Geotechnical Investigation Report

New Bankstown Hospital

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26 February 2026
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Refer Appendix A for additional notes and limitations related to this report.

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Abbreviations

Abbreviation	Description
AHD	Australian Height Datum
AIP	Aquifer Interference Policy
ASS	Acid Sulfate Soils
BYDA	Before You Dig Australia
CBR	California Bearing Ratio
CEMP	Construction Environment Management Plan
CRD	Cumulative Rainfall Departure
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DLWC	Department of Land and Water Conservation
DMP	Dewatering Management Protocol
EC	Electrical Conductivity
ECe	corrected Electrical Conductivity value
GIA	Groundwater Impact Assessment
GIR	Geotechnical Interpretive Report
ha	Hectares
HGL	Hydrogeological Landscapes
HI	Health Infrastructure New South Wales
ID	Identification name
km	Kilometres
L/sec	Litres per second
m	Metres
mbgl	Metres below ground level
mTOC	Meters below Top of Casing
ML	Megalitres
ML/year	Megalitres per year
MPa	Megapascal
m/day	Metres per day
mg/L	Milligrams per litre
m^3	Cubic metres
PESA	Preliminary Erosion and Sedimentation Assessment
PVC	Polyvinyl Chloride
RL	Relative level in meters Australian Height Datum
RIS	Reduced Inorganic Sulfur
SEARs	Secretary's Environmental Requirements
SSDA	State Significant Development Application
SWMS	Safe Work Method Statements
TAFE	Technical and Further Education
TfNSW	Transport for New South Wales
TRH	Total Recoverable Hydrocarbons
UCS	Unconfined Compressive Strength
WAL	Water Access Licence

1. Introduction

1.1 Project Description

SMEC Australia Pty Ltd (SMEC) has been engaged by Health Infrastructure New South Wales (HI) to undertake geotechnical and environmental investigations for the development of the New Bankstown Hospital. SMEC understands that HI has engaged Capital Insight Pty Ltd (CIP) as the project manager for this project. The new hospital development is currently at a concept design stage and will include contemporary purpose-built facilities for emergency health care and community health services.

1.2 Proposed Development

The New Bankstown Hospital is proposed to be built at the current Bankstown TAFE site in south-western Sydney (refer Figure 1–1). The site is located at 490 Chapel Road, Bankstown, within the Canterbury Bankstown Local Government Area (LGA).

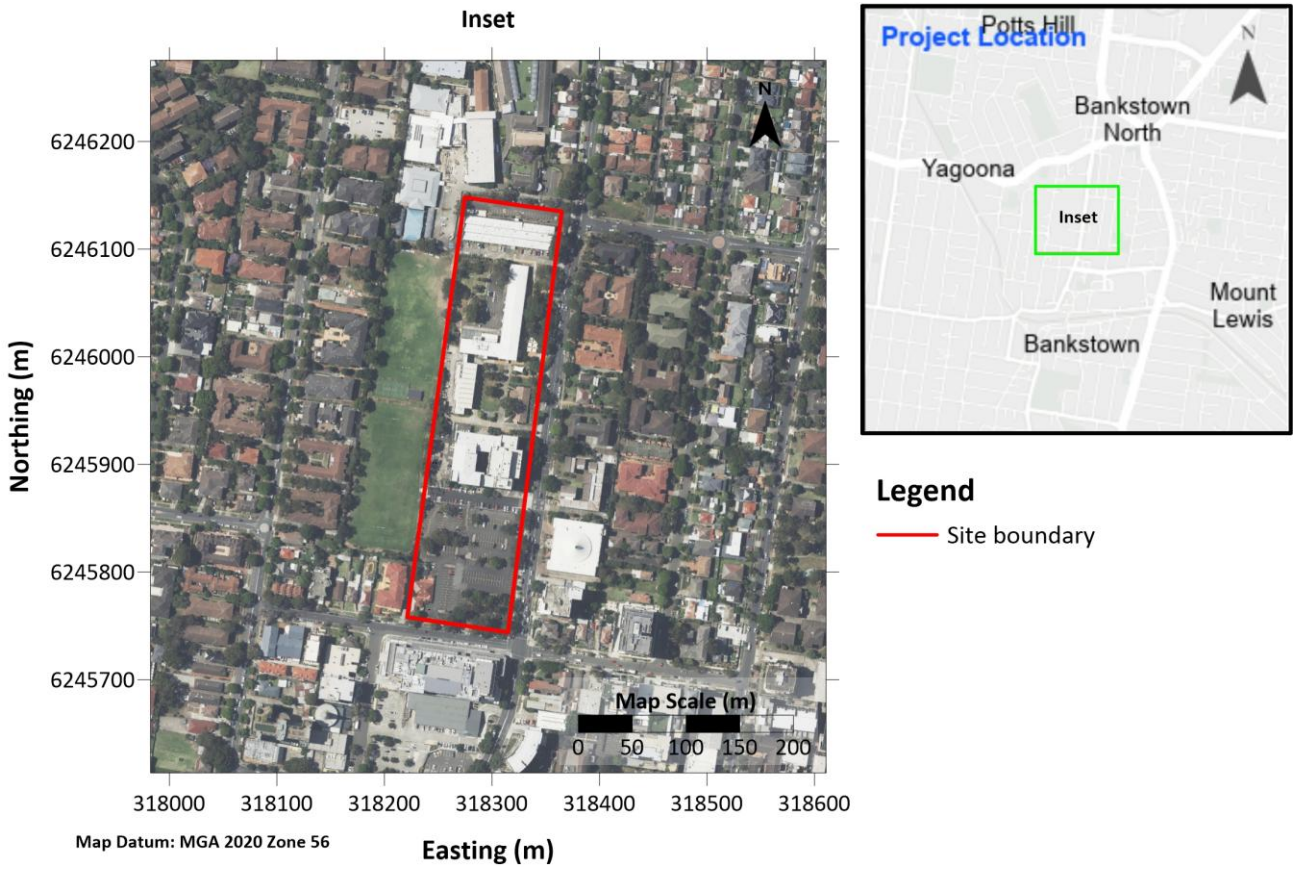


Figure 1–1: Site aerial of the proposed development

1.2.1 Summary of the Activity

The proposed development includes the construction and operation of a new health services facility (hospital) including the following works:

- A 14 storey hospital building plus roof plant
- A 10 storey building for logistics and multi-storey car parking
- Site preparation including earthworks, cut and fill and tree removal

- Construction of new vehicular access points, internal roads and on-grade car parking spaces
- Inground building services works and utility adjustments, including service diversions
- Building foundation works
- Signage, including wayfinding
- Landscaping.

The EIS prepared by Colliers provides a full description of the proposed works. The concept stage design surface layout is shown on Figure 1–2. The architectural block and stack drawings, shown on Figure 1–3, indicate:

- In the southern part of the Site a car park basement excavation (B01) with finished slab level at Relative Level (RL) 28.55 meters Australian Height Datum (AHD).
- In the southern to central part of the Site excavation for a building level (L00) with finished slab level at RL 32.05 mAHD.
- In the central part of the Site excavation for an above ground car park structure (C01) with finished slab level at RL 36.55mAHD.

1.3 Scope of this Report

The content of this Geotechnical Investigation Report (GIR) follows the scope and technical requirements for the concept stage geotechnical design provided by HI, and includes:

- A description of the work carried out
- Site description and site investigation plan showing borehole locations and relevant site features
- Description of the soil and rock types encountered
- Engineering borehole logs and site photographs
- Geotechnical laboratory test results
- Geotechnical interpretation and evaluation of the investigation results
- Recommended geotechnical design parameters
- Groundwater assessment including hydraulic permeability and inflow assessment
- High-level advice on foundations and retention systems
- Recommendation for geotechnical instrumentation/monitoring as appropriate.

1.4 Changes Since Previous Submission

The Geotechnical Investigation Report (SMEC, 2025) was undertaken for an initial concept design which did not include the car park basement excavation. In mid-late 2025 additional site investigations and groundwater level monitoring were undertaken to provide inputs to the revised concept design which includes excavation areas and a car park basement. The GIR has been updated to include these results in this Report.

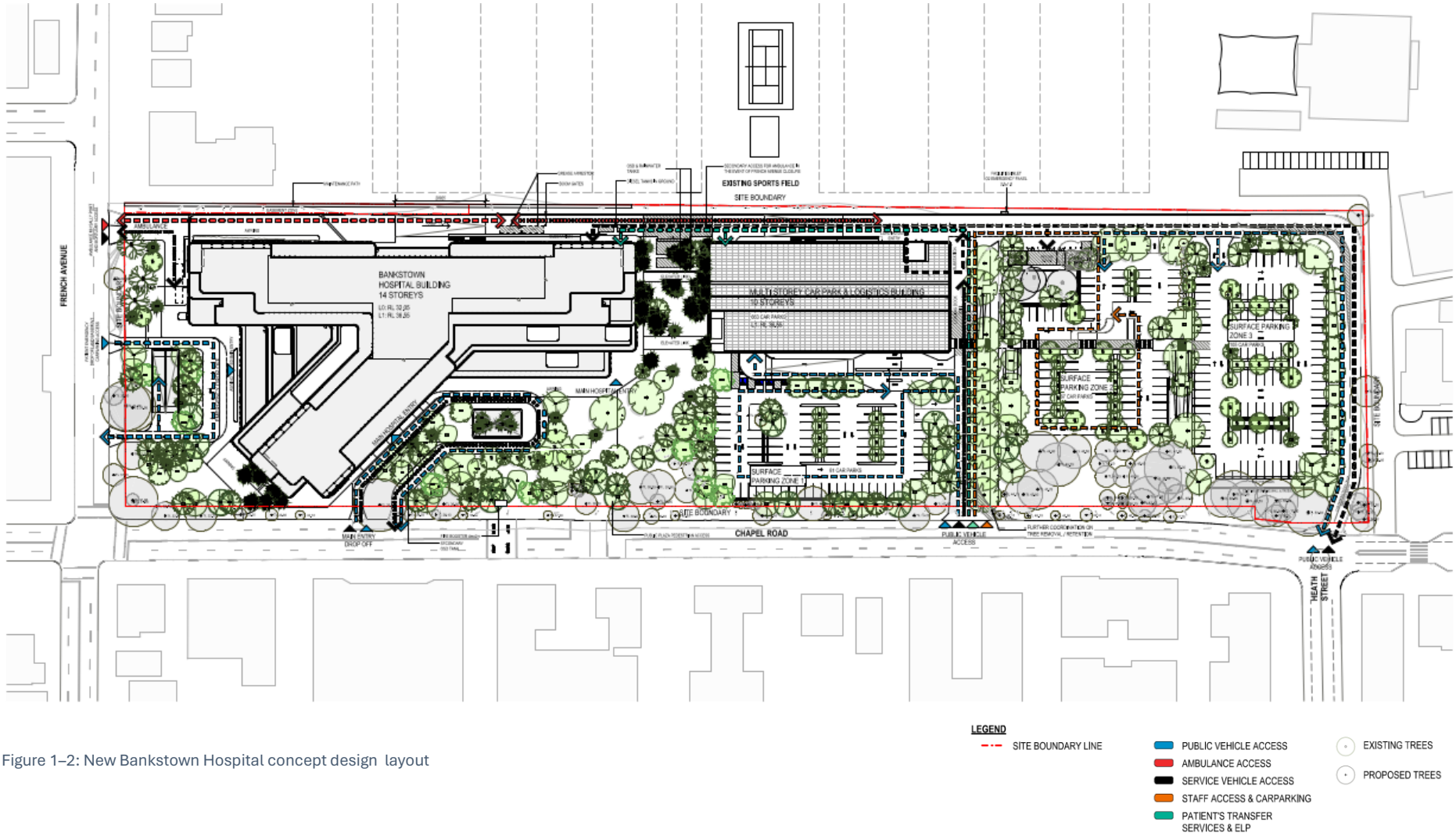


Figure 1–2: New Bankstown Hospital concept design layout

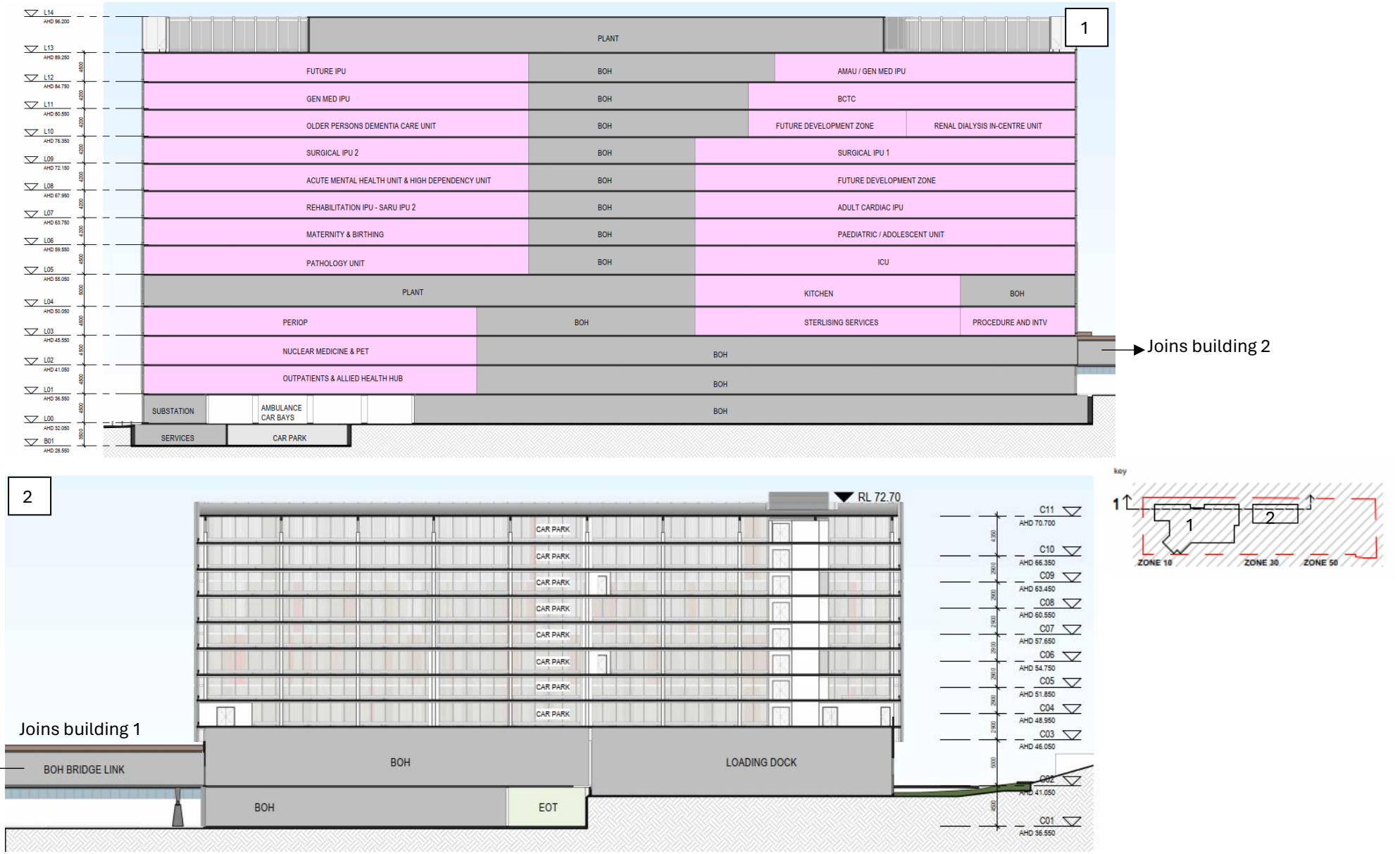


Figure 1–3: Conceptual design building sections with elevation levels

1.5 Scope of Geotechnical Works

Geotechnical investigation is required to assess the ground conditions at the site and to inform the hospital concept design.

The scope for the geotechnical investigations for this includes:

- Undertaking 16 shallow boreholes (i.e. drilled to a maximum depth of 15m below ground level) within the site to assess the ground conditions
- Undertaking 2 deep boreholes (i.e. drilled to 32m below ground level) to inform the geotechnical design of pile foundations for the proposed Y-shaped multi-storey hospital building
- Installation of 3 groundwater bores within the footprint of the proposed basement including hydraulic permeability and inflow assessment
- Undertaking geotechnical test pits and collection of up to 8 bulk samples for CBR testing
- Laboratory testing of soil, rock and groundwater samples
- Groundwater level monitoring in installed and existing monitoring
- Reporting, including Groundwater Impact Assessment.

The Groundwater Impact Assessment (GIA) has been undertaken to support HI's State Significant Development Application (SSDA). The GIA was undertaken in general accordance with the Guidelines for Groundwater Documentation for SSD/SSI Projects (DPE, 2022) to address Requirement 13 of the Secretary's Environmental Requirements (SEARs). The Surface Impact assessment, part of Requirement 13, is not part of the scope of works and is understood to have been undertaken by others.

2. Site Information

2.1 Site Location and Topography

The Site is located 2.5 km north-west of existing Bankstown-Lidcombe hospital, 4 km east of Bankstown Airport and 500 m North of Bankstown train station. The Site is bound by Chapel Road to the east, French Avenue to the south, a sports field to the west and a school to the north.

The Site is generally flat but slopes gently toward the south. Based on the surrounding topography, there is a minor slope towards the southerly direction which indicates that the Site has previously been levelled to facilitate the development of the current TAFE buildings, cark park, etc.

The development of the New Bankstown Hospital will require the demolition of the existing Bankstown TAFE, which is being undertaken under a separate planning approval. Figure 1 in Appendix B shows the extent of the Site.

2.2 Regional Geology

The Site is predominantly underlain by Bringelly Shale geological unit of the Permian-Triassic aged Wianamatta Group. Figure 2–1 shows the location of the Site and the regional geological units from the NSW Seamless Geology digital dataset v2.5 dated May 2025 (Colquhoun et al. 2024). The Bringelly Shale is described as light to mid-grey claystone to dark grey-black carbonaceous claystone, laminite, lithic sandstone, and rare coal.

The south-east of the Site is anticipated to be underlain by the Minchinbury Sandstone geological unit of varying thickness comprising fine to medium lithic sandstone. Minchinbury Sandstone forms a geological contact between Ashfield Shale (Twia) geological unit and Bringelly Shale geological unit. Ashfield Shale geological unit found at adjacent to the Site is described as black to light grey shale and laminite.

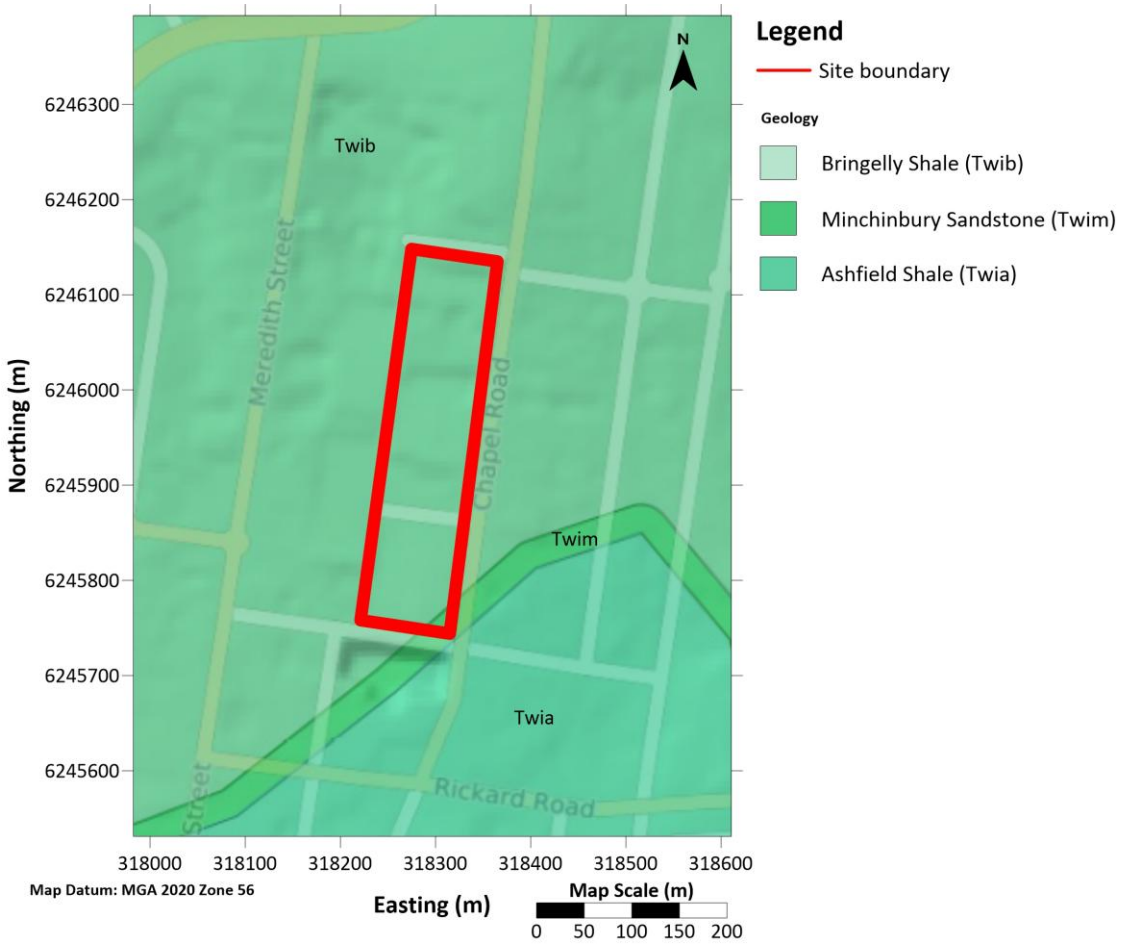


Figure 2–1: Regional geology of the Site (modified from NSW Seamless Geology digital dataset v2.5)

2.3 Soil Landscapes

The *Soil Landscapes of the Sydney 1:100,000 Sheet* (Chapman et al, 2009) indicates that the Site is underlain by the Blacktown and Glenorie soil landscapes as shown on Figure 2–2. The dominant soil landscape is the Glenorie soil landscape unit. This landscape comprises undulating to rolling low hills on Wianamatta Group shales. The dominate soil materials of the Glenorie soil landscape unit are friable dark brown loam, hardsetting brown clay loam, reddish brown strongly pedal clay, grey plastic clay and brownish grey plastic silty clay. Lateritic ironstone concretions may be found in the deep subsoil and are associated with the grey plastic clay. The Glenorie soil landscape unit features localised impermeable highly plastic soil which is moderately reactive, seasonal waterlogging, moderate surface swelling potential and a high soil erosion hazard if stripped of vegetation.

In the south of the Site the Blacktown soil landscape unit is present. Soils within this landscape comprise gently undulating rises on Wianamatta Group shales and Hawkesbury Sandstone. The main soil materials are similar to the Glenorie. The soil is moderately reactive, with seasonal waterlogging and moderate erodibility.

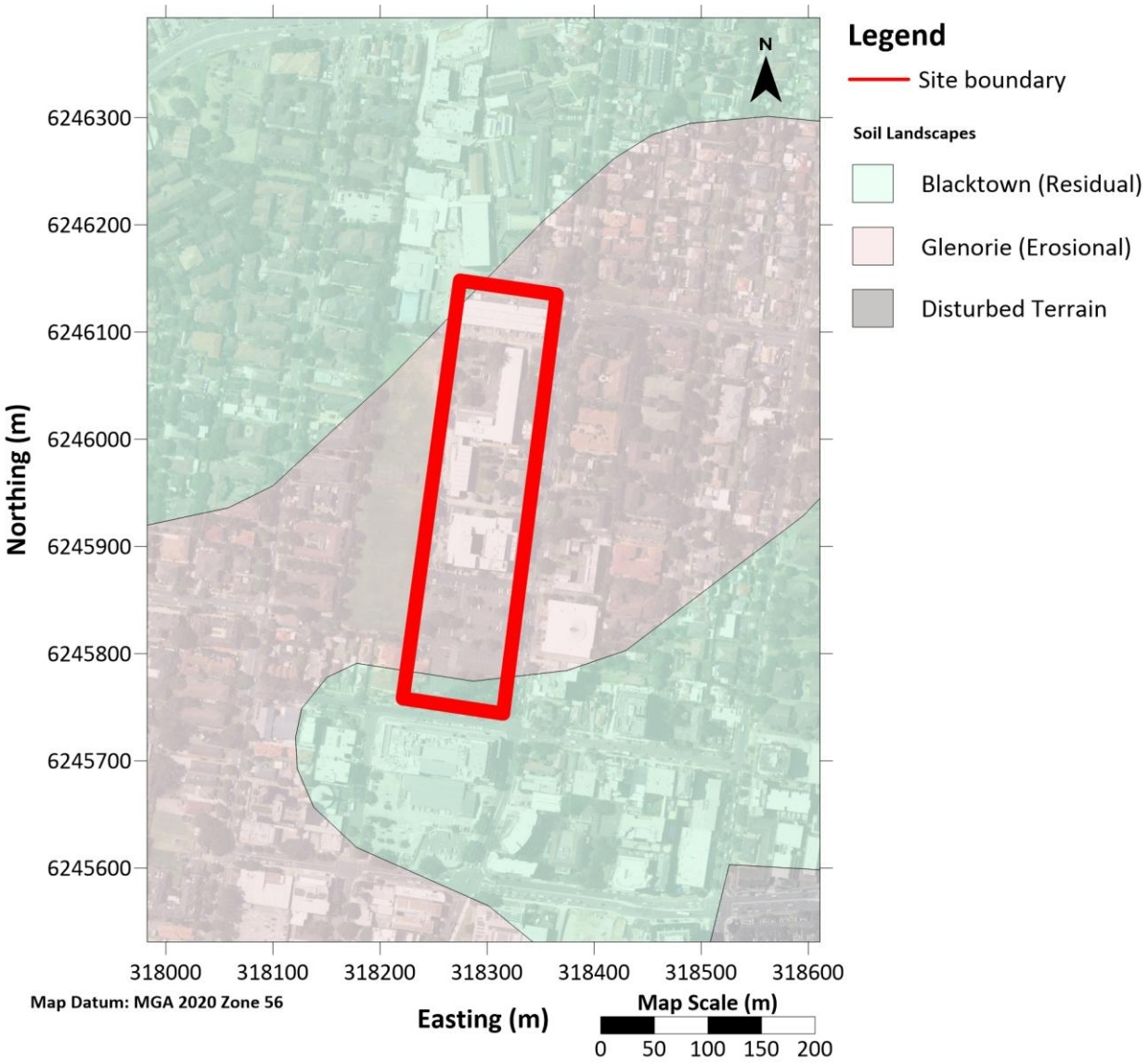


Figure 2–2: Soil landscapes at the Site (modifiled from Chapman et al 2009)

2.3.1 Soil salinity

Salinity outbreaks are most common on lower slopes and drainage systems where salt concentrations develop due to the presence of shallow groundwater or poorly drained clayey soils which have the potential to become waterlogged. Figure 2–3 shows the mapped Salinity Potential in Western Sydney, from the digital dataset (DCCEEW, 2002), for the Site is of 'moderate salinity potential' with 'high salinity potential' in the southwestern corner of the site.

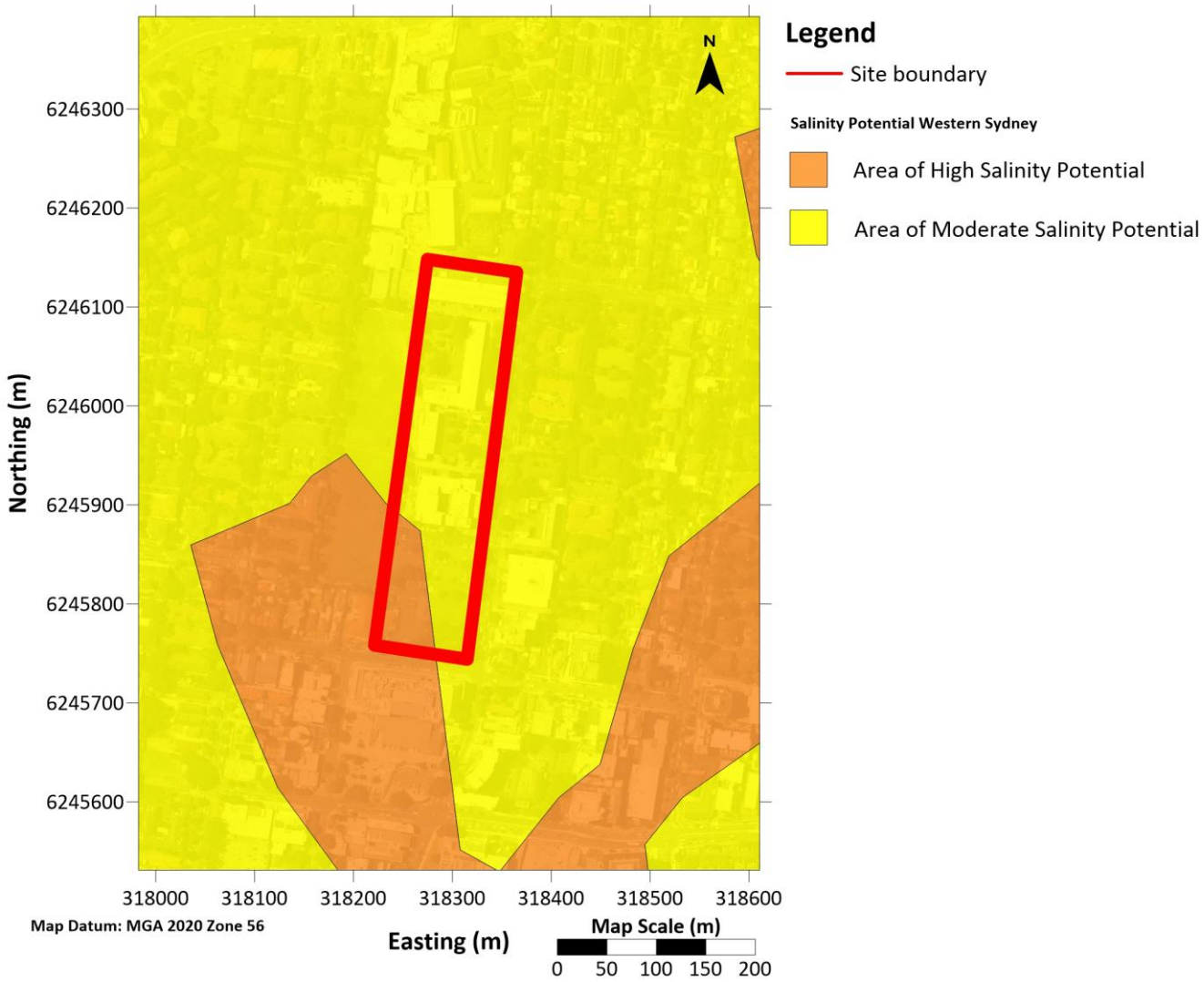


Figure 2–3: Soil salinity potential map (modified from DCCEEW, 2002)

2.3.2 Acid sulphate soils

Acid Sulfate Soils (ASS) are naturally occurring soil and sediment, distinguished from other soil or sediment materials by having properties and behaviour that have either been affected by the oxidation of Reduced Inorganic Sulfur (RIS) (principally the mineral iron pyrite), or the capacity to be affected considerably by the oxidation of their RIS constituents. These soils are typically found in low-lying coastal areas and saline inland areas (Sullivan et al., 2018). Coastal ASS are generally found on land with elevation less than 5 mAHD (Sullivan et al., 2018).

Review of the Acid sulfate soil risk mapping available online (DCCEEW, 1998) indicates the Site is not within an area of mapped ASS risk.

3. Fieldwork and Methodology

3.1 Preparatory Works

Prior to any field work commencing on site, Safe Work Method Statements (SWMS) were prepared for the geotechnical site investigation. This included the preparation of an excavation planning checklist, excavation work plan and a construction hazard log. All field staff also completed “Working with Children Check” and the relevant TAFE induction prior to commencement of the field work.

A set of Before You Dig Australia (BYDA) plans was obtained for the investigation area. Copies of valid BYDA plans and any sketches indicating the locations of known utilities (i.e. detailed services survey plan) were kept on site during investigations and referred to when mobilising and setting up plant at specific test locations. A service locator carried out utility scanning in the vicinity of the borehole locations to check for the presence of any potential services.

3.2 Fieldwork

The geotechnical investigations were undertaken during the following periods:

- Between 9 December 2024 and 6 January 2025, excluding works during the Christmas period, with two track mounted drilling rigs were mobilised to undertake a total of 16 boreholes, 3 test pits and 3 groundwater monitoring bores
- 14 January 2025 for the installation of groundwater level monitoring ‘data loggers’ in existing monitoring bores
- Between 3 September and 8 October 2025 with a truck and track mounted drilling rig mobilised to undertake the two deep 2 boreholes and 3 groundwater monitoring bores,
- Between 30 September 2025 and 1 October 2025 to undertake groundwater bore development, hydraulic conductivity testing and installation of ‘data loggers’ in two of the new bores
- 8 October 2025 to undertake groundwater quality sampling
- 12 February 2026 for the completion of the groundwater level monitoring.

All boreholes, with the exception of BH201A, BH201B and BH202A, were commenced using convention spiral auger techniques through the soils and some of the upper more weathered and lower strength rock. The rock was then core drilled to the borehole termination depth using rotary diamond coring techniques and an NMLC triple tube core barrel with water flush. Groundwater bores BH201A, BH201B and BH202A were installed using convention spiral auger techniques to target depth.

The strength and relative density of the encountered subsurface profile was assessed from Standard Penetration Test (SPT) ‘N’ values, undertaken at 1.5m intervals. Where the rock was core drilled, the recovered rock core was placed in steel core trays, photographed and point load strength index (I(s50)) testing was carried out on site. Using established correlations, the Unconfined Compressive Strength (UCS) of the bedrock was estimated from the I(s50) results. Four selected rock core samples were delivered to the laboratory for Unconfined Compressive Strength (UCS).

Groundwater was not observed during auger drilling and test pitting. Groundwater observations in the boreholes could not be made below the auger drilling depth due to the use of drilling fluid during rock coring.

All boreholes, test pits and groundwater monitoring bore locations are presented in Table 4–1and were surveyed by SMEC survey subcontractor, except for BH201 and BH202 which are measured in relation to respective ground water wells. The datum of the levels is Australian Height Datum (AHD) and the coordinates are in Map Grid of Australia (MGA) 2020, Zone 56.

The recovered soil and rock samples were logged onsite in accordance with AS1726-2017 by a SMEC Geotechnical Engineer who directed the site works and in-situ testing. All boreholes were backfilled using the cutting material upon completion. Engineering borehole logs and explanatory notes are presented in Appendix C.

Test pit logs are enclosed in Appendix D. Groundwater monitor bore logs and construction details are presented along with respective borehole logs in Appendix C.

Prior to development, hydraulic permeability testing and groundwater sampling the groundwater level was measured using an electronic dip meter. Hydraulic permeability testing was undertaken using the rising head test method. Groundwater sampling was undertaken using the low flow sampling method.

3.3 Groundwater Bores

Groundwater monitoring bores were installed at BH101, BH102 and BH103 on 19 December 2024 and at BH201A, BH201B and BH202A in September 2025. The monitoring bores were constructed in general accordance with the Minimum Construction Requirements of Water bores in Australia Ed 4 (NUDLC, 2020), which consisted of:

- Class 18, uPVC (unplasticized polyvinyl chloride) casing with screwed joins
- 1mm machine slotted screens
- Graded 3 to 6mm clean quartz gravel filter pack
- Bentonite seal above the gravel pack and grout backfill to surface.

BH101, BH102 and BH103 were developed following installation and BH201A, BH201B and BH202A were developed on 30 September 2025. Table 3–1 provides a summary of the monitoring bore details including total depth and screened lithology. The elevation of the top of the PVC casing was surveyed, with levels presented in Section 4.3.1.

Table 3–1: Summary of Site monitoring bore construction details

BH ID	Total Constructed Depth (mbgl)	Hole size (mm)	Screen Interval (mbgl)	Gravel Pack Interval (mbgl)	Screened Lithology
BH101	12.6	110	9.6 to 12.6	9.4 to 12.6	Siltstone
BH102	11.1	110	8.1 to 11.1	7.6 to 11.1	Sandstone
BH103	14.5	110	8.5 to 14.5	8.0 to 14.5	Sandstone
BH201A	8.8	115	5.8 to 8.8	5.0 to 8.8	Siltstone
BH201B	5.1	115	2.1 to 5.1	1.8 to 5.1	Silty clay
BH202A	10.7	115	7.7 to 10.7	7.0 to 10.7	Siltstone

In January 2024 pressure transducers with electronic logging capabilities (i.e. data loggers) were installed in BH101, BH102 and BH103. Following the completion of the hydraulic permeability testing in October 2025 the data loggers from BH101 and BH102 were moved to BH201A and BH201B whilst the data logger in BH103 remained. Data loggers had previously been recording at 6 hourly intervals and were relaunched to a 1-hour interval.

3.4 Laboratory Testing

3.4.1 Soil and Rock

Laboratory testing was carried out in a NATA accredited laboratory to assess geotechnical properties for the materials encountered. Laboratory analysis certificates are presented in Appendix E. The laboratory testing undertaken is presented in Table 3–2.

Table 3–2: Scope of Geotechnical Laboratory Testing

Laboratory Testing	Method	Quantity
Moisture Content	AS 1289 2.1.1	16
Atterberg Limits including Linear Shrinkage	AS 1289 3.1.1, 3.2.1, 3.3.1, 3.4.1	4
Particle Size Distribution	AS 1289.3.6.1	4
California Bearing Ratio (CBR) – 4 day soaked	AS 1289.6.1.1	8
Agressivity (pH, sulfate, chloride, electrical conductivity)	APHA	3
Point load strength on rock core	AS 4133.4.1	1 test per metre of rock core
Unconfined Compressive Strength test	AS 4133.4.2.2	4

3.4.2 Groundwater

Laboratory testing was carried out at a NATA accredited laboratory for six groundwater samples to assess the groundwater quality. Laboratory analysis certificates are presented in Appendix E. The following analytes were tested:

- Physical properties: pH, electrical conductivity (EC), total dissolved solids (TDS), total alkalinity
- Major ions: calcium, magnesium, potassium, sodium, chloride, ammonia, bicarbonate
- Total and dissolved heavy metals: iron, aluminium, manganese, arsenic, copper, nickel, lead, zinc, mercury, chromium
- Total Recoverable Hydrocarbons (TRH), oil and grease, total nitrogen, reactive phosphorous, total phosphate, nitrate, nitrite.

4. Geotechnical Investigation Results

4.1 General

Table 4–1 presents a summary of the investigation works undertaken.

Table 4–1: Investigation summary

Borehole / Test Pit ID	Easting	Northing	Approximate Elevation (m AHD)	Total Depth (m bgl)
BH01	318295.563	6246144.362	51.018	15.00
BH02	318357.824	6246138.407	52.339	15.30
BH03	318288.906	6246094.642	48.146	15.00
BH04	318349.673	6246081.553	48.129	15.00
BH05	318271.751	6246054.115	44.699	15.00
BH06	318328.780	6246012.171	40.846	15.00
BH07	318295.229	6245991.822	41.145	16.30
BH08	318330.611	6245975.232	41.056	15.00
BH09	318258.835	6245953.659	41.493	15.17
BH10	318337.944	6245948.613	41.088	14.93
BH11	318268.200	6245851.910	34.631	15.00
BH12	318312.120	6245851.080	36.193	15.25
BH13	318238.450	6245809.730	32.043	14.85
BH14	318305.240	6245792.600	33.738	15.00
BH15	318,251.890	6245776.500	31.684	15.00
BH16	318312.440	6245754.960	32.231	15.00
BH101	318281.470	6246145.279	50.089	12.60
BH102	318287.700	6245874.890	36.023	11.10
BH103	318308.110	6245755.610	32.064	14.50
BH201*	318243.000	6245902.000	36.000	32.00
BH201A	318245.730	6245901.553	36.260	9.00
BH201B	318248.132	6245901.200	36.380	5.50
BH202*	318239.000	6245764.000	31.000	32.00
BH202A	318241.989	6245765.001	30.920	10.70
TP01	318347.473	6246049.156	46.134	2.0
TP02	318293.930	6245812.870	34.334	1.5
TP03	318240.350	6245765.660	30.852	1.8
TP120	318324.397	6245880.852	37.044	1.0

**not surveyed, position and elevation estimated based on distance from nearby surveyed bore*

4.2 Subsurface Conditions

The encountered sub-surface conditions are summarised in Table 4–2. The boreholes generally encountered fill at shallow depths, underlain by residual soils grading into shale/siltstone bedrock. Reference should be made to the borehole logs attached in Appendix C for more pertinent details of the geotechnical conditions encountered during the investigation.

Table 4–2: Encountered sub-surface conditions

Unit Origin	Unit ID	Description	Is(50) (MPa)	Consistency / Strength
Existing FILL / topsoil / Asphalt / Concrete	Unit 1	Asphalt, concrete and topsoil. Fill typically comprises mixtures of Clay and Gravel in varying proportions	-	-
Residual Soil (Stiff or better) and extremely weathered material	Unit 2a to 2c	Silty CLAY / CLAY / Gravelly CLAY, medium and high plasticity, gravel is fine, angular to sub-angular	-	Stiff to Hard
Shale/Siltstone bedrock	Unit 3a to 3c	SHALE / SILTSTONE, ranging from very low to medium to high strength, extremely weathered to slightly weathered	0.01 to 3.1	Very low to Medium to High Strength

4.3 Groundwater

During drilling observations of groundwater inflow depths were limited to the auger drilling section and no visible groundwater inflows were observed at the time of drilling. It should be noted that groundwater levels are dynamic, may be subject to seasonal fluctuations, and may change in direct response to climatic events such as rainfall. No test pits encountered groundwater inflows at the time of test pit activities.

4.3.1 Groundwater Level

Table 4–3 presents the groundwater levels measured in the monitoring bores between January 2025 and October 2025 and in February 2026 in meters below top of casing (mTOC) which is the relative level (RL) reference point.

Table 4–4 presents the measured groundwater levels in mAHD.

Table 4–3: Groundwater level manual measurements in mTOC

Date	BH101	BH102	BH103	BH201A	BH201B	BH202A
19/12/2024	11.37	7.03	14.08	-	-	-
9/1/2025	10.50	8.90	10.82	-	-	-
14/01/2025	8.77	7.34	8.45	-	-	-
30/09/2025	8.06	7.65	8.00	3.56	1.09	5.63
1/10/2025	7.90	7.29	7.83	4.85	1.11	5.68
8/10/2025	8.10	7.51	7.90	4.95	0.28	6.82
12/02/2026	8.40	7.09	7.69	4.57	0.11	6.42

Table 4–4: Groundwater level manual measurements in mAHD

Date	BH101	BH102	BH103	BH201A	BH201B	BH202A
RL TOC (mAHD)	**50.02**	**36.10**	**32.15**	**36.14**	**36.15**	**30.83**
19/12/2024	38.65	29.07	22.02			
9/1/2025	39.52	27.20	25.28			
14/01/2025	41.25	28.76	27.65			
30/09/2025	41.96	28.45	28.10	32.58	35.06	25.20
1/10/2025	42.12	28.81	28.27	31.29	35.04	25.15
8/10/2025	41.92	28.59	28.20	31.20	35.87	24.01
12/02/2026	41.62	29.01	28.41	31.57	36.04	24.41

The installed data loggers were downloaded and processed for atmospheric compensation. Figure 4–1 presents the groundwater level hydrographs for the site including the manual measured water levels and logger trace data. The hydrograph also presents daily rainfall and cumulative rainfall departure (CRD), which has been assessed in general accordance with the method of Ferdowsian et al (2001).

The CRD compares the cumulative monthly rainfall with the long-term average monthly values to establish a trend in terms of periods of trends of above or below average rainfall. It is a useful tool for assessing drivers for water level changes in hydrographs and aids in the review of impacts caused by factors other than climate. Where a water table aquifer is responding to climatic variations the hydrograph plot will tend to mirror the CRD.

The groundwater level in BH101, BH102 and BH103 appears to increase following drilling and installation and likely reflects recovery after drilling. The logger trace data shows groundwater has a limited response to rainfall events with a subdued response to long term climatic conditions. There are very slight increases in groundwater level observed following significant rainfall. The CRD shows a trend of average to climatic conditions until May 2025 where the trend appears to show above average rainfall conditions.

Groundwater is present at BH201B in the residual soil / extremely weathered siltstone. The other monitoring bores are screened in the siltstone / sandstone bedrock and the depth to water ranges from around 4.9 mbgl at BH201A to 8.2 mbgl at BH101. The regional groundwater flow direction is anticipated to be south with discharge likely towards Salt Pan Creek which flows into the Georges River.

4.3.2 Hydraulic Permeability

Hydraulic permeability testing using the rising head method was undertaken between 30 September and 1 October 2025. At the end of development of BH201A and BH201B, a water foot valve was used to remove as much water from the bore as possible and then the recovery of the water level over time was measured. In the six monitoring bores a disposable plastic bailer was used to remove a slug of water from the bore. A single falling head test was undertaken in BH103 using a plastic bailer filled with water.

The slug test method involves the displacement of water and measuring the rate at which the water level recovers. The data was processed using the slug test wizard in Aqtesolv Pro (version 4.50.002) for a confined aquifer using the Bouwer-Rice (1976) and Hvorslev (1951) solutions. The analysis reports are provided in Appendix G and a summary of the estimated permeability (K) is provided in Table 4–5.

The results showed a double straight-line effect which is typically in lower permeability material where the first slope reflects drainage of the gravel pack under gravity. Analysis considered the second slope to be more representative of the aquifer. The estimated hydraulic permeability of the siltstone ranges from 0.001 m/day to 0.009 m/day and is within the typical values for this material type. The silty clay / weathered siltstone is within the same order of magnitude at around 0.002 m/day. The sandstone shows a higher permeability and ranges from around 0.02 m/day to 0.07 m/day.

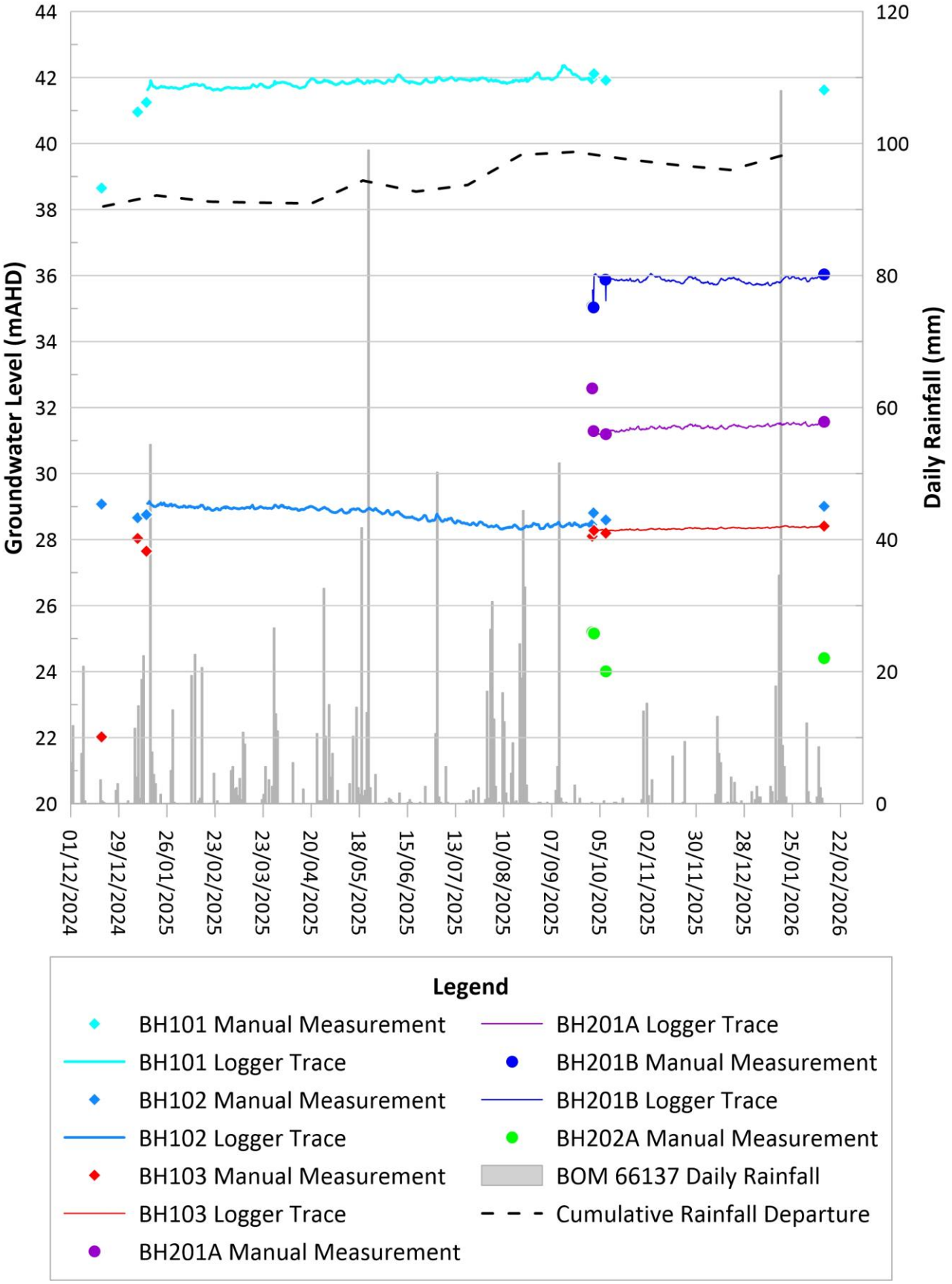


Figure 4–1: Groundwater hydrograph for groundwater levels at the Site

Table 4–5: Summary of results and estimated hydraulic permeability

BH ID	Number of tests	Average K in m/day (Bouwer-Rice)	Average K in m/day (Hvorslev)	Average K in m/sec (Bouwer-Rice)	Average K in m/sec (Hvorslev)	Screened Lithology
BH101	1	0.007	0.001	8.1E-08	1.1E-08	Siltstone
BH102	1	0.024	0.032	2.7E-07	3.7E-07	Sandstone
BH103	3	0.040	0.070	4.5E-07	8.0E-07	Sandstone
B201A	2	0.006	0.009	6.9E-08	9.8E-08	Siltstone
BH201B	2	0.002	0.003	1.7E-08	3.4E-08	Silty clay
BH202A	2	0.008	0.01	9.2E-08	1.1E-07	Siltstone

4.3.3 Groundwater Quality

Groundwater samples were collected on 8 October 2025 using a bladder pump low flow sampling method. Field measurements of groundwater parameters were undertaken during the purging stage prior to the sample being collected. Appendix H provides the field sampling record sheets. Table 4–6 provides a summary of selected field water quality results. The monitoring bores typically have brackish to saline electrical conductivity results and low pH. The results at BH202A may reflect the recent development in which potable water was added to assist with the removing of drilling fines.

Table 4–6: Summary of selected field water quality results

Bore ID	pH	Electrical Conductivity (µS/cm)	Redox (mV)	Temperature (°C)
BH101	6.99	12,394	-266.9	22.3
BH102	6.70	13,477	-33.1	19.8
BH103	6.91	11,666	-299.7	21.1
BH201A	6.53	11,720	27.9	19.9
BH201B	4.55	1,780	208.7	19.1
BH202A	5.86	4,453	118.4	22.4

4.4 Laboratory Results

4.4.1 Soil and Rock

The results from the laboratory testing are presented in Table 4–7 to Table 4–11. Point load test results are shown on the borehole logs enclosed in Appendix C. Laboratory test certificates, including particle size distribution graphs and unconfined compressive strength, are presented in Appendix E. Some of the bulk samples were combined for laboratory California Bearing Ratio (CBR) testing due to limited samples collected provided they appear to have similar grading.

The clay plasticity results indicate that the clay samples were generally medium and high plasticity clay. The Atterberg Limit test results have been plotted on the soil plasticity chart in Figure 4–2.

Table 4–7: Moisture content results

Sample	Material	Moisture Content (%)
BH01 1.00 – 1.45m	Clay with gravel	14.1
BH02 1.00 – 1.30m	Silty Clay	19.5
BH03 1.50 – 1.94m	Fill: Gravelly Clay	24.3
BH04 3.50 – 4.00m	Silty Clay	9.4
BH06 1.00-1.07m	Fill: Silty Clay	21.4
BH07 1.50 – 1.70m	Fill: Silty Clay	12.3
BH07 4.50 – 4.64m	Silty Clay	6.5
BH08 1.00 – 1.45m	Fill: Silty Clay	9.2
BH09 1.00 – 1.45m	Fill: Clay	14.9
BH10 2.50 – 2.95m	Clay	10.6
BH11 3.00 – 3.22m	Silty Clay	11.7
BH13 4.00 – 4.45m	Silty Gravelly Clay	15.0
BH14 1.50 – 1.63m	Gravelly Clay	7.1
BH15 4.00 – 4.05m	Clay with Gravel	22.0
BH16 1.50 – 1.76m	Gravelly Clay	7.5

Table 4–8: CBR and compaction test results

Sample	Material	CBR at 2.5mm Penetration (%)	CBR swell (%)	Maximum Dry Density (t/m^3)	Optimum Moisture Content (%)
BH02 0.8 – 1.4m	Silty Clay	1.5	5.8	1.74	17.8
BH11 0.60 – 1.00m & 1.6-2m	Fill: Gravelly Clay	2.5	2.6	1.65	20.4
BH14 0.6 – 1.0m & 1.6-2m	Gravelly Clay	1.0	6.2	1.68	20.2
BH15 1.2 – 1.7m & 1.7-2.2m	Clay	1.5	4.7	1.88	14.1
TP01 0.6 – 1.0m & 0.8-2m	Fill: Silty Sand with Cobbles	20.0	0.2	1.93	11.5
TP02 1.0 – 1.5m	Clay	2.0	6.5	1.74	18.5
TP03 1.20 – 1.70m	Clay	6.0	1.1	1.78	17.9
TP120 0.6 – 1.0m & 1.6-2m	Clay with cobbles	4.0	3.6	1.79	16.9

Table 4–9: Atterberg limits and linear shrinkage test results

Sample	Material	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)
BH01 1.00 – 1.45m	Clay with gravel	48	18	30	12.5
BH07 3.00 – 3.50m	Silty Clay	37	14	23	10.5
BH13 1.00 – 1.45m	Gravelly Clay	57	15	42	13.0
BH15 2.50 – 2.95m	Clay	38	16	22	12.0

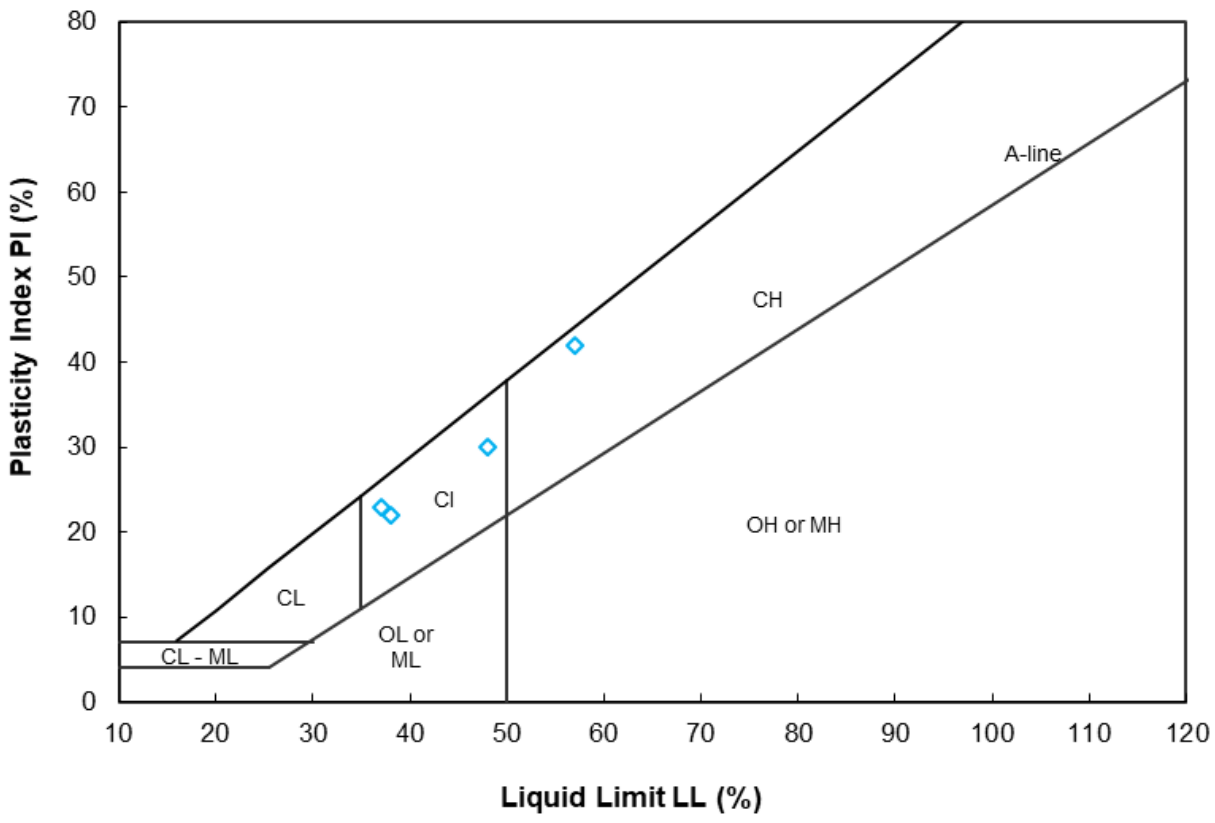


Figure 4–2: Atterberg limit test results

The particle size distribution test of selected samples generally indicate that the laboratory soil description is consistent with material description on borehole logs.

Laboratory test results relevant to aggressivity assessment are presented in Table 4–10.

Table 4–10: Aggressivity test results

Sample	Material	pH	Sulfate (mg/kg)	Chloride (mg/kg)	Electrical Conductivity (µS/cm)
BH02 2.5 – 2.8m	Silty Clay/Clay	8.9	73	55	140
BH09 2.5 – 2.95m	Clay	5.0	180	30	140
BH15 1.0– 1.45m	Clay	5.6	480	640	770
TP108 0.6 to 1.0m	Clay	4.3	-	-	140
TP110 0.6 to 0.7m	Clay	5.0	-	-	200
TP123 0.4 to 0.7m	Clay	4.1	-	-	350
TP131 0.5 to 1.1m	Clay	6.7	-	-	200

Table 4–11: Unconfined compressive strength test results

Sample ID	Depth (m)	Material	UCS (MPa)	Failure Mode
BH201	12.42 – 12.62	Siltstone	14	Axial Multiple
BH201	24.68 – 24.94	Sandstone	87+	Mixed Mode
BH202	8.17 – 8.35	Siltstone	5.7	Axial Multiple
BH202 *	11.07 – 11.3	Siltstone	16	Axial Multiple

*Sample length to diameter ratio was outside 2-2.5

The ratio between the axial point load and Unconfined Compressive Strength (UCS) results are presented in Table 4–12. The ratio correlates well with our field assessments of rock strength. Based on our previous experiences on Shales and Sandstone in Sydney region, it is anticipated that the ratio of UCS to the axial point load for medium strength and better rock to be 20 for Sandstone and 13 to 16 for Shale/Siltstone.

Table 4–12: Comparison between axial point load and UCS results

Sample	Material	UCS (MPa)	Is50 Axial (MPa)	Ratio
BH201 12.42 – 12.62m	Siltstone	14	0.43	33
BH201 24.68 – 24.94m	Sandstone	87+	1.31	>66
BH202 6.17 – 6.35m	Siltstone	5.7	0.43	13
BH202 11.07 – 11.3m	Siltstone	16	0.78	20

The laboratory test results for electrical conductivity are presented in Table 4–13. The results will be used for soil salinity and aggressivity assessment

Table 4–13: Electrical Conductivity Results

Borehole/Test Pit ID	Depth range (m)	Testing Date	EC (µS/cm)
BH02	2.5 to 2.8	24 Feb 2025	140
BH09	2.5 to 2.95	24 Feb 2025	140
BH15	1.0 to 1.45	24 Feb 2025	770
TP108	0.6 to 1.0	11 Dec 2024	140
TP110	0.6 to 0.7	09 Dec 2024	200
TP123	0.4 to 0.7	10 Dec 2024	350
TP131	0.5 to 1.1	11 Dec 2024	200

4.4.2 Groundwater

The results from the laboratory testing are presented in Table 4–14 and Table 4–15. Laboratory analysis certificates are presented in Appendix E.

Table 4–14: Groundwater sample results for physical properties, major anions and cations, nutrients and hydrocarbons

Analyte	LOR	Unit	BH101	BH102	BH103	BH201A	BH201B	BH202A
Physical Properties								
pH	0.1	pH	7.2	6.9	7.1	6.8	4.9	6.0
EC	10	µS/cm	12000	14000	12000	12000	1700	4300
TDS	10	mg/L	7400	7600	6600	6800	980	2500
Hydroxide Alkalinity	20	mg/L	< 20	< 20	< 20	< 20	< 20	< 20
Carbonate Alkalinity	20	mg/L	< 20	< 20	< 20	< 20	< 20	< 20
Bicarbonate Alkalinity	20	mg/L	1200	1100	780	900	21	370
Total Alkalinity	20	mg/L	1200	1100	780	900	21	370
Major Anions and Cations								
Sulfate	2	mg/L	240	590	420	690	290	230
Chloride	1	mg/L	3400	3600	3200	3200	240	940
Calcium	0.5	mg/L	110	97	120	76	6.1	50
Magnesium	0.5	mg/L	180	320	280	250	16	77
Sodium	0.5	mg/L	18	22	19	17	7.2	17
Potassium	0.5	mg/L	2100	2400	2100	2000	300	620
Nutrients								
Ammonia	0.01	mg/L	1.7	0.48	0.79	0.11	0.11	0.4
Nitrite	0.02	mg/L	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.03
Nitrate	0.02	mg/L	0.55	< 0.02	< 0.02	< 0.02	< 0.02	0.13
Total Nitrogen	0.2	mg/L	1.8	1	4.3	0.6	< 0.5	1.6
Total Phosphate	0.01	mg/L	0.2	0.1	0.2	0.06	0.04	0.88
Reactive Phosphorous	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hydrocarbons								
Oil and Grease	10	mg/L	< 10	< 10	< 10	12	< 10	< 10
TRH								
C6-C9 Fraction	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
C10-C14 Fraction	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	0.18	0.05
C15-C28 Fraction	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
C29-C36 Fraction	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
C10-C36 Fraction Sum	0.05	mg/L	0.1	< 0.1	< 0.1	< 0.1	0.18	0.25

Table 4–15: Groundwater sample results for total and dissolved heavy metals

Analyte	LOR	Unit	BH101	BH102	BH103	BH201A	BH201 B	BH202A
Dissolved								
Arsenic	0.001	mg/L	0.003	< 0.001	0.001	< 0.001	< 0.001	0.002
Aluminium	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	0.09	0.09
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.001	0.22	0.007
Nickle	0.001	mg/L	0.025	0.002	0.002	0.011	0.016	0.011
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001
Zinc	0.005	mg/L	< 0.005	0.01	< 0.005	0.022	0.28	0.034
Iron	0.05	mg/L	0.71	0.69	0.83	0.2	5.6	0.26
Manganese	0.005	mg/L	0.14	0.11	0.36	2.2	0.25	1.3
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Total								
Arsenic	0.001	mg/L	0.006	0.003	0.011	0.001	0.014	0.032
Aluminium	0.05	mg/L	5.4	1.6	9.6	1.6	20	28
Cadmium	0.0001	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0003	0.0004
Chromium	0.001	mg/L	0.015	0.004	0.022	0.004	0.034	0.059
Copper	0.001	mg/L	0.048	0.031	0.063	0.032	0.33	0.22
Nickle	0.001	mg/L	0.05	0.006	0.028	0.014	0.03	0.081
Lead	0.001	mg/L	0.01	0.005	0.02	0.003	0.055	0.051
Zinc	0.005	mg/L	0.068	0.029	0.12	0.04	0.37	0.36
Iron	0.05	mg/L	15	8.2	27	3.4	83	82
Manganese	0.005	mg/L	0.3	0.16	0.88	2.3	0.37	2.8
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	0.0002	< 0.0001	0.0002	0.0003

The water quality results show the groundwater is saline with high TDS. BH201B shows a lower TDS concentrations than the siltstone and sandstone bores and a much more acidic pH. The results from BH202A may have been influenced by the addition of potable water in the recent development of the bore. The results for heavy metals (total and dissolved) are typical of clay soils and extremely weathered rock derived from Ashfield / Bringelly Shales. Oil and grease were detected in BH201A. This borehole is in a car park and may reflect run off from the road surface and or potential contamination from drilling. For further discussion related to chemical contamination of the site, refer to a separate Detailed Site Investigation report.

5. Geotechnical Interpretation

5.1 Geotechnical Model

A geotechnical model including two geotechnical interpretative long sections have been developed based on the investigations undertaken for this project. The long sections are presented in Appendix F. Refer to Figure 1 in Appendix A for Long section locations.

Classification of the rock encountered in the cored boreholes is based on the classification system of Pells et al (2019) "Classification of Sandstones and Shales in the Sydney Region: A Forty Year Review". The interpreted depth and reduced levels at the upper surface of each unit encountered in each borehole location is shown in Table 5–1.

Table 5–1: Geotechnical model at boreholes location

	Depth to top of Unit 2a		Depth to top of Unit 2b		Depth to top of Unit 2c		Depth to top of Unit 3a		Depth to top of Unit 3b		Depth to top of Unit 3c	
Borehole	(mbgl)	(mAHD)	(mbgl)	(mAHD)	(mbgl)	(mAHD)	(mbgl)	(mAHD)	(mbgl)	(mAHD)	(mbgl)	(mAHD)
BH01					0.8	50.2	4.4	46.6	6.2	44.8	7.9	43.2
BH02	1.2	51.1	1.5	50.8	2	50.3			5.7	46.7	10.1	42.2
BH03					2	46.1					4.9	43.2
BH04	1	47.1	1.5	46.6	2.5	45.6			4.0	44.1	6.6	41.5
BH05			1	43.7			3.9	40.8	4.5	40.2	6.3	38.4
BH06			1.2	39.6			2.3	38.5	2.6	38.2	4.8	36.1
BH07	2	39.1							4.7	36.4	6.3	34.8
BH08			1.45	39.6			2.7	38.3			4.6	36.5
BH09	2	39.5	3.5	38.0			5.9	35.6	6.7	34.8	8.2	33.3
BH10	1.2	39.9	1.5	39.6			3.0	38.1	5.3	35.8	7.2	33.8
BH11	1	33.6			3.3	31.3			4.4	30.2	5.2	29.4
BH12					1	35.2			2.2	34.0	4.5	31.7
BH13			0.5	31.5			4.5	27.5	5.2	26.8	6.9	25.1
BH14					0.3	33.4			3.0	30.7	4.6	29.1
BH15	1	30.7	2	29.7	2.7	29.0			4.2	27.5	6.8	24.9
BH16					0.2	32.0			3.1	29.1	3.7	28.5
BH101*	0.8	49.3					4.5	45.6				
BH102*			0.1	35.9			5.5	30.5				
BH103*	0.3	31.8					3.4	28.7				
BH201			1.1	34.9	2.4	33.6			4.9	31.1	7.4	28.6
BH202	1.2	51.1	1.5	50.8	2	50.3			5.7	46.7	10.1	42.2

*Note, groundwater boreholes which are non-cored

5.2 Design Subgrade CBR

The CBR test results indicate the CBR value for the collected soil samples range from 1.0% to 20.0%, with an average value of about 2.6% and a median value of about 2.3%. It is assessed that the residual clays typically have a CBR value of 1.0% to 2.0% and the presence of sandy and gravelly inclusions (which may derive from the transition to extremely weathered bedrock) tends to increase the CBR values.

The CBR swell percentage for majority of samples is greater than 2.5% indicating the clay subgrade is soil with highly expansive nature in accordance with Austroads (2024) Guide to Pavement Technology Part 2: Pavement Structural Design.

For pavement design purposes, it is recommended to adopt a design subgrade CBR value of 2% for the residual clay subgrade. CBR of less than 2% or swell of ≥2.5% should be considered as unsuitable materials and shall be either replaced or capped by impervious capping layer as specified by the pavement designer.

5.3 Soil salinity

Electrical conductivity (EC) testing was carried out to assess soil salinity. The Department of Land and Water Conservation (DLWC) (2002) has defined soil salinity classes shown in Table 5–2 based on their ECe (corrected EC values).

Table 5–2: DLWC soil salinity classes

Class	ECe(dS/m)	Comments
Non-saline	<2	Salinity effects mostly negligible
Slightly saline	2 to 4	Yields of very sensitive crops may be affected
Moderately saline	4 to 8	Yields of many crops affected
Very saline	8 to 16	Only tolerant crops yield satisfactorily
Highly saline	>16	Only very few tolerant crops yield satisfactorily

Soil salinity has been measured in seven samples in the upper three metre of the soil profile. The soil salinity assessment results (refer Table 5–3) indicate low salinity with the maximum being 770 µS/cm. Groundwater salinity may be used as an approximation for soil salinity especially below the water table where salinity is measured. Based on the results, the soils at the site are generally assessed as “non to moderately saline”.

Table 5–3: Soil electrical conductivity test results

Borehole/ Test Pit ID	Depth range (m)	Soil type	EC (µS/cm)	MF[1]	Ece (dS/m)	Soil Class
BH02	2.5 to 2.8	Medium to High Plasticity Clay	140	7	1.0	Non-saline
BH09	2.5 to 2.95	Medium to High Plasticity Clay	140	7	1.0	Non-saline
BH15	1.0 to 1.45	Medium to High Plasticity Clay	770	7	5.4	Moderately saline
TP108	0.6 to 1.0	High Plasticity Clay	140	7	1.0	Non-saline
TP110	0.6 to 0.7	High Plasticity Clay	200	7	1.4	Non-saline
TP123	0.4 to 0.7	High Plasticity Clay	350	7	2.5	Slightly saline
TP131	0.5 to 1.1	High Plasticity Clay	200	7	1.4	Non-saline

[1]MF is soil textural factor

5.4 Aggressivity

The laboratory aggressivity test results in Table 5–4 indicate that the tested samples are “mild to moderately aggressive” to buried concrete structures and “non-aggressive” to buried steel elements in accordance with the provisions of Australian Standard AS2159 – 2009 Piling – Design and Installation Table 6.4.2 (C) and Table 6.5.2 (C). The results for shallow depth samples are impacted by near surface environmental factors as such they have been excluded from the aggressivity assessment.

Table 5–4: Exposure classification for piles in soil

Sample	pH	Sulfate (mg/kg)	Chloride (mg/kg)	Resistivity (ohm.cm)	Soil Condition	Exposure Class for Concrete Piles	Exposure Class for Steel Piles
BH02 2.5 – 2.8m	8.9	73	55	7143	B	Mild	Non-aggressive
BH09 2.5 – 2.95m	5.0	180	30	7143	B	Moderate	Non-aggressive
BH15 1.0– 1.45m	5.6	480	640	1299	B	Mild	Non-aggressive

5.5 Earthquake Design Sub-Soil Classification

Based on the geotechnical investigations undertaken, the site sub-soil classification is Class C_e – Shallow Soil Class in accordance with AS1170.4-2007. Based on AS1170.4-2007, a Hazard Factor (Z) of 0.08 may be considered for seismic design.

5.6 Geotechnical Design Parameters

Recommended geotechnical design parameters for various soil and rock units are presented in Table 5–5 and Table 5–6. The design strength parameters, and elastic modulus values for the soil and rock units are estimated based on the consistency of soil and rock mass classifications. These values are developed based on the encountered investigation data, SMEC’s experience with similar ground conditions on other projects and published literature.

Table 5–5: Geotechnical parameters for retention system design

Geotechnical Unit	Bulk Unit Weight, ɣ (kN/m³)[4]	Undrained Shear Strength, S_u (kPa)	Drained Cohesion, c' (kPa)	Drained Friction Angle, φ' (°)	Drained Elastic Modulus, E' (MPa)	Poisson's Ratio, v'	Co-efficient of Lateral Earth Pressure at rest, Ko[3]	Co-efficient of Lateral Earth Pressure (active), Ka	Co-efficient of Lateral Earth Pressure (passive), Kp	Ultimate Bond Stress (kPa)
Unit 1 – Existing Fill	22	-	2	26	10	0.3	0.56	0.41	2.56	-
Unit 2a – Residual Clay (Stiff)	20	50	5	26	20	0.3	0.56	0.41	2.56	-
Unit 2b – Residual Clay (Very Stiff)	21	100	5	28	30	0.3	0.53	0.36	2.77	-
Unit 2c – Residual Clay (Hard)	22	200	10	28	40	0.3	0.53	0.36	2.77	-
Unit 3a – Shale Bedrock (Class V[1])	23	-	30	28	75	0.3	0.53	0.36	Refer Note 2	100
Unit 3b – Shale Bedrock (Class IV[1])	24	-	50	30	150	0.3	0.5	0.33	Refer Note 2	200
Unit 3c – Shale Bedrock (Class III[1] or better)	25	-	100	30	300	0.25	1.0	0.33	Refer Note 2	400

Note:

1 Rock mass classification system is in accordance with Pells et al (2019) *Classification of Sandstones and Shales in the Sydney Region: A Forty Year Review*

2 The ultimate lateral resistance in rock should be calculated using the ultimate lateral resistance in Table 5–6.

3 Where walls movements are to be kept low, an 'at rest' earth pressure coefficient (Ko) should be adopted.

4 Bulk unit weight should be reduced using reduction factors recommended in Australian Standards if they form part of stabilising force.

Table 5–6: Geotechnical parameters for foundation design

Geotechnical Unit	Bulk Unit Weight, ɣ (kN/m^3)	Drained Elastic Modulus, E' (MPa)	Ultimate End Bearing (kPa)	Serviceability End Bearing (kPa)[2]	Ultimate Shaft Adhesion (kPa)[3]	Ultimate Lateral Resistance (kPa)	Horizontal Subgrade Reaction Modulus, kh (MPa/m)
Unit 1 – Fill	18	10	-	-	-	Refer Note 4	-
Unit 2a – Residual Clay (Stiff)	19	20	250 (Pad footing) 450 (pile)	80 (Pad footing) 150 (pile)	20	Refer Note 4	20
Unit 2b – Residual Clay (Very Stiff)	19	30	500 (Pad footing) 900 (pile)	150 (Pad footing) 300 (pile)	30	Refer Note 4	30
Unit 2c – Residual Clay (Hard)	20	40	1000 (Pad footing) 1800 (pile)	300 (Pad footing) 600 (pile)	50	Refer Note 4	40
Unit 3a – Shale Bedrock (Class V[1])	22	75	3000	700	75	500[5]	75
Unit 3b – Shale Bedrock (Class IV[1])	22	150	3000	1000	150	1500[5]	150
Unit 3c – Shale Bedrock (Class III[1] or better)	23	300	6000	1500	400	3000[5]	300

Notes:

1 Rock mass classification system is in accordance with Pells et al (2019) Classification of Sandstones and Shales in the Sydney Region: A Forty Year Review

2 Bearing pressure to limit settlement to <1% of minimum footing dimension

3 Clean sockets of roughness category R2 or better. Socket roughness R2 is defined as socket with grooves depth of 1 to 4mm, width greater than 2mm at spacing of 50mm to 200mm

4 The ultimate lateral resistance in soil should be calculated using the coefficient of passive earth pressure (Kp) provided in Table 5–5

5 Provided adverse jointing is not encountered

5.7 Preliminary Inflow Assessment

The proposed development has three main areas of excavation that would occur during the cut and fill activities as shown on Figure 5–1. These excavations are associated with Level C01 in the central part of the Site, Level 00 in the central to southern part of the Site and Level B01 which is the basement carpark. It is assumed that the bulk excavation depth is around half a meter below the proposed finished slab level. Based on the Concept Design architectural drawings the assumed finished slab levels and bulk excavation depths are presented in Table 5–7.

Table 5–7: Excavation and finished slab elevations

Location	Bulk Excavation Depth (mAHD)	Finished Slab Level (mAHD)
C01	36.05	36.55
Level 00	31.55	32.05
B01	28.05	28.55

Groundwater was observed in BH101 at around RL41.62mAHD, at RL 31.57 mAHD at BH201A and 28.41 mAHD in BH103. Figure 5–2 presents the conceptual north-south hydrogeological model for the Site showing the interpreted groundwater table and the excavations. The groundwater table is a subdued version of the topographic surface. The bulk excavation for C01 is anticipated to be at or just above the groundwater table, whilst at Level 00 the bulk excavation may be just into the water table in the northern part. For B01 the northern side of the excavation will be deeper into the water table than the southern part.

The excavations of C01 and Level 00 may intersect the groundwater table in the northern part of the excavation however the finished slab level is anticipated to be at or just above the water table. For B01, this excavation will intersect the water table.

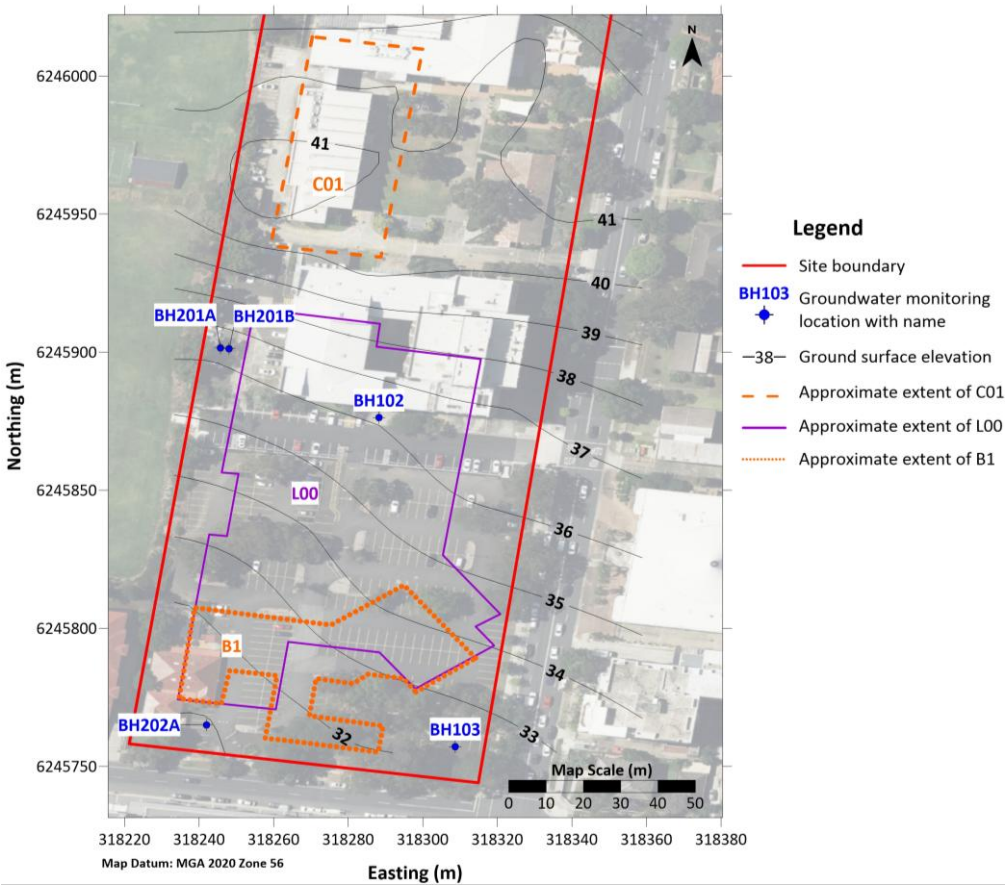


Figure 5–1: Extent of excavation areas at the Site

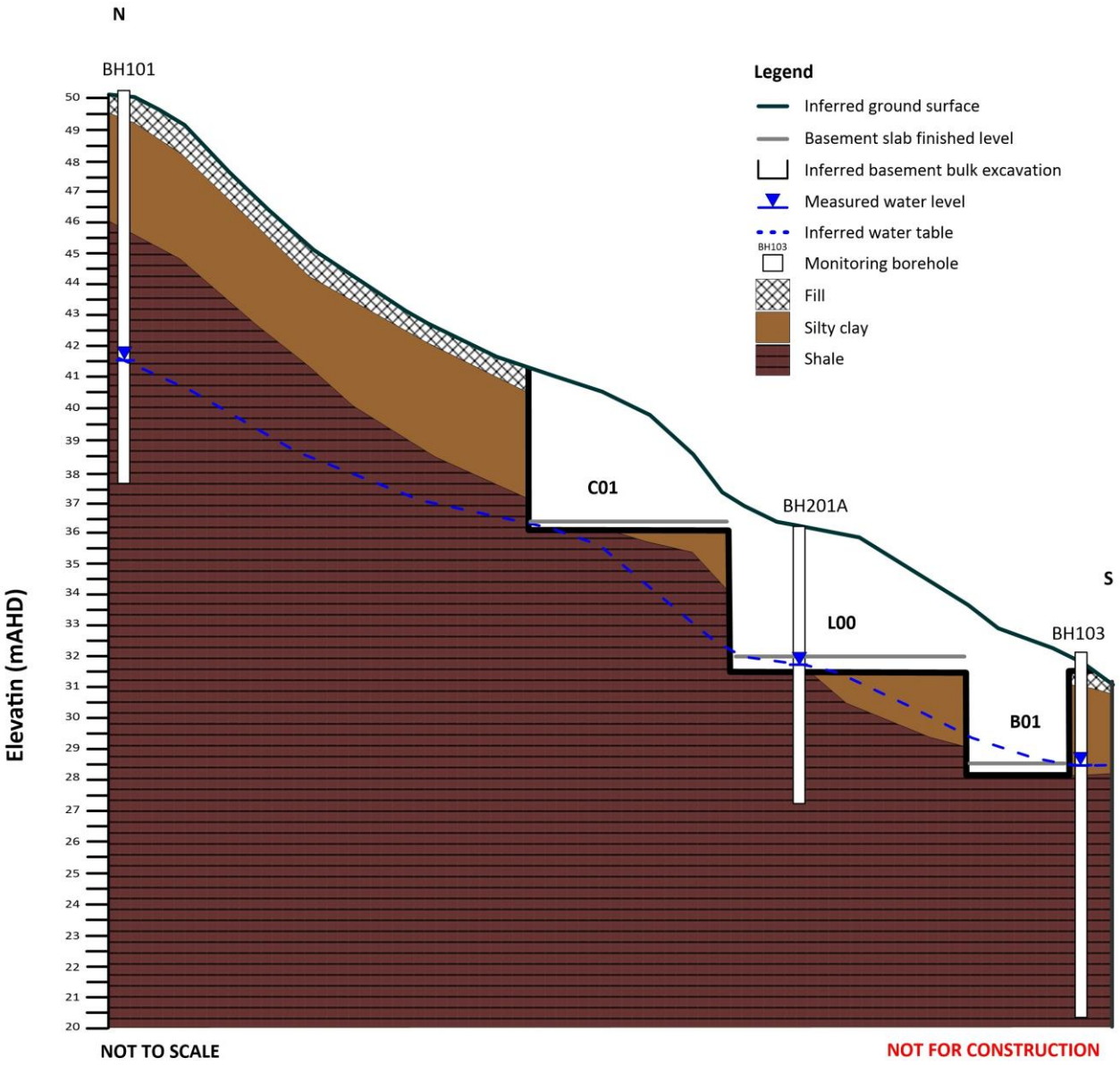


Figure 5–2: Conceptual North-South hydrogeological model

5.7.1 Analytical Steady State Inflow

The steady state inflow is estimated according to the analytical method by Marinelli and Niccoli (2000) for inflow to a pit with the parameter assumptions outlined in Table 5–8 and assuming:

- Distributed recharge flux is 0.0002 m/day (i.e. rainfall) which is 5 % of the highest annual total of 2038 mm
- Horizontal hydraulic conductivity is 0.006 m/day.

Table 5–8: Inflow assessment assumptions

Location	Pit Dimension Length (m) x Width (m)	Water Level (mAHD)	Bulk Excavation Base (mAHD)	Depth of Excavation Below Water Table (m)
C01	75 x 30	36.25	36.05	0.2
Level 00	100 x 70	32.25	31.75	0.5
B01	30 x 60	29.00	28.05	0.95

The estimated inflow is <0.001 L/sec for C01 and around 0.003 L/sec for Level 00. For these excavations, the water table depth was assumed to be either the finished slab level (i.e. for Level 00) or just below it (i.e. for C01). The method assumes radial flow however, inflow is likely only from three sides with approximately half the area assumed to be below the water table. The estimated inflow rate for B01 is 0.003 L/sec during construction. For this excavation a normalised water level was used to account for the gradient across the pit. Using the same interpreted water levels and the highest estimated permeability result from the Site testing (i.e. 0.01 m/day), the estimated inflows are approximately 0.001 L/sec for C01 and 0.004 L/sec for Level 00 and B01.

The estimated total construction dewatering volume estimated to be less than 0.5 ML/year.

This volume is below the 3 ML per any 12-month period and therefore it is anticipated that a Water Access Licence and allocation is not required. Inflows are likely to consist of minor seeps, particularly at the interface between the weathered rock and unless made from a single defect or structure are likely to be observed as damp walls and floor.

In C01 and Level 00 it is likely that evaporation would occur at higher rates than the seepage inflows. Seepage may is more likely to be encountered on the northern side of the excavations compared to the southern side. The finished slab level is anticipated to be at or above the water table and therefore seepage after construction is expected to be minor, likely less than 50% of the construction seepage.

For B01 the estimated upper order inflow is less than 0.2 ML/year and therefor a tanked design is not anticipated to be required. Spoon drains and sump and pump methods are likely to be sufficient to capture the groundwater for disposal. Dewatering inflows may be slightly higher during excavation and after rainfall.

Specific dewatering and mitigations measures for groundwater are not required, however as the excavation for B01is below the water table a Water Supply Works Approval (Dewatering License) may be required depending on the SSDI application determination.

5.7.2 Groundwater Impact Assessment

The Groundwater Impact Assessment is provided in Appendix I. A summary of the impacts and key finding is outlined below.

The potential groundwater impacts during construction are pollution, resulting in changes in water quality, and changes in water level from recharge and/or dewatering. The construction activities that have the potential to impact groundwater are:

- Site facilities, stockpiles and materials laydown
- Cut and fill activities
- Basement excavation
- Foundation piling
- Construction of buildings, utilities trenching, internal road concrete and asphalt activities
- Construction of new access points with existing roads
- Landscaping.

Under the Aquifer Interference Policy (AIP) 2012 the predicted construction impacts to groundwater meet the criteria for Level 1 minimal impact and are considered acceptable. This is based on the following findings:

- Wianamatta Group Shales are classed as a ‘less productive groundwater source’
- Drawdown of the water table is less than 2 m
- The nearest registered water supply works is 1.9 km to the south-east and the risk of changes to level and groundwater quality are low
- The risk of change to groundwater quality which would result in a change in beneficial use category is low, due to the limited interaction with groundwater and low inflow volumes
- There are no high priority culturally significant sites listed within the Water Share Plan

- The risk of changes to groundwater level impacting a potentially high priority GDE is considered low as there are no high priority GDE's within 40 m of the Site.

Operational impacts to groundwater are less than construction. The operation activities that have potential to impact groundwater are the long-term dewatering associated with the proposed car park basement B01 and accidental leaks and spills of chemicals at the Site. With the implementation of the proposed mitigation measures, the proposal is expected to have acceptable and minimal impacts on existing groundwater resources and environmental values during both the construction and operation phases.

6. Discussion and Recommendations

6.1 Excavatability

Based on the encountered ground conditions, it is expected that the soils (fill, residual soil) will be easily excavatable using conventional excavation equipment such as buckets of hydraulic excavators. The upper extremely weathered and highly weathered rock (Class V / IV shale) is expected to be excavatable using conventional excavation equipment and some light ripping. Excavation in low to medium strength and stronger rock (Class III or better shale) is likely to require heavy ripping equipment, rock saws and/or rock hammers depending on features in the rock mass such as the presence of fractured zones.

The excavatability of the subsurface materials for piled foundations will depend on the type of machinery used. The piling contractor should review all available geotechnical information and undertake their own assessments on the type of machinery required for the project.

6.2 Excavation Support

The geotechnical investigations typically indicate weathered shale bedrock typically occurring at depths between 3 m to 5 m below ground level.

Vertical excavations for the basement will require temporary / permanent support. One of the possible shoring options is a soldier piled wall with shotcrete infill to support the excavation (refer to Figure 6–1 for an example).



Figure 6–1: Example of a soldier piled wall with shotcrete infill (Source: Caporn Piling)

Temporary ground anchors may be required to limit ground movements where sensitive structures and infrastructure are identified at the adjacent property boundary. Ground anchor lengths may extend outside the site boundary and this will require consultation with the land owner. The use of struts instead of ground anchors may also be feasible depending on the construction methodology and contractor preferences.

Where walls movements are to be kept low, an ‘at rest’ earth pressure coefficient (Ko) should be adopted.

6.3 Foundations for Structures

Foundations for structures will likely comprise shallow pad footings or deep piled foundations. The type of footing adopted will depend on factors such as the design loading, the encountered ground conditions and the structural serviceability requirements i.e. settlement criteria. If piled foundations are preferred, then we consider that bored piles to be the most appropriate for the site. Reference should be made to the recommended geotechnical design parameters for foundations in Table 5–6.

A geotechnical strength reduction factor (ϕ_g) should be considered for limit state design of foundations. The assessment of a suitable geotechnical strength reduction factor is presented in AS2159 – 2009. Based on SMEC's experience with similar ground conditions, a preliminary geotechnical strength reduction factor of 0.5 may be adopted at this stage, however, SMEC recommends the pile designer to undertake their own assessments and develop a suitable geotechnical strength reduction factor.

6.4 Soil Salinity

The limited soil salinity laboratory results indicate non saline to moderately saline soils within a mapped area of moderate to high salinity risk and therefore a Soil Salinity Management Plan is required. The following soil salinity management strategies should be considered at detailed design stage and Construction Environmental Management Plan (CEMP) for the project:

- Develop the best use of the existing topography in order to minimise cut and fill operations
- All sediment and erosion controls shall be installed prior to commencement of any construction works
- Good site drainage to prevent water ponding by having appropriate surface and subsurface drainage system across the site. If groundwater is intercepted during construction works, the flow should be diverted to stormwater drains via surface and subsurface drainage.
- Use of native and deep rooted vegetation in landscaping to minimise the need for irrigation and minimise erosion.

6.5 Acid Sulphate Soils

The available information does not indicate an acid sulfate soils risk and therefore the development of an Acid Sulphate Management Plan is not required. The CEMP should include management measures for incidental finds if ASS is suspected or identified during construction.

6.6 Soil Erosion

The project is at concept level stage and as such a preliminary soil erosion and sediment assessment (PESA), has not been undertaken. The existing Site is highly urbanised with hard stand material covering the Site and the proposed development will likely contain a similar level of hard stand material. The laboratory testing results and proposed development activities are unlikely to pose a high risk of erosion and sediment. Management of any onsite soil stockpiles would be undertaken as part of the CEMP. Stockpiles should be addressed in the Surface Water Impact Assessment which has been undertaken by others.

6.7 Groundwater

The basement excavation B01 is likely to intersect the groundwater table. Excavation cuts associated with C01 and L00 may intercept the top of the water table. The estimated inflows during construction are low and the total estimated dewatering volume will vary depending on the permeability that is adopted. The upper order inflow volume is assessed to be below the maximum allowable 3 ML in any 12-month period during construction and operation and therefore does not require a Water Access Licence (WAL) under the Water Management Act 2000, or allocation from the relevant groundwater source.

Dewatering is anticipated to be via a sump and pump method. Any aquifer interference that takes groundwater will require a Water Supply Works Approval from Water NSW for taking groundwater under the Water Management Act 2000. The Dewatering Management Protocol (DMP) is part of the Water Supply Works Approval. If the project is determined to be State Significant Infrastructure, then the project would be excepted from requiring a Water Supply Works Approval for the construction phase. This exemption does not cover the ongoing take of groundwater during operation.

The groundwater quality is poor, ranging from 980 mg/L TDS to 7600 mg/L TDS and contains variable naturally occurring metals in dissolved form.

Dewatering disposal options may include:

1. Sewer - will require a Sydney Water trade waste application and approval
2. Stormwater – will require Council approval
3. Off site - Liquid waste disposal.

The volume of dewatering is low but its quality would not likely meet a trade waste or stormwater discharge option without treatment. Treatment may include mixing the water with potable water to meet the discharge quality criteria of the relevant disposal option.

Dewatering cannot commence without an approved dewatering licence in place. Approvals for dewatering licences may take up to 8 weeks. The long-term steady state groundwater inflows to the basement is likely to be less than 0.5 ML/annum on average.

The approved method of disposal would be outlined in the Dewatering Management Plan.

Design of the operational stage drainage system should consider the estimated steady state groundwater inflow rate and groundwater quality. Infiltration of dewatered groundwater to the soil and or bedrock is unlikely to be viable. The soil is predominantly clay, which is anticipated to be of low permeability, and this clay overlies a low permeability siltstone bedrock. Infiltration may result in localised water table mounding and water logging of the soil.

