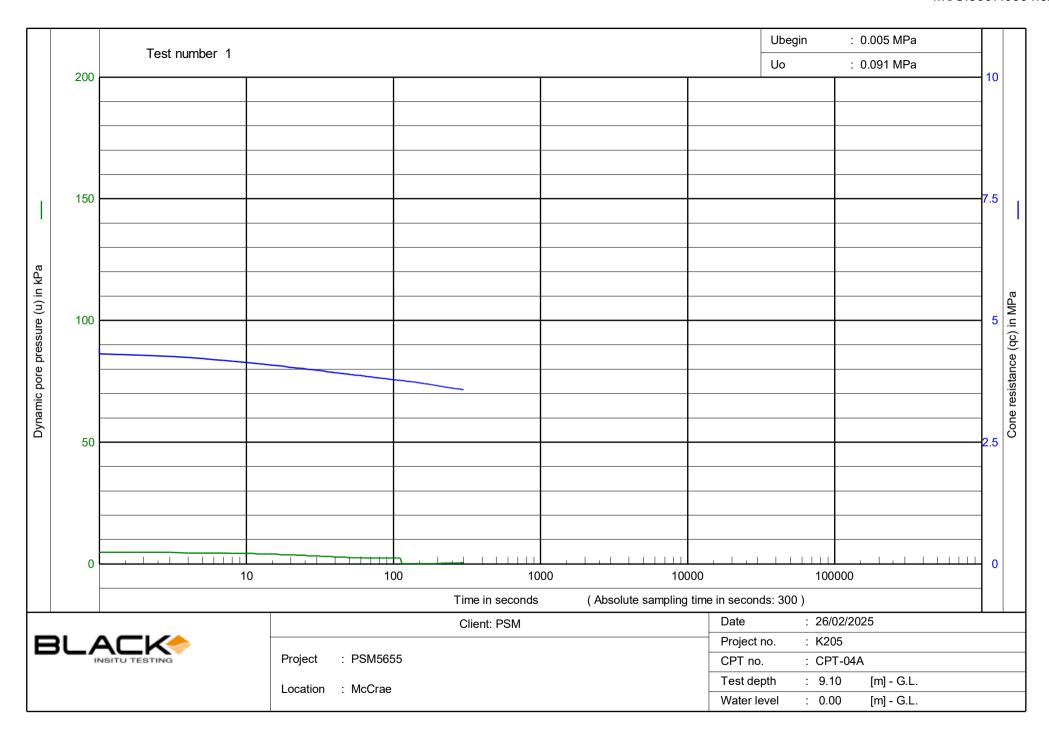


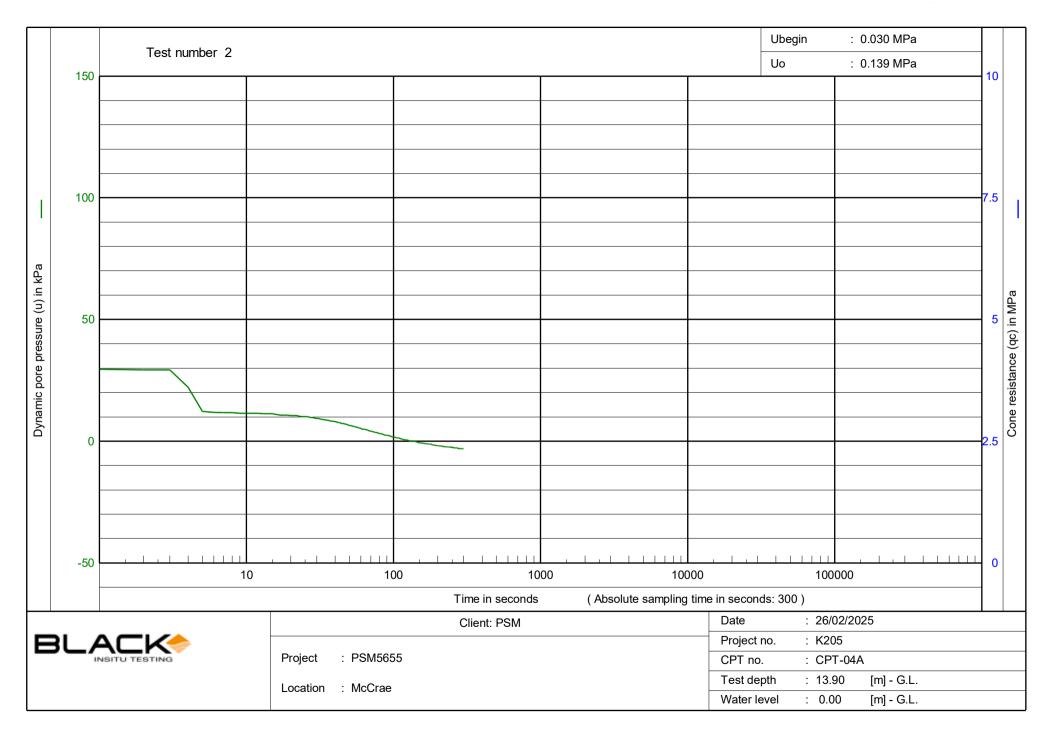


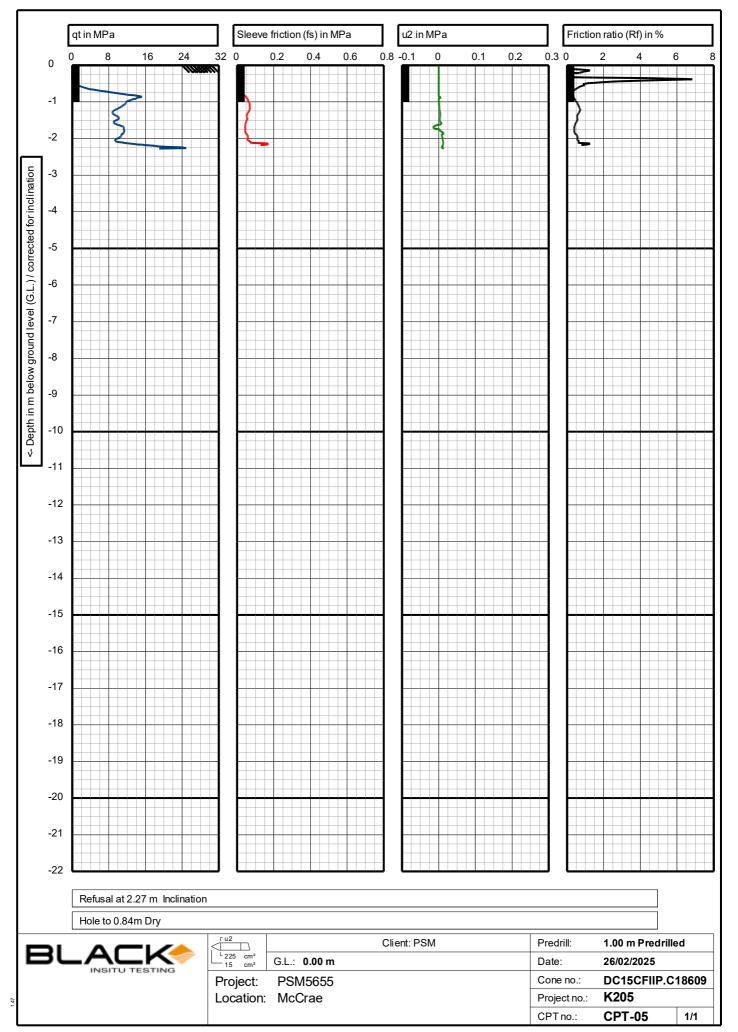


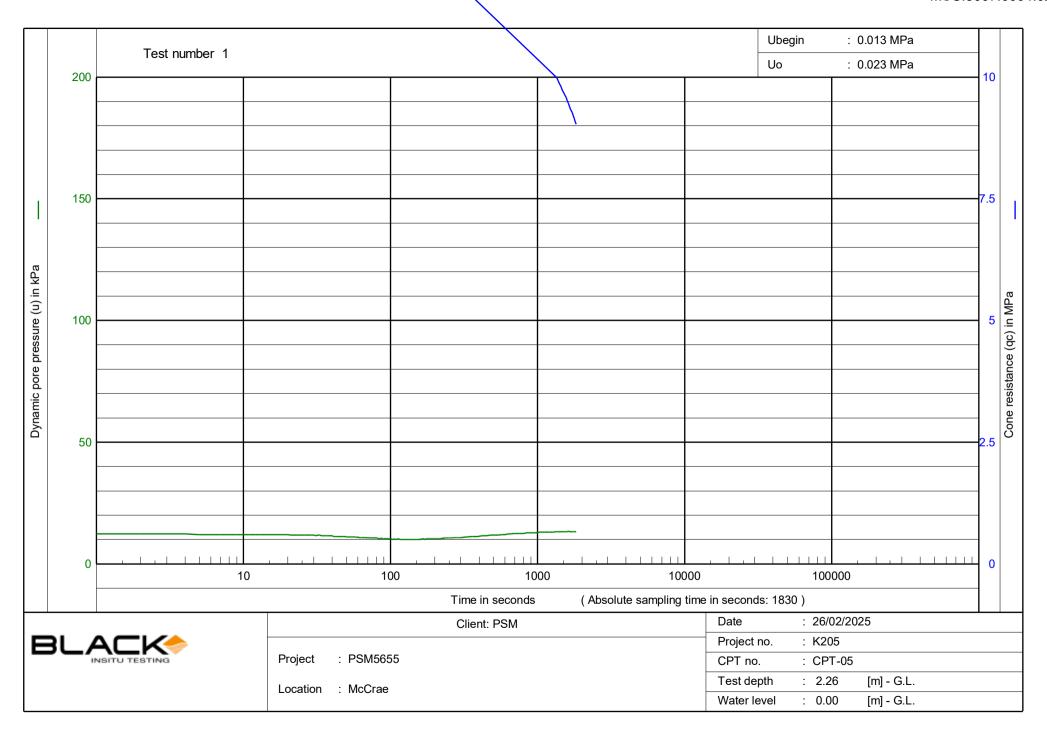














Office 16

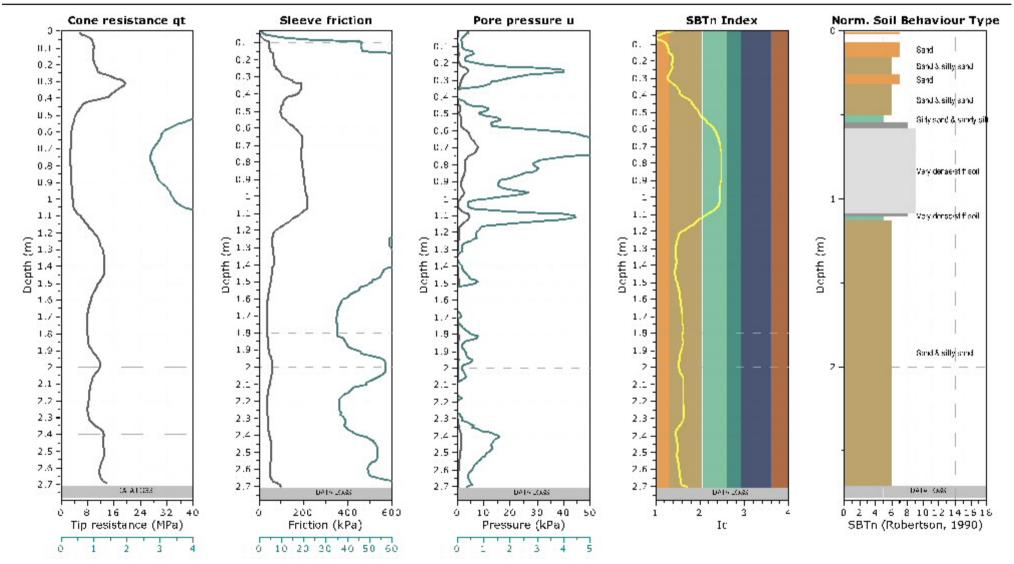
Level 4, 60 Moorabool Street Geelong VIC 3220 www.psm.com.au

Project: McCrae Landslide Location: McCrae, VIC CPT: CPT-01

Total depth: 2.78 m, Date: 24/02/2025

Surface Elevation: 31.63 m

Coords: X:319564.80, Y:5753703.80





Office 16

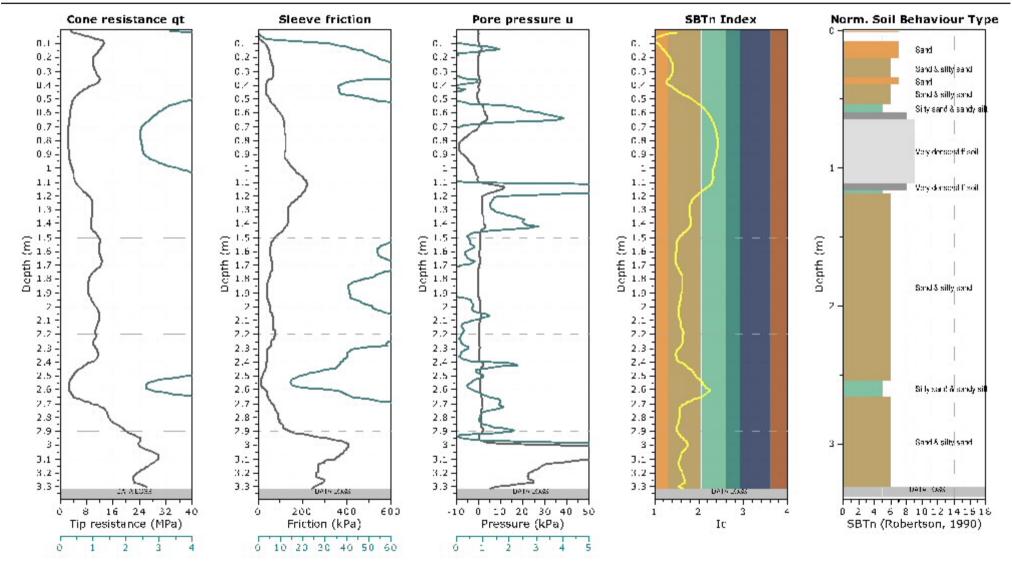
Level 4, 60 Moorabool Street Geelong VIC 3220 www.psm.com.au