To improve groundwater quality to meet quality objectives for disposal, mixing with potable water (i.e. during construction) and mixing with captured surface water (i.e. during operation) may be considered. Additional treatments may be required depending on the disposal option.

6.7.1 Groundwater Impact Assessment

The Groundwater Impact Assessment indicates:

- The proposal is anticipated to take groundwater through an aquifer interference activity during construction and during operation.
- Under Schedule 4, Part 1, clause 2 of the Water Management Regulation, public authorities are exempt from the requirement to hold a WAL where the proposal is below 3 ML / annum in active or passive groundwater take.
- Exemptions under the Water Management Act 2000 and Water Management Regulation do not include ongoing operational groundwater take whether passive or intentional.
- If the project is determined as State Significant Infrastructure it would be exempt from requiring a Water Supply Works Approval for the construction phase.
- Groundwater take during construction and is anticipated to be less than 0.5 ML/ annum.
- Drawdown of the water table is estimated to be less than 1 m with the radius of drawdown impacts unlikely to extend beyond 10 m from the excavation boundary.
- Groundwater take during operation is anticipated to be less than 0.5 ML/ annum.
- Disposal of dewatered groundwater during the operational phase would be required compliance with the Water Management Act 2000 and conditions associated with the method of discharge outlined in an Operational DMP.
- The predicted impacts to groundwater under the Aquifer Interference Policy (AIP) 2012 meet the criteria for Level 1 minimal impact and are considered acceptable.
- With the implementation of the proposed mitigation measures, the proposal is expected to have acceptable and minimal impacts on existing groundwater resources and environmental values during both the construction and operation phases.

6.7.2 Recommendations

The following recommendations are made:

- Groundwater levels be manually measured monthly at the monitoring bores BH101, BH102, BH103, BH201A, BH201B and BH202A during the construction phase.
- The monitoring bores should be protected and monitored during construction. If these bores are destroyed or are not inaccessible, additional monitoring bores should be installed with at least one month monitoring overlap between replacement and existing.
- The inflow estimation be revisited if the basement depth and or location changes and or if the observed inflows during construction are higher than anticipated.
- Where an existing monitoring bore is to be destroyed by construction activities, and the activity does not remove the full extent of bore installation, it should be decommissioned prior to the surface being buried with bentonite grout from total depth to finished level in accordance with the NSW Aquifer Interference Policy (2012).
- Commence discussions with Sydney Water and the local Council regarding disposal options for dewatered groundwater.
- When the disposal option is confirmed a DMP may be prepared to support a dewatering licence application.
- Monitoring of inflows/ discharge volume during excavation and if inflows exceed the estimated then consultation with a suitably qualified hydrogeologist.

6.8 Construction Monitoring Requirements

The construction monitoring requirements will need to consider the extent of any proposed excavations and its proximity to nearby infrastructure and sensitive structures. Chapel Road (located along the eastern boundary of the Site) is listed on the Schedule of Classified Roads and Unclassified Regional Roads by Transport for New South Wales (TfNSW) as of February 2023. Developments adjacent to TfNSW assets may require monitoring during construction to manage construction risk.

Vibration, dust and noise monitoring will need to be implemented in accordance with the approved Construction Environmental Management Plan (CEMP) due to the presence of nearby residential, commercial and educational facilities.

The following needs to be considered for the Site:

- Monitoring requirements may include inclinometer measurements to monitor the deflection of the shoring system during construction.
- The design of substructures/shoring system will need to consider the impact of hydrostatic pressure against them.
- Groundwater monitoring during construction may be required to assess the groundwater impacts during construction and excavation in accordance with the NSW Aquifer Interference Policy (2012).
- Monitoring of the quality and volume of discharge water from dewatering will be required for compliance with the Dewatering Management Protocol.

6.9 Trafficability of Natural Material During Construction

Based on SMEC's experience in similar ground conditions, the residual clays and extremely weathered shale will likely provide poor trafficability during construction particularly following rain events. SMEC recommends placement densely graded base (DGB) over the in-situ clays during construction to improve trafficability. The highly weathered shale or better material is likely to provide good trafficability during construction, however it is possible for the material to degrade over time. Placement of a surface layer of DGB may be considered depending on the duration for which the material will be exposed to air and water.

6.10 Geotechnical Support During Construction

The geotechnical factual data presented in this report is based on observations and measurements made from discrete points within the project Site. The ground conditions can vary significantly between these data points which may affect the assessments undertaken. To reduce the geotechnical risks to the project, geotechnical supervision and inspection during construction are recommended. Some key activities that can be considered to reduce the geotechnical risks during construction include:

- Supervision during piling works and drilling of anchors to confirm an appropriate rock class has been encountered and the design intent is satisfied
- Inspection of foundation materials to confirm the design founding material is achieved
- Excavation face mapping during construction to reduce risk of excavation instability
- Proof roll inspections to confirm suitability of subgrade for pavement construction
- Monitoring and review of inclinometer, survey, and piezometer data.

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Appendix A

Geotechnical Report Limitations

Geotechnical Report Limitations

Important Notice

Headings in these Geotechnical Report Limitations are for ease of reference only and do not affect its construction or interpretation.

The meaning of general words is not limited by any specific examples, lists or the likes introduced by 'include' or 'including', or 'e.g.' or 'for example', or any similar expressions, and any such examples, lists or the likes are taken to be non-exhaustive.

References to a "party" may include an individual, body corporate (wherever incorporated), unincorporated association, trust or partnership (whether or not having separate legal personality), government, state or agency of a state, or two or more of the foregoing.

The report supersedes all previous draft or interim reports, whether written or presented orally, before the date of this report.

The contents of the report are confidential and for the sole use of the party who commissioned SMEC for the work (the "Client"). No responsibility or liability will be accepted to any party other than the Client.

SMEC has prepared this report in accordance with the scope of work commissioned, under which SMEC undertook to perform a specific and limited task for the Client. This report is strictly limited to the matters stated in it and subject to the various assumptions, qualifications and limitations in it and does not apply by implication to other matters. Data or opinions contained within the report may not be used in other contexts or for any other purposes without prior review and agreement with SMEC. SMEC makes no representation that the scope, assumptions, qualifications and exclusions set out in this report will be suitable or sufficient for other purposes nor that the content of the report covers all matters which you may regard as material for your purposes.

Geotechnical Reports

Site subsurface conditions can cause design and construction technical challenges. Therefore, we have provided these notes to assist you in understanding your report.

The recommendations in this report are based on data observed and collected at specific locations using specific investigation techniques. Only a finite amount of information has been collected to meet the specific financial and technical requirements of the scope of works and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it must be appreciated that actual conditions could vary from the extrapolated model. This report has not and will not be updated for events or transactions occurring after the date of the report or any other matters which might have a material effect on its contents or which come to light after the date of the report.

If this report is reproduced, it must be in full. Investigation logs, laboratory test certificates, figures and drawings etc should not be extracted for use in other documents or separated from this report in any way.

Should there be any queries concerning this report please do not hesitate to contact SMEC.

Project Specific Criteria

Where the report has been prepared for a specific purpose (e.g. design of a three-storey building), the information and interpretation may not be appropriate if the design is changed (e.g. a four-storey building). In such cases, the report and the sufficiency of the existing work should be reviewed by SMEC in the light of the new purpose.

Every care is taken with the report content. However, it is not always possible to anticipate or assume responsibility for the following conditions:

- Unexpected variations in ground conditions. The potential for this depends on the amount and distribution of investigative work undertaken.
- Changes in policy or interpretation by statutory authorities.
- The actions of consultants and contractors responding to commercial pressures.

If these occur, SMEC would be pleased to assist through further investigation, analysis or advice.

Understanding Ground Conditions

Introduction

The characteristics of any site (including small scale sites such as a small retaining wall up to large scale sites such as that material through which a tunnel is advanced) is spatially variable due to various processes. These processes could include natural processes, such as geological, chemical, physical, and thermal, and those of biological agents. Chemical and Biological issues are often due to the impacts imposed on the earth by humankind.

For the purposes of engineering design, a site is characterised by undertaking studies and investigations to gather data from the site. The site data is collected in accordance with accepted practices or in compliance with Guidelines and Standards, and provided to a Geologist or Engineer for interpretation and characterisation. The studies can include reviews of published literature, mapping, and test results, with site specific investigations. The site investigations can include intrusive works such as test pitting, trenching, and drilling, in addition to nonintrusive methods such as surveying (including LiDAR), imaging, geophysical profiling, surveying, and mapping. All of these items are combined to improve the data available for interpretation for its intended purpose.

Investigation Information

Logs of a borehole, recovered core, test pit, excavated face, or Cone Penetration Test (CPT) are an engineering and/or geological interpretation of the subsurface conditions. The reliability of the logged information depends on the drilling/testing method, sampling/observation spacings, and the ground conditions. It is not always possible or economical to obtain continuous high-quality data. It should also be recognised that the volume of material observed or tested is only a small fraction of the total subsurface profile.

Factual Data

Factual data is material or information that has been observed or measured. It is, however, inherently limited with regard to the area, or volume, of the site it represents. For example, a single HMLC core measures 64 mm diameter, from a drill hole of 98 mm diameter. Within a cubic metre of material, the core represents just 0.3% of the volume, the drill hole 0.8%, and assuming the drill hole is imaged, the remaining 99.2% of the material is untested and requires interpretation. Across a site, the number of observation points from intrusive investigations versus the size of the site is a very small percentage. Thus, any model developed relies heavily on interpretation of this data.

Geological mapping and geophysical surveys improve the contextual understanding of intrusive investigation results and is strongly recommended as part of any investigative process.

Interpretation

For the development of the characteristics utilised in design, data may be sourced from many locations and weighted according to the source. In some cases, data may be skewed toward literature (technical papers) or sources in the public domain, and in others it may be predominantly site based.

Any engineering judgements, inputs sourced from the literature, or the experience of the person/s undertaking the interpretation will be documented so the reader is informed as to the limitations of the data utilised.

Interpretation of subsurface information and application to design and construction takes into consideration the spacing of the test locations, the frequency of observations and testing, and the possibility that geological boundaries may vary between observation points.

Further to the limitations associated with the data, the interpretation of the data can vary from person to person and team to team, based on the experience and knowledge of those undertaking the analysis and interpretation of the data. Whilst some interpretive methods follow procedures to reduce that variability, some elements may still provide decision points at which two or more paths may be selected for progression. Our advice is based on a process of internal, and sometimes external, review, drawing upon the experience of senior technical staff. Whilst the likely scenario may be explored and characterised, it is essential that the reader understands that other interpretations of the same database may be possible.

Certainty

Geotechnical interpretation relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other disciplines such as Structural Engineering.

With all ground investigations and designs, there is no process that will provide one hundred percent certainty. As the database increases in size and different methods of investigation and analysis are employed, the uncertainty in the data can be reduced, increasing the reliability of the ground model and characteristics (as per Figure 1 and Table 1).

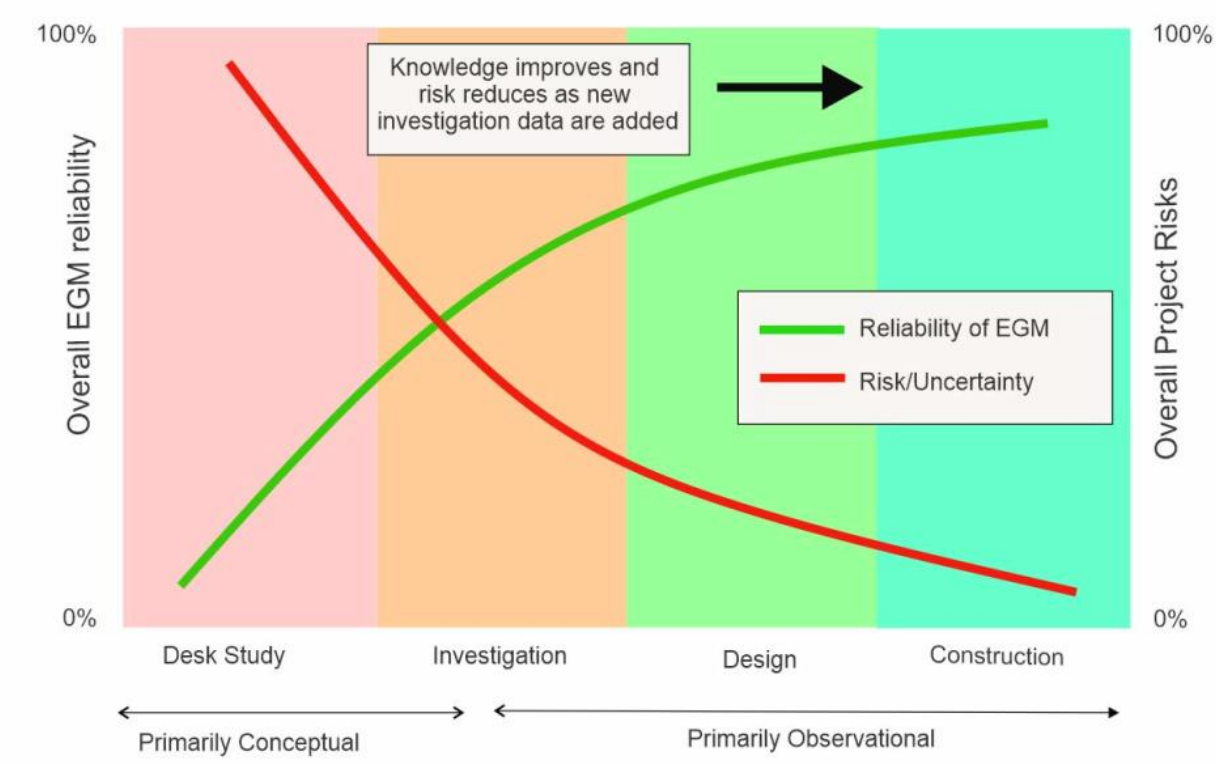


Figure 1: Idealised improvement in Engineering Ground Model (EGM) reliability as the project progresses (sourced from Baynes and Parry 2022)

Table 1: Stage, Geotechnical Uncertainty and Recommended Action (sourced from Baynes and Parry 2022)

Stage	Level of Geotechnical Uncertainty	Recommended Action (sourced from Baynes and Parry 2022)	Description of Geotechnical Model Development
Concept / Desk Study	Very High	Further investigation necessary	Typically based on desktop studies, literature reviews, open-source information, and experience of the team. Site visit.
Preliminary Design	High	Project future threatened but can be managed with additional investigation.	Addition of limited site-based works, some pitting, drilling or geophysics (surface and downhole), mapping, and review of client held core. Two-dimensional modelling. Material characterisation.
Detailed Design	Moderate	Identifiable risks to project that can be addressed with specific measures	Significant field investigation, pitting, trenching, drilling, geophysics (surface and downhole), three-dimensional modelling. Material characterisation.
Construction	Low	Risk management through procedures and involvement by geotechnical professional during construction	Site observation, high resolution mapping and other documentation.

The final investigation on any site is the construction phase. The Engineering Geologist or Geotechnical Engineer should remain involved, and the designer should communicate with the Engineering Geologist or Geotechnical Engineer, until all works are completed. Lastly, the ground model has been formulated using engineering judgement and experience. The process and background of the model formulation has been documented in the report to clearly show the limitations of the database.

Report Preparation

Geotechnical reports are prepared by qualified and experienced personnel using the information supplied or obtained and are based on current engineering and geological standards, methods, guidelines, or accepted industry practice of interpretation and analysis. These processes change with time and this report is limited to those in effect at the time of publication.

Changed Subsurface Conditions

Should conditions encountered on site differ markedly from those anticipated from the information contained in the report, SMEC should be notified immediately. Early identification of site anomalies generally results in

problems being more readily resolved and allows re-interpretation and assessment of the implications for future work.

Subsurface conditions can change because of natural or anthropogenic processes. Fill can be placed on a site, contamination can migrate with time and water levels can vary with weather cycles or groundwater extraction. Such changes should be borne in mind, particularly if the findings and/or recommendations contained within this report are used after a delay.

Hydrogeology

Groundwater observations and measurements outside of specially designed and constructed piezometers should be treated with care for the following reasons:

- In low permeability soils, groundwater may not seep into an excavation or bore in the short time it is left open and local effects, through the excavation process, may alter the permeability of the material.
- A localised perched water table may not represent the true water table.
- Groundwater levels may vary according to rainfall events or season.
- Some drilling and testing procedures mask, prevent, or exacerbate groundwater inflow.
- The installation of piezometers and long-term monitoring of groundwater levels may be required to adequately identify groundwater conditions.

This report is based on investigations and conditions that were observed at a specific time. Use of the information in this report should consider how the data and recommendations may have been affected by time, and activities on and off the site.

Contamination

This report has been prepared to address a geotechnical scope of work and unless requested by the Client, does not address Contamination issues. As such, it is unlikely to discuss investigations of the site for the presence of contaminants or hazardous materials, or provide discussions and recommendations about their presence or handling. The assessment of site contamination utilises specialist techniques and equipment under the direction of specialist, trained personnel. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact SMEC for information. On site contamination can create major safety, health and environmental risks to those on site or in the vicinity. SMEC can be contacted for advice regarding investigation of potential contamination or environmental issues at the site.

Use by Other Project Parties

Unless expressly agreed otherwise in writing, SMEC does not accept a duty of care or any other legal responsibility whatsoever in relation to this report (including any amendments or updates made to the same after the date of this report), or any related enquiries, advice or other work, nor does SMEC make any representation in connection with this report, to any party other than the Client. Any other party who receives a draft or a copy of this report (or any part of it) or discusses it (or any part of it) or any related matter with SMEC, does so on the basis that they acknowledge and accept that they may not rely on this report nor on any related information or advice given by SMEC for any purpose whatsoever.

Geotechnical engineering is based on the interpretation and understanding of ground conditions using limited site-specific information, along with relevant experience, skill, and knowledge. To reduce the risk of inappropriate use of the data contained herein, it is strongly recommended that any plans and specifications prepared by others and relating to the content of this report, or any amendments to the original plans and specifications, are reviewed by SMEC to assess that the intent of the recommendations and advice contained herein are appropriately applied to, or reflected in, the design. If the encountered site conditions are assessed to vary significantly from the interpretation and model provided herein, SMEC is able to provide assistance or review the findings in combination with the investigation to more appropriately inform the design.

Subsurface conditions relevant to construction works should be assessed by Contractors who may make their own interpretation of the provided factual data, possibly provided under separate cover. The Contractor should undertake any additional tests as necessary for their own information and purposes.

Reference

Baynes, F. J. and Parry, S. 2022. Guidelines for the development and application of engineering geological models on projects. International Association for Engineering Geology and the Environment (IAEG) Commission 25 Publication No. 1, 129 pp.

Appendix B

Geotechnical Investigation Plan



smec
an SJ company

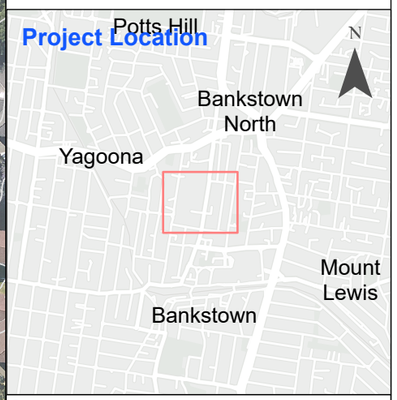
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LEGEND

- Site Boundary
- Groundwater Monitoring Well
- Borehole
- Test Pit
- Contours - 1m

Project Location



Sources:
1. © State of New South Wales (Spatial Services, a business unit of the Department of Customer Service NSW).
2. © Commonwealth of Australia (Geoscience Australia) 2021
3. Light Gray Base: Esri, TomTom, Garmin, METI/NASA, USGS
Australia latest: Aerometrex Pty Ltd

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Project No:	30013640
Figure No:	1
Figure Name:	Geotechnical Investigation Plan
Version:	1
Date:	22/10/2025
Created by:	LL16284
Page Size:	A3

Appendix C

Borehole Logs

Explanatory Notes of Abbreviations and Terms

Used on Borehole and Excavation Logs

General

The "Geological and Engineering Log" presents data from drilling or excavation operations where material recovery is soil and or rock. Data presented is a combination of material recovered, regular sampling and insitu testing. Excavations may present data obtained on the subsurface profile from observations of natural or man-made excavations. Logs may contain scaled graphical presentations, photography, or downhole imagery results. Logs may not contain all data types presented in these notes.

The "Non Core Drill Hole Engineering Log" presents data from drilling operations where a core barrel has not been used. The material is penetrated using methods other than those designed to recover core and is commonly soil or extremely to highly weathered. The "Cored Drill Hole Engineering Log" presents data from drilling operations where a core barrel has been used. The "Excavation - Geological Log" presents data obtained on the subsurface profile from observations of excavations, either natural or anthropogenic. As far as is practicable, the data contained on the log sheet is factual. Some interpretation is inevitable with respect to the: assessment of material boundaries in areas of partial sampling and recovery,

a. location of areas of core loss,
b. description and classification of material,
c. estimate of field strength, and
d. identification of drilling induced fractures.

Material description and classification is generally based on AS1726-2017 (as amended).

Drilling Method

Code	Description
AD/T	Auger drilling with TC-bit
AD/V	Auger drilling V-bit
AS	Auger screwing
AT	Air track
CA	Casing advancer
CC	Concrete core
CT	Cable tool rig
DB	Wash bore drag bit
HA	Hand auger
HAND	Hand methods
HSA	Hollow flight auger
HMLC	Diamond core 64mm diameter
HQ	Wireline, 64mm core diameter
HQ3	Wireline, triple tube, 61mm core diameter
NDD	Non destructive drilling
NMLC	Diamond core 52mm diameter
NQ	Wireline, 48mm core diameter
NQ3	Wireline, triple tube, 45mm core diameter
PT	Continuous push tube
PQ	Wireline, 85mm core diameter
PQ3	Wireline, triple tube, 83mm core diameter
RAB	Rotary air blast
RC	Reverse circulation
RD	Rotary blade or drag bit
RR	Rock roller
RT	Rotary tricone bit
S	Sonic drilling
SFA	Solid flight auger
TBX	Tube-X
VC	Vibro-core drilling
VE	Vaccume Excavation
WB	Wash bore drilling

Casing

Code	Outside Diameter
AW	57.1 mm
BW	73 mm
HW / HWT	114.3 mm
NW / NWT	89.9 mm
PW / PWT	139.7 mm
PVC90	90 mm
PVC150	150 mm

Defect Spacing

The average distance between defects is measured parallel to the core axis in mm and may be expressed as a range or average.

Borehole angle and Azimuth

Angle from horizontal where a positive angle is above horizontal, and a negative angle is below horizontal. Azimuth is to magnetic north and in degrees.

Defect Orientation

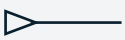
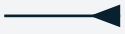
For vertical boreholes, the dip of the defect is measured relative to core normal (unless specified otherwise). The dip direction can not be ascertained for vertical holes. For inclined boreholes, the Alpha angle is recorded relative to the core axis and where core orientation has been undertaken (with appropriate reference line), a Beta angle can be measured clockwise from the reference line looking down the core axis in the direction of drilling. The alpha and beta angles can be converted to dip and dip direction if the position of the reference line relative the hole is known, and the borehole angle and azimuth is known.

Excavation Method

N	Natural exposure
X	Existing excavation
BH	Tractor mounted backhoe bucket
E	Hydraulic excavator
EH	Hydraulic excavator with hammer
B	Bulldozer blade
R	Ripper

Water / Drilling Fluid

The drilling fluid used is identified and loss of return to the surface is estimated as a percentage, generally of each core lift.

Symbol	Description
	Water inflow
	Water inflow partial
	Water outflow
	Water outflow partial
	Water level: during drilling or immediately after completion of drilling

Groundwater

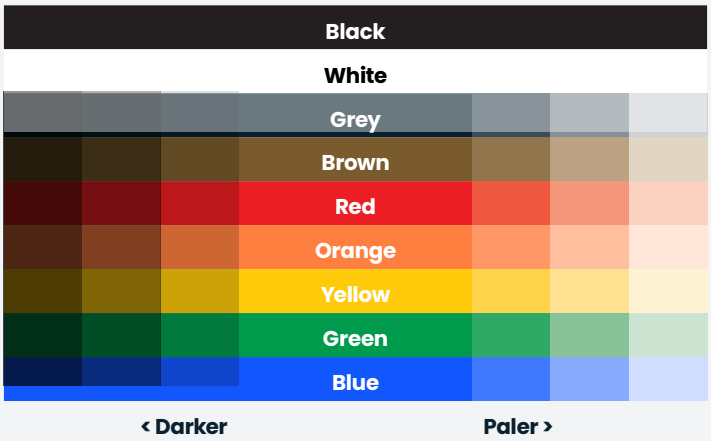
Symbol	Description
	Groundwater level with date observed prior to introduction of fluids or after standpipe construction
Not observed	The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole / test pit.
Not en-countered	The borehole / test pit was dry soon after excavation, however groundwater could be present in less permeable strata. Inflow may have been observed had the borehole / test pit been left open for a longer period.

Core Run

Core lifts are identified by a line and depth. The run number may be shown and total core recovery is shown as a percentage in brackets followed by the RQD percentage unless otherwise indicated.

Colour

The colour of a soil or rock is described in a moist/wet condition using simple terms, such as black, white, grey, red, brown, orange, yellow green or blue. These are modified as necessary by 'pale', 'dark' or 'mottled'. Borderline colours are described as a combination of these colours (e.g. orange-brown). Where a soil or rock consists of a primary colour with a secondary mottling it is described as (primary colour) mottled (first colour) and (secondary colour).



Description of Soil

i. Soil name
ii. Plasticity or particle size of soil
iii. Colour
iv. Secondary soil components names & estimated proportions including their plasticity / particle characteristics, colour
v. Minor soil components name, estimated proportions, including their plasticity / particle characteristics, colour
vi. Other minor soil components
vii. Structure of soil including zoning, defects & cementing
viii. Additional observations including odour & staining

The origin of soil, soil classification, consistency / density & soil moisture condition are presented separately from the material description.

Particle Size

Term		Grain Size
Clay		< 2 µm
Silt		2 – 75 µm
Sand	Fine	0.075 – 0.21 mm
	Medium	0.21 – 0.6 mm
	Coarse	0.6 – 2.36 mm
Gravel	Fine	2.36 – 6.7 mm
	Medium	6.7 – 19 mm
	Coarse	19 – 63 mm
Cobbles		63 – 200 mm
Boulders		> 200 mm

Fine Grained and Coarse Grained Soils

Term	Description
Fine Grained Soil (cohesive)	More than 35% of the material less than 63 mm is smaller than 0.075 mm (silts and clays)
Coarse Grained Soil	More than 65% of the material less than 63 mm is larger than 0.075 mm (sands, gravels and cobbles)

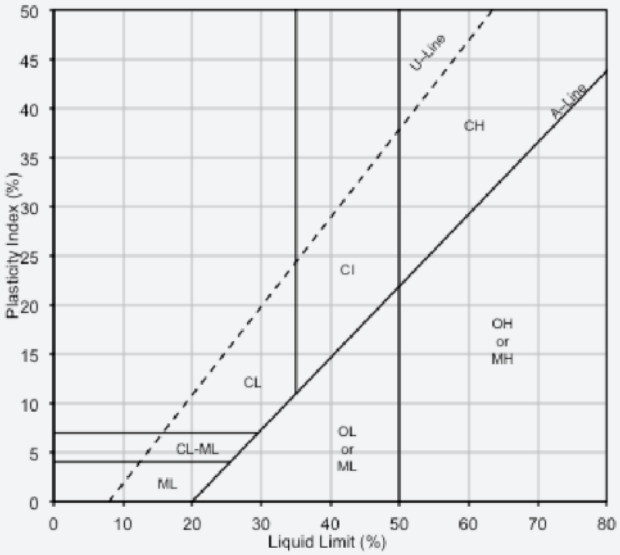
Descriptive Terms for Secondary and Minor Components

Designation of Components	In coarse grained soils				In fine grained soils	
	% Fines	Terminology	% Accessory coarse fraction	Terminology	% Sand / Gravel	Terminology
Minor	≤5	trace	≤15	trace	≤15	trace
	>5, ≤12	with	>15, ≤30	with	>15, ≤30	with
Secondary	>12	prefix	>30	prefix	>30	prefix

Plasticity – Fine Grained Soils

Liquid Limit (LL) %	Description
≤ 35	Low plasticity
>35 to ≤ 50	Medium plasticity
> 50	High plasticity

Plasticity Chart– Fine Grained Soils



Consistency Terms – Fine Grained Soils

Term	Undrained shear strength (kPa)	Indicative SPT (N) Blow Count	Field Guide to Consistency
Very Soft (VS)	<12	0 – 2	Easily penetrated several centimetres by fist, exudes between fingers when squeezed in fist
Soft (S)	12 – 25	2 – 4	Easily penetrated several centimetres by thumb, easily moulded by light finger pressure
Firm (F)	25 – 50	4 – 8	Can be penetrated several centimetres by thumb with moderate effort, and moulded between the fingers by strong pressure
Stiff (St)	50 – 100	8 – 15	Readily indented by thumb but penetrated only with difficultly. Cannot be moulded by fingers
Very Stiff (VSt)	100 – 200	15 –30	Readily indented by thumb nail, still very tough
Hard (H)	>200	>30	Indented with difficulty by thumb nail, brittle
Friable (Fr)	-		Can be easily crumbled or broken into small pieces

Density Terms – Coarse Grained Soils

Term	Density Index (%)	SPT (N) Blow Count
Very Loose (VL)	< 15	0 – 4
Loose (L)	15 – 35	4 – 10
Medium Dense (MD)	35 – 65	10 – 30
Dense (D)	65 – 85	30 – 50
Very Dense (VD)	> 85	>50

Particle Characteristics – Coarse Grained Soils

Term	Description
Well Graded	Having good representation of all particle sizes
Poorly graded	With one or more intermediate size poorly represented
Gap graded	With one or more intermediate sizes absent
Uniform	Essentially of one size

Angularity – Coarse Grained Soils

	Rounded
	Sub-rounded
	Angular
	Sub-angular

Origin of Soil

Fill	Formed by humans
Aeolian	Formed by wind
Alluvial	Formed by streams and rivers
Colluvial	Formed on slopes (talus)
Estuarine	Formed in marine environments
Lacustrine	Formed in lakes
Residual	Formed by weathering insitu

Soil Moisture

	Term	Code	Description
Coarse Grained	Dry	D	Looks and feels dry and free running
	Moist	M	Soil feels cool, darkened in colour, soils tend to stick together, soil grains do not run freely through fingers and no visible free water
	Wet	W	Soil feels cool, darkened in colour, soils tend to stick together, free water on remoulding
Fine Grained	Moist, Less than Plastic Limit	W < PL	Hard and friable or powdery, moisture content well below Plastic Limit
	Moist, Near Plastic Limit	W ≈ PL	Soil feels cool, darkened in colour, can be moulded, near Plastic Limit
	Moist, Wet of Plastic Limit	W > PL	Soil feels cool, dark, usually weakened, free water, moisture content well above Plastic Limit
	Wet, Near Liquid Limit	W ≈ LL	Soil exudes easily
	Wet, Wet of Liquid Limit	W > LL	Soil behaves as a liquid

Boundary Classifications

Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well graded gravel-sand mixture with clay binder.

Graphic Symbols

	Asphalt		MH
	CH		ML
	Cl		OH
	CL		OL
	Concrete		PT
	Fill		SC
	GC		SM
	GM		SP
	GP		SW
	GW		

Description of Rock

i. Rock name
ii. Grain size and mineralogy
iii. Colour
iv. Fabric, bedding and texture
v. Features, inclusions, minor components, moisture condition and durability
vi. Rock mass properties - discontinuities and structure of rock
vii. Additional observations including odour & staining

The origin of rock, interpreted stratigraphic unit, strength weathering and alteration are presented separately from the material description.

Simple rock names are used to provide a reasonable engineering description, rather than a precise geological classification. The rock name is chosen by considering the nature and shape of the grains or crystals, the texture and fabric of the rock material, the geological structure and setting, and information from the geological map of the area. Further guidance on the naming of rocks can be found in AS1726-2017, Tables 15, 16, 17 and 18. Typical rock types are described below, though subject to site specific variations.

Rock Type	Description	Example of Rock Name
Sedimentary	Formed by deposited beds of sediments, have grains that are cemented together and often rounded. Significant porosity	COMMON: Conglomerate, Breccia, Sandstone, Mudstone, Siltstone, Claystone ≥90% CARBONATE: Limestone, Dolomite, Calcirudite, Calcarenite, Calcisiltite, Calcilutite PYROCLASTIC: Agglomerate, Volcanic Breccia, Tuff
Igneous	Formed from molten rock and have a crystalline texture. Typically massive and low porosity. Rock types are from coarse to fine grained.	HIGH QUARTZ CONTENT: Granite, Microgranite, Rhyolite MODERATE QUARTZ CONTENT: Diorite, Microdiorite, Andesite LOW QUARTZ CONTENT: Gabbro, Dolerite, Basalt
Metamorphic	Formed when rocks are subject to heat and/or pressure and have typically have directional fabric. Typically have low porosity and crystalline structure. Rock types are from coarse to fine grained	FOLIATED: Gneiss, Schist, Phyllite, Slate NON-FOLIATED: Marble, Quartzite, Serpentinite, Hornfels
Duricrust	Formed as part of a weathering profile and show evidence of being cemented in situ. Cementation is typically irregular and exhibits replacement textures.	Ferricrete (Iron oxides and hydroxides) Silicrete (Silica) Calcrete (Calcium carbonate) Gypcrete (Gypsum)

Note: ( ) denotes dominant cementing mineralogy

Grain Size

Terms describing dominate grain size in sedimentary rocks.

Term	Grain size
Coarse	Mainly 0.6 mm to 2 mm
Medium	Mainly 0.2 mm to 0.6 mm
Fine	Mainly 0.06 mm (just visible)

Terms describing dominate grain size in igneous and metamorphic rocks

Term	Grain size
Coarse	Mainly greater than 2 mm
Medium	0.06 mm to 2 mm
Fine	Mainly less than 0.06 mm (just visible)

Texture and Fabric

Sedimentary rocks

Thickness	Bedding Term
< 6 mm	Thinly laminated
6 – 20 mm	Laminated
20 – 60 mm	Very thinly bedded
60 – 200 mm	Thinly bedded
0.2 – 0.6 m	Medium bedding
0.6 – 2 m	Thickly bedded
> 2 m	Very thickly bedded

Igneous rocks

Term	Definition
Amorphous	Indicates that the rock has no obvious crystalline structure
Crystalline	A regular molecular structure, showing crystal structure and symmetry.
Cryptocrystalline	The texture comprises crystals that are too small to recognise under an ordinary microscope. Indistinctly crystalline.
Porphyritic	Indicates the presence of phenocrysts (relatively large crystals in a fine grained ground mass) in igneous rocks.
Flow banded	Indicates visible flow lines in volcanic rocks and some intrusive rocks
Glassy	Entirely glass like. No crystalline units and without crystalline structure.
Vesicular	A texture of volcanic rocks that indicates the presence of vesicles (small gas bubbles). Where the vesicles are filled with a mineral substance they are termed Amygdales and the texture is Amygdaloidal.

Metamorphic

Term	Definition
Foliation	The parallel arrangement of minerals due to metamorphic process, which shall be defined by the terms in weak, moderate and strongly foliated.
Porphyroblastic	A texture indicating the presence of porphyroblasts (larger crystals formed by recrystallization during metamorphism, such as garnet or staurolite in a mica schist).
Cleavage	A type of foliation developed in fine grained metamorphic rocks such as slates.

Bedding and Fabric Development

Type	Definition
Massive	No obvious development of bedding – rock appears homogeneous
Poorly Developed	Bedding is barely obvious as faint mineralogical layering or grain size banding, but bedding planes are poorly defined.
Well Developed	Bedding is apparent in outcrops or drill core as distinct layers or lines marked by mineralogical or grain size layering.
Very Well Developed	Bedding is often marked by a distinct colour banding as well as by mineralogical or grain size layering.
Indistinct fabric	There is little effect on strength properties
Distinct Fabric	The rock may break more easily parallel to the fabric

Rock Strength

Term (Code)	UCS (MPa)	$Is_{(50)}$ (MPa)	Field Guide to Strength
Soil Strength (SS)	<0.6	<0.03	Soil strength materials, formerly classified as Extremely Low Strength rock, as to be assigned a soil strength based on the soil characteristics: granular or cohesive. Where strength ranges between soil and Very Low Strength rock, Soil Strength may be used for transitional strengths.
Very Low (VL)	0.6 – 2	> 0.03 to ≤0.1	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 3 cm thick can be broken by finger pressure.
Low (L)	2 - 6	> 0.1 to ≤ 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blow of the pick point; has dull sound under hammer. A piece of core 150 mm long 50 mm in diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium (M)	6 - 20	> 0.3 to ≤ 1.0	Readily scored with a knife; a piece of core 150 mm long by 50 mm in diameter can be broken by hand with difficulty.
High (H)	20 - 60	> 1 to ≤ 3	A piece of core 150 mm long by 50 mm in 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)	60 -200	> 3 to ≤ 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High (EH)	>200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Rock strength is assessed by laboratory Uniaxial Compressive Strength (UCS) testing and/or Point Load Strength Index (PLT) testing to obtain the $Is_{(50)}$ the strength table implies a 20 times correlation between $Is_{(50)}$ and UCS used for classification. Note however, multiplier may range from 4 (e.g. some carbonated and low strength rocks) to 40 (e.g. some igneous rocks and/or some high strength rocks). A site specific correlation based on testing, previous investigation or literature may be used where available. These terms refer to the strength of the rock material and not to the strength of the rock mass which may be considered weaker due to the effect of rock defects. Material with strength less than Very Low are described using soil characteristics including consistency / density as detailed on page 4.

Visual Log

A detailed core photo or diagrammatic plot of defects showing type, spacing and orientation in relation to the core axis.

- Defects open in-situ or clay sealed
- Defects closed in-situ
- Drill induced fractures or handling breaks
- Infilled seam

Rock Weathering and Alteration Classification

Term (Code)		Definition	
Residual soil (RS)		Soil developed on extremely weathered rock. The rock mass structure and substance fabric are no longer evident but the soil has not been significantly transported.	
Extremely weathered (XW) Extremely altered (XA)		Rock is weathered to such an extent that it has 'soil' properties, i.e, it either disintegrates or can be remoulded in water, but the texture of original rock is still evident.	
Highly weathered (HW) Highly Altered (HA)	Distinctly weathered (DW)* Distinctly Altered (DA)	Whole rock material is discoloured usually by extent that iron staining or bleaching and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock usually as a result of iron leaching or deposition. The colour and strength of the original rock substance is no longer recognisable	*Where is it not practical to distinguish between 'HW' and MW'. Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores
Moderately weathered (MW) Moderately Altered (MA)		Whole rock material is discoloured usually by staining that original colour of the fresh rock is no longer recognisable	
Slightly weathered (SW) Slightly altered (SA)		Rock is slightly discoloured but shows little or no change of strength from fresh rock	
Fresh rock (FR)		Rock shows no sign of decomposition or staining.	

Rock Core Recovery

TCR = Total Core Recovery (%)

$$\frac{\textbf{Length of Core Recovered}}{\textbf{Length of Core run}} \times 100$$

SCR = Solid Core Recovery (%)

$$\frac{\textbf{Sum Length of Cylindrical Core Recovered}}{\textbf{Length of Core run}} \times 100$$

RQD = Rock Quality Designation (%)

$$\frac{\textbf{Sum Length of Sound Core Pieces > 100mm in length}}{\textbf{Length of Core run}} \times 100$$

Types of Defects

Term		Code	Description
Parting		P	A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering (e.g. bedding) or a planar anisotropy in the rock material (i.e. cleavage). May be opened or closed.
Joint		J	A surface or crack with no apparent shear displacement and across which the rock has little or no tensile strength, but which is not parallel or sub-parallel to layering or to planar anisotropy in the rock material. May be open or closed.
Sheared Surface		S	A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.
Sheared Zone		SZ	Zone of rock material with roughly parallel, near planar, curved, or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.
Crushed Zone[a]		CZ	A zone of broken and disturbed ground containing more than one identifiable Crushed Seam.
Fracture Zone[a]		FZ	A zone of broken ground with parallel to opposing boundaries dominated by abundant, extremely closely to closely spaced defects, which may be intact or open, and planar, curved, undulating, irregular, or stepped, resulting in a dissected rock mass of angular trapezoidal, triangular or rectangular fragments.
Seam (SE)	Sheared Seam	SS	Seam of soil material with roughly parallel almost planar boundaries, composed of soil materials with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.
	Crushed Seam	CS	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.
	Infilled Seam	IS	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1 mm thick may be described as a veneer or coating on a joint surface.
	Extremely Weathered Seam	EW	Seam of soil material, often with gradational boundaries. Formed by weathering of the rock material in place.
Fault [b]		FT	A fracture (defect) or fracture zone along which there has been an observable amount of displacement.
Vein [c]		VE	Any fracture that contains mineralized material. Veins can display either crack-normal extension or shear displacement coupled with crack-normal extension.
Vugh [a]		VG	An open void with secondary crystallisation which may be coated, partly or nearly completely filled.
Void [a]		VO	An open space created through natural or anthropogenic processes, including, but not limited to, caves, kettles, tunnels, mines, pipes, piping, landslides, faulting, shearing, dissolution, & erosion.
Mechanical Break		MB	A fracture or break induced or created by the sampling process (i.e. drilling (DB) handling (HB), drill lift (DL), excavation, or blasting).

All definitions as per AS1726-2017 except: a) SMEC Field Manual, b) British Standard BS 5930:2015 and c) Glossary of Geology (Fifth Edition - revised 2011) American Geosciences Institute.

Discontinuity Planarity

Code	Description
CU	Curved – A defect with a gradual change in orientation
IR	Irregular – A defect with many sharp changes in orientation
PR	Planar – Defect forms a continuous plane without variation in orientation
ST	Stepped – A defect with distinct sharp steps or step
UN	Undulose – A defect with undulations

Discontinuity Roughness

Code	Description
VR	Very rough – many large surface irregularities, amplitude generally more than 1mm
RF	Rough – Many small surface irregularities generally related to the grain size of the parent rock
SM	Smooth – Few or no surface irregularities related to the grain size of the parent rock
PO	Polished – Planes have a distinct sheen or a smoothness
SL	Slickensided – Planes have a polished, grooved or striated surface consistent with differential movement of the parent rocs along the plane

Type of Structures

Term	Code	Description
Bedding	BD	A layered arrangement of minerals parallel to the surface of deposition which has caused planar anisotropy in the rock substance.
Cleavage	CV	An alignment of fine grained minerals caused by deformation.
Fold Axis	FX	The orientation of a line representing the location of greatest curvature of a fold
Schistosity	SH	A layered arrangement of minerals to each other
Foliation	FL	A planar alignment of minerals caused by deformation.
Void	VO	A completely empty space
Dyke	DK	Sheet-like bodies of igneous rock that cut across sedimentary bedding or foliations in rocks. They may be single or multiple in nature
Sill	SI	A sill is an intrusion of magma that spreads underground between the layers of another kind of rock
Contact	CX	A contact between intrusive and stratigraphic units.
Boundary	BN	A distinct boundary between two stratigraphic units

Note: Drill breaks (DB) and handling breaks (HB) are not included as natural discontinuity.

Discontinuity Spacing

Spacing (mm)	Description
>6000	Extremely Widely Spaced
2000 - 6000	Very Widely Spaced
600 - 2000	Widely Spaced
200 - 600	Moderately Widely Spaced
60 - 200	Closely Spaced
20 - 60	Very Closely Spaced
<20	Extremely Closely Spaced

Discontinuity Aperture Openness

Code	Description
tight	Nil, Closed
very narrow	>0-2 mm, Closed
narrow	2-6 mm, Closed
moderately narrow	6-20 mm, Gapped
moderately wide	20-60 mm, Open
wide	60-200 mm, Open
very wide	>200 mm, Open

Infill Material

Code	Name	Code	Name
AM	Azurite / Malachite	Gp	Gypsum
Ap	Apatite	He	Hematite
Ca	Calcite	Is	Ironstone
Co	Coal	Mn	Manganese
Ch	Chlorite	Pl	Pyrolusite
Cp	Chalcopyrite	Py	Pyrite
Cy	Chalcedony	Sd	Siderite
Ep	Epidote	Se	Serpentine minerals
Fe	Limonite/Goethite	Sp	Sphalerite
FeO	Iron oxide	Um	Unidentified mineral
Fs	Feldspar (K)	Qz	Quartz
FsC	Feldspar (Ca/Na)	X	Carbonaceous
Ga	Galena	Ze	Zeolite

Discontinuity Observation

Term	Code	Description
Clean	CN	No visible coating or infill
Stain	SN	No visible coating or infill but surfaces are discoloured by mineral staining
Veneer	VN	A visible coating or soil or mineral substance but usually unable to be measured. If discontinuous over the plane, patchy veneer.
Coating	CT	A visible coating up to 1mm thick. Thicker soil material shall be described using defect terms (e.g. infilled seam). Thicker rock strength material shall be described as a vein.

Discontinuity Nature

Code	Description
C	Crushed
DL	Dilated
DS	Displaced
HL	Hairline
HE	Healed
IF	Infilled
IT	Intact

Samples

Code	Description
B	Bulk disturbed sample
BLK	Block sample
C	Core sample
D	Small disturbed sample
ES	Soil sample for environmental testing
EW	Water sample for environmental testing
G	Gas sample
LB	Large bulk disturbed sample
P	Piston sample
SPTLS	Standard penetration test liner sample
U	Undisturbed push in sample
U50	Undisturbed tube sample (50 mm diameter)
U75	Undisturbed tube sample (75 mm diameter)
CONCC	Concrete core
M	Mazier type sample

Field Tests

Code	Description
DCP	Dynamic Cone Penetration test
H	Hydraulic fracturing
HB	Hammer bouncing
PP	Hand penetrometer test
$Is_{(50)}$	Point Load Index
K	Permeability
N	Standard penetration test result
REC	Recovered length of SPT
PID	Photoionisation detector reading in ppm
R	Refusal
SPT	Standard penetration test
VS	Vane shear test
FP	Pressuremeter
● (A)	Axial Test
○ (D)	Diametral Test
□	Irregular Lump test
uL	Lugeon value

Laboratory Tests

Code	Description
ACM	Asbestos Containing Material
AT+MC	Atterberg Limits + moisture content
CD	Consolidated Drained
CBR	California Bearing Ratio (4 day, 4.5kg, 98%)
Cerchar	Cerchar Abrasivity
CU	Consolidated Undrained
DS	Direct shear along defect
DSI	Direct shear through intact rock
DTd	Direct Tensile - defect
DTr	Direct Tensile - rock
EC	Emerson Class
HELD	Sample held at this time for possible later testing
LL	Liquid Limit
LS	Linear Shrinkage
MC	Moisture Content
MDD	Maximum Dry Density
MSD	Modified slake durability
NAGC	Nett Acid Generating Capacity
OMC	Optimum Moisture Content
PBT	Plate Bearing Test
PET	Petrography
PHD	Pinhole dispersion
PI	Plasticity Index
PL	Plastic Limit
PSD	Particle Size Distribution
PSD+	PSD + hydrometer
ρ_b	Bulk Density
ρ_p	Particle Density
ρ_d	Dry Density
UCS+	Unconfined Compressive Strength + Youngs Modulus + Poisson's Ratio (rock) + Moisture content + wet density
UU	Undrained Unconsolidated
TXL	Triaxial (rock)
TX	Triaxial (soil)
CHEM	Geochemical Testing
■	UCS Test

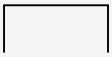
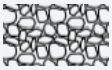
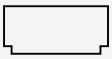
Types fo Defects - Televiewer logging

Type	Description
BD	Bedding, a depositional fabric in the rock, that is not considered a geotechnical defect as it is closed at the location in which it was observed
BN	A distinct boundary between two stratigraphic units
BSH	Bedding Shear, a shear connecting bedding surfaces or shearing along a bedding surface
CX	A contact between intrusive and stratigraphic units
CS	Crush seam, typically sub-horizontal seam with soft infill and possible rock fragments showing evidence of localised crushing at the location in which it was observed
CV	Cleavage, a secondary deformation fabric, not inherently part of the deposition fabric of the rock that presents as a surface of weakness or defect
FX	Fold axis, not dip and dip direction of a plane but trend and plunge of a line that represents the axis of the folded limbs
FT	Fault, a fracture, similar to a joint, but where defined displacement is observed (e.g. through mismatching of bedding across the structure)
FT/FZ	A fault or group of closely spaced faults with cumulative defined displacement observed
J	Joint, a fracture in the rock with little to no tensile strength
P	Parting, as per bedding but forms a defect in the rock as the two sides are separated at the location in which it was observed
SM	Clay seam, typically sub-horizontal seam with clay and no evidence of shearing at the location in which it was observed
SR	Shear, deformation feature with evidence of movement within the infill zone at the location in which it was observed. Often bounded by discreet structures
SR/ SZ	Shear zone, multiple shear features making up a wider zone of deformation
SS	Sheared seam, typically sub-horizontal with evidence of movement within the infill zone at the location in which it was observed
VE	Vein, open bounding surfaces or vuginess at the location in which it was observed
Vc	Vein with closed bounding surfaces at the location i n which it was observed

Concrete Bond Logging

Type	Description
BLJ	Bonded Lift Joint
ULJ	Unbonded Lift Joint
LJ	Lift Joint

Backfill / Standpipe Detail

Symbol	Description
	Cement seal
	Grout backfill
	Blank pipe
	Slotted pipe
	Surface Completion: Monument Above Ground
	Filter pack: sand filter
	Filter pack: gravel filter
	Bentonite seal
	Cutting – excavated material backfill
	Surface Completion: Gatic Ground Monument

Completion Details

Type	Description
Collapse	Exploratory hole collapsed before reaching planned depth
Equipment Failure	Boring or excavator equipment operational failure
Flooding	Flooding of excavation
Machine Limit	Limit of machine capability reached
Obstruction in the hole	Obstruction preventing further advancement
Possible services	Indication of possible services below
Services present	Services encountered during exploratory hole
Squeezing	Hole squeezing boring equipment
Target Depth	Depth reached as planned
Target Depth Instrumentation Installed	Depth reached as planned instrumentation installed
Target Depth Standpipe Installed	Depth reached as planned open standpipe constructed
Refusal	Material preventing further advancement

Status

Code	Description
-2	Historic
-1	For information
0	Preliminary
1	Checked
2	Draft
3	Final

Geological & Engineering Log

Project	New Bankstown Hospital	East	318295.6 m	Start Date	10/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246144.4 m	End Date	11/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	51.02 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

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Borehole Identifier: **BH01**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T							Not Observed	0.0 *51.0*			0.10 *50.92*	BITUMEN: dark grey.										ROAD SURFACE	
				D						Cl -CH		FILL CLAY: medium to high plasticity, red-brown, with fine to medium grained, sub-rounded to sub-angular gravel.	w<PL									FILL	
											0.80 *50.22*	CLAY: medium to high plasticity, grey mottled orange-brown, with fine grained, sub-angular siltstone gravel.		H								RESIDUAL SOIL	
					1.00m			1.0 *50.0*															1.0
				D	SPT 7,11,27 HB N=38 (0.45m REC)																		
					1.45m																		
								2.0 *49.0*				2.00: becomming orange brown											2.0
					2.50m					Cl -CH													
				D	SPT 1,20/110mm HB N=R (0.26m REC)																		
					2.76m																		
								3.0 *48.0*															3.0
					4.00m						4.00 *47.02*	CLAY: high plasticity, grey, (Extremely Weathered siltstone).										EXTREMELY WEATHERED MATERIAL	4.0
				D	SPT 7,23,20/70mm HB N=R (0.30m REC)			4.0 *47.0*		CH													
					4.37m						4.40												
NMLC			R1 (98%) 89%		4.76 m Is(50) D=0.03MPa 4.76 m Is(50) A=0.04MPa						*46.62*	SILTSTONE: fine grained, grey, distinctly laminated.			HA	HW	VL				4.62: P, 5°, clay VN, PR, RF 4.79-4.81: Px2, 0°, clay VN, PR, RF 4.94-4.98: CZ, 5°, 40 mm	SEDIMENTARY	
								5.0															

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	11/12/2024
Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318295.6 m	Start Date	10/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246144.4 m	End Date	11/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	51.02 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

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Borehole Identifier: **BH01**

Depth (m) / Elevation	Graphic Log	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 / 46.0			5.52	SILTSTONE: fine grained, grey, distinctly laminated. *(continued)*				HW (cont)	VL (cont)	R1 (98%) 89%		5.11 m Is(50) D=0.01MPa 5.11 m Is(50) A=0.02MPa			5.15: P, 5°, clay VN, CU, RF 5.28: P, 10°, FeO VN, CU, RF	SEDIMENTARY	
								MW				5.48 m Is(50) D=0.01MPa 5.48 m Is(50) A=0.02MPa			5.44: P, 5°, clay VN, CU, RF		
		GC	45.50	Clayey GRAVEL: fine to coarse grained, poorly graded, sub-angular, grey, clay is brown; (Extremely Weathered siltstone).		MD		XW		5.52						EXTREMELY WEATHERED MATERIAL	
			5.71														
		Cl	5.82	Gravelly CLAY: medium plasticity, brown, gravel is fine grained, sub-rounded; (Extremely Weathered siltstone).		VSt											
		GC	45.20			MD											
6.0 / 45.0			6.00	Clayey GRAVEL: fine to coarse grained, poorly graded, sub-angular, grey-brown, (Extremely Weathered siltstone).												SEDIMENTARY	6.0
			6.08					HW	L							EXTREMELY WEATHERED MATERIAL	
		GC	6.20	SILTSTONE: fine grained, grey-brown, indistinctly laminated.		MD		XW				6.24 m Is(50) D=0.02MPa 6.24 m Is(50) A=0.28MPa			6.20: P, 0°, CN, PR, RF 6.27: P, 0°, CN, ST, RF 6.31: P, 0°, CN, ST, RF 6.36: P, 0°, CN, PR, RF 6.42: P, 0°, CN, PR, RF 6.47: P, 5°, clay CT, PR, RF 6.55: P, 0°, CN, PR, RF	SEDIMENTARY	
			44.82	Clayey GRAVEL: fine to coarse grained, poorly graded, sub-angular, grey-brown, (Extremely Weathered siltstone).				MW	L	R2 (100%) 33%		6.66 m Is(50) D=0.26MPa 6.66 m Is(50) A=0.39MPa			6.82: J, 0°, CN, PR, RF 6.94: J, 80°, CN, UN, RF 7.02: P, 0°, clay VN, ST, RF 7.06: J, 50°, CN, IR, RF 7.14: J, 15°, CN, CU, RF 7.17: J, 90°, CN, UN, RF		
7.0 / 44.0				SILTSTONE: fine grained, grey-brown, distinctly laminated.						7.20					7.31-7.33: CS, 0°, 20 mm 7.33-7.35: EW, clay, 20 mm 7.37-7.40: EW, clay, 30 mm		7.0
			7.85					SW							7.59-7.61: IS, 0°, clay, 20 mm 7.67-7.69: CS, 0°, medium grained gravel 7.57-7.85: Px11, 0°, CN, PR, SM		
			43.17	SANDSTONE: fine grained, grey, indistinctly bedded.					M			7.96 m Is(50) D=0.30MPa 7.96 m Is(50) A=0.39MPa 8.07 m Is(50) D=0.62MPa 8.07 m Is(50) A=1.34MPa			8.00: P, 5°, CN, CU, RF		8.0
8.0 / 43.0															8.17: P, 5°, FeO SN, UN, RF 8.26: J, 80°, FeO SN, UN, RF 8.29: P, 0°, CN, PR, RF 8.37: J, 15°, FeO SN, CU, RF 8.44: P, 0°, CN, PR, SM		
			8.37														
			42.65	SILTSTONE: fine grained, grey, distinctly laminated.						R3 (100%) 63%					8.78: P, 0°, CN, PR, RF 8.87: P, 0°, CN, PR, RF 8.90: P, 5°, CN, CU, RF		
9.0 / 42.0												9.04 m Is(50) D=0.13MPa 9.04 m Is(50) A=0.41MPa			9.28: P, 5°, CN, ST, RF		9.0
															9.61: P, 0°, CN, PR, RF		
10.0										10.00		10.02 m Is(50)			9.82: P, 5°, CN, ST, RF		

NMLC

Not Observed

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	11/12/2024
Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318295.6 m	Start Date	10/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246144.4 m	End Date	11/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	51.02 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

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Borehole Identifier: **BH01**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC					D=0.51MPa 10.02 m Is(50) A=0.59MPa			10.0 *41.0*			10.16	SILTSTONE: fine grained, grey, distinctly laminated. *(continued)*				SW *(cont)*	M *(cont)*				10.18: J, 10°, CN, CU, RF 10.21: P, 0°, CN, PR, RF 10.25-10.26: Px2, 0°, CN, PR, RF	SEDIMENTARY	
											40.86	INTERLAMINATED SANDSTONE (90%) AND SILTSTONE (10%): sandstone is fine grained, grey, indistinctly bedded. siltstone is indistinctly laminated.								10.40: P, 0°, CN, PR, RF		
											10.52									10.54: P, 15°, CN, ST, RF 10.61: P, 20°, CN, ST, RF		
											40.50	SILTSTONE: fine grained, grey, distinctly laminated.										
			R4 (100%) 80%		11.00 m Is(50) D=0.30MPa 11.00 m Is(50) A=0.64MPa			11.0 *40.0*												11.31-11.32: CZ, 0°, 10 mm		11.0
																				11.43-11.46: CZ, 0°, 30 mm 11.49-11.53: EW, 0°, clay, 40 mm 11.53: J, 10°, CN, PR, RF 11.59: EW, 5°, clay		
																XW SW	M					
			12.00		11.96 m Is(50) D=0.60MPa 11.96 m Is(50) A=1.21MPa			12.0 *39.0*			12.00					FR	M - H					12.0
											39.02	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is indistinctly laminated. 12.10-12.90: quartz vein, 2-10mm								12.34: P, 0°, CN, PR, SM		
											12.34									12.54: P, 0°, CN, PR, SM		
											38.68	INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, grey, indistinctly laminated. sandstone is indistinctly laminated.								12.67: P, 0°, CN, PR, SM 12.80: P, 0°, CN, PR, SM 12.82: P, 0°, CN, PR, SM		
					12.76 m Is(50) D=0.33MPa 12.76 m Is(50) A=0.82MPa		Not Observed													12.99: J, 70°, CN, CU, RF 13.06: P, 5°, CN, UN, RF		
								13.0 *38.0*			13.06									13.19: P, 0°, CN, PR, RF		13.0
											37.96	SILTSTONE: fine grained, grey, distinctly laminated.										
			R5 (100%) 93%																	13.57-13.58: CS, 0°, 10 mm		
					13.96 m Is(50) D=0.59MPa 13.96 m Is(50) A=0.78MPa			14.0 *37.0*														14.0
											14.32											
											36.70	SANDSTONE: fine grained, grey, indistinctly bedded.								14.50: P, 5°, CN, ST, RF 14.60: P, 5°, CN, ST, RF 14.66-14.69: Px2, 5°, CN, UN, RF		
					14.96 m Is(50) D=1.39MPa 14.96 m Is(50) A=3.09MPa															14.82: P, 0°, CN, PR, RF		
			15.00					15.0				BH Terminated at 15.00 m Target Depth										

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH01 Depth Range: 4.00 - 8.00 m



PointID : BH01 Depth Range: 8.00 - 12.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH01	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH01 Depth Range: 8.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH01	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 2/2

Geological & Engineering Log

Project	New Bankstown Hospital	East	318357.8 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246138.4 m	End Date	12/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	52.34 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH02**

Depth RL	Soil / Rock Material Description	Soil Group Symbol	Moisture Condition	Consistency Density	Sampling	SPT / DCP / Is(50) / UCS	Permeability	Level & Inflow	Origin, Geology Unit, Other Testing & General Observations	Installation
0.0 (52.3)									ROAD SURFACE	
0.10 (52.24)	BITUMEN: black.									
	FILL CLAY: medium to high plasticity, red-brown mottled black, with fine grained, sub-rounded to sub-angular gravel.	CI -CH	w<PL		B				FILL 0.40-0.80: 1bag 0.80-1.40: 2 bags	
1.00m										
1.0 (51.3)					B D	SPT 5,5,6 N=11 (0.30m REC)				1.0
1.20 (51.14)	Silty CLAY: medium to high plasticity, orange-brown mottled grey.	CI -CH		St VSt					RESIDUAL SOIL	
1.45m										
2.0 (50.3)				H						2.0
2.50m					D	SPT 17,25/140mm N=R (0.30m REC) 2.79m				
2.70 (49.64)	CLAY: medium to high plasticity, grey mottled orange-brown.									
3.0 (49.3)		CI -CH								3.0
4.00m										
4.0 (48.3)					D	SPT 18,15/80mm HB N=R (0.23m REC) 4.23m			EXTREMELY WEATHERED MATERIAL 4.00: increased resistance	4.0
4.00 (48.34)	CLAY: high plasticity, grey-brown, with fine grained, sub-angular siltstone gravel; (Extremely Weathered siltstone).	CH								
5.0										

Method: AD/T
Casing
Progress Water (Loss/Return)
Run (TCR) RQD
Permeability: Not Observed
Graphic Log
Inferred Rock Strength — Point Load Is(50) ● - Axial ○ - Diametral; UCS ■ — VL 0.1, L 0.3, M 1, H 3, VH 10, EH
Defect Spacing (mm): 20, 60, 200, 600, 2000
Weathering
Alteration
Rock Strength
Visual
Fabric, Structure & Defect Description

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318357.8 m	Start Date	12/12/2024	Contractor	Terratest	Inclination	-90°
Client	Health Infrastructure	North	6246138.4 m	End Date	12/12/2024	Rig Type	Geo-205	Azimuth	
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	52.34 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	

smec

Borehole Identifier: **BH02**

Depth (m) / Elevation	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
5.0 / 47.3	CLAY: high plasticity, grey-brown, with fine grained, sub-angular siltstone gravel; (Extremely Weathered siltstone). *(continued)*	w<PL	H					EXTREMELY WEATHERED MATERIAL
5.65 / 46.69	SILTSTONE: fine grained, grey, distinctly laminated.				HW	VL	5.86: P, 0°, clay CT, PR, RF	SEDIMENTARY
6.0 / 46.3					MW		6.17-6.18: EW, 15°, clay, 10 mm	
	6.50-6.54: sandstone inclusions, 10mm						6.53: P, 10°, FeO SN, CU, RF 6.68: P, 0°, CN, ST, RF 6.86: P, 0°, clay CT, ST, RF	
7.0 / 45.3							7.00: P, 0°, clay CN, PR, RF 7.06: P, 0°, CN, PR, RF 7.19: P, 0°, CN, ST, RF 7.27: P, 0°, CN, PR, RF	
7.76							7.75: P, 0°, CN, PR, RF	
7.88 / 44.46	SANDSTONE: fine grained, grey, indistinctly bedded. SILTSTONE: fine grained, grey, distinctly laminated.				SW MW	M L	7.89: P, 0°, CN, PR, RF 7.98: J, 50°, CN, CU, RF	
8.0 / 44.3	8.40-9.07: becomming very thinly distinctly laminated						8.40: CS, 0°, CN, PR, RF	
9.07							8.92: J, 70°, CN, UN, RF	
9.20 / 43.14	Clayey GRAVEL: fine grained, poorly graded, sub-rounded to sub-angular, grey, (Extremely Weathered siltstone). SILTSTONE: fine grained, grey, distinctly laminated.		MD		XW MW	L	9.25: J, 50°, clay CT, CU, RF	EXTREMELY WEATHERED MATERIAL SEDIMENTARY
9.0 / 43.3							9.33-9.75: Px8, 0°, CN, PR, RF	
10.0							9.83: P, 10°, CN, PR, RF 9.90: P, 10°, CN, PR, RF	

Method: AD/T; NMLC
Casing
Progress Water (Loss/Return)
Run (TCR) RQD: R1 (100%) 93%; 7.10; R2 (100%) 49%
Sampling: D
SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa): 5.50m; SPT 16,20/80mm HB N=R (0.23m REC) 5.73m; 5.84 m Is(50) A=0.03MPa; 6.73 m Is(50) A=0.02MPa; 7.76 m Is(50) D=0.21MPa; 7.76 m Is(50) A=0.32MPa; 8.80 m Is(50) D=0.01MPa; 8.80 m Is(50) A=0.11MPa; 9.90 m Is(50) A=0.32MPa
Permeability
Level & Inflow: Not Observed
Graphic Log
Soil Group Symbol: CH; GC
Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■: VL 0.1, L 0.3, M 1, H 3, VH 10, EH
Defect Spacing (mm): 20, 60, 200, 600, 2000
Visual

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318357.8 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246138.4 m	End Date	12/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	52.34 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH02**

Depth (m) / Elevation	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Defect Spacing (mm)	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
10.0 / 42.3		42.34	SANDSTONE: fine grained, grey, indistinctly bedded.				SW	H		10.02: P, 0°, CN, ST, RF 10.07: P, 10°, CN, ST, RF	SEDIMENTARY	
		10.48								10.39: P, 5°, clay CT, PR, RF		
		10.61	CLAYSTONE: grey, distinctly laminated.				MW	L				
		41.73	SILTSTONE: fine grained, grey, distinctly laminated.					L - M		10.57-10.72: Px5, 0°, clay VN, PR, RF		
							SW			10.80-10.81: EW, 0°, 10 mm		
11.0 / 41.3										10.95: P, 0°, CN, PR, RF		11.0
										11.10: P, 0°, CN, PR, RF		
										11.30: P, 0°, CN, ST, RF		
										11.50: J, 10°, CN, ST, RF 11.56: J, 10°, CN, ST, RF		
										11.74-11.75: EW, 10 mm		
		12.00								11.85: P, 0°, CN, ST, RF		
12.0 / 40.3		40.34	INTERLAMINATED SANDSTONE (60%) AND SILTSTONE (40%): sandstone is fine grained, grey, indistinctly bedded. siltstone is grey.							12.09: P, 10°, CN, CU, RF		12.0
		12.33								12.33-12.36: Px2, 20°, CN, PR, RF		
		40.01	SILTSTONE: fine grained, grey, distinctly laminated.							12.55: J, 70°, CN, ST, RF 12.52-12.59: Px5, 0°, CN, PR, RF 12.65: P, 0°, clay CT, PR, RF		
										12.76-12.77: EW, 5°, clay		
										12.89: P, 0°, CN, ST, RF		
13.0 / 39.3										13.12: P, 10°, CN, ST, RF		13.0
		13.45										
		38.89	CLAYSTONE: grey, distinctly laminated.				MW	VL		13.59-13.60: CS, 0°, 10 mm		
		13.90								13.69-13.94: Px6, 0°, clay VN, PR, RF		
14.0 / 38.3		38.44	INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is fine grained, grey, distinctly laminated. sandstone is indistinctly laminated, grey.				FR	M				14.0
		14.17										
		38.17	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is distinctly laminated, dark grey.					M - H		14.30: P, 0°, CN, PR, RF		
										14.51: P, 0°, CN, PR, RF		
										14.66: P, 0°, CN, PR, RF		
15.0										14.77: P, 0°, CN, PR, RF		

Method: NMLC

Run (TCR) RQD: R2 (100%) 10.20–13.20; R3 (100%) 92%; R4 (100%) 87%

Sampling: 10.20 m ls(50) D=0.49MPa; 10.20 m ls(50) A=1.81MPa; 10.96 m ls(50) A=0.13MPa; 11.26 m ls(50) D=0.05MPa; 11.26 m ls(50) A=0.84MPa; 11.80 m ls(50) D=0.32MPa; 11.80 m ls(50) A=0.45MPa; 12.22 m ls(50) D=0.04MPa; 12.22 m ls(50) A=0.54MPa; 12.90 m ls(50) A=0.19MPa; 13.12 m ls(50) D=0.52MPa; 13.12 m ls(50) A=0.65MPa; 13.88 m ls(50) A=0.03MPa; 14.00 m ls(50) D=0.36MPa; 14.00 m ls(50) A=0.57MPa; 14.50 m ls(50) D=1.10MPa; 14.50 m ls(50) A=1.57MPa; 14.65 m ls(50) A=1.06MPa; 14.94 m ls(50) D=0.48MPa; 14.94 m ls(50)

Permeability / Level & Inflow: Not Observed

Inferred Rock Strength Point Load Is(50) (● - Axial, ○ - Diametral, UCS ■): VL -0.1, L -0.3, M -1, H -3, VH -10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Visual

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	12/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318357.8 m	Start Date	12/12/2024	Contractor	Terratest	Inclination	-90°
Client	Health Infrastructure	North	6246138.4 m	End Date	12/12/2024	Rig Type	Geo-205	Azimuth	
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	52.34 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	

Borehole Identifier: **BH02**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC			R4 (100%) 87% 15.30		A=0.61MPa 15.05 m Is(50) A=0.65MPa			15.0 *37.3*			15.30	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is distinctly laminated, dark grey. *(continued)*				FR *(cont)*	M - H *(cont)*				14.98: P, 0°, clay CT, PR, RF 15.08-15.09: CS, 0°, 10 mm 15.23-15.27: Px2, 0°, CN, PR, RF	SEDIMENTARY	
					15.20 m Is(50) D=0.61MPa 15.20 m Is(50) A=0.65MPa						*37.04*	BH Terminated at 15.30 m Target Depth										
								16.0 *36.3*															16.0
								17.0 *35.3*															17.0
								18.0 *34.3*															18.0
								19.0 *33.3*															19.0
								20.0															

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH02 Depth Range: 5.65 - 9.00 m



PointID : BH02 Depth Range: 9.00 - 13.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH02	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 1/2



PointID : BH02 Depth Range: 13.00 - 15.30 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH02	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318288.9 m	Start Date	18/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246094.6 m	End Date	18/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	48.15 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH03**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) / Elevation	Graphic Log	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
CC								0.0 / 48.1			48.15 / 0.19	CONCRETE.										CONCRETE	
											47.96	FILL Gravelly CLAY: fine grained, sub-rounded to angular, medium to high plasticity, grey to dark grey.	w>PL									FILL	
								1.0 / 47.1		CI -CH													1.0
AD/T				1.50m																			
				D	SPT 1,2,3 N=5 (0.44m REC)																		
				1.95m																			
								2.0 / 46.1			2.00 / 46.15	Silty CLAY: fine grained, medium to high plasticity, orange and dark grey, (Extremely Weathered siltstone).	w≈PL - w>PL	H								EXTREMELY WEATHERED MATERIAL	2.0
				3.00m																			
				D	SPT 5,12,21 N=33 (0.49m REC)																		
				3.45m																			
								3.0 / 45.1		CI -CH													3.0
								4.0 / 44.1															4.0
											4.60												
NMLC			R1 (93%) 69%				Not Observed				43.55 / 4.94	INTERBEDDED SILTSTONE (80%) AND SANDSTONE (20%): fine grained, black.				XW	VL			4.60-4.76: CS, 100 mm 4.91: P, 0°, CN, ST, RF	SEDIMENTARY	
								5.0 / 43.21															

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	LR	Date	18/12/2024
Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318288.9 m	Start Date	18/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246094.6 m	End Date	18/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	48.15 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH03**

Depth (m) / Elevation	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 / 43.1	INTERLAMINATED SANDSTONE (70%) AND SILTSTONE (30%): sandstone is fine to medium grained, orange, thinly laminated at 0 to 5°. siltstone is black. *(continued)*				HW *(cont)*	L *(cont)*	5.10: P, 5°, FeO SN, PR, RF 5.22: P, 0°, FeO SN, PR, RF 5.32-5.35: CZ, 30 mm 5.48-5.70: EW, 220 mm	SEDIMENTARY	
					MW		5.82: J, 10°, CN, PR, RF 5.86: J, 10°, CN, PR, RF 5.96: J, 10°, CN, PR, RF 6.03: P, 5°, FeO SN, PR, RF 6.10: J, 10°, FeO SN, PR, RF		6.0
6.0 / 42.1							6.20: P, 0°, CN, PR, RF		
6.20 / 41.95	INTERLAMINATED SANDSTONE (60%) AND SILTSTONE (40%): sandstone is fine to medium grained, grey and pale grey, distinctly laminated at 0 to 5°. siltstone is fine grained, black.						6.35: J, 20°, CN, PR, RF 6.45: P, 0°, clay CT, PR, SM, <1 mm 6.65: P, 0°, CN, PR, RF 6.66: P, 0°, CN, PR, RF 6.78: P, 0°, FeO SN, PR, RF 6.84: P, 0°, FeO SN, PR, RF 6.92: P, 0°, CN, PR, RF		
7.0 / 41.1							7.10: J, 10°, FeO SN, PR, RF 7.16: P, 5°, FeO SN, PR, RF 7.22: J, 0 - 10°, FeO SN, IR, RF 7.30: J, 20°, CN, PR, RF 7.35: J, 20°, CN, PR, RF 7.39: J, 10°, CN, PR, RF		7.0
							7.66: P, 5°, clay CT, PR, SM, 1 mm 7.68: P, 5°, clay CT, PR, SM, 1 mm 7.78: P, 0°, FeO SN, PR, RF 7.86-7.92: EW, 60 mm		
8.0 / 40.1							8.04: J, 30°, CN, PR, RF 8.18: J, 30°, FeO SN, PR, RF 8.30-8.33: CZ, 30 mm 8.47: J, 80°, FeO SN, UN, SM		8.0
					XW	VL	8.69-8.71: EW, 20 mm 8.77: P, 0°, clay CT, PR, SM, <1 mm 8.95: P, 0°, clay CT, PR, SM, <1 mm		
9.0 / 39.1									9.0
9.20 / 38.95	INTERLAMINATED SANDSTONE (70%) AND SILTSTONE (30%): sandstone is fine grained, grey to dark grey, distinctly laminated at 0 to 5°. siltstone is fine grained, black.				SW	M	9.18: P, 0°, clay CT, PR, SM, <1 mm 9.32: J, 10°, CN, PR, RF 9.47: P, 0°, CN, PR, RF		
10.0							9.76: P, 0°, CN, PR, SM 9.86: P, 0°, CN, PR, RF		

Method: NMLC

Casing

Progress Water (Loss/Return): 90-100% Water RETURN

Run (TCR) RQD: R1 (93%) 69%; R2 (100%) 84%; R3 (100%) 88%

Sampling

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
- 5.32 m Is(50) A=0.56MPa
- 5.40 m Is(50) D=0.70MPa
- 6.46 m Is(50) D=0.00MPa
- 6.46 m Is(50) A=0.02MPa
- 7.41 m Is(50) D=0.03MPa
- 7.41 m Is(50) A=0.16MPa
- 8.35 m Is(50) D=0.10MPa
- 8.35 m Is(50) A=0.28MPa
- 9.40 m Is(50) D=0.10MPa
- 9.40 m Is(50) A=0.85MPa

Permeability

Level & Inflow: Not Observed

Graphic Log

Soil Group Symbol

Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL -0.1, L -0.3, M -1, H -3, VH -10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Visual

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	LR	Date	18/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318288.9 m	Start Date	18/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246094.6 m	End Date	18/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	48.15 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination -90°
Azimuth North
Survey

smec

Borehole Identifier: **BH03**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		90-100% Water RETURN	R3 (100%) 88%		10.80 m Is(50) D=0.01MPa 10.80 m Is(50) A=MPa	Not Observed		10.0 *38.1*				INTERLAMINATED SANDSTONE (70%) AND SILTSTONE (30%): sandstone is fine grained, grey to dark grey, distinctly laminated at 0 to 5°. siltstone is fine grained, black. *(continued)*				SW *(cont)*	M *(cont)*				10.17: P, 0°, CN, PR, SM 10.20: P, 0°, CN, PR, SM 10.30: P, 0°, CN, PR, SM 10.36-10.37: EW, 10 mm	SEDIMENTARY	
																	L						
								11.0 *37.1*									M					11.0	
					11.70 m Is(50) A=0.55MPa 11.72 m Is(50) D=0.15MPa															11.43-11.45: CZ, 20 mm		
		11.78																					
								12.0 *36.1*														12.0	
					12.65 m Is(50) D=0.08MPa 12.65 m Is(50) A=0.57MPa															12.41: P, 0°, CN, PR, RF		
																				12.90-12.91: EW, 5 mm 13.04-13.05: EW, 10 mm		
								13.0 *35.1*														13.0	
		90-100% Water RETURN	R4 (100%) 68%																	13.26: P, 0°, clay CT, PR, SM 13.29: P, 0°, clay CT, PR, SM 13.32: P, 0°, clay CT, PR, SM				
					13.60 m Is(50) D=0.12MPa 13.60 m Is(50) A=0.58MPa															13.45-13.57: EW, 120 mm 13.59: P, 0°, CN, PR, RF		
					14.00 m Is(50) D=0.64MPa 14.00 m Is(50) A=1.44MPa															13.88: P, 0°, CN, UN, SM		
								14.0 *34.1*														14.0	
			15.00					15.0				BH Terminated at 15.00 m Target Depth											

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
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PointID : BH03 Depth Range: 4.60 - 9.00 m



PointID : BH03 Depth Range: 9.00 - 14.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH03	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH03 Depth Range: 14.00 - 15.00 m

smec	TITLE: Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH03	DRAWN: GDM	DATE: 18/2/2025
		CHECKED: MT	DATE: 18/2/2025
		SCALE: Not To Scale	A4
		PROJECT No: 30013640	FIGURE No: 2/2

Geological & Engineering Log

Project	New Bankstown Hospital	East	318349.7 m	Start Date	18/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246081.6 m	End Date	19/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	48.13 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination -90°
Azimuth
North
Survey

smec

Borehole Identifier: **BH04**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					1.00m		Not Observed	0.0 *48.1*		CI	*48.13* 1.00	FILL Sandy CLAY: medium plasticity, brown, sand is fine to medium grained, sub-rounded; with roots and bark.	w<PL									FILL	
				D	SPT 6,6,8 N=14 (0.45m REC) 1.45m			1.0 *47.1*			*47.13*	CLAY: medium to high plasticity, grey mottled red-brown.		St								RESIDUAL SOIL	1.0
														VSt									
					2.50m			2.0 *46.1*		CI -CH													2.0
				D	SPT 20/100mm HB N=R (0.10m REC) 2.60m									H									
				D				3.0 *45.1*			3.30 *44.83*	Silty CLAY: high plasticity, grey-brown, (Extremely Weathered siltstone).	w<PL - w≈PL									EXTREMELY WEATHERED MATERIAL	3.0
NMLC		80-90% Water RETURN	R1 (100%) 31%		4.64 m Is(50) D=MPa 4.64 m Is(50) A=MPa			4.0 *44.1*		CH	4.00 ***44.13***	SILTSTONE: orange-brown and grey-brown, indistinctly laminated.				XW - HW	VL				4.02-4.04: CZ, 20 mm 4.12: P, 0°, FeO SN, PR, SM 4.14: P, 0°, FeO SN, PR, SM 4.19: P, 0°, FeO SN, PR, SM 4.22: P, 0°, clay CT, PR, SM, 1 mm 4.27: P, 90°, FeO SN, PR, RF 4.32-4.33: EW, 10 mm 4.41-4.42: EW, 10 mm 4.72: J, 80°, FeO SN, PR, RF 4.85: P, 0°, clay CT, PR, SM, 1 mm	SEDIMENTARY	4.0
								5.0															

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318349.7 m	Start Date	18/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246081.6 m	End Date	19/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	48.13 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH04**

Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 / 43.1	SILTSTONE: orange-brown and grey-brown, indistinctly laminated. *(continued)*				XW - HW *(cont)*	VL *(cont)*	5.11-5.13: CZ, 20 mm 5.32: P, 0°, FeO SN, PR, RF 5.35: P, 5°, FeO SN, PR, RF 5.44: P, 0°, clay CT, PR, SM, 1 mm 5.47-5.63: EW, 160 mm	SEDIMENTARY	
5.60 / 42.53	INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, dark grey, distinctly laminated at 0 to 5°, orange. sandstone is fine grained, pale grey.					VL - L			
					HW - MW		5.90: J, 20°, clay CT, PR, SM, 1 mm		
6.0 / 42.1									6.0
							6.07-6.21: CS, 140 mm		
					MW		6.32: P, 0°, CN, PR, RF 6.42-6.43: EW, 10 mm 6.49-6.52: CS, 30 mm 6.57: J, 20°, clay CT, PR, SM, 1 mm		
						L			
							6.82: P, 0°, CN, PR, RF		
7.0 / 41.1									7.0
							7.08: P, 0°, CN, PR, RF		
							7.42-7.48: EW, 60 mm		
							7.73: P, 0°, CN, PR, RF		
							7.86-7.87: EW, 10 mm		
8.0 / 40.1									8.0
							8.03-8.19: J, 60 - 80°, FeO SN, IR, RF 8.20: P, 0°, CN, PR, RF		
							8.36-8.58: J, 80°, FeO SN, PR, RF		
8.60									
8.70	CORE LOSS 0.10m (8.60-8.70)								
39.43	INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, dark grey, distinctly laminated at 0 to 5°, orange. sandstone is fine grained, pale grey.				MW	L	8.85: J, 50°, CN, ST, RF	SEDIMENTARY	
9.0 / 39.1									9.0
							9.03-9.10: CZ, 70 mm		
							9.26-9.27: CS, 10 mm 9.29-9.40: EW, 110 mm		
							9.46-9.52: EW, 60 mm		
9.61							9.58-9.61: CZ, 30 mm		
38.52	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, pale grey. siltstone is fine grained, distinctly laminated at 0 to 5°, black.				SW	M	9.75: P, 0°, CN, PR, RF 9.84: P, 0°, CN, PR, RF		
10.0									

Method: NMLC

Casing

Progress Water (Loss/Return): 80-90% Water RETURN; 70-80% Mud RETURN; 60-70% Water RETURN

Run (TCR) RQD: R1 (100%) 31%; R2 (97%) 75%; R3 (100%) 63%

Sampling

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
- 5.63 m Is(50) D=0.05MPa
- 5.63 m Is(50) A=0.42MPa
- 6.61 m Is(50) D=MPa
- 6.61 m Is(50) A=0.13MPa
- 7.60 m Is(50) D=MPa
- 7.60 m Is(50) A=0.37MPa
- 8.00 m Is(50) A=0.02MPa
- 8.50 m Is(50) D=0.12MPa
- 10.03 m Is(50)

Permeability

Level & Inflow: Not Observed

Graphic Log

Soil Group Symbol

Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL -0.1, L -0.3, M -1, H -3, VH -10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Visual

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318349.7 m	Start Date	18/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246081.6 m	End Date	19/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	48.13 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH04**

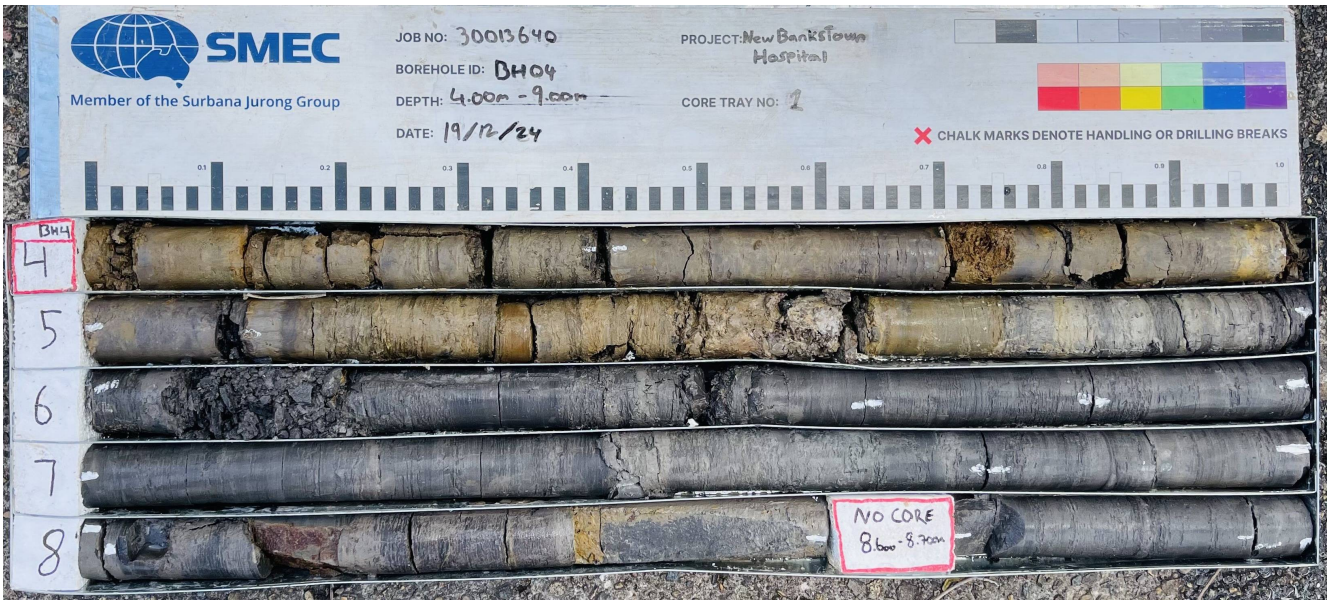
Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		60-70% Water RETURN	R3 (100%) 63%		A=1.27MPa 10.07 m Is(50) D=0.13MPa	Not Observed		10.0 *38.1*			10.63	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, pale grey. siltstone is fine grained, distinctly laminated at 0 to 5°, black. *(continued)*				SW *(cont)*	M *(cont)*				10.29: P, 0°, CN, PR, RF 10.38: P, 0°, CN, PR, RF 10.51: P, 0°, clay CT, PR, SM, 1 mm 10.60-10.61: EW, 10 mm 10.75: P, 0°, CN, PR, RF 10.86-10.92: CZ, 60 mm 10.95: J, 30°, CN, IR, RF 11.00-11.05: CS, 50 mm	SEDIMENTARY	
					11.06 m Is(50) D=0.14MPa 11.06 m Is(50) A=0.09MPa 11.10 m Is(50) D=0.69MPa 11.10 m Is(50) A=1.26MPa			11.0 *37.1*			*37.50* 11.75	SILTSTONE: dark grey, indistinctly bedded.								11.45: P, 0°, CN, PR, RF 11.48: J, 65°, CN, IR, RF 11.50-11.54: CS, 40 mm 11.69: J, 20°, CN, PR, RF		11.0
			11.70								*36.38*	INTERBEDDED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, dark grey, indistinctly bedded at 0 to 5°, orange. sandstone is fine grained, pale grey.										
								12.0 *36.1*												12.06-12.08: CZ, 20 mm 12.20: J, 10°, CN, UN, RF 12.32: P, 5°, CN, UN, SM 12.46-12.47: EW, 5 mm 12.48-12.49: EW, 10 mm 12.56: P, 0°, CN, PR, RF 12.68-12.69: EW, 10 mm 12.73: J, 20°, CN, PR, RF 12.79: J, 20°, clay CT, PR, SM 12.88-12.94: CZ, 60 mm		12.0
		40-50% Water RETURN	R4 (91%) 42%		13.13 m Is(50) D=0.51MPa 13.13 m Is(50) A=0.84MPa			13.0 *35.1*												13.01-13.02: CZ, 10 mm 13.09: P, 5°, CN, PR, RF 13.11: P, 5°, CN, PR, RF 13.19: P, 5°, CN, PR, RF 13.21: J, 20°, CN, PR, RF 13.44-13.49: EW, 50 mm 13.56: P, 0°, clay CT, PR, SM 13.58: P, 0°, clay CT, PR, SM 13.62: P, 0 - 10°, clay CT, UN, SM 13.70-13.78: EW, 80 mm		13.0
					14.00 m Is(50) D=0.22MPa 14.00 m Is(50) A=0.11MPa			14.0 *34.1*												13.94-14.00: EW, 60 mm 14.09-14.10: EW, 5 mm 14.15: P, 0°, CN, PR, RF		14.0
			15.00					15.0			14.90	BH Terminated at 15.00 m ~~Target Depth~~ CORE LOSS 0.10m (14.90-15.00)										

Observations and Comments

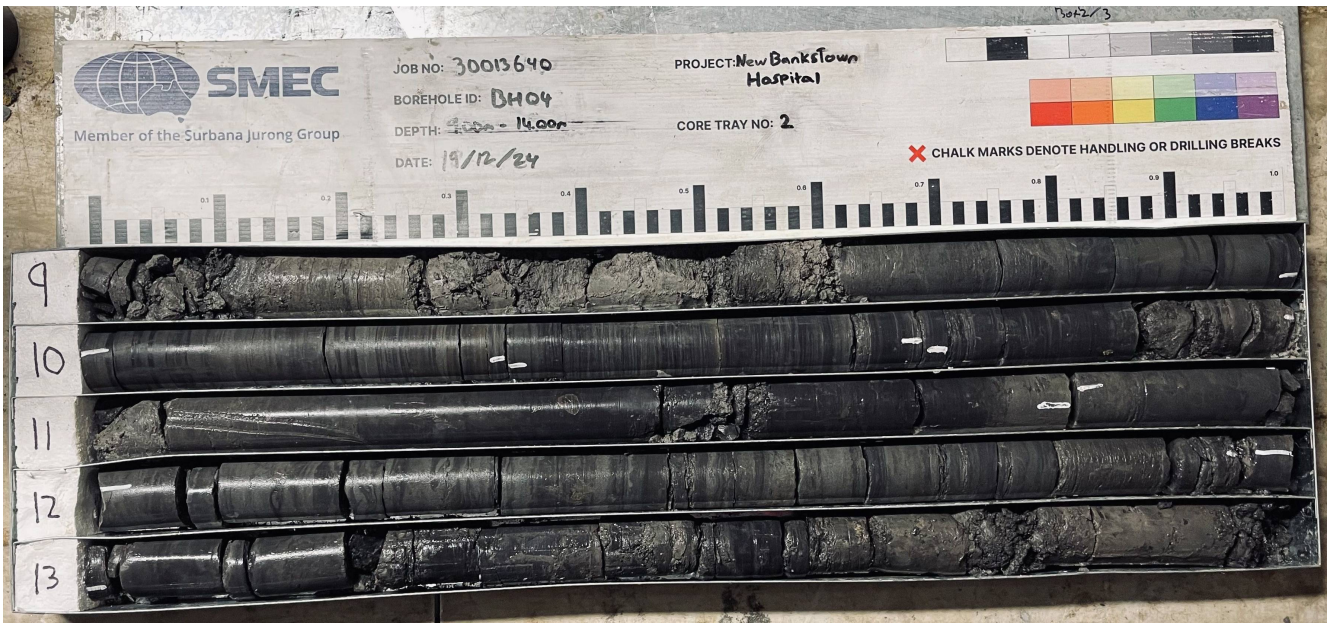
Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
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PointID : BH04 Depth Range: 4.00 - 9.00 m



PointID : BH04 Depth Range: 9.00 - 14.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH04	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH04 Depth Range: 14.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH04	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318271.8 m	Start Date	6/1/2025	Contractor	Terratest
Client	Health Infrastructure	North	6246054.1 m	End Date	6/1/2025	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	44.70 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH05**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					1.00m		Not Observed	0.0 *44.7*		Cl	*44.70* 1.00	FILL CLAY: medium plasticity, brown, with fine to medium grained, sub-rounded to sub-angular gravel; with fine to medium grained sand; trace roots.	w<PL								FILL	
				D	SPT 5,7,10 N=17 (0.20m REC) 1.45m			1.0 *43.7*		Cl -CH	*43.70*	CLAY: medium to high plasticity, grey mottled brown, trace fine to medium grained gravel.		VSt							RESIDUAL SOIL	1.0
					2.50m			2.0 *42.7*			2.50											2.0
				D	SPT 25 HB N=R (0.15m REC) 2.65m						*42.20*	CLAY: high plasticity, grey, (Extremely Weathered siltstone).		H		XW					EXTREMELY WEATHERED MATERIAL	
								3.0 *41.7*		CH	3.90											3.0
					4.00m						*40.80*	SILTSTONE: fine grained, grey, distinctly laminated.				HW	VL			3.90-4.13: Px7, 5°, Clay VN, PR, SM	SEDIMENTARY	
					SPT 15/50mm HB N=R (0.00m REC) 4.05m			4.0 *40.7*			4.13											4.0
NMLC			R1 (100%) 52%							CH	*40.57*	CLAY: high plasticity, brown, with coarse grained, rounded sand; with fine grained, sub-angular gravel; (Extremely Weathered siltstone).		H		XW					EXTREMELY WEATHERED MATERIAL	
					4.80 m Is(50) A=0.02MPa 4.80 m Is(50) D=0.00MPa						4.53 *40.17*	SILTSTONE: fine grained, grey, distinctly laminated.				HW	VL			4.52: P, 0 - 5°, Clay CT, PR, SM 4.60: P, 5°, Clay CT, PR, SM	SEDIMENTARY	
								5.0															

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
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Logged By	PP	Date	6/1/2025
Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318271.8 m	Start Date	6/1/2025	Contractor	Terratest
Client	Health Infrastructure	North	6246054.1 m	End Date	6/1/2025	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	44.70 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH05**