Project: McCrae Landslide Location: McCrae, VIC CPT: CPT-01A

Total depth: 3.39 m, Date: 24/02/2025

Surface Elevation: 31.69 m

Coords: X:319565.00, Y:5753702.30





Office 16

Level 4, 60 Moorabool Street Geelong VIC 3220 www.psm.com.au

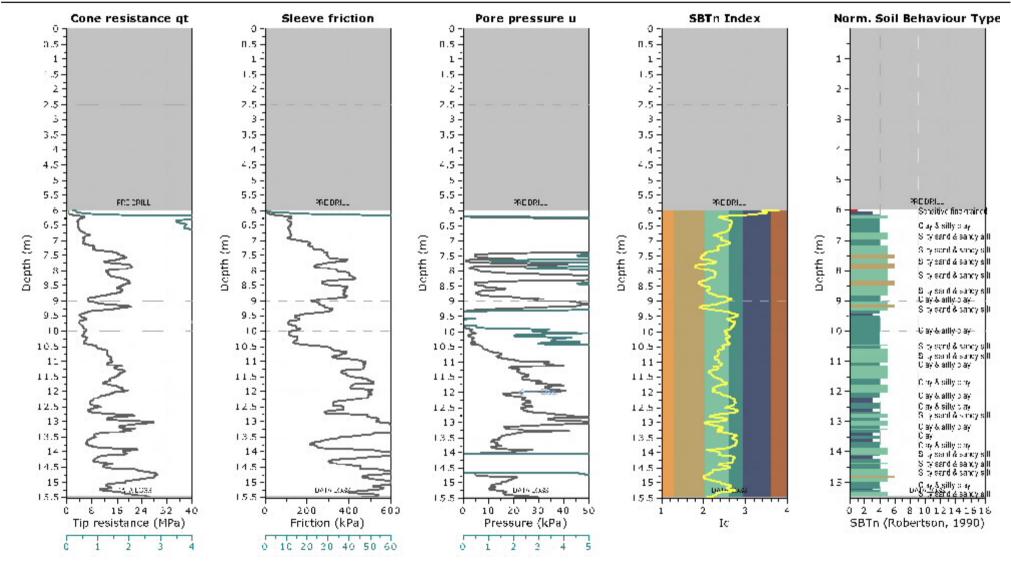
Project: McCrae Landslide Location: McCrae, VIC

CPT: CPT-01B

Total depth: 15.53 m, Date: 25/02/2025

Surface Elevation: 31.70 m

Coords: X:319565.70, Y:5753702.10





Office 16

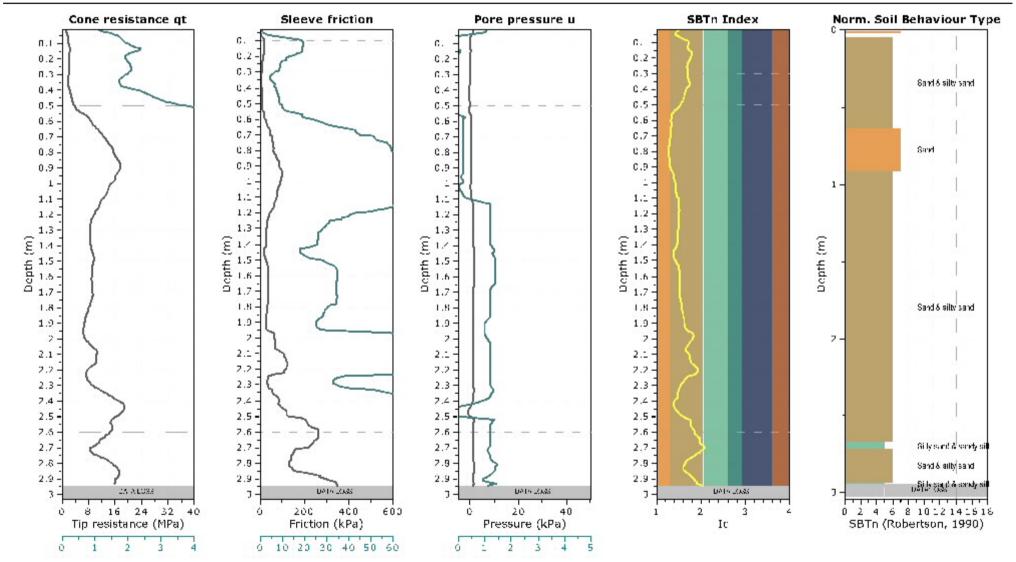
Level 4, 60 Moorabool Street Geelong VIC 3220 www.psm.com.au

Project: McCrae Landslide Location: McCrae, VIC CPT: CPT-03

Total depth: 3.03 m, Date: 24/02/2025

Surface Elevation: 28.68 m

Coords: X:319533.30, Y:5753716.30





Office 16

Level 4, 60 Moorabool Street Geelong VIC 3220 www.psm.com.au

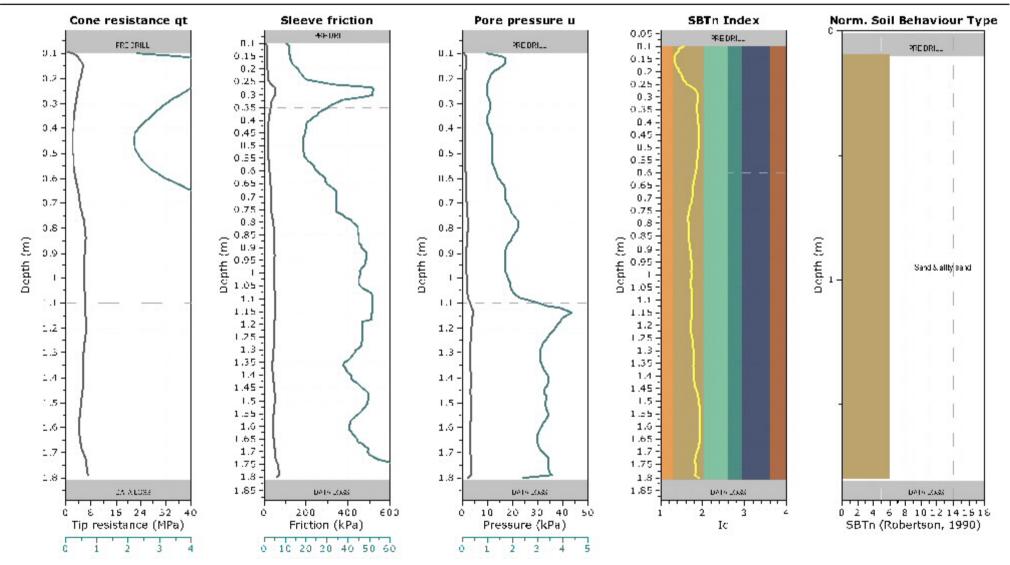
Project: McCrae Landslide Location: McCrae, VIC

CPT: CPT-04

Total depth: 1.89 m, Date: 25/02/2025

Surface Elevation: 26.86 m

Coords: X:319499.20, Y:5753666.10





Office 16

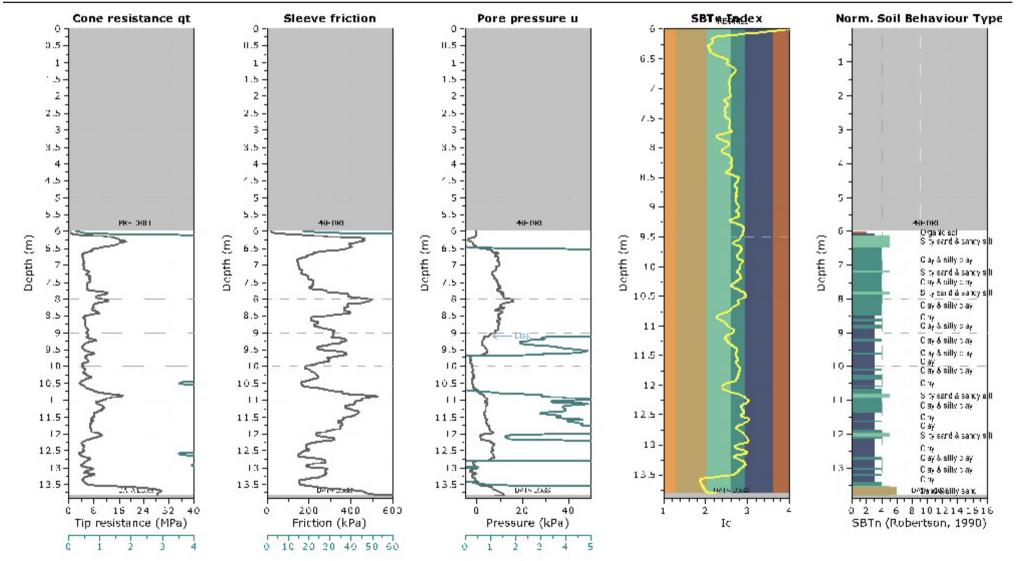
Level 4, 60 Moorabool Street Geelong VIC 3220 www.psm.com.au

Project: McCrae Landslide Location: McCrae, VIC CPT: CPT-04A

Total depth: 13.90 m, Date: 26/02/2025

Surface Elevation: 26.86 m

Coords: X:319499.20, Y:5753666.10





Office 16

Level 4, 60 Moorabool Street Geelong VIC 3220 www.psm.com.au

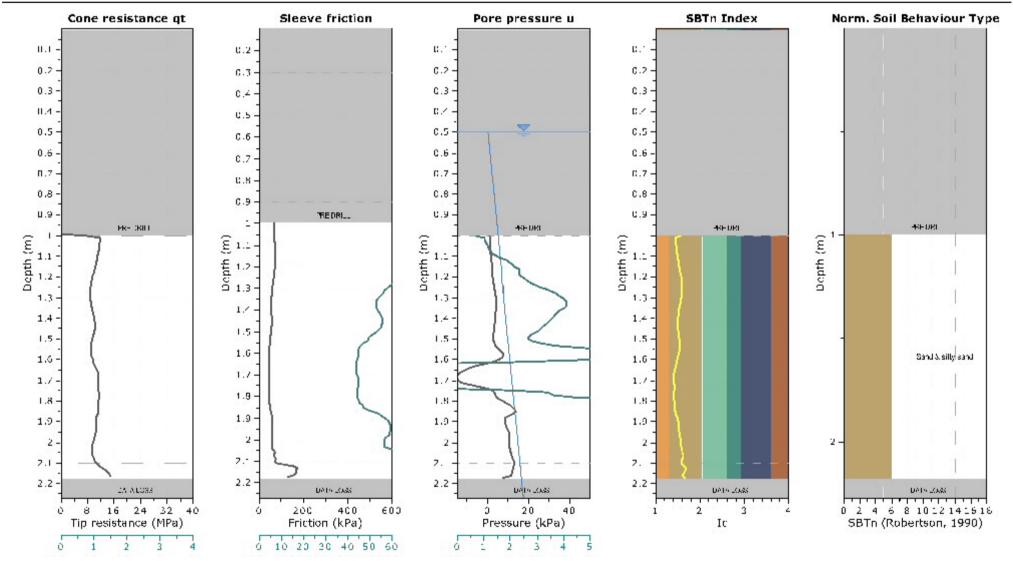
Project: McCrae Landslide Location: McCrae, VIC

CPT: CPT-05

Total depth: 2.27 m, Date: 26/02/2025

Surface Elevation: 1.91 m

Coords: X:319501.30, Y:5753776.90



# **Appendix E Laboratory Testing – Material Test Reports**



**Report Number:** GSSW2352-1

Issue Number:

Date Issued: 14/02/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** 10-12 POINT VIEW ROAD

McCRAE **Project Location:** PSM5665 Client Reference: Work Request: 22410 2352-S1 Sample Number: **Date Sampled:** 24/01/2025

**Dates Tested:** 05/02/2025 - 14/02/2025

Sampling Method: Sampled by Client - Tested as Received

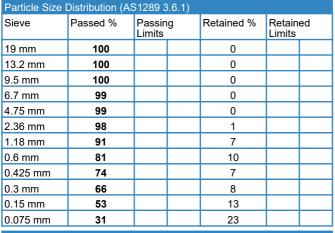
The results apply to the sample as received

Sample Location: RILL/Consolidated waste on slope, Depth: 0.00m

Lot No: Sample ID S1

Report Number: GSSW2352-1

clayey/silty SAND, trace gravel, pale grey, fine to coarse grained, low to medium plasticity, gravel 2%. Material:



Moisture Content (AS1289.2.1.1)			Max
Moisture Content (%)	8.9		



Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

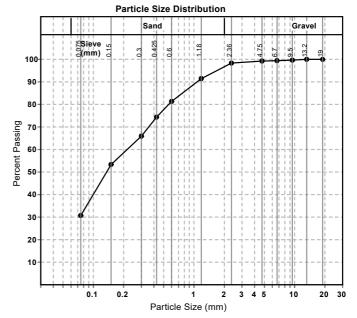
Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Elliott