Depth (m) / Elevation	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
5.0 / 39.7		5.11	SILTSTONE: fine grained, grey, distinctly laminated. *(continued)*				HW *(cont)*	VL *(cont)*		SEDIMENTARY
	CH	39.59	Gravelly CLAY: high plasticity, brown, gravel is fine grained, sub-angular; (Extremely Weathered siltstone).		H		XW			EXTREMELY WEATHERED MATERIAL
		5.40								
		39.30	SILTSTONE: fine grained, grey, distinctly laminated.				HW	VL		SEDIMENTARY
									5.60: P, 0°, FeO SN, PR, SM	
									5.92: P, 10°, FeO SN, ST, SM	
6.0 / 38.7									5.98-6.02: CZ, 0°, 40 mm	
									6.25: P, 0°, CN, PR, SM	
							MW	L - M	6.38: P, 0°, Clay CT, PR, SM	
									6.46: P, 0°, CN, PR, SM	
									6.60: P, 0°, CN, PR, SM	
									6.70: P, 0°, CN, PR, SM	
7.0 / 37.7									6.86-7.27: Px11, 0°, CN, PR, SM	
		7.27								
	CH	37.43	Gravelly CLAY: high plasticity, brown, gravel is fine grained, sub-angular; (Extremely Weathered siltstone).		H		XW			EXTREMELY WEATHERED MATERIAL
		7.69								
		37.01	SILTSTONE: fine grained, grey, distinctly laminated.				SW	M		SEDIMENTARY
									7.85: P, 0°, CN, PR, SM	
8.0 / 36.7									7.94: P, 5°, CN, PR, SM	
									8.12: P, 10°, CN, ST, SM	
									8.18: P, 5°, CN, CU, SM	
									8.59: P, 5°, Clay VN, CU, SM	
									8.79: P, 5°, Clay CT, PR, SM	
									8.86: P, 5°, CN, PR, SM	
9.0 / 35.7										
									9.45-9.54: CZ, 0°, CN, PR, SM	
									9.51: P, 90°, CN, ST, RF	
									9.72: P, 5°, CN, ST, SM	
									9.77: P, 0°, CN, PR, SM	
10.0										

Method: NMLC

Progress Water (Loss/Return): Not Observed

Run (TCR) RQD: R1 (100%) 52%; 6.80; R2 (100%) 69%; 9.83; R3 (100%) 71%

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa): 5.79 m Is(50) D=0.00MPa; 5.79 m Is(50) A=0.01MPa; 6.63 m Is(50) D=0.12MPa; 6.63 m Is(50) A=2.90MPa; 6.96 m Is(50) A=0.34MPa; 7.74 m Is(50) A=0.22MPa; 8.03 m Is(50) D=0.50MPa; 8.03 m Is(50) A=0.98MPa; 8.68 m Is(50) D=0.15MPa; 8.90 m Is(50) D=0.40MPa; 8.90 m Is(50) A=2.65MPa; 9.68 m Is(50) A=0.39MPa

Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL -0.1, L -0.3, M -1, H -3, VH -10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Installation: 6.0, 7.0, 8.0, 9.0

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	6/1/2025
Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318271.8 m	Start Date	6/1/2025	Contractor	Terratest
Client	Health Infrastructure	North	6246054.1 m	End Date	6/1/2025	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	44.70 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH05**

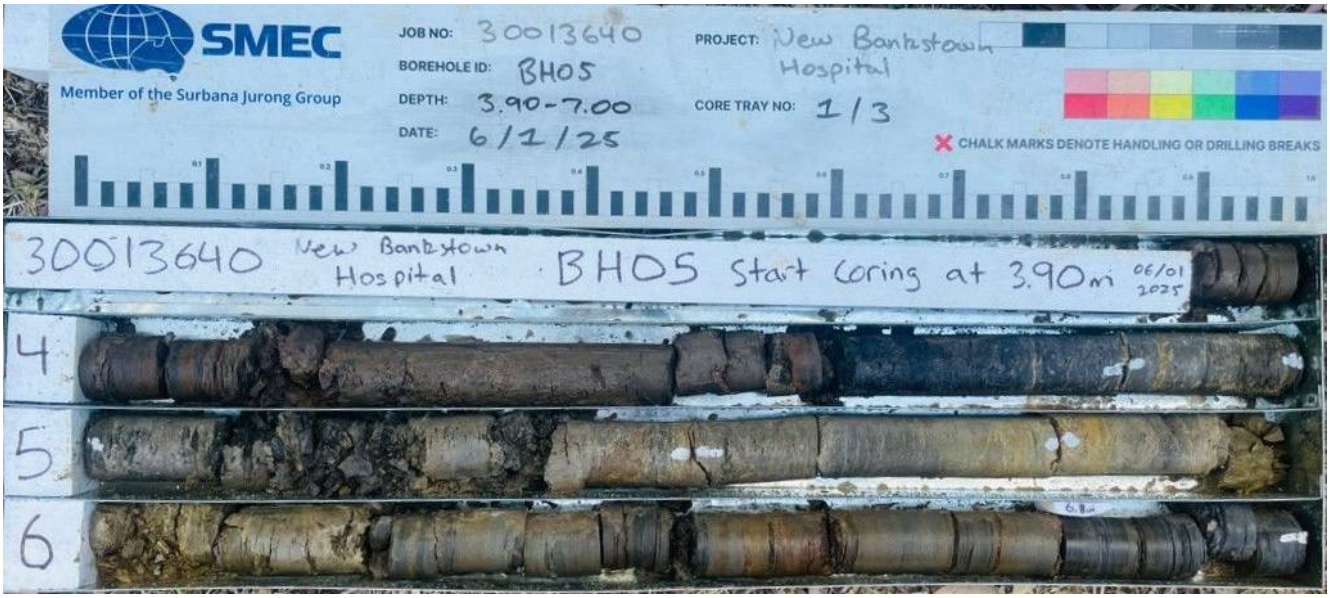
Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC			R3 (100%) 71% 12.90 R4 (100%) 86% 15.00		10.84 m Is(50) D=0.15MPa 10.84 m Is(50) A=0.72MPa 11.58 m Is(50) D=0.15MPa 11.58 m Is(50) A=0.88MPa 12.62 m Is(50) D=0.08MPa 12.62 m Is(50) A=1.21MPa 13.81 m Is(50) D=1.26MPa 13.81 m Is(50) A=2.43MPa 14.89 m Is(50) D=0.51MPa 14.89 m Is(50) A=0.88MPa	Not Observed		10.0 *34.7* 11.0 *33.7* 12.0 *32.7* 13.0 *31.7* 14.0 *30.7* 15.0			13.50 *31.20* 14.31 *30.39*	SILTSTONE: fine grained, grey, distinctly laminated. *(continued)* SANDSTONE: fine grained, grey, indistinctly bedded. SILTSTONE: fine grained, grey, distinctly laminated. BH Terminated at 15.00 m Target Depth				SW *(cont)* FR FR	M *(cont)* H M				9.90-10.16: Px8, 0°, Clay VN, PR, SM 10.17: P, 0°, CN, PR, SM 10.22: P, 0°, CN, PR, SM 10.34: P, 0°, CN, PR, SM 10.35-10.73: Px12, 0°, Clay VN, PR, SM 10.73: P, 0°, CN, PR, SM 10.84: P, 0°, CN, PR, SM 10.89: P, 0°, CN, PR, SM 10.92-10.95: Px2, 0°, CN, PR, SM 11.06: P, 0°, CN, PR, SM 11.08: P, 5°, CN, PR, SM 11.34: P, 5°, CN, CU, SM 11.63: P, 5°, CN, CU, SM 11.74: P, 5°, CN, CU, SM 11.84: P, 0°, CN, PR, SM 13.44-13.52: Px2, 0°, CN, ST, SM 13.54: P, 10°, CN, CU, SM 13.59-13.64: Px2, 0°, CN, ST, SM 13.85-13.89: Px2, 10°, Clay VN, ST, SM 14.31: P, 0°, Clay VN, ST, SM 14.33: P, 5°, Clay VN, PR, SM 14.39: P, 10°, Clay VN, ST, SM 14.49: P, 10°, CN, IR, SM 14.52: P, 5°, CN, ST, SM 14.66-14.78: Px3, 0°, CN, PR, SM	SEDIMENTARY	11.0 12.0 13.0 14.0

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH05 Depth Range: 3.90 - 7.00 m



PointID : BH05 Depth Range: 7.00 - 11.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH05	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 1/2



PointID : BH05 Depth Range: 11.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH05	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318328.8 m	Start Date	17/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246012.2 m	End Date	18/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	40.85 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH06**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) / Elevation	Graphic Log	Soil Group Symbol	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					1.00m D SPT 16/70mm HB N=R (0.07m REC) 1.07m			0.0 / 40.8			0.10 / 40.75	PAVERS.	w<PL									ROAD SURFACE
												FILL: Silty CLAY: medium to high plasticity, grey.										FILL
								1.0 / 39.8		Cl -CH	1.20											1.0
											39.65	Silty CLAY: medium to high plasticity, grey.		VSt							RESIDUAL SOIL
								2.0 / 38.8		Cl -CH	2.30											2.0
NMLC			R1 (100%) 80%		2.78 m Is(50) D=0.02MPa 2.78 m Is(50) A=0.84MPa		Not Observed				38.55	SILTSTONE: fine grained, grey, distinctly laminated.				HW	L			2.37: P, 0°, Clay VN, IR, SM	SEDIMENTARY	
																MW				2.49-2.61: Px8, 0°, Clay VN, PR, SM 2.56: J, 90°, FeO SN, ST, SM 2.62-2.63: CS, 0°, gravel CT, PR, RF		
								3.0 / 37.8			3.42											3.0
										Cl	3.52	Gravelly CLAY: medium plasticity, grey, (Extremely Weathered siltstone).	w>PL	H		XW					EXTREMELY WEATHERED MATERIAL
			3.80		3.70 m Is(50) A=0.10MPa						37.33	SILTSTONE: fine grained, grey, distinctly laminated.				MW	L			3.54: P, 5°, gravel CT, PR, SM 3.56: J, 30°, gravel CT, PR, SM 3.60: P, 0°, CN, PR, SM 3.82: P, 0°, CN, PR, SM	SEDIMENTARY	
								4.0 / 36.8			4.08											4.0
			R2 (100%) 67%		4.28 m Is(50) D=0.40MPa 4.28 m Is(50) A=0.55MPa						36.77	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is distinctly laminated, grey.					L - M			4.00: P, 5°, CN, CU, SM 4.02: J, 85°, CN, PR, SM 4.03: P, 0°, CN, IR, SM 4.05: J, 40°, CN, ST, SM 4.07-4.08: CS, 0°, 10 mm 4.33: P, 0°, CN, PR, SM 4.37: J, 10°, CN, ST, SM 4.41: J, 10°, Clay VN, ST, SM 4.48: J, 20°, Clay CN, ST, SM		
											4.48											
					4.96 m Is(50) D=0.05MPa 4.96 m Is(50) A=0.45MPa						36.37	INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is fine grained, grey, distinctly laminated. sandstone is fine grained, indistinctly laminated, grey.					L			4.79: P, 0°, CN, PR, SM		
								5.0														

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	18/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318328.8 m	Start Date	17/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246012.2 m	End Date	18/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	40.85 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

Borehole Identifier: **BH06**

Depth (m) / Elevation	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
5.0 / 35.8		5.50	INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is fine grained, grey, distinctly laminated. sandstone is fine grained, indistinctly laminated, grey. *(continued)*				MW (cont)	L (cont)					SEDIMENTARY
	CI	35.35 / 5.65	Gravelly CLAY: medium to high plasticity, grey, (Extremely Weathered siltstone).	w>PL	VSt		XW						EXTREMELY WEATHERED MATERIAL
		35.20	SILTSTONE: fine grained, grey, distinctly laminated.				MW	L					SEDIMENTARY
6.0 / 34.8									R2 (100%) 67%		5.96 m Is(50) D=0.02MPa 5.96 m Is(50) A=0.16MPa 6.34 m Is(50) D=0.04MPa 6.34 m Is(50) A=0.29MPa	5.88: P, 0°, CN, PR, SM 6.03: P, 5°, CN, PR, SM 6.14: P, 0°, CN, ST, SM 6.45: J, 90°, CN, ST, SM 6.51: P, 5°, Clay VN, CU, SM 6.65: P, 0°, Clay VN, PR, SM 6.69: P, 0°, Clay VN, PR, SM 6.75: P, 0°, Clay VN, PR, SM	
							HW	VL	6.80				
7.0 / 33.8												6.75-7.27: FZ, 0°, CN, PR, SM, very closely spaced partings	
							MW	L				7.31: P, 0°, CN, PR, SM 7.40: P, 0°, CN, PR, SM 7.46: P, 0°, CN, PR, SM 7.48: J, 80°, CN, UN, SM 7.51-7.52: CS, 0°, gravel, PR, SM 7.58: P, 5°, CN, UN, SM	
		7.50 / 33.35	INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is fine grained, grey, distinctly laminated. sandstone is fine grained, indistinctly laminated, grey.				SW	M			7.70 m Is(50) D=0.35MPa 7.70 m Is(50) A=1.16MPa 7.96 m Is(50) D=0.20MPa 7.96 m Is(50) A=0.38MPa		
8.0 / 32.8												8.04-8.10: Px3, 0°, Clay CT, PR, SM	
									R3 (100%) 77%			8.27-8.29: Px2, 0°, CN, PR, SM 8.46: P, 0°, sand CT, ST, SM 8.55: P, 0°, CN, ST, SM	
											8.72 m Is(50) D=0.57MPa 8.72 m Is(50) A=0.87MPa 8.96 m Is(50) D=0.54MPa 8.96 m Is(50) A=0.45MPa	8.74: P, 5°, CN, UN, SM	
9.0 / 31.8											9.28 m Is(50) D=0.10MPa 9.28 m Is(50) A=0.66MPa 9.33 m Is(50) D=0.68MPa	9.15: P, 5°, CN, UN, SM	
		9.70 / 31.15	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is distinctly laminated, grey.					H	9.90		9.86 m Is(50) D=0.88MPa 9.86 m Is(50) A=3.00MPa	9.60: P, 5°, CN, ST, SM 9.63-9.64: CS, 20°, gravel 9.71-9.81: Px3, 0°, CN, UN, SM	
10.0													

Method: NMLC
Casing:
Progress Water (Loss/Return):
Permeability: Not Observed
Level & Inflow:
Graphic Log:
Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL ~0.1, L ~0.3, M ~1, H ~3, VH ~10, EH
Defect Spacing (mm): 20, 60, 200, 600, 2000
Visual:

Installation: 6.0, 7.0, 8.0, 9.0

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	18/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318328.8 m	Start Date	17/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246012.2 m	End Date	18/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	40.85 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH06**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC			R4 (100%) 71%		10.66 m Is(50) D=0.66MPa 10.66 m Is(50) A=0.90MPa	Not Observed		10.0 *30.8*				INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is distinctly laminated, grey. *(continued)*				SW *(cont)*	H *(cont)*				9.96-10.00: CS, 0°, 40 mm	SEDIMENTARY	
																	M			10.23: J, 10°, Clay VN, CU, RF 10.34: P, 0°, CN, PR, RF 10.43: P, 5°, CN, PR, RF		
																				10.66: P, 0°, CN, PR, RF		
																				10.79: P, 0°, Clay CT, PR, RF 10.86: P, 0°, Clay VN, PR, RF 10.89-10.93: Px4, 0°, Clay VN, PR, RF		
								11.0 *29.8*			11.02 *29.83*	SILTSTONE: fine grained, grey, distinctly laminated.										11.0
																				11.03-11.17: Px6, 0°, Clay VN, PR, SM 11.17-11.23: CZ, 0°, 60 mm		
					11.69 m Is(50) D=0.36MPa 11.69 m Is(50) A=0.61MPa															11.69: P, 0°, CN, PR, SM		
																				11.92: P, 0°, Clay CT, PR, SM		
								12.0 *28.8*												12.06-12.08: CS, 0°, 20 mm		12.0
																				12.17: P, 0°, CN, PR, SM 12.31: P, 0°, CN, PR, SM		
			13.00		12.78 m Is(50) D=0.18MPa 12.78 m Is(50) A=0.50MPa 12.87 m Is(50) D=0.66MPa 12.87 m Is(50) A=0.70MPa															12.53: J, 25°, Clay VN, ST, RF 12.69: J, 15°, Clay CT, ST, RF 12.78: P, 0°, CN, ST, SM 12.88: P, 0°, CN, ST, SM		
								13.0 *27.8*								FR						13.0
												13.29-13.40: band of sandstone								13.35: P, 5°, CN, ST, SM		
																				13.63-13.69: Px5, 0°, CN, PR, RF		
			R5 (100%) 85%		13.91 m Is(50) D=0.59MPa 13.91 m Is(50) A=0.49MPa 14.00 m Is(50) A=0.96MPa 14.14 m Is(50) D=0.69MPa 14.14 m Is(50) A=0.62MPa															13.90-13.93: Px2, 0°, CN, PR, RF		
								14.0 *26.8*												14.17-14.19: CS, 0°, 20 mm 14.22-14.40: Px4, 0°, CN, PR, SM		14.0
																				14.47-14.53: CZ, 0°, 60 mm		
			15.00		14.88 m Is(50) D=0.60MPa 14.88 m Is(50) A=1.12MPa			15.0				BH Terminated at 15.00 m Target Depth										

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	18/12/2024
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PointID : BH06 Depth Range: 2.30 - 6.00 m



PointID : BH06 Depth Range: 6.00 - 10.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH06	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH06 Depth Range: 10.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH06	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 2/2

Geological & Engineering Log

Project	New Bankstown Hospital	East	318295.2 m	Start Date	9/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245991.8 m	End Date	10/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.15 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH07**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) / Elevation	Graphic Log	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					0.50m			0.0 41.1		SM	41.15 0.30	TOPSOIL Silty SAND: fine to medium grained, dark brown.	D									TOPSOIL	
				D	SPT 3,6,7 HB N=13 (0.40m REC) 0.95m					CL	40.85 0.90	FILL Silty CLAY: low plasticity, brown, with sub-angular gravel.										FILL 0.50: double bounce	
					1.50m			1.0 40.1			40.25 1.10	VOID: coarse grained, non plastic. Landfill Tiles.										VOID FILL	1.0
				D	SPT 1,4,6 N=10 (0.20m REC) 1.95m					CL	40.05	FILL Silty CLAY: low plasticity, brown, with sub-angular gravel.	w<PL										
								2.0 39.1			2.00 39.15	Silty CLAY: medium to high plasticity, grey mottled orange.		St								RESIDUAL SOIL	2.0
								3.0 38.1		CI -CH													3.0
								4.0 37.1															4.0
NMLC			R1 (89%) 32%					5.0			4.70 36.45	INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is dark grey, distinctly laminated at 0 to 5°. sandstone is fine grained, pale grey.				MW	VL - L				4.73: P, 5°, clay CT, PR, SM, 1 mm 4.75: P, 5°, clay CT, PR, SM, 1 mm 4.82: P, 5°, clay CT, PR, SM, 1 mm 4.87: P, 5°, clay CT, PR, SM, 1 mm	SEDIMENTARY	

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318295.2 m	Start Date	9/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245991.8 m	End Date	10/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.15 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth North	
						Survey	

smec

Borehole Identifier: **BH07**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		70-80% Water RETURN	R1 (89%) 32%		5.80 m Is(50) A=0.11MPa			5.0 *36.1*				INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is dark grey, distinctly laminated at 0 to 5°. sandstone is fine grained, pale grey. *(continued)*				MW *(cont)*	VL - L *(cont)*				SEDIMENTARY
								6.0 *35.1*			6.52 *34.63*									4.90: P, 5°, clay CT, PR, SM, 1 mm 4.95: P, 5°, clay CT, PR, SM, 1 mm 5.02-5.04: EW, 20 mm 5.10: P, 5°, FeO SN, PR, RF 5.15: EW, 10 mm 5.17: EW, 5 mm 5.22: P, 5°, clay CT, PR, SM, 1 mm 5.24: P, 5°, clay CT, PR, SM, 1 mm 5.30-5.32: CS, 20 mm 5.35-5.36: EW, 10 mm 5.40-5.43: EW, 30 mm 5.46: J, 15°, FeO SN, PR, SM 5.53-5.57: EW, 40 mm 5.75: J, 40°, clay CT, PR, SM 5.79: EW, 10 mm 5.83: P, 0°, CN, PR, RF 5.90: P, 0°, CN, PR, RF 6.03-6.04: EW, 10 mm 6.06-6.08: EW, 20 mm 6.10-6.12: EW, 20 mm 6.15-6.22: EW, 70 mm 6.26-6.27: EW, 10 mm 6.38: P, 0°, clay CT, PR, SM 6.51: P, 0°, clay CT, PR, SM		6.0
					6.92 m Is(50) D=1.17MPa 6.92 m Is(50) A=1.31MPa			7.0 *34.1*				INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is dark grey, distinctly laminated at 0 to 5°. sandstone is fine grained, pale grey.				SW	M				6.64: P, 0°, clay CT, PR, SM 6.73: J, 10°, CN, PR, RF 6.80: J, 10°, CN, PR, RF 6.86-6.87: EW, 5 mm		7.0
			7.50																	7.04: P, 5°, clay CT, PR, SM 7.15: P, 5°, clay CT, PR, SM		
			R2 (100%) 80%		7.84 m Is(50) D=0.26MPa 7.84 m Is(50) A=0.61MPa			8.0 *33.1*												7.40: J, 10°, CN, PR, RF 7.57: J, 10°, CN, PR, RF 7.68: P, 5°, CN, PR, RF		8.0
		90-100% Water RETURN	8.50																	8.21: P, 0°, clay CT, PR, SM 8.35: J, 40°, CN, PR, RF 8.37: P, 0°, clay CT, PR, SM		
			R3 (100%) 100%		8.96 m Is(50) D=0.45MPa 8.96 m Is(50) A=0.90MPa 9.00 m Is(50) D=0.20MPa 9.00 m Is(50) A=0.54MPa			9.0 *32.1*												8.65: J, 60°, CN, PR, RF 9.07: P, 5°, CN, PR, RF		9.0
			9.50																			
			R4 (100%) 100%		10.00 m Is(50) D=0.26MPa			10.0												9.72: P, 5°, CN, UN, RF		

Observations and Comments

Notes

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Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	LR	Date	10/12/2024
Approved By	HW	Date	18/2/2025
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318295.2 m	Start Date	9/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245991.8 m	End Date	10/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.15 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH07**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		90-100% Water RETURN	R4 (100%) 100%		10.00 m Is(50) A=0.57MPa			10.0 *31.1*				INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is dark grey, distinctly laminated at 0 to 5°. sandstone is fine grained, pale grey. *(continued)*				SW *(cont)*	M *(cont)*				10.36: P, 5°, CN, PR, RF	SEDIMENTARY	
			10.50																	10.85: P, 0°, CN, PR, RF		
			R5 (100%) 60%		11.08 m Is(50) D=0.38MPa 11.08 m Is(50) A=0.45MPa			11.0 *30.1*									L			11.05: J, 20°, CN, PR, RF		11.0
			11.50														M			11.24: P, 5°, CN, PR, RF 11.27: P, 5°, CN, PR, RF 11.31: P, 5°, CN, PR, RF 11.34-11.37: EW, 30 mm 11.39: P, 0°, CN, PR, RF 11.51-11.53: EW, 20 mm 11.55: P, 0°, CN, PR, RF 11.71: J, 30°, CN, PR, RF 11.76-11.78: CS, 20 mm		
			R6 (100%) 65%		12.04 m Is(50) D=0.34MPa 12.04 m Is(50) A=0.61MPa			12.0 *29.1*														12.0
			12.50																	12.35: P, 5°, CN, PR, RF		
			R7 (100%) 90%		13.30 m Is(50) D=0.05MPa 13.30 m Is(50) A=0.23MPa 13.37 m Is(50) D=0.62MPa 13.37 m Is(50) A=0.21MPa			13.0 *28.1*													12.83: J, 20°, CN, PR, RF 12.90: J, 20°, CN, PR, RF 13.04: J, 10°, CN, PR, RF		13.0
		80-90% Water RETURN	13.50																			
			R8 (100%) 90%					14.0 *27.1*												14.07-14.08: EW, 10 mm		14.0
			14.50																	14.45: P, 5°, CN, PR, RF 14.51: P, 5°, CN, PR, RF 14.53: P, 5°, CN, PR, RF 14.55: P, 5°, CN, PR, RF 14.57: J, 30°, CN, PR, RF		
			R9 (100%) 87%					15.0												14.97: J, 20°, CN, PR, RF		

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318295.2 m	Start Date	9/12/2024	Contractor	Terratest	Inclination	-90°
Client	Health Infrastructure	North	6245991.8 m	End Date	10/12/2024	Rig Type	Geo-205	Azimuth	
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.15 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	

smec

Borehole Identifier: **BH07**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		80-90% Water RETURN	R9 (100%) 87%		15.36 m Is(50) D=0.14MPa 15.36 m Is(50) A=0.67MPa			15.0 *26.1*			15.65	INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is dark grey, distinctly laminated at 0 to 5°. sandstone is fine grained, pale grey. *(continued)*				SW *(cont)*	M *(cont)*				15.10: J, 10°, CN, PR, RF 15.35: P, 0°, CN, PR, RF	SEDIMENTARY	
			15.65								*25.50*	BH Terminated at 15.65 m										
								16.0 *25.1*															16.0
								17.0 *24.1*															17.0
								18.0 *23.1*															18.0
								19.0 *22.1*															19.0
								20.0															

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
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PointID : BH07 Depth Range: 4.70 - 9.00 m



PointID : BH07 Depth Range: 9.00 - 13.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH07	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH07 Depth Range: 13.00 - 15.65 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH07	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318330.6 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245975.2 m	End Date	16/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.06 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH08**

Depth (m) / Elevation	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Run (TCR) RQD	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
0.0 / 41.1	SM	41.06	TOPSOIL Silty SAND: fine to medium grained, dark brown.	w<PL									TOPSOIL	
		0.30												
		40.76	FILL Silty CLAY: low plasticity, brown.										FILL	
	CL									1.00m				
									D	SPT 30,33,18 N=51 (0.45m REC)				
										1.45m				
1.0 / 40.1		39.61	CLAY: medium plasticity, brown.	w≈PL	VSt								RESIDUAL SOIL	
	Cl													
										2.50m				
									D	SPT 22/60mm HB N=R (0.06m REC)				
										2.56m				
	CH	38.46	CLAY: high plasticity, grey, (Extremely Weathered siltstone).		H		XW						EXTREMELY WEATHERED MATERIAL	
		2.72											SEDIMENTARY	
		38.34	SILTSTONE: fine grained, grey, indistinctly bedded.				MW	L		2.96 m Is(50) D=0.06MPa 2.96 m Is(50) A=0.37MPa		2.72-2.88: Px6, 0°, FeO SN, IR, RF		
3.0 / 38.1							HW				R1 (100%) 24%	3.08: J, 5°, CN, ST, RF 3.10-3.15: Px2, 0°, FeO SN, ST, RF 3.18: J, 5°, FeO SN, PR, RF 3.20-3.22: CS, 10 mm 3.26: J, 90°, CN, IR, VR 3.30: P, 0°, CN, PR, RF 3.40-3.46: Jx3, 90°, ST, RF 3.49: P, 5°, CN, PR, RF		
							MW							
							HW			3.52 m Is(50) A=0.09MPa				
		3.80									3.80	3.65: J, 50°, CN, PR, RF		
		37.26	SILTSTONE: grey, indistinctly bedded.									3.80-3.93: Px3, 0°, CN, PR, RF		
4.0 / 37.1		4.11												
		36.95	SANDSTONE: grey, indistinctly bedded.				MW					4.14: J, 5°, FeO SN, ST, RF		
		4.27										4.28-4.30: IS, 0°, clay, PR, RF		
		36.79	SILTSTONE: grey, distinctly laminated.								R2 (100%) 72%	4.40: J, 45°, FeO VN, PR, SM 4.41-4.45: CS, gravel, ST, RF 4.54-4.55: Px2, 0°, FeO SN, PR, RF		
5.0										4.76 m Is(50) D=0.01MPa 4.76 m Is(50) A=0.19MPa				

Method: AD/T, NMLC. Casing. Progress Water (Loss/Return). Permeability. Level & Inflow. Graphic Log. Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH). Defect Spacing (mm): 20, 60, 200, 600, 2000. Visual.

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318330.6 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245975.2 m	End Date	16/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.06 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth North	
						Survey	

smec

Borehole Identifier: **BH08**

Depth (m) *Elevation*	Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 *36.1*	NMLC											SILTSTONE: grey, distinctly laminated. *(continued)*				MW *(cont)*	L *(cont)*					SEDIMENTARY	
						5.50 m Is(50) D=0.07MPa 5.50 m Is(50) A=0.23MPa															5.58: J, 30°, SN, PR, RF 5.64: P, 0°, FeO VN, PR, SM		
				R2 (100%) 72%																	5.85: J, 45°, UN, RF 5.90: P, 5°, CN, PR, SM		
6.0 *35.1*																					6.05: P, 0°, CN, UN, VR 6.07: J, 80°, CN, ST, RF		6.0
																	L - M				6.34: J, 10°, FeO SN, ST, VR 6.38: P, 0°, FeO SN, PR, SM 6.40: CS, 0°, gravel, IR, VR 6.44: J, 0°, FeO SN, CU, RF		
				6.90		6.74 m Is(50) D=0.05MPa 6.74 m Is(50) A=0.23MPa																	
7.0 *34.1*																					7.05-7.08: Px2, 0°, CN, PR, RF 7.18-7.21: CS, 0°, gravel, IR, VR		7.0
																					7.48-7.50: CS, 0°, gravel, IR, VR 7.56: J, 80°, CU, RF 7.59: J, 10°, CN, PR, RF		
						7.90 m Is(50) D=0.16MPa 7.90 m Is(50) A=0.41MPa															7.66-7.94: Px5, 0 - 5°, CN, PR, RF		
8.0 *33.1*																					8.00-8.19: Px4, 0°, CN, PR, RF 8.21-8.33: Px3, 0 - 5°, CN, PR, RF		8.0
											8.33 *32.73*	SANDSTONE: grey, distinctly laminated.				SW	M				8.40-8.60: Px4, 0°, CN, PR, RF 8.67: CS, 0°, gravel, IR, VR		
				R3 (100%) 45%																	8.80-8.90: CS, 0°, gravel, IR, VR 8.87: J, 5°, CN, ST, RF		
9.0 *32.1*						8.87 m Is(50) D=0.04MPa 8.87 m Is(50) A=1.26MPa																	9.0
																					9.28: P, 0°, CN, PR, SM		
						9.91 m Is(50) D=0.30MPa 9.91 m Is(50) A=0.80MPa															9.56: P, 0°, CN, PR, RF 9.64: P, 5°, CN, PR 9.77: P, 5°, CN, PR, SM		
10.0				10.00																			

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
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Logged By	PS/CT	Date	16/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318330.6 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245975.2 m	End Date	16/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.06 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

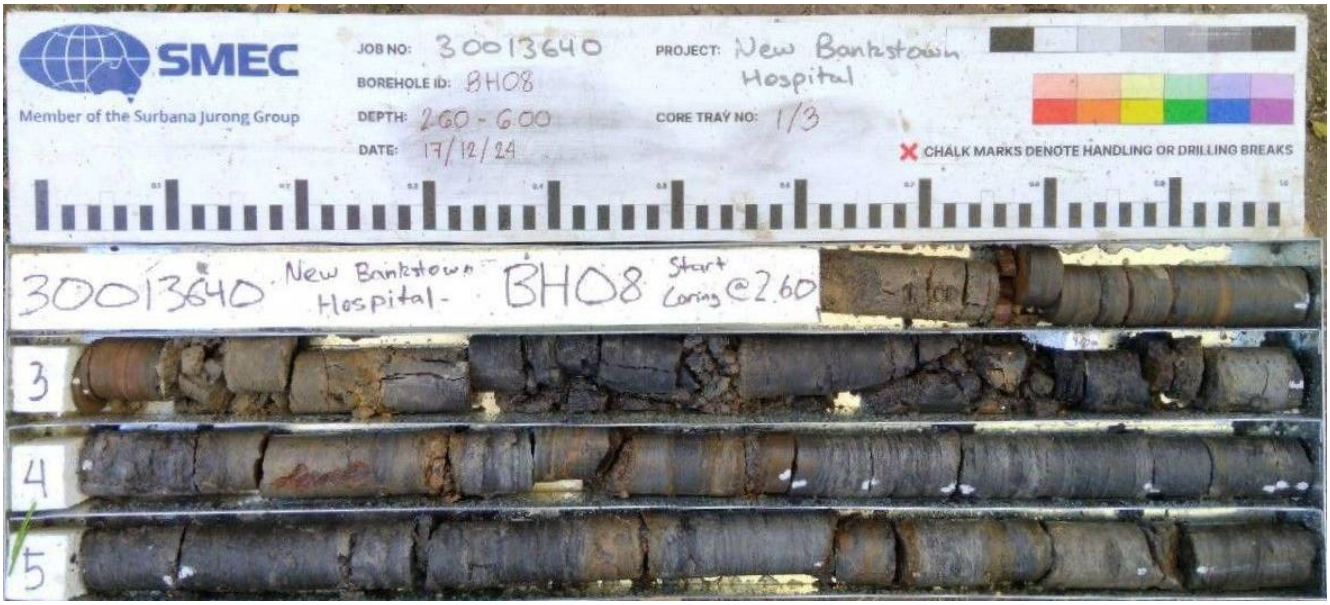
Borehole Identifier: **BH08**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC			R4 (100%) 76%		10.83 m Is(50) D=0.10MPa 10.83 m Is(50) A=0.97MPa			10.0 *31.1*			*31.06*	INTERBEDDED SANDSTONE (80%) AND SILTSTONE (20%): grey, indistinctly bedded.				SW *(cont)*	M *(cont)*				10.06-10.09: Px2, 0°, CN, PR, SM 10.22: P, 0°, CN, PR, SM 10.26: P, 0°, CN, PR, SM 10.46: P, 0°, CN, PR, SM 10.59: P, 0°, CN, PR, SM 10.86: P, 0°, CN, PR, SM 10.96: P, 0°, CN, PR, SM 11.05: P, 0°, CN, PR, SM 11.22: P, 0°, CN, PR, SM	SEDIMENTARY	
								11.0 *30.1*			11.62 *29.44*	SILTSTONE: grey, distinctly laminated.									11.58-11.61: Px2, 0°, CN, PR, SM 11.77: P, 5°, CN, PR, SM 11.81: P, 0°, CN, PR, SM		11.0
					11.96 m Is(50) D=0.50MPa 11.96 m Is(50) A=0.44MPa			12.0 *29.1*													12.10: P, 0°, CN, IR, RF 12.18-12.20: CS, 0°, gravel, IR, VR 12.24: J, 10°, CN, UN, RF 12.42: J, 10°, CN, UN, RF 12.62-12.65: CS, 0°, Ep, IR, RF 12.79-12.84: CS, gravel, IR, VR		12.0
			13.13		12.72 m Is(50) A=0.51MPa			13.0 *28.1*													13.03-13.05: CS, 0°, gravel, IR, VR 13.15-13.16: CS, 0°, gravel, IR, VR 13.17-13.19: CS, gravel, IR, VR 13.25: P, 0°, CN, PR, SM 13.40: P, 0°, CN, PR, RF 13.54-13.56: CS, 0°, gravel, IR, VR 13.57: P, 0°, CN, PR, RF 13.67: P, 0°, CN, PR, SM		13.0
			R5 (100%) 56%		13.85 m Is(50) D=0.57MPa 13.85 m Is(50) A=1.01MPa 13.90 m Is(50) D=0.56MPa 13.90 m Is(50) A=0.36MPa			14.0 *27.1*													13.92: P, 5°, CN, IR, RF 13.97: P, 0°, CN, PR, SM 14.02: P, 0°, CN, IR, RF 14.10-14.11: CS, gravel, IR, VR 14.15: P, 0°, CN, IR, RF 14.21: P, 0°, CN, PR, SM 14.26: P, 0°, CN, PR, RF 14.30-14.37: CZ, gravel, IR, VR		14.0
			15.00		14.96 m Is(50) D=0.83MPa 14.96 m Is(50) A=1.69MPa			15.0				BH Terminated at 15.00 m Target Depth									14.57: P, 5°, CN, IR, RF 14.64: J, 0°, CN, IR, VR 14.85: J, 5°, CN, PR, RF		

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH08 Depth Range: 2.60 - 6.00 m



PointID : BH08 Depth Range: 6.00 - 10.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH08	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 1/2



PointID : BH08 Depth Range: 10.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH08	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318258.8 m	Start Date	9/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245953.7 m	End Date	10/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.49 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH09**

Depth RL	Soil / Rock Material Description	Soil Group Symbol	Moisture Condition	Consistency Density	Sampling	SPT / DCP / Is(50) / UCS	Permeability	Level & Inflow	Origin, Geology Unit, Other Testing & General Observations	Installation
41.49	CONCRETE: 30% aggregate 70% matrix, fine to medium grained, sub-rounded to sub-angular gravel, grey, steel reinforcement at 50mm.								CONCRETE	
0.15 / 41.34	FILL Sandy GRAVEL: fine to medium grained, poorly graded, sub-angular, dark grey, sand is medium to coarse grained; with clay.	GP	M						FILL	
0.30	CONCRETE: 40% aggregate 60% matrix, medium grained, angular gravel.								CONCRETE	
0.40 / 41.09	FILL CLAY: medium to high plasticity, red-brown, with fine to medium grained, sub-rounded gravel; trace medium to coarse grained, sub-angular sand.		w<PL		D				0.30-0.40: Concrete observed in half of the hole, running east to west across the road FILL	
1.00m						SPT 4,5,5 N=10 (0.20m REC)				
1.45m		Cl -CH			D					1.0
2.00 / 39.49	CLAY: medium to high plasticity, red mottled grey.			St					RESIDUAL SOIL	
2.50m					D	SPT 4,5,8 N=13 (0.35m REC)				2.0
2.95m										
3.50	3.50: Becoming grey mottled orange brown	Cl -CH		VSt						3.0
4.00m					D	SPT 8,13,15 N=28 (0.45m REC)				
4.45m										4.0
5.0										

Method: DT, AD/T. Permeability: Not Observed.

Inferred Rock Strength — Point Load Is(50) ● - Axial ○ - Diametral; UCS ■. Scale: VL 0.1, L 0.3, M 1, H 3, VH 10, EH. Defect Spacing (mm): 20, 60, 200, 600, 2000.

Visual. Fabric, Structure & Defect Description.

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	10/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318258.8 m	Start Date	9/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245953.7 m	End Date	10/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.49 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH09**

Depth (m) Elevation	Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Graphic Log	Soil Group Symbol	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 / 36.5	AD/T									CI -CH		CLAY: medium to high plasticity, red mottled grey. *(continued)*	w<PL	VSt								RESIDUAL SOIL	
						5.50m						5.50-5.93: lenses of highly weathered siltstone											
					D	SPT 17,20,25/130mm HB N=R (0.43m REC)							w≈PL	H		XW								
						5.93m					5.93													
6.0 / 35.5				R1 (100%) 64%							35.56	SILTSTONE: fine grained, dark grey, distinctly laminated, 0 degree laminations.				HW	VL					SEDIMENTARY	6.0
																XW	VL				6.16: P, 5°, CN, ST, RF		
																HW							
											6.43			H		XW	VL				6.43: P, 0°, CN, PR, RF		
																HW							
										CH	35.06	CLAY: high plasticity, grey, lenses of highly weathered siltstone; (Extremely Weathered siltstone).		H		XW						EXTREMELY WEATHERED MATERIAL	
						6.75 m Is(50) D=0.30MPa 6.75 m Is(50) A=0.15MPa					6.70										6.70: P, 0°, CN, ST, RF	SEDIMENTARY	
				7.00							34.79	SANDSTONE: fine grained, dark grey, indistinctly laminated.				MW	L				6.88: P, 5°, FeO SN, PR, RF		
											6.93										6.97: P, 0°, FeO SN, PR, SM		
7.0 / 34.5											34.56	SILTSTONE: fine grained, dark grey, distinctly laminated.									7.00-7.03: EW, clay CT, PR, SM		7.0
																					7.06-7.14: Px4, 0°, clay CT, ST, RF		
																					7.21-7.24: EW, 0°, clay CT, PR, RF		
																					7.36: P, 0°, clay VN, PR, RF		
																					7.39-7.42: Px3, 0°, CN, PR, SM		
											7.50										7.59: P, 5°, CN, CU, RF		
						7.81 m Is(50) D=0.20MPa 7.81 m Is(50) A=0.14MPa 7.96 m Is(50) A=0.15MPa					33.99	INTERLAMINATED SANDSTONE (60%) AND SILTSTONE (40%): sandstone is fine grained, grey, indistinctly laminated. siltstone is fine grained, distinctly laminated, dark grey.									7.70-7.73: EW, 0°, clay CT, PR, RF		
				R2 (100%) 48%																	7.75: P, 5°, CN, PR, RF		
																SW					7.90: P, 10°, CN, PR, SM		
8.0 / 33.5																							8.0
																MW					8.09: P, 5°, FeO SN, PR, RF		
											8.24										8.18: J, 5 - 45°, FeO CT, IR, RF		
											33.25	INTERLAMINATED SANDSTONE (90%) AND SILTSTONE (10%): sandstone is fine grained, grey, indistinctly bedded. siltstone is fine grained, dark grey.				SW	M				8.25: P, 5°, FeO SN, PR, RF		
																					8.28: J, 20 - 30°, CN, ST, RF		
				8.60		8.42 m Is(50) D=1.35MPa															8.43-8.58: Px4, 0°, CN, CU, RF		
																					8.70: P, 5°, FeO SN, CU, RF		
																					8.75-8.77: Jx2, 5 - 15°, FeO VN, CU, RF		
						8.96 m Is(50) D=1.47MPa 8.96 m Is(50) A=2.71MPa															8.81: J, 70 - 90°, clay CT, CU, RF		
																					8.84-8.86: Px2, 5°, FeO VN, PR, RF		
9.0 / 32.5											9.10										9.01: P, 10°, CN, ST, RF		9.0
											32.39	INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, dark grey, distinctly laminated. sandstone is fine grained, indistinctly bedded, grey.									9.08: J, 20°, FeO SN, PR, RF		
																					9.12: P, 5°, FeO SN, PR, SM		
				R3 (100%) 41%																	9.28: P, 0°, CN, ST, RF		
						9.89 m Is(50) D=0.34MPa 9.90 m Is(50) A=0.19MPa															9.63: J, 70°, FeO CT, ST, RF		
10.0	NMLC							Not Observed													9.67-9.97: Px5, 0°, FeO SN, PR, RF		

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318258.8 m	Start Date	9/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245953.7 m	End Date	10/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.49 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH09**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC			10.10		10.10 m Is(50) D=0.63MPa 10.10 m Is(50) A=0.94MPa		Not Observed	10.0 *31.5*			10.10 *31.39*	INTERLAMINATED SANDSTONE (90%) AND SILTSTONE (10%): sandstone is fine grained, grey, indistinctly bedded. siltstone is fine grained, distinctly laminated, dark grey.				SW *(cont)*	M *(cont)*				10.04: J, 45°, FeO SN, CU, RF 10.04-10.10: CZ	SEDIMENTARY	
																					10.30: P, 0°, CN, PR, RF		
																					10.55: P, 0°, CN, IR, RF		
																					10.65-10.68: EW, 0°, siltstone		
					10.96 m Is(50) D=0.46MPa 10.96 m Is(50) A=0.39MPa						10.85 *30.64*	INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is fine grained, dark grey, distinctly laminated. sandstone is fine grained, indistinctly bedded, grey.									10.85: P, 0°, FeO SN, CU, RF 10.91: P, 0°, FeO SN, IR, RF 10.93: J, 15°, FeO SN, CU, RF		
								11.0 *30.5*															11.0
																					11.07: Px2, 5°, CN, PR, RF		
																					11.18: J, 30°, FeO SN, PR, RF 11.21: IS, 0°, clay, 5 mm 11.27: P, 5°, CN, PR, RF 11.32: P, 5°, CN, PR, RF		
					11.41 m Is(50) D=0.14MPa 11.41 m Is(50) A=0.45MPa																		
			R4 (100%) 82%																		11.59: EW, 10°, 2 mm 11.65-11.67: EW, 20°, 20 mm 11.69-11.70: EW, 20°, clay, 10 mm 11.75-11.77: EW, 5°, 20 mm		
					11.97 m Is(50) A=0.38MPa																		
								12.0 *29.5*															12.0
																					12.05-12.07: EW, 0°, 20 mm		
																					12.43: P, 0°, CN, PR, RF		
																					12.60: P, 0°, CN, ST, RF		
																					12.73-12.74: EW, 0°, 10 mm		
					12.93 m Is(50) D=0.34MPa 12.93 m Is(50) A=1.28MPa																12.86: J, 15°, CN, UN, RF		
			13.10					13.0 *28.5*															13.0
																					13.04: P, 10°, CN, PR, RF 13.05: P, 0°, CN, PR, RF 13.13-13.17: Px3, 0°, CN, ST, RF		
																					13.23: P, 0°, CN, PR, RF		
																					13.37: P, 15°, CN, CU, RF		
																					13.50: P, 5°, CN, CU, RF		
					13.71 m Is(50) D=0.30MPa 13.71 m Is(50) A=0.56MPa																13.71: P, 5°, CN, ST, RF		
																					13.83-13.86: CZ, 0°, CN, ST, RF		
			R5 (100%) 81%					14.0 *27.5*								MW					13.95: P, 15°, CN, CU, RF		14.0
																SW	M - H				14.12-14.14: CS, 5°, CN, IR, RF		
																					14.54: P, 15°, CN, PR, RF		
																					14.68: P, 10°, CN, PR, RF		
					14.76 m Is(50) D=0.54MPa 14.76 m Is(50) A=1.34MPa																14.80: P, 10°, CN, PR, RF 14.87: P, 0°, CN, PR, RF		
								15.0															

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318258.8 m	Start Date	9/12/2024	Contractor	Terratest	Inclination	-90°
Client	Health Infrastructure	North	6245953.7 m	End Date	10/12/2024	Rig Type	Geo-205	Azimuth	
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.49 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	

Borehole Identifier: **BH09**

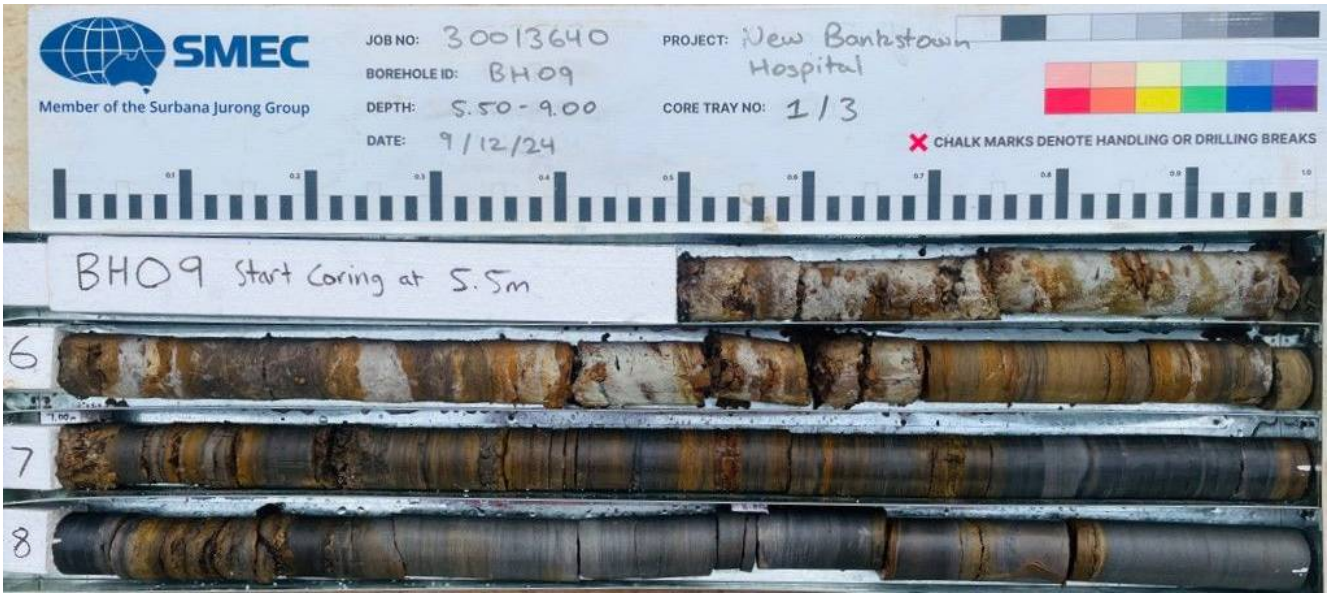
Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
			15.17					15.0 *26.5*			15.17					SW *(cont)*	M - H *(cont)*				14.98: P, 0°, CN, ST, RF 15.10: P, 0°, CN, PR, RF 15.15: P, 5°, CN, PR, RF	SEDIMENTARY	
											26.32	BH Terminated at 15.17 m Target Depth										
								16.0 *25.5*														16.0
								17.0 *24.5*														17.0
								18.0 *23.5*														18.0
								19.0 *22.5*														19.0
								20.0														

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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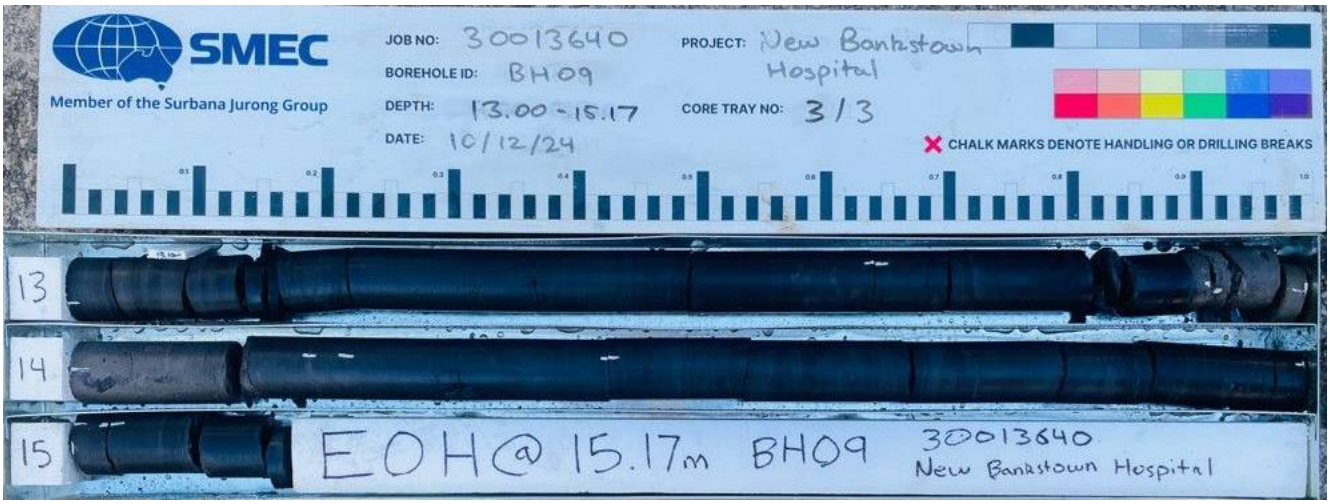


PointID : BH09 Depth Range: 5.50 - 9.00 m



PointID : BH09 Depth Range: 9.00 - 13.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH09	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH09 Depth Range: 13.00 - 15.17 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH09	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318337.9 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245948.6 m	End Date	16/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.09 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH10**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T				D	1.00m		Not Observed	0.0 *41.1*		SM	*41.09*	TOPSOIL Silty SAND: fine to medium grained, brown.	w<PL									TOPSOIL	
											0.30												
											40.79	FILL Silty CLAY: medium plasticity, brown, with fine to medium grained sand.										FILL	
				D	SPT 5,5,8 N=13 (0.25m REC)					Cl													
					1.45m			1.0 *40.1*			1.20												1.0
											39.89	CLAY: medium to high plasticity, grey mottled red-brown.		St							RESIDUAL SOIL	
														VSt								
					2.50m					Cl -CH													
				D	SPT 9,13,20/100mm HB N=R (0.45m REC) 2.90m			2.0 *39.1*			2.80												2.0
										CH	*38.29*	Silty CLAY: high plasticity, grey, (Extremely Weathered siltstone).		H							EXTREMELY WEATHERED MATERIAL	
											2.95												
											3.02	SILTSTONE: fine grained, grey, distinctly laminated.				HW	VL				SEDIMENTARY	
								3.0 *38.1*		CH	3.15	CLAY: high plasticity, grey, (Extremely Weathered siltstone).		H		XW					EXTREMELY WEATHERED MATERIAL	3.0
											37.94	SILTSTONE: fine grained, grey, distinctly laminated.		L		HW				3.17: P, 0°, clay VN, ST, SM 3.26-3.31: EW, clay	SEDIMENTARY	
											3.45									3.43: P, 0°, CN, PR, SM 3.45: P, 0°, CN, PR, SM 3.48: P, 0°, CN, PR, SM 3.52-3.55: Px2, 10°, CN, CU, SM 3.62-3.79: Px4, 10°, FeO SN, PR, SM		
NMLC			R1 (100%) 12%		3.68 m Is(50) A=0.92MPa						*37.64*	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is fine grained, distinctly laminated, grey.				MW	L - M			3.92-3.96: Px3, 0°, FeO SN, PR, SM 4.02-4.17: Px4, 0°, FeO SN, PR, SM		
			3.90					4.0 *37.1*			4.17											4.0
										CH	*36.92*	CLAY: high plasticity, grey-brown, (Extremely Weathered siltstone). 4.17-5.27: highly fractured siltstone, low strength, highly weathered		H		XW					EXTREMELY WEATHERED MATERIAL	
			R2 (100%) 43%					5.0														

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP/CT	Date	16/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318337.9 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245948.6 m	End Date	16/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.09 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH10**

Depth (m) / Elevation	Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Graphic Log	Soil Group Symbol	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 / 36.1	NMLC						Not Observed			CH	5.27	CLAY: high plasticity, grey-brown, (Extremely Weathered siltstone). *(continued)*		H		XW *(cont)*					5.27: P, 0°, clay VN, PR, SM 5.37: J, 20°, FeO SN, PR, RF	EXTREMELY WEATHERED MATERIAL	
											35.82	SILTSTONE: fine grained, grey, indistinctly laminated.				MW	L - M				5.52-5.54: CSx2, 10°, FeO SN, CU, RF 5.76: J, 10°, CN, ST, RF	SEDIMENTARY	
				R2 (100%) 43%		5.87 m Is(50) D=0.12MPa 5.87 m Is(50) A=0.41MPa															5.93: P, 5°, CN, PR, SM 5.97: J, 70°, CN, IR, RF 6.05: J, 80 - 90°, FeO SN, IR, RF 6.09: J, 50°, FeO SN, IR, RF 6.11-6.14: CS, 0°, FeO SN, IR, RF		
6.0 / 35.1				6.20																			6.0
																HW	L				6.20-6.38: FZ 6.42: IS, 0°, clay CT, PR, SM		
						6.75 m Is(50) D=0.02MPa 6.75 m Is(50) A=0.18MPa															6.57: J, 20°, FeO SN, PR, SM 6.63: P, 0°, CN, PR, SM 6.67: J, 30°, FeO SN, ST, RF 6.69: P, 0°, CN, PR, SM 6.82: J, 45°, clay VN, PR, RF 6.86: J, 45°, clay VN, PR, SM 6.95: J, 30°, clay VN, CU, RF 7.00: P, 0°, CN, PR, SM 7.04: P, 5°, FeO SN, PR, RF 7.04-7.21: CZ, 50°, FeO SN, IR, RF, vertical joints and partings		
7.0 / 34.1						7.24 m Is(50) A=0.16MPa																	7.0
				R3 (100%) 39%		7.76 m Is(50) A=0.50MPa 7.80 m Is(50) D=0.00MPa 7.80 m Is(50) A=0.29MPa					7.75										7.39: J, 45°, FeO SN, PR, RF 7.70-7.71: IS, clay, 10 mm		
											33.34	INTERLAMINATED SANDSTONE (50%) AND SILTSTONE (50%): sandstone is fine grained, grey, indistinctly bedded. siltstone is fine grained, distinctly laminated, grey.				MW	M				7.94: P, 0°, FeO SN, PR, SM		
8.0 / 33.1																					8.12: J, 5°, FeO CT, CU, RF 8.20: P, 10°, CN, PR, RF		8.0
						8.84 m Is(50) D=0.12MPa 8.84 m Is(50) A=0.61MPa															8.40: J, 35°, CN, CU, RF 8.44: P, 5°, FeO SN, UN, RF 8.48: J, 35°, CN, CU, RF 8.59: P, 5°, FeO SN, ST, RF		
						9.15 m Is(50) D=0.23MPa 9.15 m Is(50) A=0.60MPa															8.75-8.77: CS, 0°, gravel CT, PR, RF 8.94: P, 5°, FeO SN, PR, SM		
9.0 / 32.1				9.20																	9.12: J, 15°, CN, ST, RF 9.20-9.35: Px6, 5°, FeO SN, PR, SM		9.0
											9.35												
											31.74	CLAY: high plasticity, grey-brown, (Extremely Weathered siltstone). 9.35-9.60: highly fractured siltstone, low strength, highly weathered		H		XW					EXTREMELY WEATHERED MATERIAL	
				R4 (100%) 45%		9.79 m Is(50) A=0.37MPa				CH	9.60										9.71: P, 0°, clay VN, PR, RF 9.73: P, 0°, CN, PR, RF	SEDIMENTARY	
10.0											*31.49*	SILTSTONE: fine grained, grey, indistinctly laminated.				MW - SW	M						

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP/CT	Date	16/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318337.9 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245948.6 m	End Date	16/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	41.09 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH10**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC			R4 (100%) 45%		10.86 m Is(50) A=0.64MPa 10.90 m Is(50) A=0.27MPa 10.95 m Is(50) D=0.16MPa 10.95 m Is(50) A=0.40MPa		Not Observed	10.0 *31.1*				SILTSTONE: fine grained, grey, indistinctly laminated. *(continued)*				MW - SW *(cont)*	M *(cont)*				10.05: P, 0°, CN, PR, SM 10.11: P, 0°, clay VN, IR, RF 10.23-10.24: CS, 0°, gravel 10.38-10.40: CS, 0°, gravel 10.63-10.64: CS, 0°, gravel 10.77-10.90: Px7, 0°, clay VN, PR, SM	SEDIMENTARY	
								11.0 *30.1*								SW				11.19: P, 0°, CN, ST, RF 11.39: J, 10°, CN, ST, RF 11.49-11.50: CS, 0°, 10 mm 11.54-11.56: Px2, 5°, CN, PR, RF 11.65-11.68: CS, 0°, clay, 30 mm 11.72: P, 0°, CN, UN, SM		11.0
			12.30		11.84 m Is(50) D=0.63MPa 11.84 m Is(50) A=0.75MPa 11.94 m Is(50) D=0.31MPa 11.94 m Is(50) A=0.86MPa			12.0 *29.1*												11.87-11.89: CS, 0°, 20 mm 12.00: P, 0°, CN, IR, RF 12.20: P, 0°, CN, PR, RF 12.23: P, 0°, clay CT, PR, RF 12.39: P, 0°, CN, UN, SM 12.57-12.71: CSx4, 0°, gravel VN, PR, RF 12.76-12.98: Px6, 0°, CN, PR, RF		12.0
					12.88 m Is(50) D=0.44MPa 12.88 m Is(50) A=1.06MPa			13.0 *28.1*												13.10-13.22: Px2, 0°, CN, PR, RF		13.0
			R5 (100%) 71%		13.87 m Is(50) D=0.44MPa 13.87 m Is(50) A=0.52MPa 13.96 m Is(50) D=0.36MPa 13.96 m Is(50) A=0.59MPa 14.76 m Is(50) D=0.62MPa 14.76 m Is(50) A=1.14MPa 14.80 m Is(50) D=0.04MPa 14.80 m Is(50) A=1.19MPa			14.0 *27.1*												13.48-13.49: Px2, 0°, CN, PR, RF 13.56: P, 0°, CN, PR, RF 13.68-13.69: CS, 0°, gravel VN, PR, RF 13.79-13.81: CS, 0°, gravel, PR, RF 13.82: P, 0°, CN, PR, RF 14.05: J, 5°, CN, ST, RF		14.0
			14.93		14.89 m Is(50) A=1.42MPa			15.0			14.93	BH Terminated at 14.93 m Target Depth									14.67: J, 20°, CN, CU, RF 14.81: P, 0°, CN, PR, SM 14.89: J, 5°, CN, PR, RF		

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH10 Depth Range: 2.90 - 6.00 m



PointID : BH10 Depth Range: 6.00 - 10.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH10	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH10 Depth Range: 10.00 - 14.93 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH10	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 2/2

Geological & Engineering Log

Project	New Bankstown Hospital	East	318268.2 m	Start Date	17/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245851.9 m	End Date	17/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	34.63 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH11**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					1.50m		Not Observed	0.0 *34.6*			0.10	ASPHALT.										ROAD SURFACE
											34.53	FILL Gravelly CLAY: medium plasticity, dark brown, gravel is fine grained, sub-angular.										FILL
				D	SPT 3,4,5 N=9 (0.44m REC)					Cl												
					1.95m			1.0 *33.6*			1.00											RESIDUAL SOIL
											33.63	Silty CLAY: medium to high plasticity, grey mottled orange.		St								
								2.0 *32.6*		Cl -CH												
					3.00m																	
				D	SPT 7,7 HB N=R (0.22m REC)																	
					3.30m			3.0 *31.6*			3.30											
											31.33	Silty CLAY: high plasticity, with fine grained, sub-angular gravel; (Extremely Weathered siltstone).		H								EXTREMELY WEATHERED MATERIAL
										CH												
								4.0 *30.6*			4.40											
NMLC		100% Water RETURN	R1 (100%) 94%								*30.23*	SILTSTONE: dark grey, distinctly laminated at 0 to 5°.				HW XW - HW	VL			4.52-4.53: CS, 10 mm 4.58-4.59: CS, 10 mm 4.63-4.64: CS, 10 mm		SEDIMENTARY
								5.0														

Observations and Comments

Notes

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318268.2 m	Start Date	17/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245851.9 m	End Date	17/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	34.63 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH11**

Depth (m) / Elevation	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
5.0 / 29.6	SILTSTONE: dark grey, distinctly laminated at 0 to 5°. *(continued)*				XW - HW *(cont)*	VL *(cont)*		SEDIMENTARY
5.20 / *29.43*	INTERLAMINATED SANDSTONE (75%) AND SILTSTONE (25%): sandstone is fine to medium grained, dark grey, thinly laminated, Orange. siltstone is fine grained, black.				HW	L	5.33: P, 10°, CN, PR	
							5.51: P, 5°, Co VN, PR, RF 5.54: J, 5°, C, ST, RF 5.60: J, 20°, CN, PR, RF	
							5.74-5.75: EW, 10 mm	
							5.92: P, 0°, FeO SN, PR, RF	
6.0 / 28.6								6.0
6.11 / *28.52*	INTERBEDDED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, black, distinctly bedded at 0 to 5°. sandstone is fine grained, dark grey.				MW	L - M	6.11-6.12: EW, clay, 10 mm	
							6.42: P, 10°, CN, PR, RF	
					XW	VL		
7.0 / 27.6								7.0
					MW	L - M	7.19: J, 10°, clay CT, CU, RF	
							7.30-7.32: CZ, 20 mm	
							7.80-7.82: EW, clay, 20 mm	
							7.91-7.92: EW, clay, 5 mm	
8.0 / 26.6							8.04: P, 5°, CN, ST, RF, 5 mm	8.0
							8.37: P, 5°, CN, PR, RF 8.43: P, 0°, CN, PR, RF	
							8.55: J, 5°, CN, PR, RF	
							8.68-8.72: CZ, 40 mm	
							8.92-8.94: CZ, 20 mm	
9.0 / 25.6								9.0
							9.25: P, 0°, CN, CU, SM, 5 mm	
							9.39: P, 5°, CN, PR, RF	
							9.50: P, 5°, CN, PR, RF	
							9.68: J, 10°, CN, PR, RF	
							9.77: J, 20°, CN, PR, RF	
10.0							9.92: HB, 20°, CN, PR, RF	

Method: NMLC

Casing

Progress Water (Loss/Return): 100% Water RETURN; 90-100% Water RETURN; 90-100% Mud RETURN

Run (TCR) RQD: R1 (100%) 94%; R2 (100%) 93%; R3 (98%) 90%

Sampling

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
- 5.33 m Is(50) D=0.04MPa
- 5.33 m Is(50) A=0.29MPa
- 6.43 m Is(50) D=0.06MPa
- 6.43 m Is(50) A=0.30MPa
- 7.31 m Is(50) D=0.29MPa
- 7.31 m Is(50) A=0.49MPa
- 8.32 m Is(50) D=0.29MPa
- 8.32 m Is(50) A=0.48MPa
- 9.40 m Is(50) D=MPa
- 9.40 m Is(50) A=0.80MPa

Permeability

Level & Inflow: Not Observed

Graphic Log

Soil Group Symbol

Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL -0.1, L -0.3, M -1, H -3, VH -10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Visual

Installation

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	LR	Date	17/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318268.2 m	Start Date	17/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245851.9 m	End Date	17/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	34.63 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH11**

Depth (m) / Elevation	Soil / Rock Material Description	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
10.0 / 24.6			SEDIMENTARY	
10.12 / 24.51	INTERBEDDED SANDSTONE (90%) AND SILTSTONE (10%): sandstone is fine grained, grey, indistinctly bedded at 0°, Orange. siltstone is black.			
10.80 / 23.83	INTERBEDDED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, black, distinctly bedded at 0 to 5°. sandstone is fine grained, dark grey.			
11.0 / 23.6		11.16: J, 20°, CN, ST, RF		11.0
12.0 / 22.6		11.90: P, 0°, CN, PR, RF 12.10-12.13: EW, 30 mm 12.20-12.24: CZ, 40 mm		12.0
13.0 / 21.6		12.53: P, 0°, CN, PR, RF 12.65: J, 10°, CN, PR, RF 12.80-12.81: EW, 5 mm 12.96: P, 0°, CN, PR, RF 13.17: P, 5°, CN, PR, RF 13.20: P, 0°, CN, PR, RF 13.30-13.36: EW, 60 mm 13.56: P, 0°, clay CT, PR, SM, 1 mm 13.77-13.81: EW, 40 mm		13.0
14.0 / 20.6		14.00-14.07: CS, 70 mm 14.11: P, 5°, clay CT, PR, SM, 1 mm 14.15: J, 10°, clay CT, PR, SM, 1 mm 14.20-14.21: VE, Qz CT, PR, SM, 10 mm 14.24: J, 70°, CN, PR, RF 14.30: P, 0°, CN, PR, RF 14.34: P, 0°, CN, PR, RF 14.37: P, 0°, CN, PR, RF 14.39: P, 0°, CN, PR, RF 14.47: J, 30°, CN, PR, RF 14.54: P, 0°, CN, PR, RF 14.60: J, 10°, CN, PR, RF		14.0
15.0	BH Terminated at 15.00 m			

Method: NMLC

Casing

Progress Water (Loss/Return): 90-100% Mud RETURN; 90-100% Water RETURN

Run (TCR) RQD: R3 (98%) 90%; R4 (100%) 64%

Sampling

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
- 10.40 m Is(50) D=0.08MPa
- 10.40 m Is(50) A=0.22MPa
- 11.38 m Is(50) D=0.01MPa
- 11.38 m Is(50) A=0.86MPa
- 12.47 m Is(50) D=0.20MPa
- 12.47 m Is(50) A=0.25MPa
- 13.87 m Is(50) D=0.01MPa
- 13.87 m Is(50) A=0.30MPa
- 14.80 m Is(50) D=0.60MPa
- 14.80 m Is(50) A=0.21MPa

Permeability: Not Observed

Level & Inflow

Graphic Log

Soil Group Symbol

Moisture Condition: MW (cont)

Consistency Density: L - M (cont)

Alteration

Weathering

Rock Strength

Inferred Rock Strength — Point Load Is(50) ● - Axial ○ - Diametral; UCS ■ — VL ~0.1, L ~0.3, M ~1, H ~3, VH ~10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Visual

Observations and Comments

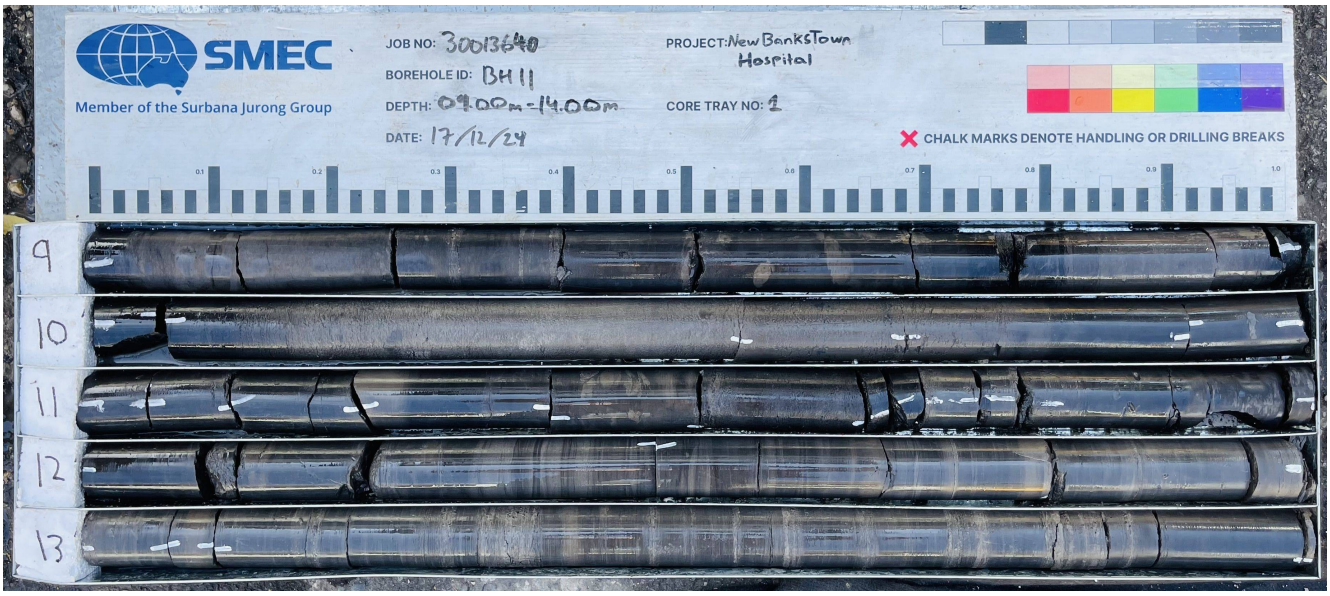
Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
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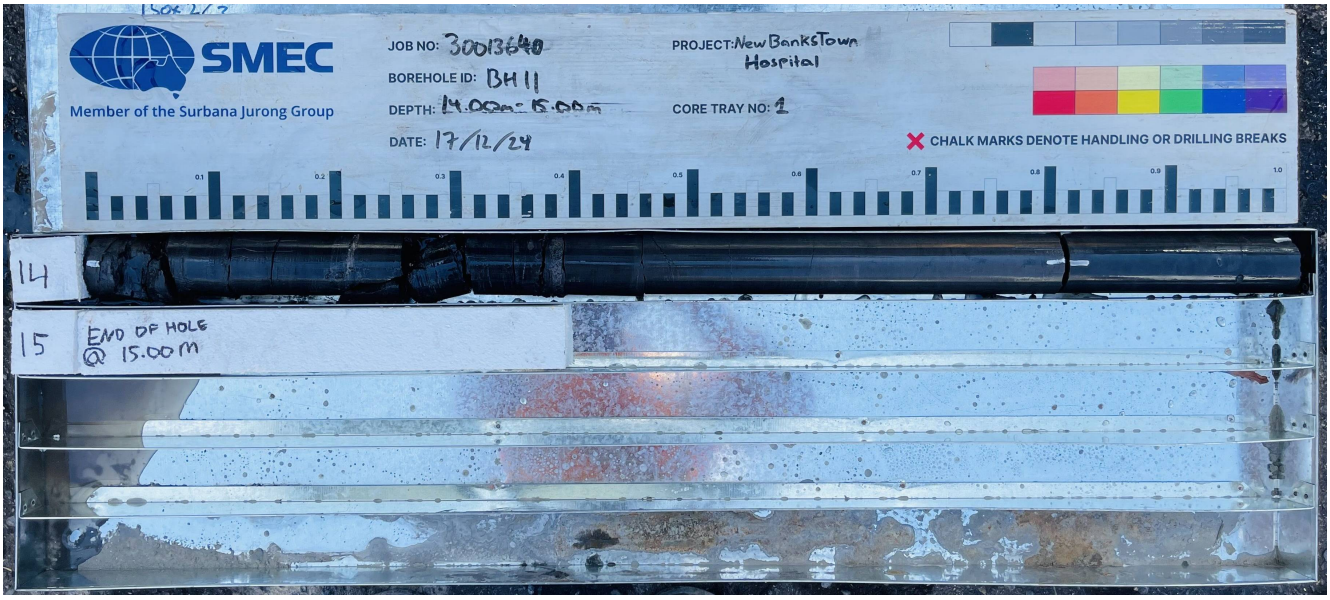


PointID : BH11 Depth Range: 4.40 - 9.00 m



PointID : BH11 Depth Range: 9.00 - 14.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH11	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 1/2



PointID : BH11 Depth Range: 14.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH11	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318312.1 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245851.1 m	End Date	13/12/2024	Rig Type	Commancio 205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	36.19 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	

smec

Borehole Identifier: **BH12**

Depth (m) / Elevation	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Installation
0.0 / 36.2		0.10	ASPHALT.	D					ROAD SURFACE	
	SP	36.09	FILL SAND: orange-red.						FILL	
1.0 / 35.2	CI -CH	1.00 / 35.19	Gravelly Silty CLAY: medium to high plasticity, gravel is fine to medium grained; (Extremely Weathered siltstone).	w<PL - w≈PL	H		RS - XW		EXTREMELY WEATHERED MATERIAL	1.0
		1.50 / 34.69	CORE LOSS 0.70m (1.50-2.20)							
2.0 / 34.2		2.20 / 33.99	SILTSTONE: fine grained, dark grey to black, thinly laminated.				XW	VL	SEDIMENTARY	2.0
		2.89 / 33.31	INTERBEDDED SILTSTONE (75%) AND SANDSTONE (25%): siltstone is fine grained, black-orange, thinly laminated. sandstone is fine to medium grained, distinctly bedded at 0 to 5°.				XW - HW			3.0
3.0 / 33.2		4.00 / 32.2	CORE LOSS 0.10m (4.00-4.10)							
		4.10 / 32.09	INTERBEDDED SILTSTONE (75%) AND SANDSTONE (25%): siltstone is fine grained, black-orange, thinly laminated. sandstone is fine to medium grained, distinctly bedded at 0 to 5°.				XW - HW	VL	SEDIMENTARY	4.0
		4.53 / 31.66	INTERLAMINATED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is fine grained, dark grey, thinly laminated at 0 to 5°. sandstone is fine grained.				MW	L		
5.0										

Method: AD/T; NMLC

Casing

Progress Water (Loss/Return): 100% Water RETURN; 90-100% Water RETURN

Run (TCR) RQD: R1 (71%) 59%; R2 (96%) 77%

Sampling: 1.00m SPT 13,19,25 N=44 (m REC) 1.45m; 3.90

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa): 3.37 m Is(50) D=0.02MPa 3.37 m Is(50) A=0.02MPa; 4.39 m Is(50) D=MPa 4.39 m Is(50) A=MPa

Permeability

Level & Inflow

Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL -0.1, L -0.3, M -1, H -3, VH -10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Visual

Fabric, Structure & Defect Description

- 2.52: P, 0°, CN, PR, RF
- 2.63: P, 0°, CN, PR, RF
- 2.75: P, 0°, CN, PR, RF
- 2.86: P, 0°, FeO SN, PR, RF
- 2.95: P, 0°, CN, PR, RF
- 3.15: P, 0°, FeO SN, PR, RF
- 3.22-3.27: EW, 50 mm
- 3.32: J, 60 - 80°, FeO SN, CU, RF
- 3.32-3.34: CS, 20 mm
- 3.52: P, 0°, CN, PR, RF
- 3.57: P, 0°, CN, PR, RF
- 3.61-3.65: CZ, 40 mm
- 3.67-3.74: CZ, 70 mm
- 3.81: P, 0°, FeO SN, PR, RF
- 3.84: P, 0°, CN, PR, RF
- 3.85: J, 80°, CN, PR, RF
- 4.25: P, 5°, FeO SN, PR, RF
- 4.30: P, 0°, clay VN, PR, SM
- 4.50-4.51: EW, 5 mm
- 4.70-4.71: EW, 5 mm

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318312.1 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245851.1 m	End Date	13/12/2024	Rig Type	Commancio 205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	36.19 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH12**

Depth (m) Elevation	Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Graphic Log	Soil Group Symbol	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1, L -0.3, M -1, H -3, VH -10, EH	Defect Spacing (mm) 20, 60, 200, 600, 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 31.2	NMLC		90-100% Water RETURN	R2 (96%) 77%		5.36 m Is(50) D=0.18MPa 5.36 m Is(50) A=0.17MPa						INTERLAMINATED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is fine grained, dark grey, thinly laminated at 0 to 5°. sandstone is fine grained. *(continued)*				MW *(cont)*	L *(cont)*				5.60: P, 0°, CN, PR, RF	SEDIMENTARY	
																					5.78: J, 10°, CN, PR, RF 5.83: P, 5°, CN, PR, RF		
				5.90																	5.95: J, 10°, CN, PR, RF 5.97: J, 10°, CN, IR, RF		
6.0 30.2						6.34 m Is(50) D=0.14MPa 6.34 m Is(50) A=0.23MPa															6.15: P, 0°, CN, PR, RF		6.0
			90-100% Mud RETURN	R3 (100%) 94%																	6.60: J, 10°, CN, PR, RF		
						7.00 m Is(50) D=MPa 7.00 m Is(50) A=MPa															6.80: P, 5°, CN, PR, RF		
7.0 29.2																					7.19: P, 5°, CN, PR, RF		7.0
																					7.41: P, 5°, CN, PR, RF		
																					7.51: P, 0°, CN, PR, RF		
				7.90																	7.76: P, 0°, CN, PR, RF 7.83: P, 0°, CN, PR, RF		
8.0 28.2						8.03 m Is(50) D=0.18MPa 8.03 m Is(50) A=0.28MPa																	8.0
			90-100% Mud RETURN	R4 (100%) 60%																	8.34: P, 5°, CN, PR, RF		
																					8.51-8.54: EW, 30 mm		
																					8.63: J, 30°, CN, PR, RF 8.64: J, 15°, CN, PR, RF 8.75: J, 70°, HE, PR		
				8.90																	8.86-8.91: CZ, 50 mm		
9.0 27.2						9.07 m Is(50) D=0.58MPa 9.07 m Is(50) A=1.21MPa															9.04: P, 0°, CN, PR, RF		9.0
			40-50% Mud RETURN	R5 (100%) 62%																	9.16: P, 5°, CN, PR, RF		
				9.90		10.00 m Is(50) D=0.24MPa															9.80: P, 0°, CN, PR, RF 9.92: P, 0°, CN, PR, RF		
10.0																							

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318312.1 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245851.1 m	End Date	13/12/2024	Rig Type	Commancio 205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	36.19 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH12**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		20-30% Mud RETURN	R6 (99%) 85%		10.00 m Is(50) A=0.21MPa			10.0 26.2				INTERLAMINATED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is fine grained, dark grey, thinly laminated at 0 to 5°. sandstone is fine grained. *(continued)*				MW *(cont)*	L - M				10.20: J, 10°, CN, PR, RF 10.25: J, 30°, CN, IR, RF 10.27: P, 5°, CN, PR, RF 10.40: P, 5°, clay CT, PR, SM, 2 mm 10.42-10.44: EW, 20 mm 10.47: P, 0°, CN, PR, RF 10.61: P, 5°, CN, PR, RF	SEDIMENTARY	
					11.00 m Is(50) D=0.16MPa 11.00 m Is(50) A=0.27MPa			11.0 25.2															11.0
																				11.19: P, 5°, CN, IR, RF 11.21: P, 5°, CN, PR, RF		
																				11.44: P, 5°, CN, PR, RF		
																				11.71: P, 5°, CN, PR, RF 11.75: J, 20°, CN, PR, RF		
			11.90					12.0 24.2															12.0
		30% Mud RETURN	R7 (100%) 83%		12.83 m Is(50) D=0.41MPa 12.83 m Is(50) A=0.22MPa															12.66: J, 45°, CN, PR, RF		
								13.0 23.2												12.95: P, 0°, CN, PR, RF 13.15: J, 20°, CN, PR, RF		13.0
																				13.55: J, 45°, CN, ST, RF		
			13.88		13.91 m Is(50) D=0.25MPa 13.91 m Is(50) A=0.22MPa			14.0 22.2												13.84-14.00: VE, Qz CN, C, CU, SM, <1 mm		14.0
		Mud	R8 (100%) 88%																	14.14: J, 30°, CN, PR, RF 14.20: J, 30°, CN, PR, RF		
					14.96 m Is(50) D=0.37MPa 14.96 m Is(50) A=0.35MPa			15.0															

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318312.1 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245851.1 m	End Date	13/12/2024	Rig Type	Commancio 205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	36.19 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	

smec

Borehole Identifier: **BH12**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		Mud	R8 (100%) 88% 15.25					15.0 *21.2*			15.25 *20.94*	INTERLAMINATED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is fine grained, dark grey, thinly laminated at 0 to 5°. sandstone is fine grained. *(continued)*				MW *(cont)*	L - M *(cont)*				SEDIMENTARY	
												BH Terminated at 15.25 m										
								16.0 *20.2*														16.0
								17.0 *19.2*														17.0
								18.0 *18.2*														18.0
								19.0 *17.2*														19.0
								20.0														

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH12 Depth Range: 2.20 - 7.00 m



PointID : BH12 Depth Range: 7.00 - 12.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH12	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH12 Depth Range: 12.00 - 15.25 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH12	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318238.5 m	Start Date	11/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245809.7 m	End Date	12/12/2024	Rig Type	Commancio 205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	32.04 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	

smec

Borehole Identifier: **BH13**

Depth (m) / Elevation	Soil Group Symbol	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
0.0 / 32.0		0.10 / 31.94	ASPHALT.							ROAD SURFACE	
	CL		FILL Silty Gravelly ORGANIC CLAY: low plasticity, red-orange, gravel is medium grained, angular to sub-angular.							FILL	
		0.50 / 31.54	Gravelly CLAY: medium plasticity, grey-red-orange, gravel is fine to medium grained, angular.	w<PL	VSt					RESIDUAL SOIL	
1.0 / 31.0	CI										1.0
2.0 / 30.0				w≈PL - w>PL							2.0
		3.00 / 29.04	Silty Gravelly CLAY: medium plasticity, grey to dark grey, gravel is fine grained, angular to sub-angular; (Extremely Weathered siltstone).	w<PL - w≈PL	H					EXTREMELY WEATHERED MATERIAL	3.0
4.0 / 28.0		4.10 / 27.94	SILTSTONE: dark grey and orange-brown.				XW - HW HW	VL	4.10-4.25: J, 80°, FeO SN, UN, SM 4.28-4.39: EW, 110 mm 4.44: P, 0°, clay VN, PR, SM 4.50: P, 5°, FeO SN, PR, SM 4.55-4.58: Px3, 0°, FeO SN, PR, SM 4.71: P, 0°, FeO SN, PR, SM 4.75: P, 0°, FeO SN, PR, SM 4.83: P, 0°, FeO SN, PR, SM 4.97: P, 0°, FeO SN, PR, SM	SEDIMENTARY	4.0
5.0											

Method: AD/T; NMLC
Casing: HWT
Progress Water (Loss/Return): 100% Water RETURN
Run (TCR) RQD: R1 (100%) 91%
Sampling:
SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
1.00m — SPT 6,11,9 N=20 (m REC)
1.45m
2.50m — SPT 6,10,14 N=24 (m REC)
2.95m
4.00m — SPT 3,5,7 HB N=12 (m REC)
4.45m
4.88 m Is(50) D=MPa
4.88 m Is(50) A=MPa
Permeability:
Level & Inflow: Not Observed
Graphic Log:
Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL -0.1 | L -0.3 | M -1 | H -3 | VH -10 | EH
Defect Spacing (mm): 20 | 60 | 200 | 600 | 2000
Visual:
Fabric, Structure & Defect Description:
Installation:

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318238.5 m	Start Date	11/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245809.7 m	End Date	12/12/2024	Rig Type	Commancio 205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	32.04 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH13**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		100% Water RETURN	R1 (100%) 92%				Not Observed	5.0 *27.0*			5.21	SILTSTONE: dark grey and orange-brown. *(continued)*				HW *(cont)*	VL *(cont)*				SEDIMENTARY	
			5.21								*26.83*	INTERBEDDED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is dark grey, indistinctly bedded at 0 to 5°. sandstone is fine grained, pale grey and grey.				MW	L - M					
		100% Water RETURN	R2 (100%) 79%		5.67 m Is(50) D=0.14MPa 5.67 m Is(50) A=0.82MPa			6.0 *26.0*														
			6.21																			
		100% Water RETURN	R3 (100%) 49%		6.72 m Is(50) D=MPa 6.72 m Is(50) A=0.44MPa			7.0 *25.0*														
			7.71																			
		100% Water RETURN	R4 (100%) 86%		7.80 m Is(50) D=0.29MPa 7.80 m Is(50) A=0.24MPa 8.08 m Is(50) D=0.12MPa 8.08 m Is(50) A=0.53MPa			8.0 *24.0*			8.00 *24.04*	INTERBEDDED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is dark grey, distinctly bedded at 0 to 5°. sandstone is fine grained, pale grey.										
			8.97																			
		100% Water RETURN	R5 (94%) 41%		9.06 m Is(50) D=0.06MPa 9.06 m Is(50) A=0.44MPa			9.0 *23.0*														
								10.0														

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318238.5 m	Start Date	11/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245809.7 m	End Date	12/12/2024	Rig Type	Commancio 205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	32.04 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

Borehole Identifier: **BH13**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1, L -0.3, M -1, H -3, VH -10, EH	Defect Spacing (mm) 20, 60, 200, 600, 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		90% Water RETURN	R5 (94%) 41%		10.13 m Is(50) D=0.20MPa 10.13 m Is(50) A=0.48MPa	Not Observed		10.0 *22.0*				INTERBEDDED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is dark grey, distinctly bedded at 0 to 5°. sandstone is fine grained, pale grey. *(continued)*				MW *(cont)*	L - M *(cont)*				9.83: P, 0°, CN, PR, RF 9.95: P, 0°, clay CT, PR, SM 10.03: P, 0°, CN, PR, RF 10.06-10.11: Px4, 0°, CN, PR, RF, 10-20mm spacing 10.19: P, 0°, CN, PR, RF 10.24: P, 0°, CN, PR, RF 10.29: P, 5°, FeO SN, PR, RF 10.32: P, 0°, FeO SN, PR, RF 10.34-10.37: CZ, 30 mm 10.41-10.42: EW, 10 mm 10.45: P, 0°, CN, PR, RF 10.52: Px2, 0°, CN, PR, RF 10.56: P, 0°, CN, PR, RF 10.67: P, 0°, CN, PR, RF 10.75: P, 0°, CN, PR, RF 10.80-10.81: EW, 10 mm 10.84: P, 0°, CN, PR, RF 10.87: P, 0°, CN, PR, RF 10.93: P, 0°, CN, PR, RF 10.96: P, 0°, CN, PR, RF 11.04: J, 70°, CN, UN, RF 11.05-11.07: EW, 20 mm 11.08-11.10: EW, 20 mm 11.13-11.14: EW, 10 mm 11.16-11.17: EW, 5 mm 11.20: J, 90°, CN, PR, RF 11.26-11.29: EW, 30 mm 11.33: P, 5°, CN, PR, RF 11.37: P, 5°, CN, PR, RF 11.58-11.60: CZ, 20 mm 11.48-11.98: J, 70 - 90°, CN, IR, RF 11.76: J, 15°, CN, PR, RF 12.06-12.10: Px4, 0°, CN, PR, RF, 10-20mm spacing 12.23-12.24: EW, 10 mm 12.30-12.31: EW, 5 mm 12.36: P, 0°, CN, PR, RF 12.45-12.46: EW, 5 mm 12.51: P, 5°, CN, PR, RF 12.53: J, 60°, HE 12.54: P, 0°, CN, PR, RF 12.61: P, 0°, CN, PR, RF 12.66: P, 0°, CN, PR, RF 12.85-12.86: EW, 10 mm 12.94: J, 90°, CN, PR, RF 13.07-13.08: EW, 10 mm 13.71: P, 5°, CN, PR, RF	SEDIMENTARY	11.0 12.0 13.0 14.0
			R6 (100%) 40%					11.0 *21.0*															
			10.35																				
		90% Water RETURN	R7 (100%) 45%																				
			11.35																				
			R8 (100%) 32%		12.65 m Is(50) D=0.11MPa 12.65 m Is(50) A=0.06MPa			12.0 *20.0*			12.00 *20.04*	INTERBEDDED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is dark grey, distinctly bedded at 0 to 5°. sandstone is fine grained, pale grey.											
			12.00																				
			12.93																				
		100% Mud RETURN	R9 (93%) 92%		13.71 m Is(50) D=0.49MPa 13.71 m Is(50) A=0.58MPa			13.0 *19.0*									M						
					14.72 m Is(50) D=0.58MPa 14.72 m Is(50) A=0.48MPa			14.0 *18.0*			14.85 *17.19*	CORE LOSS 0.15m (14.85-15.00)											
			15.00					15.0				BH Terminated at 15.00 m Target Depth											

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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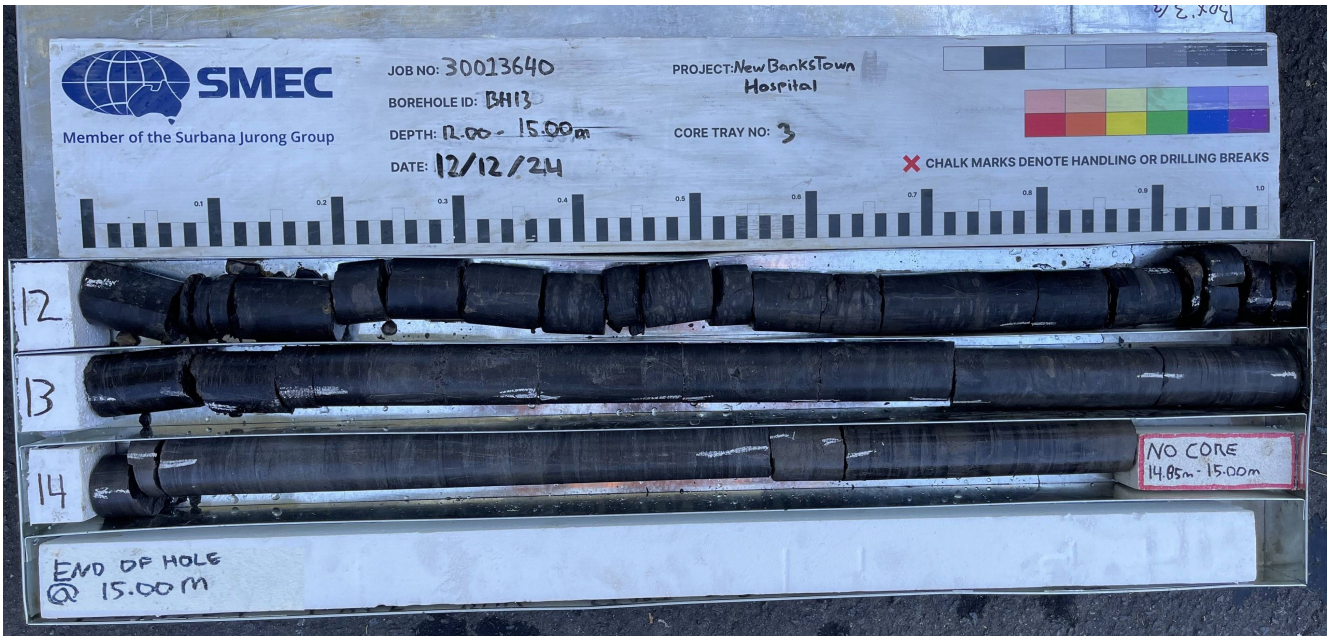


PointID : BH13 Depth Range: 4.10 - 8.00 m



PointID : BH13 Depth Range: 8.00 - 12.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH13	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH13 Depth Range: 12.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH13	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 2/2

Geological & Engineering Log

Project	New Bankstown Hospital	East	318305.2 m	Start Date	13/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245792.6 m	End Date	13/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	33.74 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH14**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					1.50m			0.0 33.7			0.10 33.64	ASPHALT.	w<PL									ROAD SURFACE	
				D	SPT 30 HB N=R (0.13m REC) 1.65m					CI	0.30 33.44	FILL Gravelly CLAY: medium plasticity, dark brown, gravel is fine grained, sub-angular.										FILL	
								1.0 32.7				Gravelly CLAY: high plasticity, grey, gravel is fine grained, sub-angular; (Extremely Weathered siltstone).		H								EXTREMELY WEATHERED MATERIAL 1.50: 65mm	1.0
								2.0 31.7		CH													2.0
											2.99 30.75	CORE LOSS 0.01m (2.99-3.00)											
NMLC		100% Water RETURN	R1 (100%) 79%		3.67 m Is(50) A=0.15MPa 3.71 m Is(50) A=0.23MPa 3.72 m Is(50) D=0.25MPa 3.72 m Is(50) A=0.36MPa			3.0 30.7				INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is dark grey, distinctly laminated at 0 to 5°. sandstone is fine grained, pale grey and grey.				HW	VL - L			3.07: J, 50°, HE 3.10-3.11: EW, 5 mm 3.22: J, 10°, FeO SN, PR, RF 3.32: P, 5°, CN, PR, RF 3.46: P, 5°, clay VN, PR, SM 3.57: J, 10°, CN, PR, RF 3.84: P, 5°, FeO SN, PR, RF 3.98-3.99: EW, 5 mm 4.08-4.10: EW, 20 mm 4.19-4.23: EW, 40 mm 4.27: P, 0°, clay VN, PR, SM 4.32-4.34: EW, 20 mm 4.37: P, 5°, CN, PR, RF 4.41: P, 5°, CN, PR, RF 4.52: J, 10°, CN, PR, RF 4.56: J, 10°, CN, PR, RF 4.66: P, 0°, CN, PR, RF 4.70-4.79: J, 70°, CN, UN, RF 4.84: P, 0°, FeO SN, PR, SM 4.94-4.95: EW, 10 mm	SEDIMENTARY	3.0
											4.07 29.67	INTERBEDDED SANDSTONE (70%) AND SILTSTONE (30%): sandstone is fine grained, pale grey and grey, distinctly bedded at 0 to 5°. siltstone is dark grey.				HW - MW	L - M						4.0
					4.87 m Is(50) D=0.16MPa 4.87 m Is(50) A=0.31MPa 4.82 m Is(50)			5.0															

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318305.2 m	Start Date	13/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245792.6 m	End Date	13/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	33.74 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH14**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		100% Water RETURN	R1 (100%) 79%		D=0.05MPa 4.82 m Is(50) A=0.25MPa 5.35 m Is(50) D=0.42MPa 5.35 m Is(50) A=1.07MPa			5.0 28.7				INTERBEDDED SANDSTONE (70%) AND SILTSTONE (30%): sandstone is fine grained, pale grey and grey, distinctly bedded at 0 to 5°. siltstone is dark grey. *(continued)*				MW	L - M *(cont)*			4.97-4.98: EW, 10 mm 5.06: J, 20°, FeO SN, PR, RF 5.16-5.17: EW, 10 mm 5.18: P, 0°, FeO SN, PR, RF 5.45-5.46: EW, 10 mm 5.51: J, 40°, FeO SN, PR, RF	SEDIMENTARY	
											5.69					HW - MW				5.71-5.73: CZ, 20 mm		
		90-100% Water RETURN			5.88 m Is(50) D=0.05MPa 5.88 m Is(50) A=0.50MPa			6.0 27.7												5.86-5.88: CZ, 20 mm 5.91-5.92: EW, 10 mm 5.93-5.94: EW, 10 mm 5.95-5.97: EW, 20 mm 6.07-6.23: J, 70 - 90°, HE, UN 6.32: P, 0°, FeO SN, PR, RF		6.0
			R2 (99%) 91%		6.23 m Is(50) D=0.18MPa 6.23 m Is(50) A=0.35MPa 6.27 m Is(50) A=0.26MPa 6.77 m Is(50) D=0.44MPa 6.77 m Is(50) A=0.22MPa 6.85 m Is(50) D=0.06MPa 6.85 m Is(50) A=0.16MPa 6.88 m Is(50) A=0.35MPa			7.0 26.7												6.52-6.53: EW, 10 mm 6.60: P, 0°, FeO SN, PR, RF 6.65-6.75: EW, 100 mm 6.80: P, 0°, CN, PR, RF 7.09-7.10: CZ, 10 mm 7.19: J, 20°, CN, PR, RF		7.0
					7.73 m Is(50) A=0.24MPa 7.92 m Is(50) A=0.19MPa			8.0 25.7												7.42: P, 0°, CN, PR, RF 7.52-7.53: EW, 5 mm 7.62-7.63: EW, 10 mm 7.80: P, 0°, CN, PR, RF 8.21-8.25: CZ, 40 mm 8.29: J, 20°, CN, PR, RF		8.0
											8.68											
			R3 (100%) 97%		8.82 m Is(50) D=0.04MPa 8.82 m Is(50) A=0.34MPa 8.94 m Is(50) A=0.49MPa 9.87 m Is(50) A=0.31MPa 9.91 m Is(50) D=0.04MPa 9.91 m Is(50)			9.0 24.7 10.0												9.08: J, 10°, CN, PR, RF 9.40: P, 0°, CN, PR, RF 9.64: J, 5°, CN, PR, RF 9.82: J, 0°, CN, PR, RF 9.87-9.88: EW, 10 mm		9.0

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	LR	Date	13/12/2024
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318305.2 m	Start Date	13/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245792.6 m	End Date	13/12/2024	Rig Type	Geo-305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	33.74 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

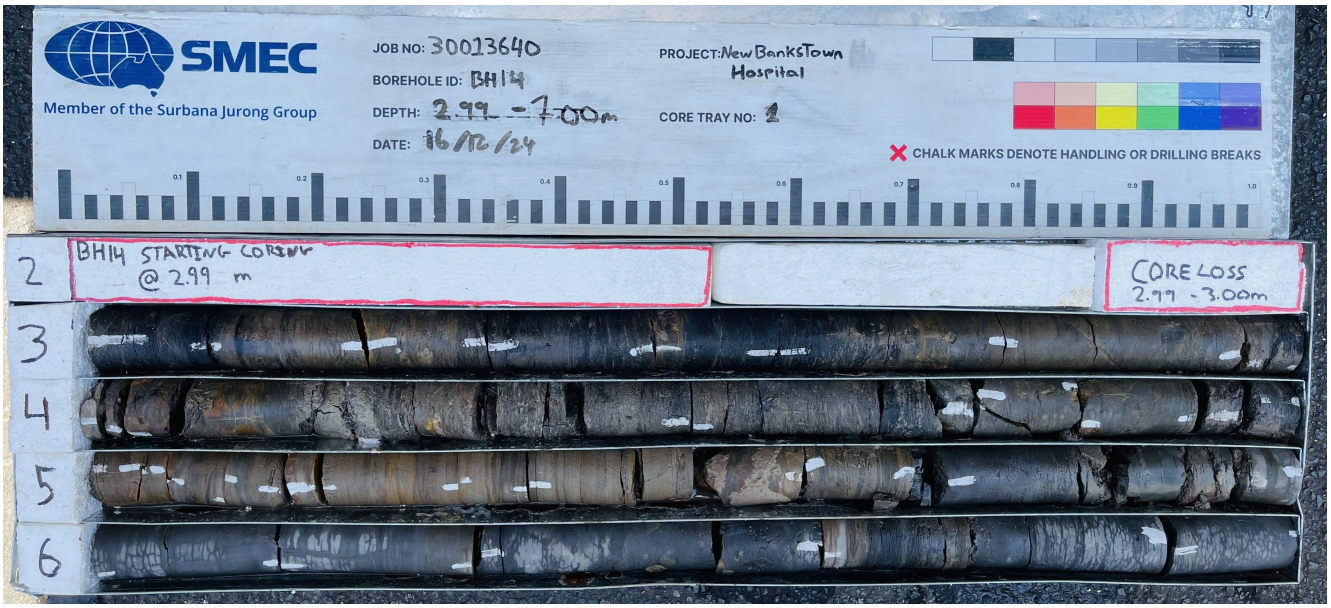
Borehole Identifier: **BH14**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		90-100% Water RETURN	R3 (100%) 97%		A=0.32MPa 9.83 m Is(50) D=0.03MPa 9.83 m Is(50) A=0.34MPa			10.0 *23.7*			10.40 *23.34*	INTERBEDDED SANDSTONE (70%) AND SILTSTONE (30%): sandstone is fine grained, pale grey and grey, distinctly bedded at 0 to 5°. siltstone is dark grey. *(continued)*				HW - MW *(cont)*	L - M *(cont)*				10.08-10.09: EW, 10 mm 10.17: J, 15°, CN, PR, RF	SEDIMENTARY	
												INTERLAMINATED SILTSTONE (80%) AND SANDSTONE (20%): siltstone is fine grained, dark grey, indistinctly laminated at 0 to 5°. sandstone is fine grained, grey.								10.41: P, 0°, clay VN, PR, SM 10.54: P, 0°, CN, PR, RF		
					10.80 m Is(50) D=0.12MPa 10.80 m Is(50) D=0.38MPa 10.82 m Is(50) D=0.69MPa 10.82 m Is(50) A=0.70MPa 10.84 m Is(50) A=0.45MPa			11.0 *22.7*											10.88: P, 0°, CN, UN, RF 11.07: J, 30°, CN, PR, RF 11.10: P, 0°, CN, PR, RF 11.23: P, 5°, CN, PR, RF 11.26: P, 0°, CN, PR, RF 11.43: P, 0°, CN, PR, RF 11.48: P, 0°, CN, PR, RF		11.0
			11.59																	11.60: P, 0°, CN, PR, RF		
					11.71 m Is(50) D=0.62MPa 11.71 m Is(50) A=0.62MPa 11.83 m Is(50) D=0.05MPa 11.83 m Is(50) A=0.44MPa			12.0 *21.7*								MW - SW	M				12.07: J, 20°, CN, PR, RF		12.0
																				12.40-12.43: FZ, 30 mm 12.49-12.52: FZ, 30 mm		
					12.79 m Is(50) D=0.22MPa 12.79 m Is(50) A=0.45MPa 12.96 m Is(50) D=0.84MPa 12.96 m Is(50) A=1.32MPa			13.0 *20.7*															13.0
			R4 (100%) 79%																	13.31-13.32: CZ, 10 mm		
					13.88 m Is(50) D=0.76MPa 13.88 m Is(50) A=0.56MPa 13.90 m Is(50) D=0.59MPa 13.90 m Is(50) A=1.27MPa 13.96 m Is(50) A=0.78MPa			14.0 *19.7*													13.86-13.87: VE, Qz CT, CU, SM, 15 mm 14.12: J, 20°, CN, ST, RF		14.0
					14.80 m Is(50) A=0.48MPa 14.84 m Is(50) D=0.15MPa 14.84 m Is(50) A=0.58MPa 14.90 m Is(50) D=0.30MPa 14.90 m Is(50) A=0.61MPa			15.0				BH Terminated at 15.00 m									14.50-14.51: EW, 10 mm		
			15.00																			

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH14 Depth Range: 2.99 - 7.00 m



PointID : BH14 Depth Range: 7.00 - 12.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH14	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH14 Depth Range: 12.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH14	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318251.9 m	Start Date	13/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245776.5 m	End Date	13/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	31.68 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH15**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1, L -0.3, M -1, H -3, VH -10, EH	Defect Spacing (mm) 20, 60, 200, 600, 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					1.00m			0.0 *31.7*			*31.63*	BITUMEN: black.	w<PL									ROAD SURFACE	
												FILL Gravelly CLAY: medium plasticity, dark brown, gravel is fine grained, sub-angular.									FILL	
										Cl	1.00												
					SPT 4,5,6 N=11 (0.30m REC)			1.0 *30.7*			*30.68*	CLAY: medium to high plasticity, grey mottled red orange.		St							RESIDUAL SOIL	1.0
				D	1.45m																1.20-1.70: 1 bag		
				B						Cl -CH											1.70-2.20: 1 bag		
					2.50m			2.0 *29.7*				2.00: Becoming to orange brown		VSt								2.0
					SPT 12,17,28 HB N=45 (0.30m REC)		Not Observed				2.70												
				D	2.95m						*28.98*	CLAY: high plasticity, grey, with fine grained, sub-angular gravel; (Extremely Weathered siltstone).	w<PL	H							EXTREMELY WEATHERED MATERIAL	
								3.0 *28.7*		CH												3.0
					4.00m																		
				D	SPT 10/50mm HB N=R (0.05m REC) 4.05m			4.0 *27.7*			4.20												4.0
NMLC			R1 (100%) 100%								*27.48*	SILTSTONE: fine grained, grey, distinctly laminated.				HW	L			4.20-4.25: CS, 0°, 50 mm 4.28: P, 0°, CN, PR, RF	SEDIMENTARY	
																				4.59: P, 0°, CN, PR, RF 4.65-4.71: Px2, 0°, CN, PR, RF		
			4.90		5.00 m Is(50) D=0.20MPa			5.0			4.90 *26.78*	SANDSTONE: fine grained, grey, indistinctly bedded.				MW	L - M					

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318251.9 m	Start Date	13/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245776.5 m	End Date	13/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	31.68 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH15**

Depth (m) / Elevation	Soil / Rock Material Description	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
5.0 / 26.7	SANDSTONE: fine grained, grey, indistinctly bedded. *(continued)*	MW *(cont)*	L - M *(cont)*	4.97-5.13: Px4, 0°, CN, PR, RF	SEDIMENTARY
				5.16-5.18: EW, 0°, clay, 20 mm	
				5.24: J, 90°, FeO SN, PR, SM	
				5.28: P, 5°, CN, PR, SM	
5.57 / *26.11*	SILTSTONE: fine grained, grey, distinctly laminated.	HW	L	5.57-5.62: EW	
				5.65-5.67: EW, 0°, 20 mm	
				5.82-5.85: EW, 0°, 20 mm	
6.0 / 25.7					6.0
6.03 / *25.65*	SANDSTONE: fine grained, grey, indistinctly bedded.	MW	M	6.14: J, 85°, CN, PR, RF	
6.31 / *25.37*	SILTSTONE: fine grained, grey, distinctly laminated.	HW	L	6.31: P, 0°, clay CT, PR, RF	
				6.44: P, 0°, clay SN, PR, RF	
				6.60: P, 0°, clay SN, PR, RF	
				6.81: EW, 0°, clay VN, PR, RF	
				6.84: EW, 0°, clay, 10 mm	
				6.94: P, 0°, CN, ST, RF	
7.0 / 24.7		MW	M	7.00: P, 0°, CN, PR, RF	7.0
				7.23: P, 0°, CN, ST, RF	
				7.46: P, 0°, CN, ST, RF	
				7.65: P, 0°, clay CT, PR, RF	
				7.70: P, 0°, CN, PR, RF	
		HW	L	7.76-7.80: EW, 0°, 40 mm	
				7.85-7.88: Px2, 0°, CN, PR, RF	
				7.96: P, 0°, CN, PR, RF	
8.0 / 23.7				8.03-8.15: Px4, 0°, CN, PR, RF	8.0
				8.16-8.20: EW, 0°, 40 mm	
8.40 / *23.28*	INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, grey, distinctly laminated. sandstone is fine grained, indistinctly bedded, grey.	SW		8.48: P, 0°, CN, ST, RF	
				8.60: P, 0°, clay VN, ST, RF	
				8.83-8.86: Px2, 0°, CN, PR, SM	
9.0 / 22.7			M	8.98-9.00: Px2, 0°, CN, PR, RF, 20 mm	9.0
				9.08: P, 0°, CN, PR, RF	
				9.17: P, 0°, clay CT, PR, RF	
				9.23: J, 50°, CN, PR, RF	
				9.26: P, 0°, CN, PR, RF	
				9.41: P, 45°, CN, PR, RF	
				9.48: P, 0°, clay CT, PR, RF	
				9.61: P, 0°, CN, PR, RF	
10.0				9.76: P, 0°, CN, PR, RF	
				9.82: P, 0°, CN, PR, RF	
				9.83: P, 0°, CN, PR, RF	

Method: NMLC

Casing

Progress Water (Loss/Return)

Run (TCR) RQD: R2 (100%) 81%; 8.00; R3 (100%) 50%

Sampling

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa): 5.00 m Is(50) A=0.30MPa; 5.96 m Is(50) A=0.18MPa; 6.89 m Is(50) A=0.47MPa; 7.48 m Is(50) D=0.16MPa; 7.48 m Is(50) A=0.50MPa; 8.76 m Is(50) D=0.06MPa; 8.76 m Is(50) A=0.21MPa; 9.73 m Is(50) D=0.28MPa; 9.73 m Is(50) A=0.49MPa

Permeability

Level & Inflow: Not Observed

Graphic Log

Soil Group Symbol

Moisture Condition

Consistency Density

Alteration

Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■: VL 0.1, L 0.3, M 1, H 3, VH 10, EH

Defect Spacing (mm): 20, 60, 200, 600, 2000

Visual

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318251.9 m	Start Date	13/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245776.5 m	End Date	13/12/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	31.68 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH15**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC			R3 (100%) 50%		10.96 m Is(50) D=0.56MPa 10.96 m Is(50) A=0.82MPa	Not Observed		10.0 *21.7*				INTERLAMINATED SILTSTONE (70%) AND SANDSTONE (30%): siltstone is fine grained, grey, distinctly laminated. sandstone is fine grained, indistinctly bedded, grey. *(continued)*				SW *(cont)*	M *(cont)*				10.05-10.22: Px7, 0°, CN, PR, SM 10.28: P, 0°, clay CT, PR, RF 10.33: P, 0°, CN, PR, RF 10.38-10.41: CS, 0°, clay, 30 mm	SEDIMENTARY	
											10.80												
											20.88	SILTSTONE: fine grained, grey, indistinctly bedded.				MW	L				10.53: P, 10°, CN, PR, RF		
			11.00													SW	M				10.68-10.73: Px4, 0°, CN, PR, RF 10.75: P, 10°, gravel CT, UN, RF		
					11.38 m Is(50) D=0.68MPa 11.38 m Is(50) A=0.70MPa			11.0 *20.7*												10.92: P, 0°, CN, ST, RF		11.0
																				11.29: P, 0°, CN, PR, RF		
											11.60									11.59: Px2, 0°, clay CT, PR, RF, 20 mm		
											20.08	SILTSTONE: fine grained, grey, distinctly laminated.				HW	L			11.73: P, 0°, CN, PR, SM		
					11.88 m Is(50) A=2.02MPa											SW	H						
								12.0 *19.7*								HW	L			11.91-12.00: EW, 0°, 90 mm 12.02: J, 30°, CN, CU, RF 12.05: P, 0°, clay CT, PR, RF 12.10: P, 0°, clay CT, PR, RF 12.19: P, 0°, CN, PR, RF 12.31: P, 0°, clay SN, PR, RF 12.34-12.35: CS, 0°, gravel CT, PR, RF		12.0
											12.38												
			R4 (100%) 57%							GC	*19.30*	Clayey GRAVEL: fine grained, poorly graded, sub-angular, dark grey, (Extremely Weathered).	M			XW					EXTREMELY WEATHERED MATERIAL	
					12.89 m Is(50) A=0.34MPa						12.86									12.86: P, 0°, clay VN, ST, RF		
											18.82	INTERLAMINATED SANDSTONE (80%) AND SILTSTONE (20%): sandstone is fine grained, grey, indistinctly bedded. siltstone is distinctly laminated, grey.				FR	M				SEDIMENTARY	
								13.0 *18.7*												13.02: P, 0°, clay VN, ST, RF		13.0
																				13.27: P, 5°, CN, ST, RF		
																				13.42: P, 0°, CN, PR, RF		
																				13.58-13.60: EW, 0°, 20 mm		
			14.00		13.96 m Is(50) D=0.65MPa 13.96 m Is(50) A=0.91MPa 14.15 m Is(50) A=0.52MPa			14.0 *17.7*														14.0
																				14.25: Px3, 0°, clay CT, PR, RF		
			R5 (100%) 80%																				
					14.79 m Is(50) D=0.41MPa 14.79 m Is(50) A=0.92MPa															14.69-14.80: CZ, 0°, 110 mm		
			15.00					15.0				BH Terminated at 15.00 m Target Depth								14.95: J, 10°, CN, CU, RF		

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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PointID : BH15 Depth Range: 4.20 - 8.00 m



PointID : BH15 Depth Range: 8.00 - 12.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH15	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH15 Depth Range: 12.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH15	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 2/2	

Geological & Engineering Log

Project	New Bankstown Hospital	East	318312.4 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245755.0 m	End Date	17/12/2024	Rig Type	Commancio 305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	32.23 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	

Borehole Identifier: **BH16**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) Elevation	Graphic Log	Soil Group Symbol	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T					1.50m SPT 18 HB N=R (0.26m REC) 1.65m			0.0 32.2		GP	0.10 0.20	ASPHALT. FILL Sandy GRAVEL: coarse grained, poorly graded, non plastic.									ROAD SURFACE FILL	
				D							32.03	Silty CLAY: medium to high plasticity, grey mottled orange.	w<PL	H							RESIDUAL SOIL	
								1.0 31.2		CI -CH	1.50											1.0
											30.73	Gravelly CLAY: high plasticity, grey and orange, gravel is fine grained, sub-angular; (Extremely Weathered siltstone).									EXTREMELY WEATHERED MATERIAL	
								2.0 30.2		CH												2.0
								3.0 29.2			3.10											3.0
NMLC		90-100% Water RETURN	R1 (100%) 83%		3.83 m Is(50) D=0.06MPa 3.83 m Is(50) A=0.33MPa						29.13	INTERBEDDED SILTSTONE (75%) AND SANDSTONE (25%): siltstone is dark grey. sandstone is fine grained, grey and orange-brown.				XW - HW	VL			3.14: J, 15°, clay VN, PR, SM 3.23-3.24: EW, 5 mm 3.25-3.26: EW, 5 mm 3.35: J, 50°, clay VN, PR, SM 3.41-3.45: EW, 40 mm 3.48: J, 70°, clay VN, PR, SM	SEDIMENTARY	
											3.71									3.66: P, 5°, CN, PR, SM		
								4.0 28.2			28.52	INTERBEDDED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is dark grey, indistinctly bedded at 0 to 5°, orange. sandstone is fine grained, grey and orange-brown.				HW - MW	VL - L			3.95-3.97: EW, 20 mm		4.0
																				4.16: P, 5°, FeO SN, PR, SM 4.29: P, 5°, clay VN, PR, SM		
					4.72 m Is(50) D=0.04MPa 4.72 m Is(50) A=0.13MPa															4.65: J, 10°, CN, PR, RF 4.85: P, 0°, clay VN, PR, SM		
								5.0														

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318312.4 m	Start Date	16/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245755.0 m	End Date	17/12/2024	Rig Type	Commancio 305
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	32.23 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	

Borehole Identifier: **BH16**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) Elevation	Graphic Log	Soil Group Symbol	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■	Defect Spacing (mm)	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		90-100% Water RETURN	R1 (100%) 83%		5.80 m Is(50) D=0.03MPa 5.80 m Is(50) A=0.02MPa			5.0 27.2			5.89	INTERBEDDED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is dark grey, indistinctly bedded at 0 to 5°, orange. sandstone is fine grained, grey and orange-brown. *(continued)*				HW - MW *(cont)*	VL - L *(cont)*	VL -0.1 L -0.3 M -1 H -3 VH -10 EH	20 60 200 600 2000		5.19: VOx2, 10-20mm 5.30: P, 0 - 5°, clay VN, PR, SM 5.44-5.46: EW, 15 mm 5.50-5.51: EW, 10 mm 5.55-5.57: EW, 20 mm 5.81: P, 0°, clay VN, PR, SM	SEDIMENTARY	
											5.89 26.34	INTERLAMINATED SILTSTONE (75%) AND SANDSTONE (25%): siltstone is dark grey, distinctly to indistinctly laminated at 0 to 5°. sandstone is fine grained, pale grey and grey.				MW	L - M				6.10: P, 0°, CN, PR, RF 6.54-6.58: CZ, 40 mm 6.68-6.69: EW, 10 mm		6.0
					6.67 m Is(50) D=0.01MPa 6.67 m Is(50) A=0.44MPa			6.0 26.2															
					7.49 m Is(50) D=0.00MPa 7.49 m Is(50) A=0.34MPa			7.0 25.2													7.10-7.22: J, 80°, clay CT, PR, SM 7.22-7.23: EW, 5 mm 7.39: P, 0°, clay VN, PR, SM 7.51: J, 70°, HE		7.0
		90-100% Water RETURN	R2 (90%) 77%																		7.85-7.91: CZ, 60 mm		
					8.52 m Is(50) D=0.06MPa 8.52 m Is(50) A=0.07MPa			8.0 24.2													8.34: J, 90°, CN, PR, RF 8.37-8.38: EW, 5 mm		8.0
																VL							
																L					8.65: J, 30°, CN, PR, RF 8.68: P, 0°, CN, PR, RF 8.80: P, 0°, CN, PR, RF		
								9.0 23.2															9.0
		80-90% Water RETURN	9.21 R3 (100%) 96%		9.44 m Is(50) D=0.04MPa 9.44 m Is(50) A=0.16MPa											MW - SW					9.03-9.05: EW, 20 mm 9.10: P, 0°, CN, PR, RF 9.27: P, 0°, CN, PR, RF 9.36: P, 0°, CN, PR, RF 9.42-9.43: EW, 10 mm 9.56-9.57: EW, 5 mm 9.62: P, 0°, CN, PR, RF 9.72: P, 0°, CN, PR, RF 9.80: P, 0°, CN, PR, RF 9.91: P, 0°, CN, PR, RF		
								10.0									M - H						

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318312.4 m	Start Date	16/12/2024	Contractor	Terratest	Inclination	-90°
Client	Health Infrastructure	North	6245755.0 m	End Date	17/12/2024	Rig Type	Commancio 305	Azimuth	
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	32.23 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	

Borehole Identifier: **BH16**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● - Axial ○ - Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Visual	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
NMLC		80-90% Water RETURN	R3 (100%) 96%		10.35 m Is(50) D=0.22MPa 10.35 m Is(50) A=0.83MPa			10.0 *22.2*			10.15 *22.08*	INTERBEDDED SILTSTONE (60%) AND SANDSTONE (40%): siltstone is dark grey, indistinctly bedded at 0 to 5°, orange. sandstone is fine grained, pale grey and grey.				MW - SW *(cont)*	M - H *(cont)*				10.08: J, 10°, CN, PR, RF 10.18-10.26: EW, 80 mm 10.28: P, 0°, CN, PR, RF 10.51: P, 0°, CN, PR, RF	SEDIMENTARY	
					11.25 m Is(50) D=0.83MPa 11.25 m Is(50) A=1.24MPa			11.0 *21.2*												11.22: J, 20°, CN, PR, RF 11.61-11.65: J, 90°, CN, PR, RF 11.76-11.78: CZ, 15 mm		11.0
			11.88					12.0 *20.2*												12.08-12.11: EW, 30 mm 12.12: J, 30°, CN, PR, RF 12.22-12.23: EW, 5 mm 12.49-12.50: CZ, 10 mm 12.60: J, 5°, CN, PR, RF		12.0
					12.82 m Is(50) D=0.88MPa 12.90 m Is(50) A=1.37MPa 13.10 m Is(50) D=0.12MPa 13.10 m Is(50) A=0.86MPa			13.0 *19.2*			13.20 *19.03*	INTERLAMINATED SILCRETE (60%) AND SANDSTONE (40%): silcrete is dark grey, distinctly laminated at 0 to 5°. sandstone is fine grained, pale grey and grey.									12.82: J, 10°, CN, PR, RF 13.30: P, 0°, CN, PR, RF 13.40: P, 5°, CN, PR, RF 13.49: P, 0°, CN, PR, RF		13.0
		90-100% Water RETURN	R4 (100%) 87%																				
					14.24 m Is(50) D=0.03MPa 14.24 m Is(50) A=1.14MPa			14.0 *18.2*												14.11: VE, Qz, 2 mm 14.60: P, 10°, CN, PR, RF		14.0
			15.00					15.0				BH Terminated at 15.00 m											

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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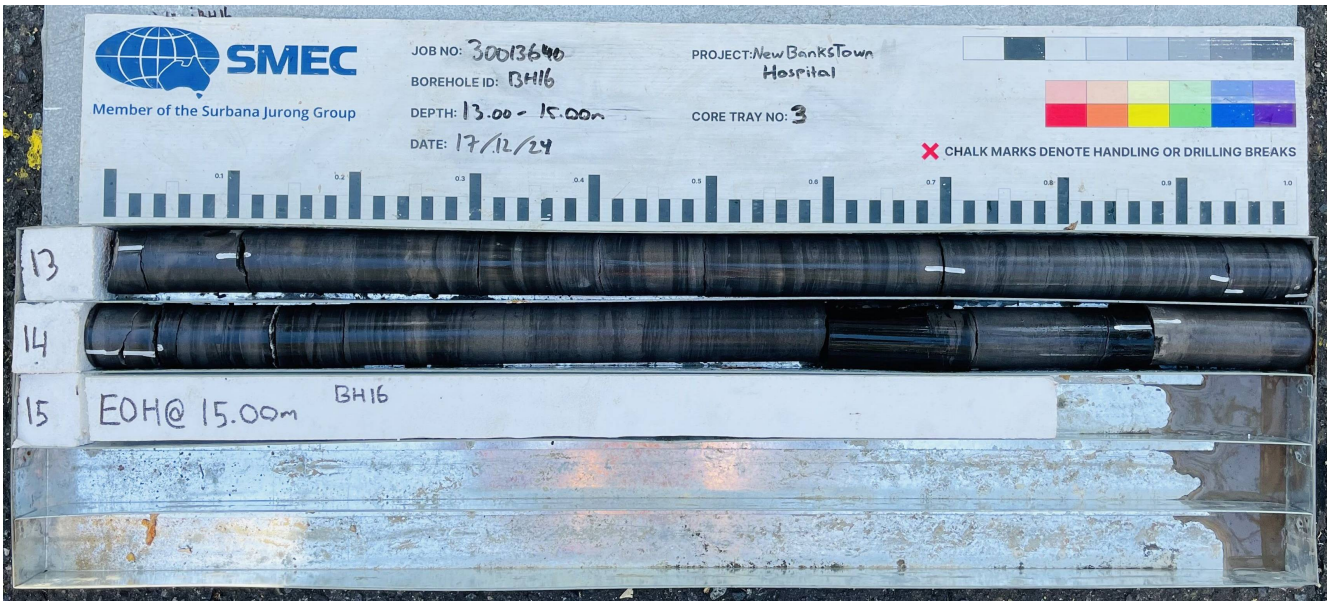


PointID : BH16 Depth Range: 3.09 - 8.00 m



PointID : BH16 Depth Range: 8.00 - 13.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH16	DRAWN GDM / DATE 18/2/2025 CHECKED MT / DATE 18/2/2025 SCALE Not To Scale / A4 PROJECT No 30013640 / FIGURE No 1/2	



PointID : BH16 Depth Range: 13.00 - 15.00 m

smec	TITLE Health Infrastructure 500 Chapel Road, Bankstown NSW 2118 New Bankstown Hospital Core Photo - BH16	DRAWN GDM	DATE 18/2/2025
		CHECKED MT	DATE 18/2/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 2/2

Geological & Engineering Log

Project	New Bankstown Hospital	East	318281.5 m	Start Date	12/19/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246145.3 m	End Date	12/19/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	50.09 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD	Casing Stickup	-0.10 m	Inclination	-90°
				Top of Casing RL	50.01 m	Azimuth	
						North	
						Survey	

smec

Borehole Identifier: **BH101**

Method	Casing	Progress Water (Loss/Return)	Hole Diameter	Sampling	Air Lift Yeild	Water Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Code	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Construction Notes	Installation
AT			100mm			9/30/2025 12/19/2024	0.0 *50.1* 2.0 *48.1* 4.0 *46.1* 6.0 *44.1* 8.0 *42.1* 10.0 *40.1* 12.0 *38.1* 14.0 *36.1*		CH CH	*49.99* 0.80 *49.29* 4.50 *45.59* 12.60	ASPHALT. FILL CLAY: high plasticity, red-brown, trace fine to medium grained, up to 40mm in size gravel. CLAY: high plasticity, grey mottled orange-brown, trace up to 20mm in size gravel. SILTSTONE: fine grained, grey. BH Terminated at 12.60 m Target Depth (Standpipe Installed)	w≈PL D W	H St VSt				FILL RESIDUAL SOIL SEDIMENTARY	Concrete: 0.2 Bentonite: 0.4 Grout: 3.9 Bentonite: 9.4 Start Slotted 9.6m 9.6 Gravel: 10.0 End Slotted 12.6m 12.6	BH101 14.0

Observations and Comments

Pipe Description:

Pipe Screen Details:

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Approved By		Date	
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318287.7 m	Start Date	12/19/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245874.9 m	End Date	12/19/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	36.02 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD	Casing Stickup	-0.10 m	Inclination	-90°
				Top of Casing RL	36.02 m	Azimuth North	
						Survey	

Borehole Identifier: **BH102**

Depth (m) / Elevation	Soil Code	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Origin, Geology Unit, Other Testing & General Observations
0.0 / 36.0		35.92	CONCRETE.			EXTREMELY WEATHERED MATERIAL
	Cl		Silty CLAY: medium plasticity, dark grey, (Extremely Weathered).	w<PL	VSt	
2.0 / 34.0						
4.0 / 32.0		5.50 / 30.52	SANDSTONE: fine grained, dark grey with orange.	D	H	SEDIMENTARY
6.0 / 30.0						
8.0 / 28.0				W		
10.0 / 26.0		11.10	BH Terminated at 11.10 m Target Depth (Standpipe Installed)			
12.0 / 24.0						
14.0 / 22.0						

Method: AT | Casing: 100mm | Sampling: ES, ES | Water Level & Inflow: 9/30/2024 12/19/2024

Construction Notes: Concrete: 1.0 | Bentonite: 1.6 | Grout: | Bentonite: 7.1 – 7.6 | Start Slotted 8.1m: 8.1 | Gravel: | End Slotted 11.1m: 11.1

Installation: BH102

Observations and Comments

Pipe Description:

Pipe Screen Details:

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital	East	318308.1 m	Start Date	12/19/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245755.6 m	End Date	12/19/2024	Rig Type	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	32.06 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD	Casing Stickup	-0.18 m	Inclination	-90°
				Top of Casing RL	32.06 m	Azimuth	
						North	
						Survey	

Borehole Identifier: **BH103**

Depth (m) / Elevation	Graphic Log	Soil Code	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Origin, Geology Unit, Other Testing & General Observations
0.0 / 32.1		GP	0.30 / 31.76	ASPHALT.	M	L	FILL
				FILL Sandy GRAVEL: coarse grained, up to 40 mm, dark grey.	w≈PL	St	RESIDUAL SOIL
2.0 / 30.1		CL		Silty CLAY: low plasticity, orange-brown.			
			3.40 / 28.66	SILTSTONE: fine grained, dark grey, orange.	D	H	SEDIMENTARY
4.0 / 28.1							
			6.00 / 26.06	SANDSTONE: medium grained, pale orange with pale grey.			
6.0 / 26.1							
8.0 / 24.1							
10.0 / 22.1					W		
12.0 / 20.1							
14.0 / 18.1			14.50	BH Terminated at 14.50 m Target Depth (Standpipe Installed)			

Method: AT
Casing: 100mm
Water Level & Inflow: 9/30/2025, 12/19/2024

Construction Notes / Installation

Concrete:	0.2
Bentonite:	0.7
Grout:	
Bentonite:	7.5 – 8.0
Start Slotted 8.5m	8.5
Gravel:	
End Slotted 14.5m	14.5

BH103

Observations and Comments

Pipe Description:

Pipe Screen Details:

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

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Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318243 m	Start Date	2/9/2025	Contractor	DB Services
Client	HINSW	North	6245902 m	End Date	2/9/2025	Rig Type	Drillman
Site	TAFE Bankstown	Elevation	36.00 m			Mounting	Truck
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	MAP5

smec

Borehole Identifier: **BH201**

Depth (m) / Elevation	Soil Code	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
0.0 / 36.0		0.10	BITUMEN: black.						ROAD SURFACE
	GP	35.90	FILL Sandy GRAVEL: fine to coarse grained, up to 20 mm, angular to sub-rounded, dark grey-brown, sand is medium to coarse grained.	D	MD				FILL
		0.45							
	CL	35.55	FILL Silty CLAY: low plasticity, dark grey, trace fine to medium grained, sub-angular gravel.	w>PL	St				
1.0 / 35.0		1.10							
		34.90	Silty CLAY: high plasticity, red-brown.	w<PL					RESIDUAL SOIL 1.15: PP =300 kPa 1.22: PP =270 kPa 1.30: PP =220 kPa
	CH		1.80-2.40: becoming orange-brown mottled red		VSt				
2.0 / 34.0		2.40							
		33.60	Sandy CLAY: high plasticity, grey mottled brown, sand is fine to medium grained; trace fine grained, sub-angular gravel; (Extremely Weathered Siltstone).		H	XW			EXTREMELY WEATHERED MATERIAL 2.70: PP >450 kPa 2.80: PP >450 kPa 2.85: PP >450 kPa
3.0 / 33.0	CH		3.70-4.64: becoming grey mottled red-brown						
		4.64							4.49: PP =250 kPa 4.60: PP =250 kPa
		31.36	SILTSTONE: orange-brown mottled grey, distinctly bedded at 0-5 degrees.			HW	VL	4.64: P , 5°, Clay CT, PR, RF 4.71: J , 30 - 40°, FeO SN, PR, RF 4.72: P , 0°, Clay VN, PR, RF 4.74: P , 15°, Clay VN, PR, RF	SEDIMENTARY
4.0 / 32.0			4.90: becoming dark grey			MW	L	4.91: P , 0°, FeO SN, PR, RF	
5.0									

Method: AD/T, HQ, NMLC
Casing
Progress Water (Loss/Return): 0% Water LOSS
Run (TCR) RQD: R1 (100%) 71%
Sampling
SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
1.00m SPT 3,5,4 N=9 (0.38m REC)
1.45m
2.50m SPT 14,17,24 N=41 (0.40m REC)
2.95m
4.00m SPT 13,18,3/10mm HB N=R (0.30m REC)
4.31m
Permeability
Level & Inflow: Not Observed
Graphic Log
Inferred Rock Strength Point Load Is(50) (Axial / Diametral) UCS: VL -0.1, L -0.3, M -1, H -3, VH -10, EH
Defect Spacing (mm): 20, 60, 200, 600, 2000

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	2/9/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318243 m	Start Date	2/9/2025	Contractor	DB Services	Inclination	-90°
Client	HINSW	North	6245902 m	End Date	2/9/2025	Rig Type	Drillman	Azimuth	
Site	TAFE Bankstown	Elevation	36.00 m			Mounting	Truck	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	MAP5

smec

Borehole Identifier: **BH201**

Depth (m) / Elevation	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) (● Axial ○ Diametral UCS ■)	Defect Spacing (mm)	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
5.0 / 31.0		SILTSTONE: orange-brown mottled grey, distinctly bedded at 0-5 degrees. *(continued)*				MW *(cont)*	L *(cont)*			5.03: P , Clay CT, PR, RF 5.05: P , 0°, FeO SN, PR, RF, Tight 5.09: P , 5°, FeO SN, PR, RF, Tight 5.11: P , 0°, FeO SN, PR, RF, Tight 5.18: HB 5.19: P , 5°, FeO SN, PR, RF 5.22: P , 0°, FeO SN, PR, RF, Tight 5.27: P , 10 - 15°, FeO SN, PR, RF 5.42: P , 10°, FeO SN, PR, RF 5.49: P , 0°, Clay CT, PR, RF 5.59-5.61: CS , 5°, Clay, 25 mm 5.63: P , 0°, FeO SN, PR, RF 5.68: HB 5.72: P , 5°, Clay CT, PR, RF 5.72-5.77: CZ , FeO SN, 70 mm 5.81: P , 5°, Clay VN, PR, RF 5.83: P , 5°, Clay VN, PR, RF 5.85: HB 5.86: P , 0°, Clay CT, PR, RF 5.92: P , 5°, FeO SN, PR, RF 6.00: P , 5°, CT, PR, RF 6.17: P , 5°, Clay CT, PR, RF 6.19: P , 0°, Clay VN, PR, RF 6.35-6.36: CS , gravel, 14 mm 6.42: P , 5°, CN, PR, RF 6.47: J , 90°, FeO SN, PR, RF 6.47: P , 10°, Clay VN, PR, RF 6.52-6.55: IS , 0 - 5°, Clay CT, 29 mm 6.62-6.64: DB 6.73: DB 6.81: P , 15°, FeO SN, PR, RF 6.85-7.26: EW , Clay, 410 mm 7.27: J , 30°, Clay VN, PR, RF 7.31: P , 5°, Clay CT, PR, RF 7.34: J , 80°, FeO SN, PR, RF, Clay CT 7.38: P , 0°, Clay CT, PR, RF 7.71: P , 0°, FeO SN, PR, RF 8.17: P , 0°, Clay CT, PR, RF 8.18: P , 0°, Clay VN, PR, RF 8.52-8.72: EW , Clay, 210 mm 8.74: P , 0°, Clay CT, PR, RF 8.85-8.87: CS , 0°, Clay CT, 25 mm 8.90: 0°, Clay CT, PR, RF 8.98-9.03: CS , 0°, Clay, 46 mm 9.10: P , 0°, Clay VN, PR, RF 9.35-9.36: CS , 0°, Clay, 15 mm 9.93: P , 5°, Clay CT, PR, RF	SEDIMENTARY	
6.0 / 30.0												6.0
7.0 / 29.0						XW	VL					7.0
						SW	M					
8.0 / 28.0		7.60-8.15: with 15% fine grained sandstone laminations										8.0
							L					
						XW	VL					
						SW	L - M					
9.0 / 27.0	9.10						M					9.0
	26.90	SILTSTONE: dark grey, indistinctly bedded, with 10% sandstone laminations and clasts up to 20 mm.				FR						
10.0		9.75-9.85: with 50% fine grained sandstone laminations										

Method: NMLC
Casing:
Progress Water (Loss/Return): 0% Water LOSS
Run (TCR) RQD: R1 (100%) 71% | 5.70 | R2 (97%) 0% | 7.20 | R3 (100%) 24% | 9.90
Sampling:
SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
6.69 m Is(50) D=0.30MPa
6.74 m Is(50) A=0.15MPa
7.62 m Is(50) D=0.33MPa
7.66 m Is(50) A=0.43MPa
8.28 m Is(50) D=0.16MPa
8.32 m Is(50) A=0.24MPa
9.13 m Is(50) D=0.13MPa
9.18 m Is(50) A=0.36MPa
Permeability:
Level & Inflow: Not Observed
Graphic Log:
Soil Code:

Observations and Comments

Notes Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	2/9/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318243 m	Start Date	2/9/2025	Contractor	DB Services	Inclination	-90°
Client	HINSW	North	6245902 m	End Date	2/9/2025	Rig Type	Drillman	Azimuth	
Site	TAFE Bankstown	Elevation	36.00 m			Mounting	Truck	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	MAP5

smec

Borehole Identifier: **BH201**

Depth (m) / Elevation	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
10.0 / 26.0	SILTSTONE: dark grey, indistinctly bedded, with 10% sandstone laminations and clasts up to 20 mm. *(continued)*				FR *(cont)*	M *(cont)*	10.72: P , 0°, CN, PR, RF 10.95: J , 80°, CN, PR, RF	SEDIMENTARY
11.64 / *24.36*	CORE LOSS 0.14m (11.64-11.78)							
11.78 / *24.22*	SILTSTONE: dark grey, indistinctly bedded, with 5% sandstone laminations and clasts up to 10 mm.				FR	M	11.78: P , 0°, CN, PR, RF	SEDIMENTARY
12.0 / 24.0	12.20-12.33: band of medium grained sandstone							
13.0 / 23.0							12.74: P , 5°, CN, PR, RF	
14.0 / 22.0	14.20-14.70: with 20% fine grained sandstone laminations					M - H	13.89: P , 0°, CN, PR, RF 13.95-14.00: CS , 0°, Clay, 50 mm	
14.70 / *21.30*	SILTSTONE: dark grey, distinctly bedded at 0-5 degrees, with 5 % fine grained sandstone laminations and clasts.					M		
15.0								

Method: NMLC
Casing:
Progress Water (Loss/Return): 0% Water LOSS
Run (TCR) RQD: R4 (97%) 81% | 11.70 | R5 (97%) 89% | 14.70 | R6 (100%) 78%
Sampling: C-UCS
SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa): 10.14 m Is(50) D=0.10MPa; 10.19 m Is(50) A=0.58MPa; 11.22 m Is(50) D=0.50MPa; 11.24 m Is(50) A=0.90MPa; 12.04 m Is(50) D=0.27MPa; 12.06 m Is(50) A=0.43MPa; 13.02 m Is(50) A=0.43MPa; 13.04 m Is(50) D=0.80MPa; 14.02 m Is(50) A=0.64MPa; 14.04 m Is(50) D=0.36MPa; 15.02 m Is(50)
Permeability:
Level & Inflow: Not Observed
Graphic Log:
Soil Code:
Inferred Rock Strength — Point Load Is(50) ● Axial ○ Diametral; UCS ■: VL 0.1, L 0.3, M 1, H 3, VH 10, EH
Defect Spacing (mm): 20, 60, 200, 600, 2000

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	2/9/2025
Approved By	HW	Date	
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Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318243 m	Start Date	2/9/2025	Contractor	DB Services
Client	HINSW	North	6245902 m	End Date	2/9/2025	Rig Type	Drillman
Site	TAFE Bankstown	Elevation	36.00 m			Mounting	Truck
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	MAP5

smec

Borehole Identifier: **BH201**

Depth (m) / Elevation	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
15.0 / 21.0	SILTSTONE: dark grey, distinctly bedded at 0-5 degrees, with 5 % fine grained sandstone laminations and clasts. *(continued)*				FR *(cont)*	M *(cont)*		SEDIMENTARY
							16.18: P , 5°, Co CT, PR, RF	
							16.30: P , Co VN, PR, RF	
						H		
							17.12: J , 80 - 90°, CN, PR, RF	
						L	17.57-17.60: CS , Co, 35 mm	
							17.65: P , Co CT, PR, RF	
							17.80-18.05: CS , Co, 255 mm	
							18.09: P , 0°, Co CT, PR, RF	
							18.14-18.23: CS , 0°, Co, 90 mm	
							18.28-18.32: CS , 0°, Co CT, 40 mm	
						H	18.34: P , 0°, Co CT, PR, RF	
18.94 / 17.06	18.40-18.80: with fine grained sandstone clasts up to 15 mm							
19.0 / 17.0	INTERLAMINATED SANDSTONE (70%) WITH SILTSTONE (30%): sandstone is fine grained, pale grey, distinctly laminated at 0-5 degrees. siltstone is dark grey.							
							19.61: P , 0°, CN, PR, RF	
20.0								

Method: NMLC
Casing:
Progress Water (Loss/Return): 0% Water LOSS
Run (TCR) RQD: R6 (100%) 78%; 17.60; R7 (100%) 73%
Sampling:
SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa): A=0.93MPa; 15.08 m Is(50); D=0.76MPa; 16.02 m Is(50); A=0.79MPa; 16.04 m Is(50); D=0.34MPa; 16.64 m Is(50); A=1.18MPa; 16.66 m Is(50); D=0.76MPa; 18.36 m Is(50); A=1.06MPa; 18.39 m Is(50); D=0.47MPa; 19.28 m Is(50); A=1.89MPa; 19.45 m Is(50); D=0.96MPa; 20.05 m Is(50)
Permeability: Not Observed
Level & Inflow
Graphic Log
Soil Code
Inferred Rock Strength Point Load Is(50) (● Axial ○ Diametral UCS ■): VL -0.1 L -0.3 M -1 H -3 VH -10 EH
Defect Spacing (mm): 20 60 200 600 2000
Installation

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318243 m	Start Date	2/9/2025	Contractor	DB Services	Inclination	-90°
Client	HINSW	North	6245902 m	End Date	2/9/2025	Rig Type	Drillman	Azimuth	
Site	TAFE Bankstown	Elevation	36.00 m			Mounting	Truck	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	MAP5

smec

Borehole Identifier: **BH201**

Depth (m) / Elevation	Depth RL	Soil / Rock Material Description	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
20.0 / 16.0	20.11			SEDIMENTARY
	15.89	INTERBEDDED SILTSTONE (70%) WITH SANDSTONE (30%): siltstone is dark grey to grey, distinctly bedded at 5-10 degrees, with fine grained sandstone laminations. sandstone is fine grained, pale grey.		
21.0 / 15.0	21.60		21.18: P , 0°, Co CT, PR, RF 21.27-21.38: CS , 0°, Co, 110 mm	
	14.40	SILTSTONE: dark grey to grey, distinct bedding, with 15% fine grained sandstone laminations.		
22.0 / 14.0			22.42: P , 0°, CN, PR, RF	
23.0 / 13.0			23.52: P , 0°, CN, PR, RF	
24.0 / 12.0	24.00			
	12.00	INTERLAMINATED SANDSTONE (75%) WITH SILTSTONE (25%): sandstone is fine grained, pale grey, distinctly laminated at 5-10 degrees. siltstone is dark grey.	24.08: J , 90°, CN, PR, RF	
25.0				

Method: NMLC | Casing | Progress Water (Loss/Return): 0% Water LOSS | Run (TCR) RQD: R7 (100%) 73% | R8 (100%) 94% | R9 (100%) 86% | Sampling: C-UCS

SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
- D=1.48MPa
- 20.05 m Is(50)
- A=1.51MPa
- 21.10 m Is(50)
- D=1.11MPa
- 21.10 m Is(50)
- A=2.02MPa
- 22.69 m Is(50)
- D=1.10MPa
- 22.69 m Is(50)
- A=2.20MPa
- 23.07 m Is(50)
- D=0.96MPa
- 23.07 m Is(50)
- A=1.00MPa
- 24.27 m Is(50)
- D=0.58MPa
- 24.27 m Is(50)
- A=1.31MPa

Permeability: Not Observed

Moisture Condition | Consistency Density | Alteration | Weathering: FR (cont)

Rock Strength: H (cont) | M | H | L | H

Inferred Rock Strength Point Load Is(50) (● Axial, ○ Diametral, UCS ■): VL -0.1 | L -0.3 | M -1 | H -3 | VH -10 | EH

Defect Spacing (mm): 20 | 60 | 200 | 600 | 2000

Installation: 21.0 | 22.0 | 23.0 | 24.0

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	2/9/2025
Approved By	HW	Date	
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Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318243 m	Start Date	2/9/2025	Contractor	DB Services
Client	HINSW	North	6245902 m	End Date	2/9/2025	Rig Type	Drillman
Site	TAFE Bankstown	Elevation	36.00 m			Mounting	Truck
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	MAP5

Borehole Identifier: **BH201**

Depth (m) / Elevation	Soil / Rock Material Description	Depth / RL	Sampling	SPT / Ls(50) / UCS	Run (TCR) RQD	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
25.0 / 11.0	25.00-25.30: cross-laminated at 25-30 degrees INTERLAMINATED SANDSTONE (75%) WITH SILTSTONE (25%): sandstone is fine grained, pale grey, distinctly laminated at 5-10 degrees. siltstone is dark grey. *(continued)*			25.45 m Is(50) D=1.37MPa 25.45 m Is(50) A=1.56MPa	R9 (100%) 86%	FR *(cont)*	H *(cont)*	25.15: J , 50°, CN, CU, RF	SEDIMENTARY
26.0 / 10.0		26.08						25.70: J , 65°, CN, PR, RF	
	SILTSTONE: dark grey, distinctly bedded at 0-5 degrees, with 15% fine grained sandstone laminations.	*9.92*		26.45 m Is(50) D=1.59MPa 26.45 m Is(50) A=2.42MPa	26.50				
27.0 / 9.0								26.96: P , 10°, CN, PR, RF	
28.0 / 8.0		28.15		28.21 m Is(50) D=0.31MPa 28.21 m Is(50) A=1.31MPa	R10 (100%) 100%				
	INTERLAMINATED SANDSTONE (70%) WITH SILTSTONE (30%): fine grained, pale grey, distinctly laminated at 0-5 degrees.	*7.85*							
29.0 / 7.0				29.09 m Is(50) D=0.10MPa 29.09 m Is(50) A=1.10MPa					
		29.43			29.43		M		
	SILTSTONE: dark grey to grey, distinctly bedded at 0-5 degrees, with coal seams up to 190 mm.	*6.57*			R11 (86%) 72%			29.62-29.84: CS , 0°, Co, 140 mm, Clay	
		29.84		30.02 m Is(50)					
30.0	CORE LOSS 0.16m (29.84-30.00)	*6.16*							

Method: NMLC
Casing
Progress Water (Loss/Return): 0% Water LOSS
Permeability / Level & Inflow: Not Observed
Graphic Log / Soil Code
Moisture Condition
Consistency Density
Alteration
Inferred Rock Strength — Point Load Is(50) (Axial / Diametral) UCS: VL, L, M, H, VH, EH
Defect Spacing (mm): 20, 60, 200, 600, 2000
Installation

Observations and Comments

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	2/9/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318243 m	Start Date	2/9/2025	Contractor	DB Services
Client	HINSW	North	6245902 m	End Date	2/9/2025	Rig Type	Drillman
Site	TAFE Bankstown	Elevation	36.00 m			Mounting	Truck
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	MAP5

smec

Borehole Identifier: **BH201**

Depth (m) / *Elevation*	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations
30.0 *6.0*	*6.00*	SILTSTONE: dark grey to grey, distinctly bedded at 0-5 degrees, with coal seams and fine grained sandstone clasts up to 3mm.				FR	M	30.00-30.02: CS , 0°, Clay, 15 mm 30.49-30.60: CS , 0°, Co, 110 mm	SEDIMENTARY
	30.60								
	5.40	CORE LOSS 0.21m (30.60-30.81)							
	30.81								
	5.19	SILTSTONE: dark grey to grey, distinctly bedded at 0-5 degrees, with 10% fine grained sandstone laminations.				FR	M		SEDIMENTARY
31.0 *5.0*									31.0
32.0 *4.0*	32.00	BH Terminated at 32.00 m Target Depth							32.0
33.0 *3.0*									33.0
34.0 *2.0*									34.0
35.0									

Method: NMLC
Casing:
Progress Water (Loss/Return): 0% Water LOSS
Run (TCR) RQD: R11 (86%) 72%
Sampling:
SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa): D=0.93MPa 30.02 m Is(50) A=1.44MPa; 31.27 m Is(50) D=0.89MPa 31.27 m Is(50) A=1.49MPa
Permeability: Not Observed
Level & Inflow:
Graphic Log:
Soil Code:
Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■: VL -0.1, L -0.3, M -1, H -3, VH -10, EH
Defect Spacing (mm): 20, 60, 200, 600, 2000

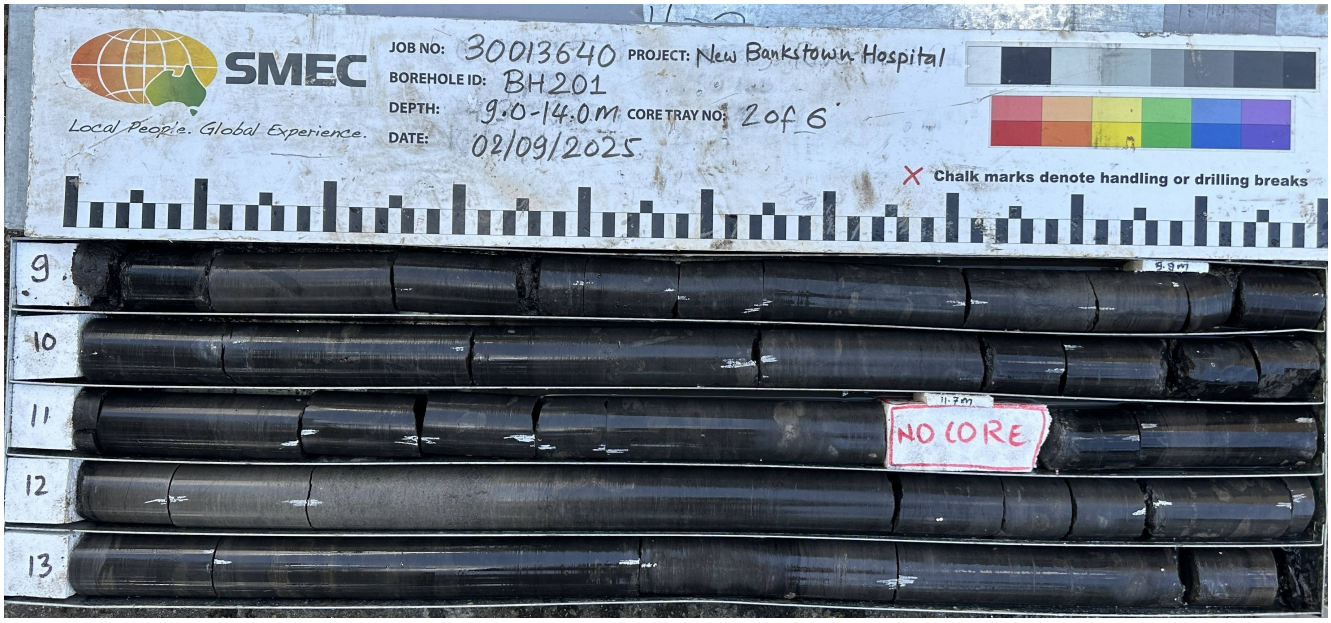
Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	2/9/2025
Approved By	HW	Date	
Status	1		

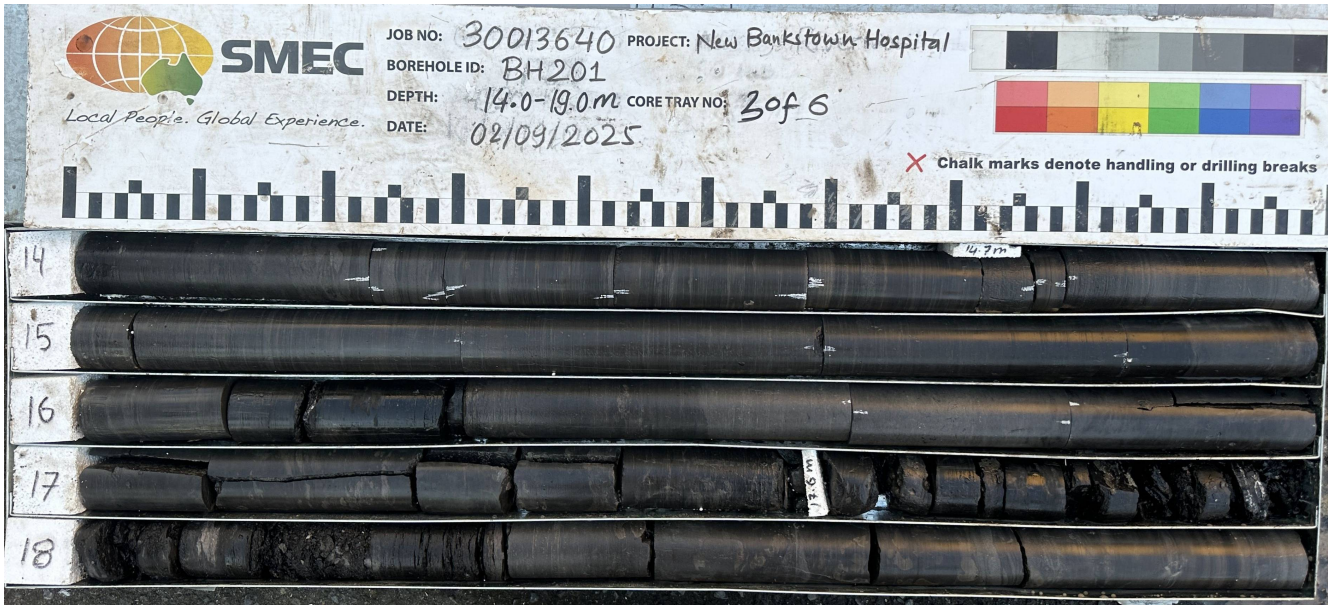


PointID : BH201 Depth Range: 4.60 - 9.00 m

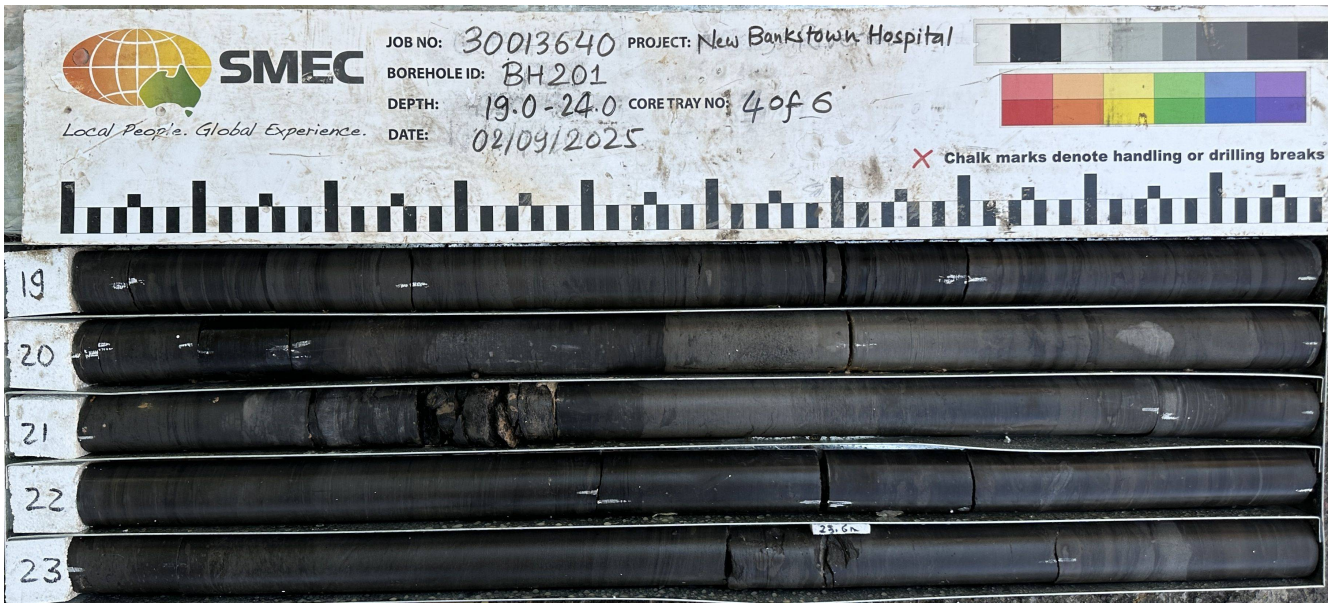


PointID : BH201 Depth Range: 9.00 - 14.00 m

smec	TITLE HINSW TAFE Bankstown New Bankstown Hospital Additional SI Core Photo - BH201	DRAWN GDM	DATE 21/10/2025
		CHECKED RL	DATE 21/10/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 1/3

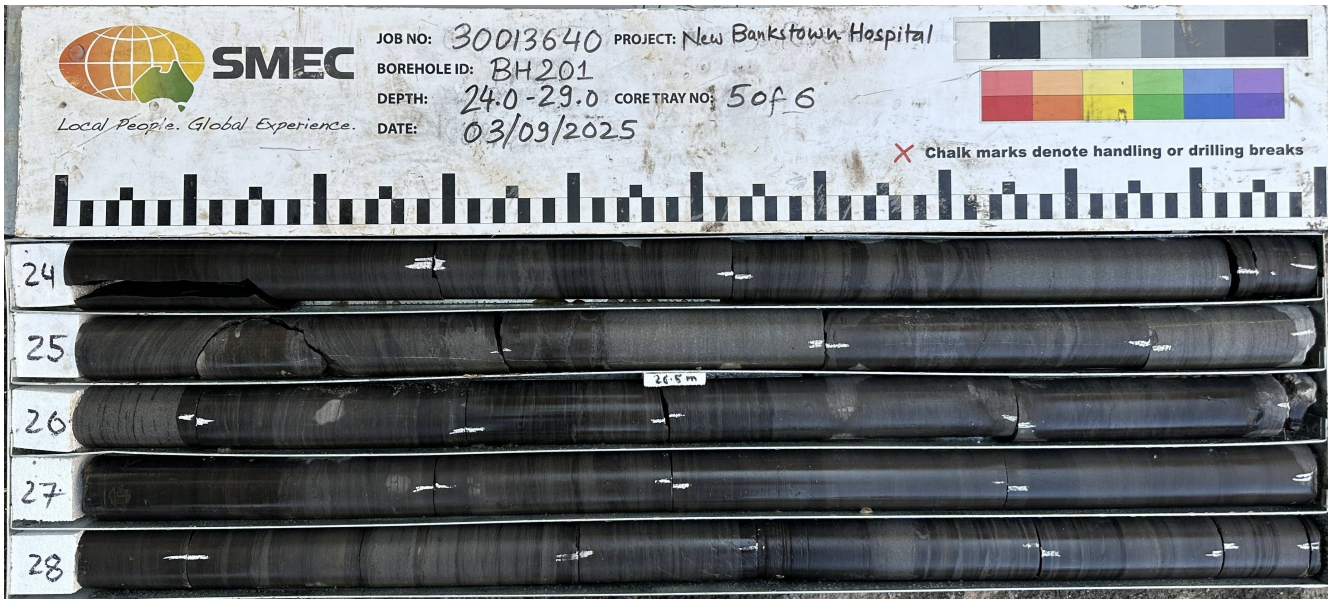


PointID : BH201 Depth Range: 14.00 - 19.00 m

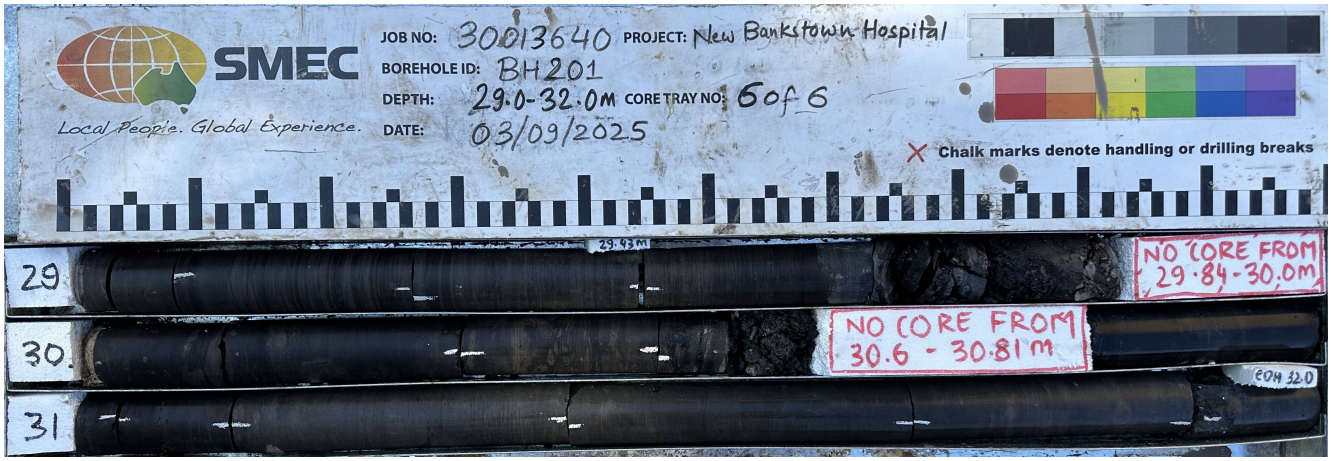


PointID : BH201 Depth Range: 19.00 - 24.00 m

smec	TITLE HINSW TAFE Bankstown New Bankstown Hospital Additional SI Core Photo - BH201	DRAWN GDM	DATE 21/10/2025
		CHECKED RL	DATE 21/10/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 2/3



PointID : BH201 Depth Range: 24.00 - 29.00 m



PointID : BH201 Depth Range: 29.00 - 32.00 m

smec	TITLE HINSW TAFE Bankstown New Bankstown Hospital Additional SI Core Photo - BH201	DRAWN GDM	DATE 21/10/2025
		CHECKED RL	DATE 21/10/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 3/3

Geological & Engineering Log

Project	New Bankstown Hospital	East	318245.7 m	Start Date	9/1/2025	Contractor	DB Services	Inclination	-90°
Client	Health Infrastructure	North	6245901.6 m	End Date	9/1/2025	Rig Type	Drillman	Azimuth	
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	36.26 m			Mounting	Truck	North	
Job No	30013640	Datum	MGA2020-56/AHD	Casing Stickup	-0.10 m			Survey	
				Top of Casing RL	36.14 m				

Borehole Identifier: **BH201A**

Method	Casing	Progress Water (Loss/Return)	Hole Diameter	Sampling	Air Lift Yeild	Water Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Code	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Construction Notes	Installation
AD/T			115mm			9/30/2025	0.0 *36.3*		GP	*36.16* 0.40 *35.86*	BITUMEN: black. FILL Sandy GRAVEL: fine to medium grained, up to 25 mm, sub-angular to sub-rounded, dark brown-grey, sand is medium grained. FILL Silty CLAY: low to medium plasticity, dark grey, trace medium grained sand; trace fine to medium grained gravel.	D w>PL	MD St				ROAD SURFACE FILL	Grout:	0.1 0.3 BH201A
									CL -Cl	1.30									
										34.96	Silty CLAY: high plasticity, red-brown.	w≈PL					RESIDUAL SOIL		
							2.0 *34.3*		CH				VSt					Bentonite:	
										3.00									
										33.26	Silty CLAY: high plasticity, grey mottled pale brown, trace fine to medium grained, angular gravel; (Extremely Weathered Siltstone).	w<PL	H		XW		EXTREMELY WEATHERED MATERIAL		
							4.0 *32.3*		CH										5.0
										5.80									
							6.0 *30.3*			*30.46*	SILTSTONE: dark grey to grey.				HW - MW	L	SEDIMENTARY	Start Slotted 5.8m	5.8 6.0
															SW	M		Gravel:	
							8.0 *28.3*												
										9.00								End Slotted 8.8m	8.8 9.0
							10.0				BH Terminated at 9.00 m Target Depth							Cuttings:	

Observations and Comments

Pipe Description: Class 18 50mm PVC screwed
Pipe Screen Details: 1mm machine slotted, 50mm Class 18 PVC

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	
Approved By		Date	
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Geological & Engineering Log

Project	New Bankstown Hospital	East	318248.1 m	Start Date	9/1/2025	Contractor	DB Services	Inclination	-90°
Client	Health Infrastructure	North	6245901.2 m	End Date	9/1/2025	Rig Type	Drillman	Azimuth	
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	36.38 m			Mounting	Truck	North	
Job No	30013640	Datum	MGA2020-56/AHD	Casing Stickup	-0.06 m			Survey	
				Top of Casing RL	36.15 m				

smec

Borehole Identifier: **BH201B**

Depth (m) / Elevation	Graphic Log	Soil Code	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Construction Notes	Installation
Method: AD/T; Casing: 115mm; Hole Diameter: 115mm; Water Level & Inflow: 10/1/2025												
0.0 / 36.4		GP	36.34	BITUMEN: black.	D	MD				ROAD SURFACE FILL	Grout:	BH201B
			0.40	FILL Sandy GRAVEL: fine to coarse grained, up to 25 mm, sub-angular to sub-rounded, dark grey-brown, sand is medium to coarse grained.								
			35.98	FILL CLAY: low to medium plasticity, dark grey-brown, with fine to medium grained, sub-angular to sub-rounded gravel.	w>PL	St						
1.0 / 35.4		CL -CI									Bentonite:	0.8
			1.80									1.8
2.0 / 34.4			34.58	Silty CLAY: high plasticity, red-brown.	w≈PL					RESIDUAL SOIL	Start Slotted 2.1m	2.0 2.1
		CH										
3.0 / 33.4					w<PL	VSt						3.0
			3.50								Gravel:	
			32.88	Silty CLAY: high plasticity, grey mottled pale-brown, trace fine grained, angular gravel; (Extremely Weathered Siltstone).		H				EXTREMELY WEATHERED MATERIAL		
4.0 / 32.4		CH										4.0
5.0 / 31.4								XW			End Slotted 5.1m	5.0 5.1
			5.50								Cuttings:	5.5
				BH Terminated at 5.50 m Target Depth								
6.0 / 30.4												6.0
7.0 / 29.4												7.0
8.0												

Observations and Comments

Pipe Description: Class 18 50mm PVC screwed
Pipe Screen Details: 1mm machine slotted, 50mm Class 18 PVC

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	
Approved By		Date	
Status	3	Page	1 of 1

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318239 m	Start Date	30/9/2025	Contractor	Stratacore	Inclination	-90°
Client	HINSW	North	6245764 m	End Date	1/10/2025	Rig Type	Massenza MI4	Azimuth	
Site	TAFE Bankstown	Elevation	31.00 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	MAP5

smec

Borehole Identifier: **BH202**

Depth (m) / Elevation	Graphic Log	Soil Code	Depth / RL	Soil / Rock Material Description	Weathering	Rock Strength	Defect Spacing (mm)	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
0.0 / 31.0		GM	0.10 / 30.90	FILL ASPHALT: grey-black.					FILL - ASPHALT	
			0.30 / 30.70	FILL Sandy Silty GRAVEL: fine to medium grained, grey-brown.					FILL - ROAD BASE	
		CI		FILL Sandy Silty CLAY: low to medium plasticity, grey-brown, with gravel; trace cobbles, brick fragments, and wood.					FILL	
1.0 / 30.0			1.00 / 30.00	Silty CLAY: medium to high plasticity, grey mottled red-brown, trace sand.					RESIDUAL SOIL	1.0
		CI -CH								
2.0 / 29.0			2.00 / 29.00	Gravelly CLAY: medium to high plasticity, grey, red-brown, (weathered siltstone).	XW	VL			WEATHERED SILTSTONE 2.00-4.00: Auger cuttings dry	2.0
3.0 / 28.0		CI -CH								3.0
4.0 / 27.0				4.00: Becoming dark grey	HW					4.0
			4.59 / 4.66			L			SEDIMENTARY	
			4.73 / 26.27	SANDY SILTSTONE: grey with dark grey, distinctly bedded. CORE LOSS 0.07m (4.66-4.73)	HW - MW	L			SEDIMENTARY	
5.0				SHALE: grey-brown, indistinctly bedded, with 5mm thick carbonaceous seams.	XW	VL		4.81-4.82: IS , 0°, X CT, UN, 5 mm 4.82-4.83: IS , 10°, X CT, UN, 5 mm 4.88-4.95: EW , 5°, CT, IF, UN, SM, 40 mm		

Method: NDD; AD/T; HQ3. Casing: HWT. Progress Water (Loss/Return): 0% Water LOSS. Run (TCR) RQD: R1 (100%) 100% 4.65; R2 (95%) 63%. Sampling: 3.00m SPT 10/100mm HB N=R (0.10m REC) 3.10m. SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa). Permeability: Not Observed. Level & Inflow.

Moisture Condition. Consistency Density. Alteration.

Inferred Rock Strength — Point Load Is(50) ● Axial ○ Diametral; UCS ■. VL -0.1 L -0.3 M -1 H -3 VH -10 EH.

Defect Spacing (mm): 20 60 200 600 2000.

Installation: 1.0, 2.0, 3.0, 4.0.

Observations and Comments

Backfilled with sand, cold mix cap

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	RL	Date	1/10/2025
Approved By	HW	Date	
Status	1	Page	1 of 7

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318239 m	Start Date	30/9/2025	Contractor	Stratacore
Client	HINSW	North	6245764 m	End Date	1/10/2025	Rig Type	Massenza MI4
Site	TAFE Bankstown	Elevation	31.00 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth	
North	
Survey	MAP5

smec

Borehole Identifier: **BH202**

Depth (m) / Elevation	Soil / Rock Material Description	Depth / RL
5.0 / 26.0		
	SILTSTONE: dark grey, indistinctly bedded, with occasional shale clasts up to 20mm, and trace sand.	25.95
6.0 / 25.0		
7.0 / 24.0		7.63
	INTERBEDDED SILTSTONE (70%) SANDSTONE (30%): siltstone is dark grey. sandstone is pale grey.	23.37
8.0 / 23.0		
9.0 / 22.0		9.00
	SILTSTONE: dark grey, indistinctly bedded, occasional rounded shale clasts up to 30mm and sandy laminations.	22.00
10.0		

Method: HQ3 | Casing | Progress Water (Loss/Return): 0% Water LOSS | Run (TCR) RQD: R2 (95%) 63% | 6.15 | R3 (100%) 97% | 9.15 | R4 (100%) 85% | Sampling: C-UCS | SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa):
5.21 m Is(50) D=0.30MPa
5.21 m Is(50) A=0.48MPa
6.38 m Is(50) D=0.33MPa
6.38 m Is(50) A=0.43MPa
7.65 m Is(50) D=0.40MPa
7.65 m Is(50) A=0.64MPa
8.98 m Is(50) D=0.03MPa
8.98 m Is(50) A=0.59MPa

Permeability / Level & Inflow: Not Observed

Graphic Log | Soil Code

Moisture Condition | Consistency Density | Alteration

Weathering: HW - MW (cont) | SW | FR

Rock Strength: L (cont) | M | L | M

Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ (VL -0.1 | L -0.3 | M -1 | H -3 | VH -10 | EH)

Defect Spacing (mm): 20 | 60 | 200 | 600 | 2000

Fabric, Structure & Defect Description

- 5.05: IS , 5°, X CT, UN, 5 mm
- 5.18: P , 5°, CN, PR, SM
- 5.52-5.61: HB
- 5.78: P , 5°, CN, PR, SM
- 6.60: J , 80°, UN, healed
- 6.97: J , 85°, CN, PR, SM
- 7.21: P , 5°, CN, PR, SM
- 7.24: P , 5°, CN, PR, SM
- 7.27: J , 85°, CN, PR, SM
- 8.40: J , 45°, CN, IR, SM
- 8.42: J , 45°, CN, IR, SM
- 9.28: P , 5°, CN, PR, SM
- 9.34: P , 5°, CN, IR, SM
- 9.37: J , 35°, clay VN, CU, SM, 0.2 mm
- 9.40: J , 20°, clay VN, IR, SM
- 9.43: J , 35°, clay VN, CU, SM, 0.2 mm
- 9.49-9.50: IS , 5°, X CT, UN, SM, 3 mm
- 9.60: J , 15°, CN, IR, SM
- 9.66: P , 5°, CN, UN, SM
- 9.70: J , 30°, CN, IR, SM
- 9.92: J , 80°, CN, IT, PR, SM

Origin, Geology Unit, Other Testing & General Observations: SEDIMENTARY

Installation

Observations and Comments

Backfilled with sand, cold mix cap

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

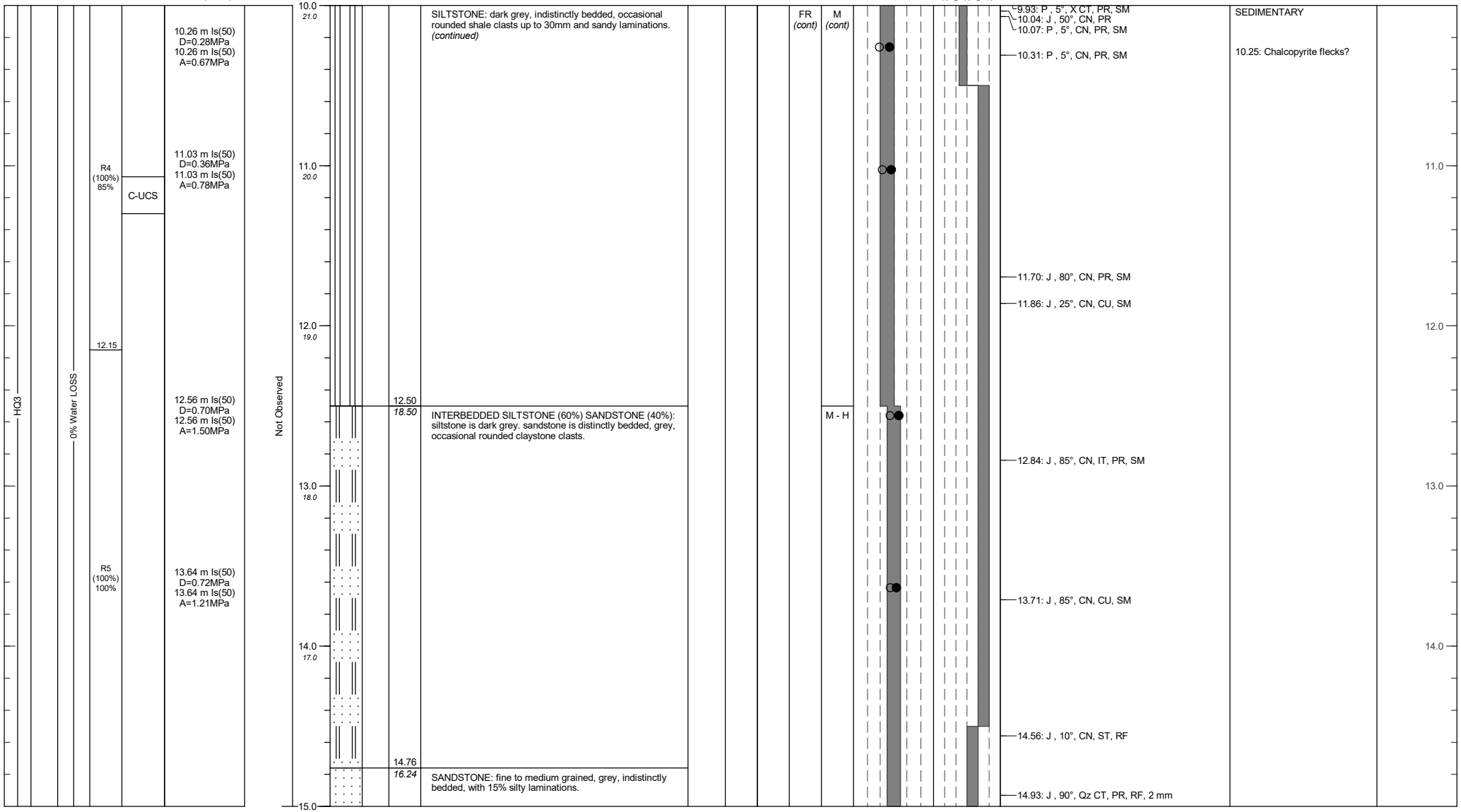
Logged By	RL	Date	1/10/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318239 m	Start Date	30/9/2025	Contractor	Stratacore	Inclination	-90°
Client	HINSW	North	6245764 m	End Date	1/10/2025	Rig Type	Massenza MI4	Azimuth	
Site	TAFE Bankstown	Elevation	31.00 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	MAP5

smec

Borehole Identifier: **BH202**



Observations and Comments
Backfilled with sand, cold mix cap

Notes
Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
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Logged By	RL	Date	1/10/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318239 m	Start Date	30/9/2025	Contractor	Stratacore
Client	HINSW	North	6245764 m	End Date	1/10/2025	Rig Type	Massenza MI4
Site	TAFE Bankstown	Elevation	31.00 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth North	
Survey	MAP5

smec

Borehole Identifier: **BH202**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Code	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ (VL -0.1 L -0.3 M -1 H -3 VH -10 EH)	Defect Spacing (mm) (20 60 200 600 2000)	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
HQ3		0% Water LOSS	15.15		15.13 m Is(50) D=0.87MPa 15.13 m Is(50) A=0.85MPa		Not Observed	15.0 *16.0*			15.32	SANDSTONE: fine to medium grained, grey, indistinctly bedded, with 15% silty laminations. *(continued)*				FR *(cont)*	M - H *(cont)*			15.38: J , 45°, CN, IR, RF	SEDIMENTARY	
											15.68	INTERBEDDED SILTSTONE (75%) SANDSTONE (25%): siltstone is dark grey. sandstone is fine to medium grained, grey.										
					15.98 m Is(50) D=0.95MPa 15.98 m Is(50) A=1.86MPa						15.83						L			15.74: P , 5°, X CT, UN, SM, 1 mm 15.77: P , 5°, X CT, UN, SM, 1 mm 15.78: P , 5°, X CT, UN, SM, 1 mm 15.82: J , 85°, Qz VN, PR, RF, 0.5 mm		
											15.17	CLAYSTONE: grey, indistinctly bedded, with thin irregular silty laminations.					M - H			16.00: P , 5°, clay VN, CU, SM, 1 mm		
								16.0 *15.0*			16.14										16.0
											14.86	INTERBEDDED SILTSTONE (75%) SANDSTONE (25%): siltstone is dark grey. sandstone is fine to medium grained, grey, with occasional rounded claystone clasts.										
			R6 (100%) 95%														M				
					16.98 m Is(50) D=0.47MPa 16.98 m Is(50) A=0.66MPa			17.0 *14.0*													17.0
																			17.72: P , 10°, silt VN, IR, SM, 0.1 mm		
					17.98 m Is(50) D=0.47MPa 17.98 m Is(50) A=0.57MPa			18.0 *13.0*													18.0
			18.09														L		18.14: P , 5°, X VN, IR, SM 18.16: P , 5°, X VN, IR, SM		
																	H				
																	M				
																	M - H		18.56: J , 35°, CN, CU, SM		
					18.88 m Is(50) D=1.01MPa 18.88 m Is(50) A=0.59MPa																
			R7 (100%) 100%					19.0 *12.0*									M				19.0
																	H		19.27-19.28: IS , 5°, clay CT, IF, PR, SM, 8 mm		
					19.88 m Is(50) D=0.74MPa 19.88 m Is(50) A=1.92MPa			20.0													

Observations and Comments
Backfilled with sand, cold mix cap

Notes
Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	RL	Date	1/10/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318239 m	Start Date	30/9/2025	Contractor	Stratacore	Inclination	-90°
Client	HINSW	North	6245764 m	End Date	1/10/2025	Rig Type	Massenza MI4	Azimuth	
Site	TAFE Bankstown	Elevation	31.00 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	MAP5

smec

Borehole Identifier: **BH202**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Code	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	Defect Spacing (mm) (20, 60, 200, 600, 2000)	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
HQ3		0% Water LOSS	R7 (100%) 100%		20.98 m Is(50) D=0.48MPa 20.98 m Is(50) A=0.80MPa		Not Observed	20.0 *11.0*				INTERBEDDED SILTSTONE (75%) SANDSTONE (25%): siltstone is dark grey. sandstone is fine to medium grained, grey, with occasional rounded claystone clasts. *(continued)*				FR *(cont)*	H *(cont)*				SEDIMENTARY	
			21.14					21.0 *10.0*														21.0
					21.88 m Is(50) D=0.73MPa 21.88 m Is(50) A=1.14MPa			22.0 *9.0*			22.36											22.0
											8.64	SANDSTONE: fine to medium grained, pale grey, distinctly bedded, some thin silty laminations.								22.54: J , 85°, silt VN, PR, RF		
			R8 (100%) 88%								22.62											
											8.38	INTERBEDDED SILTSTONE (70%) SANDSTONE (30%): siltstone is dark grey. sandstone is fine to medium grained, grey.										
					22.98 m Is(50) D=0.68MPa 22.98 m Is(50) A=1.72MPa			23.0 *8.0*									M			23.15: P , 5°, X CT, UN, SM, 0.5 mm 23.23: P , 5°, X CT, UN, SM, 0.5 mm 23.24: J , 30°, CN, CU, SM 23.32-23.35: IS , 5°, clay, IF, PR, SM, 30 mm, with sand		23.0
											23.29					HW	VL					
											7.65	CLAYSTONE: brown.				FR	H					
					23.81 m Is(50) D=0.46MPa 23.81 m Is(50) A=MPa							INTERBEDDED SILTSTONE (85%) SANDSTONE (15%): siltstone is dark grey. sandstone is fine to medium grained, grey, with occasional rounded claystone clasts, often carbonaceous.					L - M				23.69: P , 5°, X CT, UN, SM, 0.5 mm 23.77: P , 5°, X CT, UN, SM, 0.5 mm 23.80: J , 75°, CN, IR, SM		
			24.10					24.0 *7.0*									M					24.0
											24.10											
											6.90	INTERBEDDED SANDSTONE (50%) SILTSTONE (50%): sandstone is fine to medium grained, grey. siltstone is dark grey.					H					
			R9 (100%) 100%																			
					24.96 m Is(50) D=3.33MPa 24.96 m Is(50) A=4.07MPa						24.70											
											6.30	SANDSTONE: fine to medium grained, with occasional silty laminations and rounded clasts.					H - VH			24.77: J , 80°, IT		
								25.0														

Observations and Comments
Backfilled with sand, cold mix cap

Notes
Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	RL	Date	1/10/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318239 m	Start Date	30/9/2025	Contractor	Stratacore	Inclination	-90°
Client	HINSW	North	6245764 m	End Date	1/10/2025	Rig Type	Massenza MI4	Azimuth	
Site	TAFE Bankstown	Elevation	31.00 m			Mounting	Track	North	
Job No	30013640	Datum	MGA2020-56/AHD					Survey	MAP5

smec

Borehole Identifier: **BH202**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) / Elevation	Graphic Log	Soil Code	Depth / RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) (Axial / Diametral) UCS	Defect Spacing (mm)	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
HQ3		0% Water LOSS	R9 (100%) 100% 27.12 R10 (100%) 100%		25.98 m Is(50) D=0.76MPa 25.98 m Is(50) A=1.85MPa 26.98 m Is(50) D=0.57MPa 26.98 m Is(50) A=1.44MPa 27.98 m Is(50) D=3.42MPa 27.98 m Is(50) A=4.15MPa 28.63 m Is(50) D=1.05MPa 28.63 m Is(50) A=2.92MPa 29.98 m Is(50) D=1.16MPa 29.98 m Is(50) A=3.70MPa		Not Observed	25.0 *6.0* 26.0 *5.0* 27.0 *4.0* 28.0 *3.0* 29.0 *2.0* 30.0		25.81 *5.19* 27.45 *3.55*	SANDSTONE: fine to medium grained, with occasional silty laminations and rounded clasts. *(continued)* INTERBEDDED SILTSTONE (60%) SANDSTONE (40%): siltstone is dark grey. sandstone is fine to medium grained, pale grey. INTERBEDDED SANDSTONE (55%) SILTSTONE (45%): sandstone is fine to medium grained, grey. siltstone is dark grey.				FR *(cont)*	H - VH *(cont)* H H - VH H H - VH			26.15: P , 0°, Qz CT, PR, SM, 1 mm 28.89: J , 75°, CN, UN, RF	SEDIMENTARY	26.0 27.0 28.0 29.0

Observations and Comments

Backfilled with sand, cold mix cap

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	RL	Date	1/10/2025
Approved By	HW	Date	
Status	1		

Geological & Engineering Log

Project	New Bankstown Hospital Additional SI	East	318239 m	Start Date	30/9/2025	Contractor	Stratacore
Client	HINSW	North	6245764 m	End Date	1/10/2025	Rig Type	Massenza MI4
Site	TAFE Bankstown	Elevation	31.00 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth North	
Survey	MAP5

smec

Borehole Identifier: **BH202**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	SPT (Recovered length), DCP, Is(50) (MPa) UCS (MPa)	Permeability	Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Code	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Inferred Rock Strength Point Load Is(50) ● Axial ○ Diametral UCS ■ VL -0.1 L -0.3 M -1 H -3 VH -10 EH	Defect Spacing (mm) 20 60 200 600 2000	Fabric, Structure & Defect Description	Origin, Geology Unit, Other Testing & General Observations	Installation
HQ3		0% Water LOSS	30.08 R11 (100%) 100% 32.00		30.98 m Is(50) D=1.19MPa 30.98 m Is(50) A=2.40MPa		Not Observed	30.0 *1.0* 31.0 *0.0* 32.0 *-1.0* 33.0 *-2.0* 34.0 *-3.0* 35.0			32.00	INTERBEDDED SANDSTONE (55%) SILTSTONE (45%): sandstone is fine to medium grained, grey. siltstone is dark grey. *(continued)* BH Terminated at 32.00 m Target Depth Backfilled				FR *(cont)*	H				SEDIMENTARY	31.0 32.0 33.0 34.0

Observations and Comments
Backfilled with sand, cold mix cap

Notes
Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999
Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal.
For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	RL	Date	1/10/2025
Approved By	HW	Date	
Status	1		



PointID : BH202 Depth Range: 4.59 - 8.00 m



PointID : BH202 Depth Range: 8.00 - 12.00 m

smec	TITLE HINSW TAFE Bankstown New Bankstown Hospital Additional SI Core Photo - BH202	DRAWN GDM	DATE 21/10/2025
		CHECKED RL	DATE 21/10/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 1/4



PointID : BH202 Depth Range: 12.00 - 16.00 m



PointID : BH202 Depth Range: 16.00 - 20.00 m

smec	TITLE HINSW TAFE Bankstown New Bankstown Hospital Additional SI Core Photo - BH202	DRAWN GDM	DATE 21/10/2025
		CHECKED RL	DATE 21/10/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 2/4



PointID : BH202 Depth Range: 20.00 - 24.00 m



PointID : BH202 Depth Range: 24.00 - 28.00 m

smec	TITLE HINSW TAFE Bankstown New Bankstown Hospital Additional SI Core Photo - BH202	DRAWN GDM	DATE 21/10/2025
		CHECKED RL	DATE 21/10/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 3/4



PointID : BH202 Depth Range: 28.00 - 32.00 m

smec	TITLE HINSW TAFE Bankstown New Bankstown Hospital Additional SI Core Photo - BH202	DRAWN GDM	DATE 21/10/2025
		CHECKED RL	DATE 21/10/2025
		SCALE Not To Scale	A4
		PROJECT No 30013640	FIGURE No 4/4

Geological & Engineering Log

Project	New Bankstown Hospital	East	318242.0 m	Start Date	9/1/2025	Contractor	DB Services
Client	Health Infrastructure	North	6245765.0 m	End Date	9/1/2025	Rig Type	Drillman
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	30.92 m			Mounting	Truck
Job No	30013640	Datum	MGA2020-56/AHD	Casing Stickup	-0.09 m		
				Top of Casing RL	30.83 m		

Inclination	-90°
Azimuth	
North	
Survey	

Borehole Identifier: **BH202A**

Depth (m) / Elevation	Graphic Log	Soil Code	Depth RL	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations
0.0 / 30.9		GP	0.25	BITUMEN: black.	D	D				ROAD SURFACE
			30.67	FILL Sandy GRAVEL: fine to coarse grained, up to 25 mm, sub-angular to sub-rounded, dark grey, sand is fine to coarse grained, sub-angular.	w≈PL	St				FILL
		CI	1.00	FILL CLAY: medium plasticity, dark grey mottled brown, with medium grained sand; trace gravel.						
			29.92	Silty CLAY: high plasticity, grey mottled red-brown.						RESIDUAL SOIL
2.0 / 28.9		CH		1.50-2.70: becoming yellow brown mottled grey	w<PL	VSt				
			2.80							
		CH	28.12	Silty CLAY: high plasticity, brown mottled dark grey, trace fine to medium grained gravel; (Extremely Weathered Siltstone).		H		XW		EXTREMELY WEATHERED MATERIAL
			4.00							
4.0 / 26.9			26.92	SILTSTONE: dark grey-brown.				HW	L	SEDIMENTARY
				5.50-7.40: becoming grey mottled pale brown				HW - MW		
6.0 / 24.9										
				7.40-10.70: becoming grey to dark grey				SW	M	
8.0 / 22.9										
10.0 / 20.9			10.70	BH Terminated at 10.70 m Target Depth						
12.0										

Method: AD/T

Casing: 115mm

Hole Diameter: 115mm

Water Level & Inflow: 10/1/2025

Construction Notes / Installation:

- Grout: 0.0 – 6.5
- Bentonite: 6.5 – 7.0
- Start Slotted 7.7m
- Gravel: 7.0 – 10.7
- End Slotted 10.7m

BH202A

Observations and Comments

Pipe Description: Class 18 50mm PVC screwed

Pipe Screen Details: 1mm machine slotted, 50mm Class 18 PVC

Notes

Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PD	Date	
Approved By		Date	
Status	3	Page	1 of 1

Appendix D

Test Pit Logs

Geological & Engineering Log

Project	New Bankstown Hospital	East	318347.5 m	Start Date	13/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6246049.2 m	End Date	13/12/2024	Equipment	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	46.13 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth North	
						Survey	

smec

Pit Identifier: **TP01**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	Testing: SPT (Recovered length)	Testing: DCP	Testing: PP (kPa) VS (kPa) (P/R uncorrected) PID (ppm)	Water Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T				B		2 2 2 2 3 2 2 3 3 2 3 2 3 4 4			0.0 *46.1*		SP	*46.13*	FILL SAND: fine grained, brown.	M					FILL	
												0.20								
												45.93	FILL Silty SAND: fine grained, brown, with angular to sub-angular cobbles.							
									0.5 *45.6*		SM									0.5
												1.00								
									1.0 *45.1*			*45.13*	FILL Silty SAND: fine grained, brown.							1.0
									1.5 *44.6*		SM									1.5
									2.0 *44.1*			2.00	TP Terminated at 2.00 m							2.0
									2.5 *43.6*											2.5
									3.0											

Observations and Comments

Penetrometer Notes
Type: DCP9
Blows per 100 mm

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	LR	Date	13/12/2024
Approved By	HW	Date	18/2/2025
Status	3	Page	1 of 1

Geological & Engineering Log

Project	New Bankstown Hospital	East	318293.9 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245812.9 m	End Date	12/12/2024	Equipment	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	34.33 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth North	
						Survey	

smec

Pit Identifier: **TP02**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	Testing: SPT (Recovered length)	Testing: DCP	Testing: PP (kPa) VS (kPa) (P/R uncorrected) PID (ppm)	Water Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T								Not Encountered	0.0 *34.3*			0.05 *34.28*	BITUMEN: black.						ROAD SURFACE	
													FILL CLAY: medium plasticity, red-brown, with fine, sub-angular black gravel.	w≈PL					FILL	
									0.5 *33.8*		CI									0.5
				B					1.0 *33.3*			1.00 *33.33*	CLAY: medium to high plasticity, grey mottled brown.		VSt				RESIDUAL SOIL 1.00-1.50: 2 bags	1.0
											CI -CH	1.50								
									1.5 *32.8*				TP Terminated at 1.50 m Target Depth							1.5
									2.0 *32.3*											2.0
									2.5 *31.8*											2.5
									3.0											

Observations and Comments

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	12/12/2024
Approved By	HW	Date	18/2/2025
Status	3	Page	1 of 1

Geological & Engineering Log

Project	New Bankstown Hospital	East	318240.4 m	Start Date	12/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245765.7 m	End Date	12/12/2024	Equipment	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	30.85 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD			Inclination	-90°
						Azimuth North	
						Survey	

smec

Pit Identifier: **TP03**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	Testing: SPT (Recovered length)	Testing: DCP	Testing: PP (kPa) VS (kPa) (P/R uncorrected) PID (ppm)	Water Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Installation
AD/T				B		2, 2, 2, 2, 2, 4, 4, 4, 4, 5, 8, 8, 10, 11, 10, 15		Not Encountered	0.0 *30.9*			0.05 *30.80*	BITUMEN: black.						ROAD SURFACE	
											GP		FILL Sandy GRAVEL: fine to medium grained, poorly graded, sub-angular, dark grey, sand is medium to coarse grained, sub-angular.	D					FILL	
												0.20 *30.65*	FILL Sandy CLAY: medium plasticity, dark grey, sand is medium grained.	w≈PL						
									0.5 *30.4*		CI									0.5
									1.0 *29.9*			1.20 *29.65*	CLAY: medium to high plasticity, brown, with sand.	w<PL	H				RESIDUAL SOIL 1.20-1.70: 2 bags	1.0
									1.5 *29.4*		CI -CH									1.5
												1.80	TP Terminated at 1.80 m Target Depth							
									2.0 *28.9*											2.0
									2.5 *28.4*											2.5
									3.0											

Observations and Comments

Penetrometer Notes
Type: DCP9
Blows per 100 mm

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	PP	Date	12/12/2024
Approved By	HW	Date	18/2/2025
Status	3	Page	1 of 1

Geological & Engineering Log

Project	New Bankstown Hospital	East	318324.4 m	Start Date	10/12/2024	Contractor	Terratest
Client	Health Infrastructure	North	6245880.9 m	End Date	10/12/2024	Equipment	Geo-205
Site	500 Chapel Road, Bankstown NSW 2118	Elevation	37.04 m			Mounting	Track
Job No	30013640	Datum	MGA2020-56/AHD				

Inclination	-90°
Azimuth North	
Survey	

smec

Pit Identifier: **TP120**

Method	Casing	Progress Water (Loss/Return)	Run (TCR) RQD	Sampling	Testing: SPT (Recovered length)	Testing: DCP	Testing: PP (kPa) VS (kPa) (P/R uncorrected) PID (ppm)	Water Level & Inflow	Depth (m) *Elevation*	Graphic Log	Soil Group Symbol	Depth *RL*	Soil / Rock Material Description	Moisture Condition	Consistency Density	Alteration	Weathering	Rock Strength	Origin, Geology Unit, Other Testing & General Observations	Installation
250mm Auger				ES		3		Not Encountered	0.0 *37.0*			*37.04*	CONCRETE.						CONCRETE	
						3						0.18								
						2						*36.86*	CLAY WITH COBBLES: medium plasticity, dark grey, orange, cobbles are uniform, fine grained, angular to sub-angular; (Extremely Weathered).	w≈PL	VSt				EXTREMELY WEATHERED MATERIAL	
						3			0.5 *36.5*		CI									0.5
						2														
				B		8														
						9														
						9														
						7														
						8			1.0 *36.0*			1.00	TP Terminated at 1.00 m Target Depth							1.0
						17														
						17														
						17														
						18			1.5 *35.5*											1.5
						18														
						18														
						18														
						17			2.0 *35.0*											2.0
									2.5 *34.5*											2.5
									3.0											

Observations and Comments

Penetrometer Notes
Type: DCP9
Blows per 100 mm

Notes: Classifications compliant with AS1726-2017: Geotechnical Site Investigations unless otherwise noted. Lugeon: BS5930:1999 Defect Log Abridged. Additional detail in digital dataset. For Vertical Holes: Angles reported in defects are relative to core normal. For Inclined Holes: Angles reported in defects are measured relative to core axis. Where beta angles are indicated, orientation of the core has been performed. Refer to explanatory notes for SMEC logs for details of abbreviations or basis of description.