Laboratory Manager



**Report Number:** GSSW2352-1

Issue Number:

Date Issued: 14/02/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** 10-12 POINT VIEW ROAD

**Project Location:** McCRAE PSM5665 **Client Reference:** Work Request: 22410 2352-S2 Sample Number: 24/01/2025 Date Sampled:

**Dates Tested:** 05/02/2025 - 13/02/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: On LHS/NE Slope, Depth: 0.00m

Lot No: Sample ID S2

Report Number: GSSW2352-1

clayey/silty SAND, trace gravel, pale grey and brown, fine to coarse grained, low to medium plasticity, gravel  $4\%.\,$ Material:



8 Freedman Street North Geelong Vic 3215

Email: chrism@groundsciencesw.com.au

Phone: (03) 5282 1566

Accredited for compliance with ISO/IEC 17025 - Testing

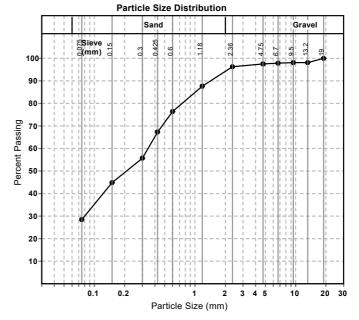


Approved Signatory: Brent Elliott

Laboratory Manager NATA Accredited Laboratory Number: 20109

Particle Size Distribution (AS1289 3.6.1)						
Sieve	Passed %	Passin Limits	g	Retained %	Retain Limits	ed
19 mm	100			0		
13.2 mm	98			2		
9.5 mm	98			0		
6.7 mm	98			0		
4.75 mm	98			0		
2.36 mm	96			1		
1.18 mm	88			9		
0.6 mm	76			11		
0.425 mm	67			9		
0.3 mm	56			12		
0.15 mm	45			11		
0.075 mm	28			16		
Maiatuma Cam	topt (AC1000 1	1 4 4)			Min	Max

Moisture Content (AS1289.2.1.1)			Max
Moisture Content (%)	19.0		



**Report Number:** GSSW2352-1

Issue Number:

Date Issued: 14/02/2025

PELLS SULLIVAN MEYNINK (PSM) Client:

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** 10-12 POINT VIEW ROAD

McCRAE **Project Location:** PSM5665 **Client Reference:** Work Request: 22410 2352-S3 Sample Number: 24/01/2025 **Date Sampled:** 

**Dates Tested:** 05/02/2025 - 13/02/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Lower flank of RILL on RHS/SW Slope, Depth: 0.00m Sample Location:

Lot No: Sample ID S3

Report Number: GSSW2352-1

clayey/silty SAND, trace gravel, pale grey, fine to coarse grained, low to medium plasticity, gravel 2%. Material:



Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

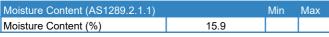
Phone: (03) 5282 1566

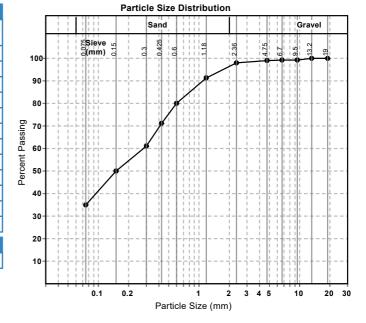
Email: chrism@groundsciencesw.com.au Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Brent Elliott

Laboratory Manager

Particle Size I	Distribution (A	S1289 3	3.6.1)			
Sieve	Passed %	Passin Limits	g	Retained %	Retained Limits	
19 mm	100			0		
13.2 mm	100			0		
9.5 mm	99			1		
6.7 mm	99			0		
4.75 mm	99			0		
2.36 mm	98			1		
1.18 mm	91			7		
0.6 mm	80			11		
0.425 mm	71			9		
0.3 mm	61			10		
0.15 mm	50			11		
0.075 mm	35			15		





**Report Number:** GSSW2352-1

Issue Number:

Date Issued: 14/02/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** 10-12 POINT VIEW ROAD

**Project Location:** McCRAE PSM5665 **Client Reference:** Work Request: 22410 2352-S4 Sample Number: 24/01/2025 Date Sampled:

**Dates Tested:** 05/02/2025 - 13/02/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Upper RHS/SW Slope, Gum Tree/Scarp, Depth: 0.00m Sample Location:

Lot No: Sample ID S4

Report Number: GSSW2352-1

 $\rm CH$  - sandy CLAY, trace gravel, pale grey mottled brown, high plasticity, sand 33% fine to coarse grained, gravel 1%. Material:

Ground Science South West
Geotechnical & Environmental Consultants

Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Elliott

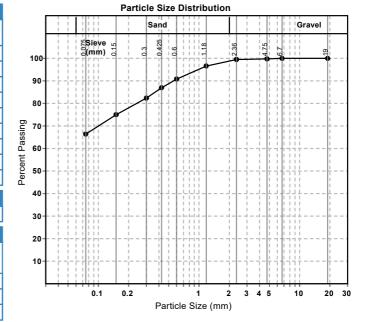
Laboratory Manager

Particle Size Distribution (AS1289 3.6.1)							
Sieve	Passed %	Passing Limits		Retained %	Retained Limits		
6.7 mm	100			0			
4.75 mm	100			0			
2.36 mm	99			0			
1.18 mm	97			3			
0.6 mm	91			6			
0.425 mm	87			4			
0.3 mm	82			5			
0.15 mm	75			7			
0.075 mm	66			9			

Moisture Content (AS1289.2.1.1)			Max
Moisture Content (%) 34.0			
Atterberg Limit (AS1289 3 1 1 & 3 2 1 & 3 3 1)			Max

Atterberg Limit (AS1289 3.1.1 & 3.2	Min	Max	
Sample History Oven Dried			
Preparation Method	Dry Sieve		
Liquid Limit (%)	55		
Plastic Limit (%)	19		
Plasticity Index (%)	36		

Linear Shrinkage (AS1289 3.4.1)	Min	Max	
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	12.0		
Cracking Crumbling Curling	Curling		



**Report Number:** GSSW2352-1

Issue Number:

Date Issued: 14/02/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** 10-12 POINT VIEW ROAD

**Project Location:** McCRAE PSM5665 **Client Reference:** Work Request: 22410 2352-S5 Sample Number: 24/01/2025 Date Sampled:

**Dates Tested:** 05/02/2025 - 14/02/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

S4 Upper, Depth: 0.00m Sample Location:

Lot No: Sample ID S5

Report Number: GSSW2352-1

sandy CLAY/SILT, trace gravel, pale grey, medium to high plasticity, sand 56% fine to coarse grained, gravel 2%. Material:



Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

Phone: (03) 5282 1566

 ${\it Email: chrism@groundsciencesw.com.au}$ Accredited for compliance with ISO/IEC 17025 - Testing

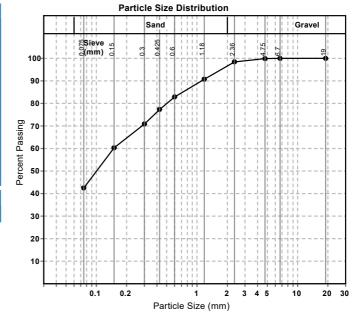


Approved Signatory: Brent Elliott

Laboratory Manager

Particle Size Distribution (AS1289 3.6.1)							
Sieve	Passed %	Passing Limits		Retained %	Retain Limits	ed	
6.7 mm	100			0			
4.75 mm	100			0			
2.36 mm	98			1			
1.18 mm	91			8			
0.6 mm	83			8			
0.425 mm	77			6			
0.3 mm	71			6			
0.15 mm	60			11			
0.075 mm	42			18			

Moisture Content (AS1289.2.1.1)			Max
Moisture Content (%)	27.3		



**Report Number:** GSSW2352-1

Issue Number:

Date Issued: 14/02/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** 10-12 POINT VIEW ROAD

**Project Location:** McCRAE PSM5665 **Client Reference:** Work Request: 22410 2352-S6 Sample Number: 24/01/2025 Date Sampled:

**Dates Tested:** 05/02/2025 - 14/02/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

SW Flank 2022 Air Dry, Depth: 0.00m Sample Location:

Lot No: Sample ID S6

 $\rm SM$  - silty SAND, trace gravel, pale grey, fine to coarse grained, low plasticity, gravel 8%.Material:

Particle Size Distribution (AS1289 3.6.1)							
Sieve	Passed %	Passin Limits	g	Retained %	Retained Limits		
19 mm	100			0			
13.2 mm	100			0			
9.5 mm	99			1			
6.7 mm	99			0			
4.75 mm	98			1			
2.36 mm	92			6			
1.18 mm	77			16			
0.6 mm	63			13			
0.425 mm	56			7			
0.3 mm	50			7			
0.15 mm	40			10			
0.075 mm	25			14			

Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	0.7		

Atterberg Limit (AS1289 3.1.1 & 3.2.1 & 3.3.1)			Max
Sample History Oven Dried			
Preparation Method	Dry Sieve		
Liquid Limit (%)	18		
Plastic Limit (%)	16		
Plasticity Index (%)	2		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.1		
Linear Shrinkage (%)	1.0		
Cracking Crumbling Curling	Cracking		

Report Number: GSSW2352-1



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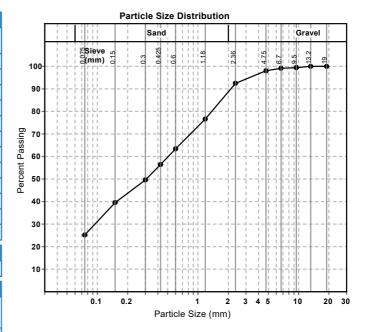
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Approved Signatory: Brent Elliott

Laboratory Manager



Report Number: GSSW2352-1

Issue Number:

**Date Issued:** 14/02/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Contact: Dane Pope
Project Number: GSSW2352

Project Name: 10-12 POINT VIEW ROAD

Project Location: McCRAE
Client Reference: PSM5665
Work Request: 22410

Report Number: GSSW2352-1

**Dates Tested:** 05/02/2025 - 06/02/2025



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Approved Signatory: Brent Elliott

Laboratory Manager NATA Accredited Laboratory Number: 20109

Moisture Content AS	1289 2.1.1				
Sample Number	Sample Location	Moisture Content (%)	Min	Max	Material
2352-S1	RILL/Consolidated waste on slope, Depth: 0.00m	8.9 %	**	**	clayey/silty SAND, trace gravel, pale grey, fine to coarse grained, low to medium plasticity, gravel 2%.
2352-S2	On LHS/NE Slope, Depth: 0.00m	19.0 %	**	**	clayey/silty SAND, trace gravel, pale grey and brown, fine to coarse grained, low to medium plasticity, gravel 4%.
2352-S3	Lower flank of RILL on RHS/SW Slope, Depth: 0.00m	15.9 %	**	**	clayey/silty SAND, trace gravel, pale grey, fine to coarse grained, low to medium plasticity, gravel 2%.
2352-S4	Upper RHS/SW Slope, Gum Tree/Scarp, Depth: 0.00m	34.0 %	**	**	CH - sandy CLAY, trace gravel, pale grey mottled brown, high plasticity, sand 33% fine to coarse grained, gravel 1%.
2352-S5	S4 Upper, Depth: 0.00m	27.3 %	**	**	sandy CLAY/SILT, trace gravel, pale grey, medium to high plasticity, sand 56% fine to coarse grained, gravel 2%.
2352-S6	SW Flank 2022 Air Dry, Depth: 0.00m	0.7 %	**	**	SM - silty SAND, trace gravel, pale grey, fine to coarse grained, low plasticity, gravel 8%.

**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S7 Sample Number: **Date Sampled:** 17/02/2025

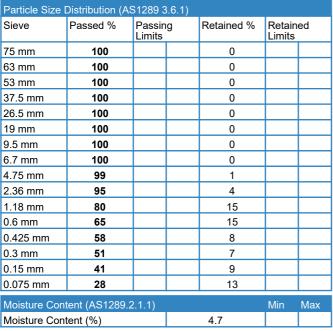
**Dates Tested:** 11/03/2025 - 21/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH03, Depth: 2.70m - 4.00m

clayey/silty SAND, trace gravel, fine to coarse, low to medium plasticity, gravel 5%.Material:



Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	4.7		

Report Number: GSSW2352-2



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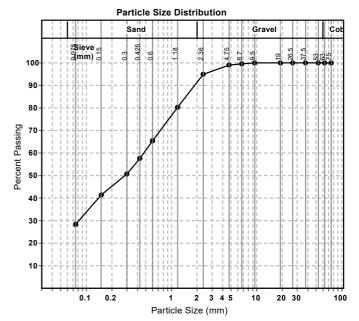
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Approved Signatory: Brent Elliott

Laboratory Manager



Report Number: GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Contact: Dane Pope
Project Number: GSSW2352

Project Name: McCRAE LANDSLIDE

Project Location: 10-12 POINT VIEW ROAD, McCRAE

 Client Reference:
 PSM5665

 Work Request:
 22767

 Sample Number:
 2352-S8

 Date Sampled:
 17/02/2025

**Dates Tested:** 11/03/2025 - 24/03/2025

82

71

60

0.3 mm

0.15 mm

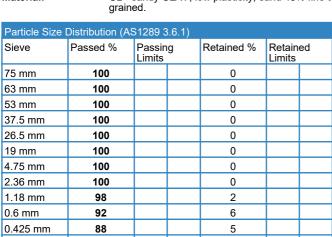
0.075 mm

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH03, Depth: 7.20m - 8.00m

Material: CL - sandy CLAY, low plasticity, sand 40% fine to coarse



Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	9.3		

6

10

12

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)			Max
Sample History Oven Dried			
Preparation Method	Dry Sieve		
Liquid Limit (%)	27		
Plastic Limit (%)	12		
Plasticity Index (%)	15		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	4.0		
Cracking Crumbling Curling	Cracking		



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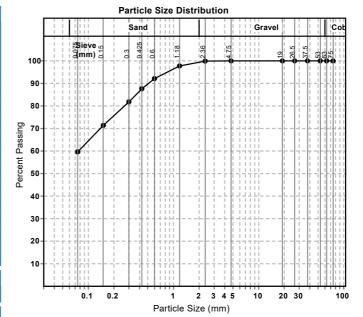
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Approved Signatory: Brent Elliott

Laboratory Manager



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S9 Sample Number: Date Sampled: 17/02/2025

**Dates Tested:** 11/03/2025 - 25/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH03, Depth: 10.80m - 11.50m

 $\mbox{CI}$  - sandy CLAY, trace gravel, medium plasticity, sand 57% fine to coarse grained, gravel 2%.Material:



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Approved Signatory: Brent Elliott Laboratory Manager

NATA Accredited Laboratory Number: 20109

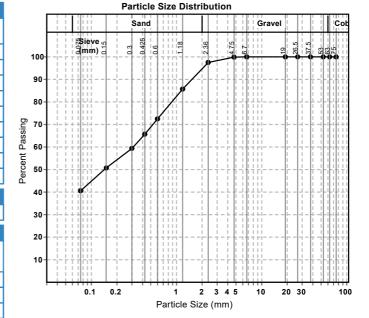
Particle Size Distribution (AS1289 3.6.1)						
Sieve	Passed %	Passin Limits	ıg	Retained %	Retain Limits	ed
6.7 mm	100			0		
4.75 mm	100			0		
2.36 mm	98			2		
1.18 mm	86			12		
0.6 mm	72			13		
0.425 mm	66			7		
0.3 mm	59			6		
0.15 mm	51			9		
0.075 mm	41			10		

Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	13.7		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)			Max
Sample History Oven Dried			
Preparation Method	Dry Sieve		
Liquid Limit (%)	37		
Plastic Limit (%)	16		
Plasticity Index (%)	21		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	7.0		
Cracking Crumbling Curling	Curling		

Report Number: GSSW2352-2



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S10 Sample Number: Date Sampled: 17/02/2025

**Dates Tested:** 11/03/2025 - 25/03/2025

Sampled by Client - Tested as Received Sampling Method:

The results apply to the sample as received

Sample Location: BH03, Depth: 14.75m - 14.85m

sandy CLAY/SILT, trace gravel, low to medium plasticity, sand 51% fine to coarse grained, gravel 5%. Material:



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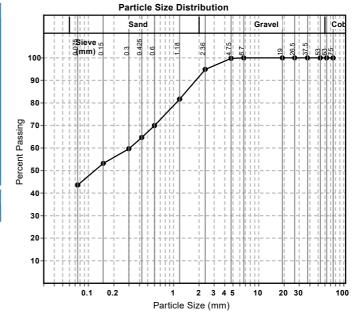


Approved Signatory: Brent Elliott

Laboratory Manager

Particle Size Distribution (AS1289 3.6.1)						
Sieve	Passed %	Passing Limits		Retained %	Retained Limits	
6.7 mm	100			0		
4.75 mm	100			0		
2.36 mm	95			5		
1.18 mm	82			13		
0.6 mm	70			12		
0.425 mm	65			5		
0.3 mm	60			5		
0.15 mm	53			6		
0.075 mm	44			10		

Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	12.7		



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

PELLS SULLIVAN MEYNINK (PSM) Client:

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S12 Sample Number: Date Sampled: 18/02/2025

Report Number: GSSW2352-2

**Dates Tested:** 11/03/2025 - 18/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH03, Depth: 21.40m - 21.55m

sandy CLAY/SILT, trace gravel, low to medium plasticity, sand 56% fine to coarse grained, gravel 3%.Material:



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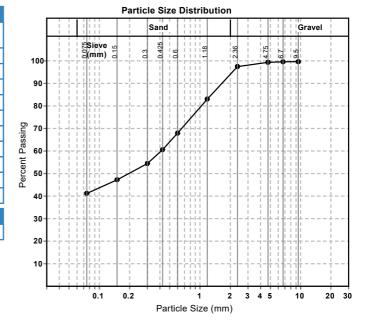


Approved Signatory: Brent Elliott

Laboratory Manager

Particle Size I	Distribution (AS	S1289 3	3.6.1)			
Sieve	Passed %	Passing Limits		Retained %	Retain Limits	ed
9.5 mm	100			0		
6.7 mm	100			0		
4.75 mm	99			0		
2.36 mm	97			2		
1.18 mm	83			14		
0.6 mm	68			15		
0.425 mm	61			7		
0.3 mm	54			6		
0.15 mm	47			7		
0.075 mm	41			6		

Moisture Content (AS1289.2.1.1)	Min	Max	
Moisture Content (%)	11.5		



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

PELLS SULLIVAN MEYNINK (PSM) Client:

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S13 Sample Number: Date Sampled: 18/02/2025

Report Number: GSSW2352-2

**Dates Tested:** 11/03/2025 - 25/03/2025

Sampled by Client - Tested as Received Sampling Method:

The results apply to the sample as received

Sample Location: BH03, Depth: 23.30m - 23.40m

clayey/silty SAND, trace gravel, fine to coarse grained, low to medium plasticity, gravel 13% fine. Material:



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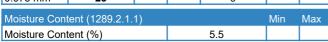
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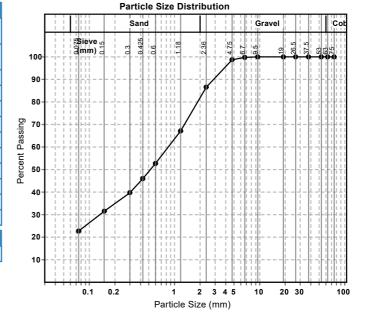


Approved Signatory: Brent Elliott

Laboratory Manager

Particle Size Distribution (AS1141.11.1)							
Sample Washing		Sample was Washed					
Sieve	Passed %	Passing Limits		Retained %	Retain Limits	ed	
9.5 mm	100			0			
6.7 mm	100			0			
4.75 mm	99			1			
2.36 mm	87			12			
1.18 mm	67			19			
0.6 mm	53			14			
0.425 mm	46			7			
0.3 mm	40			6			
0.15 mm	31			8			
0.075 mm	23			9			





**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S14 Sample Number: **Date Sampled:** 19/02/2025

Sample

Washing

13.2 mm

9.5 mm

6.7 mm

4.75 mm

2.36 mm

1.18 mm

0.6 mm

0.3 mm

0.15 mm

0.425 mm

Sieve

**Dates Tested:** 11/03/2025 - 25/03/2025

Passed %

100

100

99

99

95

79

63

54

46

37

Report Number: GSSW2352-2

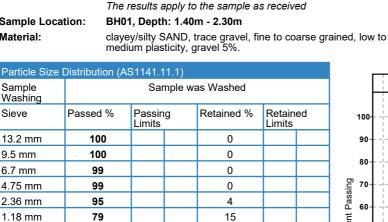
Sampling Method: Sampled by Client - Tested as Received

Limits

The results apply to the sample as received

Sample Location: BH01, Depth: 1.40m - 2.30m

Material:



16

9

8

10

0.075 mm	26			10			
Moisture Content (1289.2.1.1)						Min	Max
Moisture Cont	tent (%)			4 4			



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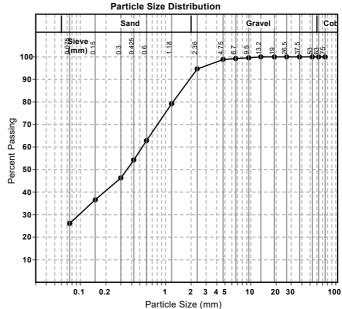
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Approved Signatory: Brent Elliott

Laboratory Manager



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S15 Sample Number: **Date Sampled:** 19/02/2025

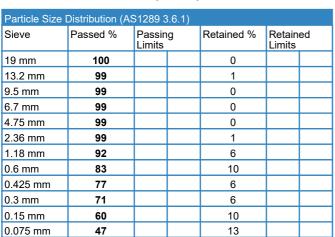
**Dates Tested:** 11/03/2025 - 24/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH01, Depth: 7.20m - 8.00m

 $\mbox{CL}$  - sandy CLAY, trace gravel, low plasticity, sand 52% fine to coarse grained, gravel 1%. Material:



Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	11.3		

Atterberg Limit (AS1289 3.1.2 & 3.2	Min	Max	
Sample History	ry Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	32		
Plastic Limit (%)	12		
Plasticity Index (%)	20		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	6.0		
Cracking Crumbling Curling	Cracking		



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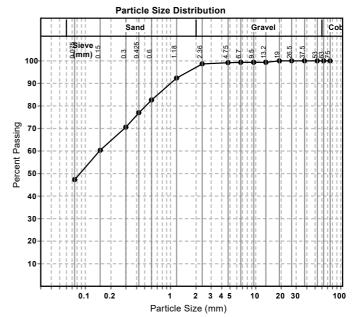
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Laboratory Manager



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S18 Sample Number: Date Sampled: 21/02/2025

**Dates Tested:** 11/03/2025 - 21/03/2025

Sampled by Client - Tested as Received Sampling Method:

The results apply to the sample as received

Sample Location: BH02, Depth: 1.60m - 2.60m

clayey/silty SAND, trace gravel, fine to coarse grained, low to medium plasticity, gravel 7%.Material:



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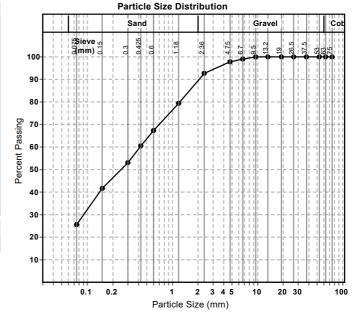


Approved Signatory: Brent Elliott

Laboratory Manager

Particle Size Distribution (AS1289 3.6.1)							
Sieve	Passed %	Passing Limits		Retained %	Retained Limits		
13.2 mm	100			0			
9.5 mm	100			0			
6.7 mm	99			1			
4.75 mm	98			1			
2.36 mm	93			5			
1.18 mm	79			13			
0.6 mm	67			12			
0.425 mm	60			7			
0.3 mm	53			7			
0.15 mm	42			11			
0.075 mm	26			16			

Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	1.4		



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

PELLS SULLIVAN MEYNINK (PSM) Client:

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

**Client Reference:** PSM5665 Work Request: 22767 2352-S19 Sample Number: Date Sampled: 21/02/2025

**Dates Tested:** 11/03/2025 - 24/03/2025

Sampled by Client - Tested as Received Sampling Method:

The results apply to the sample as received

Sample Location: BH02, Depth: 4.20m - 5.00m

 $\mbox{CL}$  - sandy CLAY, trace gravel, low plasticity, sand 55% fine to coarse grained, gravel 1%. Material:



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Laboratory Manager

NATA Accredited Laboratory Number: 20109

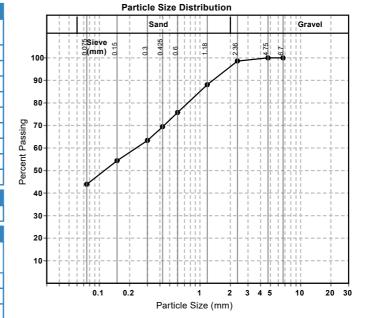
Particle Size Distribution (AS1289 3.6.1)							
Sieve	Passed %	Passing Limits		Retained %	Retained Limits		
6.7 mm	100			0			
4.75 mm	100			0			
2.36 mm	99			1			
1.18 mm	88			11			
0.6 mm	76			12			
0.425 mm	69			6			
0.3 mm	63			6			
0.15 mm	54			9			
0.075 mm	44			10			

Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	3.9		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	25		
Plastic Limit (%)	12		
Plasticity Index (%)	13		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	4.5		
Cracking Crumbling Curling	Crackin	Cracking	

Report Number: GSSW2352-2



Report Number: GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Contact: Dane Pope
Project Number: GSSW2352

Project Name: McCRAE LANDSLIDE

Project Location: 10-12 POINT VIEW ROAD, McCRAE

 Client Reference:
 PSM5665

 Work Request:
 22767

 Sample Number:
 2352-S20

 Date Sampled:
 21/02/2025

**Dates Tested:** 11/03/2025 - 24/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH02, Depth: 6.70m - 7.50m

Material: CI - sandy CLAY, medium plasticity, sand 43% fine to coarse

grained.