Logged By	LR	Date	10/12/2024
Approved By	HW	Date	18/2/2025
Status	3	Page	1 of 1

Appendix E

Laboratory Certificates

MOISTURE CONTENT TEST REPORT

Client	SMEC	**Job #**	S24671-1
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Report #**	S102492-MC
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)		

Test Procedure

- ☑ AS 1289 2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method).
- ☐ AS4133 1.1.1 Determination of the moisture content of rock - Oven drying method (standard method)
- ☐ RMS T120 Moisture content of road construction materials (Standard method)
- ☐ RMS T262 Determination of moisture content of aggregates (Standard method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 11/01/2025

Sample #	Source	Sample Description	Moisture Content %
S102492	BH01 1-1.45m	Silty Sandy CLAY	**14.1**
S102495	BH02 1-1.3m	Silty CLAY	**19.5**
S102496	BH09 1-1.45m	Silty CLAY	**14.9**
S102499	BH15 4-4.05m	Silty CLAY	**22.0**

MOISTURE CONTENT TEST REPORT

Client	SMEC	**Job #**	S24671-2
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Report #**	S102708-MC
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)		

Test Procedure

- ☑ AS 1289 2.1.1 Determination of the moisture content of a soil - Oven drying method (Standard method).
- ☐ AS4133 1.1.1 Determination of the moisture content of rock - Oven drying method (standard method)
- ☐ RMS T120 Moisture content of road construction materials (Standard method)
- ☐ RMS T262 Determination of moisture content of aggregates (Standard method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 11/01/2025

Sample #	Source	Sample Description	Moisture Content %
S102708	BH03 1.5-1.94m	Silty CLAY	**24.3**
S102709	BH04 3.5-4m	Silty Sandy CLAY	**9.4**
S102710	BH06 1-1.07m	Silty CLAY	**21.4**
S102712	BH07 1.5-1.7m	Silty CLAY	**12.3**
S102714	BH07 4.5-4.64m	Silty Sandy CLAY	**6.5**
S102715	BH08 1-1.45m	Silty CLAY	**9.2**
S102716	BH10 2.5-2.95m	Silty CLAY	**10.6**
S102717	BH11 3-3.22m	Silty Sandy CLAY	**11.7**
S102718	BH12 1-1.45m	Silty CLAY	**9.9**
S102720	BH13 4-4.45m	Silty CLAY	**15.0**
S102721	BH14 1.5-1.63m	Sandy Gravelly CLAY	**7.1**
S102722	BH16 1.5-1.76m	Sandy Gravelly CLAY	**7.5**

Notes

Accredited for compliance with ISO/IEC 17025 - Testing.

NATA Accredited Laboratory Number: 14874

Authorised Signatory:

Chris Lloyd

14/01/2025

Date:

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SOIL CLASSIFICATION REPORT

Client	SMEC	**Source**	BH01 1-1.45m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty Sandy CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102492-PI
Job No.	S24671-1	**Lab No.**	S102492

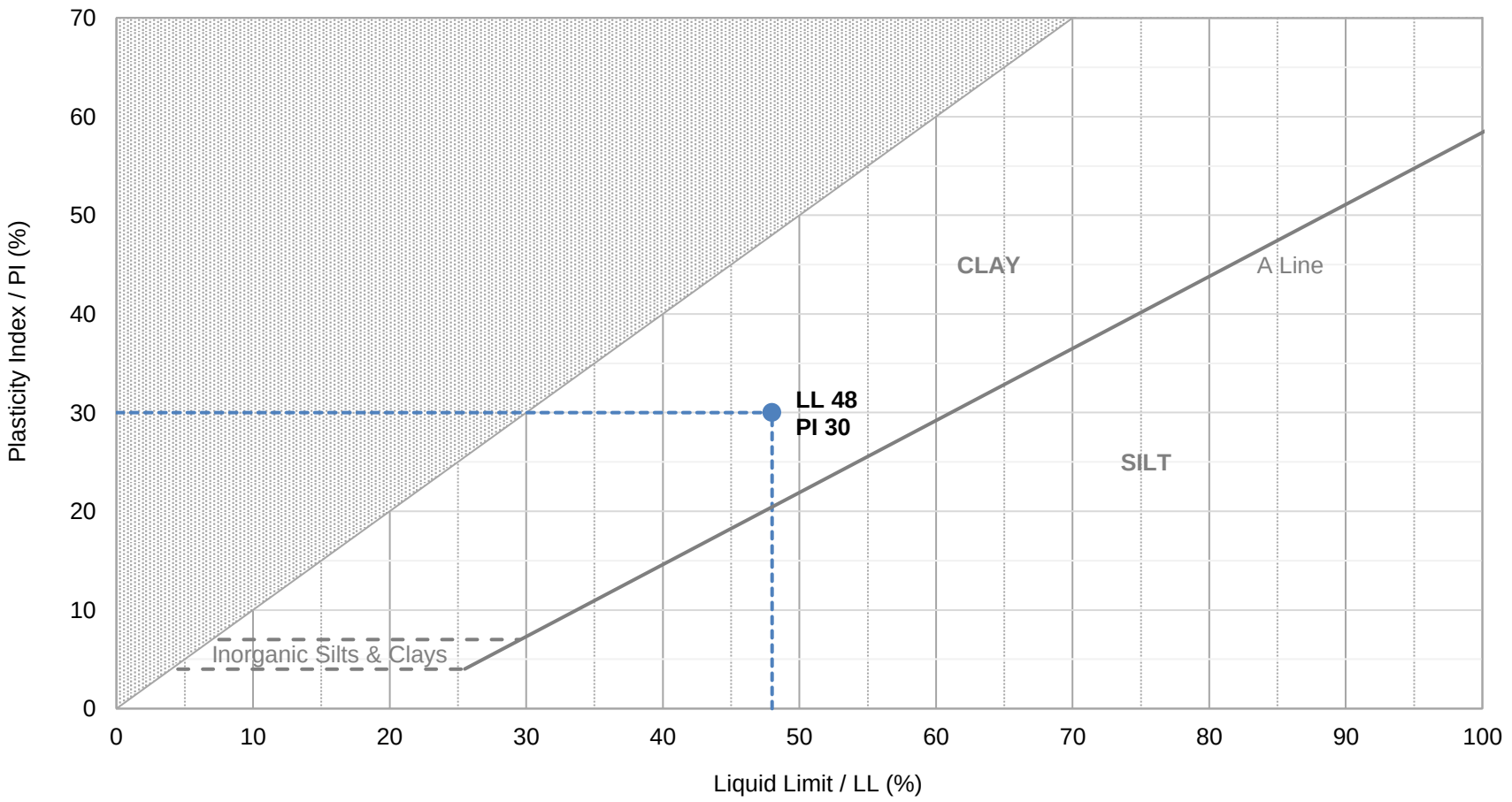
Test Procedure

- ☑ AS1289 3.1.1 Liquid Limit - Four point Casagrande method
- ☐ AS1289 3.1.2 Liquid Limit - One point Casagrande method
- ☑ AS1289 3.2.1 Plastic Limit - Standard method
- ☑ AS1289 3.3.1 Calculation of the Plasticity Index
- ☑ AS1289 3.4.1 Linear Shrinkage - Standard method

Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	Unknown
Preparation	Prepared in accordance with the test method	**Date Tested**	4/02/2025

Plasticity Chart for Classification of Fine-Grained Soils

AS 1726:2017 Clause 6.1.6 (Figure 5)



Preparation		Results	
Method of Preparation	**Dry Sieved**	Liquid Limit / LL (%)	**48**
History of the Sample	**Oven Dried**	Plastic Limit (%)	**18**
		Plasticity Index / PI (%)	**30**
		Linear Shrinkage (%)	**12.5**
		Condition upon Drying	**Linear**

Notes

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SOIL CLASSIFICATION REPORT

Client	SMEC	**Source**	BH07 3-3.5m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY with Gravel, trace of Sand
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102713-PI
Job No.	S24671-2	**Lab No.**	S102713

Test Procedure

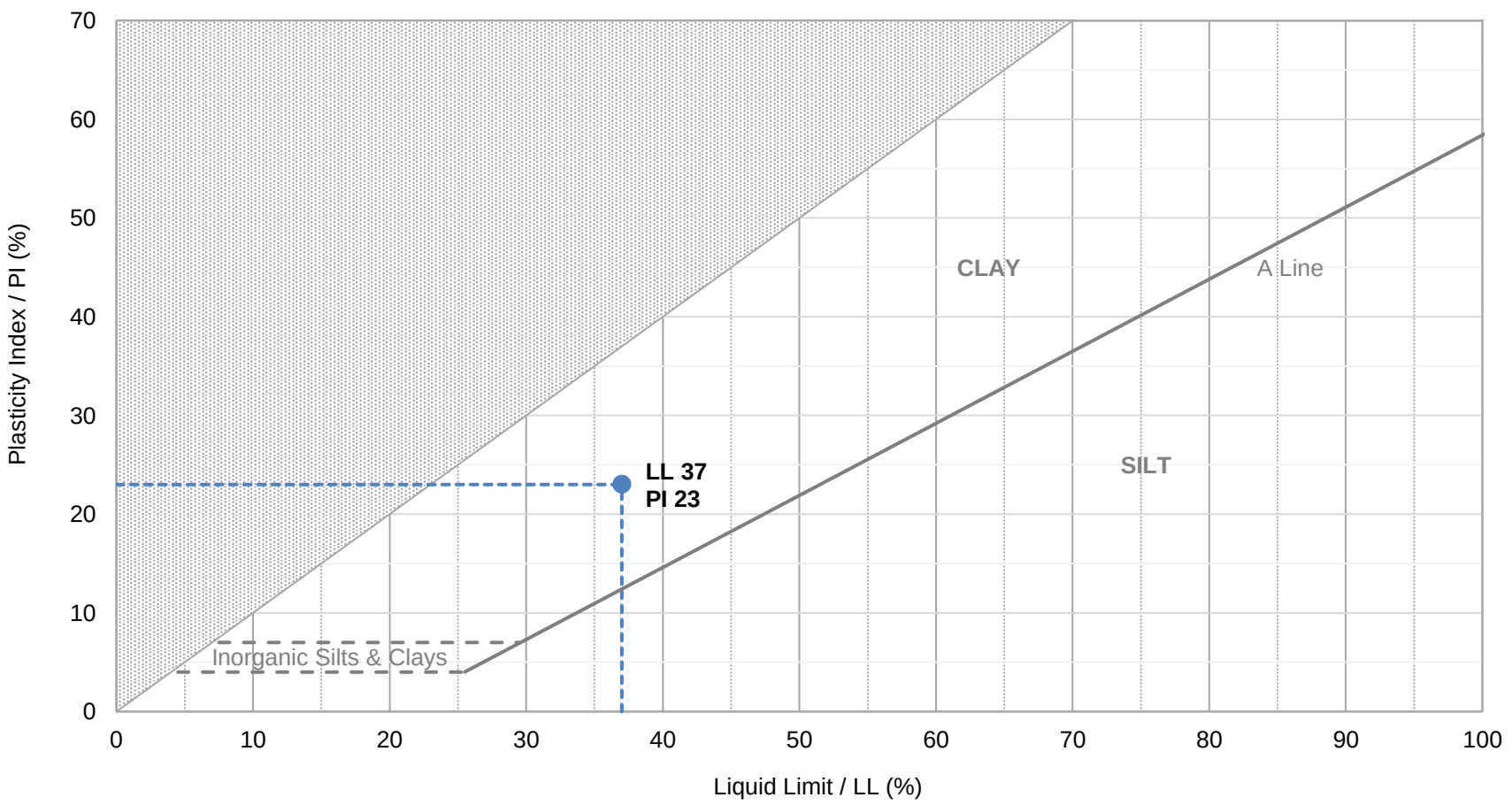
☑	AS1289 3.1.1	Liquid Limit - Four point Casagrande method
☐	AS1289 3.1.2	Liquid Limit - One point Casagrande method
☑	AS1289 3.2.1	Plastic Limit - Standard method
☑	AS1289 3.3.1	Calculation of the Plasticity Index
☑	AS1289 3.4.1	Linear Shrinkage - Standard method

Sampling Sampled by Client - results apply to the sample as received — **Date Sampled** Unknown

Preparation Prepared in accordance with the test method — **Date Tested** 10/02/2025

Plasticity Chart for Classification of Fine-Grained Soils

AS 1726:2017 Clause 6.1.6 (Figure 5)



Preparation		Results	
Method of Preparation	**Dry Sieved**	Liquid Limit / LL (%)	**37**
History of the Sample	**Oven Dried**	Plastic Limit (%)	**14**
		Plasticity Index / PI (%)	**23**
		Linear Shrinkage (%)	**10.5**
		Condition upon Drying	**Linear**

Notes

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SOIL CLASSIFICATION REPORT

Client	SMEC	**Source**	BH13 1-1.45m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY with Sand, trace of Gravel
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102719-PI
Job No.	S24671-2	**Lab No.**	S102719

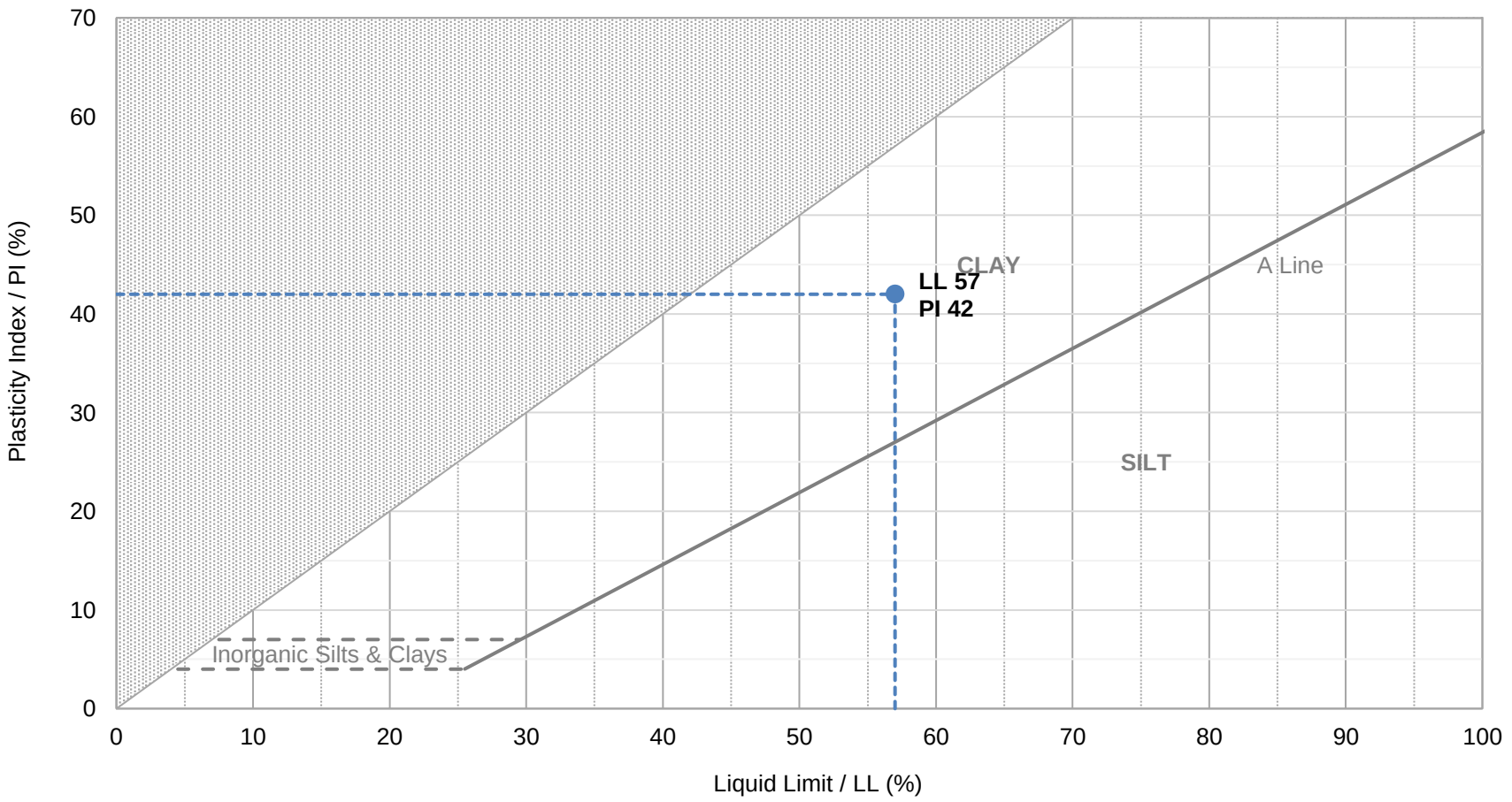
Test Procedure

- ☑ AS1289 3.1.1 Liquid Limit - Four point Casagrande method
- ☐ AS1289 3.1.2 Liquid Limit - One point Casagrande method
- ☑ AS1289 3.2.1 Plastic Limit - Standard method
- ☑ AS1289 3.3.1 Calculation of the Plasticity Index
- ☑ AS1289 3.4.1 Linear Shrinkage - Standard method

Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	Unknown
Preparation	Prepared in accordance with the test method	**Date Tested**	11/02/2025

Plasticity Chart for Classification of Fine-Grained Soils

AS 1726:2017 Clause 6.1.6 (Figure 5)



Preparation		**Results**	
Method of Preparation	**Dry Sieved**	Liquid Limit / LL (%)	**57**
History of the Sample	**Oven Dried**	Plastic Limit (%)	**15**
		Plasticity Index / PI (%)	**42**
		Linear Shrinkage (%)	**13.0**
		Condition upon Drying	**Linear**

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SOIL CLASSIFICATION REPORT

Client	SMEC	**Source**	BH15 2.5-2.95m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY, trace of Sand and Gravel
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102498-PI
Job No.	S24671-1	**Lab No.**	S102498

Test Procedure

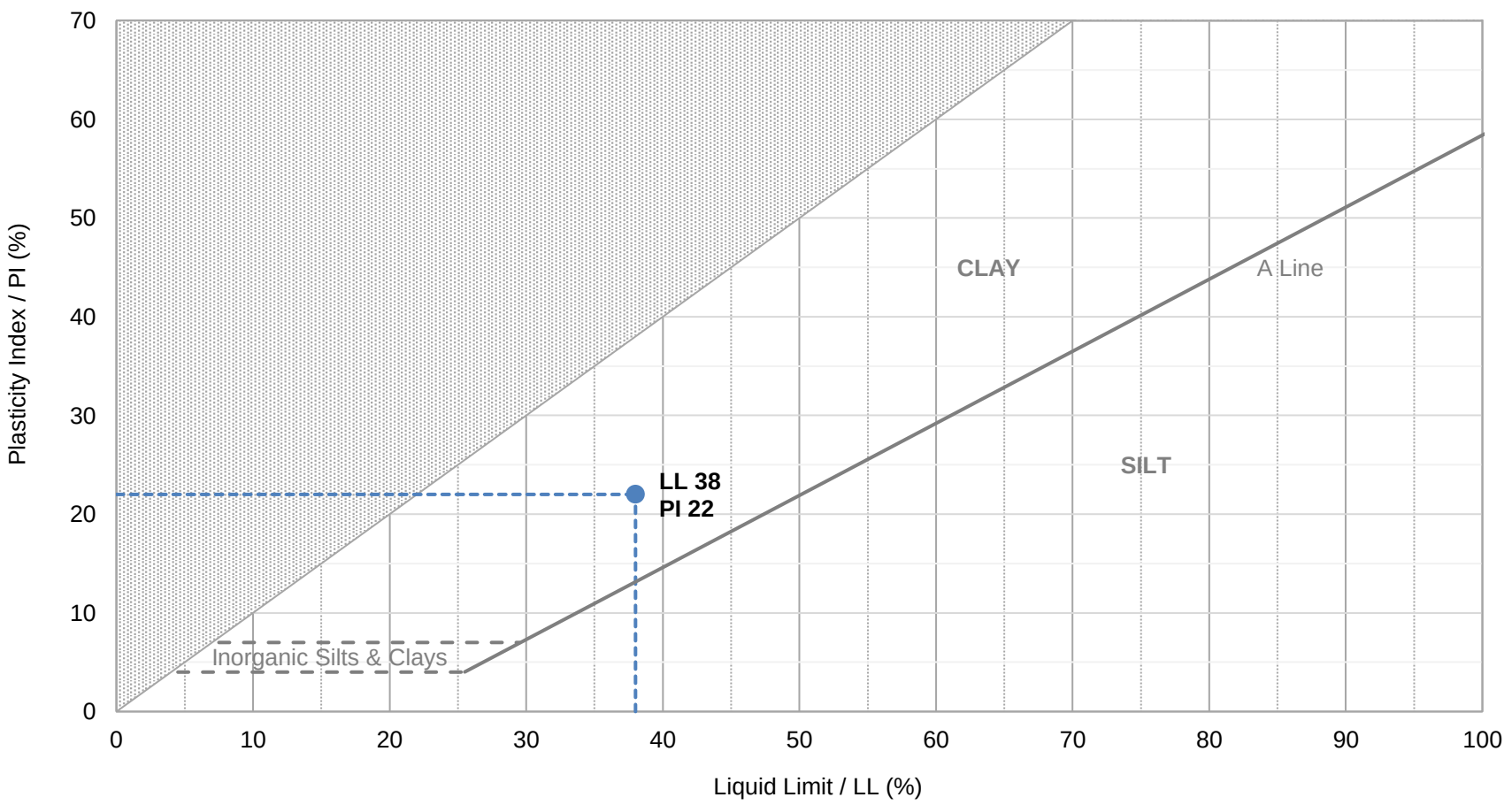
☑	AS1289 3.1.1	Liquid Limit - Four point Casagrande method
☐	AS1289 3.1.2	Liquid Limit - One point Casagrande method
☑	AS1289 3.2.1	Plastic Limit - Standard method
☑	AS1289 3.3.1	Calculation of the Plasticity Index
☑	AS1289 3.4.1	Linear Shrinkage - Standard method

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 5/02/2025

Plasticity Chart for Classification of Fine-Grained Soils

AS 1726:2017 Clause 6.1.6 (Figure 5)



Preparation

Method of Preparation	**Dry Sieved**
History of the Sample	**Oven Dried**

Results

Liquid Limit / LL (%)	**38**
Plastic Limit (%)	**16**
Plasticity Index / PI (%)	**22**
Linear Shrinkage (%)	**12.0**
Condition upon Drying	**Linear**

Notes

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11/02/2025

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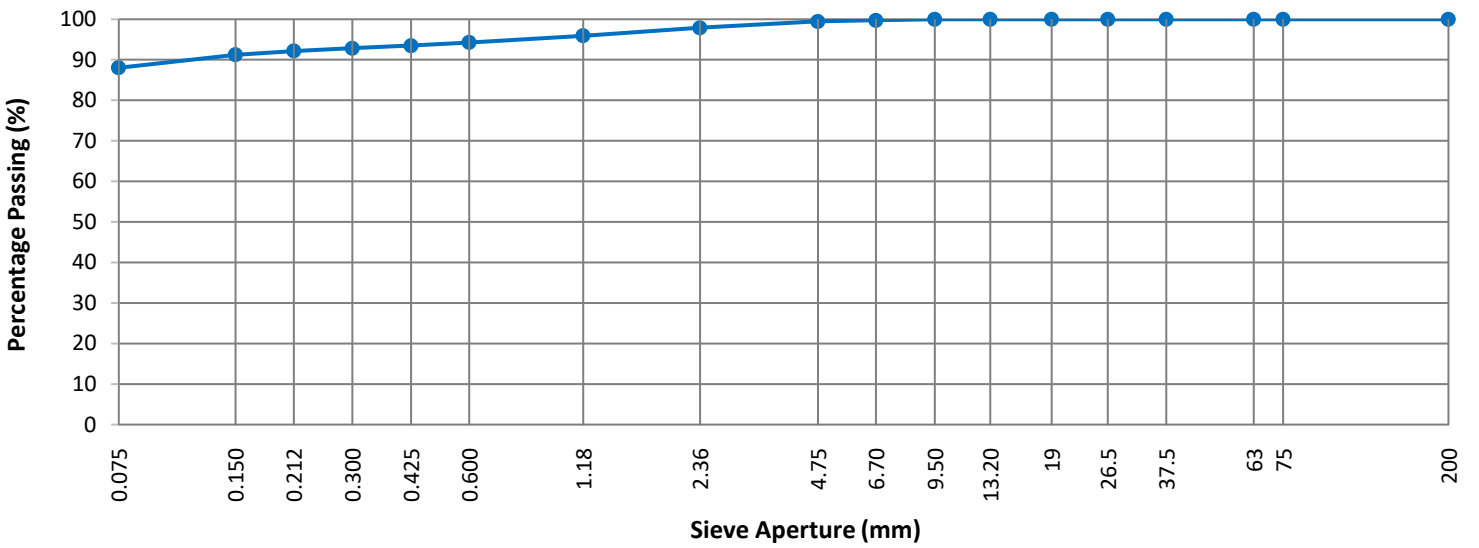
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Particle Size Distribution Report

Client	SMEC	**Source**	BH01 2.5-2.76m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY, trace of Sand and Gravel
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102493-PSD
Job No	S24671-1	**Lab No**	S102493

Test Procedure	AS 1289.3.6.1 Determination of the particle size distribution of a soil - Standard method of analysis by sieving		
Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	Unknown
Preparation	Prepared in accordance with the test method	**Date Tested**	4/02/2025



Sieve Aperture (mm)	Percentage Passing (%)
200	**100**
75	**100**
63	**100**
37.5	**100**
26.5	**100**
19.0	**100**
13.2	**100**
9.50	**100**
6.70	**100**
4.75	**99**
2.36	**98**

Sieve Aperture (mm)	Percentage Passing (%)
1.18	**96**
0.600	**94**
0.425	**93**
0.300	**93**
0.212	**92**
0.150	**91**
0.075	**88**

Notes

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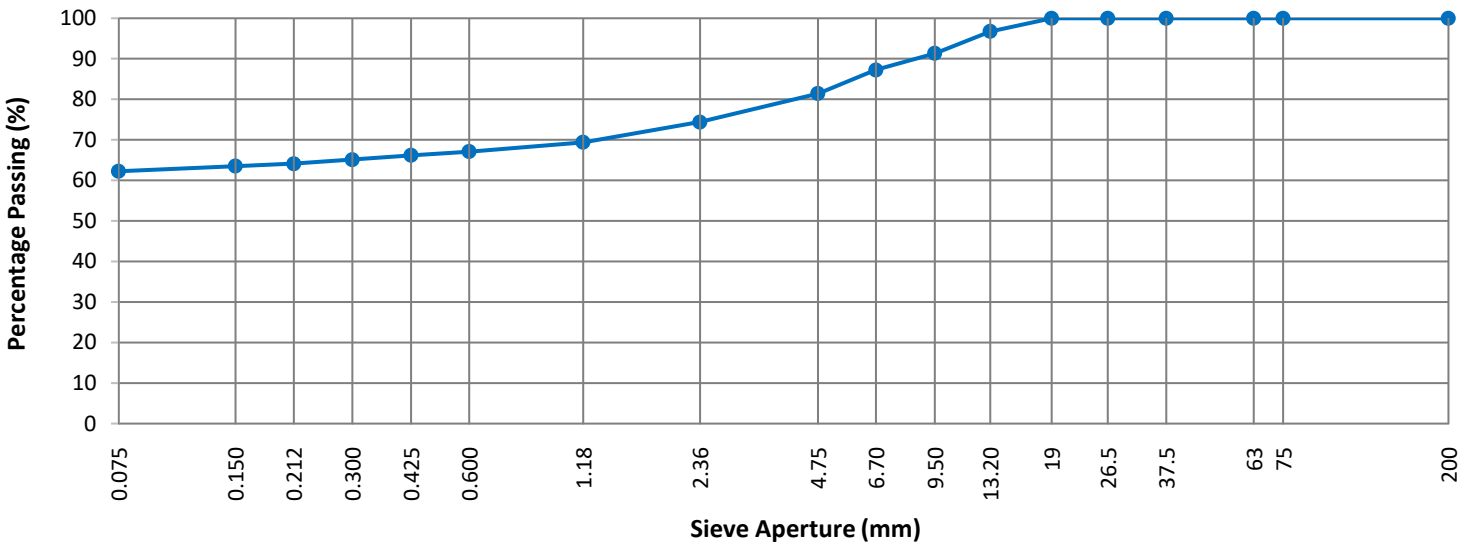
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Particle Size Distribution Report

Client	SMEC	**Source**	BH07 3-3.5m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY with Gravel, trace of Sand
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102713-PSD
Job No	S24671-2	**Lab No**	S102713

Test Procedure	AS 1289.3.6.1 Determination of the particle size distribution of a soil - Standard method of analysis by sieving		
Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	Unknown
Preparation	Prepared in accordance with the test method	**Date Tested**	4/02/2025



Sieve Aperture (mm)	Percentage Passing (%)
200	**100**
75	**100**
63	**100**
37.5	**100**
26.5	**100**
19.0	**100**
13.2	**97**
9.50	**91**
6.70	**87**
4.75	**81**
2.36	**74**

Sieve Aperture (mm)	Percentage Passing (%)
1.18	**69**
0.600	**67**
0.425	**66**
0.300	**65**
0.212	**64**
0.150	**64**
0.075	**62**

Notes

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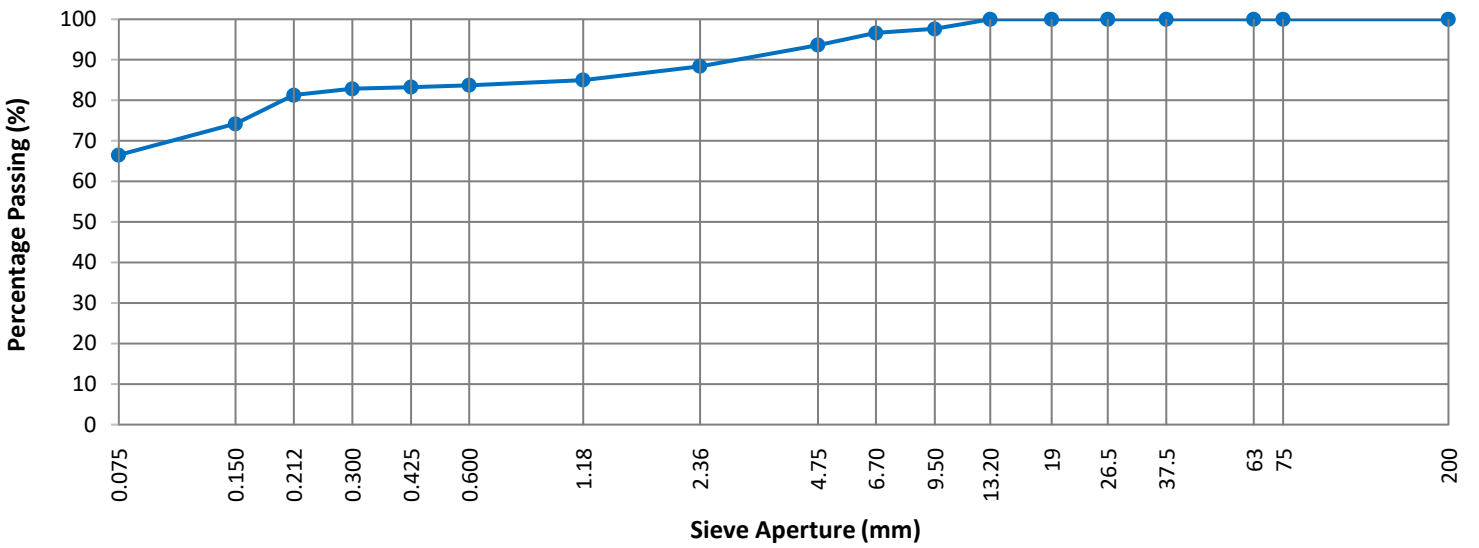
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Particle Size Distribution Report

Client	SMEC	**Source**	BH13 1-1.45m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY with Sand, trace of Gravel
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102719-PSD
Job No	S24671-2	**Lab No**	S102719

Test Procedure	AS 1289.3.6.1 Determination of the particle size distribution of a soil - Standard method of analysis by sieving		
Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	Unknown
Preparation	Prepared in accordance with the test method	**Date Tested**	4/02/2025



Sieve Aperture (mm)	Percentage Passing (%)
200	**100**
75	**100**
63	**100**
37.5	**100**
26.5	**100**
19.0	**100**
13.2	**100**
9.50	**98**
6.70	**97**
4.75	**94**
2.36	**88**

Sieve Aperture (mm)	Percentage Passing (%)
1.18	**85**
0.600	**84**
0.425	**83**
0.300	**83**
0.212	**81**
0.150	**74**
0.075	**67**

Notes

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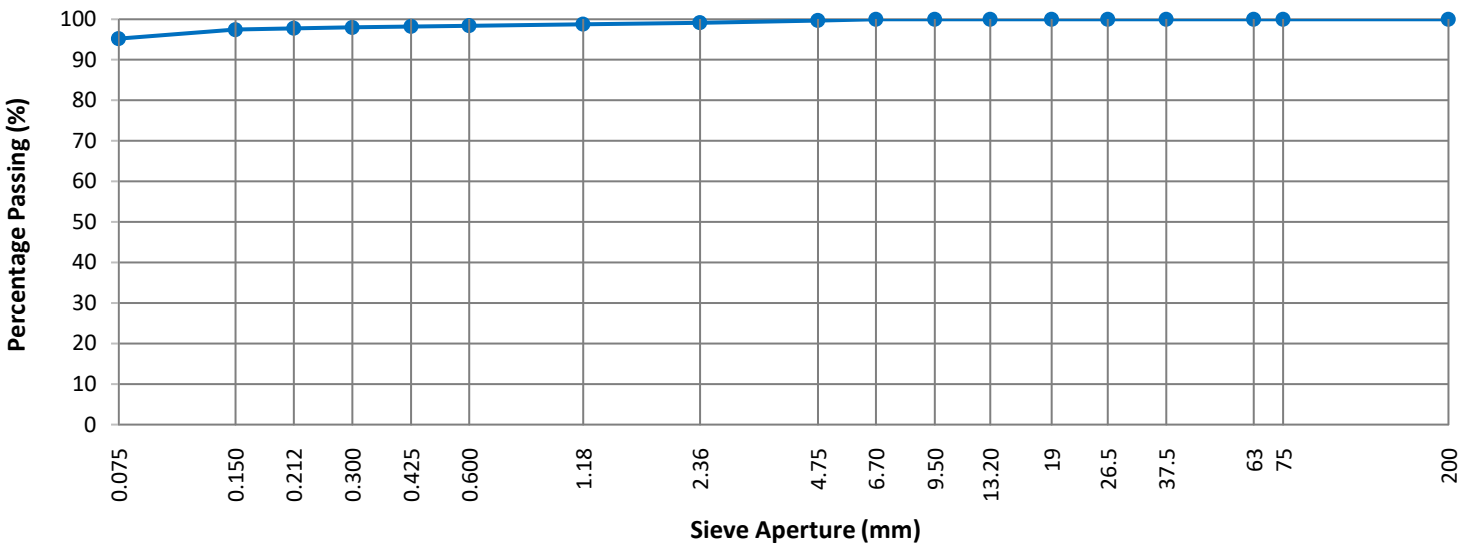
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Particle Size Distribution Report

Client	SMEC	**Source**	BH15 2.5-2.95m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY, trace of Sand and Gravel
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102498-PSD
Job No	S24671-1	**Lab No**	S102498

Test Procedure	AS 1289.3.6.1 Determination of the particle size distribution of a soil - Standard method of analysis by sieving		
Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	Unknown
Preparation	Prepared in accordance with the test method	**Date Tested**	29/01/2025



Sieve Aperture (mm)	Percentage Passing (%)
200	**100**
75	**100**
63	**100**
37.5	**100**
26.5	**100**
19.0	**100**
13.2	**100**
9.50	**100**
6.70	**100**
4.75	**100**
2.36	**99**

Sieve Aperture (mm)	Percentage Passing (%)
1.18	**99**
0.600	**98**
0.425	**98**
0.300	**98**
0.212	**98**
0.150	**97**
0.075	**95**

Notes

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Authorised Signatory: Date: 29/01/2025

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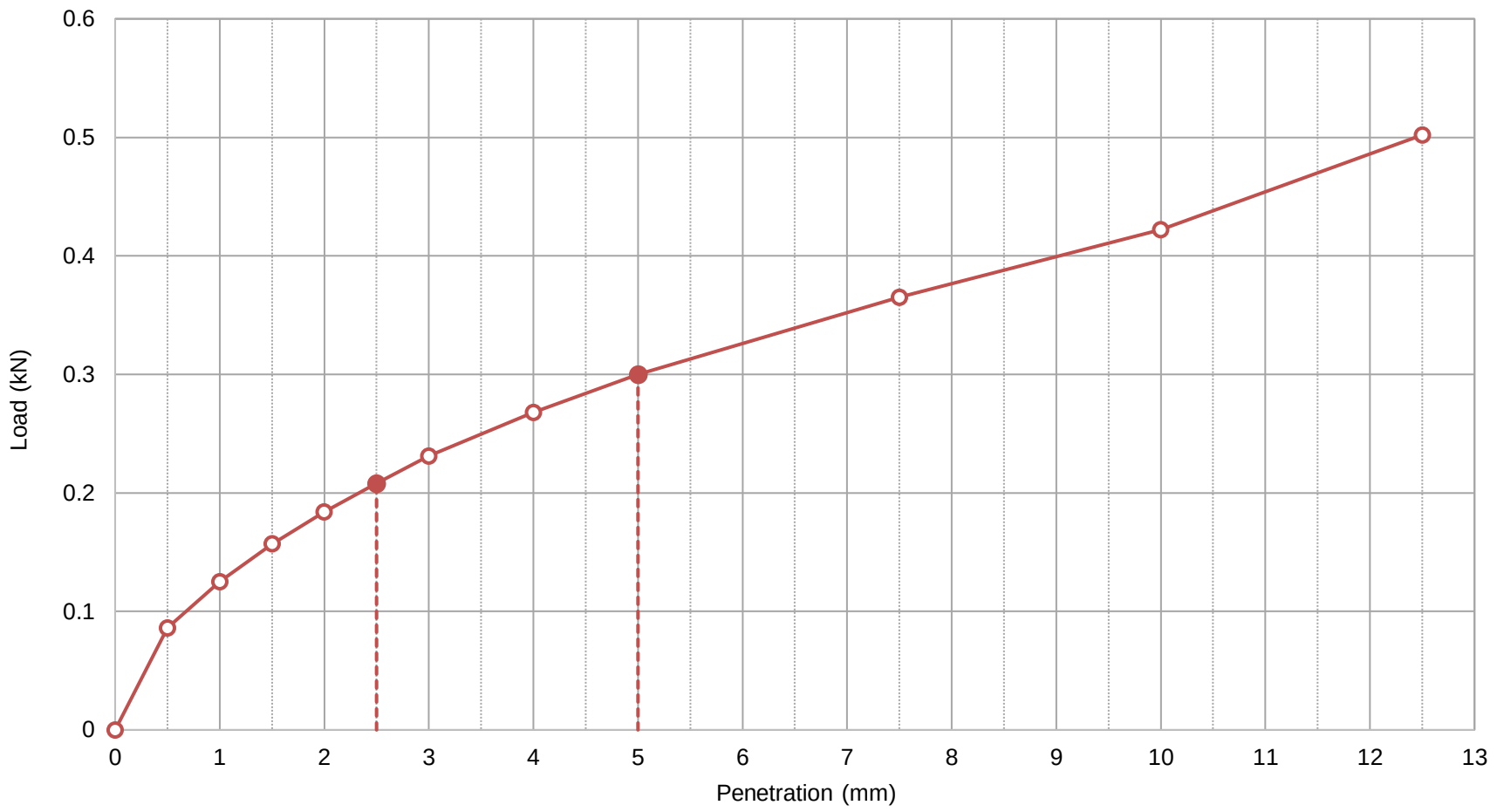
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CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	BH02 0.8-1.4m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102494-CBR
Job No.	S24671-1	**Sample No.**	S102494

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling	Sampled by Client - results apply to the sample as received	**Date Sampled**	Unknown
Preparation	Prepared in accordance with the test method	**Date Tested**	4/02/2025



Preparation & Specification	
Retained on 19.0mm Sieve (%)	0
Method of Establishing Plasticity Level	Technician Assessment
Sample Curing Time (hrs)	239 hrs
Compaction Hammer Used	Standard
Surcharge Mass Applied (kg)	4.5
Period of Soaking (Days)	4
Maximum Dry Density - MDD (t/m³)	1.74
Optimum Moisture Content - OMC (%)	17.8

Density & Moisture	Achieved	Target
Lab Moisture Ratio - LMR (%)	100.5	100.0
Lab Density Ratio - LDR (%)	100.0	100.0
Dry Density - At Compaction (t/m³)	1.74	1.74
Dry Density - After Soaking (t/m³)	1.65	
Specimen Swell (%)	5.8	
Moisture Content - At Compaction (%)	17.9	
Moisture Content - Top 30mm (%)	31.0	
Moisture Content - Remainder (%)	20.4	

Material CBR Value (%): 1.5 at a penetration of 2.5 mm

Notes

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Authorised Signatory:

6/02/2025

Chris Lloyd Date:

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	BH02 0.8-1.4m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102494-MDD
Job No	S24671-1	**Sample No**	S102494

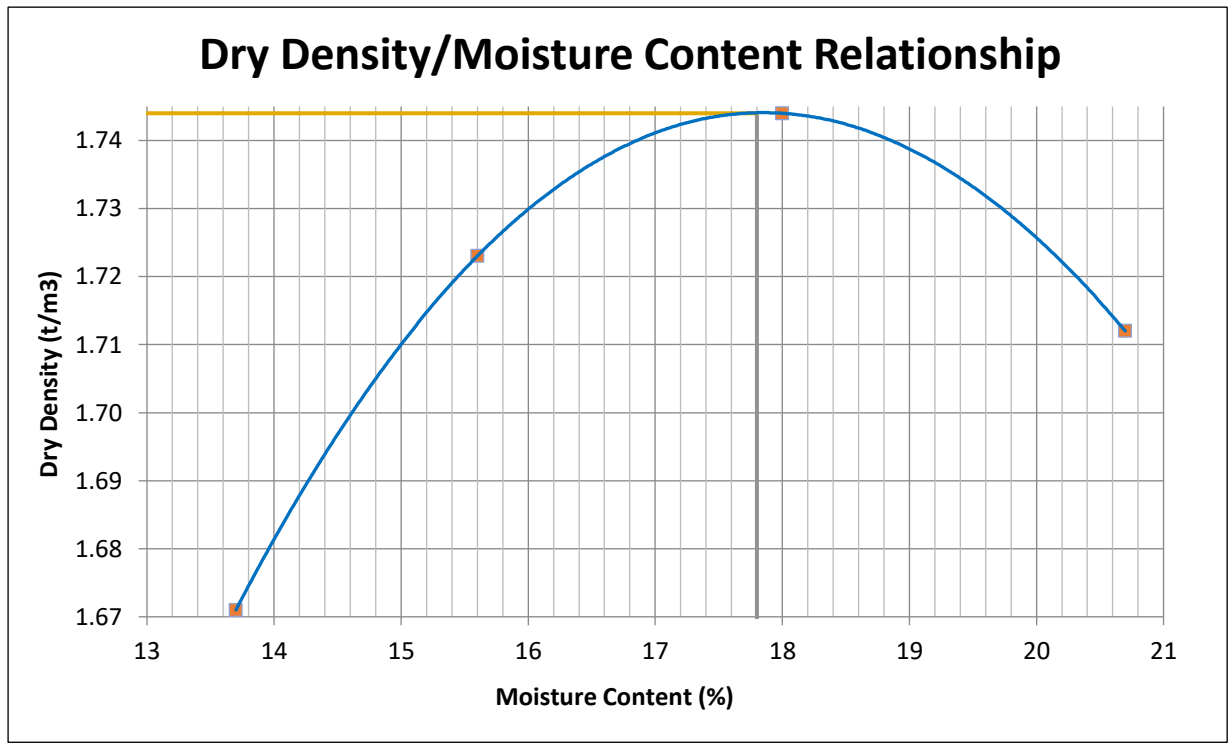
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 20/01/2025



Maximum Dry Density (t/m^3)	1.74
Optimum Moisture Content (%)	17.8
Oversize Retained on 19mm sieve (%)	0
Oversize Retained on 37.5mm sieve (%)	0
Curing Time	98 hrs
Liquid Limit Determination	Technician Assessment

Notes

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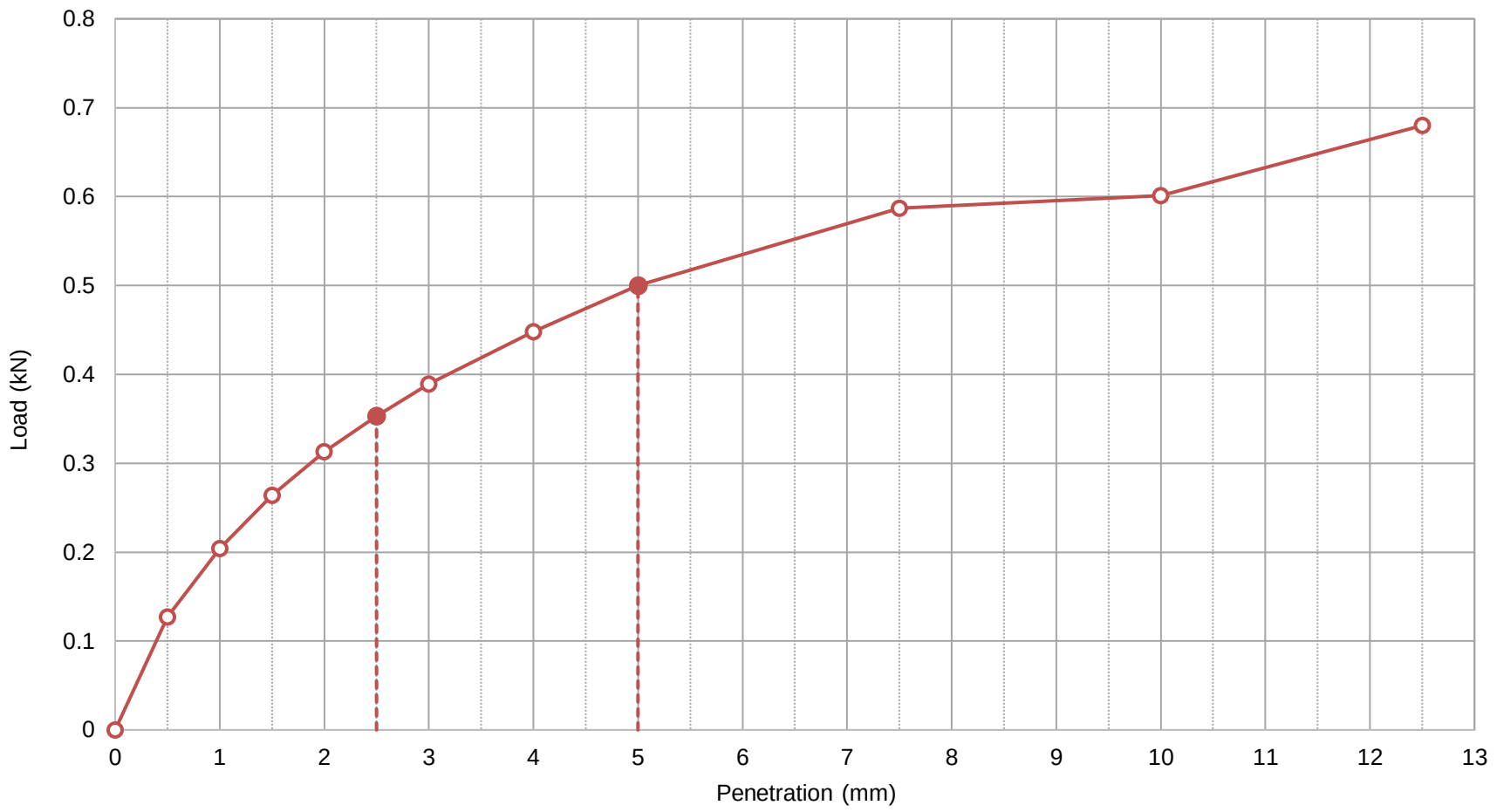
CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	BH11 0.6-1m & 1.6-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102505-CBR
Job No.	S24671-1	**Sample No.**	S102505

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 10/02/2025



Preparation & Specification	
Retained on 19.0mm Sieve (%)	0
Method of Establishing Plasticity Level	Technician Assessment
Sample Curing Time (hrs)	188 hrs
Compaction Hammer Used	Standard
Surcharge Mass Applied (kg)	4.5
Period of Soaking (Days)	4
Maximum Dry Density - MDD (t/m³)	1.65
Optimum Moisture Content - OMC (%)	20.4

Density & Moisture	Achieved	Target
Lab Moisture Ratio - LMR (%)	100.0	100.0
Lab Density Ratio - LDR (%)	100.0	100.0
Dry Density - At Compaction (t/m³)	1.65	1.65
Dry Density - After Soaking (t/m³)	1.61	
Specimen Swell (%)	2.6	
Moisture Content - At Compaction (%)	20.4	
Moisture Content - Top 30mm (%)	27.4	
Moisture Content - Remainder (%)	23.3	

Material CBR Value (%): 2.5 at a penetration of 2.5 mm

Notes

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Authorised Signatory:

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	BH11 0.6-1m & 1.6-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102505-MDD
Job No	S24671-1	**Sample No**	S102505

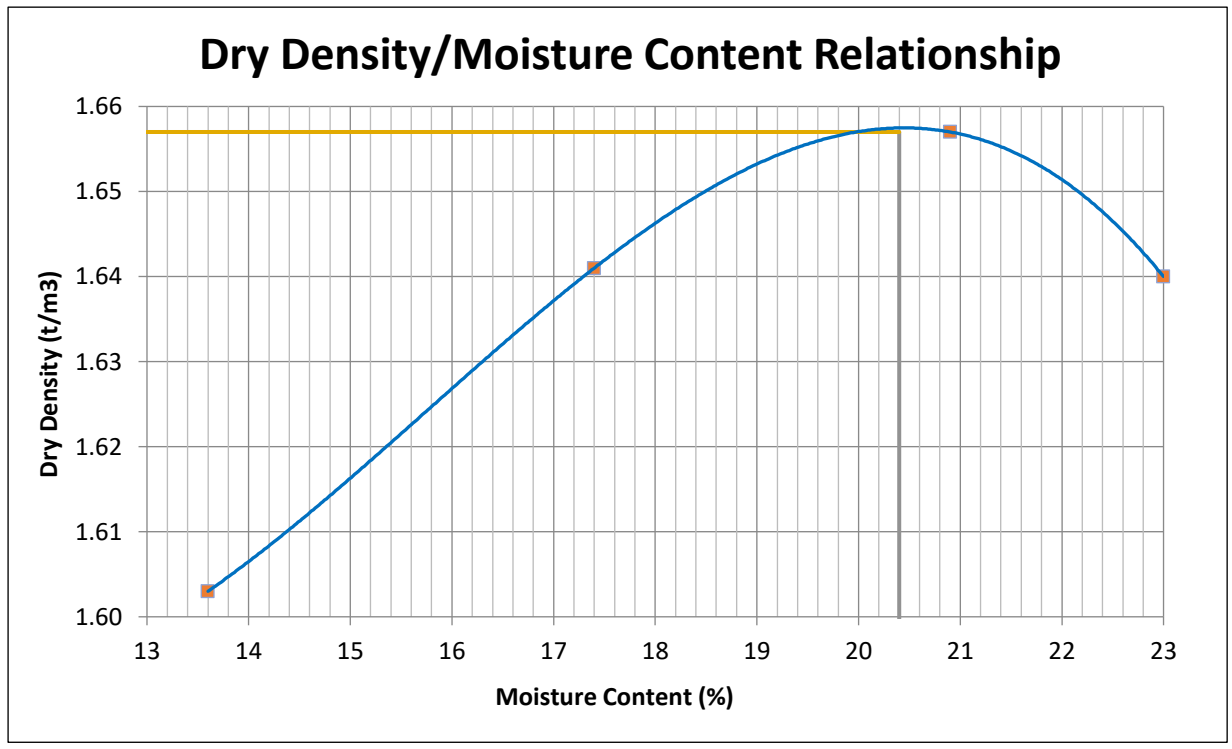
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 29/01/2025



Maximum Dry Density (t/m^3)	1.65
Optimum Moisture Content (%)	20.4
Oversize Retained on 19mm sieve (%)	0
Oversize Retained on 37.5mm sieve (%)	0
Curing Time	213 hrs
Liquid Limit Determination	Technician Assessment

Notes

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NATA Accredited Laboratory Number: 14874

Authorised Signatory:

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6/02/2025

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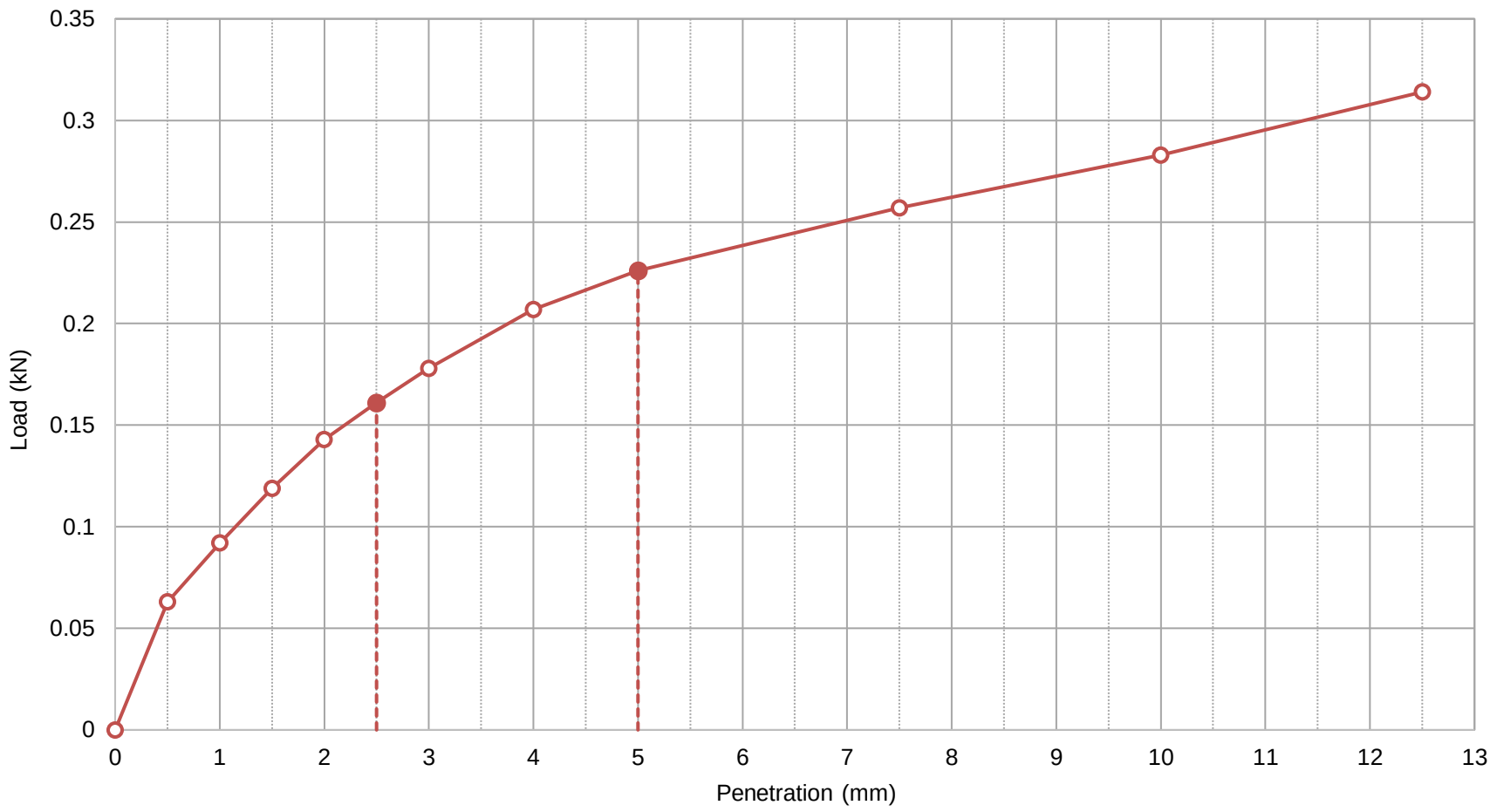
CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	BH14 0.6-1m & 1.6-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102502-CBR
Job No.	S24671-1	**Sample No.**	S102502

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 4/02/2025



Preparation & Specification		Density & Moisture	Achieved	Target
Retained on 19.0mm Sieve (%)	0	Lab Moisture Ratio - LMR (%)	99.5	100.0
Method of Establishing Plasticity Level	Technician Assessment	Lab Density Ratio - LDR (%)	100.0	100.0
Sample Curing Time (hrs)	165 hrs	Dry Density - At Compaction (t/m³)	1.68	1.68
Compaction Hammer Used	Standard	Dry Density - After Soaking (t/m³)	1.58	
Surcharge Mass Applied (kg)	4.5	Specimen Swell (%)	6.2	
Period of Soaking (Days)	4	Moisture Content - At Compaction (%)	20.1	
Maximum Dry Density - MDD (t/m³)	1.68	Moisture Content - Top 30mm (%)	33.6	
Optimum Moisture Content - OMC (%)	20.2	Moisture Content - Remainder (%)	22.6	

Material CBR Value (%): 1 at a penetration of 2.5 mm

Notes

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Authorised Signatory:

Chris Lloyd Date: 6/02/2025

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	BH14 0.6-1m & 1.6-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102502-MDD
Job No	S24671-1	**Sample No**	S102502

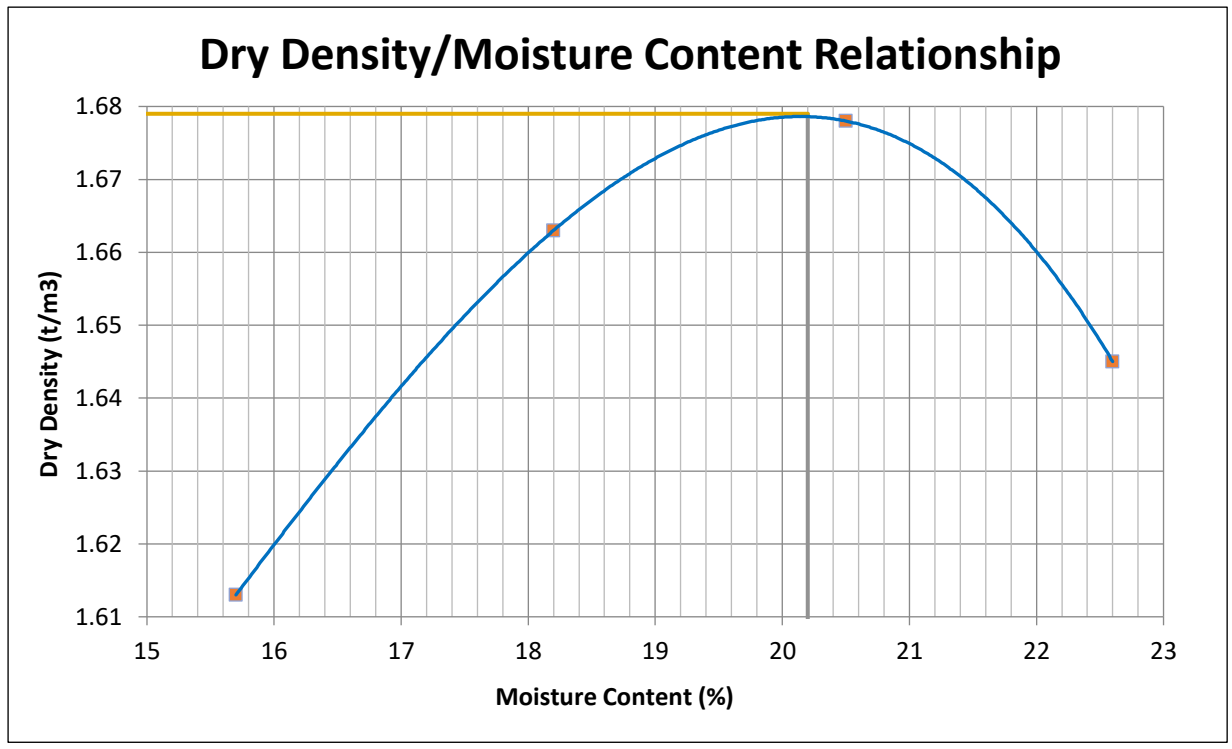
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 23/01/2025



Maximum Dry Density (t/m^3)	1.68
Optimum Moisture Content (%)	20.2
Oversize Retained on 19mm sieve (%)	0
Oversize Retained on 37.5mm sieve (%)	0
Curing Time	168 hrs
Liquid Limit Determination	Technician Assessment

Notes

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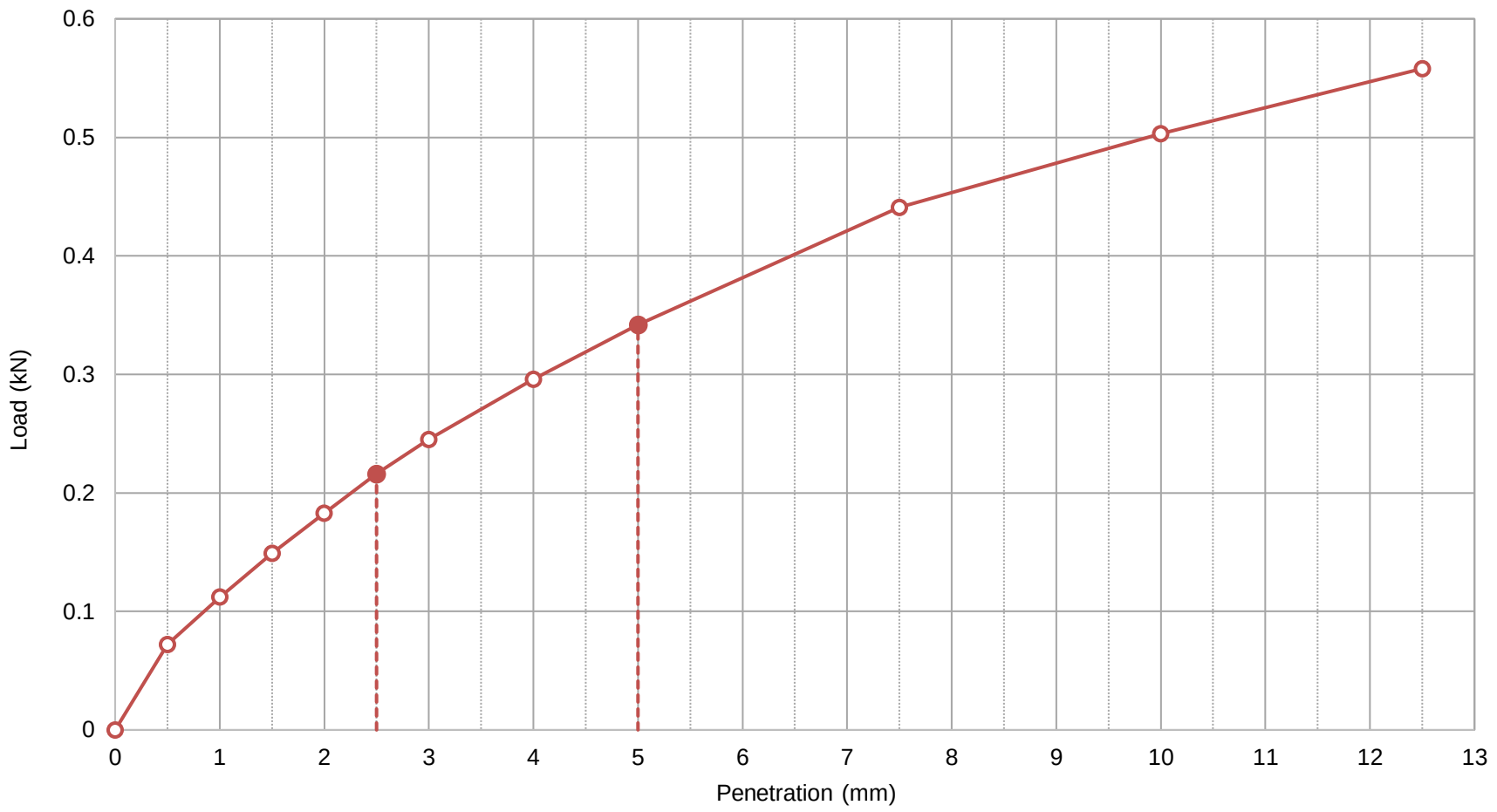
CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	BH15 1.2-1.7m & 1.7-2.2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102497-CBR
Job No.	S24671-1	**Sample No.**	S102497

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 10/02/2025



Preparation & Specification	
Retained on 19.0mm Sieve (%)	0
Method of Establishing Plasticity Level	Technician Assessment
Sample Curing Time (hrs)	145 hrs
Compaction Hammer Used	Standard
Surcharge Mass Applied (kg)	4.5
Period of Soaking (Days)	4
Maximum Dry Density - MDD (t/m³)	1.88
Optimum Moisture Content - OMC (%)	14.1

Density & Moisture	Achieved	Target
Lab Moisture Ratio - LMR (%)	100.0	100.0
Lab Density Ratio - LDR (%)	100.0	100.0
Dry Density - At Compaction (t/m³)	1.88	1.88
Dry Density - After Soaking (t/m³)	1.79	
Specimen Swell (%)	4.7	
Moisture Content - At Compaction (%)	14.1	
Moisture Content - Top 30mm (%)	21.3	
Moisture Content - Remainder (%)	16.6	

Material CBR Value (%): 1.5 at a penetration of 2.5 mm

Notes

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	BH15 1.2-1.7m & 1.7-2.2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102497-MDD
Job No	S24671-1	**Sample No**	S102497

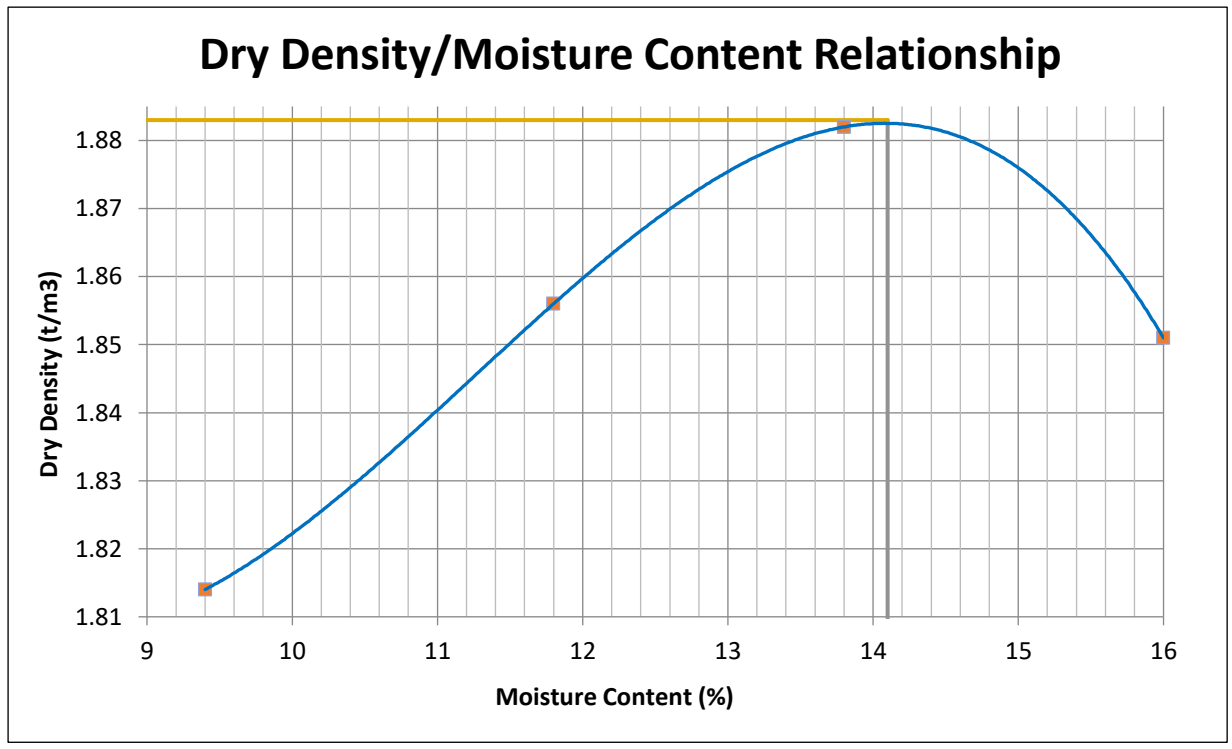
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 29/01/2025



Maximum Dry Density (t/m^3)	1.88
Optimum Moisture Content (%)	14.1
Oversize Retained on 19mm sieve (%)	0
Oversize Retained on 37.5mm sieve (%)	0
Curing Time	187 hrs
Liquid Limit Determination	Technician Assessment

Notes

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Authorised Signatory:

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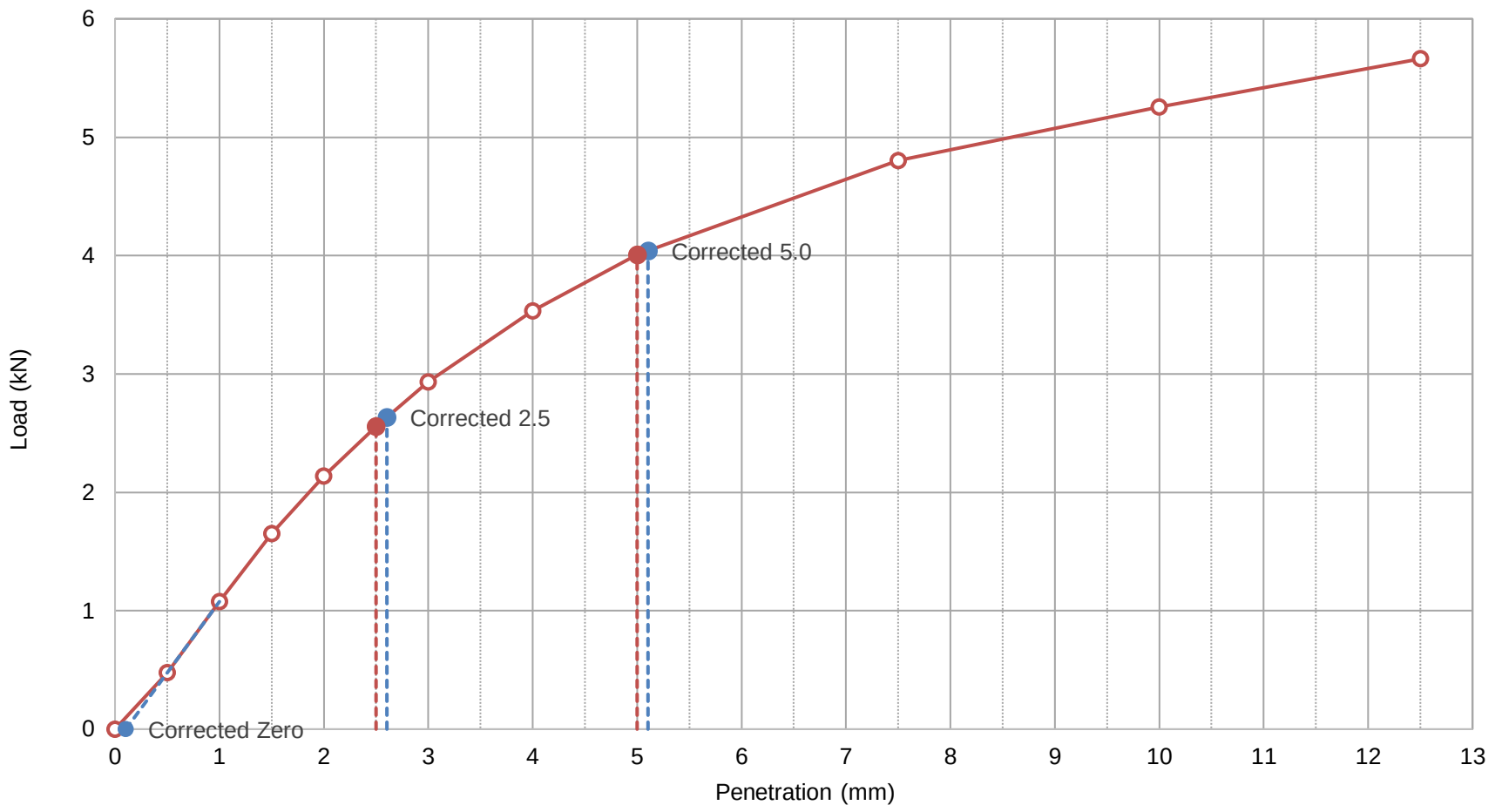
CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	TP01 0.6-1m & 0.8-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Gravelly SILT
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102504-CBR
Job No.	S24671-1	**Sample No.**	S102504

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 4/02/2025



Preparation & Specification	
Retained on 19.0mm Sieve (%)	6
Method of Establishing Plasticity Level	Technician Assessment
Sample Curing Time (hrs)	70 hrs
Compaction Hammer Used	Standard
Surcharge Mass Applied (kg)	4.5
Period of Soaking (Days)	4
Maximum Dry Density - MDD (t/m³)	1.93
Optimum Moisture Content - OMC (%)	11.5

Density & Moisture	Achieved	Target
Lab Moisture Ratio - LMR (%)	99.0	100.0
Lab Density Ratio - LDR (%)	100.0	100.0
Dry Density - At Compaction (t/m³)	1.93	1.93
Dry Density - After Soaking (t/m³)	1.92	
Specimen Swell (%)	0.2	
Moisture Content - At Compaction (%)	11.4	
Moisture Content - Top 30mm (%)	15.2	
Moisture Content - Remainder (%)	12.4	

Material CBR Value (%): 20 at a penetration of 2.5 mm

Notes

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	TP01 0.6-1m & 0.8-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Gravelly SILT
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102504-MDD
Job No	S24671-1	**Sample No**	S102504

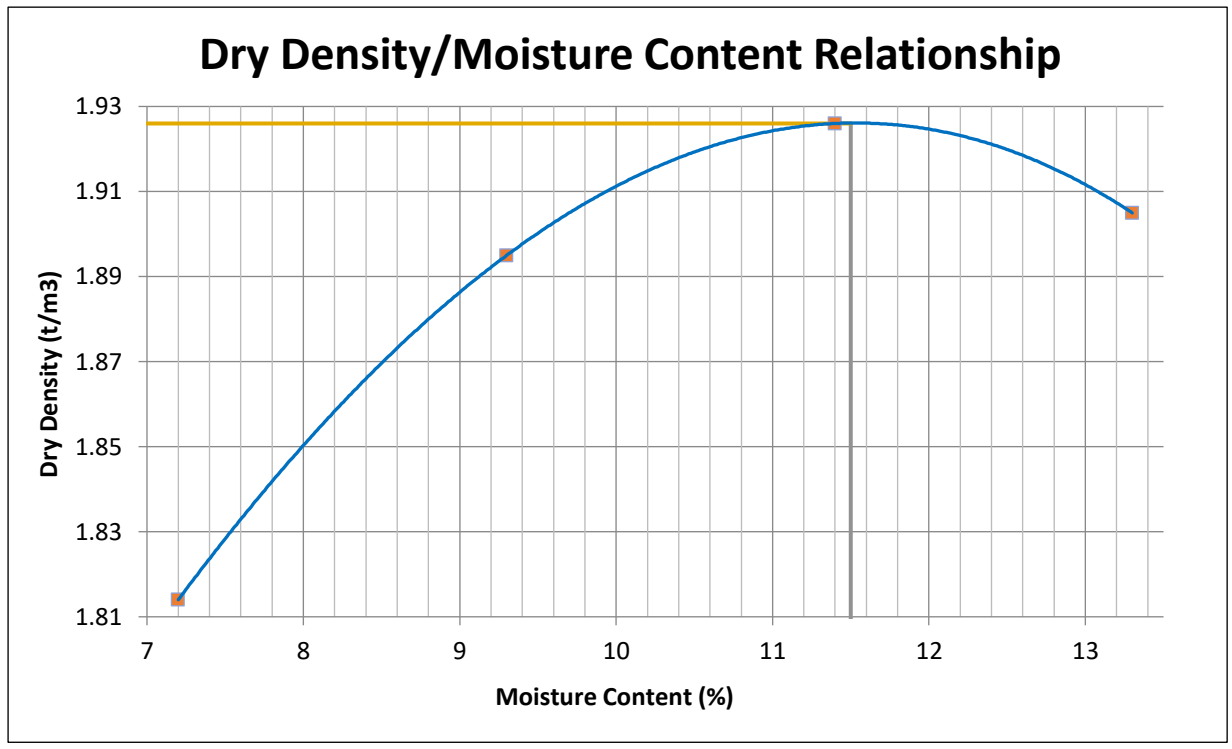
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 24/01/2025



Maximum Dry Density (t/m^3)	1.93
Optimum Moisture Content (%)	11.5
Oversize Retained on 19mm sieve (%)	6
Oversize Retained on 37.5mm sieve (%)	1
Curing Time	49 hrs
Liquid Limit Determination	Technician Assessment

Notes

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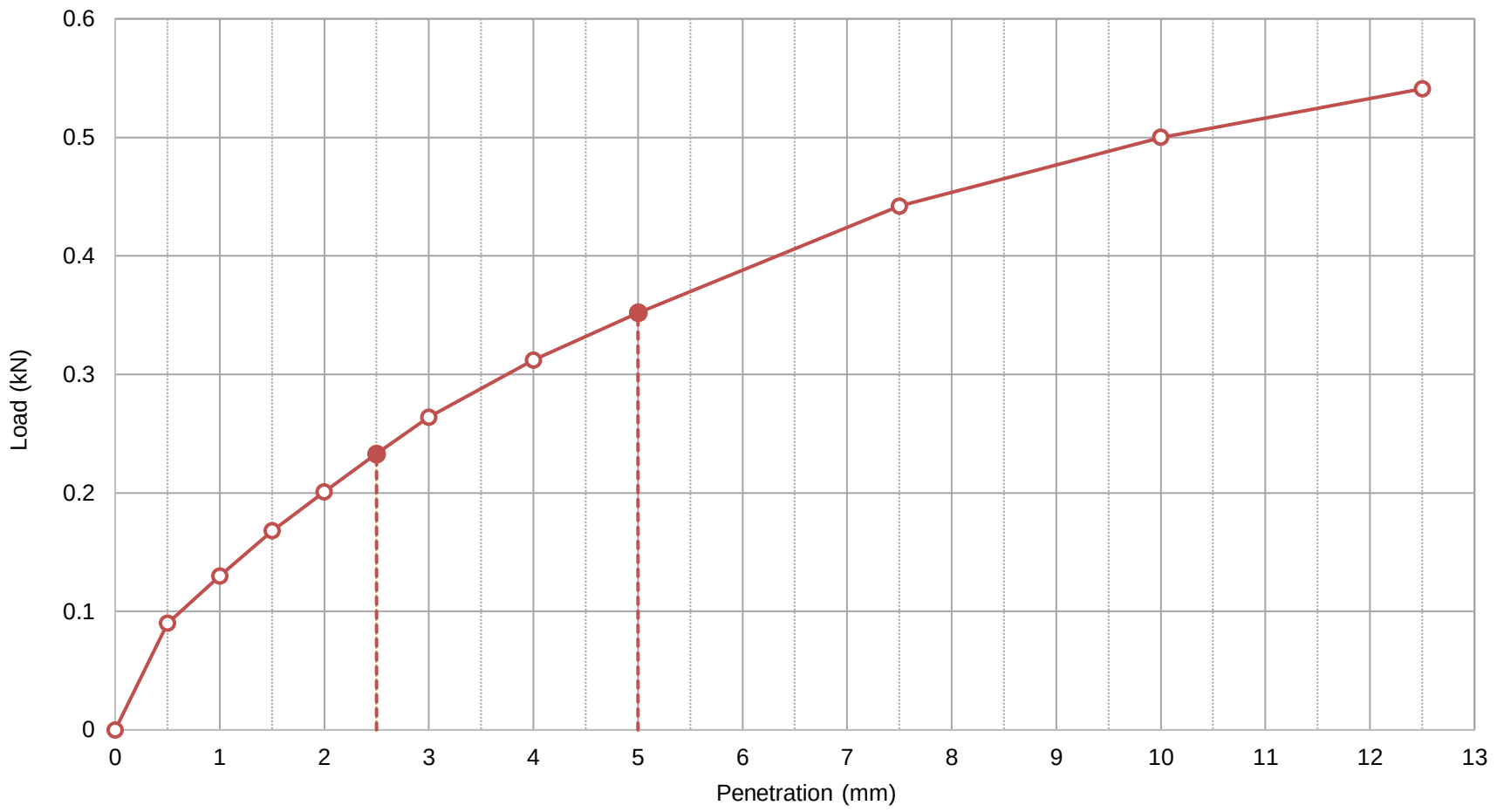
CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	TP02 1-1.5m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Gravelly Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102500-CBR
Job No.	S24671-1	**Sample No.**	S102500

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 4/02/2025



Preparation & Specification		Density & Moisture	Achieved	Target
Retained on 19.0mm Sieve (%)	1	Lab Moisture Ratio - LMR (%)	101.5	100.0
Method of Establishing Plasticity Level	Technician Assessment	Lab Density Ratio - LDR (%)	100.0	100.0
Sample Curing Time (hrs)	240 hrs	Dry Density - At Compaction (t/m³)	1.74	1.74
Compaction Hammer Used	Standard	Dry Density - After Soaking (t/m³)	1.63	
Surcharge Mass Applied (kg)	4.5	Specimen Swell (%)	6.5	
Period of Soaking (Days)	4	Moisture Content - At Compaction (%)	18.8	
Maximum Dry Density - MDD (t/m³)	1.74	Moisture Content - Top 30mm (%)	31.6	
Optimum Moisture Content - OMC (%)	18.5	Moisture Content - Remainder (%)	21.7	

Material CBR Value (%): 2 at a penetration of 2.5 mm

Notes

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Authorised Signatory:

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	TP02 1-1.5m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Gravelly Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102500-MDD
Job No	S24671-1	**Sample No**	S102500

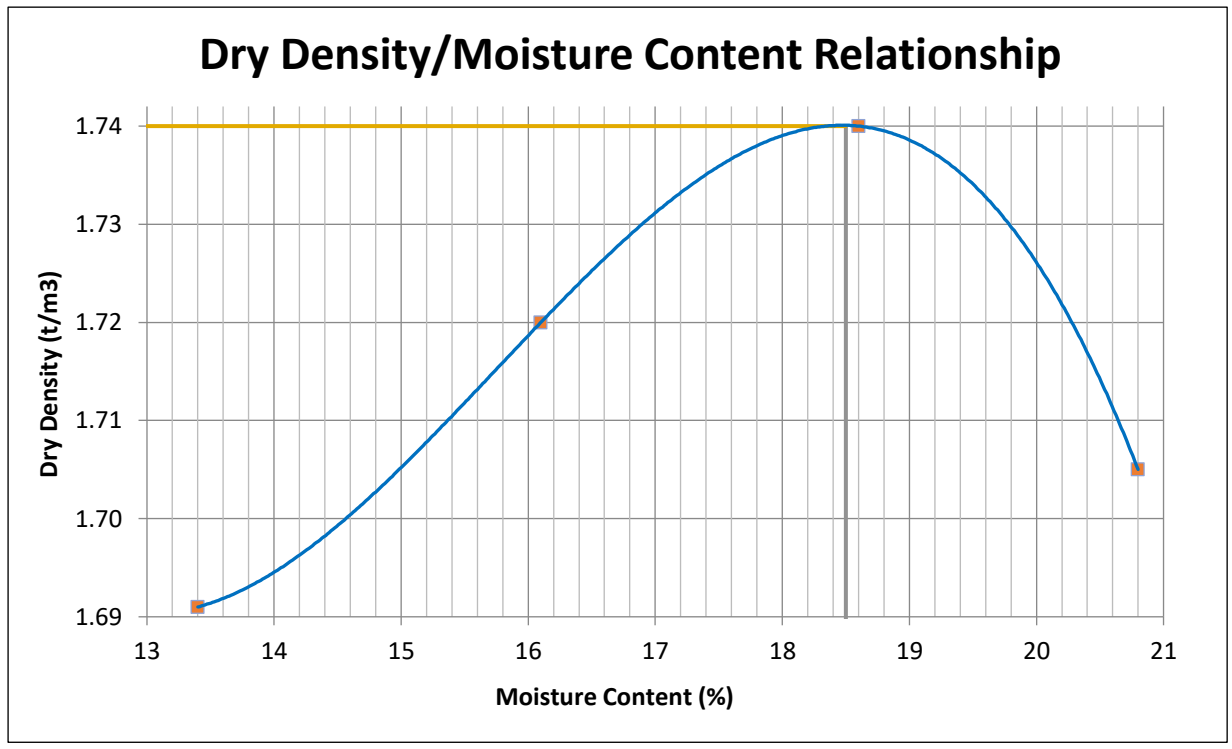
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 20/01/2025