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Laboratory Manager

NATA Accredited Laboratory Number: 20109

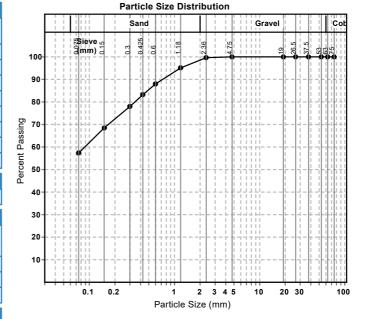
Particle Size I	Distribution (AS	S1289 3	3.6.1)			
Sieve	Passed %	Passin Limits	g	Retained %	Retain Limits	ed
4.75 mm	100			0		
2.36 mm	100			0		
1.18 mm	95			5		
0.6 mm	88			7		
0.425 mm	83			5		
0.3 mm	78			5		
0.15 mm	68			10		
0.075 mm	57			11		

Moisture Content (AS1289.2.1.1)		Min	Max
Moisture Content (%)	11.1		

Atterberg Limit (AS1289 3.1.2 & 3.2	2.1 & 3.3.1)	Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	43		
Plastic Limit (%)	17		
Plasticity Index (%)	26		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	9.0		
Cracking Crumbling Curling	Curling		

Report Number: GSSW2352-2



**Report Number:** GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Dane Pope Contact: **Project Number:** GSSW2352

**Project Name:** McCRAE LANDSLIDE

10-12 POINT VIEW ROAD, McCRAE **Project Location:** 

Client Reference: PSM5665 Work Request: 22767 2352-S23 Sample Number: **Date Sampled:** 26/02/2025

0.075 mm

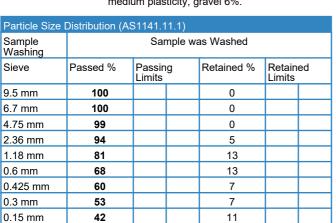
**Dates Tested:** 11/03/2025 - 25/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH05, Depth: 2.60m - 3.60m

clayey/silty SAND, trace gravel, fine to coarse grained, low to medium plasticity, gravel 6%.Material:



	-		
Moisture Content (1289.2.1.1)		Min	Max
Moisture Content (%)	13.0		

12

29

Report Number: GSSW2352-2



Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

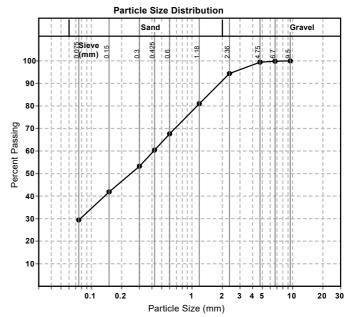
Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Elliott

Laboratory Manager



Report Number: GSSW2352-2

Issue Number:

**Date Issued:** 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Contact: Dane Pope
Project Number: GSSW2352

Project Name: McCRAE LANDSLIDE

Project Location: 10-12 POINT VIEW ROAD, McCRAE

 Client Reference:
 PSM5665

 Work Request:
 22767

 Sample Number:
 2352-S24

 Date Sampled:
 26/02/2025

**Dates Tested:** 11/03/2025 - 24/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH04, Depth: 3.10m - 3.60m

Material: SILT, low plasticity.

Report Number: GSSW2352-2

Atterberg Limit (AS1289 3.1.2 & 3.2	2.1 & 3.3.1)	Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	16		
Plastic Limit (%)	14		
Plasticity Index (%)	2		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	1.0		
Cracking Crumbling Curling	Crackin	a	



Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Elliott

Laboratory Manager

Report Number: GSSW2352-2

Issue Number:

**Date Issued:** 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Contact: Dane Pope
Project Number: GSSW2352

Project Name: McCRAE LANDSLIDE

Project Location: 10-12 POINT VIEW ROAD, McCRAE

 Client Reference:
 PSM5665

 Work Request:
 22767

 Sample Number:
 2352-S25

 Date Sampled:
 26/02/2025

Report Number: GSSW2352-2

**Dates Tested:** 11/03/2025 - 24/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received

Sample Location: BH04, Depth: 5.00m - 5.80m

Material: CLAY, low plasticity.

Atterberg Limit (AS1289 3.1.2 & 3.2	2.1 & 3.3.1)	Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	30		
Plastic Limit (%)	13		
Plasticity Index (%)	17		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	5.5		
Cracking Crumbling Curling	Cracking & C	Curling	



Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

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Email: chrism@groundsciencesw.com.au Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Elliott

Laboratory Manager

Report Number: GSSW2352-2

Issue Number:

Date Issued: 25/03/2025

Client: PELLS SULLIVAN MEYNINK (PSM)

Contact: Dane Pope
Project Number: GSSW2352

Project Name: McCRAE LANDSLIDE

Project Location: 10-12 POINT VIEW ROAD, McCRAE

Client Reference: PSM5665 Work Request: 22767

Report Number: GSSW2352-2

**Dates Tested:** 11/03/2025 - 12/03/2025

Sampling Method: Sampled by Client - Tested as Received

The results apply to the sample as received



Ground Science South West Pty Ltd 8 Freedman Street North Geelong Vic 3215

Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au Accredited for compliance with ISO/IEC 17025 - Testing



Approved Signatory: Brent Elliott

Laboratory Manager

Moisture Content AS	1289 2.1.1				
Sample Number	Sample Location	Moisture Content (%)	Min	Max	Material
2352-S10	BH03, Depth: 14.75m - 14.85m	12.7 %	**	**	sandy CLAY/SILT, trace gravel, low to medium plasticity, sand 51% fine to coarse grained, gravel 5%.
2352-S11	BH03, Depth: 15.50m - 15.60m	5.9 %	**	**	**
2352-S12	BH03, Depth: 21.40m - 21.55m	11.5 %	**	**	sandy CLAY/SILT, trace gravel, low to medium plasticity, sand 56% fine to coarse grained, gravel 3%.
2352-S13	BH03, Depth: 23.30m - 23.40m	5.5 %	**	**	clayey/silty SAND, trace gravel, fine to coarse grained, low to medium plasticity, gravel 13% fine.
2352-S16	BH01, Depth: 17.80m - 17.90m	0.6 %	**	**	**
2352-S17	BH01, Depth: 22.90m - 23.00m	0.6 %	**	**	**
2352-S22	BH05, Depth: 1.60m - 2.30m	10.0 %	**	**	**
2352-S26	BH04, Depth: 15.00m - 15.10m	3.4 %	**	**	**

**Appendix F Surface Water Testing – Detailed Laboratory Reports** 





File Name: C\Users\rtandon\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\PSM\68664\_McCrae\GIS\02\_MapProjects\68664\_SurfaceWaterSampling.aprx; Name:68664\_01\_Surface Water Sampling Reference: www.nearmap.com - Imagery Date: 30/12/2024



# **Chain of Custody**

PROJECT NO.: 68664				LA	ABO	RAT(	ORY BATCH	NO.:								
PROJECT NAME: Land Slide Wat	er Testing			SA	SAMPLERS: JH											
DATE NEEDED BY: 72 HR				Q	QC LEVEL: NEPM (2013)											
PHONE: Melbourne 03 9642	0599															
		osg.com.au; (2) jb	sglabresults@jbsg.com.au ; (3) jphall@jbs	sg.com.a	u; (4	4) Ibe	ell@jbsg.cor	n.au								
COMMENTS / SPECIAL HANDLING / STOR/	NGE OR DISPOSAL:										П			TYPE C		
		ن	F11791041							IIII				ANALY		
		1								I I I	11			z		
			1179041	B11B Suite	Suite		Fluoride				Ш			DENTIFICATION	NEPM/WA	
SAMPLE ID	MATRIX	DATE	TYPE & PRESERVATIVE	811	₹	핌	-E				Ш		Ш	N O €N	NOTES:	
SW01	Water	20/01/24	1 x green,1 x red,1 x purple	Х	Х	Х	х									
SW02	Water	20/01/24	1 x green,1 x red,1 x purple	X	Х	Х	X									
SW03	Water	20/01/24	1 x green,1 x red,1 x purple	Х	Х	Х	X									
SW04	Water	20/01/24	1 x green,1 x red,1 x purple	X	Х	Х	Х									
SW05	Water	20/01/24	1 x green,1 x red,1 x purple	Х	Х	х	х									
DUP01	Water	20/01/24	1 x green,1 x red,1 x purple	Х	Х	Х	х									
DUP02	Water	20/01/24	1 x green,1 x red,1 x purple	Х	Х	Х	Х									
DUP03	Water	20/01/24	1 x green,1 x red,1 x purple	X	Х	х	х		- 0							
SPLIT01	Water	20/01/24	1 x green,1 x red,1 x purple	Х	Х	Х	Х		F	LEASE F	WD TO	) ENV	IROL	4Β		
SPLIT02	Water	20/01/24	1 x green,1 x red,1 x purple	X	Х	Х	х		F	LEASE F	WD TO	ENV	'IROL	AΒ		
SPLIT03	Water	20/01/24	1 x green,1 x red,1 x purple	X	Х	Х	X		F	PLEASE FWD TO ENVIROLAB						
														П		
														$\Box$		
										$\Box$	$\top$			$\Box$		
						П								$\Box$		
														$\Box$		
														$\Box$		
														$\Box$		
RELINQUISHED BY:			METHOD OF SHIPMENT:				RECEIVED 8	BY:				FOR	RECEIV	NG LA	B USE ONLY:	
NAME: JH DATE:	20/01/2025	CONSIGNMEN	T NOTE NO.		AME: ATE:					COOLER	SEAL -	Yes	No	In	tact Broken	
OF: JBS&G		TRANSPORT C		0						COOLER						
NAME: DATE:		CONSIGNMEN	T NOTE NO.	N.	AME: F:				ATE:	COOLER	SEAL -	Yes	No	Ir	ntact Broken	
OF:		TRANSPORT C								COOLER						
Container & Preservative Codes: P = Plas	tic; I = Soil Jar; B =	Glass Bottle; N = Nitric	Acid Prsvd.; C = Sodium Hlydroxide Prsvd; VC = Hlydroc	chloric Acid	Prsvo	d Vial;	VS = Sulfuric Ac	id Prsvd V	ial; S = Su	Ifuric Acid Prs	vd; Z = Zir	nc Prsvd;	E = EDT/	A Prsvd;	ST = Sterile Bottle; O = Othe	er



Re: 68664 - Updated COC

From Karl Bulow <Karl.Bulow@eurofinsanz.com>

Date Mon 20/01/25 4:01 PM

To Jake P. Hall <jphall@jbsg.com.au>; Harry Bacalis <Harry.Bacalis@eurofinsanz.com>; SH AU CAU001 EnviroSampleVic <EnviroSampleVic@eurofinsanz.com>

Verified Sender: This email is from an internal and/or verified domain which passed security verifications. Remember to still be cautious with personal data and follow company policies.

Thanks Jake.

@SH\_AU\_CAU001\_EnviroSampleVic - Please use this updated COC for report 68664 - 72 hour TAT.

Kind Regards,

Karl Bulow Analytical Services Manager SA

Eurofins | Environment Testing

6 Monterey Rd

Dandenong South, VIC, 3175

Mobile: 0477 574 867

Email: karl.bulow@eurofinsanz.com

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From: Jake P. Hall <jphall@jbsg.com.au> Sent: Monday, January 20, 2025 3:58 PM

To: Karl Bulow <Karl.Bulow@eurofinsanz.com>; Harry Bacalis <Harry.Bacalis@eurofinsanz.com>

Cc: SH\_AU\_CAU001\_EnviroSampleVic <EnviroSampleVic@eurofinsanz.com>

Subject: RE: 68664 - Updated COC

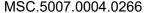
Univerified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Hi Karl.

Please see attached

Cheers.







Exceptional Outcomes

From: Karl Bulow < Karl. Bulow@eurofinsanz.com>

Sent: Monday, 20 January 2025 3:45 PM

To: Jake P. Hall <jphall@jbsg.com.au>; Harry Bacalis <Harry.Bacalis@eurofinsanz.com>

Cc: SH AU CAU001 EnviroSampleVic <EnviroSampleVic@eurofinsanz.com>

Subject: Re: 68664 - Updated COC

\*\*\* [EXTERNAL EMAIL] Stop and think before opening attachments, clicking or responding.\*\*\*

Hi Jake.

If possible, would you be able to send an updated COC attachment that includes Fluoride added. Mainly so we can send that to enviro-lab as well so they don't miss it.

Kind Regards.

Karl Bulow Analytical Services Manager SA

Eurofins | Environment Testing

6 Monterey Rd

Dandenong South, VIC, 3175

Mobile: 0477 574 867

Email: karl.bulow@eurofinsanz.com

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From: Jake P. Hall < jphall@jbsg.com.au>

Sent: Monday, January 20, 2025 3:40 PM

To: Harry Bacalis < Harry Bacalis @eurofinsanz.com>

Cc: Karl Bulow < Karl Bulow @eurofinsanz.com>

Subject: 68664 - Updated COC

Unverified Sender: The sender of this email has not been verified. Review the content of the message carefully and verify the identity of the sender before acting on this email: replying, opening attachments or clicking links.

Hi Harry,

Hope you are well

I dropped off some samples today (around 2:00pm) that are on a 72hr TAT.

Can I please add Fluoride analysis to all samples (including those being forwarded onto Envirolab)

				Cha	ain o	f Cı	usto	ody						5	STI	JASEG
PROJECT NO (Esdat Ref.): 68	664					LAE	BORA	TORY E	ATCH NO.:							
PROJECT NAME: Land Slide		_				SAI	MPLE	RS: JH								
DATE NEEDED BY: 52	HI TAT					QC	LEVE	L: NEPM	(2013)							
PHONE: Melhourne 03 96	42.0599															
SEND REPORT & INVOICE TO	): (1) adminvic@j	bsg.com.au;	(2) jbsgla	bresults@jbsg.com.au; (3) jphall@jbs	sg.com.	.au; (4	4)	pell.		Djbsg.con	n.au					
COMMENTS / SPECIAL HANDLING /	STORAGE OR DISPOSA	\L:												AS8	E OF BESTOS	
*Cations / Anions #3 Alkali Metals (N	Na, K, Ca, Mg), NH3, N	IO3 (as N), Alkalir	nity (CO3, Hi	CO3) (as CaCO3), CI, SO4 (as SO4), EC, TDS		B11B Suite*	uite							DENTIFICATION	ALYSIS	
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	рН	8118	M8 Suite	핍						IDEN	NEP.W/	NOTES:
Swol	Water	20/1/25		ix inorganic, Invetal, Ix Nuticus		×	X	X								
Swol		1														
SW03																
SWOY																
SWOS						ш										
Octol					-	Н	++	$\Box$								
DUPOZ						Н	1	+							$\top$	
DUP 03 SPLITOI						H	+	+		0164	SE EL	VID. TO	EN	1100	AB	
SPLITOI					-	$\Box$	+	+	+	1911	2110	1 1	PI	VIPOC	10	
SPLITOR					-		Н.	1			$\rightarrow$	4	-	+++	+	
SPLITO3	4	4		7		0	4.	2		$\vdash$		-0	-	++	+	
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RELINQUISHE		CONC	GNMENT	METHOD OF SHIPMENT:		N/A	AME:	KE	LEIVED BT:		COOLER	SEAL - Ye				Broken
NAME: WW DATE	20/1/2	CONS	GHINENT	NOTE NO.			ATE:									

COOLER TEMP ..... deg C OF: TRANSPORT CO. OF: JBS&G COOLER SEAL - Yes...... No ....... Intact ....... Broken ........ DATE: NAME: CONSIGNMENT NOTE NO. NAME: DATE: OF: COOLER TEMP ..... deg C TRANSPORT CO. Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; ST = Sterile Bottle; O = Other

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# Chain of Custody



PROJECT NONE Land Side Water Country  SAMPLES J. H  DATE NEEDED BY: 12 FF TAX  OC LEVEL: NEPM (2013)  PHONE: Melbourne 03 9642 0599  SEND REPORT & INVOICE TO (1) adminive@jbsc com.au. (2) jbsc/abresuits@jbsc com.au. (3) jphall@jbsc com.au. (4) F- D-21.  COMMERNY SPECIAL PARCINO STOCKED OR DROSAL  **Carlorins / Annone # Africal Metals (No. K. C. Mg), MN), NO (se N), Alkalininy (CO3 HCO3) (63 CAC)1, CL 304 (as 304), EC. TOS  SAMPLE ID MATRIX DATE TIME TYPE & PRESERVATIVE pH # # * * * * * * * * * * * * * * * * *
DATE NEEDED BY 12 H. TAT  PHONE: Melbourne 03 9642 0599  SEND REPORT 8 INVOICE TO (1) adminisc@pisg.com.au; (2) jbsglabresults@jbsg.com.au; (3) jbhall@jbsg.com.au; (4) L. D. II.  COMMENTS 7 SPECIAL PARQUING 7 STORAGE ON DISTOSAL:  **CARRING A MARRIED**  **SAMPLE ID**  MATRIX*  DATE  INE  TYPE & PRESERVATIVE  pH  **SAMPLE ID**  **SAMPLE ID**  MATRIX*  DATE  INE  TYPE & PRESERVATIVE  pH  **SAMPLE ID**  **SAMPLE ID**  MATRIX*  SAMPLE ID**  SAMPLE ID**  MATRIX*
PHONE: Melbourne 03 9647 0599  SEND REPORT & INVOICE TO I Jaminus (2) josgiabresults@josg.com.au; (3) johall@josg.com.au; (4) Lock (2) (2) josgiabresults@josg.com.au; (3) johall@josg.com.au; (4) Lock (2) (2) josgiabresults@josg.com.au; (3) johall@josg.com.au; (4) Lock (2) (2) josgiabresults@josg.com.au; (4) Lock (2) (2) josgiabresults@josg.com.au; (5) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) Lock (2) (2) josgiabresults@josg.com.au; (6) Lock (2) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Lock (2) Josgiabresults@josg.com.au; (6) Josgiabresults@josg.com.au; (6) Josgiabresults@josgiabr
SEND REPORT & INVOICE TO (1) adminive@ipsg.com.au. (2) jbsglabresults@ipsg.com.au. (3) johal@ipsg.com.au. (4)
COMMENTS / SPECIAL HANDLING / STORAGE ON DISPOSAL:  **CAMORN / A HORN ME A HARD MELES (Na. K. Ca. Mg), NHS. NO) (as N), ABBAINITY (COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO MATRIX DATE TIME TYPE & PRESERVATIVE p.H. To SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. To SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. To SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. To SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. To SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. To SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. To SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HCOS) (AS SOAL) (AS SOAL), EC. TOS  **SAMPLE IO WATRIX DATE TIME TYPE & PRESERVATIVE p.H. TO SAMPLE IO VICTORY / A HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN COS. HORN
*CATIONS / ANIONS #3 ANAIM Metals Na. K. Ca. Mg. NIS. NOS (as N), ABlacking (COS. HCOS) (CI, SOA (as SOA), EC, TOS  SAMPLE ID MATRIX DATE TIME TYPE & PRESERVATIVE pH & \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
SAMPLEID MATRIX DATE TIME TYPE & PRESERVATIVE pH & & & & & & & & & & & & & & & & & &
SWC1 SWC3 SWC4 SWC5 SWC4 SWC5 OUPOI DUP 02 OVP 03 SPLITOL SPLITOL SPLITOL
SWC1 SWC3 SWC4 SWC5 SWC4 SWC5 OUPOI DUP 02 OVP 03 SPLITOL SPLITOL SPLITOL
SWC1 SWC3 SWC4 SWC5 SWC4 SWC5 OUPOI DUP 02 OVP 03 SPLITOL SPLITOL SPLITOL
SWC1 SWC3 SWC4 SWC5 SWC4 SWC5 OUPOI DUP 02 OVP 03 SPLITOL SPLITOL SPLITOL
Swo1 Swo4 Swo4 Swo5 DP0 D00 D00 SPLITE SPLIT
SW 0 4  SW 0 4  SW 0 5  SW 0 7  SW 0 7  SW 10 6 7  SW 17 6 7  SW 1
SWOY SWOS  DOPO1  DOV 62  DOV 63  SPLITED  SPLIT
SWOY SWOS  DOPO1  DOV 62  DOV 63  SPLITED  SPLIT
SMOS  OPPOI  DUP OR  SPLITOR  SPLITOR  SPLITOR
OPOI DUP 62 OPO 3 SPLITOR SPLITOR
DUP 63  SPLITOZ  SPLITOS  TO THE MINERAL B  SPLITOS
SPLITOS D D D D D
SPLITOZ D D D D D D D D D D D D D D D D D D D
SPLITOZ D D D D D D D D D D D D D D D D D D D
ALTHOUGH STATE OF SHIPMENT
DECEMBER OF CHICAGO OF
RELINQUISHED BY: METHOD OF SHIPMENT: RECEIVED BY: FOR RECEIVING LAB USE ONLY:
NAME: NAME: COOLER SEAL - Yes No Intact Broken
OF: JBS&G TRANSPORT CO. OF: COOLER TEMP deg C
NAME: DATE: COOLER SEAL – Yes No Intact Broken
OF:
OF: COOLER TEMP deg C



# Chain of Custody



PROJECT NO.: 68664		LABORATORY BATCH NO.:																		
PROJECT NAME: Land Slide Wat	ter Testing				SAMPLERS: JH															
DATE NEEDED BY: 72 HR					QC LEVEL: NEPM (2013)															
PHONE: Melbourne 03 9642				_																
SEND REPORT & INVOICE TO: (1	.) adminvic@	ibsg.com.au; (2)	osglabresults@jbsg.com.au;(3) jphall@j	bsg.com	.au;	(4) It	oell@	jbsg.o	com.a	u										
COMMENTS / SPECIAL HANDLING / STORU	AGE OR DISPOSA				B Suite	Suite	ride											ASBE	E OF ESTOS LYSIS	
SAMPLE ID	MATRIX	DATE	TYPE & PRESERVATIVE		811	MIS HO	Fluoric						Ш					IDENT	NEPM	NOTES:
SW01	Water	20/01/24	1 x green,1 x red,1 x purple	)	( )	X	Х	П		Т	П		П			П				
SW02	Water	20/01/24	1 x green, 1 x red, 1 x purple	)	( x	X	Х						П			$\Box$	$\top$	$\vdash$	П	
SW03	Water	20/01/24	1 x green,1 x red,1 x purple	)	( x	X	Х						$\Box$		$\top$	$\Box$				
SW04	Water	20/01/24	1 x green, 1 x red, 1 x purple	>	X	X	Х				$\Box$	$\top$	Н	$\top$	$\top$	$\vdash$	+	$\vdash$	Н	
SW05	Water	20/01/24	1 x green, 1 x red, 1 x purple	)	X	x	x			$\top$	$\vdash$	$\top$	$\vdash$	$\perp$	+	$\Box$		$\vdash$	Н	
DUP01	Water	20/01/24	1 x green, 1 x red, 1 x purple	,	X	X	X		+		$\vdash$	$\top$	$\vdash$	$\top$	+	+	+	+		
DUP02	Water	20/01/24	1 x green, 1 x red, 1 x purple	7	+	+	X			$\vdash$		+	Н		+	$\vdash$	+	$\vdash$	Н	
DUP03	Water	20/01/24	1 x green,1 x red,1 x purple	7	x	X	X						$\vdash$		+	$\vdash$	+	$\vdash$	$\vdash$	
SPLIT01	Water	20/01/24	1 x green,1 x red,1 x purple	x	+	+	X		+	+		PLE	SF F	WD	TOF	ENVI	ROLA	AB.		
SPLIT02	Water	20/01/24	1 x green,1 x red,1 x purple	×	X	X	X									ENVI			$\dashv$	
SPLIT03	Water	20/01/24	1 x green,1 x red,1 x purple	×	-	-	Х									ENVI			$\neg$	
									$\top$				П	T	T		T		П	
				$\neg$	+	+			+	$\vdash$			$\vdash$	+	+	$\vdash$	+	$\vdash$	Н	
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					$\top$	$\top$							$\Box$			$\vdash$		$\vdash$	П	
													$\Box$			$\Box$		П	П	
													П					П	П	
					Т									$\top$		$\Box$				
					T															
RELINQUISHED BY:			METHOD OF SHIPMENT:		_		RE	CEIVE	D BY:					_		FOR R	ECEIVI	NG L	AB U	SE ONLY:
	20/01/2025	CONSIGNMEN			NAME DATE: DF:													Ir	ntact	t Broken
OF: JBS&G TRANSPORT CO.  NAME: DATE: CONSIGNMENT NOTE NO.						_				Γ.	ATT-					deg C			1-1	t Broken
DATE.		CONSIGNAMEN	THOIL NO.		AME F:					D	ATE:	100	JOLER	SEAL	- Yes	i N	10	. 1	ntac	t Broken
OF: TRANSPORT CO												C	OOLER	TEMP	·	deg C				
Container & Preservative Codes: P = Plast	tic; J = Soil Jar; B =	Glass Bottle; N = Nitric	Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydro	chloric Aci	d Prs	vd Vial	; VS =	Sulfurio	Acid P	rsvd Vi	al; 5 = 5	ulfuric	Acid Pr	svd; Z =	" Zinc P	rsvd; E	= EDTA	Prsvd	1; ST =	Sterile Bottle; O = Other





# **Environment Testing**

JBS & G Australia (VIC) P/L PO Box 3166 Norwood SA 5067





NATA Accredited Accreditation Number 1261 Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: Jake Hall

Report 1179041-W

Project name LAND SLIDE WATER TESTING

Project ID 68664

Received Date Jan 20, 2025

Client Sample ID			014/04	014/00	SW03	SW04
Sample Matrix			SW01 Water	SW02 Water	Water	Water
			M25-	M25-	M25-	M25-
Eurofins Sample No.			Ja0027677	Ja0027678	Ja0027679	Ja0027680
Date Sampled			Jan 20, 2025	Jan 20, 2025	Jan 20, 2025	Jan 20, 2025
Test/Reference	LOR	Unit				
Ammania (as NI)	0.01	no er/1	0.02	0.79	0.40	0.62
Ammonia (as N)	0.01	mg/L	19		0.48	
Chloride	1	mg/L	140	81 400	90	89 440
Conductivity (at 25 °C)	10	uS/cm				
Fluoride	0.5	mg/L	< 0.5	< 0.5	< 0.5	< 0.5
Nitrate (as N)	0.02	mg/L	0.27	< 0.02	< 0.4	< 0.4
pH (at 25 °C)	0.1	pH Units		6.9	7.2	7.4
Sulphate (as SO4)	5	mg/L	< 5	19	27	20
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	100	1400	1400	1100
Alkalinity (speciated)	1	1				
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	41	79	95	93
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10	< 10	< 10
Alkali Metals						
Calcium	0.5	mg/L	9.6	8.4	11	10
Magnesium	0.5	mg/L	1.6	7.7	8.2	7.6
Potassium	0.5	mg/L	1.2	2.5	3.3	2.8
Sodium	0.5	mg/L	11	55	64	57
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.004	0.006	0.006	0.005
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001	0.001	0.001	0.001
Zinc (filtered)	0.005	mg/L	0.008	< 0.005	< 0.005	< 0.005