Maximum Dry Density (t/m^3)	1.74
Optimum Moisture Content (%)	18.5
Oversize Retained on 19mm sieve (%)	1
Oversize Retained on 37.5mm sieve (%)	0
Curing Time	91 hrs
Liquid Limit Determination	Technician Assessment

Notes

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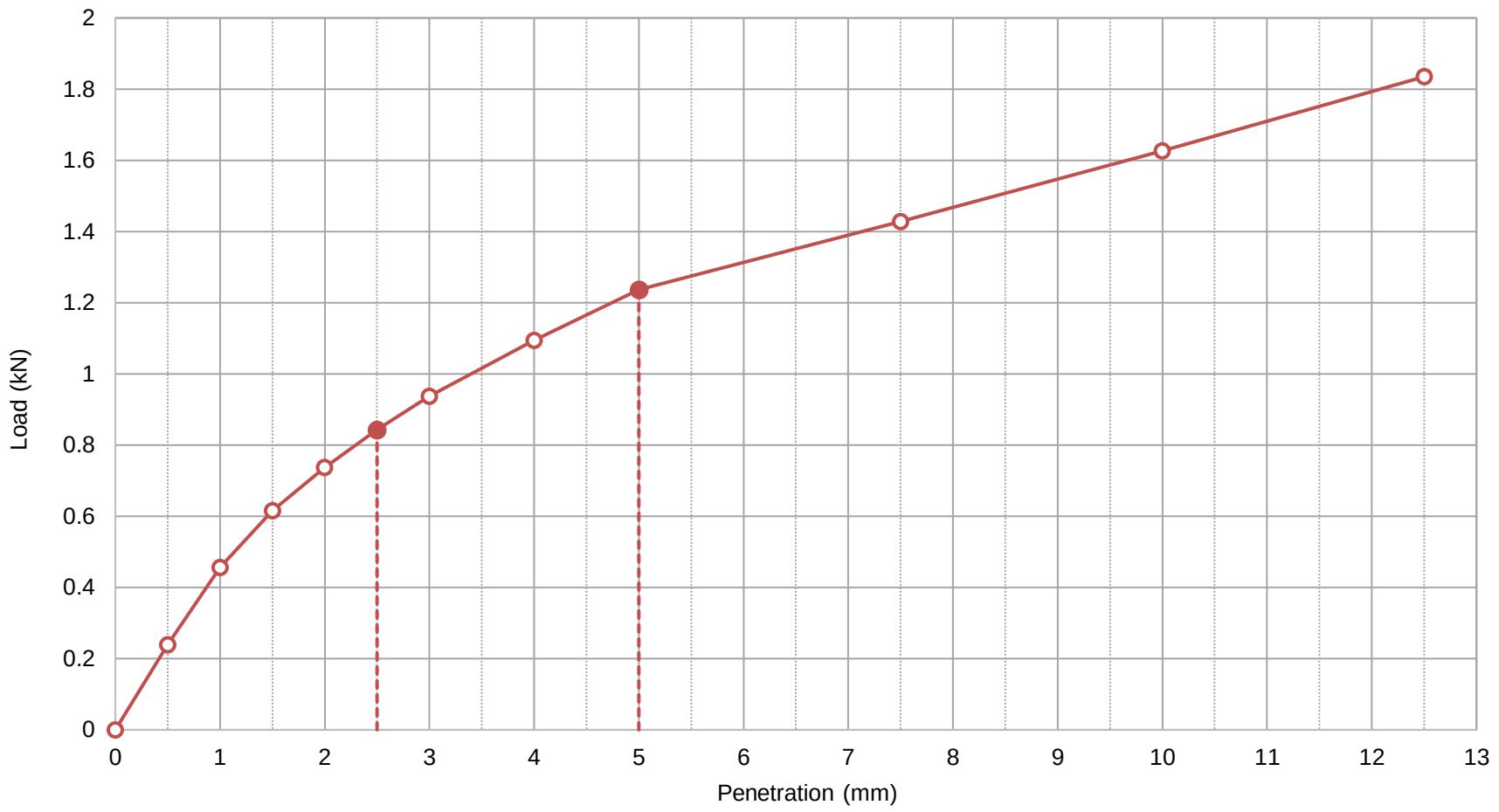
CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	TP03 1.2-1.7m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102501-CBR
Job No.	S24671-1	**Sample No.**	S102501

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 4/02/2025



Preparation & Specification		Density & Moisture	Achieved	Target
Retained on 19.0mm Sieve (%)	0	Lab Moisture Ratio - LMR (%)	98.5	100.0
Method of Establishing Plasticity Level	Technician Assessment	Lab Density Ratio - LDR (%)	100.0	100.0
Sample Curing Time (hrs)	191 hrs	Dry Density - At Compaction (t/m³)	1.79	1.78
Compaction Hammer Used	Standard	Dry Density - After Soaking (t/m³)	1.77	
Surcharge Mass Applied (kg)	4.5	Specimen Swell (%)	1.1	
Period of Soaking (Days)	4	Moisture Content - At Compaction (%)	17.6	
Maximum Dry Density - MDD (t/m³)	1.78	Moisture Content - Top 30mm (%)	22.2	
Optimum Moisture Content - OMC (%)	17.9	Moisture Content - Remainder (%)	17.8	

Material CBR Value (%): 6 at a penetration of 2.5 mm

Notes

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	TP03 1.2-1.7m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102501-MDD
Job No	S24671-1	**Sample No**	S102501

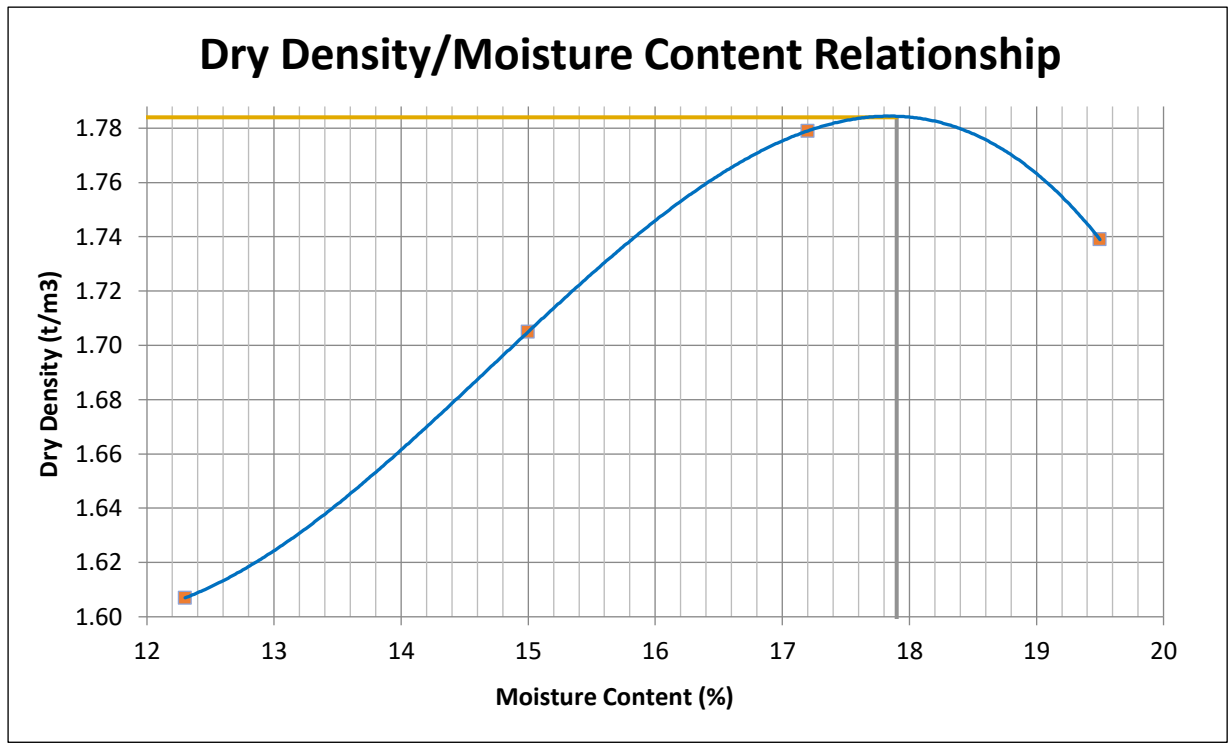
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 21/01/2025



Maximum Dry Density (t/m^3)	1.78
Optimum Moisture Content (%)	17.9
Oversize Retained on 19mm sieve (%)	0
Oversize Retained on 37.5mm sieve (%)	0
Curing Time	96 hrs
Liquid Limit Determination	Technician Assessment

Notes

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Authorised Signatory:

Chris Lloyd

22/01/2025

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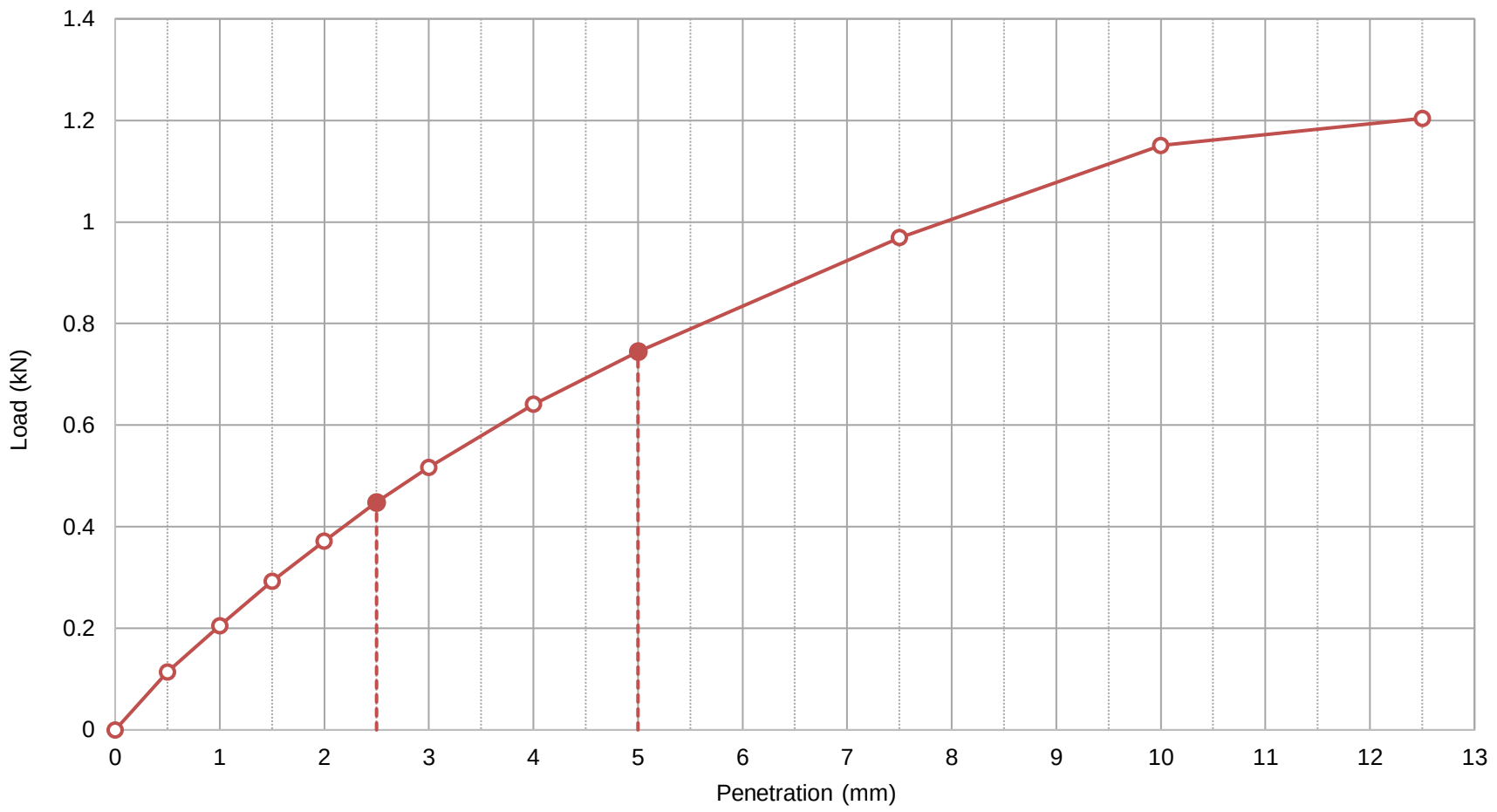
CALIFORNIA BEARING RATIO REPORT

Client	SMEC	**Source**	TP120 0.6-1m & 1.6-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty Gravelly CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No.**	S102503-CBR
Job No.	S24671-1	**Sample No.**	S102503

Test Procedure	☑ AS 1289.6.1.1	☐ RMS T117	California Bearing Ratio
	☑ AS 1289.5.1.1	☐ RMS T111	Dry Density / Moisture Content Relationship - Standard Compaction
	☐ AS 1289.5.2.1	☐ RMS T112	Dry Density / Moisture Content Relationship - Modified Compaction
	☑ AS 1289.2.1.1	☐ RMS T120	Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 4/02/2025



Preparation & Specification	
Retained on 19.0mm Sieve (%)	15
Method of Establishing Plasticity Level	Technician Assessment
Sample Curing Time (hrs)	165 hrs
Compaction Hammer Used	Standard
Surcharge Mass Applied (kg)	4.5
Period of Soaking (Days)	4
Maximum Dry Density - MDD (t/m³)	1.79
Optimum Moisture Content - OMC (%)	16.9

Density & Moisture	Achieved	Target
Lab Moisture Ratio - LMR (%)	98.5	100.0
Lab Density Ratio - LDR (%)	100.0	100.0
Dry Density - At Compaction (t/m³)	1.79	1.79
Dry Density - After Soaking (t/m³)	1.73	
Specimen Swell (%)	3.6	
Moisture Content - At Compaction (%)	16.7	
Moisture Content - Top 30mm (%)	24.2	
Moisture Content - Remainder (%)	18.9	

Material CBR Value (%): 4 at a penetration of 5.0 mm

Notes

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Authorised Signatory:

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DRY DENSITY / OPTIMUM MOISTURE CONTENT REPORT

Client	SMEC	**Source**	TP120 0.6-1m & 1.6-2m
Address	Level 6, 3 Horwood Place, Parramatta NSW 2150	**Sample Description**	Silty Gravelly CLAY
Project	New Bankstown Hospital - 500 Chapel Road Bankstown (30013640)	**Report No**	S102503-MDD
Job No	S24671-1	**Sample No**	S102503

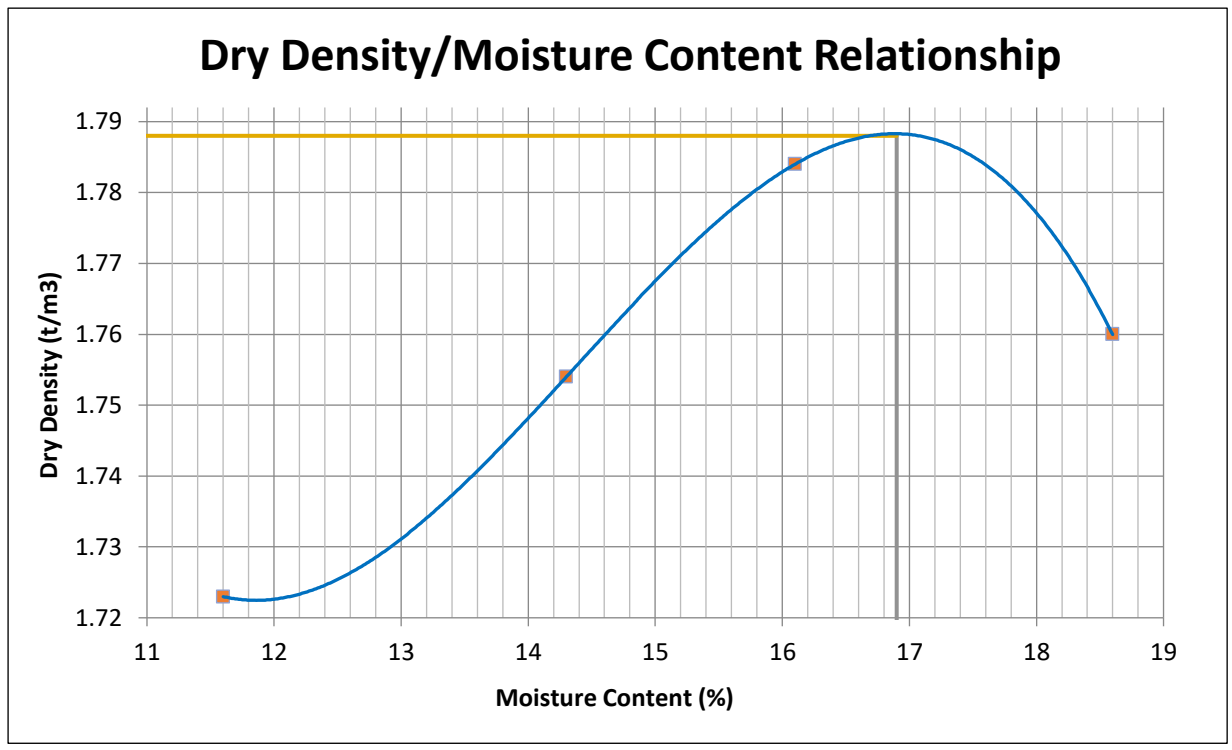
Test Procedure

☑ AS1289.5.1.1 Dry Density / Moisture Content Relationship - Standard Compaction

☑ AS1289.2.1.1 Moisture Content - Oven Drying Method (Standard Method)

Sampling Sampled by Client - results apply to the sample as received **Date Sampled** Unknown

Preparation Prepared in accordance with the test method **Date Tested** 23/01/2025



Maximum Dry Density (t/m^3)	1.79
Optimum Moisture Content (%)	16.9
Oversize Retained on 19mm sieve (%)	15
Oversize Retained on 37.5mm sieve (%)	1
Curing Time	67 hrs
Liquid Limit Determination	Technician Assessment

Notes

Accredited for compliance with ISO/IEC 17025 - Testing.

NATA Accredited Laboratory Number: 14874

Authorised Signatory:

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6/02/2025

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CERTIFICATE OF ANALYSIS 373753

Client Details

Client	Macquarie Geotech (Sydney)
Attention	D Grover
Address	3 Watt Dr, Bathurst, NSW, 2795

Sample Details

Your Reference	**S24671-3**
Number of Samples	3 Soil
Date samples received	21/02/2025
Date completed instructions received	21/02/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	28/02/2025
Date of Issue	27/02/2025

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Results Approved By
Priya Samarawickrama, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

Misc Inorg - Soil				
Our Reference		373753-1	373753-2	373753-3
Your Reference	UNITS	S103718	S103719	S103720
Sample ID		BH02 2.5-2.8m	BH09 2.5-2.95m	BH15 1.0-1.45m
Type of sample		Soil	Soil	Soil
Date prepared	-	24/02/2025	24/02/2025	24/02/2025
Date analysed	-	24/02/2025	24/02/2025	24/02/2025
pH 1:5 soil:water	pH Units	8.9	5.0	5.6
Electrical Conductivity 1:5 soil:water	µS/cm	140	140	770
Chloride, Cl 1:5 soil:water	mg/kg	55	30	640
Sulphate, SO4 1:5 soil:water	mg/kg	73	180	480

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			24/02/2025	1	24/02/2025	24/02/2025		24/02/2025	[NT]
Date analysed	-			24/02/2025	1	24/02/2025	24/02/2025		24/02/2025	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	8.9	8.9	0	102	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	140	150	7	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	55	51	8	111	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	73	67	9	109	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

MACQUARIE GEOTECH

Test Report

Unconfined compressive strength of rock core to 50 MPa strength

Methodology	TS 02799.26		
Client	SMEC	**MG Sample No.**	S109219
Address	Dharug Country, Level 6, 3 Horwood Place, Parramatta, NSW, Australia 2150	**MG Project No.**	S25460-1
Project	Bankstown Hospital Additional SI (30013640)	**Date Sampled**	2/09/2025
Sample ID	BH201 12.42-12.62m	**Date Received**	9/09/2025
Report No.	S109219-T_RUCS	**Date Tested**	18/09/2025
Sampling Method	Sampled by Client - results apply to the sample as received		
Preparation Method	Prepared in accordance with the test method		
Sample Description	Rock Core		





Unconfined Compressive Strength (MPa)	**14**	Condition of Specimen	As-Received (Moist)
Failure Mode	**Axial Multiple**	Storage History	Moisture Preserved
Rate of Displacement (mm/min)	**<0.1**	Specimen Curing	-
Test Duration (s)	**655**		
Average Specimen Diameter (mm)	**51.37**	Moisture Content - Original (%)	**4.2**
Specimen Length (mm)	**116.30**	Moisture Content - After Test (%)	**3.5**
Length to Diameter Ratio	**2.3**	Dry Density (t/m^3)	**2.44**

Notes

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NATA Accredited Laboratory Number: 14874
Macquarie Geotechnical Pty Ltd
14 Carter Street, Lidcombe NSW 2141 (Sydney Laboratory)

Authorised Signatory Jasper Haines

Date of Issue 19/09/2025

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MACQUARIE GEOTECH

Test Report

Unconfined compressive strength of rock core to 50 MPa strength

Methodology	TS 02799.26		
Client	SMEC	**MG Sample No.**	S109220
Address	Dharug Country, Level 6, 3 Horwood Place, Parramatta, NSW, Australia 2150	**MG Project No.**	S25460-1
Project	Bankstown Hospital Additional SI (30013640)	**Date Sampled**	3/09/2025
Sample ID	BH201 24.68-24.94m	**Date Received**	9/09/2025
Report No.	S109220-T_RUCS	**Date Tested**	18/09/2025
Sampling Method	Sampled by Client - results apply to the sample as received		
Preparation Method	Prepared in accordance with the test method		
Sample Description	Sandstone		





Unconfined Compressive Strength (MPa)	**87+**	Condition of Specimen	As-Received (Moist)
Failure Mode	**Mixed Mode**	Storage History	Moisture Preserved
Rate of Displacement (mm/min)	**<0.1**	Specimen Curing	-
Test Duration (s)	**795**		
Average Specimen Diameter (mm)	**51.70**	Moisture Content - Original (%)	**1.5**
Specimen Length (mm)	**118.40**	Moisture Content - After Test (%)	**1.5**
Length to Diameter Ratio	**2.3**	Dry Density (t/m^3)	**2.58**

Notes

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MACQUARIE GEOTECH

Test Report

Unconfined compressive strength of rock core to 50 MPa strength

Methodology	TS 02799.26		
Client	SMEC	**MG Sample No.**	S109905
Address	Dharug Country, Level 6, 3 Horwood Place, Parramatta, NSW, Australia 2150	**MG Project No.**	S25460-2
Project	Bankstown Hospital Additional SI (30013640)	**Date Sampled**	1/10/2025
Sample ID	BH202 6.17-6.35m	**Date Received**	2/10/2025
Report No.	S109905-T_RUCS	**Date Tested**	9/10/2025
Sampling Method	Sampled by Client - results apply to the sample as received		
Preparation Method	Prepared in accordance with the test method		
Sample Description	Siltstone		





Unconfined Compressive Strength (MPa)	**5.7**	Condition of Specimen	As-Received (Moist)
Failure Mode	**Axial Multiple**	Storage History	Moisture Preserved
Rate of Displacement (mm/min)	**<0.1**	Specimen Curing	-
Test Duration (s)	**331**		
Average Specimen Diameter (mm)	**60.35**	Moisture Content - Original (%)	**5.7**
Specimen Length (mm)	**141.55**	Moisture Content - After Test (%)	**5.0**
Length to Diameter Ratio	**2.3**	Dry Density (t/m^3)	**2.34**

Notes

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Macquarie Geotechnical Pty Ltd
14 Carter Street, Lidcombe NSW 2141 (Sydney Laboratory)

Authorised Signatory Jasper Haines

Date of Issue 10/10/2025

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MACQUARIE GEOTECH

Test Report

Unconfined compressive strength of rock core to 50 MPa strength

Methodology	TS 02799.26		
Client	SMEC	**MG Sample No.**	S109906
Address	Dharug Country, Level 6, 3 Horwood Place, Parramatta, NSW, Australia 2150	**MG Project No.**	S25460-2
Project	Bankstown Hospital Additional SI (30013640)	**Date Sampled**	1/10/2025
Sample ID	BH202 11.07-11.3m	**Date Received**	2/10/2025
Report No.	S109906-T_RUCS	**Date Tested**	9/10/2025
Sampling Method	Sampled by Client - results apply to the sample as received		
Preparation Method	Prepared in accordance with the test method		
Sample Description	Siltstone		





Corrected Unconfined Compressive Strength (MPa)	**16**	Condition of Specimen	As-Received (Moist)
Failure Mode	**Axial Multiple**	Storage History	Moisture Preserved
Rate of Displacement (mm/min)	**<0.1**	Specimen Curing	-
Test Duration (s)	**577**		
Average Specimen Diameter (mm)	**60.85**	Moisture Content - Original (%)	**2.9**
Specimen Length (mm)	**103.53**	Moisture Content - After Test (%)	**3.1**
Length to Diameter Ratio	**1.7**	Dry Density (t/m^3)	**2.49**

Deviations from Standard

Specimen length to diameter ratio does not fall within 2.0-2.5.

Notes

SMEC Australia Pty Ltd
Level 6, 76 Berry Street
North Sydney
NSW 2060

NATA Accredited
Accreditation Number 1261
Site Number 18217

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Attention: **Harrison Wood**

Report **1278086-W-V2**
Project name NEW BANKSTOWN HOSPITAL
Project ID 30013693
Received Date Oct 09, 2025

Client Sample ID			**BH101**	**BH102**	**BH103**	**BH201A**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S25-Oc0025242**	**S25-Oc0025243**	**S25-Oc0025244**	**S25-Oc0025245**
Date Sampled			**Oct 08, 2025**	**Oct 08, 2025**	**Oct 08, 2025**	**Oct 08, 2025**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
4-Bromofluorobenzene (surr.)	1	%	88	85	83	-
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)*[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C16-C34	0.1	mg/L	0.2	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.2	< 0.1	< 0.1	< 0.1
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-

Client Sample ID			BH101	BH102	BH103	BH201A
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025242	S25-Oc0025243	S25-Oc0025244	S25-Oc0025245
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
2-Fluorobiphenyl (surr.)	1	%	83	91	88	-
p-Terphenyl-d14 (surr.)	1	%	55	120	59	-
Organochlorine Pesticides						
Chlordanes - Total	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
4.4'-DDD	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
4.4'-DDE	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
4.4'-DDT	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
a-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Aldrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
b-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
d-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Dieldrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Endosulfan I	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Endosulfan II	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Endosulfan sulphate	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Endrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Endrin aldehyde	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Endrin ketone	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
g-HCH (Lindane)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Heptachlor	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Heptachlor epoxide	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Hexachlorobenzene	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Methoxychlor	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Toxaphene	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Dibutylchlorendate (surr.)	1	%	87	118	83	-
Tetrachloro-m-xylene (surr.)	1	%	110	146	106	-
Organophosphorus Pesticides						
Azinphos-methyl	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Bolstar	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Chlorfenvinphos	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
Chlorpyrifos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Chlorpyrifos-methyl	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Coumaphos	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
Demeton-S	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Demeton-O	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Diazinon	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Dichlorvos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Dimethoate	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Disulfoton	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
EPN	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Ethion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-

Client Sample ID			BH101	BH102	BH103	BH201A
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025242	S25-Oc0025243	S25-Oc0025244	S25-Oc0025245
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethoprop	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Ethyl parathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Fenitrothion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Fensulfothion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Fenthion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Malathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Merphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Methyl parathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Mevinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Monocrotophos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Naled	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Omethoate	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
Phorate	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Pirimiphos-methyl	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
Pyrazophos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Ronnel	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Terbufos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Tetrachlorvinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Tokuthion	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Trichloronate	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Triphenylphosphate (surr.)	1	%	106	140	89	-
Polychlorinated Biphenyls						
Aroclor-1016	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Aroclor-1221	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Aroclor-1232	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Aroclor-1242	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Aroclor-1248	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Aroclor-1254	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Aroclor-1260	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Total PCB*	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Dibutylchlorendate (surr.)	1	%	87	118	83	-
Tetrachloro-m-xylene (surr.)	1	%	110	146	106	-
Polycyclic Aromatic Hydrocarbons (Trace level)						
Acenaphthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Acenaphthylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Benz(a)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Benzo(a)pyrene - low level	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Benzo(b&j)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Benzo(g.h.i)perylene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Chrysene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Dibenz(a.h)anthracene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Fluorene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Naphthalene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Phenanthrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
Pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-

Client Sample ID			BH101	BH102	BH103	BH201A
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025242	S25-Oc0025243	S25-Oc0025244	S25-Oc0025245
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (Trace level)						
Total PAH*	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
2-Fluorobiphenyl (surr.)	1	%	83	91	88	-
p-Terphenyl-d14 (surr.)	1	%	55	120	59	-
Ammonia (as N)	0.01	mg/L	[R09]1.7	0.48	0.79	0.11
Ammonium Ion (as N)	0.01	mg/L	1.9	0.51	0.84	0.12
Chloride	1	mg/L	3400	3600	3200	3200
Conductivity (at 25 °C)	10	uS/cm	12000	14000	12000	12000
Nitrate & Nitrite (as N)	0.05	mg/L	0.57	< 0.05	< 0.05	< 0.05
Nitrate (as N)	0.02	mg/L	0.55	< 0.02	< 0.02	< 0.02
Nitrite (as N)	0.02	mg/L	0.02	< 0.02	< 0.02	< 0.02
Oil & Grease (HEM)	10	mg/L	< 10	< 10	< 10	12
Organic Nitrogen (as N)*	0.2	mg/L	-	0.52	3.51	0.49
pH (at 25 °C)	0.1	pH Units	7.2	6.9	7.1	6.8
Phosphate total (as P)	0.01	mg/L	0.20	0.10	0.20	0.06
Phosphorus reactive (as P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate (as SO4)	2	mg/L	240	590	420	690
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	7400	7600	6600	6800
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	1.2	1.0	4.3	0.6
Total Nitrogen (as N)*	0.2	mg/L	1.8	1.0	4.3	0.6
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	1200	1100	780	900
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	1200	1100	780	900
Heavy Metals						
Aluminium	0.05	mg/L	5.4	1.6	9.6	1.6
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic	0.001	mg/L	0.006	0.003	0.011	0.001
Arsenic (filtered)	0.001	mg/L	0.003	< 0.001	0.001	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.015	0.004	0.022	0.004
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	0.048	0.031	0.063	0.032
Copper (filtered)	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.001
Iron	0.05	mg/L	15	8.2	27	3.4
Iron (filtered)	0.05	mg/L	0.71	0.69	0.83	0.20
Lead	0.001	mg/L	0.010	0.005	0.020	0.003
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Manganese	0.005	mg/L	0.30	0.16	0.88	2.3
Manganese (filtered)	0.005	mg/L	0.14	0.11	0.36	2.2
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	0.0002	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.050	0.006	0.028	0.014
Nickel (filtered)	0.001	mg/L	0.025	0.002	0.002	0.011
Zinc	0.005	mg/L	0.068	0.029	0.12	0.040
Zinc (filtered)	0.005	mg/L	< 0.005	0.010	< 0.005	0.022

Client Sample ID			BH101	BH102	BH103	BH201A
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025242	S25-Oc0025243	S25-Oc0025244	S25-Oc0025245
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Alkali Metals						
Calcium	0.5	mg/L	110	97	120	76
Magnesium	0.5	mg/L	180	320	280	250
Potassium	0.5	mg/L	18	22	19	17
Sodium	0.5	mg/L	2100	2400	2100	2000
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	< 0.005	0.006	-
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	[N09]0.004	< 0.001	< 0.001	-
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	0.012	< 0.001	0.005	-
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	[N09]0.002	< 0.001	[N09]0.002	-
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	0.012	< 0.001	0.009	-
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
13C4-PFBA (surr.)	1	%	62	68	67	-
13C5-PFPeA (surr.)	1	%	73	78	78	-
13C5-PFHxA (surr.)	1	%	82	85	73	-
13C4-PFHpA (surr.)	1	%	81	85	79	-
13C8-PFOA (surr.)	1	%	92	91	87	-
13C5-PFNA (surr.)	1	%	83	77	83	-
13C6-PFDA (surr.)	1	%	85	86	83	-
13C2-PFUnDA (surr.)	1	%	82	91	85	-
13C2-PFDoDA (surr.)	1	%	73	80	75	-
13C2-PFTeDA (surr.)	1	%	59	71	69	-
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	< 0.001	< 0.001	0.001	-
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	< 0.001	< 0.001	[N09]0.001	-
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	[N09]0.006	[N09]0.004	[N09]0.009	-
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	[N09]0.001	< 0.001	[N09]0.001	-
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	[N09]0.024	[N09]0.015	[N09]0.022	-
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
13C3-PFBS (surr.)	1	%	98	98	89	-
18O2-PFHxS (surr.)	1	%	99	102	93	-
13C8-PFOS (surr.)	1	%	82	89	90	-
Perfluoroalkyl sulfonamido substances- Ultra Trace						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-

Client Sample ID			BH101	BH102	BH103	BH201A
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025242	S25-Oc0025243	S25-Oc0025244	S25-Oc0025245
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances- Ultra Trace						
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-
13C8-FOSA (surr.)	1	%	60	65	57	-
D3-N-MeFOSA (surr.)	1	%	70	73	85	-
D5-N-EtFOSA (surr.)	1	%	72	74	88	-
D7-N-MeFOSE (surr.)	1	%	46	53	55	-
D9-N-EtFOSE (surr.)	1	%	55	64	65	-
D5-N-EtFOSAA (surr.)	1	%	82	96	90	-
D3-N-MeFOSAA (surr.)	1	%	75	75	77	-
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	-
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	-
13C2-4:2 FTSA (surr.)	1	%	137	103	95	-
13C2-6:2 FTSA (surr.)	1	%	162	104	85	-
13C2-8:2 FTSA (surr.)	1	%	125	105	105	-
13C2-10:2 FTSA (surr.)	1	%	89	80	79	-
PFASs Summations						
Sum (PFHxS + PFOS)*	0.001	ug/L	0.03	0.019	0.031	-
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.06	0.019	0.054	-
Sum of PFASs (n=30)*	0.005	ug/L	0.061	0.019	0.056	-

Client Sample ID			BH201B	BH202	QA02	RINSATE 01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025246	S25-Oc0025247	S25-Oc0025248	S25-Oc0025249
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	-	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	-	82	81	80
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	0.18	0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	0.2	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.18	0.25	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	0.20	0.07	< 0.05	< 0.05

Client Sample ID			BH201B	BH202	QA02	RINSATE 01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025246	S25-Oc0025247	S25-Oc0025248	S25-Oc0025249
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH >C10-C16 less Naphthalene (F2)*[N01]	0.05	mg/L	0.2	0.07	< 0.05	< 0.05
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C16-C34	0.1	mg/L	< 0.1	0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.2	0.17	< 0.1	< 0.1
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	-	0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	-	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	-	0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	-	105	89	87
p-Terphenyl-d14 (surr.)	1	%	-	75	121	52
Organochlorine Pesticides						
Chlordanes - Total	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
4.4'-DDD	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
4.4'-DDE	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
4.4'-DDT	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
a-HCH	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Aldrin	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
b-HCH	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
d-HCH	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Dieldrin	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Endosulfan I	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Endosulfan II	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Endosulfan sulphate	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Endrin	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Endrin aldehyde	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Endrin ketone	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Heptachlor	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Heptachlor epoxide	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Hexachlorobenzene	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Methoxychlor	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
Toxaphene	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Aldrin and Dieldrin (Total)*	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	-	< 0.0002	< 0.0002	< 0.0002

Client Sample ID			BH201B	BH202	QA02	RINSATE 01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025246	S25-Oc0025247	S25-Oc0025248	S25-Oc0025249
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Dibutylchlorendate (surr.)	1	%	-	INT	136	112
Tetrachloro-m-xylene (surr.)	1	%	-	63	INT	131
Organophosphorus Pesticides						
Azinphos-methyl	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Bolstar	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Chlorfenvinphos	0.02	mg/L	-	< 0.02	< 0.02	< 0.02
Chlorpyrifos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Chlorpyrifos-methyl	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Coumaphos	0.02	mg/L	-	< 0.02	< 0.02	< 0.02
Demeton-S	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Demeton-O	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Diazinon	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Dichlorvos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Dimethoate	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Disulfoton	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
EPN	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Ethion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Ethoprop	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Ethyl parathion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Fenitrothion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Fensulfothion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Fenthion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Malathion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Merphos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Methyl parathion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Mevinphos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Monocrotophos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Naled	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Omethoate	0.02	mg/L	-	< 0.02	< 0.02	< 0.02
Phorate	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Pirimiphos-methyl	0.02	mg/L	-	< 0.02	< 0.02	< 0.02
Pyrazophos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Ronnel	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Terbufos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Tetrachlorvinphos	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Tokuthion	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Trichloronate	0.002	mg/L	-	< 0.002	< 0.002	< 0.002
Triphenylphosphate (surr.)	1	%	-	INT	135	124
Polychlorinated Biphenyls						
Aroclor-1016	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Aroclor-1221	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Aroclor-1232	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Aroclor-1242	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Aroclor-1248	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Aroclor-1254	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Aroclor-1260	0.005	mg/L	-	< 0.005	< 0.005	< 0.005
Total PCB*	0.005	mg/L	-	< 0.005	< 0.005	< 0.005

Client Sample ID			BH201B	BH202	QA02	RINSATE 01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025246	S25-Oc0025247	S25-Oc0025248	S25-Oc0025249
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Dibutylchlorendate (surr.)	1	%	-	INT	136	112
Tetrachloro-m-xylene (surr.)	1	%	-	63	INT	131
Polycyclic Aromatic Hydrocarbons (Trace level)						
Acenaphthene	0.00001	mg/L	-	0.00020	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	-	0.00010	< 0.00001	< 0.00001
Benzo(a)pyrene - low level	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	-	0.00010	< 0.00001	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	-	0.00010	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	-	0.00010	< 0.00001	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Naphthalene	0.00001	mg/L	-	< 0.00001	< 0.00001	< 0.00001
Phenanthrene	0.00001	mg/L	-	0.00020	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	-	0.00010	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	-	0.0009	< 0.00001	< 0.00001
2-Fluorobiphenyl (surr.)	1	%	-	105	89	87
p-Terphenyl-d14 (surr.)	1	%	-	75	121	52
Ammonia (as N)	0.01	mg/L	0.11	0.40	0.99	-
Ammonium Ion (as N)	0.01	mg/L	0.12	0.43	1.0	-
Chloride	1	mg/L	240	940	2700	-
Conductivity (at 25 °C)	10	uS/cm	1700	4300	11000	-
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	0.17	< 0.05	-
Nitrate (as N)	0.02	mg/L	< 0.02	0.13	< 0.02	-
Nitrite (as N)	0.02	mg/L	< 0.02	0.03	< 0.02	-
Oil & Grease (HEM)	10	mg/L	< 10	< 10	41	-
Organic Nitrogen (as N)*	0.2	mg/L	-	1	1.51	-
pH (at 25 °C)	0.1	pH Units	4.9	6.0	7.1	-
Phosphate total (as P)	0.01	mg/L	0.04	0.88	0.14	-
Phosphorus reactive (as P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
Sulphate (as SO4)	2	mg/L	290	230	220	-
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	980	2500	6400	-
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.5	1.4	2.5	-
Total Nitrogen (as N)*	0.2	mg/L	< 0.5	1.6	2.5	-
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	21	370	1100	-
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	-
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	-
Total Alkalinity (as CaCO3)	20	mg/L	21	370	1100	-

Client Sample ID			BH201B	BH202	QA02	RINSATE 01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025246	S25-Oc0025247	S25-Oc0025248	S25-Oc0025249
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Heavy Metals						
Aluminium	0.05	mg/L	20	28	1.4	< 0.05
Aluminium (filtered)	0.05	mg/L	0.09	0.09	< 0.05	< 0.05
Arsenic	0.001	mg/L	0.014	0.032	0.003	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	0.002	0.002	< 0.001
Cadmium	0.0002	mg/L	0.0003	0.0004	< 0.0002	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	0.034	0.059	0.013	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	0.002	< 0.001
Copper	0.001	mg/L	0.33	0.22	0.050	< 0.001
Copper (filtered)	0.001	mg/L	0.22	0.007	< 0.001	< 0.001
Iron	0.05	mg/L	83	82	4.6	-
Iron (filtered)	0.05	mg/L	5.6	0.26	0.65	-
Lead	0.001	mg/L	0.055	0.051	0.004	< 0.001
Lead (filtered)	0.001	mg/L	0.001	< 0.001	< 0.001	< 0.001
Manganese	0.005	mg/L	0.37	2.8	0.13	< 0.005
Manganese (filtered)	0.005	mg/L	0.25	1.3	0.096	< 0.005
Mercury	0.0001	mg/L	0.0002	0.0003	< 0.0001	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.030	0.081	0.044	< 0.001
Nickel (filtered)	0.001	mg/L	0.016	0.011	0.036	< 0.001
Zinc	0.005	mg/L	0.37	0.36	0.050	< 0.005
Zinc (filtered)	0.005	mg/L	0.28	0.034	< 0.005	< 0.005
Alkali Metals						
Calcium	0.5	mg/L	6.1	50	89	-
Magnesium	0.5	mg/L	16	77	140	-
Potassium	0.5	mg/L	7.2	17	16	-
Sodium	0.5	mg/L	300	620	1600	-
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	-	< 0.005	0.015	< 0.005
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	-	< 0.001	[N09]0.018	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	-	0.003	0.051	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	-	< 0.001	[N09]0.006	< 0.001
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	-	0.002	0.057	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
13C4-PFBA (surr.)	1	%	-	61	69	84
13C5-PFPeA (surr.)	1	%	-	50	73	86
13C5-PFHxA (surr.)	1	%	-	73	80	89
13C4-PFHpA (surr.)	1	%	-	82	90	85
13C8-PFOA (surr.)	1	%	-	93	90	96
13C5-PFNA (surr.)	1	%	-	86	90	90
13C6-PFDA (surr.)	1	%	-	90	90	96
13C2-PFUnDA (surr.)	1	%	-	93	98	105
13C2-PFDoDA (surr.)	1	%	-	73	88	100
13C2-PFTeDA (surr.)	1	%	-	54	78	68

Client Sample ID			BH201B	BH202	QA02	RINSATE 01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S25-Oc0025246	S25-Oc0025247	S25-Oc0025248	S25-Oc0025249
Date Sampled			Oct 08, 2025	Oct 08, 2025	Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	-	0.002	0.001	< 0.001
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	-	[N09]0.001	< 0.001	< 0.001
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	-	[N09]0.009	[N09]0.008	< 0.001
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	-	< 0.001	[N09]0.001	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	-	[N09]0.0063	[N09]0.027	0.0004
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
13C3-PFBS (surr.)	1	%	-	88	103	95
18O2-PFHxS (surr.)	1	%	-	101	112	111
13C8-PFOS (surr.)	1	%	-	82	94	104
Perfluoroalkyl sulfonamido substances- Ultra Trace						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
13C8-FOSA (surr.)	1	%	-	71	60	84
D3-N-MeFOSA (surr.)	1	%	-	81	69	97
D5-N-EtFOSA (surr.)	1	%	-	84	69	90
D7-N-MeFOSE (surr.)	1	%	-	58	56	67
D9-N-EtFOSE (surr.)	1	%	-	60	57	71
D5-N-EtFOSAA (surr.)	1	%	-	93	86	103
D3-N-MeFOSAA (surr.)	1	%	-	79	83	84
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	-	< 0.005	< 0.005	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	-	< 0.001	0.001	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	-	< 0.001	< 0.001	< 0.001
13C2-4:2 FTSA (surr.)	1	%	-	113	158	95
13C2-6:2 FTSA (surr.)	1	%	-	150	INT	93
13C2-8:2 FTSA (surr.)	1	%	-	123	164	112
13C2-10:2 FTSA (surr.)	1	%	-	78	147	104
PFASs Summations						
Sum (PFHxS + PFOS)*	0.001	ug/L	-	0.0153	0.035	< 0.001
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	-	0.0223	0.184	< 0.005
Sum of PFASs (n=30)*	0.005	ug/L	-	0.023	0.19	< 0.005

Client Sample ID			TRIP SPIKE	TRIP BLANK
Sample Matrix			Trip Spike (liquid)	Trip Blank (liquid)
Eurofins Sample No.			S25-Oc0025250	S25-Oc0025251
Date Sampled			Oct 08, 2025	Oct 08, 2025
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	-	< 0.001
Toluene	0.001	mg/L	-	< 0.001
Ethylbenzene	0.001	mg/L	-	< 0.001
m&p-Xylenes	0.002	mg/L	-	< 0.002
o-Xylene	0.001	mg/L	-	< 0.001
Xylenes - Total*	0.003	mg/L	-	< 0.003
4-Bromofluorobenzene (surr.)	1	%	-	79
Total Recoverable Hydrocarbons				
TRH C6-C9	0.02	mg/L	-	< 0.02
TRH C6-C10	0.02	mg/L	-	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02
Naphthalene[N02]	0.01	mg/L	-	< 0.01
TRH C6-C10	1	%	71	-
Total Recoverable Hydrocarbons				
Naphthalene	1	%	110	-
TRH C6-C9	1	%	72	-
BTEX				
Benzene	1	%	100	-
Ethylbenzene	1	%	100	-
m&p-Xylenes	1	%	110	-
o-Xylene	1	%	110	-
Toluene	1	%	100	-
Xylenes - Total	1	%	110	-
4-Bromofluorobenzene (surr.)	1	%	95	-

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	Holding Time
BTEX	Sydney	Oct 14, 2025	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Oct 14, 2025	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Sydney	Oct 14, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Polycyclic Aromatic Hydrocarbons (Trace level)	Melbourne	Oct 16, 2025	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water (trace)			
Ammonium Ion (as N)	Melbourne	Oct 14, 2025	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Conductivity (at 25 °C)	Sydney	Oct 14, 2025	28 Days
- Method: LTM-INO-4030 Conductivity			
Oil & Grease (HEM)	Melbourne	Oct 13, 2025	28 Days
- Method: LTM-INO-4180 Oil and Grease			
pH (at 25 °C)	Sydney	Oct 14, 2025	6 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Heavy Metals	Sydney	Oct 21, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Sydney	Oct 21, 2025	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Oct 09, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Sydney	Oct 09, 2025	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B19E: Total N, TKN, NOx, NO2, NO3, NH3, Total P, Reactive P			
Ammonia (as N)	Melbourne	Oct 13, 2025	28 Days
- Method: LTM-INO-4450 Determination of Nitrogen Species by Discrete Analyser			
Nitrate & Nitrite (as N)	Melbourne	Oct 13, 2025	28 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser			
Nitrate (as N)	Melbourne	Oct 13, 2025	28 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser			
Nitrite (as N)	Melbourne	Oct 13, 2025	2 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser			
Phosphate total (as P)	Sydney	Oct 14, 2025	28 Days
- Method: E052 Total Phosphate (as P)			
Phosphorus reactive (as P)	Sydney	Oct 14, 2025	28 Days
- Method: E052 Reactive phosphate (as P)			

Description	Testing Site	Extracted	Holding Time
Total Kjeldahl Nitrogen (as N)	Melbourne	Oct 13, 2025	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
Eurofins Suite B11E: Cl/SO4/Alkalinity			
Chloride	Sydney	Oct 14, 2025	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Sulphate (as SO4)	Sydney	Oct 14, 2025	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
Alkalinity (speciated)	Sydney	Oct 14, 2025	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Sydney	Oct 14, 2025	7 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace	Sydney	Oct 15, 2025	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace	Sydney	Oct 17, 2025	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonamido substances- Ultra Trace	Sydney	Oct 15, 2025	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) Ultra trace			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace	Sydney	Oct 15, 2025	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			

eurofins

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Project ID: 30013693

Order No.:
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Received: Oct 9, 2025 3:51 PM
Due: Oct 16, 2025
Priority: 5 Day
Contact Name: Harrison Wood

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Ammonium Ion (as N)	Conductivity (at 25 °C)	Iron	Iron (filtered)	Oil & Grease (HEM)	pH (at 25 °C)	Metals M8	Metals M8 filtered	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Eurofins Suite B19E: Total N, TKN, NOx, NO2, NO3, NH3, Total P, Reactive P	Eurofins Suite B11E: Cl/SO4/Alkalinity	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Polycyclic Aromatic Hydrocarbons (Trace level)	Total Dissolved Solids Dried at 180 °C ± 2 °C	Suite B10B:TRH/BTEXN/PAH/OCP/OPP/PCB/M8
Melbourne Laboratory - NATA # 1261 Site # 1254						X				X						X					X		X
Sydney Laboratory - NATA # 1261 Site # 18217							X	X	X		X	X	X	X	X	X	X	X	X	X		X	X
External Laboratory																							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																		
1	BH101	Oct 08, 2025		Water	S25-Oc0025242	X	X	X	X	X	X		X	X		X	X		X	X	X	X	X
2	BH102	Oct 08, 2025		Water	S25-Oc0025243	X	X	X	X	X	X		X	X		X	X		X	X	X	X	X
3	BH103	Oct 08, 2025		Water	S25-Oc0025244	X	X	X	X	X	X		X	X		X	X		X	X	X	X	X
4	BH201A	Oct 08, 2025		Water	S25-Oc0025245	X	X	X	X	X	X	X	X	X		X	X			X		X	
5	BH201B	Oct 08, 2025		Water	S25-Oc0025246	X	X	X	X	X	X	X	X	X		X	X			X		X	
6	BH202	Oct 08, 2025		Water	S25-Oc0025247	X	X	X	X	X	X		X	X		X	X		X	X	X	X	X
7	QA02	Oct 08, 2025		Water	S25-Oc0025248	X	X	X	X	X	X		X	X		X	X		X	X	X	X	X
8	RINSATE 01	Oct 08, 2025		Water	S25-Oc0025249								X						X		X		X
9	TRIP SPIKE	Oct 08, 2025		Trip Spike (liquid)	S25-Oc0025250													X					
10	TRIP BLANK	Oct 08, 2025		Trip Blank (liquid)	S25-Oc0025251										X								
Test Counts						7	7	7	7	7	7	2	8	7	1	7	7	1	6	7	6	7	6

Internal Quality Control Review and Glossary

General

1. 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.
3. 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, notification 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	**mg/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
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
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 to 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.
TBTO	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 guidelines are equally applicable:

Results <10 times the LOR:	No Limit
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

1. 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 sample 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.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDE	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDT	mg/L	< 0.0002			0.0002	Pass	
a-HCH	mg/L	< 0.0002			0.0002	Pass	
Aldrin	mg/L	< 0.0002			0.0002	Pass	
b-HCH	mg/L	< 0.0002			0.0002	Pass	
d-HCH	mg/L	< 0.0002			0.0002	Pass	
Dieldrin	mg/L	< 0.0002			0.0002	Pass	
Endosulfan I	mg/L	< 0.0002			0.0002	Pass	
Endosulfan II	mg/L	< 0.0002			0.0002	Pass	
Endosulfan sulphate	mg/L	< 0.0002			0.0002	Pass	
Endrin	mg/L	< 0.0002			0.0002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/L	< 0.0002			0.0002	Pass	
Endrin ketone	mg/L	< 0.0002			0.0002	Pass	
g-HCH (Lindane)	mg/L	< 0.0002			0.0002	Pass	
Heptachlor	mg/L	< 0.0002			0.0002	Pass	
Heptachlor epoxide	mg/L	< 0.0002			0.0002	Pass	
Hexachlorobenzene	mg/L	< 0.0002			0.0002	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Toxaphene	mg/L	< 0.005			0.005	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.002			0.002	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.02			0.02	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.005			0.005	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.005			0.005	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Chloride	mg/L	< 1			1	Pass	
Conductivity (at 25 °C)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Oil & Grease (HEM)	mg/L	< 10			10	Pass	
Phosphorus reactive (as P)	mg/L	< 0.05			0.05	Pass	
Sulphate (as SO4)	mg/L	< 2			2	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Heavy Metals							
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.005			0.005	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.001			0.001	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.001			0.001	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	0.0001			0.0001	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.001			0.001	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroalkyl sulfonamido substances- Ultra Trace							
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.005			0.005	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.005			0.005	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.005			0.005	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.005			0.005	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.005			0.005	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.005			0.005	Pass	
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.005			0.005	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Oil & Grease (HEM)	mg/L	< 10			10	Pass	
Phosphate total (as P)	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene - low level	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
BTEX							
Benzene	%	92			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	93			70-130	Pass	
m&p-Xylenes	%	102			70-130	Pass	
o-Xylene	%	97			70-130	Pass	
Xylenes - Total*	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	84			70-130	Pass	
TRH C10-C14	%	83			70-130	Pass	
TRH C6-C10	%	85			70-130	Pass	
TRH >C10-C16	%	79			70-130	Pass	
Naphthalene	%	98			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	92			70-130	Pass	
Acenaphthylene	%	99			70-130	Pass	
Anthracene	%	72			70-130	Pass	
Benz(a)anthracene	%	70			70-130	Pass	
Benzo(a)pyrene	%	70			70-130	Pass	
Benzo(b&j)fluoranthene	%	72			70-130	Pass	
Benzo(g.h.i)perylene	%	70			70-130	Pass	
Benzo(k)fluoranthene	%	80			70-130	Pass	
Chrysene	%	76			70-130	Pass	
Dibenz(a.h)anthracene	%	88			70-130	Pass	
Fluoranthene	%	73			70-130	Pass	
Fluorene	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	70			70-130	Pass	
Naphthalene	%	83			70-130	Pass	
Phenanthrene	%	100			70-130	Pass	
Pyrene	%	77			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	96			70-130	Pass	
4.4'-DDD	%	84			70-130	Pass	
4.4'-DDE	%	99			70-130	Pass	
4.4'-DDT	%	87			70-130	Pass	
a-HCH	%	83			70-130	Pass	
Aldrin	%	89			70-130	Pass	
b-HCH	%	95			70-130	Pass	
d-HCH	%	94			70-130	Pass	
Dieldrin	%	99			70-130	Pass	
Endosulfan I	%	99			70-130	Pass	
Endosulfan II	%	88			70-130	Pass	
Endosulfan sulphate	%	91			70-130	Pass	
Endrin	%	94			70-130	Pass	
Endrin aldehyde	%	103			70-130	Pass	
Endrin ketone	%	87			70-130	Pass	
g-HCH (Lindane)	%	93			70-130	Pass	
Heptachlor	%	92			70-130	Pass	
Heptachlor epoxide	%	88			70-130	Pass	
Hexachlorobenzene	%	85			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methoxychlor	%	81			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	119			70-130	Pass	
Dimethoate	%	105			70-130	Pass	
Ethion	%	115			70-130	Pass	
Fenitrothion	%	107			70-130	Pass	
Methyl parathion	%	113			70-130	Pass	
Mevinphos	%	113			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	80			70-130	Pass	
Aroclor-1260	%	99			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (Trace level)							
Acenaphthene	%	103			70-130	Pass	
Acenaphthylene	%	94			70-130	Pass	
Anthracene	%	81			70-130	Pass	
Benz(a)anthracene	%	112			70-130	Pass	
Benzo(a)pyrene - low level	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	%	102			70-130	Pass	
Benzo(g.h.i)perylene	%	101			70-130	Pass	
Benzo(k)fluoranthene	%	126			70-130	Pass	
Chrysene	%	95			70-130	Pass	
Dibenz(a.h)anthracene	%	111			70-130	Pass	
Fluoranthene	%	124			70-130	Pass	
Fluorene	%	121			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	82			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	118			70-130	Pass	
Pyrene	%	96			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	105			70-130	Pass	
Chloride	%	102			70-130	Pass	
Conductivity (at 25 °C)	%	93			70-130	Pass	
Nitrate & Nitrite (as N)	%	97			70-130	Pass	
Nitrate (as N)	%	97			70-130	Pass	
Nitrite (as N)	%	101			70-130	Pass	
Oil & Grease (HEM)	%	106			70-130	Pass	
Phosphorus reactive (as P)	%	98			70-130	Pass	
Sulphate (as SO4)	%	103			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	100			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	90			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium (filtered)	%	108			80-120	Pass	
Arsenic (filtered)	%	108			80-120	Pass	
Cadmium (filtered)	%	107			80-120	Pass	
Chromium (filtered)	%	109			80-120	Pass	
Copper (filtered)	%	106			80-120	Pass	
Iron (filtered)	%	93			80-120	Pass	
Lead (filtered)	%	102			80-120	Pass	
Manganese (filtered)	%	110			80-120	Pass	
Mercury (filtered)	%	104			80-120	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel (filtered)	%	107			80-120	Pass	
Zinc (filtered)	%	107			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	%	106			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	122			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	109			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	125			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	102			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	112			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	122			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	115			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	109			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	128			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	115			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	%	109			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	118			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	118			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	102			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	102			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	115			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	112			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	122			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	102			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	109			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	109			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	115			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	109			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	109			50-150	Pass	
Perfluorooctane sulfonamide (FOSA)	%	109			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	128			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	112			50-150	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	101			70-130	Pass	
LCS - % Recovery							
Oil & Grease (HEM)	%	106			70-130	Pass	
Phosphate total (as P)	%	94			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	98			80-120	Pass	
Arsenic	%	96			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	95			80-120	Pass	
Copper	%	93			80-120	Pass	
Iron	%	94			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead			%	90			80-120	Pass	
Manganese			%	96			80-120	Pass	
Mercury			%	93			80-120	Pass	
Nickel			%	93			80-120	Pass	
Zinc			%	93			80-120	Pass	
LCS - % Recovery									
Alkali Metals									
Calcium			%	100			80-120	Pass	
Magnesium			%	100			80-120	Pass	
Potassium			%	99			80-120	Pass	
Sodium			%	100			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
BTEX				Result 1					
Benzene	S25-Oc0032109	NCP	%	87			70-130	Pass	
Toluene	S25-Oc0032109	NCP	%	85			70-130	Pass	
Ethylbenzene	S25-Oc0032109	NCP	%	88			70-130	Pass	
m&p-Xylenes	S25-Oc0032109	NCP	%	91			70-130	Pass	
o-Xylene	S25-Oc0032109	NCP	%	90			70-130	Pass	
Xylenes - Total*	S25-Oc0032109	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S25-Oc0032109	NCP	%	78			70-130	Pass	
TRH C10-C14	S25-Oc0024857	NCP	%	77			70-130	Pass	
TRH C6-C10	S25-Oc0032109	NCP	%	78			70-130	Pass	
TRH >C10-C16	S25-Oc0024857	NCP	%	73			70-130	Pass	
Naphthalene	S25-Oc0032109	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S25-Oc0012743	NCP	%	103			70-130	Pass	
Acenaphthylene	S25-Oc0012743	NCP	%	109			70-130	Pass	
Anthracene	S25-Oc0012743	NCP	%	102			70-130	Pass	
Benz(a)anthracene	S25-Oc0033165	NCP	%	77			70-130	Pass	
Benzo(a)pyrene	S25-Oc0033165	NCP	%	77			70-130	Pass	
Benzo(b&j)fluoranthene	S25-Oc0033165	NCP	%	74			70-130	Pass	
Benzo(g.h.i)perylene	S25-Oc0012743	NCP	%	94			70-130	Pass	
Benzo(k)fluoranthene	S25-Oc0033165	NCP	%	95			70-130	Pass	
Chrysene	S25-Oc0033165	NCP	%	84			70-130	Pass	
Dibenz(a.h)anthracene	S25-Oc0012743	NCP	%	94			70-130	Pass	
Fluoranthene	S25-Oc0033165	NCP	%	81			70-130	Pass	
Fluorene	S25-Oc0033165	NCP	%	74			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S25-Oc0012743	NCP	%	93			70-130	Pass	
Naphthalene	S25-Oc0012743	NCP	%	98			70-130	Pass	
Phenanthrene	S25-Oc0033165	NCP	%	77			70-130	Pass	
Pyrene	S25-Oc0033165	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S25-Oc0030338	NCP	%	110			70-130	Pass	
4.4'-DDD	S25-Oc0030338	NCP	%	90			70-130	Pass	
4.4'-DDE	S25-Oc0030338	NCP	%	107			70-130	Pass	
4.4'-DDT	S25-Oc0030338	NCP	%	88			70-130	Pass	
a-HCH	S25-Oc0033165	NCP	%	95			70-130	Pass	
Aldrin	S25-Oc0030338	NCP	%	103			70-130	Pass	
b-HCH	S25-Oc0030338	NCP	%	115			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
d-HCH	S25-Oc0030338	NCP	%	119			70-130	Pass	
Dieldrin	S25-Oc0030338	NCP	%	105			70-130	Pass	
Endosulfan I	S25-Oc0030338	NCP	%	113			70-130	Pass	
Endosulfan II	S25-Oc0030338	NCP	%	96			70-130	Pass	
Endosulfan sulphate	S25-Oc0030338	NCP	%	99			70-130	Pass	
Endrin	S25-Oc0030338	NCP	%	89			70-130	Pass	
Endrin aldehyde	S25-Oc0030338	NCP	%	107			70-130	Pass	
Endrin ketone	S25-Oc0030338	NCP	%	99			70-130	Pass	
g-HCH (Lindane)	S25-Oc0033165	NCP	%	102			70-130	Pass	
Heptachlor	S25-Oc0030338	NCP	%	98			70-130	Pass	
Heptachlor epoxide	S25-Oc0030338	NCP	%	97			70-130	Pass	
Hexachlorobenzene	S25-Oc0030338	NCP	%	104			70-130	Pass	
Methoxychlor	S25-Oc0030338	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S25-Oc0033165	NCP	%	124			70-130	Pass	
Dimethoate	S25-Oc0030338	NCP	%	92			70-130	Pass	
Ethion	S25-Oc0030338	NCP	%	117			70-130	Pass	
Fenitrothion	S25-Oc0030338	NCP	%	110			70-130	Pass	
Methyl parathion	S25-Oc0030338	NCP	%	113			70-130	Pass	
Mevinphos	S25-Oc0030338	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	S25-Oc0033165	NCP	%	88			70-130	Pass	
Aroclor-1260	S25-Oc0033165	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1					
Acenaphthene	M25-Oc0049451	NCP	%	81			70-130	Pass	
Acenaphthylene	M25-Oc0049451	NCP	%	74			70-130	Pass	
Anthracene	M25-Oc0049451	NCP	%	92			70-130	Pass	
Benz(a)anthracene	M25-Oc0049451	NCP	%	124			70-130	Pass	
Benzo(a)pyrene - low level	M25-Oc0034705	NCP	%	76			70-130	Pass	
Benzo(b&j)fluoranthene	M25-Oc0049451	NCP	%	117			70-130	Pass	
Benzo(g.h.i)perylene	M25-Oc0049451	NCP	%	73			70-130	Pass	
Benzo(k)fluoranthene	M25-Oc0049451	NCP	%	75			70-130	Pass	
Chrysene	M25-Oc0049451	NCP	%	93			70-130	Pass	
Dibenz(a.h)anthracene	M25-Oc0049451	NCP	%	77			70-130	Pass	
Fluoranthene	M25-Oc0049451	NCP	%	87			70-130	Pass	
Fluorene	M25-Oc0049451	NCP	%	88			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M25-Oc0049451	NCP	%	79			70-130	Pass	
Naphthalene	M25-Oc0049451	NCP	%	83			70-130	Pass	
Phenanthrene	M25-Oc0049451	NCP	%	77			70-130	Pass	
Pyrene	M25-Oc0049451	NCP	%	98			70-130	Pass	
Spike - % Recovery									
				Result 1					
Phosphate total (as P)	S25-Oc0024097	NCP	%	88			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	M25-Oc0039975	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	S25-Oc0030813	NCP	%	95			75-125	Pass	
Arsenic (filtered)	S25-Oc0030813	NCP	%	99			75-125	Pass	
Cadmium (filtered)	S25-Oc0030813	NCP	%	97			75-125	Pass	
Chromium (filtered)	S25-Oc0030813	NCP	%	98			75-125	Pass	
Copper (filtered)	S25-Oc0030813	NCP	%	96			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Iron (filtered)	S25-Oc0030813	NCP	%	83			75-125	Pass	
Lead (filtered)	S25-Oc0030813	NCP	%	95			75-125	Pass	
Manganese (filtered)	S25-Oc0030813	NCP	%	88			75-125	Pass	
Mercury (filtered)	S25-Oc0030813	NCP	%	96			75-125	Pass	
Nickel (filtered)	S25-Oc0030813	NCP	%	96			75-125	Pass	
Zinc (filtered)	S25-Oc0030813	NCP	%	96			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1					
Perfluorobutanoic acid (PFBA)	S25-Oc0020680	NCP	%	109			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S25-Oc0020680	NCP	%	131			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S25-Oc0020680	NCP	%	112			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S25-Oc0020680	NCP	%	112			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S25-Oc0020680	NCP	%	102			50-150	Pass	
Perfluorononanoic acid (PFNA)	S25-Oc0020680	NCP	%	128			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S25-Oc0020680	NCP	%	118			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S25-Oc0017103	NCP	%	118			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S25-Oc0020680	NCP	%	122			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S25-Oc0020680	NCP	%	118			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S25-Oc0020680	NCP	%	106			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S25-Oc0020680	NCP	%	83			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S25-Oc0020680	NCP	%	109			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S25-Oc0020680	NCP	%	83			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S25-Oc0020680	NCP	%	93			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S25-Oc0020680	NCP	%	106			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S25-Oc0020680	NCP	%	128			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S25-Oc0020680	NCP	%	118			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S25-Oc0020680	NCP	%	109			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1					
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S25-Oc0020680	NCP	%	118			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S25-Oc0020680	NCP	%	115			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S25-Oc0020680	NCP	%	96			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S25-Oc0020680	NCP	%	115			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S25-Oc0020680	NCP	%	118			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S25-Oc0020680	NCP	%	122			50-150	Pass	
Perfluorooctane sulfonamide (FOSA)	S25-Oc0020680	NCP	%	118			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S25-Oc0020680	NCP	%	118			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S25-Oc0020680	NCP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S25-Oc0020680	NCP	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S25-Oc0020680	NCP	%	118			50-150	Pass	
Spike - % Recovery									
				Result 1					
Phosphorus reactive (as P)	S25-Oc0025243	CP	%	96			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chloride	S25-Oc0025248	CP	%	95			70-130	Pass	
Sulphate (as SO4)	S25-Oc0025248	CP	%	99			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	S25-Oc0025248	CP	%	107			75-125	Pass	
Arsenic	S25-Oc0025248	CP	%	99			75-125	Pass	
Cadmium	S25-Oc0025248	CP	%	101			75-125	Pass	
Chromium	S25-Oc0025248	CP	%	95			75-125	Pass	
Copper	S25-Oc0025248	CP	%	90			75-125	Pass	
Iron	S25-Oc0025248	CP	%	119			75-125	Pass	
Lead	S25-Oc0025248	CP	%	88			75-125	Pass	
Manganese	S25-Oc0025248	CP	%	99			75-125	Pass	
Mercury	S25-Oc0025248	CP	%	90			75-125	Pass	
Nickel	S25-Oc0025248	CP	%	90			75-125	Pass	
Zinc	S25-Oc0025248	CP	%	92			75-125	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	S25-Oc0025248	CP	%	101			75-125	Pass	
Magnesium	S25-Oc0025248	CP	%	97			75-125	Pass	
Potassium	S25-Oc0025248	CP	%	98			75-125	Pass	
Sodium	S25-Oc0025248	CP	%	108			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S25-Oc0032108	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S25-Oc0032108	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S25-Oc0032108	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S25-Oc0032108	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S25-Oc0032108	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S25-Oc0032108	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S25-Oc0032108	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S25-Oc0032108	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S25-Oc0032108	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S25-Oc0032108	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C6-C10	S25-Oc0032108	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S25-Oc0032108	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Naphthalene	S25-Oc0032108	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH >C16-C34	S25-Oc0032108	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S25-Oc0032108	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S25-Oc0039085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
4.4'-DDD	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDE	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDT	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
a-HCH	S25-Oc0033164	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Aldrin	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
b-HCH	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
d-HCH	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Dieldrin	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan I	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan II	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan sulphate	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin aldehyde	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin ketone	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
g-HCH (Lindane)	S25-Oc0033164	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor epoxide	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Hexachlorobenzene	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Methoxychlor	S25-Oc0039085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Toxaphene	S25-Oc0039085	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Bolstar	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorfenvinphos	S25-Oc0039085	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chlorpyrifos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorpyrifos-methyl	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Coumaphos	S25-Oc0039085	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-S	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Demeton-O	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Diazinon	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Dichlorvos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dimethoate	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Disulfoton	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
EPN	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethoprop	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethyl parathion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenitrothion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fensulfothion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenthion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Malathion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Merphos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methyl parathion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Mevinphos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Monocrotophos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Naled	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Omethoate	S25-Oc0039085	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phorate	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Pirimiphos-methyl	S25-Oc0039085	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Pyrazophos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ronnel	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Terbufos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tetrachlorvinphos	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tokuthion	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Trichloronate	S25-Oc0039085	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1221	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1232	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1242	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1248	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1254	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Aroclor-1260	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Total PCB*	S25-Oc0034141	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (Trace level)				Result 1	Result 2	RPD			
Benzo(a)pyrene - low level	M25-Oc0042129	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25 °C)	S25-Oc0025242	CP	uS/cm	12000	12000	<1	30%	Pass	
Oil & Grease (HEM)	S25-Oc0025242	CP	mg/L	< 10	10	8.0	30%	Pass	
Phosphate total (as P)	S25-Oc0025242	CP	mg/L	0.20	0.19	9.0	30%	Pass	
Phosphorus reactive (as P)	S25-Oc0025242	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	S25-Oc0043573	NCP	mg/L	170	170	<1	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Bicarbonate Alkalinity (as CaCO3)	S25-Oc0031024	NCP	mg/L	42	42	1.0	30%	Pass	
Carbonate Alkalinity (as CaCO3)	S25-Oc0031024	NCP	mg/L	25	28	9.0	30%	Pass	
Hydroxide Alkalinity (as CaCO3)	S25-Oc0031024	NCP	mg/L	< 20	< 20	<1	30%	Pass	
Total Alkalinity (as CaCO3)	S25-Oc0031024	NCP	mg/L	67	70	4.0	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1	Result 2	RPD			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
Perfluorooctane sulfonamide (FOSA)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S25-Oc0042596	NCP	ug/L	< 2.5	< 2.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S25-Oc0042596	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen (as N)	S25-Oc0025243	CP	mg/L	1.0	1.3	31	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S25-Oc0025247	CP	mg/L	940	940	<1	30%	Pass	
Sulphate (as SO4)	S25-Oc0025247	CP	mg/L	230	230	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Phosphate total (as P)	S25-Oc0025248	CP	mg/L	0.14	0.13	4.0	30%	Pass	
Phosphorus reactive (as P)	S25-Oc0025248	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	S25-Oc0025249	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Aluminium (filtered)	S25-Oc0025249	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Arsenic	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Arsenic (filtered)	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S25-Oc0025249	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Cadmium (filtered)	S25-Oc0025249	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chromium (filtered)	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron	S25-Oc0025249	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Iron (filtered)	S25-Oc0025249	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Lead	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese	S25-Oc0025249	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Manganese (filtered)	S25-Oc0025249	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Mercury	S25-Oc0025249	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Mercury (filtered)	S25-Oc0025249	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nickel (filtered)	S25-Oc0025249	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S25-Oc0025249	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	S25-Oc0025249	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	S25-Oc0025249	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Magnesium	S25-Oc0025249	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Potassium	S25-Oc0025249	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Sodium	S25-Oc0025249	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	

Comments

Report 1278086-W-V2 (amendment to report 1278086-W) has been issued to include Al, Mn, AlFilt, MnFilt as per client request.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Temperature of Chilled samples on receipt	5.2°C
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R09	Theoretically the TKN result should be greater or equal to the ammonia concentration. However the difference reported is within the measurement uncertainty of the individual tests

Authorised by:

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Edward Lee	Senior Analyst-Organic
Luke Holt	Senior Analyst-Inorganic
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-PFAS
Roopesh Rangarajan	Senior Analyst-Volatile
Ryan Phillips	Senior Analyst-Inorganic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

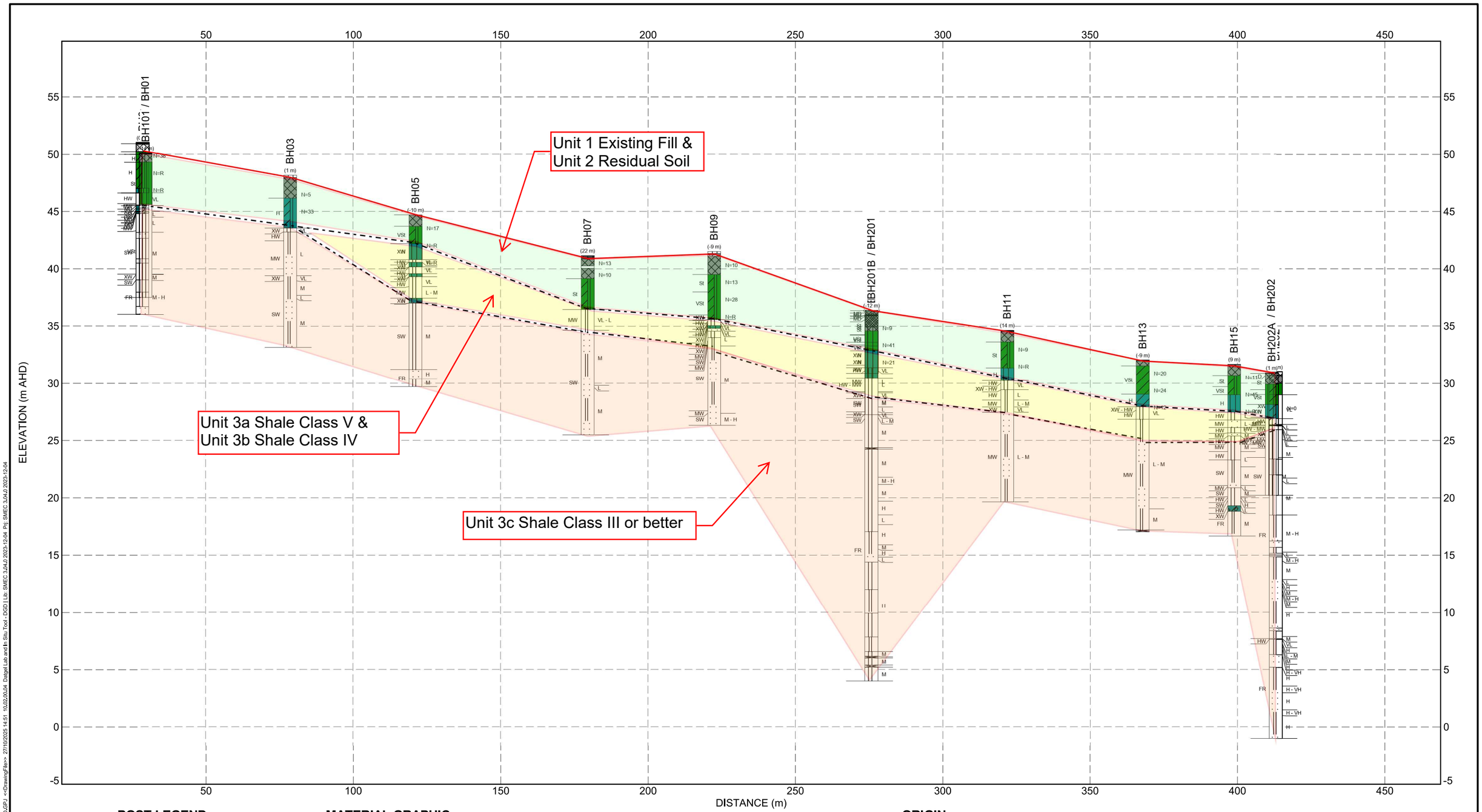
* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

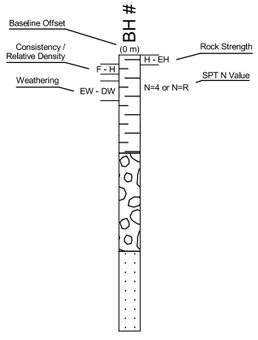
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Appendix F

Geotechnical Interpretive Long Sections



POST LEGEND



MATERIAL GRAPHIC

- TOPSOIL
- ASPHALT
- BITUMINOUS MATERIAL
- CORE LOSS
- CONCRETE
- Void
- FILL
- CH - High Plasticity CLAY
- CI - Medium Plasticity CLAY
- CI-CH - Medium to High Plasticity CLAY
- GC - Clayey GRAVEL
- SILTSTONE
- SANDSTONE
- CLAYSTONE
- SHALE
- INTERBEDDED SILTSTONE & SANDSTONE

ORIGIN

- Concrete
- Sedimentary
- Fill
- Road Surface
- Topsoil
- Residual Soil
- Extremely Weathered Material

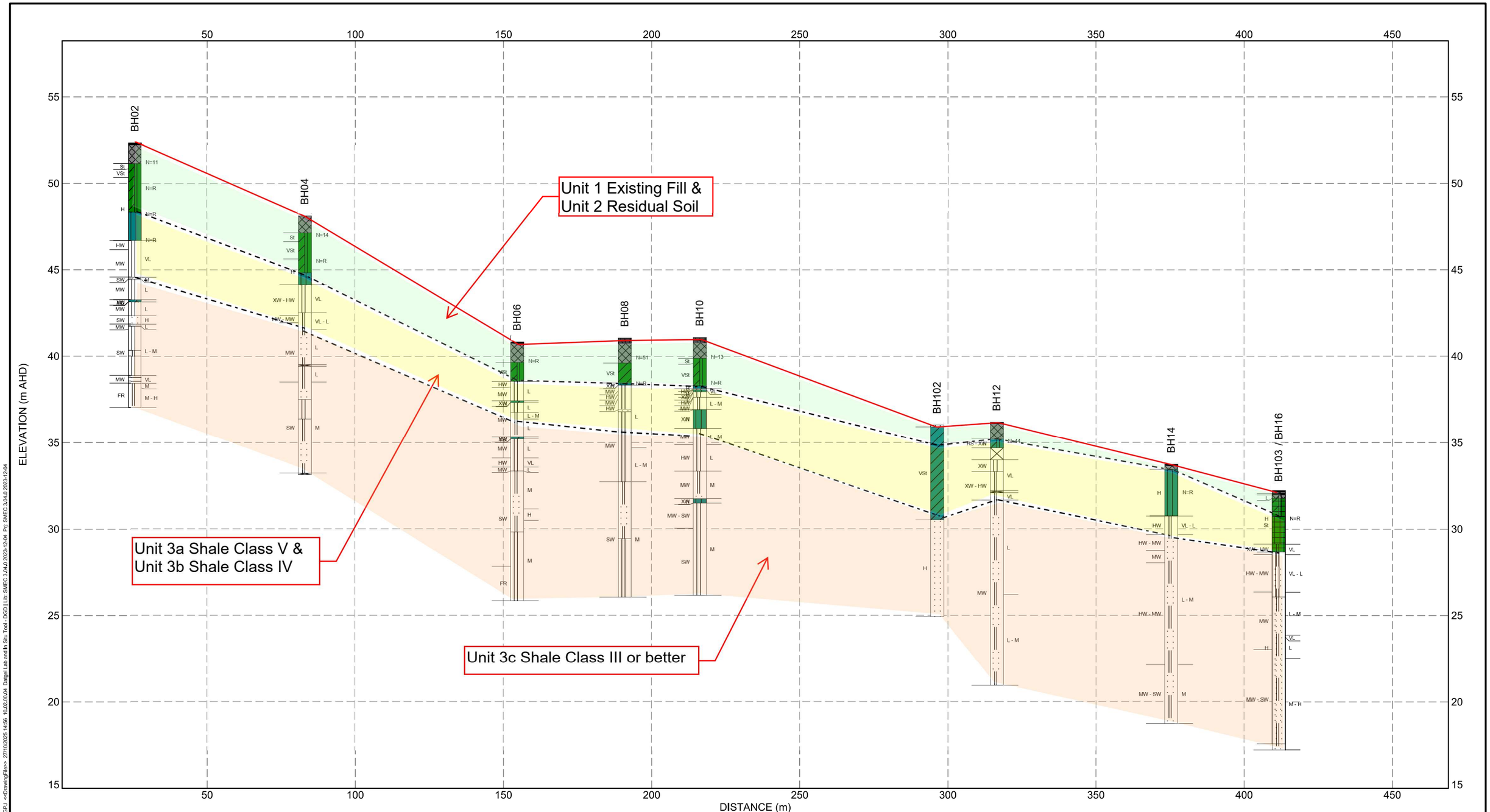
H 1:1261
0 15 30 45 60 75m
V 1:324
0 2 4 6 8 10m
Coord.System: MGA2020-56 Height Datum: AHD

smec

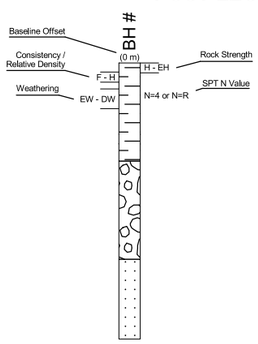
TITLE
GEOTECHNICAL INTERPRETATIVE LONG SECTION NO 1 (WESTERN)

DRAWN	GDM	DATE	27/10/2025
CHECKED	HW	DATE	27/10/2025
SCALE	H 1:1261 V 1:324		A3
PROJECT No	30013640	FIGURE No	

MODIFIED: SMEC 3.0/4.0 LIB 1K.GLB Fence: FENCE A3L SMEC GEO NSW 30013640_COMBINED.GPJ <<DrawingFile>> 27/10/2025 14:51 10.02.00.04 Datgel Lab and In Situ Tool - DGD | Lib: SMEC 3.0/4.0 2023-12-04 Prj: SMEC 3.0/4.0 2023-12-04



POST LEGEND



MATERIAL GRAPHIC

- TOPSOIL
- ASPHALT
- BITUMINOUS MATERIAL
- CORE LOSS
- CONCRETE
- FILL
- CH - High Plasticity CLAY
- CI - Medium Plasticity CLAY
- CI-CH - Medium to High Plasticity CLAY
- CL - Low Plasticity CLAY
- GC - Clayey GRAVEL
- SILTSTONE
- SANDSTONE
- CLAYSTONE
- INTERBEDDED SILTSTONE & SANDSTONE

ORIGIN

- Sedimentary
- Fill
- Road Surface
- Topsoil
- Residual Soil
- Extremely Weathered Material

H 1:1261
0 15 30 45 60 75m
V 1:216
0 2 4 6 8 10m
Coord.System: MGA2020-56 Height Datum: AHD

smec

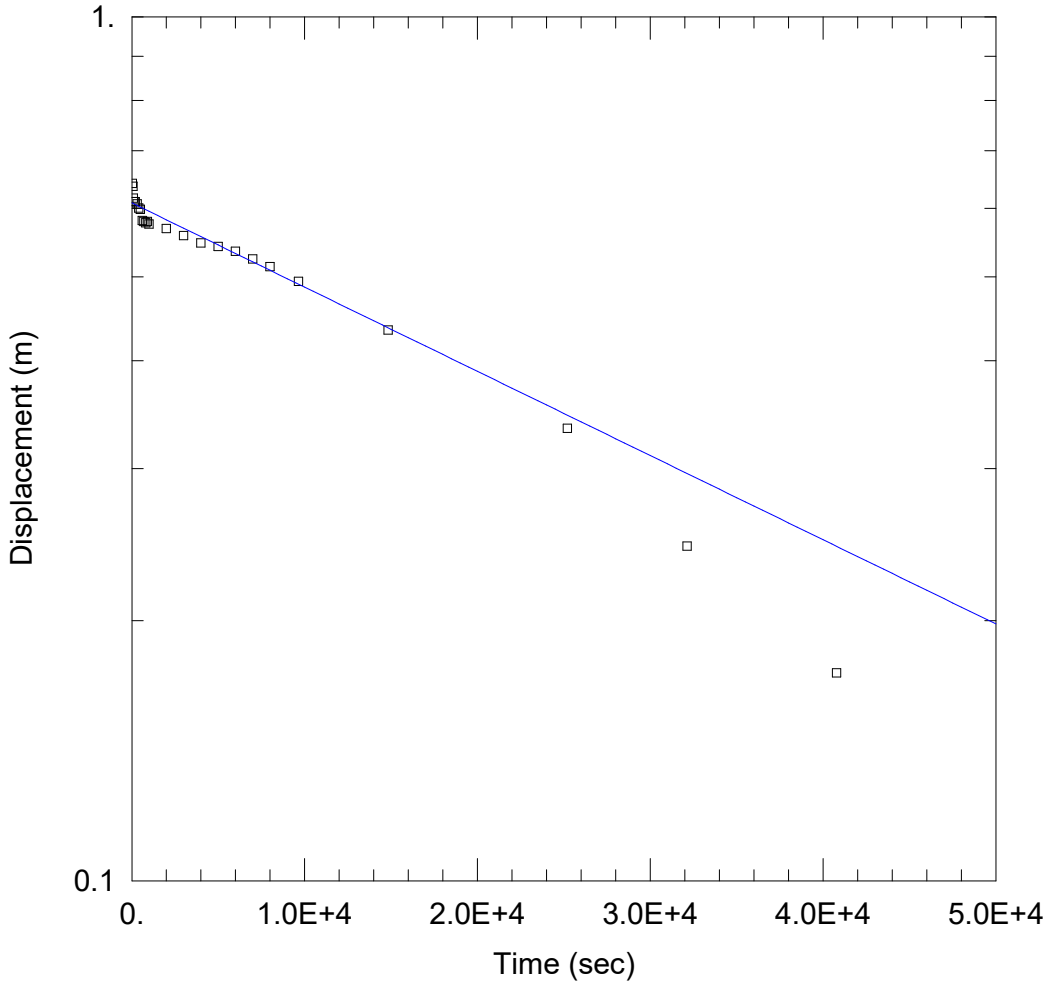
TITLE
GEOTECHNICAL INTERPRETATIVE LONG SECTION NO 2 (EASTERN)

DRAWN	GDM	DATE	27/10/2025
CHECKED	HW	DATE	27/10/2025
SCALE	H 1:1261 V 1:216		A3
PROJECT No	30013640	FIGURE No	

MODIFIED SMEC 3.0A-0.LIB; IK-GLB Fence FENCE A3L SMEC GEO NSW 30013640_COMBINED.GPJ <<DrawingFile>> 27/10/2025 14:56 10.02.00.04 Datgel Lab and In Situ Tool - DGD | Lib: SMEC 3.0A-0 2023-12-04 Prj: SMEC 3.0A-0 2023-12-04

Appendix G

Hydraulic Permeability



WELL TEST ANALYSIS

Data Set: C:\...\BH101.aqt
Date: 10/16/25 Time: 16:27:57

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH101

AQUIFER DATA

Saturated Thickness: 5.6 m Anisotropy Ratio (Kz/Kr): 0.5

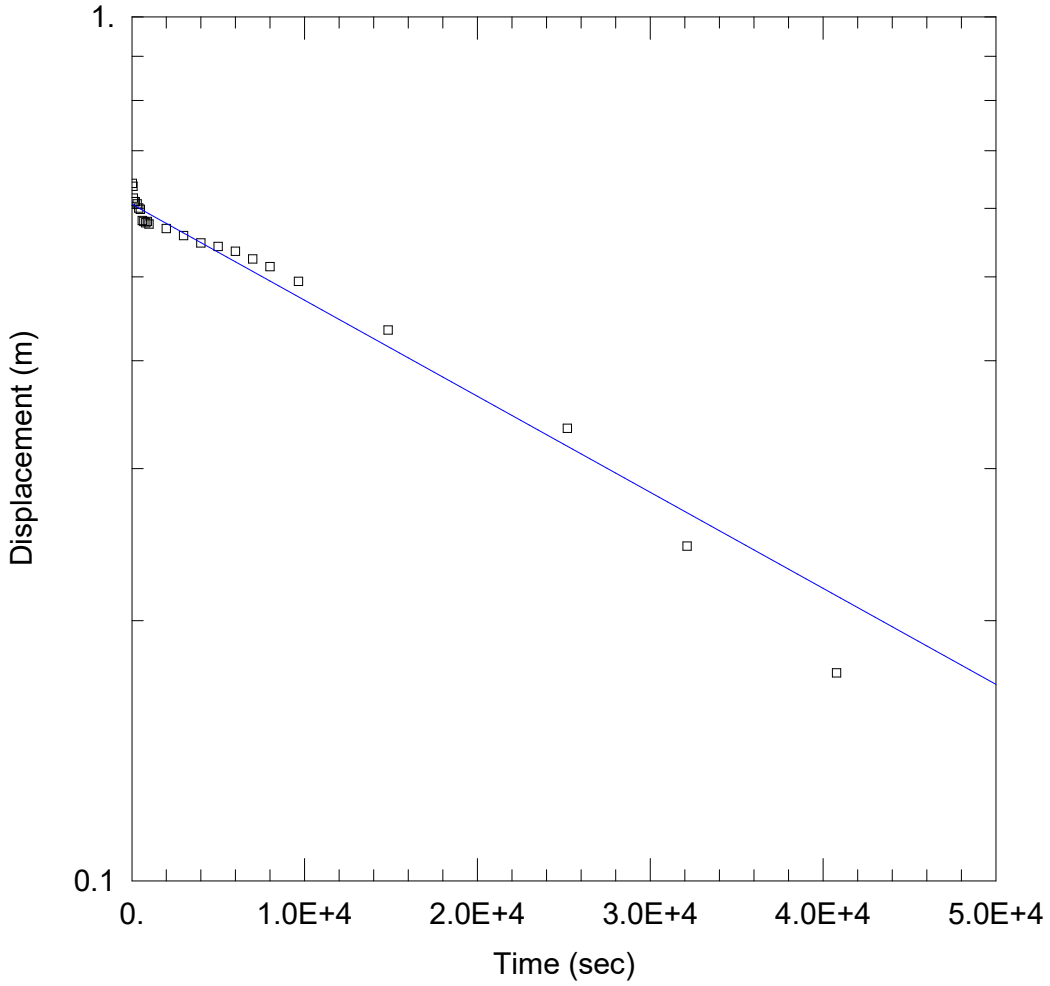
WELL DATA (BH101)

Initial Displacement: 1.12 m Static Water Column Height: 5.6 m
Total Well Penetration Depth: 5.6 m Screen Length: 3.2 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.000704 m/day y0 = 0.6089 m



WELL TEST ANALYSIS

Data Set: C:\...\BH101 (h).aqt
Date: 10/16/25 Time: 16:27:01

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH101

AQUIFER DATA

Saturated Thickness: 5.6 m Anisotropy Ratio (Kz/Kr): 0.5

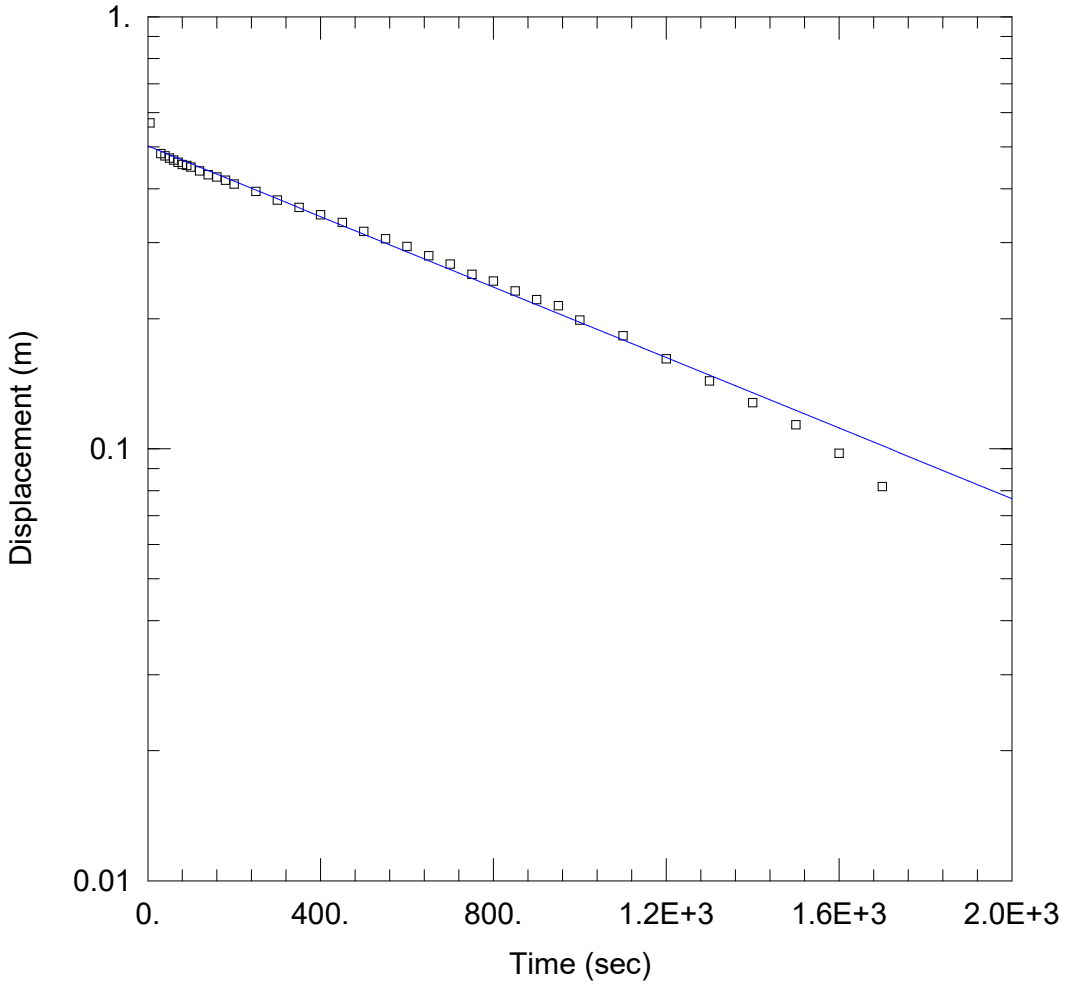
WELL DATA (BH101)