Client Sample ID			SW05	DUP01	DUP02	DUP03
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M25- Ja0027681	M25- Ja0027682	M25- Ja0027683	M25- Ja0027684
Date Sampled			Jan 20, 2025	Jan 20, 2025	Jan 20, 2025	Jan 20, 2025
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	0.42	0.44	0.52	0.45
Chloride	1	mg/L	240	82	92	220
Conductivity (at 25 °C)	10	uS/cm	1200	420	480	1200
Fluoride	0.5	mg/L	< 0.5	< 0.5	< 0.5	< 0.5
Nitrate (as N)	0.02	mg/L	< 0.4	< 0.4	< 0.4	< 0.02
pH (at 25 °C)	0.1	pH Units	8.0	6.9	7.3	8.0
Sulphate (as SO4)	5	mg/L	100	18	26	100
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	640	2000	1800	1000
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	190	88	91	220
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10	< 10	< 10
Alkali Metals						
Calcium	0.5	mg/L	41	8.3	11	42
Magnesium	0.5	mg/L	21	7.8	8.1	21
Potassium	0.5	mg/L	14	2.6	3.4	14
Sodium	0.5	mg/L	160	56	63	150
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	0.007	< 0.001	< 0.001	0.007
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	0.002	0.001	< 0.001	0.002
Copper (filtered)	0.001	mg/L	0.008	0.006	0.005	0.008
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.002	0.001	0.001	0.002
Zinc (filtered)	0.005	mg/L	0.009	< 0.005	< 0.005	0.008





## Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	<b>Holding Time</b>
Eurofins Suite B11B			
Ammonia (as N)	Melbourne	Jan 21, 2025	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Chloride	Melbourne	Jan 21, 2025	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (at 25 °C)	Melbourne	Jan 21, 2025	28 Days
- Method: LTM-INO-4030 Conductivity			
Nitrate (as N)	Melbourne	Jan 21, 2025	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Sulphate (as SO4)	Melbourne	Jan 21, 2025	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Melbourne	Jan 21, 2025	28 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			
Alkalinity (speciated)	Melbourne	Jan 21, 2025	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Alkali Metals	Melbourne	Jan 21, 2025	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon Phosphorus by ICP-AES			
Fluoride	Melbourne	Jan 21, 2025	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
pH (at 25 °C)	Melbourne	Jan 21, 2025	6 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Metals M8 filtered	Melbourne	Jan 21, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			



#### **Eurofins Environment Testing Australia Pty Ltd**

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**Company Name:** 

web: www.eurofins.com.au

Address:

Site# 1254 Site# 25403 JBS & G Australia (VIC) P/L PO Box 3166

Norwood SA 5067

Project Name: Project ID:

LAND SLIDE WATER TESTING

68664

Order No.:

Report #: Phone: Fax:

1179041 03 9642 0599

**Eurofins ARL Pty Ltd** 

ABN: 91 05 0159 898

Received: Due:

Jan 20, 2025 3:58 PM Jan 23, 2025

Priority: 3 Day Contact Name: Jake Hall

**Eurofins Analytical Services Manager: Harry Bacalis** 

		Sa	mple Detail			Fluoride	pH (at 25 °C)	Metals M8 filtered	Eurofins Suite B11B
Melb	ourne Laborato	ory - NATA # 12	.61 Site # 12	54		Х	Х	Χ	Х
Exte	rnal Laboratory	,		I					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
1	SW01	Jan 20, 2025		Water	M25-Ja0027677	Х	Х	Х	Х
2	SW02	Jan 20, 2025		Water	M25-Ja0027678	Χ	Χ	Χ	Х
3	SW03	Jan 20, 2025		Water	M25-Ja0027679	Х	Χ	Χ	Х
4	SW04	Jan 20, 2025		Water	M25-Ja0027680	Χ	Χ	Χ	Х
5	SW05	Jan 20, 2025		Water	M25-Ja0027681	Χ	Χ	Χ	Х
6	DUP01	Jan 20, 2025		Water	M25-Ja0027682	Х	Χ	Χ	Х
7	DUP02	Jan 20, 2025		Water	M25-Ja0027683	Х	Χ	Χ	Х
8	DUP03	Jan 20, 2025		Water	M25-Ja0027684	Х	Х	Х	Х
Test	Counts					8	8	8	8





Page 5 of 9

# **Environment Testing**

#### Internal Quality Control Review and Glossary

#### General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 . They are included in this QC report where applicable. Additional QC data may be available on request
- 2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis
- Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion
- 4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly
- 5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- 6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
- 7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
- 8. Samples were analysed on an 'as received' basis.
- 9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
- 10. This report replaces any interim results previously issued.

#### **Holding Times**

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notifi cation of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control

For VOCs containing vinyl chloride, styrene and 2 -chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

#### Units

mg/kg: milligrams per kilogram ma/L: milligrams per litre ppm: parts per million μg/L: micrograms per litre ppb: parts per billion %: Percentage

org/100 mL: Organisms per 100 millilitres NTU: Nephelometric Turbidity Units MPN/100 mL: Most Probable Number of organisms per 100 millilitres

CFU: Colony Forming Unit Colour: Pt-Co Units (CU)

#### Terms

APHA American Public Health Association CEC Cation Exchange Capacity COC Chain of Custody

СР Client Parent - QC was performed on samples pertaining to this report CRM Certified Reference Material (ISO17034) - reported as percent recovery

Where moisture has been determined on a s olid sample, the result is expressed on a dry weight basis Dry Duplicate A second piece of analysis from the same sample and reported in the same units as the result to show comparison.

I imit of Reporting LOR

LCS Laboratory Control Sample - reported as percent recovery.

Method Blank In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water. NCP Non-Client Parent - QC performed on samples not pertaining t o this report, QC represents the sequence or batch that client samples were analysed within.

RPD Relative Percent Difference between two Duplicate pieces of analysis SPIKE Addition of the analyte to the sample and reported as percentage recovery.

SRA Sample Receipt Advice

Surr - Surrogate The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.

твто Tributyltin oxide (bis-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured,

and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits

TCLP Toxicity Characteristic Leaching Procedure TEQ Toxic Equivalency Quotient or Total Equivalence

QSM US Department of Defense Quality Systems Manual Version 6.0

US EPA United States Environmental Protection Agency

WA DWER Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

### QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance quidelines are equally applicable:

Results between 10-20 times the LOR: RPD must lie between 0-50% Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range , not as RPD

Surrogate Recoveries: Recoveries must lie between 20 -130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 - 150%, VOC recoveries 50 - 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

### QC Data General Comments

- Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sam ple batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
- 3. pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- 4. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
- 5. For Matrix Spikes and LCS results , a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Eurofins Environment Testing 6 Monterey Road, Dandenong South, Victoria, Australia 3175 ABN: 50 005 085 521 Telephone: +61 3 8564 5000 Report Number: 1179041-W





## **Quality Control Results**

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Method Blank					
Chloride	mg/L	< 1	1	Pass	
Conductivity (at 25 °C)	uS/cm	< 10	10	Pass	
Sulphate (as SO4)	mg/L	< 5	5	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10	10	Pass	
Method Blank					
Alkali Metals					
Calcium	mg/L	< 0.5	0.5	Pass	
Magnesium	mg/L	< 0.5	0.5	Pass	
Potassium	mg/L	< 0.5	0.5	Pass	
Sodium	mg/L	< 0.5	0.5	Pass	
Method Blank	13.=				
Heavy Metals			T		
Arsenic (filtered)	mg/L	< 0.001	0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002	0.0002	Pass	
Chromium (filtered)	mg/L	< 0.0002	0.0002	Pass	
Copper (filtered)	mg/L	< 0.001	0.001	Pass	
Lead (filtered)	mg/L	< 0.001	0.001	Pass	
Mercury (filtered)	mg/L	< 0.001	0.0001	Pass	
		<del>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 </del>	0.0001		
Nickel (filtered)	mg/L	< 0.001	<del> </del>	Pass	
Zinc (filtered)	mg/L	< 0.005	0.005	Pass	
Method Blank		1 .05	1 05		
Fluoride	mg/L	< 0.5	0.5	Pass	
Method Blank		T T		Γ_	
Fluoride	mg/L	< 0.5	0.5	Pass	
Method Blank		I I		Γ_	
Ammonia (as N)	mg/L	< 0.01	0.01	Pass	
Method Blank		т т			
Alkali Metals	<u> </u>				
Calcium	mg/L	< 0.5	0.5	Pass	
Magnesium	mg/L	< 0.5	0.5	Pass	
Potassium	mg/L	< 0.5	0.5	Pass	
Sodium	mg/L	< 0.5	0.5	Pass	
Method Blank					
Alkali Metals					
Calcium	mg/L	< 0.5	0.5	Pass	
Magnesium	mg/L	< 0.5	0.5	Pass	
Potassium	mg/L	< 0.5	0.5	Pass	
Sodium	mg/L	< 0.5	0.5	Pass	
LCS - % Recovery					
Chloride	%	108	70-130	Pass	
Conductivity (at 25 °C)	%	98	70-130	Pass	
Sulphate (as SO4)	%	113	70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	101	70-130	Pass	
LCS - % Recovery					
Alkalinity (speciated)					
Carbonate Alkalinity (as CaCO3)	%	94	70-130	Pass	
LCS - % Recovery					
Alkali Metals		T T			
Calcium	%	98	80-120	Pass	
Magnesium	%	99	80-120	Pass	
Potassium	%	97	80-120	Pass	





	Test		Units	Result 1		ceptance Limits	Pass Limits	Qualifying Code
Sodium			%	97		80-120	Pass	
LCS - % Recovery								
Heavy Metals								
Arsenic (filtered)			%	94		80-120	Pass	
Cadmium (filtered)			%	93	<del>- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1</del>	80-120	Pass	
Chromium (filtered)			%	96		80-120	Pass	
Copper (filtered)			%	94		80-120	Pass	
Lead (filtered)			%	89		80-120	Pass	
Mercury (filtered)			%	91		80-120	Pass	
Nickel (filtered)			%	95	<del></del>	80-120	Pass	
Zinc (filtered)			%	95		80-120	Pass	
LCS - % Recovery			7.0			00 .20	. 455	
Fluoride			%	73		70-130	Pass	
LCS - % Recovery			,,	1 10 1		70 100	1 400	
Fluoride			%	82		70-130	Pass	
LCS - % Recovery			,,,	, ,,,			. 430	
Ammonia (as N)			%	80		70-130	Pass	
LCS - % Recovery			,,,			. 5 150	, acc	
Alkali Metals				T T				
Calcium			%	93	+ +	80-120	Pass	
Magnesium			%	93		80-120	Pass	
Potassium			%	90		80-120	Pass	
Sodium			%	90	<del>-                                    </del>	80-120	Pass	
LCS - % Recovery			/0	92		00-120	газз	
Ammonia (as N)			%	97	T	70-130	Pass	
LCS - % Recovery			70	91		70-130	Pass	
Alkali Metals				T T	<del> </del>			
Calcium	<del></del>		%	101		80-120	Pass	
			%					
Magnesium				100		80-120	Pass	
Potassium			%	97		80-120	Pass	
Sodium			%	98		80-120	Pass	0 116 -1
Test	Lab Sample ID	QA Source	Units	Result 1	Ac	ceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
				Result 1	<del> </del>			
Sulphate (as SO4)	M25-Ja0027677	СР	%	Result 1	$\overline{}$	70-130	Pass	
Sulphate (as SO4) Spike - % Recovery	M25-Ja0027677	СР	%	Result 1		70-130	Pass	
Spike - % Recovery	M25-Ja0027677	СР	%	98		70-130	Pass	
Spike - % Recovery Heavy Metals				98 Result 1				
Spike - % Recovery Heavy Metals Arsenic (filtered)	M25-Ja0027677	СР	%	98 Result 1 95		75-125	Pass	
Spike - % Recovery Heavy Metals Arsenic (filtered) Cadmium (filtered)	M25-Ja0027677 M25-Ja0027677	CP CP	% %	98  Result 1  95  93		75-125 75-125	Pass Pass	
Spike - % Recovery Heavy Metals Arsenic (filtered) Cadmium (filtered) Chromium (filtered)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP	% % %	98  Result 1  95  93  95		75-125 75-125 75-125	Pass Pass Pass	
Spike - % Recovery Heavy Metals Arsenic (filtered) Cadmium (filtered) Chromium (filtered) Copper (filtered)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP	% % %	98  Result 1  95  93  95  94		75-125 75-125 75-125 75-125	Pass Pass Pass Pass	
Spike - % Recovery Heavy Metals Arsenic (filtered) Cadmium (filtered) Chromium (filtered) Copper (filtered) Lead (filtered)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP	% % % %	98  Result 1  95  93  95  94  89		75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass	
Spike - % Recovery Heavy Metals Arsenic (filtered) Cadmium (filtered) Chromium (filtered) Copper (filtered) Lead (filtered) Mercury (filtered)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP	% % % % %	98  Result 1  95  93  95  94  89  93		75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP	% % % % % %	98  Result 1  95  93  95  94  89  93  93  93		75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)  Zinc (filtered)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP	% % % % %	98  Result 1  95  93  95  94  89  93		75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP	% % % % % %	98  Result 1  95  93  95  94  89  93  93  96		75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)  Zinc (filtered)  Spike - % Recovery	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP	% % % % % % %	98  Result 1  95  93  95  94  89  93  93  96  Result 1		75-125 75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)  Zinc (filtered)  Spike - % Recovery  Ammonia (as N)	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP	% % % % % %	98  Result 1  95  93  95  94  89  93  93  96		75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)  Zinc (filtered)  Spike - % Recovery  Ammonia (as N)  Spike - % Recovery	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP	% % % % % % %	98  Result 1  95  93  95  94  89  93  96  Result 1  88		75-125 75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)  Zinc (filtered)  Spike - % Recovery  Ammonia (as N)  Spike - % Recovery  Alkali Metals	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP CP	% % % % % % %	98  Result 1  95  93  95  94  89  93  93  96  Result 1  88		75-125 75-125 75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)  Zinc (filtered)  Spike - % Recovery  Ammonia (as N)  Spike - % Recovery  Alkali Metals  Calcium	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP CP CP CP	% % % % % % %	98  Result 1  95  93  95  94  89  93  93  96  Result 1  88  Result 1  93		75-125 75-125 75-125 75-125 75-125 75-125 75-125 75-125 70-130	Pass Pass Pass Pass Pass Pass Pass Pass	
Spike - % Recovery  Heavy Metals  Arsenic (filtered)  Cadmium (filtered)  Chromium (filtered)  Copper (filtered)  Lead (filtered)  Mercury (filtered)  Nickel (filtered)  Zinc (filtered)  Spike - % Recovery  Ammonia (as N)  Spike - % Recovery  Alkali Metals	M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677 M25-Ja0027677	CP CP CP CP CP CP CP	% % % % % % %	98  Result 1  95  93  95  94  89  93  93  96  Result 1  88		75-125 75-125 75-125 75-125 75-125 75-125 75-125 75-125 75-125	Pass Pass Pass Pass Pass Pass Pass Pass	





Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
				Result 1					
Ammonia (as N)	M25-Ja0027684	CP	%	74			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	M25-Ja0025136	NCP	mg/L	5200	5200	<1	30%	Pass	
Conductivity (at 25 °C)	M25-Ja0024891	NCP	uS/cm	33	36	7.6	30%	Pass	
pH (at 25 °C)	M25-Ja0024891	NCP	pH Units	5.0	5.0	pass	30%	Pass	
Sulphate (as SO4)	M25-Ja0025136	NCP	mg/L	1200	1200	1.0	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	M25-Ja0027677	СР	mg/L	100	130	25	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M25-Ja0027677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	M25-Ja0027677	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M25-Ja0027677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M25-Ja0027677	CP	mg/L	0.004	0.005	3.0	30%	Pass	
Lead (filtered)	M25-Ja0027677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	M25-Ja0027677	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M25-Ja0027677	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	M25-Ja0027677	CP	mg/L	0.008	0.009	6.0	30%	Pass	
Duplicate									
	-	_		Result 1	Result 2	RPD			
Fluoride	M25-Ja0027678	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	M25-Ja0027678	CP	mg/L	8.4	8.3	1.0	30%	Pass	
Magnesium	M25-Ja0027678	CP	mg/L	7.7	7.8	<1	30%	Pass	
Potassium	M25-Ja0027678	CP	mg/L	2.5	2.5	<1	30%	Pass	
Sodium	M25-Ja0027678	CP	mg/L	55	55	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Fluoride	M25-Ja0027680	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M25-Ja0027683	CP	mg/L	0.52	0.43	18	30%	Pass	





# **Environment Testing**

#### Comments

#### Sample Integrity

Custody Seals Intact (if used)

Altempt to Chill was evident

Yes
Sample correctly preserved

Appropriate sample containers have been used

Yes
Sample containers for volatile analysis received with minimal headspace

Samples received within HoldingTime

Yes
Some samples have been subcontracted

No

#### Authorised by:

Karl Bulow Analytical Services Manager
Mary Makarios Senior Analyst-Inorganic
Vivian Wang Senior Analyst-Metal

Glenn Jackson Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested
- \* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please  $\operatorname{\underline{click}}$  here.

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Project Number: 68664 Project Name: Land Slide Water Quality Testing , 599 Point Nepean Road , PSM

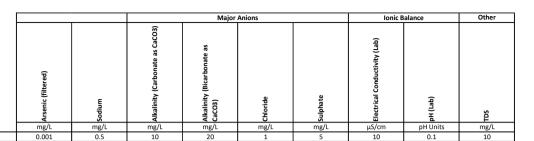


ity	Testing , 599 Poi	nt Nepean Road ,	PSM	Market 9	Metalloids					Maalliala		)F	<b>R/</b>	Cations	<b>-</b> T
				ivietais &	vietalioids				No	on-Metallic Inorga	lics		Major	Cations	
	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)	Ammonia as N	Fluoride	Nitrate (as N)	Caktium	Potassium	Magnesium	
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MG/L	mg/L	mg/L	mg/L	j
1	0.001	0.0002	0.001	0.001	0.001	0.0001	0.001	0.005	0.01	0.5	0.02	0.5	0.5	0.5	j

Location Code	Field ID	Date	Lab Report Number														
SW01	SW01	20 Jan 2025	1179041	< 0.001	<0.0002	< 0.001	0.004	< 0.001	< 0.0001	< 0.001	0.008	0.02	<0.5	0.27	9.6	1.2	1.6
SW02	SW02	20 Jan 2025	1179041	<0.001	<0.0002	< 0.001	0.006	< 0.001	< 0.0001	0.001	< 0.005	0.79	<0.5	< 0.02	8.4	2.5	7.7
SW03	SW03	20 Jan 2025	1179041	<0.001	<0.0002	< 0.001	0.006	< 0.001	< 0.0001	0.001	< 0.005	0.48	< 0.5	< 0.4	11	3.3	8.2
SW04	SW04	20 Jan 2025	1179041	<0.001	<0.0002	<0.001	0.005	< 0.001	< 0.0001	0.001	< 0.005	0.62	< 0.5	< 0.4	10	2.8	7.6
SW05	SW05	20 Jan 2025	1179041	0.007	<0.0002	0.002	0.008	< 0.001	< 0.0001	0.002	0.009	0.42	<0.5	< 0.4	41	14	21

Project Number: 68664 Project Name: Land Slide Water Quality Testing , 599 Point Nepean Road , PSM



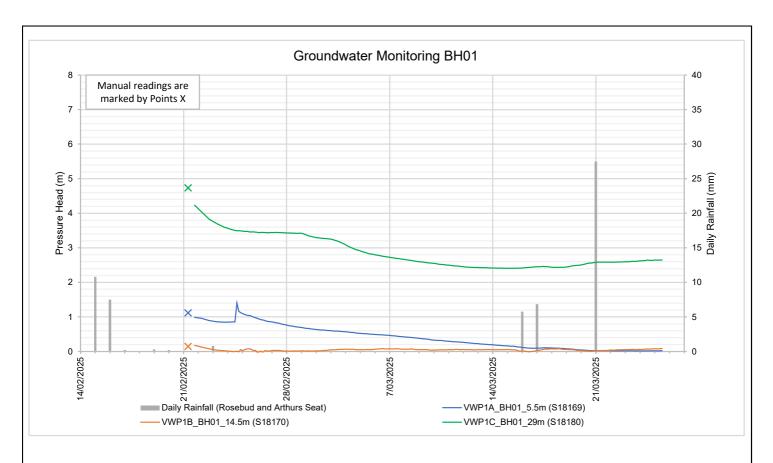


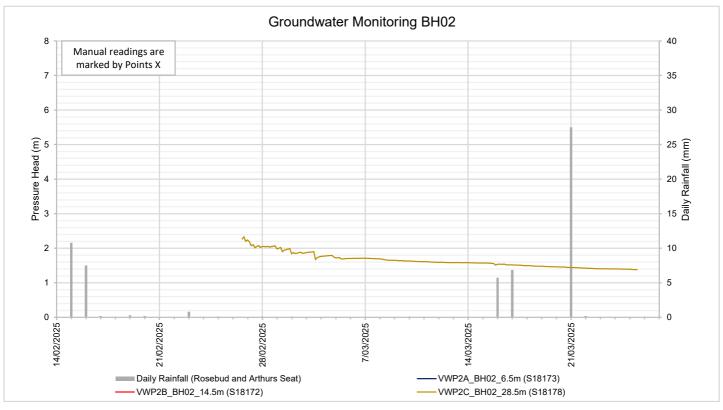
Location Code	Field ID	Date	Lab Report Number									
SW01	SW01	20 Jan 2025	1179041	< 0.001	11	<10	41	19	<5	140	6.8	100
SW02	SW02	20 Jan 2025	1179041	< 0.001	55	<10	79	81	19	400	6.9	1,400
SW03	SW03	20 Jan 2025	1179041	< 0.001	64	<10	95	90	27	480	7.2	1,400
SW04	SW04	20 Jan 2025	1179041	< 0.001	57	<10	93	89	20	440	7.4	1,100
SW05	SW05	20 Jan 2025	1179041	0.007	160	<10	190	240	100	1,200	8.0	640



# **Appendix G Piezometer Monitoring Results**







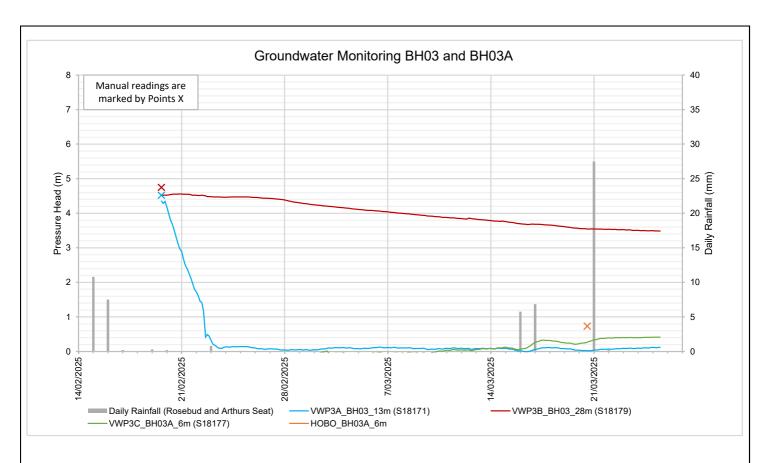
Notes: 1. Daily rainfall data has been averaged from the daily rainfall available at Rosebud (Country Club) Station ID 86213 and Arthurs Seat Rain Gauge at Seawinds National Park Station ID 586202. This data is provided up to 24/03/2025.

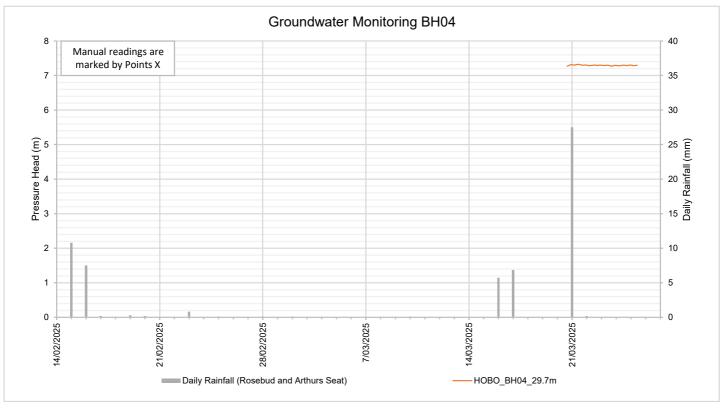


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Geotechnical Investigation
Groundwater Monitoring
BH01 and BH02

PSM5665-GFR

FIGURE G1





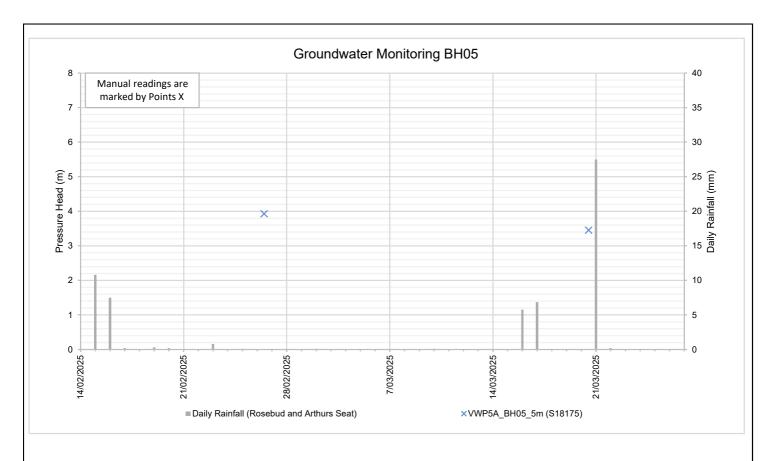
Notes: 1. Daily rainfall data has been averaged from the daily rainfall available at Rosebud (Country Club) Station ID 86213 and Arthurs Seat Rain Gauge at Seawinds National Park Station ID 586202. This data is provided up to 24/03/2025.

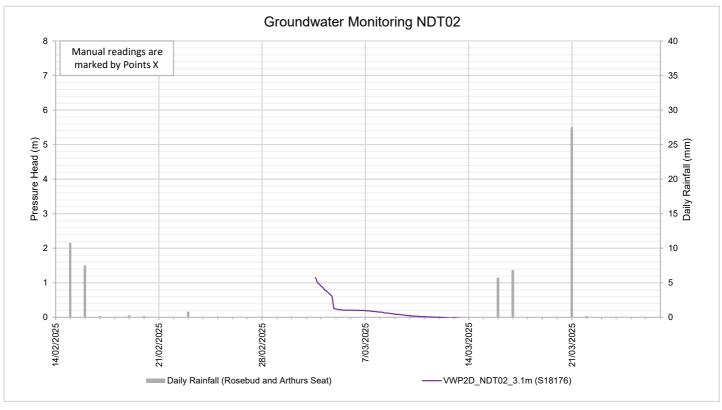


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Groundwater Monitoring
BH03, BH03A and BH04

PSM5665-GFR

FIGURE G2





Notes: 1. Daily rainfall data has been averaged from the daily rainfall available at Rosebud (Country Club) Station ID 86213 and Arthurs Seat Rain Gauge at Seawinds National Park Station ID 586202. This data is provided up to 24/03/2025.



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BH05 and NDT02

PSM5665-GFR

FIGURE G3