Initial Displacement: 1.12 m Static Water Column Height: 5.6 m
Total Well Penetration Depth: 5.6 m Screen Length: 3.2 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.001095 m/day y0 = 0.607 m



WELL TEST ANALYSIS

Data Set: C:\...\BH102.aqt
Date: 10/16/25 Time: 16:28:29

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH102

AQUIFER DATA

Saturated Thickness: 4.61 m Anisotropy Ratio (Kz/Kr): 0.5

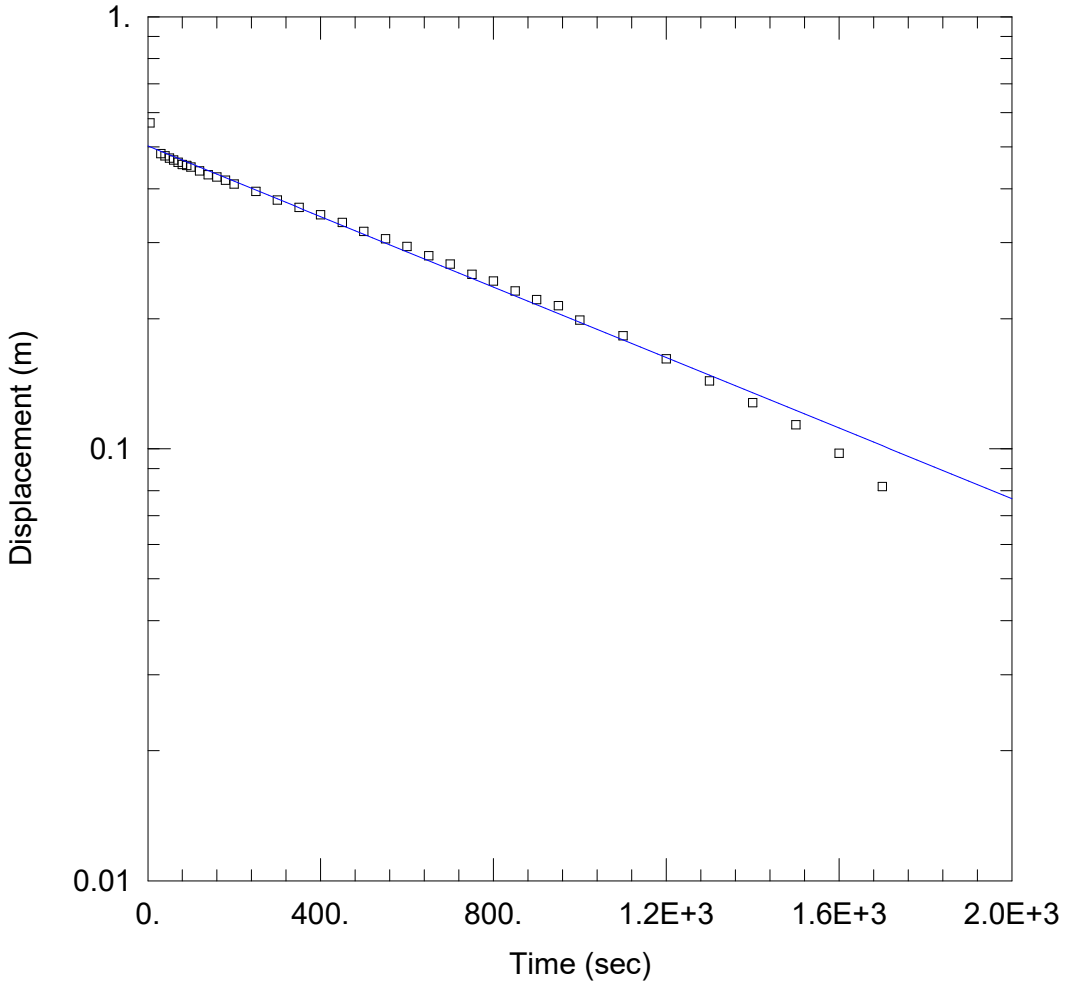
WELL DATA (BH102)

Initial Displacement: 1.58 m Static Water Column Height: 4.61 m
Total Well Penetration Depth: 4.21 m Screen Length: 3.5 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.02405 m/day y0 = 0.5021 m



WELL TEST ANALYSIS

Data Set: C:\...\BH102 (h).aqt
Date: 10/16/25 Time: 16:19:06

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH102

AQUIFER DATA

Saturated Thickness: 4.61 m Anisotropy Ratio (Kz/Kr): 0.5

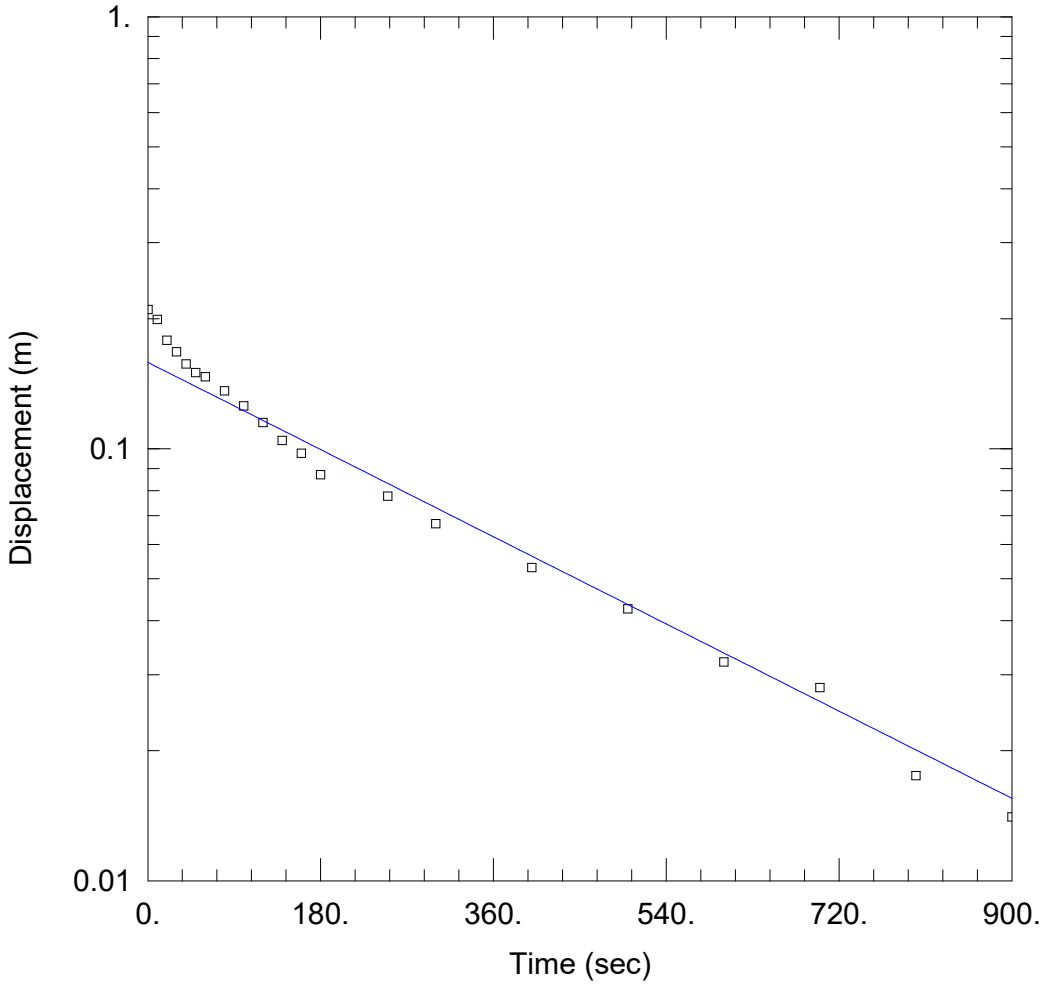
WELL DATA (BH102)

Initial Displacement: 1.58 m Static Water Column Height: 4.61 m
Total Well Penetration Depth: 4.21 m Screen Length: 3.5 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.03236 m/day y0 = 0.5021 m



WELL TEST ANALYSIS

Data Set: C:\...\BH103 Falling Head.aqt
Date: 10/16/25 Time: 16:29:50

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH103

AQUIFER DATA

Saturated Thickness: 7.17 m Anisotropy Ratio (Kz/Kr): 0.5

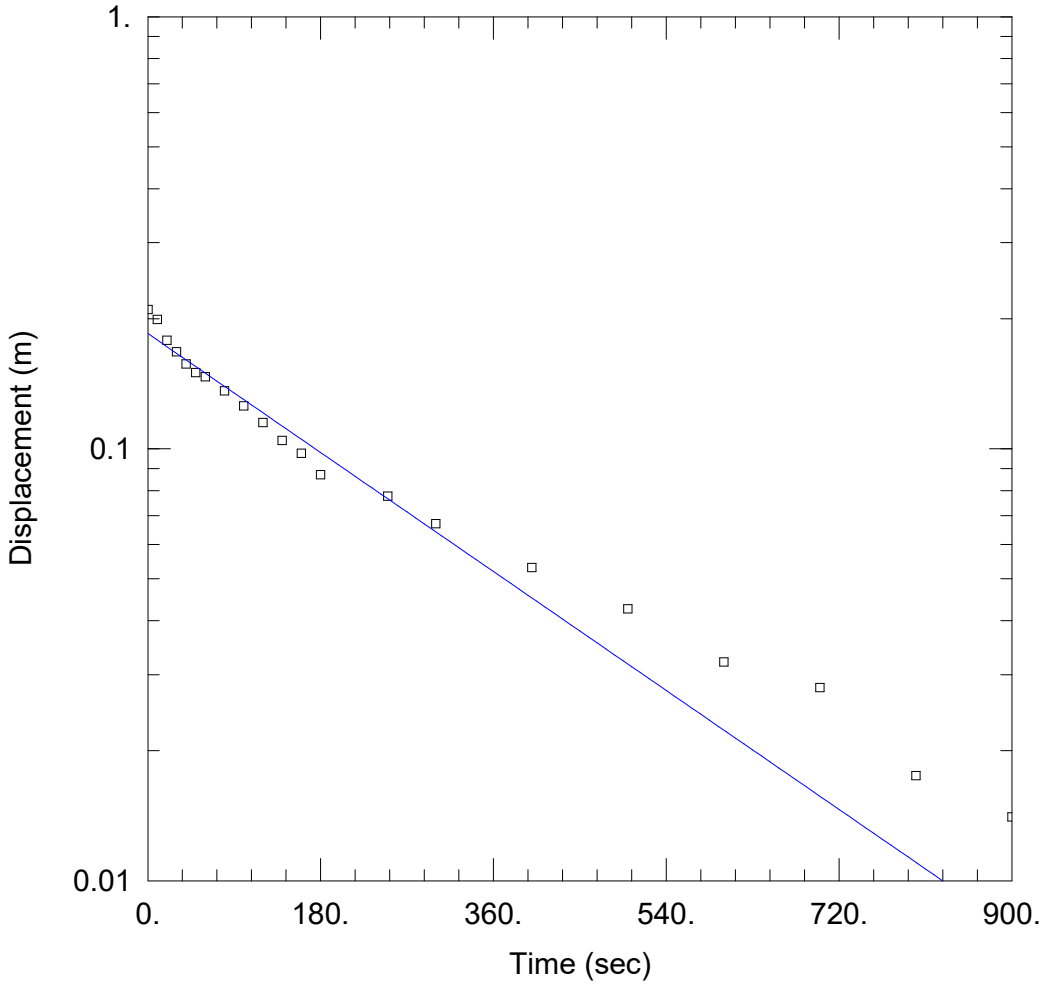
WELL DATA (BH103)

Initial Displacement: 0.21 m
Total Well Penetration Depth: 6.5 m
Casing Radius: 0.025 m
Static Water Column Height: 7.17 m
Screen Length: 6.5 m
Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.03999 m/day
y0 = 0.1585 m



WELL TEST ANALYSIS

Data Set: C:\...\BH103 Falling Head (h).aqt
Date: 10/16/25 Time: 16:18:00

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH103

AQUIFER DATA

Saturated Thickness: 7.17 m Anisotropy Ratio (Kz/Kr): 0.5

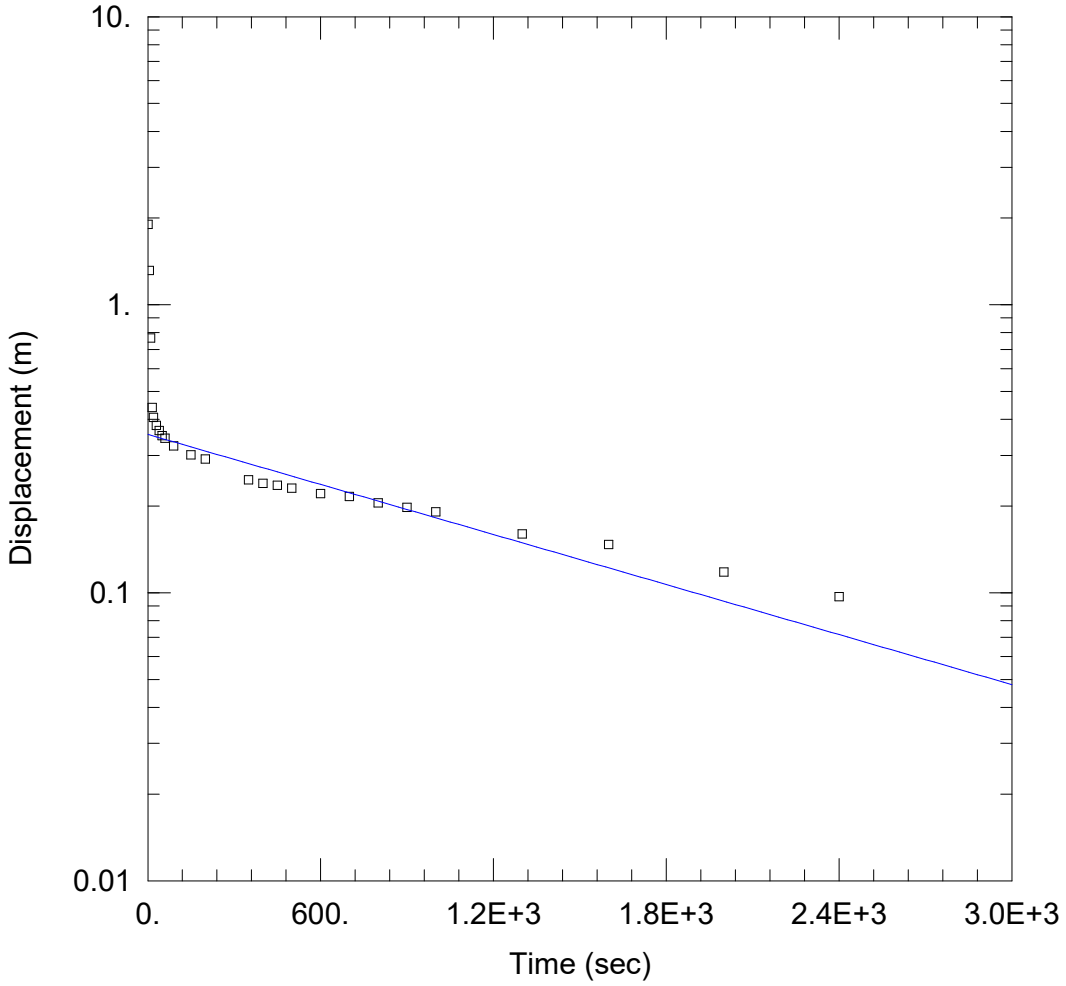
WELL DATA (BH103)

Initial Displacement: 0.21 m
Total Well Penetration Depth: 6.5 m
Casing Radius: 0.025 m
Static Water Column Height: 7.17 m
Screen Length: 6.5 m
Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.08455 m/day
y0 = 0.1849 m



WELL TEST ANALYSIS

Data Set: C:\...\BH103.aqt
Date: 10/16/25 Time: 16:30:58

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH103

AQUIFER DATA

Saturated Thickness: 7.17 m Anisotropy Ratio (Kz/Kr): 0.5

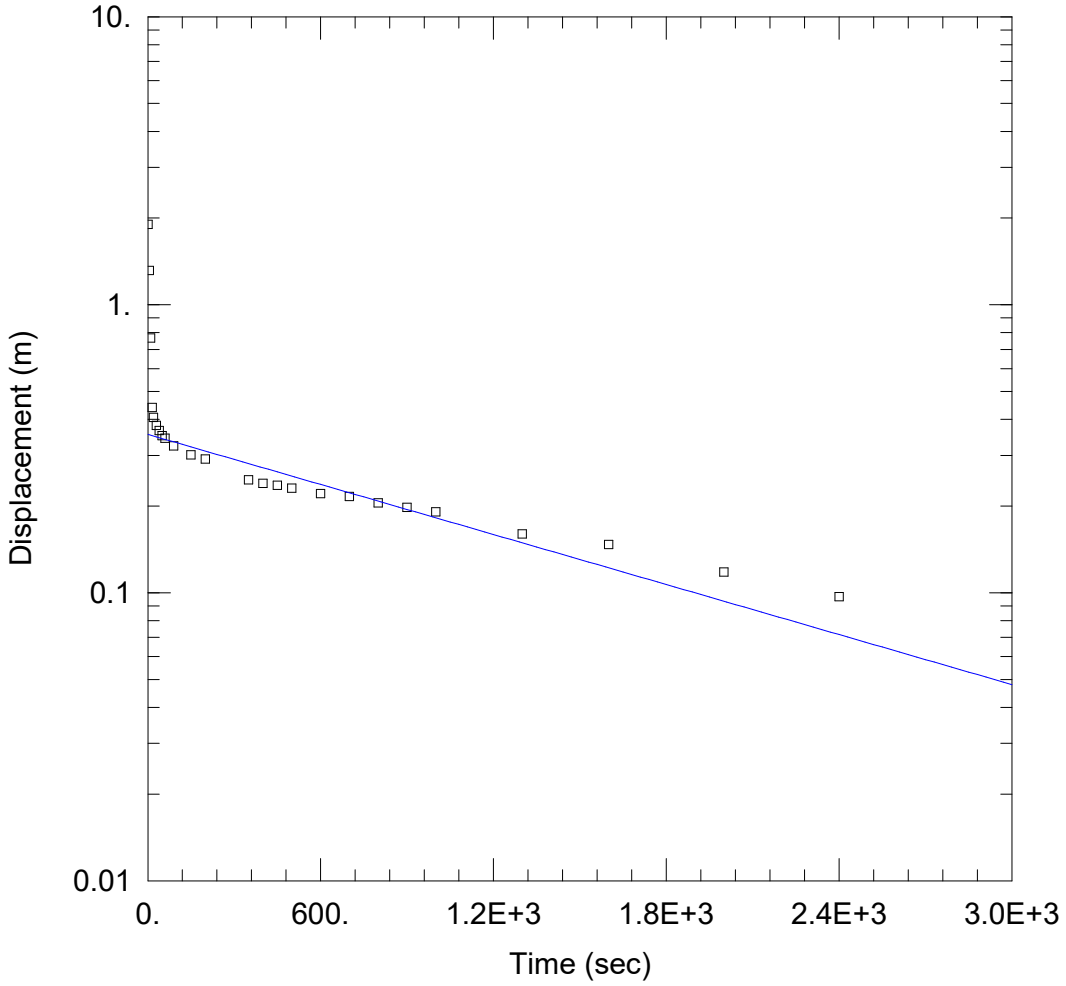
WELL DATA (BH103)

Initial Displacement: 1.9 m Static Water Column Height: 7.17 m
Total Well Penetration Depth: 6.5 m Screen Length: 6.5 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.01033 m/day y0 = 0.3548 m



WELL TEST ANALYSIS

Data Set: C:\...\BH103 (h).aqt
Date: 10/16/25 Time: 16:18:30

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH103

AQUIFER DATA

Saturated Thickness: 7.17 m Anisotropy Ratio (Kz/Kr): 0.5

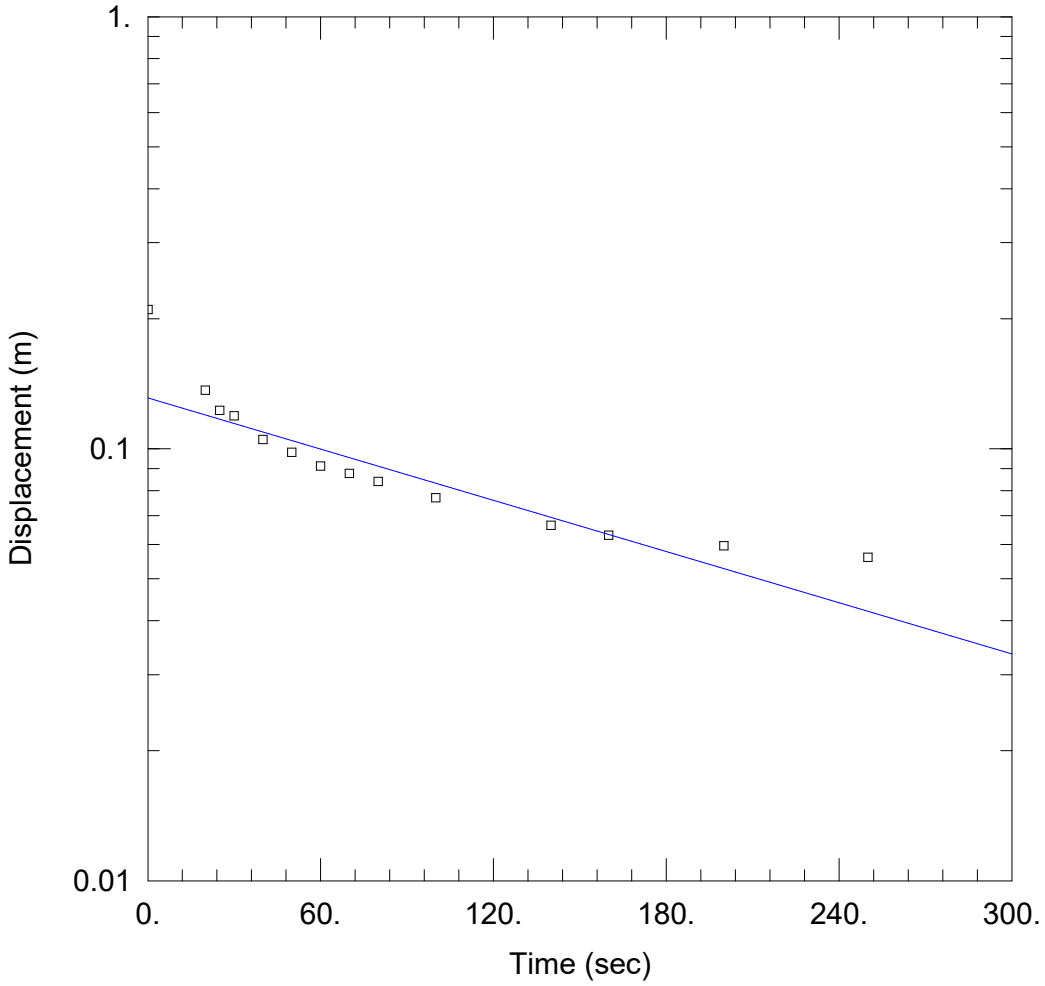
WELL DATA (BH103)

Initial Displacement: 1.9 m Static Water Column Height: 7.17 m
Total Well Penetration Depth: 6.5 m Screen Length: 6.5 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.016 m/day y0 = 0.3548 m



WELL TEST ANALYSIS

Data Set: C:\...\BH103 Test 2.aqt
Date: 10/16/25 Time: 16:29:15

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH103

AQUIFER DATA

Saturated Thickness: 7.17 m Anisotropy Ratio (Kz/Kr): 0.5

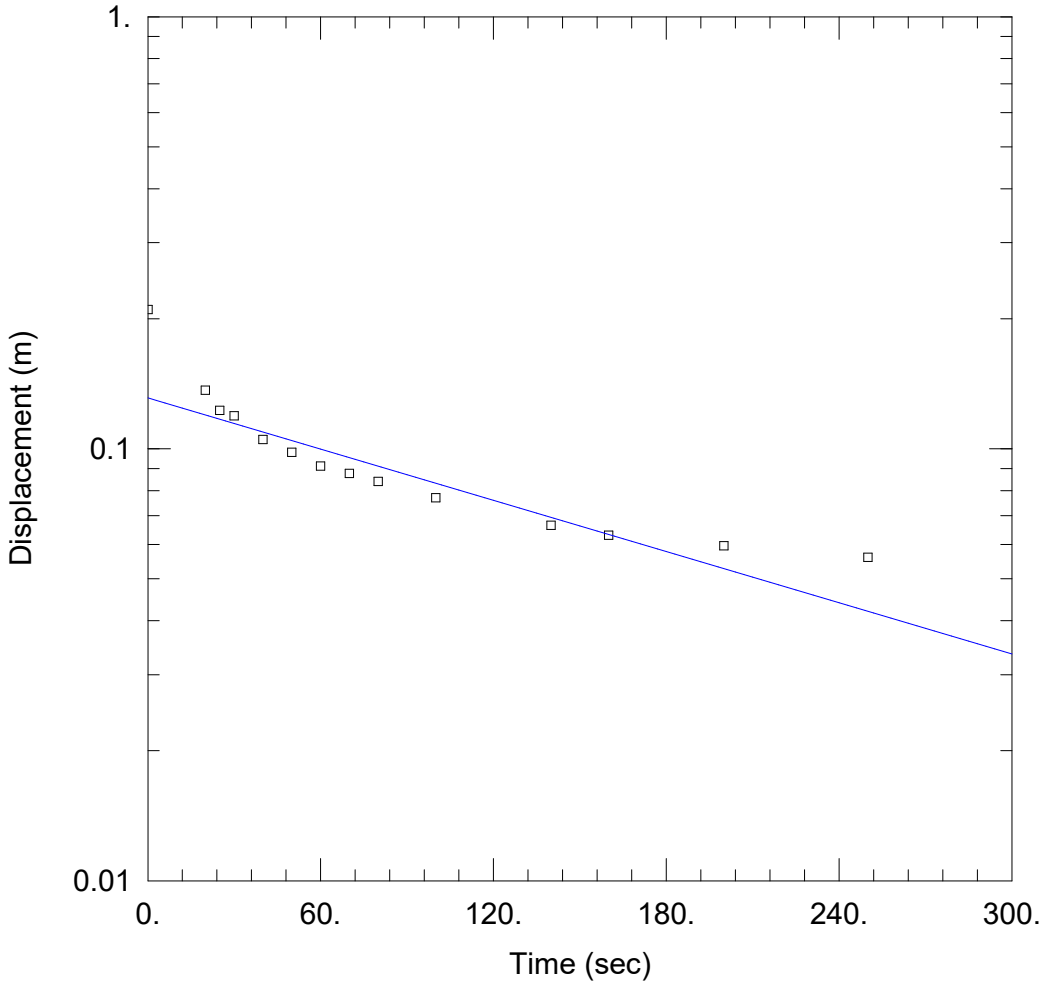
WELL DATA (BH103)

Initial Displacement: 0.21 m Static Water Column Height: 7.17 m
Total Well Penetration Depth: 6.5 m Screen Length: 6.5 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.07046 m/day y0 = 0.1313 m



WELL TEST ANALYSIS

Data Set: C:\...\BH103 Test 2 (h).aqt
Date: 10/16/25 Time: 16:16:40

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH103

AQUIFER DATA

Saturated Thickness: 7.17 m Anisotropy Ratio (Kz/Kr): 0.5

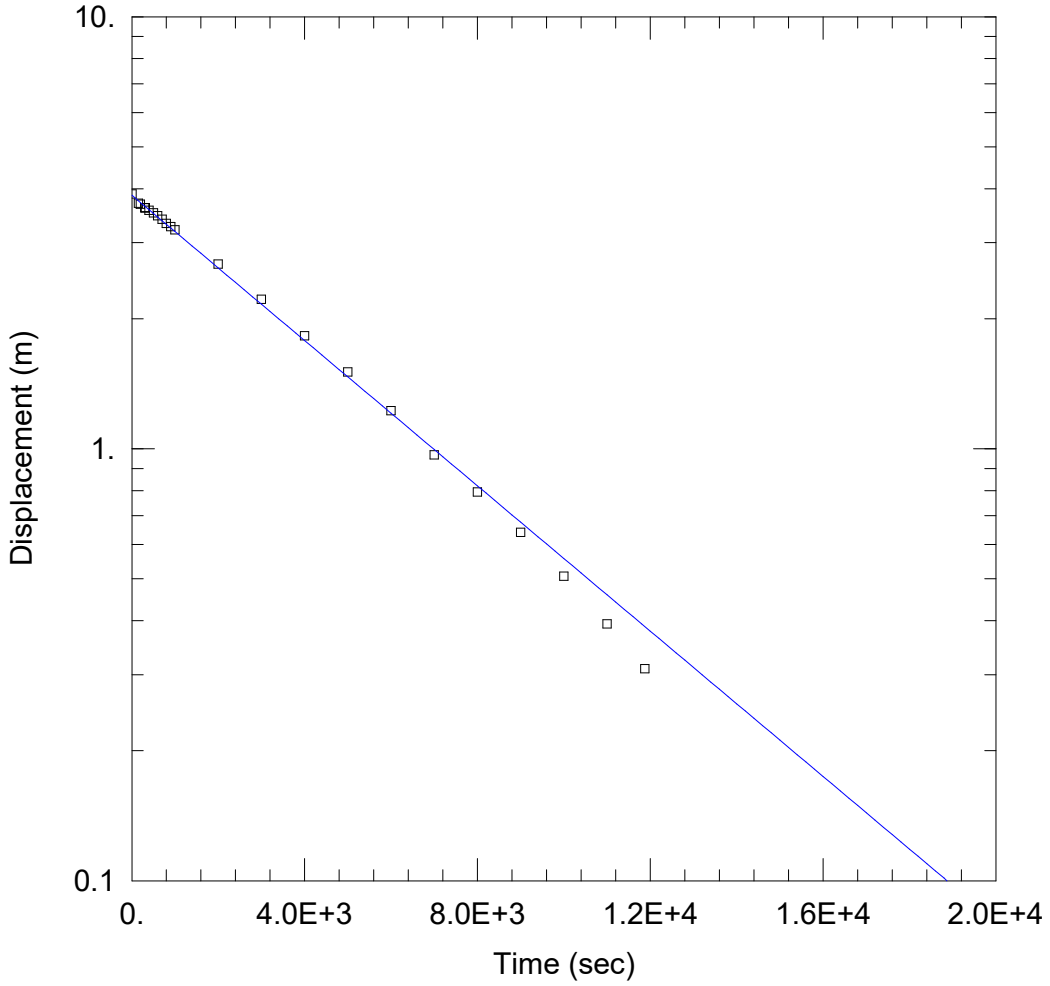
WELL DATA (BH103)

Initial Displacement: 0.21 m Static Water Column Height: 7.17 m
Total Well Penetration Depth: 6.5 m Screen Length: 6.5 m
Casing Radius: 0.025 m Well Radius: 0.057 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.1092 m/day y0 = 0.1313 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201A Recovery.aqt
Date: 10/16/25 Time: 16:32:07

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201A

AQUIFER DATA

Saturated Thickness: 5.44 m Anisotropy Ratio (Kz/Kr): 0.5

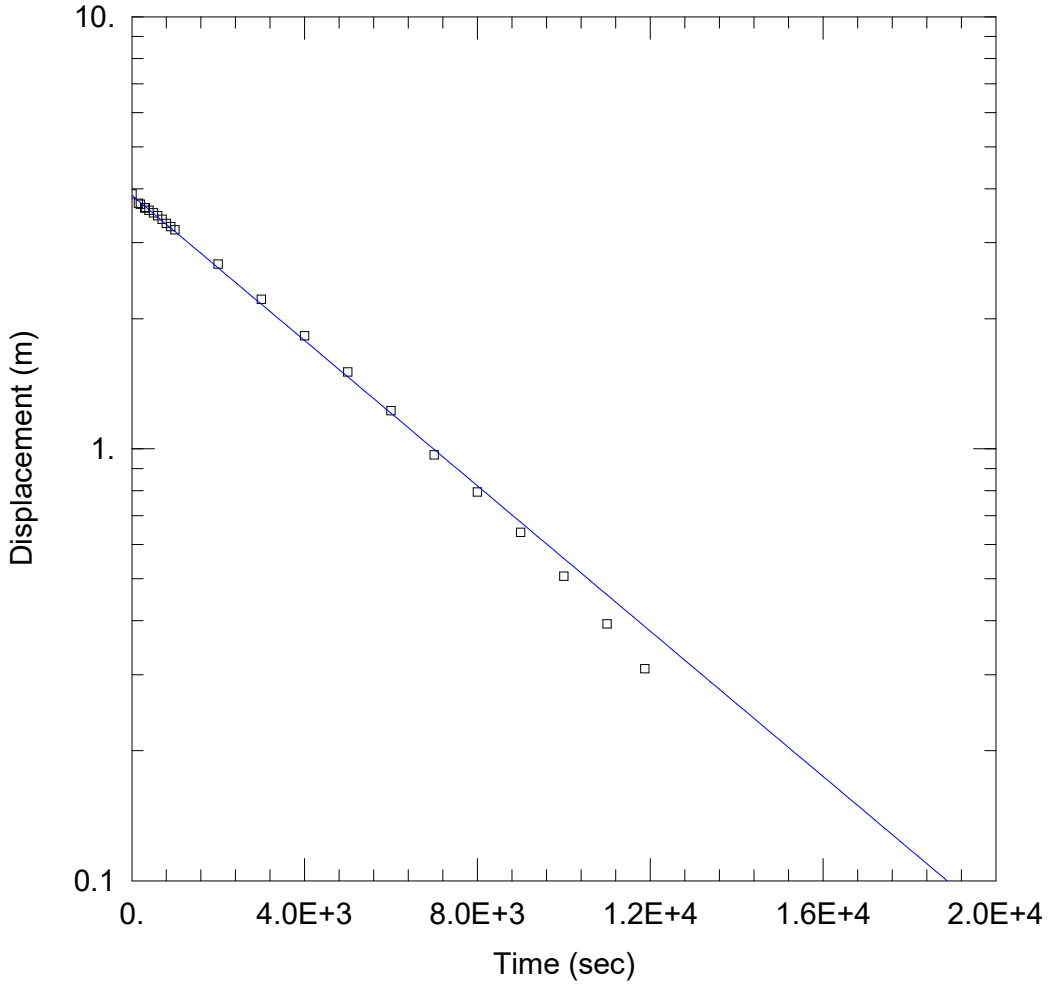
WELL DATA (BH201A)

Initial Displacement: 3.89 m
Static Water Column Height: 5.44 m
Total Well Penetration Depth: 5.24 m
Screen Length: 3.8 m
Casing Radius: 0.025 m
Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.004898 m/day
y0 = 3.864 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201A Recovery (h).aqt
Date: 10/16/25 Time: 16:21:11

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201A

AQUIFER DATA

Saturated Thickness: 5.44 m Anisotropy Ratio (Kz/Kr): 0.5

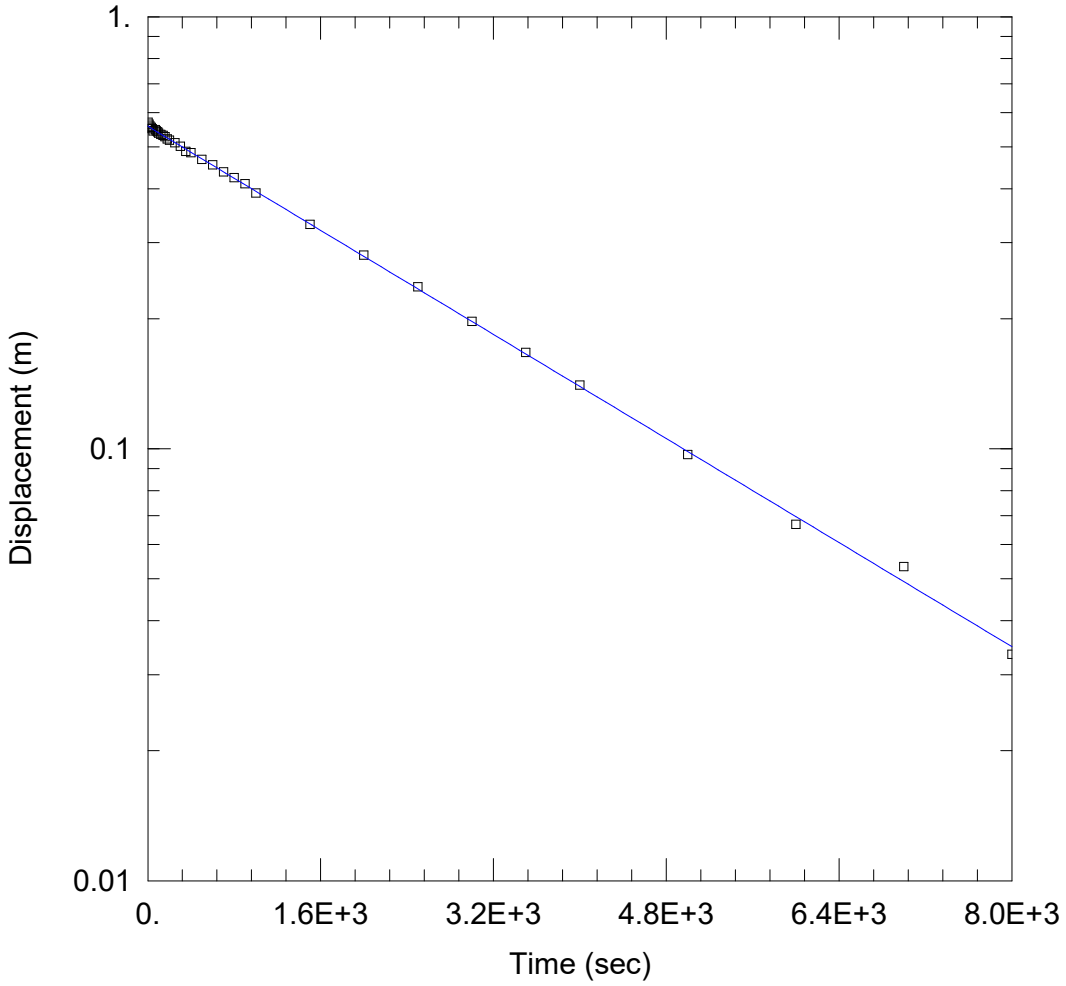
WELL DATA (BH201A)

Initial Displacement: 3.89 m
Total Well Penetration Depth: 5.24 m
Casing Radius: 0.025 m
Static Water Column Height: 5.44 m
Screen Length: 3.8 m
Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.006305 m/day
y0 = 3.864 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201A.aqt
Date: 10/16/25 Time: 16:33:46

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201A

AQUIFER DATA

Saturated Thickness: 4.15 m Anisotropy Ratio (Kz/Kr): 0.5

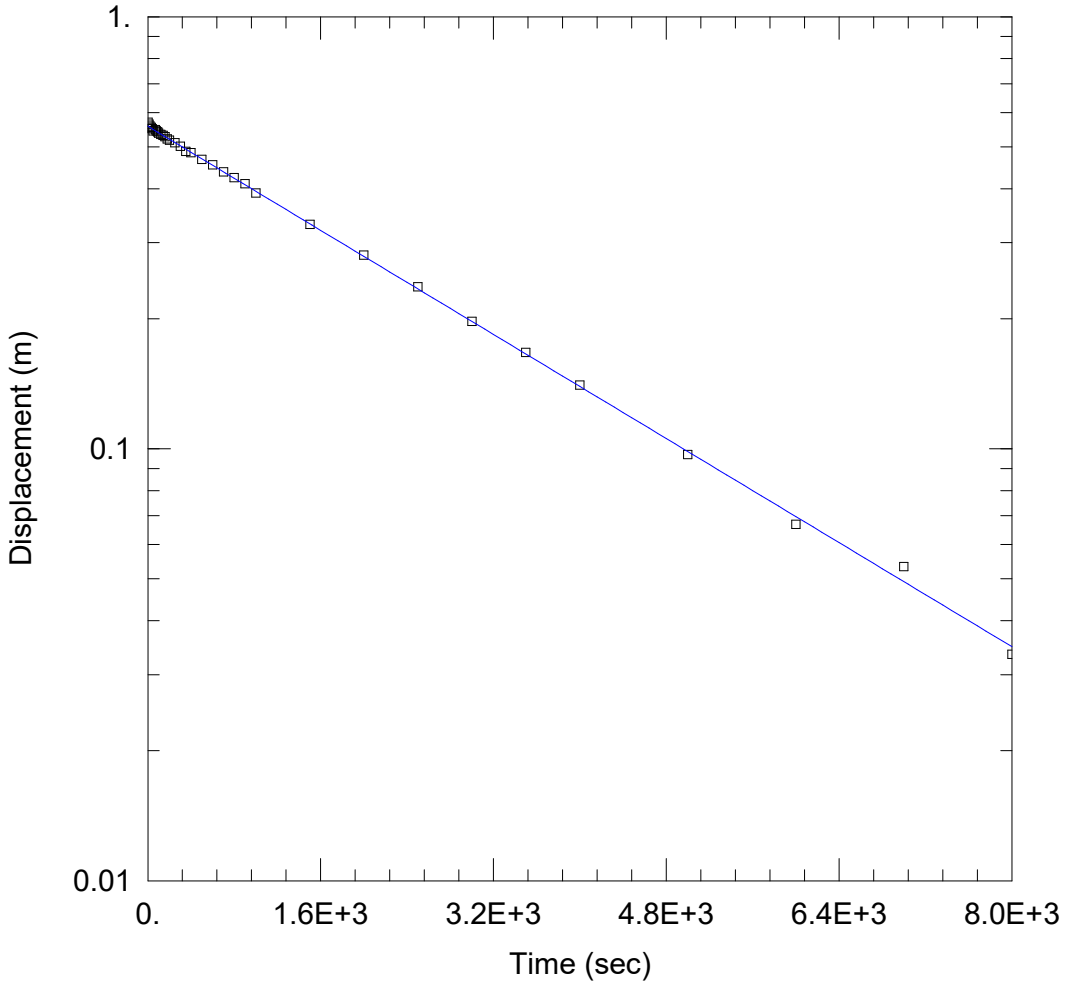
WELL DATA (BH201A)

Initial Displacement: 0.57 m
Total Well Penetration Depth: 3.95 m
Casing Radius: 0.025 m
Static Water Column Height: 4.15 m
Screen Length: 3.8 m
Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.008364 m/day
y0 = 0.5581 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201A (h).aqt
Date: 10/16/25 Time: 16:21:55

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201A

AQUIFER DATA

Saturated Thickness: 4.15 m Anisotropy Ratio (Kz/Kr): 0.5

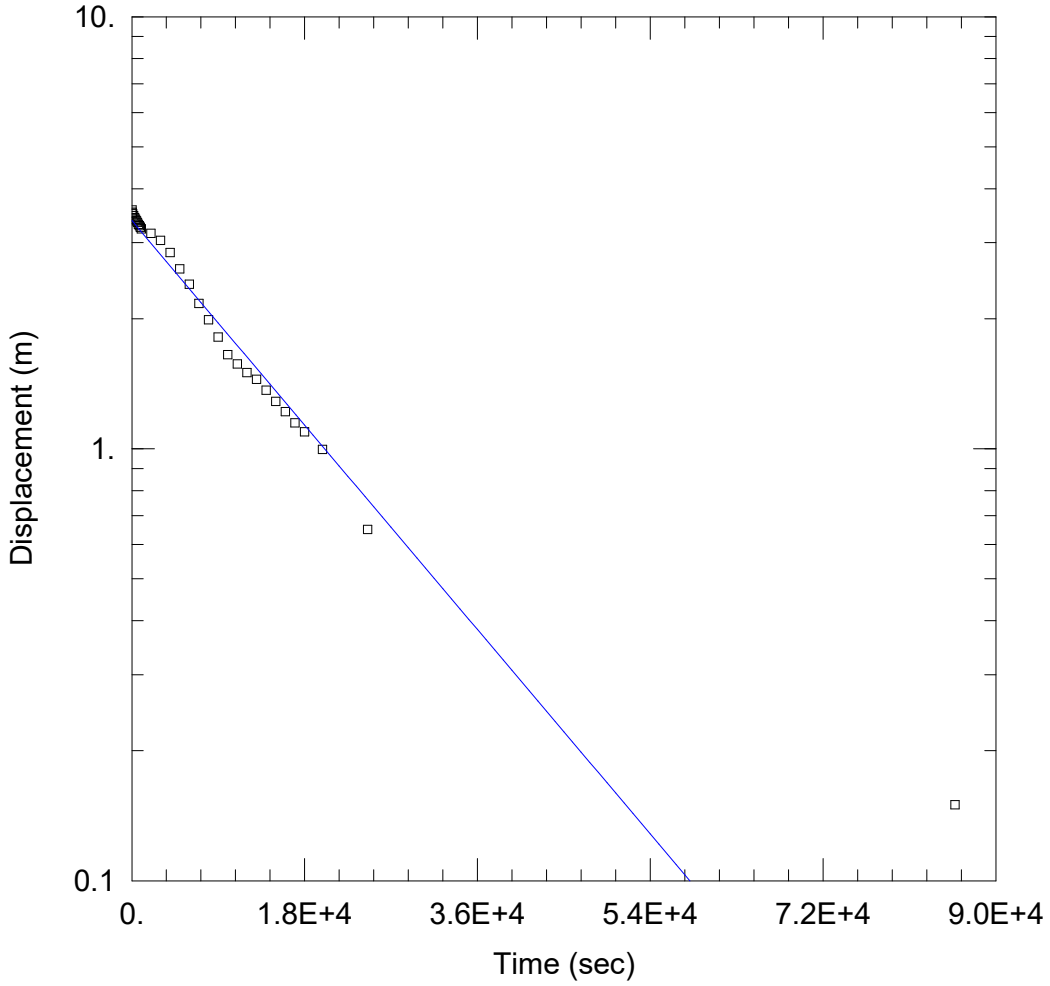
WELL DATA (BH201A)

Initial Displacement: 0.57 m
Static Water Column Height: 4.15 m
Total Well Penetration Depth: 3.95 m
Screen Length: 3.8 m
Casing Radius: 0.025 m
Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.01129 m/day
y0 = 0.5581 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201B Recovery.aqt
Date: 10/16/25 Time: 16:34:32

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201B

AQUIFER DATA

Saturated Thickness: 4.91 m Anisotropy Ratio (Kz/Kr): 0.5

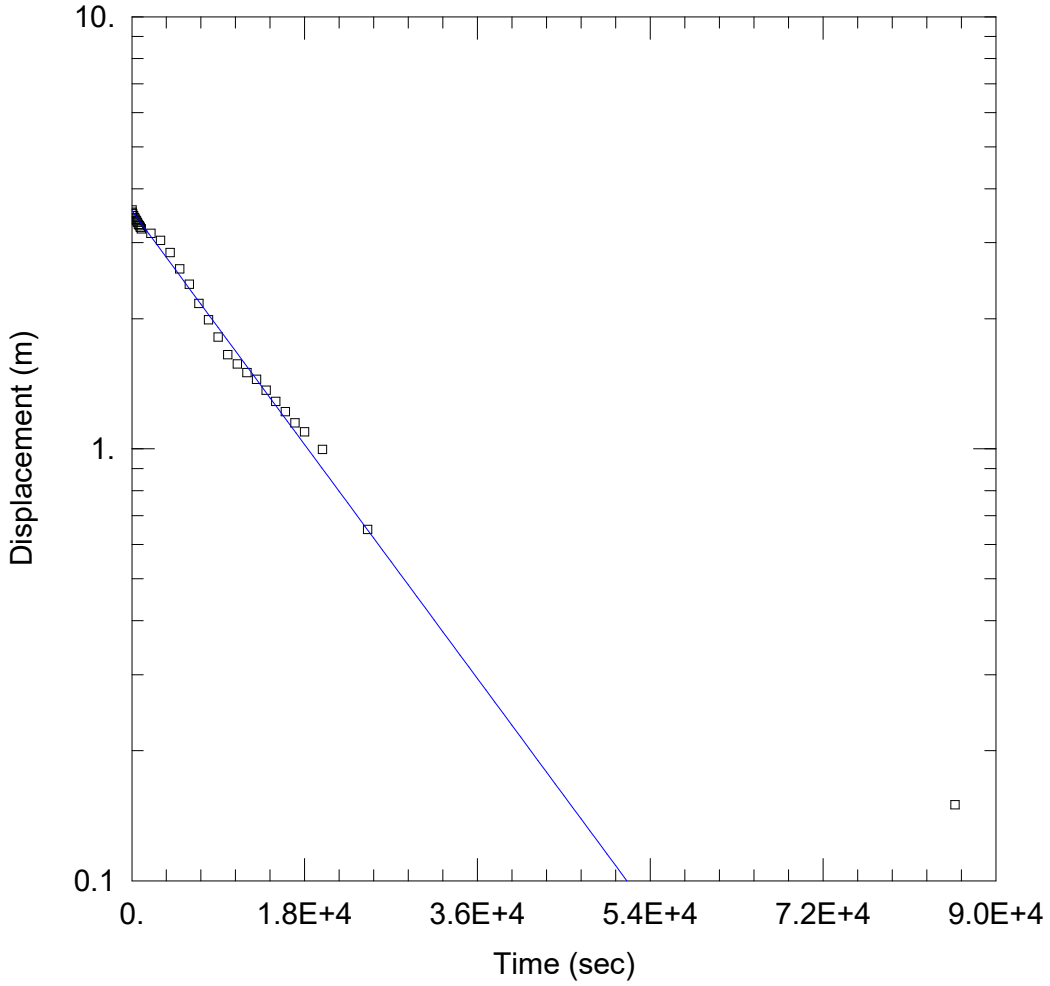
WELL DATA (BH201B)

Initial Displacement: 3.57 m
Total Well Penetration Depth: 4.01 m
Casing Radius: 0.025 m
Static Water Column Height: 4.91 m
Screen Length: 3.3 m
Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.001602 m/day
y0 = 3.373 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201B Recovery (h).aqt
Date: 10/16/25 Time: 16:23:14

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201B

AQUIFER DATA

Saturated Thickness: 4.91 m Anisotropy Ratio (Kz/Kr): 0.5

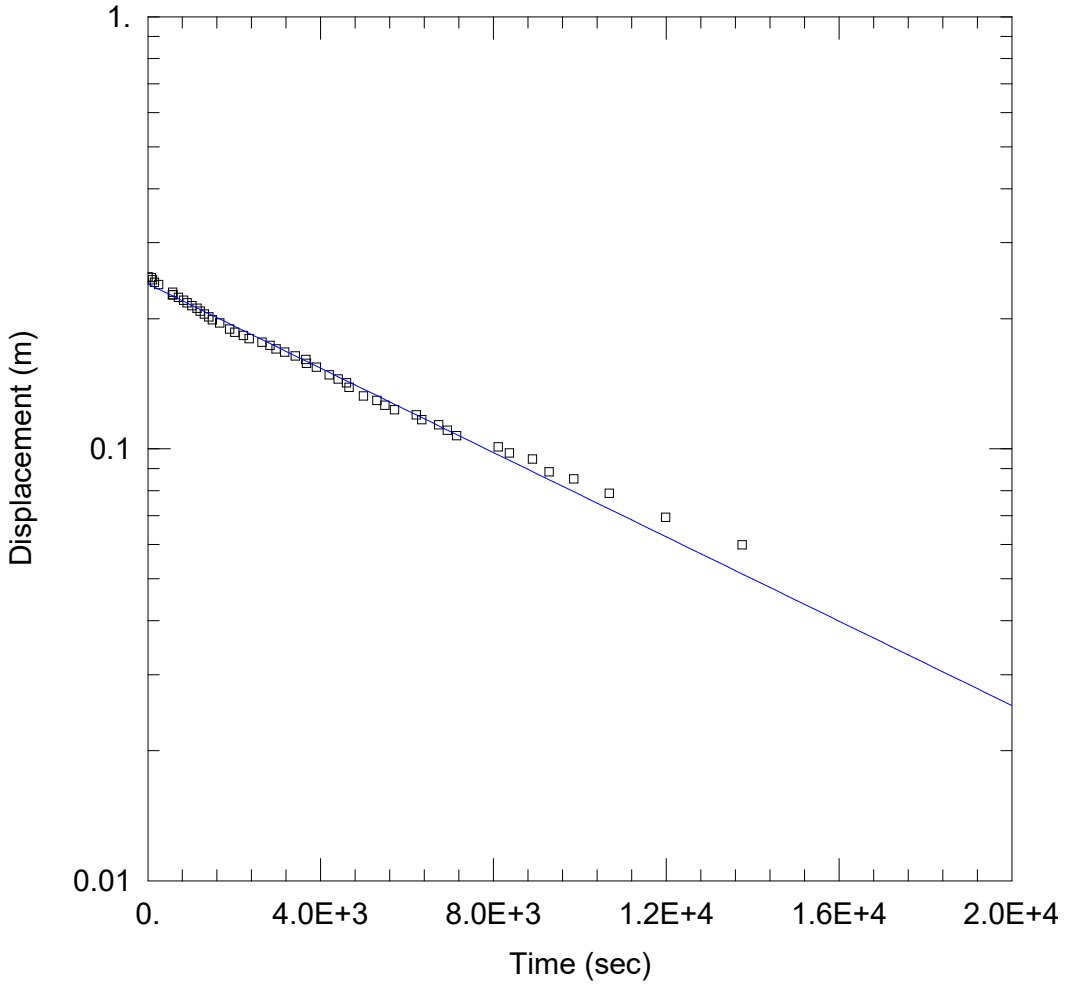
WELL DATA (BH201B)

Initial Displacement: 3.57 m
Static Water Column Height: 4.91 m
Total Well Penetration Depth: 4.01 m
Screen Length: 3.3 m
Casing Radius: 0.025 m
Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.002518 m/day
y0 = 3.56 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201B.aqt
Date: 10/16/25 Time: 16:36:05

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201B

AQUIFER DATA

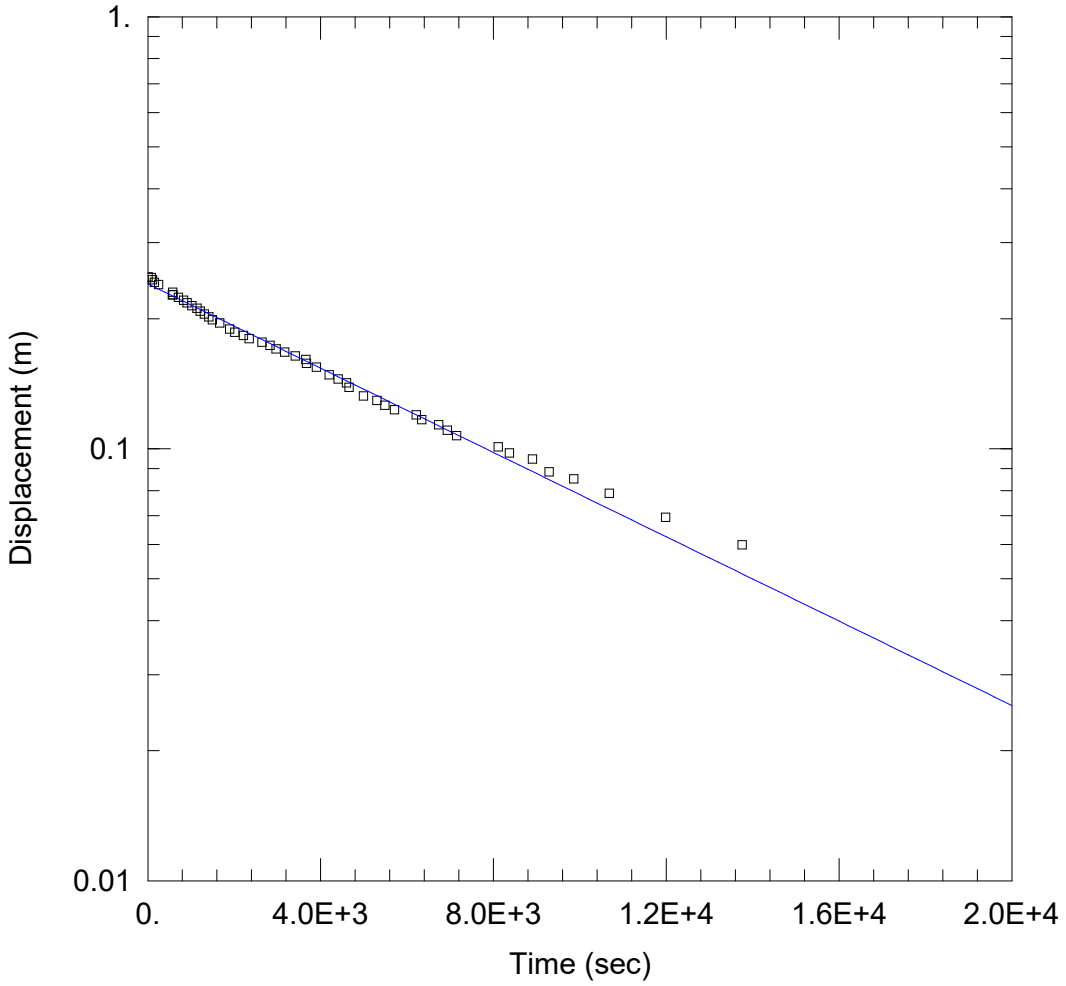
Saturated Thickness: 4.89 m Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA (BH201B)

Initial Displacement: 0.25 m
Total Well Penetration Depth: 3.99 m
Casing Radius: 0.025 m
Static Water Column Height: 4.89 m
Screen Length: 3.3 m
Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.002971 m/day
y0 = 0.2409 m



WELL TEST ANALYSIS

Data Set: C:\...\BH201B (h).aqt
Date: 10/16/25 Time: 16:23:55

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH201B

AQUIFER DATA

Saturated Thickness: 4.89 m Anisotropy Ratio (Kz/Kr): 0.5

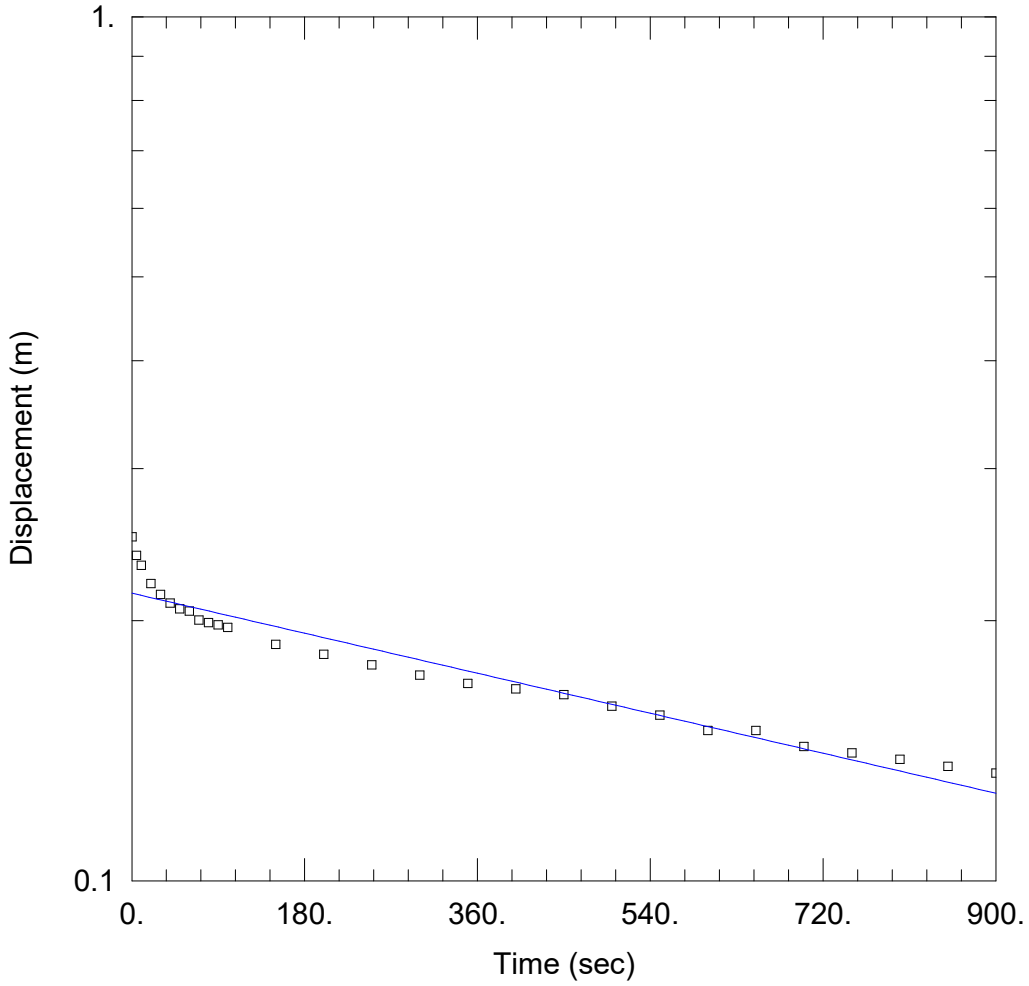
WELL DATA (BH201B)

Initial Displacement: 0.25 m Static Water Column Height: 4.89 m
Total Well Penetration Depth: 3.99 m Screen Length: 3.3 m
Casing Radius: 0.025 m Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.004083 m/day y0 = 0.2409 m



WELL TEST ANALYSIS

Data Set: C:\...\BH202A Test 1.aqt
Date: 10/16/25 Time: 16:37:41

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH202A

AQUIFER DATA

Saturated Thickness: 5.4 m Anisotropy Ratio (Kz/Kr): 0.5

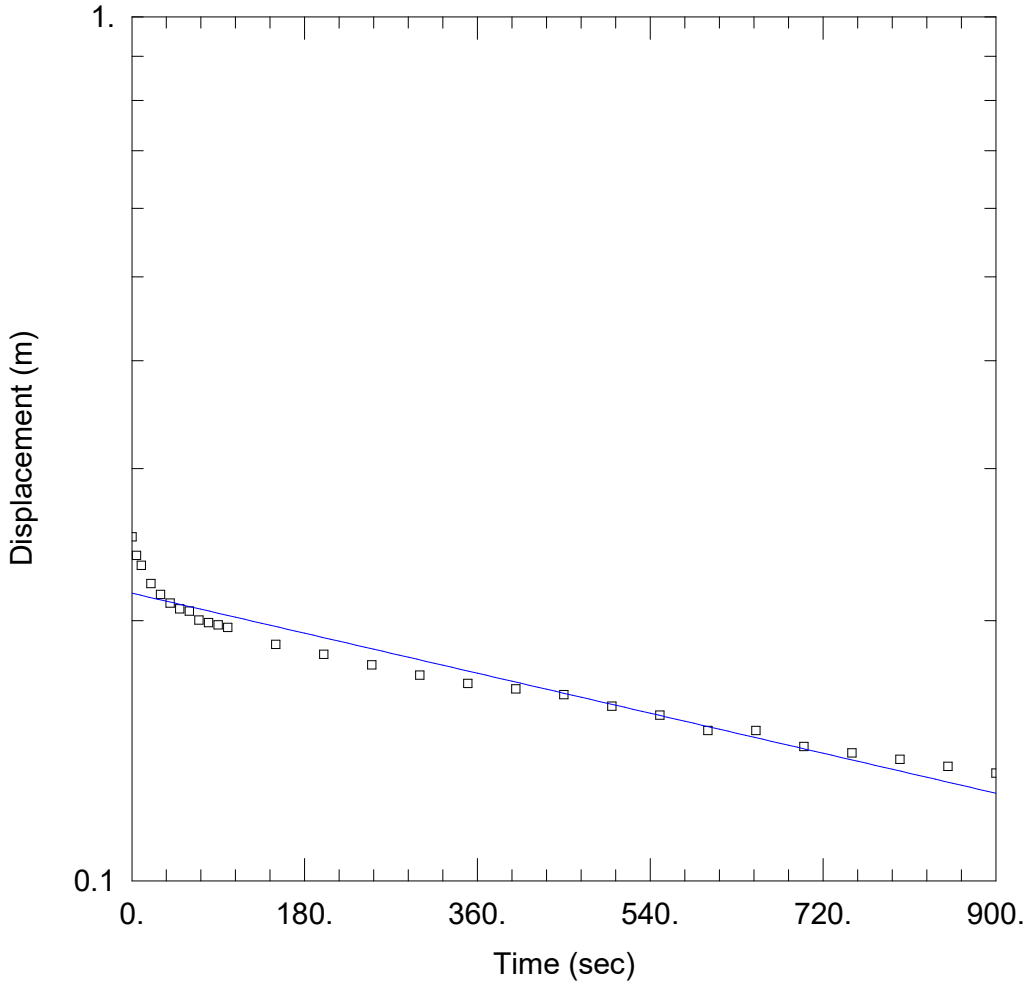
WELL DATA (BH202A)

Initial Displacement: 0.25 m Static Water Column Height: 5.4 m
Total Well Penetration Depth: 5.1 m Screen Length: 3.7 m
Casing Radius: 0.025 m Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.01513 m/day y0 = 0.2152 m



WELL TEST ANALYSIS

Data Set: C:\...\BH202A Test 1 (h).aqt
Date: 10/16/25 Time: 16:20:16

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH202A

AQUIFER DATA

Saturated Thickness: 5.4 m Anisotropy Ratio (Kz/Kr): 0.5

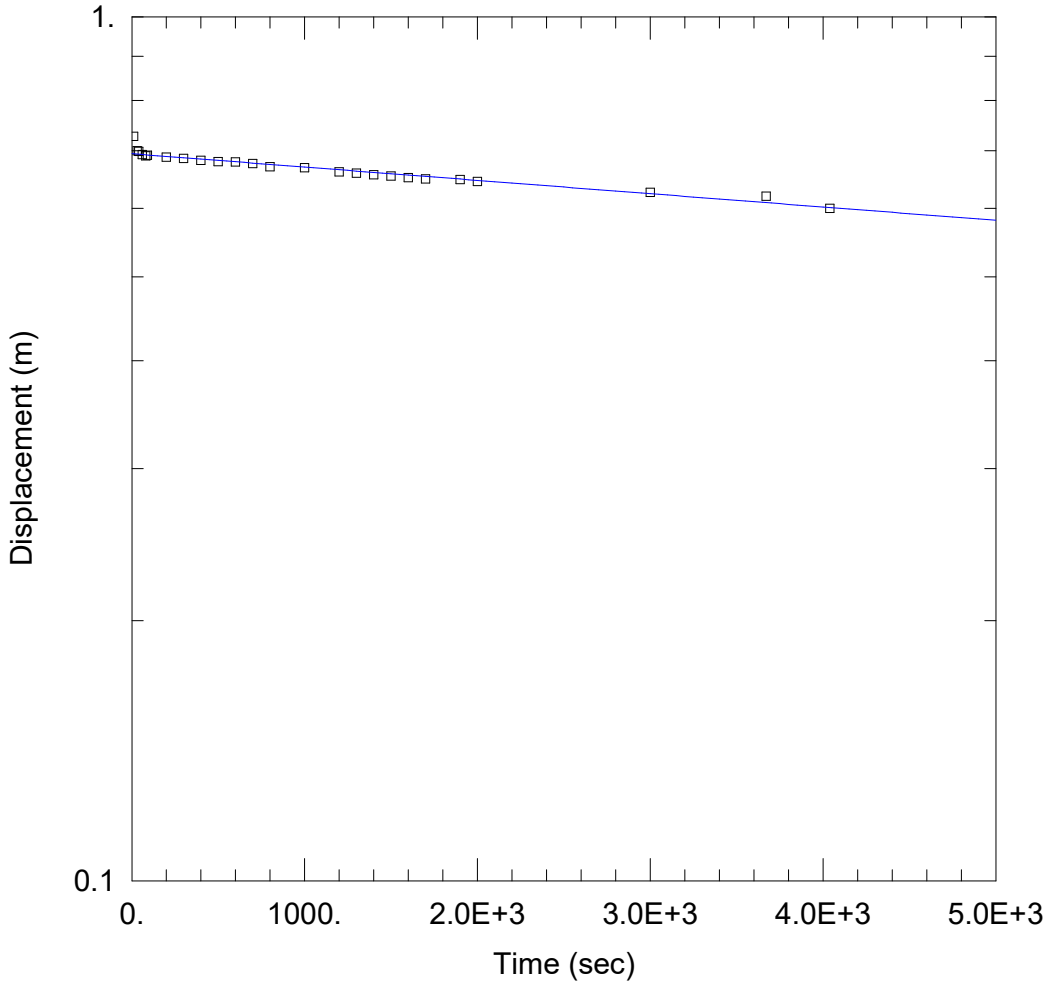
WELL DATA (BH202A)

Initial Displacement: 0.25 m Static Water Column Height: 5.4 m
Total Well Penetration Depth: 5.1 m Screen Length: 3.7 m
Casing Radius: 0.025 m Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.0197 m/day y0 = 0.2152 m



WELL TEST ANALYSIS

Data Set: C:\...\BH202A Test 2.aqt
Date: 10/16/25 Time: 16:39:01

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH202A

AQUIFER DATA

Saturated Thickness: 5.4 m Anisotropy Ratio (Kz/Kr): 0.5

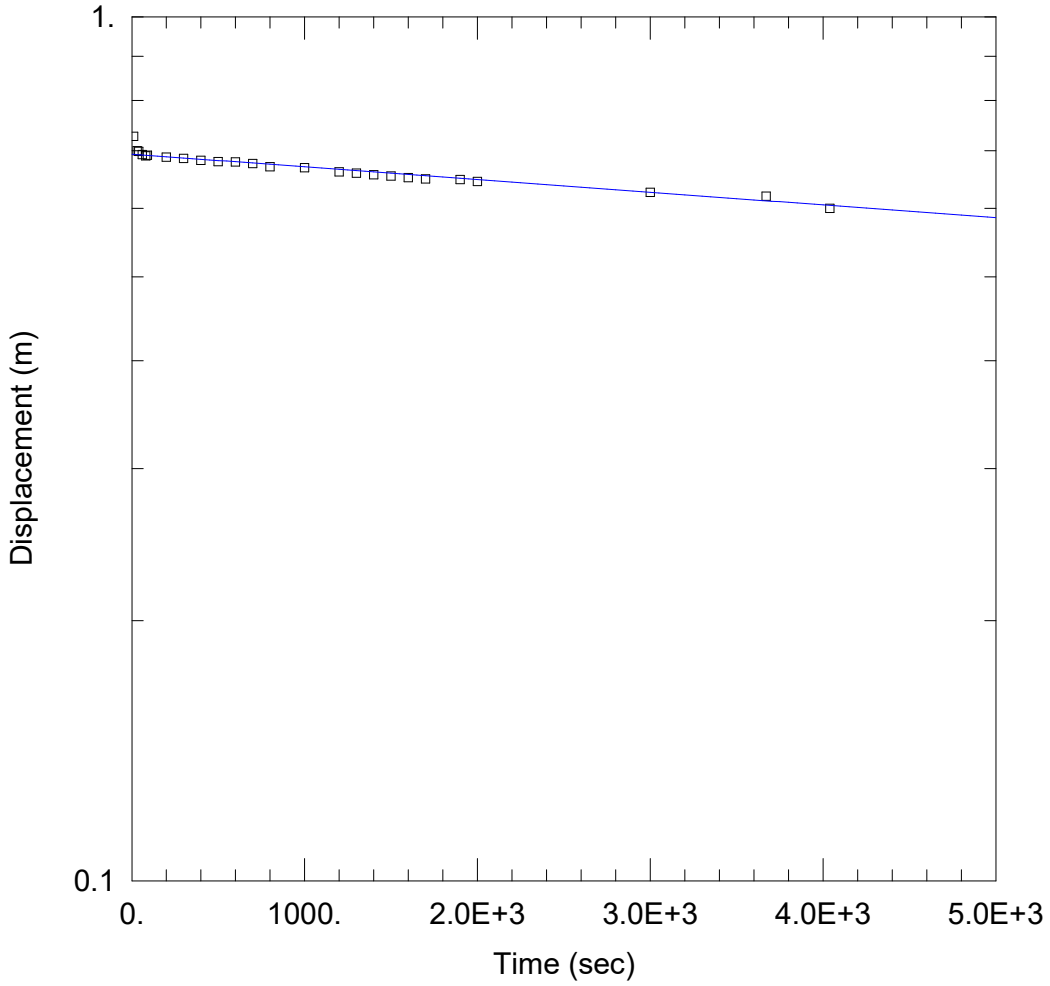
WELL DATA (BH202A)

Initial Displacement: 1.13 m Static Water Column Height: 5.4 m
Total Well Penetration Depth: 5.1 m Screen Length: 3.7 m
Casing Radius: 0.025 m Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.0009062 m/day y0 = 0.6942 m



WELL TEST ANALYSIS

Data Set: C:\...\BH202A Test 2 (h).aqt
Date: 10/16/25 Time: 16:26:29

PROJECT INFORMATION

Company: SMEC Pty Ltd
Project: 30013640
Test Well: BH202A

AQUIFER DATA

Saturated Thickness: 5.4 m Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA (BH202A)

Initial Displacement: 1.13 m Static Water Column Height: 5.4 m
Total Well Penetration Depth: 5.1 m Screen Length: 3.7 m
Casing Radius: 0.025 m Well Radius: 0.055 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.001125 m/day y0 = 0.6934 m

Appendix H

Groundwater Field Sampling Sheets

SMEC
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Groundwater Sampling Field Record

Project Information

Project Name	New Bankstown Hostpital
Site Name	Bankstown TAFE
Project Number	30013640
Client	HINSW
Date	2025-10-08
Sampled By	HW

Bore Details

Bore ID	BH101
Well Casing Diameter (mm)	50
Casing Stickup/Down (m) (+ve for above ground and -ve for below ground)	
Odour When Opening Well	No
Depth of Well (mBTOC)	12.6
Depth to NAPL (mBTOC)	
Depth to Water (mBTOC)	8.1
PID (ppm)	
Bore Condition	Good
Other Comments	
General Photos	

Surface Type

Monument	No
Gatic Covered	Yes
Stand Pipe	No

General Environmental Conditions

Temperature	Warm (<35°C)
Wind	Still
Sky	Clear
Air	Dry
Barometric Pressure	

Purge details

Method	Bladder pump
Flow cell used	Yes
Depth of sampling inlet (mbTOC)	12.1
Did the well purge dry?	No
Are field results acceptable to allow sampling?	Yes

Low Flow Methods

1x Equipment Purge Volume	200mL
Drive setting (sec)	
Vent setting (sec)	

Field Results

Time	Flow Rate (L/min)	Cumulative Purged Volume (L)	SWL (mBTOC)	pH (+/- 0.5)	EC (S/cm) (+/- 3%)	Redox (mV) (+/- 10mV)	DO (mg/L) (+/- 10%)	Temperature (°C) (+/- 3%)	Notes (colour, odour, sheen, clarity etc)
12:36	8	1	8.4	7	12378	-255.8	0.37	22.5	Brown, mild turbidity
12:38	8	2	8.4	6.99	12394	-266.9	0.23	22.3	Brown, slightly turbid

Sampling Details

Method	Bladder pump
Equipment	Disposable
Tubing type used	HDPE
Flow rate (if using low flow methods) (L/min)	
Duplicate ID	
Triplicate ID	

Member of the Surbana Jurong Group

Groundwater Sampling Field Record

Project Information

Project Name	New Bankstown Hostpital
Site Name	Bankstown TAFE
Project Number	30013640
Client	HINSW
Date	2025-10-08
Sampled By	HW

Bore Details

Bore ID	BH102
Well Casing Diameter (mm)	50
Casing Stickup/Down (m) (+ve for above ground and -ve for below ground)	
Odour When Opening Well	No
Depth of Well (mBTOC)	11.1
Depth to NAPL (mBTOC)	
Depth to Water (mBTOC)	7.51
PID (ppm)	
Bore Condition	Good
Other Comments	
General Photos	

Surface Type

Monument	No
Gatic Covered	Yes
Stand Pipe	No

General Environmental Conditions

Temperature	Warm (<35°C)
Wind	Still
Sky	Clear
Air	Dry
Barometric Pressure	

Purge details

Method	Bladder pump
Flow cell used	Yes
Depth of sampling inlet (mbTOC)	10.6
Did the well purge dry?	No
Are field results acceptable to allow sampling?	Yes

Low Flow Methods

1x Equipment Purge Volume	200mL
Drive setting (sec)	
Vent setting (sec)	

Field Results

Time	Flow Rate (L/min)	Cumulative Purged Volume (L)	SWL (mBTOC)	pH (+/- 0.5)	EC (S/cm) (+/- 3%)	Redox (mV) (+/- 10mV)	DO (mg/L) (+/- 10%)	Temperature (°C) (+/- 3%)	Notes (colour, odour, sheen, clarity etc)
11:28	8	1	7.51	6.72	13534	-45.6	0.68	19.9	Brown, mild turbidity
11:31	8	2	7.67	6.7	13477	-33.1	0.29	19.8	Brown, slightly turbid

Sampling Details

Method	Bladder pump
Equipment	Disposable
Tubing type used	HDPE
Flow rate (if using low flow methods) (L/min)	
Duplicate ID	
Triplicate ID	

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Groundwater Sampling Field Record

Project Information

Project Name	New Bankstown Hostpital
Site Name	Bankstown TAFE
Project Number	30013640
Client	HINSW
Date	2025-10-08
Sampled By	HW

Bore Details

Bore ID	BH103
Well Casing Diameter (mm)	50
Casing Stickup/Down (m) (+ve for above ground and -ve for below ground)	
Odour When Opening Well	No
Depth of Well (mBTOC)	14.9
Depth to NAPL (mBTOC)	
Depth to Water (mBTOC)	7.51
PID (ppm)	
Bore Condition	Good
Other Comments	
General Photos	

Surface Type

Monument	No
Gatic Covered	Yes
Stand Pipe	No

General Environmental Conditions

Temperature	Mild (<25°C)
Wind	Still
Sky	Clear
Air	Dry
Barometric Pressure	

Purge details

Method	Bladder pump
Flow cell used	Yes
Depth of sampling inlet (mbTOC)	14
Did the well purge dry?	No
Are field results acceptable to allow sampling?	Yes

Low Flow Methods

1x Equipment Purge Volume	200mL
Drive setting (sec)	
Vent setting (sec)	

Field Results

Time	Flow Rate (L/min)	Cumulative Purged Volume (L)	SWL (mBTOC)	pH (+/- 0.5)	EC (S/cm) (+/- 3%)	Redox (mV) (+/- 10mV)	DO (mg/L) (+/- 10%)	Temperature (°C) (+/- 3%)	Notes (colour, odour, sheen, clarity etc)
10:40	8	1	7.94	6.93	11345	-271	0.86	21.6	Brown, mild turbidity
10:45	8	3	7.99	6.91	11666	-299.7	0.23	21.1	Brown, slightly turbid

Sampling Details

Method	Bladder pump
Equipment	Disposable
Tubing type used	HDPE
Flow rate (if using low flow methods) (L/min)	
Duplicate ID	
Triplicate ID	

Groundwater Sampling Field Record

Project Information

Project Name	New Bankstown Hostpital
Site Name	Bankstown TAFE
Project Number	30013640
Client	HINSW
Date	2025-10-08
Sampled By	HW

Bore Details

Bore ID	BH201A
Well Casing Diameter (mm)	50
Casing Stickup/Down (m) (+ve for above ground and -ve for below ground)	
Odour When Opening Well	No
Depth of Well (mBTOC)	8.69
Depth to NAPL (mBTOC)	
Depth to Water (mBTOC)	4.94
PID (ppm)	
Bore Condition	Good
Other Comments	
General Photos	

Surface Type

Monument	No
Gatic Covered	Yes
Stand Pipe	No

General Environmental Conditions

Temperature	Mild (<25°C)
Wind	Still
Sky	Clear
Air	Dry
Barometric Pressure	

Purge details

Method	Bladder pump
Flow cell used	Yes
Depth of sampling inlet (mbTOC)	8.1
Did the well purge dry?	No
Are field results acceptable to allow sampling?	Yes

Low Flow Methods

1x Equipment Purge Volume	200mL
Drive setting (sec)	13
Vent setting (sec)	2

Field Results

Time	Flow Rate (L/min)	Cumulative Purged Volume (L)	SWL (mBTOC)	pH (+/- 0.5)	EC (S/cm) (+/- 3%)	Redox (mV) (+/- 10mV)	DO (mg/L) (+/- 10%)	Temperature (°C) (+/- 3%)	Notes (colour, odour, sheen, clarity etc)
08:50	8	1	5.01	6.47	11290	70.6	1.08	19.8	Brown, mild turbidity
08:53	8	2	5.1	6.53	11720	27.9	0.63	19.9	Clear, no odour

Sampling Details

Method	Bladder pump
Equipment	Disposable
Tubing type used	HDPE
Flow rate (if using low flow methods) (L/min)	
Duplicate ID	
Triplicate ID	

Groundwater Sampling Field Record

Project Information

Project Name	New Bankstown Hostpital
Site Name	Bankstown TAFE
Project Number	30013640
Client	HINSW
Date	2025-10-08
Sampled By	HW

Bore Details

Bore ID	BH201B
Well Casing Diameter (mm)	50
Casing Stickup/Down (m) (+ve for above ground and -ve for below ground)	
Odour When Opening Well	No
Depth of Well (mBTOC)	4.9
Depth to NAPL (mBTOC)	
Depth to Water (mBTOC)	1.28
PID (ppm)	
Bore Condition	Good
Other Comments	
General Photos	

Surface Type

Monument	No
Gatic Covered	Yes
Stand Pipe	No

General Environmental Conditions

Temperature	Mild (<25°C)
Wind	Still
Sky	Clear
Air	Dry
Barometric Pressure	

Purge details

Method	Bladder pump
Flow cell used	Yes
Depth of sampling inlet (mbTOC)	4.4
Did the well purge dry?	No
Are field results acceptable to allow sampling?	Yes

Low Flow Methods

1x Equipment Purge Volume	200mL
Drive setting (sec)	
Vent setting (sec)	

Field Results

Time	Flow Rate (L/min)	Cumulative Purged Volume (L)	SWL (mBTOC)	pH (+/- 0.5)	EC (S/cm) (+/- 3%)	Redox (mV) (+/- 10mV)	DO (mg/L) (+/- 10%)	Temperature (°C) (+/- 3%)	Notes (colour, odour, sheen, clarity etc)
08:08		1	1.85	4.54	1805	207.2	0.73	19.1	Brown, mild turbidity
08:11	8	3	1.92	4.55	1780	208.7	0.57	19.1	Brown, slightly turbid

Sampling Details

Method	Bladder pump
Equipment	Disposable
Tubing type used	HDPE
Flow rate (if using low flow methods) (L/min)	
Duplicate ID	
Triplicate ID	

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Groundwater Sampling Field Record

Project Information

Project Name	New Bankstown Hostpital
Site Name	Bankstown TAFE
Project Number	30013640
Client	HINSW
Date	2025-10-08
Sampled By	HW

Bore Details

Bore ID	BH202A
Well Casing Diameter (mm)	50
Casing Stickup/Down (m) (+ve for above ground and -ve for below ground)	
Odour When Opening Well	No
Depth of Well (mBTOC)	10.6
Depth to NAPL (mBTOC)	
Depth to Water (mBTOC)	6.82
PID (ppm)	
Bore Condition	Good
Other Comments	
General Photos	

Surface Type

Monument	No
Gatic Covered	Yes
Stand Pipe	No

General Environmental Conditions

Temperature	Mild (<25°C)
Wind	Still
Sky	Clear
Air	Dry
Barometric Pressure	

Purge details

Method	Bladder pump
Flow cell used	Yes
Depth of sampling inlet (mbTOC)	10
Did the well purge dry?	No
Are field results acceptable to allow sampling?	Yes

Low Flow Methods

1x Equipment Purge Volume	200mL
Drive setting (sec)	
Vent setting (sec)	

Field Results

Time	Flow Rate (L/min)	Cumulative Purged Volume (L)	SWL (mBTOC)	pH (+/- 0.5)	EC (S/cm) (+/- 3%)	Redox (mV) (+/- 10mV)	DO (mg/L) (+/- 10%)	Temperature (°C) (+/- 3%)	Notes (colour, odour, sheen, clarity etc)
09:44		1	6.74	5.92	4466	122.9	1.16	22.4	Brown, mild turbidity
09:47	8	3	6.55	5.86	4453	118.4	0.94	22.4	Brown, slightly turbid

Sampling Details

Method	Bladder pump
Equipment	Disposable
Tubing type used	HDPE
Flow rate (if using low flow methods) (L/min)	
Duplicate ID	
Triplicate ID	

Appendix I

Groundwater Impact Assessment

Report

Groundwater Impact Assessment

Prepared for: Health Infrastructure
25 February 2026
Client Reference No. HI24318



SMEC INTERNAL REF. 30013460-GE-RPT-GIA

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Document Control

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Abbreviations

Abbreviation	Description
AHD	Australian Height Datum
AIP	Aquifer Interference Policy
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines
ASS	Acid Sulfate Soils
AWS	Automated Weather Station
BOM	Bureau of Meteorology
CEMP	Construction Environment Management Plan
CRD	Cumulative Rainfall Departure
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DMP	Dewatering Management Protocol
GDE	Groundwater Dependent Ecosystems
GIA	Groundwater Impact Assessment
ha	Hectares
HGL	Hydrogeological Landscapes
HI	Health Infrastructure New South Wales
ID	Identification name
km	Kilometres
LGA	Local Government Area
L/sec	Litres per second
m	Metres
mbgl	Metres below ground level
ML	Megalitres
ML/year	Megalitres per year
m/day	Metres per day
mg/L	Milligrams per litre
m^3	Cubic metres
NWQMS	National Water Quality Management Strategy
RL	Relative level in meters Australian Height Datum
RIS	Reduced Inorganic Sulfur
WMP	Water Management Plan
TAFE	Technical and Further Education
TDS	Total Dissolved Soilds
TRH	Total Recoverable Hydrocarbons
WAL	Water Access Licence
WM Act	NSW Water Management Act 2000
WM Regulation	NSW Water Management Regulation 2018
WSP	Water Sharing Plan

1. Introduction

1.1 General

SMEC Australia Pty Ltd (SMEC) has been engaged to undertake geotechnical and environmental investigations for the development of the new Bankstown Hospital. This Groundwater Impact Assessment (GIA) has been prepared to assess the potential impacts of the proposal to groundwater. Potential impacts to Soil and Surface water are being undertaken by the Stormwater and Drainage consultants for Health Infrastructure New South Wales (HI).

1.2 Project Overview and Description

The New Bankstown Hospital is proposed to be built at the current Bankstown TAFE site in south-western Sydney (Figure 1–1). The site is located at 490 Chapel Road, Bankstown, within the Canterbury Bankstown Local Government Area (LGA).

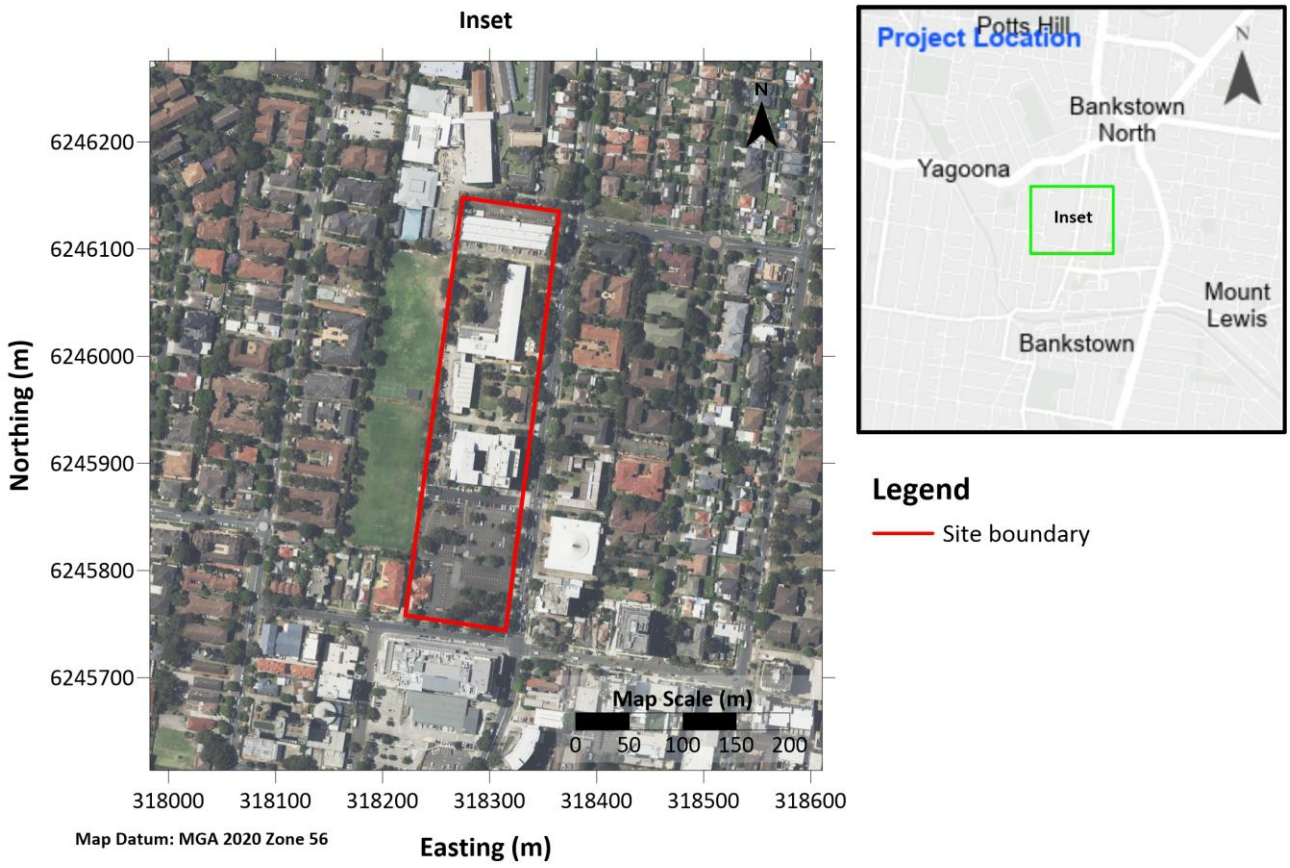


Figure 1–1: Site aerial of the proposed development

1.2.1 Summary of the Activity

The proposed development includes the construction and operation of a new health services facility (hospital) including the following works:

- A 14 storey hospital building plus roof plant
- A 10 storey building for logistics and multi-storey car parking
- Site preparation including earthworks, cut and fill and tree removal

- Construction of new vehicular access points, internal roads and on-grade car parking spaces
- Inground building services works and utility adjustments, including service diversions
- Building foundation works
- Signage, including wayfinding
- Landscaping.

The EIS prepared by Colliers provides a full description of the proposed works. The concept stage design surface layout is shown on Figure 1–2. The architectural block and stack drawings, shown on Figure 1–3, indicate:

- In the southern part of the Site a car park basement excavation (B01) with finished slab level at Relative Level (RL) 28.55 meters Australian Height Datum (AHD)
- In the southern to central part of the Site excavation for a building level (L00) with finished slab level at RL 32.05 mAHD
- In the central part of the Site excavation for an above ground car park structure (C01) with finished slab level at RL 36.55mAHD.

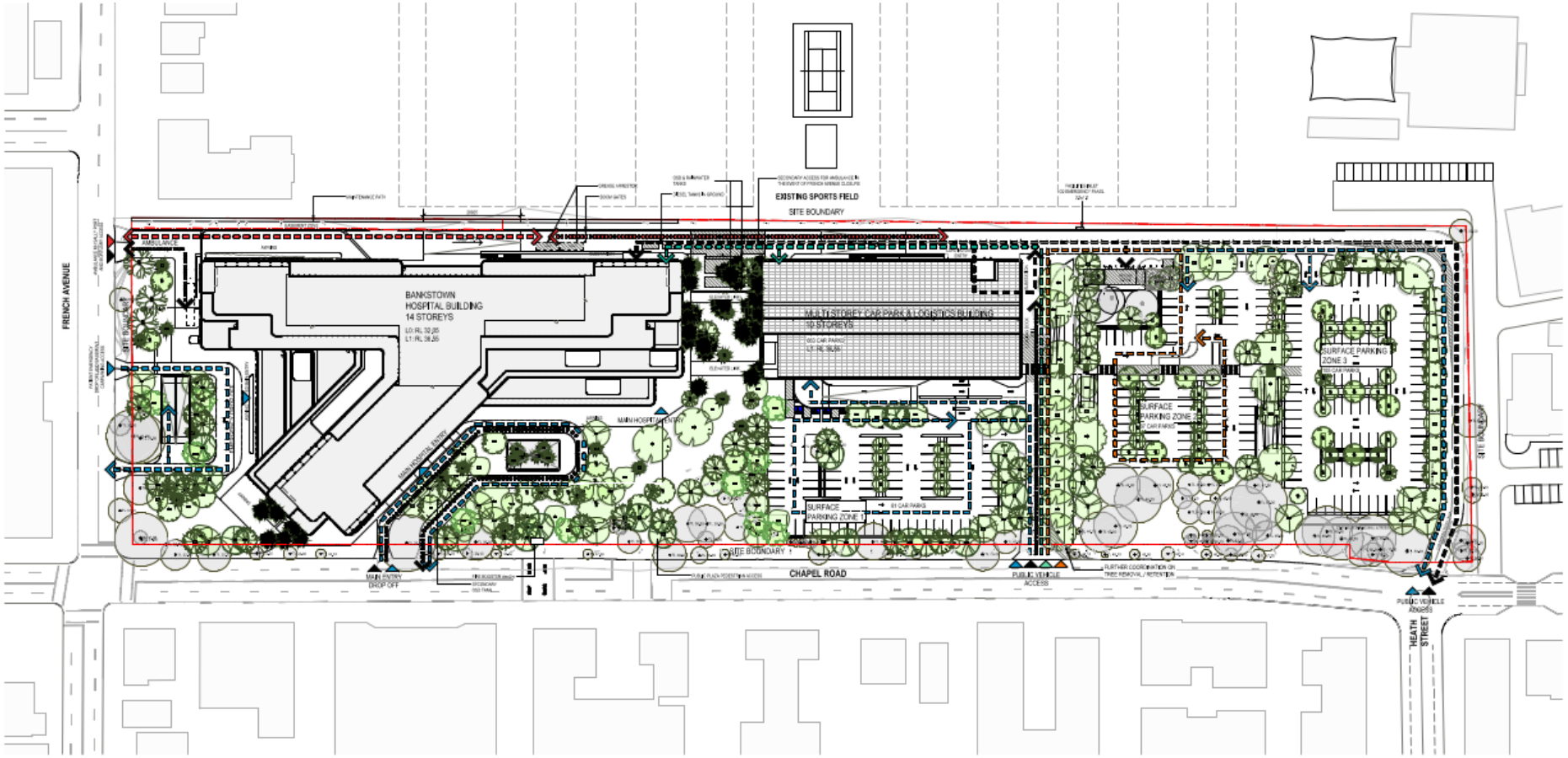


Figure 1–2: New Bankstown Hospital concept design layout

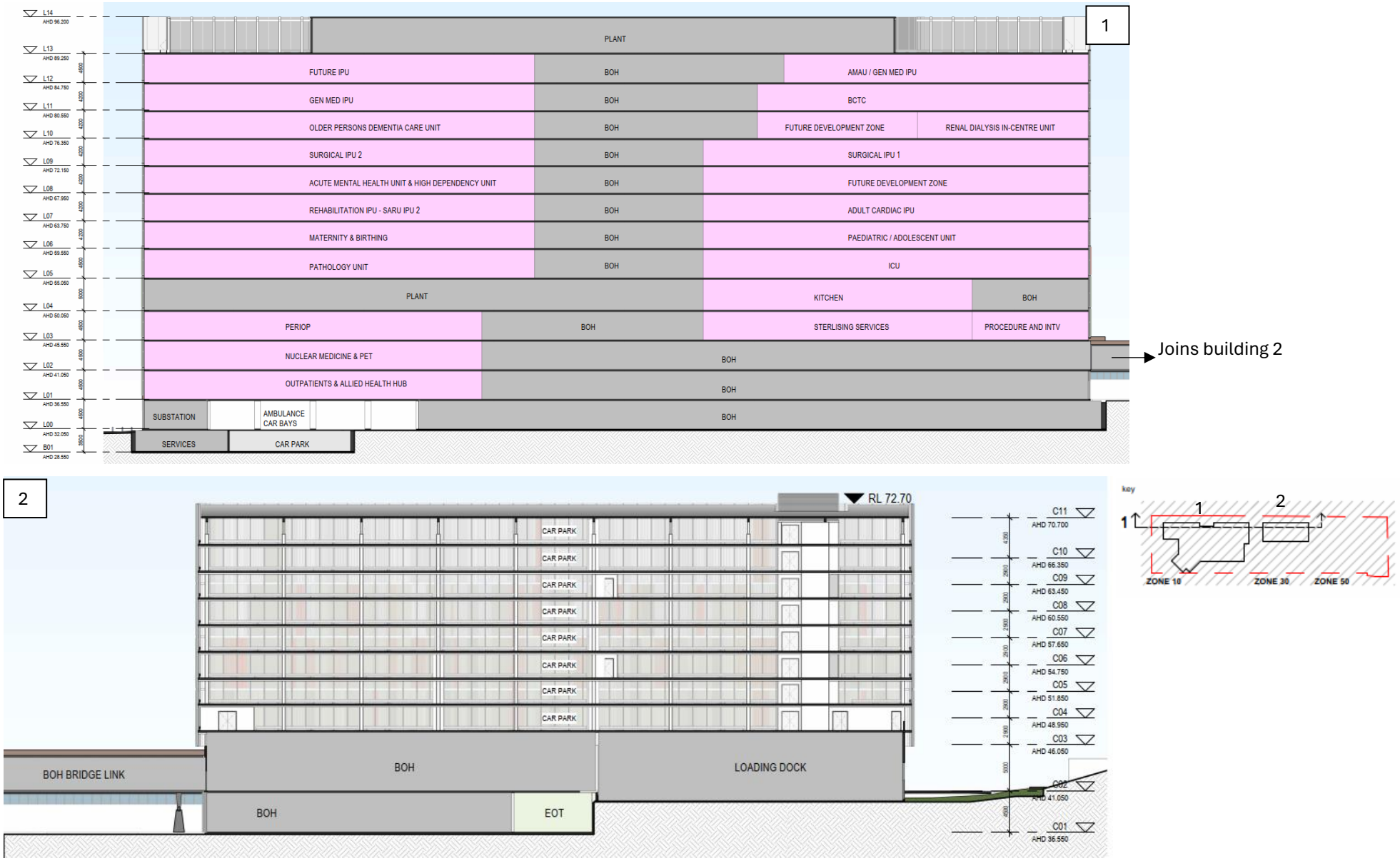


Figure 1–3: Conceptual design building sections with elevation levels

1.3 Scope of Assessment

A Groundwater Impact Assessment (GIA) is required to support HI's State Significant Development Application (SSDA) to address Requirement 13 of the Secretary's Environmental Requirements (SEARs).

The following tasks were carried out during the preparation of this assessment:

- A desktop review of relevant information, including:
  - Review of available published information relating to the study area including geology and hydrogeology
  - Review of relevant previous reports and proposal information
  - Review of relevant legislation and guidelines
  - Review of publicly available groundwater data
  - Review of relevant online records and resources
- Review of Site groundwater monitoring data
- Assessment of features likely to intersect groundwater
- Analytical assessment of inflows and radius of influence of basement excavation
- Preparation of this report.

The GIA has considered the following relevant Guidelines for Groundwater Documentation for SSD/SSI Projects. PUB 22/6 (DPE, 2022).

Key considerations for the assessment of potential groundwater impacts associated with the proposal are:

- Groundwater users
- Groundwater quality
- Groundwater drawdown
- Groundwater Dependant Ecosystems.

1.4 Data Sources

The following reports were reviewed for this assessment:

- SMEC (2025a) Geotechnical Investigation Report. Document Reference 30013640-GE-RPT-02, dated 21 March 2025, Prepared for Health Infrastructure NSW.
- SMEC (2025b) Detailed Site Investigation, Bankstown New Hospital. Document Reference 30013640_Final_DSI, dated 21 March 2025 Prepared for Health Infrastructure NSW.
- SMEC (2025c) Remediation Action Plan. Document Reference 30013640-RAP, dated 25 November 2025, Prepared for Health Infrastructure NSW.
- SMEC (2026) Geotechnical Investigation Report. Document Reference 30013640-GE-RPT-04, dated 16 February 2026, Prepared for Health Infrastructure NSW.

Table 1–1 outlines other relevant available data sources used in the preparation of this report.

Table 1–1: Data types and sources used in this report

Data type	Source
Registered groundwater bore data including intended use, status, depth, standing water level and quality	• Water NSW: – Water Register website (https://waterregister.waternsw.com.au/water-registerframe) – Real time data website (https://realtimedata.waternsw.com.au/) • Bureau of Meteorology (BOM): – Bore website (http://www.bom.gov.au/water/groundwater/index.shtml) – National Groundwater Information System (NGIS) Bore Hydro dataset (version 1.7.1) available from Australian Groundwater Explorer (http://www.bom.gov.au/water/groundwater/explorer/index.shtml)
Groundwater dependant systems	• BOM National Atlas of Groundwater Dependent Ecosystems (http://www.bom.gov.au/water/groundwater/gde/) • NSW Government Water Sharing Plan for Greater Metropolitan Region Groundwater Sources 2023 (https://legislation.nsw.gov.au/information/asi/electricity-and-water/wsp-greater-metropolitan-region-groundwater-sources)
Climate data	• BOM: – Rainfall (www.bom.gov.au/climate/data)) – Temperature (www.bom.gov.au/climate/data) – Evaporation and relative humidity (https://www.bom.gov.au/watl/eto/tables/nsw/bankstown_airport/bankstown_airport.shtml) – Climate classification (http://www.bom.gov.au/climate/maps/averages/climate-classification/) – Climate summaries (http://www.bom.gov.au/climate/current/statement_archives.shtml)
Regional geology data	• NSW Seamless Geological Mapping Digitial Dataset (Colguhoun et al, 2024) • Minview (https://minview.geoscience.nsw.gov.au/)
Regional hydrogeology	• eSPADE v 2.2 (https://www.environment.nsw.gov.au/eSpade2Webapp/) • SEED Map (seed.nsw.gov.au)
Analytical inflow tools	• Marinelli and Niccoli (2000)

2. Methodology

The assessment of potential groundwater related impacts arising from the proposal have been implemented as follows:

- Desktop review of available information and data collation
- Assessment of the proposal against relevant requirements, evaluated on a qualitative basis
- Characterisation of the existing environment including climate, topography and drainage, geology, hydrogeology, groundwater level and quality and aquifer permeability
- Review of the geotechnical interpretation report prepared by SMEC used inform the concept design development
- Analytical assessment of potential groundwater inflows and radius of influence for the excavation
- Groundwater impact assessment using a risk matrix approach and assessment of groundwater impacts in accordance with the NSW Aquifer Interference Policy 2012
- Assessment of potential cumulative impacts
- Outline management measures for the potential impacts.

The specific methodologies used for these components are described in the following sections.

2.1 Desktop assessment

The desktop assessment was carried out to gain an understanding of the existing condition by accessing available groundwater information. This included:

- Review of existing reports and proposal concept design
- Assessment of the proposal against relevant requirements, evaluated on a qualitative basis
- Collation of relevant information on the existing environment climate, topography, geology and hydrogeology
- Collation of relevant existing groundwater level, permeability and quality information
- Developing a conceptual model of the hydrogeological environment.

The data sources used to undertake the desktop review are outlined in Section 1.4.

2.2 Analytical groundwater inflow assessment

The proposal concept design indicates the potential for three excavations to intercept groundwater (Figure 2–1). These excavations are associated with Level C01 in the central part of the Site, Level 00 in the central to southern part of the Site and Level B01 which is the basement carpark. It is assumed that the bulk excavation depth is around half a meter below the proposed finished slab level. Based on the Concept Design architectural drawings the assumed finished slab levels and bulk excavation depths are presented in Table 2–1.

Table 2–1: Excavation and finished slab elevations

Location	Bulk Excavation Depth (mAHD)	Finished Slab Level (mAHD)
C01	36.05	36.55
Level 00	31.55	32.05
B01	28.05	28.55

Analytical modelling has been undertaken to estimate the potential groundwater inflows and radius of influence using the analytical method of Marinelli and Niccoli (2000) ‘Inflow to a pit’ and the radial distance drawdown using Thesis (1935). Assumptions are made given the limited existing information.

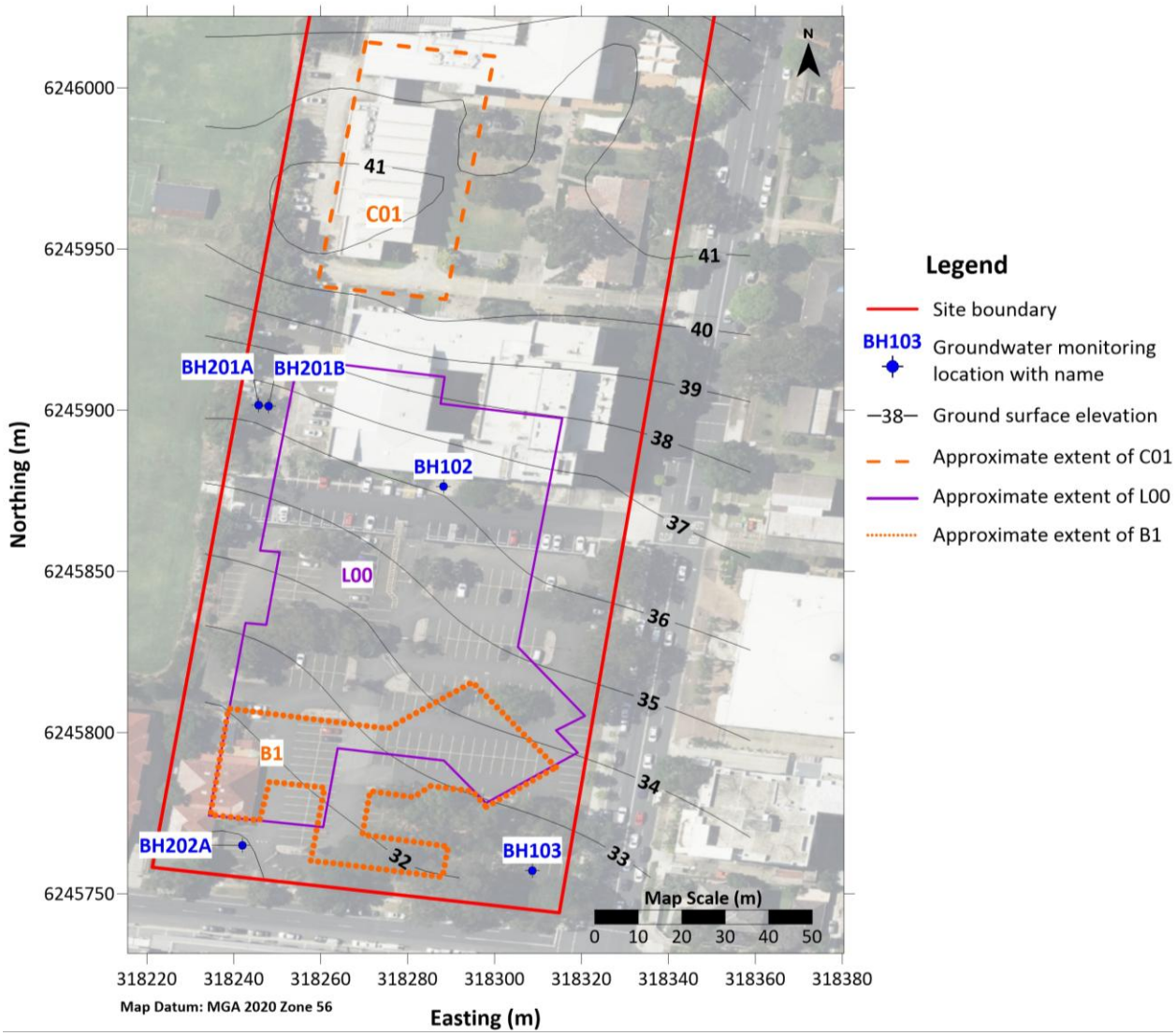


Figure 2–1: Extent of excavation areas at the Site

2.2.1 Modelling input data

To estimate the potential radius of influence and inflows the excavation the following input data is required:

- Initial preconstruction saturated thickness of the aquifer intercepted by the proposal
- Depth of excavation below the water table (excavation assumed to be in unconfined water table aquifers)
- Hydraulic conductivity of the intercepted aquifer
- Size of the excavation
- Radius of influence.

Where this information is not available assumptions have been made. The following assumptions have been adopted:

- The aquifer system is assumed to be laterally extensive and homogeneous
- Hydraulic conductivity based on site hydraulic conductivity results
- The conditions are unconfined water table aquifers
- Steady state conditions (with respect to recharge and discharge) have been achieved.

The modelling for the purpose of this assessment assumes that the construction methodology has the full excavation area open at one time. The excavations of C01 and L00 are into the side of the slope, and the water

table and therefore not all sides of the excavation would intersect the water table. Assumption has been made that 50 % of the excavation area would contribute inflow. For B01 the excavation is below the water table however there is a gradient on the water table from north to south and as such a normalised water level is used for the steady state inflow rate for the purpose of this assessment.

When considering inflows into excavations, it is worth noting that if the footprint size of the excavation is doubled (i.e. length and or width) the inflow may increase by up to 10 %. However, if the depth of the excavation below the water table is doubled the inflows may increase by 100 %.

2.3 Groundwater Impact Assessment

The impact assessment is based on assessed key construction and operation activities and their associated direct and indirect impacts groundwater and the requirements of the NSW Aquifer Interference Policy 2012. Table 2–2 presents the qualitative risk matrix for the groundwater impact assessment. Table 2–3 outlines the likelihood ratings and Table 2–4 outlines the consequence ratings. Mitigation measures are presented in Section 8. Residual impacts assessment using the risk matrix assume the application of mitigation measures.

Table 2–2: Qualitative risk assessment matrix

Risk Assessment		Consequence Level				
		Insignificant	**Minor**	**Moderate**	**Major**	**Severe**
Likelihood	**Almost Certain**	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	High	Extreme
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Low	Medium	Medium

Table 2–3: Likelihood ratings

Descriptor	Frequency	Probability
Almost Certain	Twice or more per year	Event will occur during the proposal period High number of known incidents
Likely	Once per year	Event likely to occur during the proposal period Regular incidents known
Possible	Once in 5 years	Event may occur in some instances during the proposal period Occasional incidents known
Unlikely	Once in 10 years	Event is not likely to occur during the proposal period Some occurrences known
Rare	Once in 20 years	Event will occur in exceptional circumstances during the proposal period Very few or no known occurrences

Table 2–4: Consequence ratings

Level	Descriptor
Insignificant	Negligible change to hydrological/hydrogeological processes, water availability or water quality
Minor	Short-term modification of hydrological/hydrogeological processes, water availability and quality within the study area but no change in beneficial use
Moderate	• Medium-term modification of hydrogeological processes, water availability and water quality within the study area but no change in beneficial use • Short-term modification of hydrological/hydrogeological processes, water availability and water quality outside the study area but no change in beneficial use

Level	Descriptor
Major	• Long-term modification of hydrological / hydrogeological processes, water availability and water quality within the study area but no change to beneficial use • Medium-term modification of hydrological / hydrogeological processes, water availability and water quality outside the study area but no change in beneficial use
Severe	Long-term or permanent modification of hydrologic / hydrogeological processes, water availability or water quality outside study area, with impacts to a water dependent environmental value and or change in beneficial use.

3. Legislative Context

3.1 NSW Legislation

3.1.1 Water Act 1912, Water Management Act 2000 and Water Management (General) Regulation 2018

The *Water Act 1912* and the *Water Management Act 2000* (WM Act) comprise the principal legislation for the management of water in NSW and contain provisions for the licencing of water access and use. The Water Management (General) Regulation 2018 supports the WM Act. The *Water Act 1912* is being progressively phased out and replaced by Water Sharing Plans (WSPs) under the WM Act.

Under the WM Act, activities that require approvals for water use and water supply are outlined, along with activities that may be exempt. Controlled activity guidelines and approvals apply to activities within 40 m of the high bank of a waterway, river, lake or estuary.

The proposal is considered an exempt controlled activity under the WM Act as the works would be carried out by a public authority under Subdivision 4, clause 41 of the Water Management (General) Regulation 2018.

Any aquifer interference that takes groundwater will require a Water Supply Works Approval from Water NSW for taking groundwater under the Water Management Act 2000. The Dewatering Management Protocol (DMP) is part of the Water Supply Works Approval. If the project is determined to be State Significant Infrastructure, then the project would be excepted from requiring a Water Supply Works Approval for the construction phase. This exemption does not cover the ongoing take of groundwater during operation.

3.1.2 Water units and plans

Water sources in NSW are managed by Water Sharing Plans (WSP) under the Water Management Act 2000. There are two water sharing plan applicable to the site:

- Greater Metropolitan Regional Groundwater Sources Water Sharing Plan 2023 (NSW DPIE 2024b)
- Greater Metropolitan Region Unregulated River Water Sources 2023 (NSW DPIE 2024b).

The proposed development is anticipated to intersect the groundwater table and extract groundwater. The Greater Metropolitan Regional Groundwater Sources Water Sharing Plan 2023 includes rules for environmental water provisions, long term average extraction limits and access, trading and works approvals.

Within the Plan the site is part of the Sydney Basin Central Groundwater Source, which is part of the Sydney Basin Groundwater sources. The Sydney Basin groundwater sources include all water contained within:

- All rocks of Tertiary to Permian age
- Cenozoic sediments, except the Botany Sands Groundwater Source, the Hawkesbury Alluvium Groundwater source and the Metropolitan Coastal Sands Groundwater Source.

3.2 Policies and Guidelines

3.2.1 National Water Quality Management Strategy 2018

The purpose of the National Water Quality Management Strategy (NWQMS) is to protect the nation's water resources by maintaining and improving water quality, while supporting dependent aquatic and terrestrial ecosystems, agricultural and urban communities, and industry. The NWQMS consists of three major elements: policy, process and guidelines. The guidelines include the Australian and New Zeeland Guidelines for Fresh and Marine Water Quality.

The proposal has the potential to impact groundwater quality within the Georges River catchment and should integrate water quality management strategies consistent with NWQMS such that environmental values of the receiving waterways are not adversely impacted.

3.2.2 Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018) are based on the policies and principles of the NWQMS. They are an update to the Australian and New Zealand Environment and Conservation Council (ANZECC, 2000) guidelines. The main objective of the guidelines is to provide an authoritative guide for setting water quality objectives required to sustain current or likely future environmental values for natural and semi-natural water resources. The guidelines provide a set of tools to enable the assessment and management of ambient water quality in a wide range of water resource types and define the recommended limits to acceptable changes in water quality.

The proposal development has the potential to impact groundwater water quality. The ANZECC (2000) and ANZG (2018) guidelines may apply discharge water quality where discharge of extracted groundwater is to a surface water receiving environment.

3.2.3 NSW Aquifer Interference Policy 2012

The NSW Aquifer Interference Policy (NSW Office of Water, 2012) clarifies the water licencing and approval requirements for aquifer interference activities in NSW.

The Aquifer Interference Policy (AIP) requires that potential impacts on groundwater sources, including their users and groundwater dependant ecosystems, be assessed against the minimal impact considerations outlined in the policy. The Water Management Act 2000 defines an aquifer interference activity as that which involves the following:

- The penetration of an aquifer
- The interference with water in an aquifer
- The obstruction of flow in an aquifer.
- The taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations
- The disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations.

There are two levels of minimal impact considerations, divided into categories based on highly productive and less productive groundwater sources. Highly productive groundwater is based on the following criteria:

- Has total dissolved solids of less than 1,500 mg/L
- Contains water supply works that can yield water at a rate of greater than 5 L/sec.

The main geological unit at the Site is the Wianamatta Group Unit consisting of shales. Aquifers associated with shales and siltstones are typically of low permeability, have high total dissolved solids and yields less than 5 L/sec.

Based on AIP criteria the proposed basement likely falls within the less productive porous and fractured rock groundwater source.

If the predicted impacts of the basement are less than the minimal impact considerations, then the potential groundwater impacts of the basement are acceptable. The Level 1 minimal impact considerations for less productive porous and fractured rock water sources are:

- Less than or equal to 10 % cumulative variation in the water table, allowing for typical climatic ‘post-water sharing plan’ variations, at a distance of 40 m from any high priority Groundwater Dependant Ecosystems (GDEs) or high priority culturally significant sites listed in the schedule of the relevant water sharing plan
- A maximum of a two-metre water table decline cumulatively at any water supply work
- Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m of the activity.

The proposal contains aquifer interference activities and requires assessment of their impact on groundwater users, GDE and culturally significant sites that are groundwater dependant.

3.2.4 Guidelines for Groundwater Assessments and Reporting for SSD and SSI projects

The Guidelines for Groundwater Documentation for SSD/SSI Projects PUB 22/6 (DPE, 2022) outlines the expectations for groundwater investigations to inform a Groundwater Impact assessment (GIA) and the GIA assessment expectations. A GIA is undertaken as part of an environmental impact statement (EIS). Using the high-level guidance flow chart, a risked based assessment is required, as a moderate to major interception of the water table is not anticipated. The requirements of GIA include:

- Describing the existing environment
- A conceptual hydrogeological model
- Outline of direct and associated impacts on receptors during construction and operation
- Assessment of impacts in accordance with the AIP for water supply works, high priority culturally significant sites and groundwater dependant ecosystems
- Assessment of cumulative effects.

The proposed development has been reviewed and finds:

- The proposal potentially impacts groundwater through the intersection of the water table
- The proposal does not potentially exceed the AIP Level 1 minimal impact considerations
- The proposal does not require a numerical (3 dimensional) groundwater model for inflows.

4. Existing Environment

This section provides an outline of the existing groundwater environment and has been informed by existing reports and this desktop assessment.

4.1 Location and Land Use

A summary of information about location and land use of the proposal is presented Table 4–1.

Table 4–1: Summary of Site location information

Address	Bankstown TAFE, 490 Chapel Road, Bankstown NSW 2200
Title Identifiers	Lot 1 DP853675, Lot 10 DP6880 and Raw Avenue
Area	Approximately 3.9 ha
Boundary Coordinates (approximate) **(GDA 2020, Zone 56)**	North-West: 318274 m E, 6246148 m N North-East: 318365 m E, 6246135 m N South-West: 318221 m E, 6245758 m N South-East: 318314 m E, 6245744 m N
Local Government Area	Bankstown City Local Government Area (LGA)
Zoning	The Site comprised of land zonings under Bankstown Local Environmental Plan (LEP) 2023 as follows: • SP2 Infrastructure (northern/central portion) • B4 Mixed Use (south-eastern portion)
Owner	TAFE NSW (assumed)
Occupier	TAFE NSW Bankstown Campus
Current Land Use	Tertiary Education Facility
Proposed Land Use	Hospital and ancillary facilities for health care.
Surrounding Land use	The surrounding land uses at the time of the visit are summarised below: **North:** LaSalle Catholic College boarders the Site. St Felix Catholic Primary School, Church (St Felix de Valois Parish), low and high density residential properties and Hume Highway are all located further to the north. **East:** Chapel Road followed mainly by high density residential properties, a non-profit organisation (Islamic Charity Projects Assoc Inc) and several restaurants and food stores. **South:** French Avenue and commercial properties (shopping mall – Little Saigon Plaza, Aldi, Unity Bank) and associated car parks. **West:** Sport fields associated with LaSalle Catholic College. High density residential properties and Meredith Street are located further west.

4.2 Climate and Rainfall

Climatic data is available from the Bureau of Meteorology (BOM). The proposed alignment is located within the Temperate climate classification for Australia and is characterised by warm summers and cold winters.

There are three weather stations located near the Site:

- Bankstown Airport Automated Weather Station (AWS), BOM number 66137 with data from July 1968 to present
- Milperra Bridge (Georges River), BOM number 66168 with data from December 2000 to January 2020
- Bankstown (Condell Park), BOM number 66003 with data from 1906 to 1979.

The mean annual rainfall for the region is typically around 900 mm. Higher seasonal rainfall is typical in the summer months.

Table 4–2: Mean monthly and annual rainfall from selected BOM weather stations

BOM No.	Jan (mm)	Feb (mm)	Mar (mm)	Apr (mm)	May (mm)	Jun (mm)	Jul (mm)	Aug (mm)	Sep (mm)	Oct (mm)	Nov (mm)	Dec (mm)	Annual (mm)
66137	96.7	108.9	111.9	84.1	66.0	77.0	49.1	52.3	44.7	60.3	75.3	66.4	892.0
66168	66.1	100.2	64.0	56.2	44.3	71.9	23.0	26.1	31.6	58.2	48.5	67.6	638.2
66003	92.5	95.6	111.6	76.5	79.1	96.7	69.4	60.3	48.5	64.9	71.1	75.1	945.6

Figure 4–1 presents the monthly total rainfall, between 1969 and 2025, at Bankstown AWS with the cumulative rainfall departure (CRD). The cumulative rainfall departure (CRD) compares the cumulative monthly rainfall with the long-term average and is most effective where more than 50 years of continuous records exist. It establishes a trend line in terms of above or below average rainfall conditions. It is the trend (i.e. slope) of the line that is important not a numerical value.

The CRD is calculated after the method of Ferdowsian et al (2001) for Bankstown Airport AWS between 1969 and 2025. The trend shows periods of above average (i.e. line slopes up) and below average (i.e. line slopes down) occur over both long and short durations. Between 1969 and 1978 there is a general trend of above average rainfall which is followed by a period of below average conditions until around 1983 when above average conditions return. From early 1993 to late 2019 the CRD shows a prolonged period of generally below average rainfall conditions, with some minor above average or average conditions for short period. From 2020 until 2023 there is a period of above average rainfall conditions followed by a short period of below average conditions to mid-2023 and then average conditions until mid-2025.

Figure 4–2 presents the mean annual total rainfall for each year between 1969 and 2025 for Bankstown AWS along with the mean annual rainfall line, shown in red. 2020 to 2022 have been consecutive years of total rainfall above the mean annual rainfall. The highest rainfall year on record was 2022 with a total of 2038 mm.

The Bankstown Airport AWS station has climate records for temperature, evapotranspiration and relative humidity. Temperature data is available from July 1968 to January 2026 and summarised below in Table 4–3. From 2009 evapotranspiration and relative humidity records are available. These are summarised in Table 4–3 for monthly mean for data up to January 2026.

Table 4–3: Climate data compilation from Bankstown Airport AWS

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Minimum Temperature (°C)	18.3	18.2	16.4	12.8	9.5	6.7	5.3	6.2	8.8	12.0	14.5	16.8
Mean Maximum Temperature (°C)	28.5	28.0	26.4	23.9	20.6	17.8	17.5	19.1	21.9	24.1	25.5	27.6
Highest Daily Temperature(°C)	32.3	30.8	28.8	27.8	23.4	19.7	20.2	21.9	25.4	27.9	28.6	30.8
Date / Year	04 Jan 2020	01 Feb 2020	09 Mar 1983	04 Apr 1986	01 May 2016	06 Jun 1997	30 Jul 2017	30 Aug 2024	30 Sep 1980	22 Oct 2025	25 Nov 1982	31 Dec 2019

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lowest Daily Temperature (°C)	21.5	19.8	19.0	15.6	12.3	9.6	7.6	9.6	10.9	14.0	17.2	18.9
Date / Year	08 Jan 1997	13 Feb 1996	28 Mar 1984	19 Apr 1996	28 May 2023	26 Jun 1986	26 Jul 1968	08 Aug 1974	07 Sep 1995	13 Oct 1987	04 Nov 1998	16 Dec 1994
Mean Evapo-transpiration (mm)	5.59	4.82	3.81	2.84	2.06	1.55	1.86	2.6	3.71	4.6	5.25	5.82
Mean Minimum Relative Humidity (%)	45.62	47.69	48.34	46.84	45.39	49.85	43.83	38.76	34.72	37.7	41.77	41.28
Mean Maximum Relative Humidity (%)	88.42	88.9	90.34	91.56	91.03	91.86	90.75	88.82	88.52	88.43	88.11	87.53

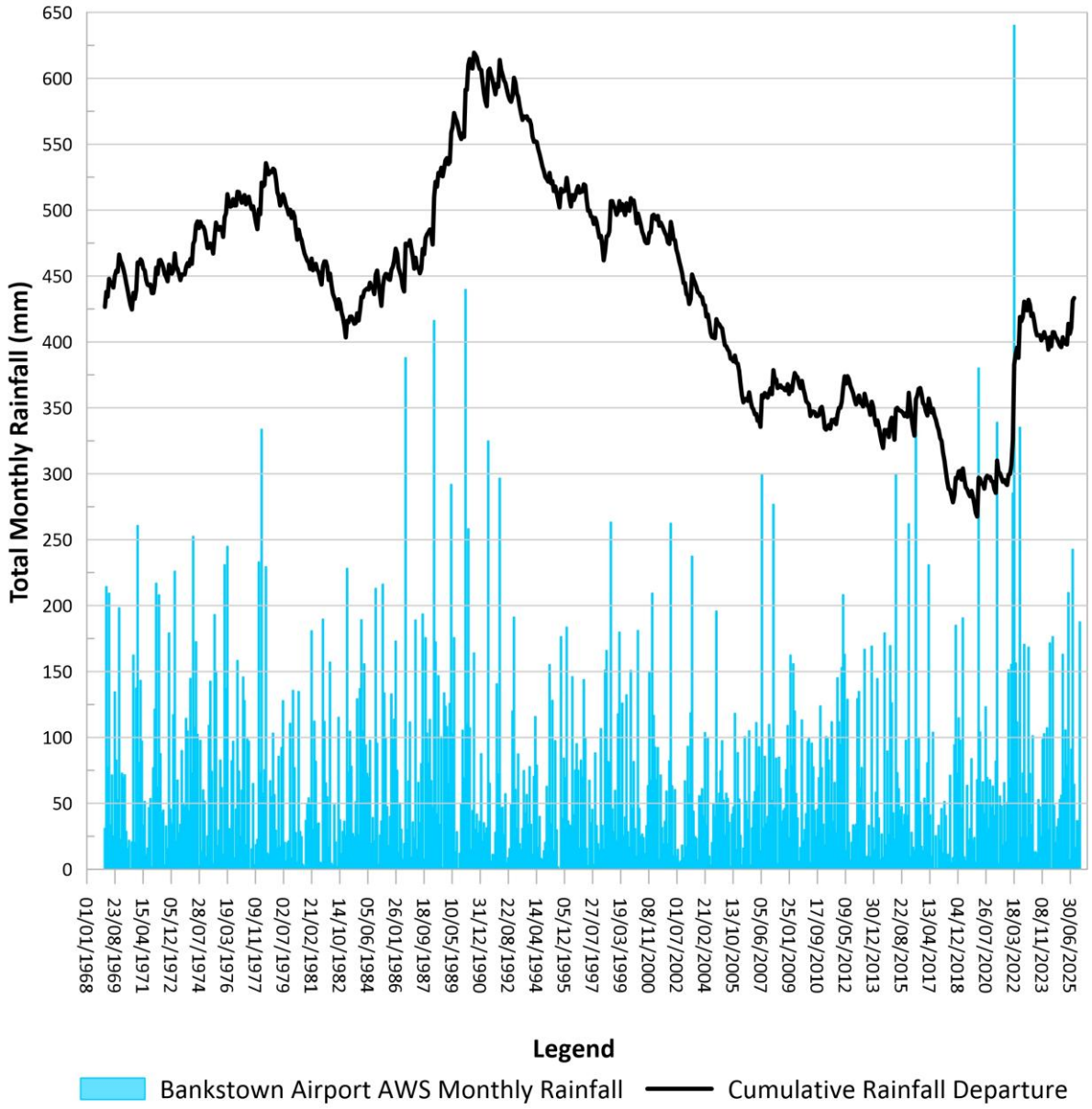


Figure 4–1: Total monthly rainfall at Bankstown Airport AWS with cumulative rainfall departure trends

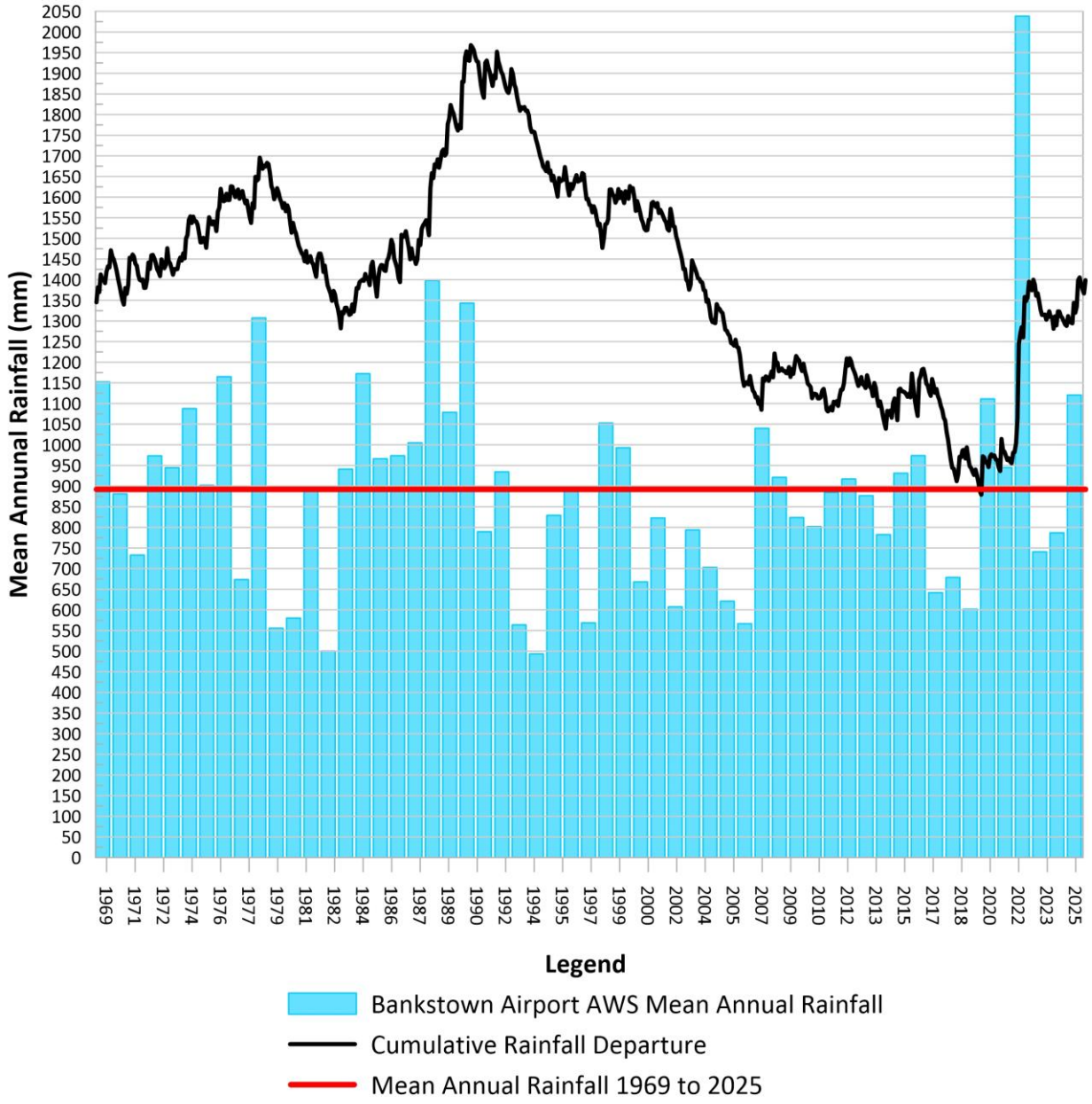


Figure 4–2: Annual total rainfall – Bankstown Airport AWS, 1969-2025 with mean annual rainfall and cumulative rainfall departure trend

4.3 Topography and Drainage

The Site is situated in the side of a natural hill slope and comprises level terraces accommodating the existing buildings and parking areas. Figure 4–3 presents the Site elevation from ELVIS 1m digital elevation data (Geoscience Australia, 2021). At the northern boundary ground elevation ranges from 49 m Australian Height Datum (mAHD) to 53 mAHD) to around 40 mAHD in the middle of the Site to around 32 mAHD at the southern boundary. The general topography of the area around the Site indicates elevation decreases to the south.

Approximately 1.3 km south of the Site is Salt Pan Creek, which flows in a southerly direction towards the Georges River.

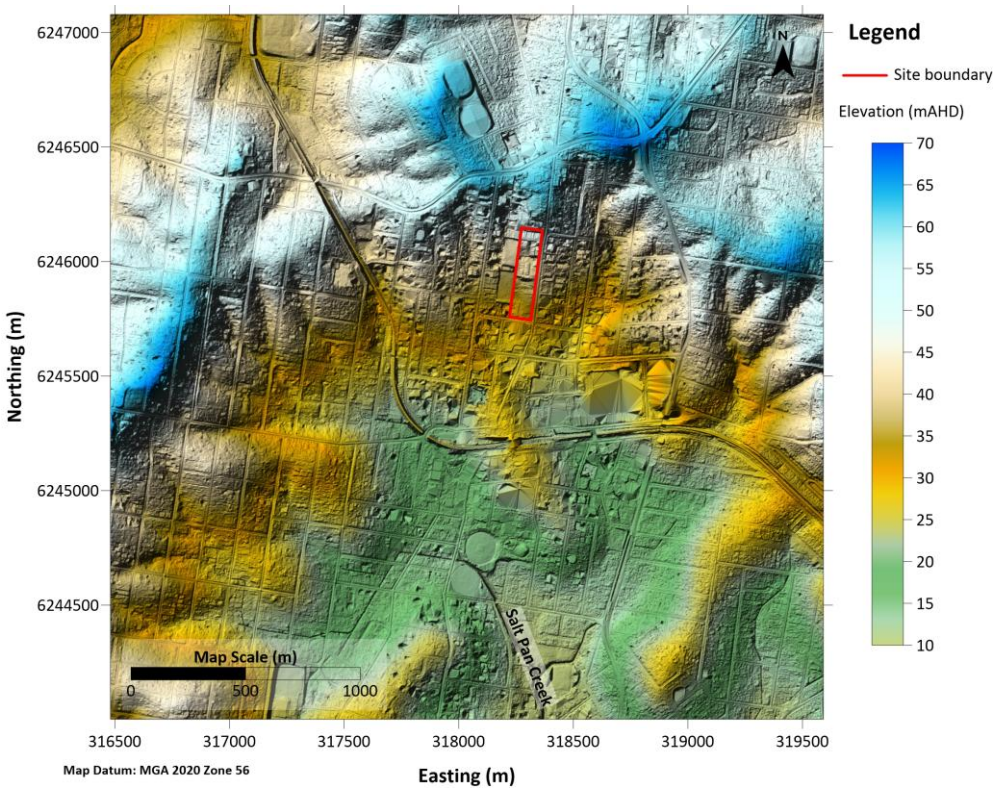


Figure 4–3: Topography at the Site (modified from Geoscience Australia, 2021)

4.4 Soil Landscapes

The *Soil Landscapes of the Sydney 1:100,000 Sheet* (Chapman et al, 2009) indicates that the Site is underlain by the Blacktown and Glenorie soil landscapes as shown on Figure 4–4. The dominant soil landscape is the Glenorie soil landscape unit. This landscape comprises undulating to rolling low hills on Wianamatta Group shales. The dominate soil materials of the Glenorie soil landscape unit are friable dark brown loam, hardsetting brown clay loam, reddish brown strongly pedal clay, grey plastic clay and brownish grey plastic silty clay. Lateritic ironstone concretions may be found in the deep subsoil and are associated with the grey plastic clay. The Glenorie soil landscape unit features localised impermeable highly plastic soil which is moderately reactive, seasonal waterlogging, moderate surface swelling potential and a high soil erosion hazard if stripped of vegetation.

In the south of the Site the Blacktown soil landscape unit is present. Soils within this landscape comprise gently undulating rises on Wianamatta Group shales and Hawkesbury Sandstone. The main soil materials are similar to the Glenorie. The soil is moderately reactive, with seasonal waterlogging and moderate erodibility.

4.4.1 Soil salinity

Salinity outbreaks are most common on lower slopes and drainage systems where salt concentrations develop due to the presence of shallow groundwater or poorly drained clayey soils which have the potential to become waterlogged. Figure 4–5 shows the mapped Salinity Potential in Western Sydney, from the digital dataset (DCCEEW, 2002), for the Site is of ‘moderate salinity potential’ with ‘high salinity potential’ in the south western corner of the site.

4.4.2 Acid sulphate soils

Acid Sulfate Soils (ASS) are naturally occurring soil and sediment, distinguished from other soil or sediment materials by having properties and behaviour that have either been affected by the oxidation of Reduced Inorganic Sulfur (RIS) (principally the mineral iron pyrite), or the capacity to be affected considerably by the oxidation of their RIS constituents. These soils are typically found in low-lying coastal areas on land with elevation less than 5 mAHD and saline inland areas (Sullivan et al., 2018). Review of the Acid sulfate soil risk mapping available online (DCCEEW, 2002) indicates the Site is not within an area of mapped ASS risk.

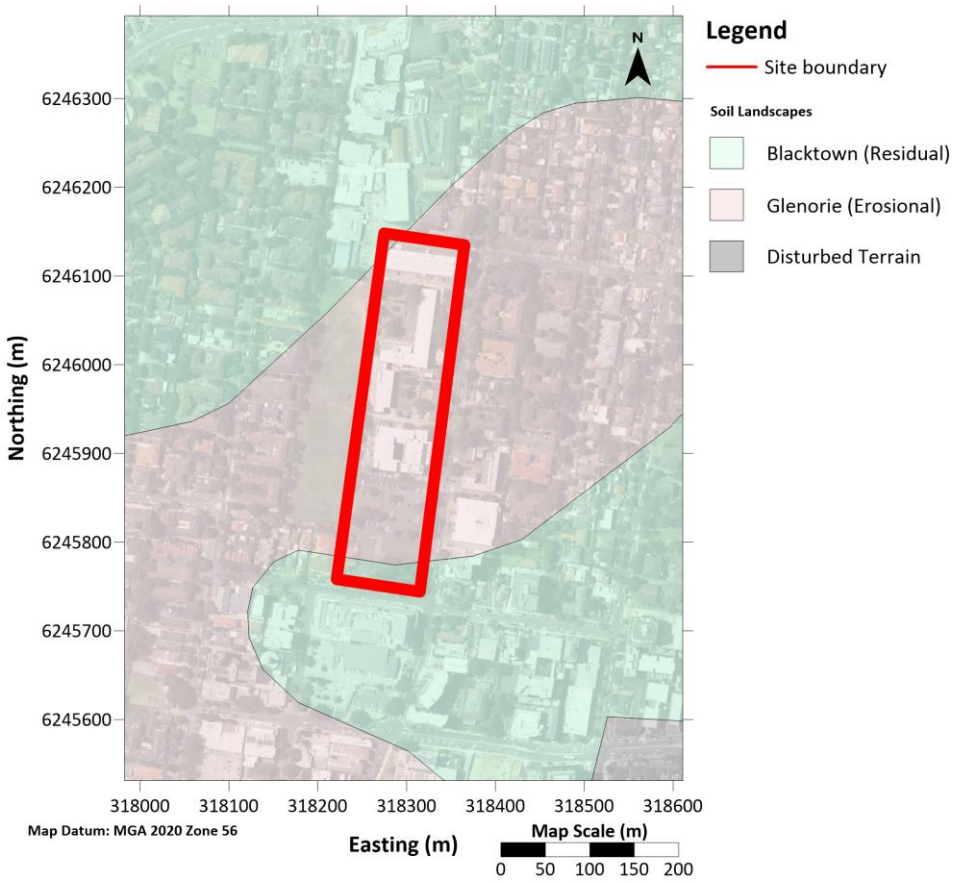


Figure 4–4: Soil landscapes at the Site (modified from Chapman et al 2009)

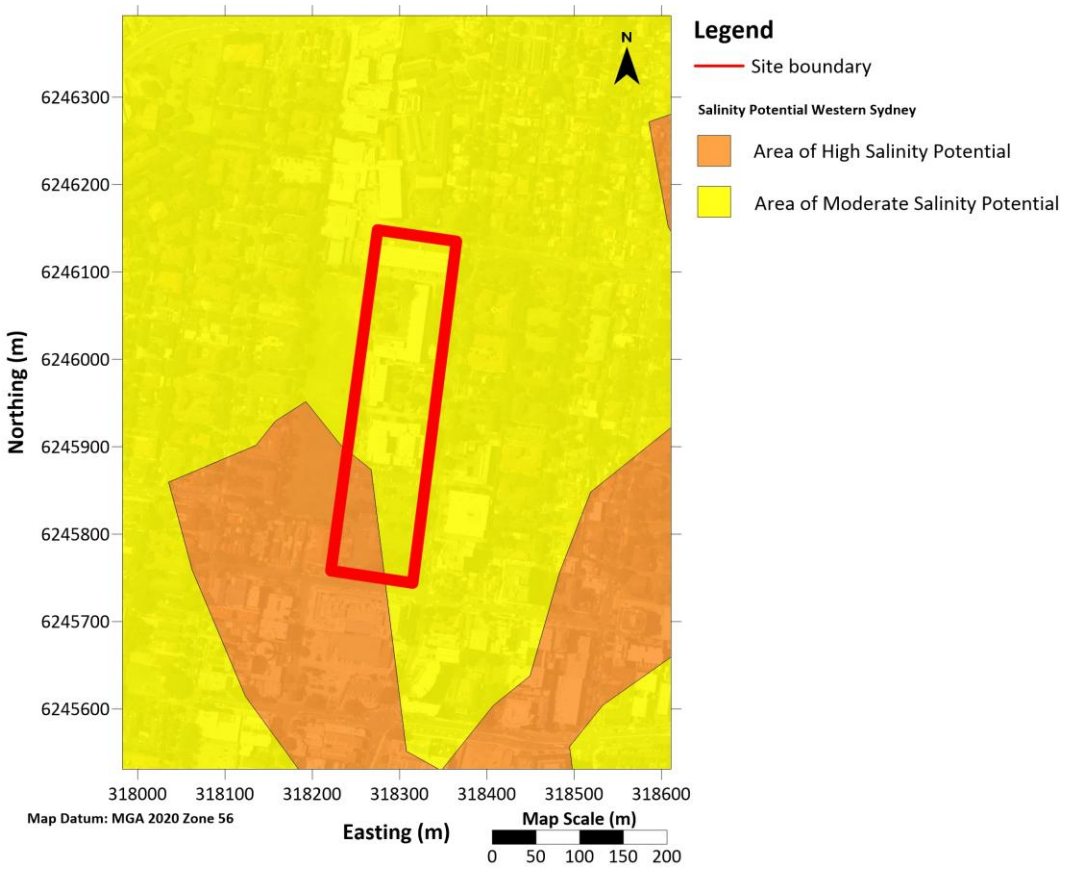


Figure 4–5: Soil salinity potential map (modified from DCCEEW, 2002)

4.5 Regional Geology

The Site is predominantly underlain by Bringelly Shale geological unit of the Permian-Triassic aged Wianamatta Group. Figure 4–6 shows the location of the Site and the regional geological units from the NSW Seamless Geology digital dataset (Colguhoun et al, 2024). The Bringelly Shale is described as light to mid-grey claystone to dark grey-black carbonaceous claystone laminate, lithic sandstone and rare coal.

The south-east of the Site is anticipated to be underlain by the Minchinbury Sandstone geological unit of varying thickness comprising fine to medium lithic sandstone. Minchinbury Sandstone forms a geological contact between Ashfield Shale (Twia) geological unit and Bringelly Shale geological unit. Ashfield Shale geological unit found at adjacent to the Site is described as black to light grey shale and laminite.

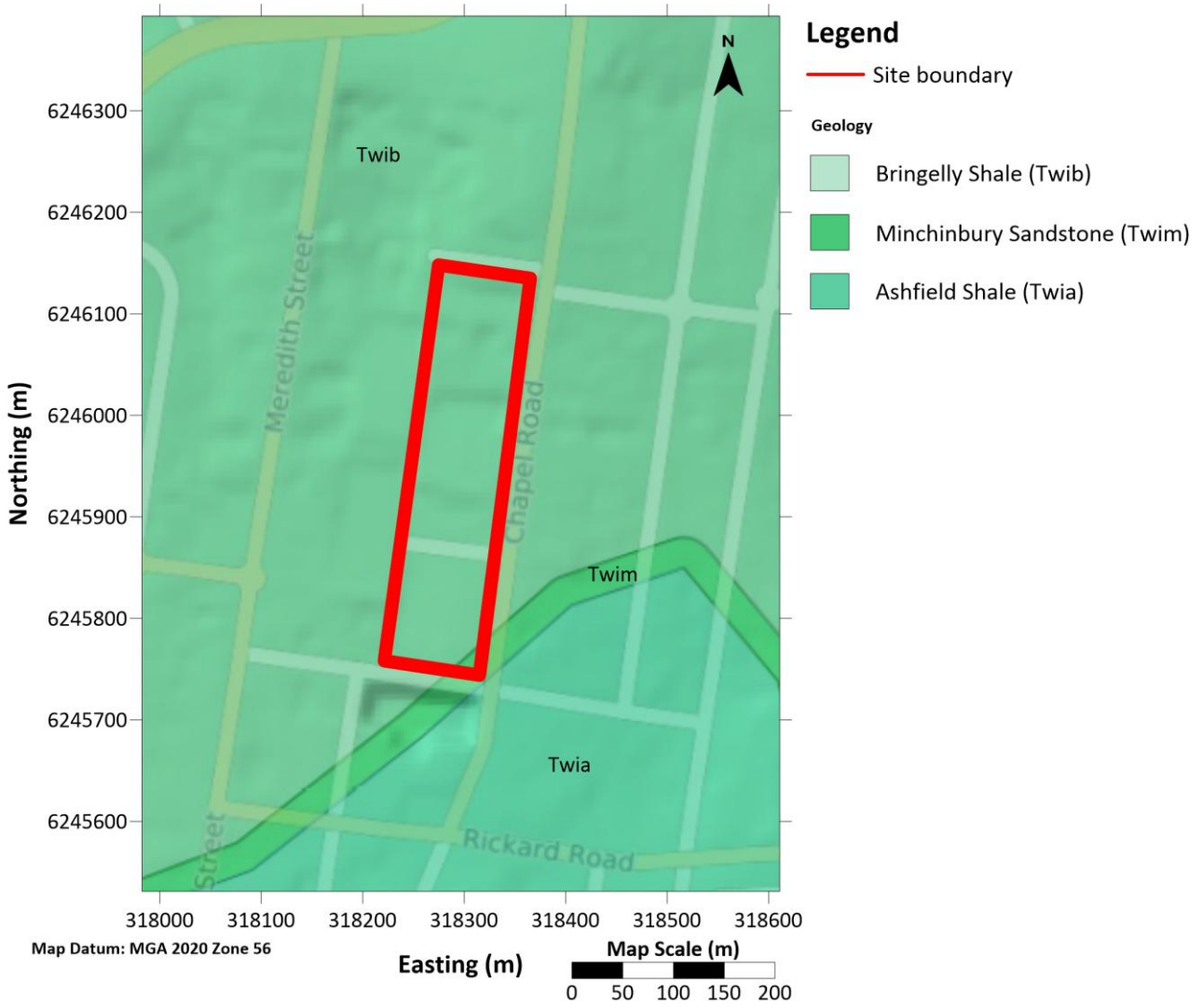


Figure 4–6: Regional geology of the Site (modified from NSW Seamless Geology digital dataset v2.5)

4.5.1 Residual Soils

Residual soils are likely to be present below the hardstand materials at varying thicknesses depending on the previous earthworks undertaken for the construction of the TAFE. The soils are anticipated to be derived from the Bringelly Shale and typically medium and high plasticity clays.

4.5.2 Bringelly Shale

The Bringelly Shale formation is the uppermost member of the Wianamatta Group sedimentary sequence within the Sydney Basin. It comprises light to mid-grey claystone to dark grey-black carbonaceous claystone laminate,

lithic sandstone and rare coal. Near-surface sections of the subsurface profile are weathered to residual clayey soil which typically exhibit the following characteristic material properties:

- Moisture sensitive – high potential for expansive behaviour and shrink-swell volume changes, and
- Weakly cemented – susceptible to breakdown and potentially erodible/dispersive.

4.5.3 Minchinbury Sandstone

The Minchinbury Sandstone formation is a fine to medium grained lithic sandstone, up to 6m thick, that forms the horizon between the Ashfield Shale and overlying Bringelly Shale.

The basement is not anticipated to intersect the Ashfield Shale however the proposal may encounter the Minchinbury Sandstone in the south-eastern part of the site.

4.5.4 Ashfield Shale

The Ashfield Shale underlies the Minchinbury Sandstone and is the lower most member of the Wianamatta Group It is a marine basin sedimentary sequence comprising black to dark grey shale and laminite. The basement is not anticipated to intersect the Ashfield Shale.

4.5.5 Structural geology

The study area is located within the Fairfield Basin, as shown on the *Sydney 1:100,000 Geological Sheet* (Herbert, 1983), and is structurally controlled and influenced by the Lapstone Structural Complex at the western edge of the Basin.

4.6 Hydrogeology

Hydrogeological conditions and groundwater levels at the Site are expected to vary based on topography, ground conditions and proximity to watercourses/drainage features. Groundwater is expected to be encountered within bedrock. With reference to observations on landforms and geological units across the site, the following hydrogeological conditions are anticipated:

- Shallow rainfall dependent, transient seepage or perched groundwater in areas of residual soils and within the weathered Bringelly Shale bedrock profile, and
- Deeper regional groundwater table within the Bringelly Shale and Ashfield Shale bedrock, occurring below the base of weathering.

4.6.1 Recharge/discharge

Recharge to the groundwater system in the vicinity of the Site is dominated by rainfall infiltration. The Site is within a groundwater discharge area. Discharge from the groundwater system is likely to be dominated by evapotranspiration followed by discharge to drainage lines and creeks and groundwater pumping. Discharge to drainage lines and creeks is known to bring salts (from the Wianamatta Group Bringelly Shale) to the surface, which are evident at the break of slope, and influence the water quality of ephemeral creeks and drainage lines.

4.6.2 Groundwater flow and gradients

The topography is generally sloping to the south with the existing ground surface elevation ranging between 53 mAHD and 32 mAHD at the Site. Groundwater flows from areas of higher elevation towards the south trending Salt Pan Creek. The groundwater gradients are in the range of 0.0005 to 0.001.

4.6.3 Regional hydrogeology and conceptual model

An overview of the regional hydrogeological processes in the project area is presented in *Hydrogeological Landscapes for the Hawkesbury-Nepean Catchment Management Authority* (Nicholson et al., 2011), which makes the following observations to describe the characteristics of the following Hydrogeological Landscapes (HGL):

- Most of the study area is located within the Bankstown HGL, which typically includes saline regional groundwater systems that flow through the Wianamatta Group shales
- The land use is dominated by intensive residential development with major industrial and commercial developments
- Salt sites within this HGL are typically associated with colluvial slopes and foot slopes but also occur in upper change of slope positions and within drainage lines, as illustrated on Figure 4–7.

Water predominantly moves laterally though shale layers (although vertical movement through fracturing does occur) and vertically through interbedded sandstone and sandstone fracturing (primary and secondary porosity). Water is likely to move relatively slowly due to the low gradient and permeability and therefore likely to accumulate more salt out of the soil and bedrock. The low gradient also gives greater opportunity for discharges to occur. The water has high EC, generally brackish, in the range of 16,000 to 48,000 µS/cm.

The water table is typically intermediate in depth but local and seasonal perching above clay-rich layers can be expected along with flow through unconsolidated alluvial sediments.

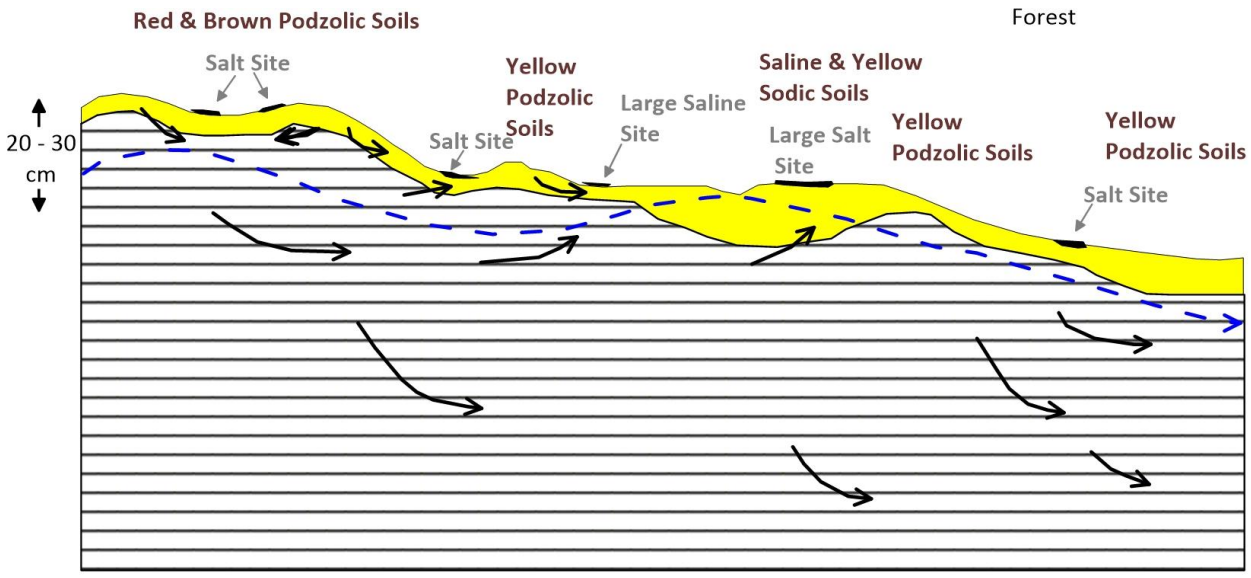


Figure 4–7: Conceptual sketch of the Bankstown Hydrogeological Landscape (modified from Nicholson et al., 2011)

4.6.4 Registered groundwater users

The registered bores within two kilometres radius of the proposal boundary are presented on Figure 4–8. There is a total of 15 registered bores in the area. Details regarding bore type, registered status and depth range are summarised in Table 4–4. 14 of the registered bores are classed for monitoring and associated with shopping centre / light industrial developments. They typically range in depth from 4 m to 11.5 m and encounter clay over shale. The licence status of the monitoring bores is reported as cancelled on the WaterNSW registered works reports which are provided in Appendix A.

One bore is active and as classed as domestic. The depth of the screen is below 110 m and appears to be associated with the Hawkesbury Sandstone aquifer. Monitoring bores are generally not considered for assessments of beneficial use and groundwater users under the AIP guidelines.

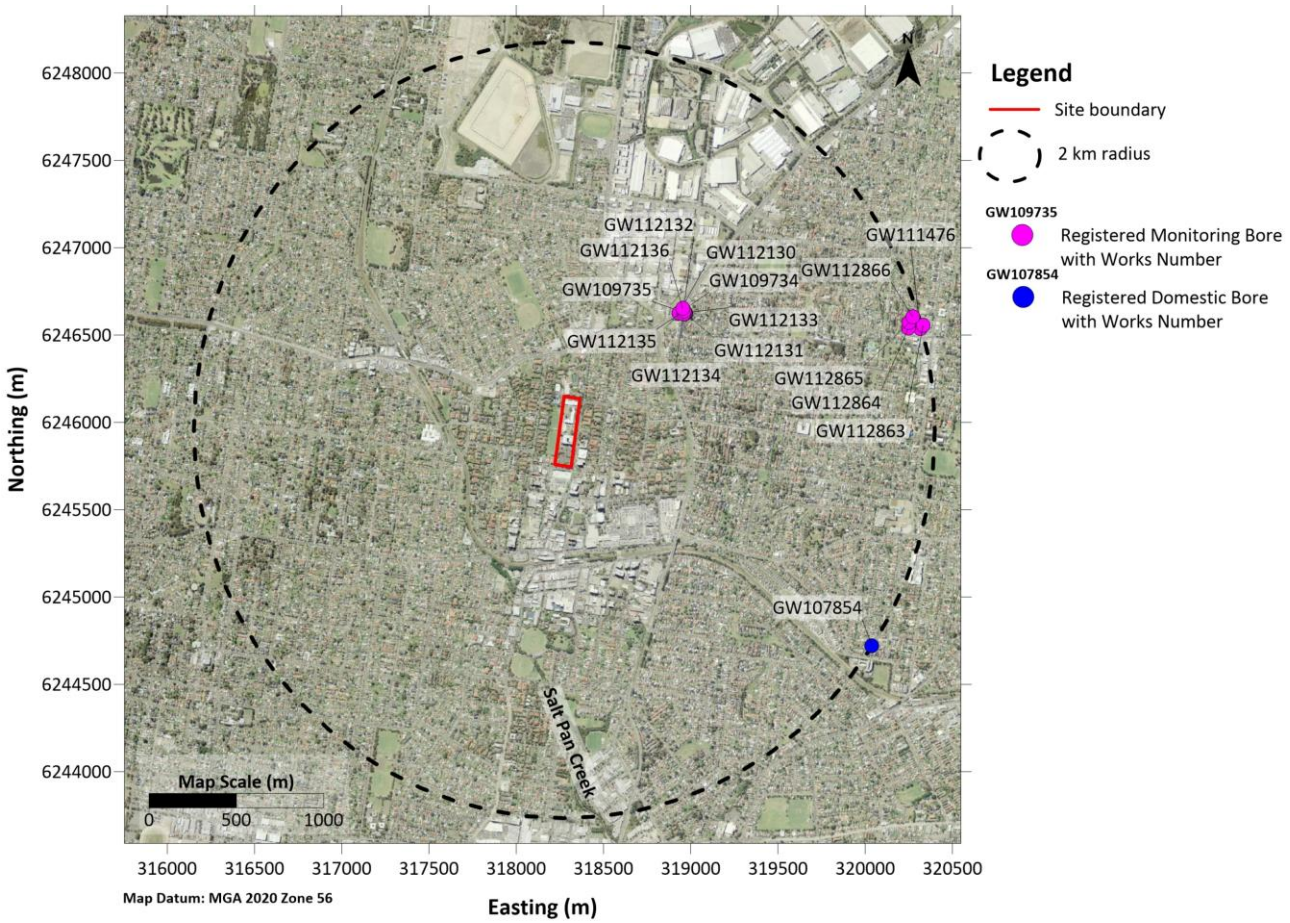


Figure 4–8: Registered bores within 2 km of the proposal boundary (modified from Water NSW, 2026)

Table 4–4: Summary of registered bores identified within 2km of the Site boundary (from WaterNSW, 2026)

Bore use	Number	Depth Range (m)	Status		
			Abandoned	Functioning/in use	Unknown
Commercial / Industrial	0				
Dewatering	0				
Exploration	0				
Irrigation	0				
Monitoring	14	4 to 11.5	14		
Stock and Domestic	1	234		1	
Water supply	0				
Other or Unknown	0				

4.6.5 Groundwater level

Existing registered bores show the depth to groundwater is variable and ranges from just a few meters below ground surface to greater than 20 mbgl, depending on the aquifer. The geotechnical investigations at the Site indicate groundwater seepage was not typically encountered within test pit excavations undertaken within the residual soil and weathered rock profile. Borehole investigations completed at the Site in 2025 did not encounter groundwater within the residual material and bedrock however the introduction of water to facilitate the drilling methods, including coring, may mask the true groundwater level as further observation of seepage flows and

levels, as drilling progresses, are precluded. Groundwater bores were drilled at the Site and monitoring of groundwater levels was undertaken between January 2025 and February 2026. Table 4–5 presents a summary of the Site monitoring bore construction details and Figure 4–9 presents the Site monitoring groundwater hydrograph.

The depth to water for bores screened in the siltstone / sandstone bedrock ranges from around 4.9 mbgl at BH201A to 8.2 mbgl at BH101. Groundwater is present at BH201B in the residual soil / extremely weathered siltstone Figure 4–9 shows groundwater has a limited response to rainfall events with a subdued response to long term climatic conditions. The groundwater drilling investigations at the Site were undertaken during a period of typically average rainfall conditions after a period of above average. Groundwater level monitoring occurred during the period of both average and above average rainfall conditions. This should be considered when using the information to infer existing conditions and the interpretation and assessment of results trends.

Table 4–5: Summary of Site monitoring bore construction details

BH ID	Total Constructed Depth (mbgl)	Hole size (mm)	Screen Interval (mbgl)	Gravel Pack Interval (mbgl)	Screened Lithology
BH101	12.6	110	9.6 to 12.6	9.4 to 12.6	Siltstone
BH102	11.1	110	8.1 to 11.1	7.6 to 11.1	Sandstone
BH103	14.5	110	8.5 to 14.5	8.0 to 14.5	Sandstone
BH201A	8.8	115	5.8 to 8.8	5.0 to 8.8	Siltstone
BH201B	5.1	115	2.1 to 5.1	1.8 to 5.1	Silty clay
BH202A	10.7	115	7.7 to 10.7	7.0 to 10.7	Siltstone

4.6.6 Groundwater dependant ecosystems

Dependence on or interaction with the vegetation communities within area on groundwater was assessed by searching the online GDE Atlas (BOM 2026). The GDEs mapped by the Atlas include aquatic ecosystems that rely on the surface expression of groundwater, and terrestrial ecosystems that rely on the subsurface presence of groundwater and inflow dependant ecosystems. A 2 km buffer is applied for consideration of potential GDEs with proximity to the Site boundary.

Within the 2 km radius is one area of terrestrial GDE / inflow dependant ecosystem associated with the Sydney Turpentine Forest and several areas of terrestrial GDE / inflow dependant ecosystems associated with the Cumberland Shale Woodland located approximately 1.5 km to the north-west of the Site. These potential terrestrial GDEs are some distance away from the Site and at a higher elevation than the Site. Aquatic GDE's are not located within the 2 km area.

Review of the schedule within the Greater Metropolitan Regional Groundwater Sources Water Sharing Plan (WSP), Schedule 4 Part1, shows one listed GDE within Salt Pan Creek which is around 4.7 km to the south-west of the Site. The WSP does not list any culturally significant sites within the area.

4.6.7 Groundwater quality

There is limited groundwater quality information for the area. Data from the WaterNSW registered bore works reports may contain limited salinity information. Only GW107854 reports salinity at around 9500 mg/L at 100 mbgl. Groundwater salinity is likely to be highly variable depending on the location. The groundwater quality results are presented in Table 4–6 and Table 4–7 from sampling of the Site monitoring bores and show:

- Electrical conductivity ranges from around 12, 000 µS/cm to 14,000 µS/cm
- Total Dissolves solids range from 6,600 mg/L to 7,400 mg/L
- Chloride ranges from 3,200 mg/L to 3,600 mg/L.

The results are consistent with water quality in shale for a saline groundwater table. Groundwater contamination is not discussed in this report, refer to the Detailed Site Investigation Report (SMEC, 2025b).

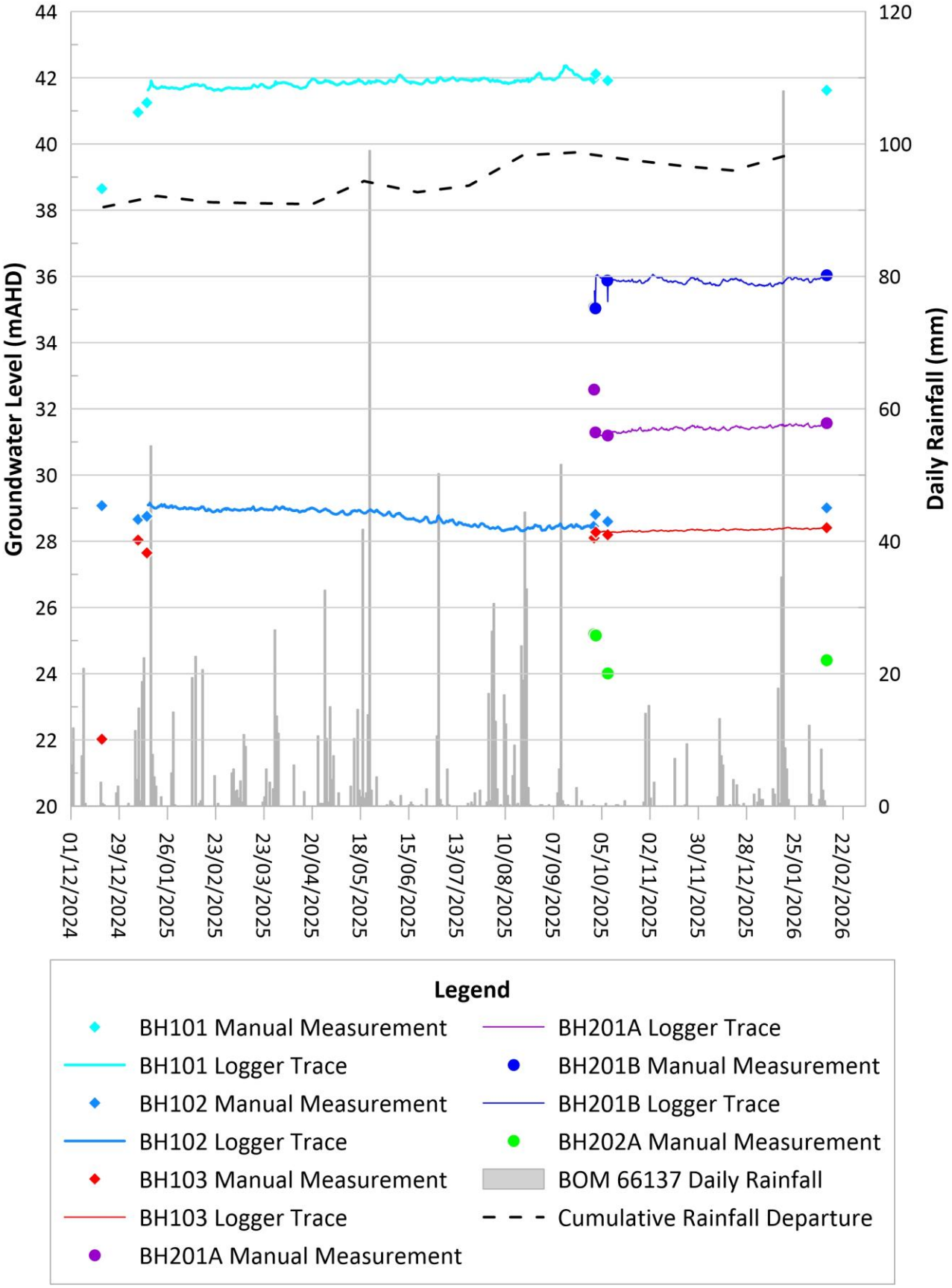


Figure 4–9: Groundwater hydrograph for groundwater levels at the Site

Table 4–6: Groundwater sample results for physical properties, major anions and cations, nutrients and hydrocarbons

Analyte	LOR	Unit	BH101	BH102	BH103	BH201A	BH201B	BH202A
Physical Properties								
pH	0.1	pH	7.2	6.9	7.1	6.8	4.9	6.0
EC	10	µS/cm	12000	14000	12000	12000	1700	4300
TDS	10	mg/L	7400	7600	6600	6800	980	2500
Hydroxide Alkalinity	20	mg/L	< 20	< 20	< 20	< 20	< 20	< 20
Carbonate Alkalinity	20	mg/L	< 20	< 20	< 20	< 20	< 20	< 20
Bicarbonate Alkalinity	20	mg/L	1200	1100	780	900	21	370
Total Alkalinity	20	mg/L	1200	1100	780	900	21	370
Major Anions and Cations								
Sulfate	2	mg/L	240	590	420	690	290	230
Chloride	1	mg/L	3400	3600	3200	3200	240	940
Calcium	0.5	mg/L	110	97	120	76	6.1	50
Magnesium	0.5	mg/L	180	320	280	250	16	77
Sodium	0.5	mg/L	18	22	19	17	7.2	17
Potassium	0.5	mg/L	2100	2400	2100	2000	300	620
Nutrients								
Ammonia	0.01	mg/L	1.7	0.48	0.79	0.11	0.11	0.4
Nitrite	0.02	mg/L	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.03
Nitrate	0.02	mg/L	0.55	< 0.02	< 0.02	< 0.02	< 0.02	0.13
Total Nitrogen	0.2	mg/L	1.8	1	4.3	0.6	< 0.5	1.6
Total Phosphate	0.01	mg/L	0.2	0.1	0.2	0.06	0.04	0.88
Reactive Phosphorous	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hydrocarbons								
Oil and Grease	10	mg/L	< 10	< 10	< 10	12	< 10	< 10
TRH								
C6-C9 Fraction	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
C10-C14 Fraction	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	0.18	0.05
C15-C28 Fraction	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
C29-C36 Fraction	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
C10-C36 Fraction Sum	0.05	mg/L	0.1	< 0.1	< 0.1	< 0.1	0.18	0.25

Table 4–7: Groundwater sample results for total and dissolved heavy metals

Analyte	LOR	Unit	BH101	BH102	BH103	BH201A	BH201B	BH202A
Dissolved								
Arsenic	0.001	mg/L	0.003	< 0.001	0.001	< 0.001	< 0.001	0.002
Aluminium	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	0.09	0.09
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.001	0.22	0.007

Analyte	LOR	Unit	BH101	BH102	BH103	BH201A	BH201B	BH202A
Nickle	0.001	mg/L	0.025	0.002	0.002	0.011	0.016	0.011
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001
Zinc	0.005	mg/L	< 0.005	0.01	< 0.005	0.022	0.28	0.034
Iron	0.05	mg/L	0.71	0.69	0.83	0.2	5.6	0.26
Manganese	0.005	mg/L	0.14	0.11	0.36	2.2	0.25	1.3
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Total								
Arsenic	0.001	mg/L	0.006	0.003	0.011	0.001	0.014	0.032
Aluminium	0.05	mg/L	5.4	1.6	9.6	1.6	20	28
Cadmium	0.0001	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0003	0.0004
Chromium	0.001	mg/L	0.015	0.004	0.022	0.004	0.034	0.059
Copper	0.001	mg/L	0.048	0.031	0.063	0.032	0.33	0.22
Nickle	0.001	mg/L	0.05	0.006	0.028	0.014	0.03	0.081
Lead	0.001	mg/L	0.01	0.005	0.02	0.003	0.055	0.051
Zinc	0.005	mg/L	0.068	0.029	0.12	0.04	0.37	0.36
Iron	0.05	mg/L	15	8.2	27	3.4	83	82
Manganese	0.005	mg/L	0.3	0.16	0.88	2.3	0.37	2.8
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	0.0002	< 0.0001	0.0002	0.0003

4.6.8 Hydraulic conductivity

The hydraulic conductivity outlined in the Bankstown Hydrogeological Landscape is low to moderate, in a range of 0.001m/day to 10/ day depending on the aquifer type. Hydraulic permeability testing was undertaken at the Site monitoring bores, and the results are outlined in Table 4–8. The estimated hydraulic permeability of the siltstone ranges from 0.001 m/day to 0.009 m/day and is within the typical values for this material type. The silty clay / weathered siltstone is within the same order of magnitude at around 0.002 m/day. The sandstone shows a slightly higher permeability and ranges from around 0.02 m/day to 0.07 m/day.

Table 4–8: Summary of Site estimated hydraulic permeability results

BH ID	Number of tests	Average K in m/day (Bouwer-Rice)	Average K in m/day (Hvorslev)	Average K in m/sec (Bouwer-Rice)	Average K in m/sec (Hvorslev)	Screened Lithology
BH101	1	0.007	0.001	8.1E-08	1.1E-08	Siltstone
BH102	1	0.024	0.032	2.7E-07	3.7E-07	Sandstone
BH103	3	0.040	0.070	4.5E-07	8.0E-07	Sandstone
B201A	2	0.006	0.009	6.9E-08	9.8E-08	Siltstone
BH201B	2	0.002	0.003	1.7E-08	3.4E-08	Silty clay
BH202A	2	0.008	0.01	9.2E-08	1.1E-07	Siltstone

4.6.9 Conceptual Site Hydrogeological Model

The conceptual hydrogeological model for the site is based on the information collected during the geotechnical investigation and is shown on Figure 4–10. The hydro-geology of the site consist of two layers:

- Residual soil consisting of silty clay
- Bedrock comprising Triassic Bringelly Shale of the Wianamatta Group.

Of the boreholes drilled at the site none appear to have intersected the underlying Hawkesbury Sandstone. In topographically elevated areas, groundwater may be present in residual soils after rainfall, however, it is transient in nature.

Discharge typically occurs under gravity flow, towards adjacent, lower lying topographic surface drainage features. This groundwater may also be 'discharged' via evapotranspiration effects and deeper drainage. Where the residual soil is of low permeability it will tend to act as an aquitard that limits hydraulic connection to the aquifer below.

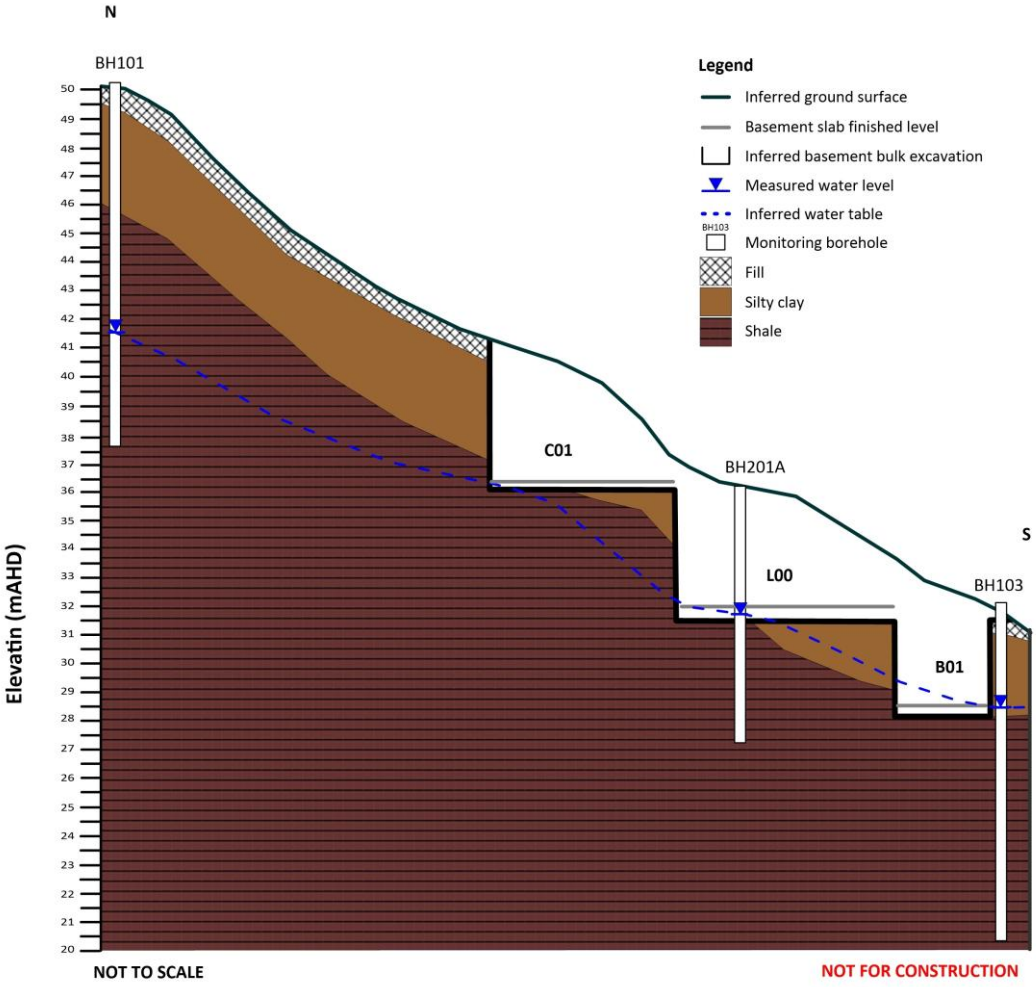


Figure 4–10: Conceptual North-South hydrogeological model

The Bringelly Shale is typically considered to act as an aquitard and in zones of outcrop the unconfined groundwater table systems is often perched or intermittent. The shale is typically of low bulk hydraulic conductivity with groundwater flow via fractures and joints. The water table is anticipated to be a subdued version of topography.

The groundwater flow direction is anticipated to be to the south towards the discharge point. Recharge is from direct rainfall infiltration in elevated areas where shale subcrops. Recharge rates are expected to be less than 5 % of annual rainfall. In areas of low topographic elevation, the Hawkesbury Sandstone aquifer, which underlies the shale, becomes confined.

5. Construction Impact Assessment

The potential construction works associated with the proposal include:

- Site facilities, stockpiles and materials laydown
- Cut and fill activities
- Basement excavation
- Foundation piling
- Construction of buildings, utilities trenching, internal road concrete and asphalt activities
- Construction of new access points with existing roads
- Landscaping.

These works would involve a range of activities associated with them which have the potential to impact on groundwater. Key construction activities are discussed in Section 5.1 and a summary of the potential impacts to groundwater are presented in Section 5.2 in Table 5–2. Surface water impacts including surface water impacts to groundwater are assessed in the Integrated Water Management Plan prepared by others.

5.1 Construction activities

This section provides a summary of the key construction activities that may potentially impact groundwater. Figure 1–2 presents the concept design finished layout, showing the location of internal access roads and connection points with French Avenue and Chapel Road.

5.1.1 Ancillary facilities and stockpiles

To support construction, a range of ancillary facilities would be required. These facilities may be located in the northern part of the Site and may include:

- Site offices, parking, sheds, workshops and storage
- Areas for material delivery and storage including culvert structural elements
- Stormwater capture and treatment locations, and
- Stockpile locations for materials.

Figure 5–1 shows the location of the new connection road for emergency vehicle access on the western site boundary and Figure 5–2 showing the location of vehicle exits to Chaple Street and surface water storage locations. Ancillary facilities would be temporary sites and structures that would be developed for the sole purpose of construction of the proposal and be removed once construction is complete.

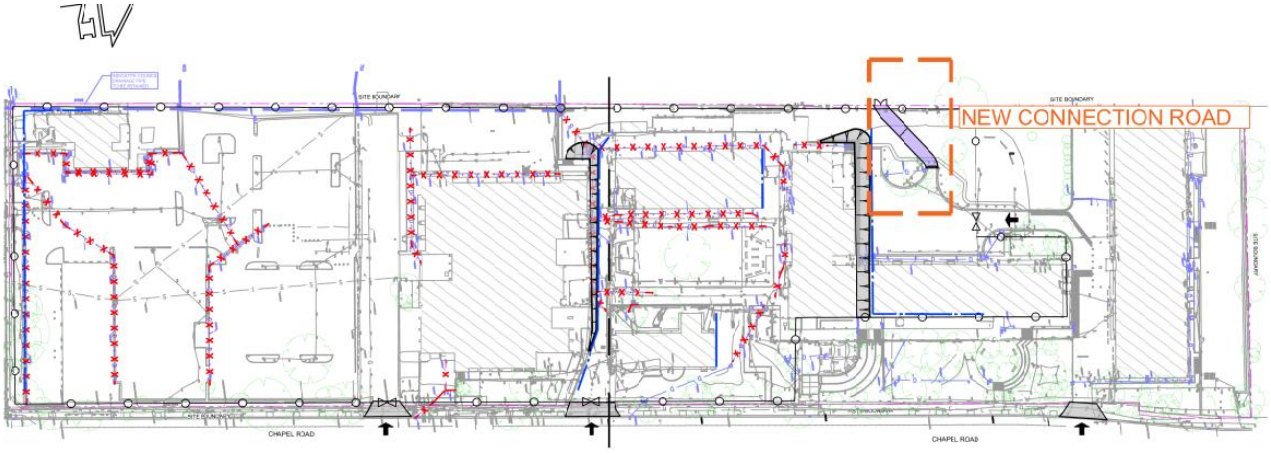


Figure 5–1: Early works site plan

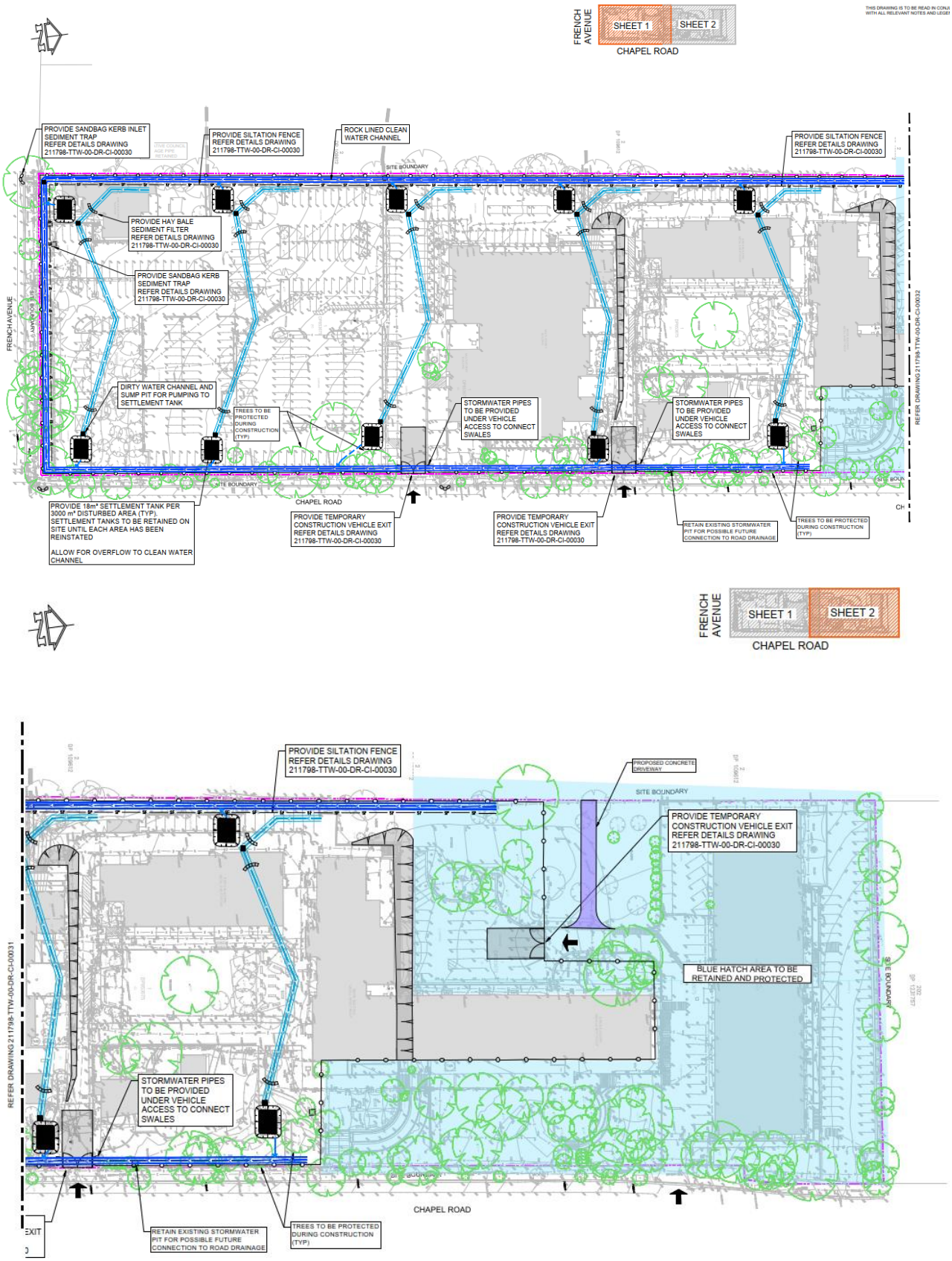


Figure 5–2: Site layout showing vehicle exits and surface water storage locations

5.1.2 Cut and fill activities

Site preparation works will include the excavation of soil in areas where cuts are required and the placement of soil in areas requiring where filling is required. Shallow (i.e. less than 1m) cuts are unlikely to intercept the water table whilst excavation associated with C01 and L00 may intercept the water table at the base of the cut and predominantly on the northern side of the cut. Areas of fill are not anticipated to be of significant depth and settlement is anticipated to be small and unlikely to impact on the groundwater aquifer.

5.1.3 Basement excavation

The proposal contains a car park basement excavation in the southern part of the Site, known as B01 (refer to Figure 2–1) and excavation for building L00 and surface car park C01. The existing ground level for the southern part of the Site and moves into the slope towards the north. The inflow rates for each of the three excavations was assessed using the analytical method of Marinelli and Niccoli (2000) for inflow to a pit, assuming the parameters outlined in Table 5–1 and the following:

- Distributed recharge flux is 0.0002 m/day (i.e. rainfall) which is 5 % of the highest annual total of 2038 mm
- Horizontal hydraulic conductivity is 0.006 m/day.

Table 5–1 presents the assumed pit dimensions, water level and base of excavation. The surface layout of the proposed built structure as shown on Figure 2–1 has been normalised for the assumed pit dimensions in the assessment.

Table 5–1: Inflow assessment assumptions

Location	Pit Dimension Length (m) x Width (m)	Water Level (mAHD)	Bulk Excavation Base (mAHD)	Depth of Excavation Below Water Table (m)
C01	75 x 30	36.25	36.05	0.2
Level 00	100 x 70	32.25	31.75	0.5
B01	30 x 60	29.00	28.05	0.95

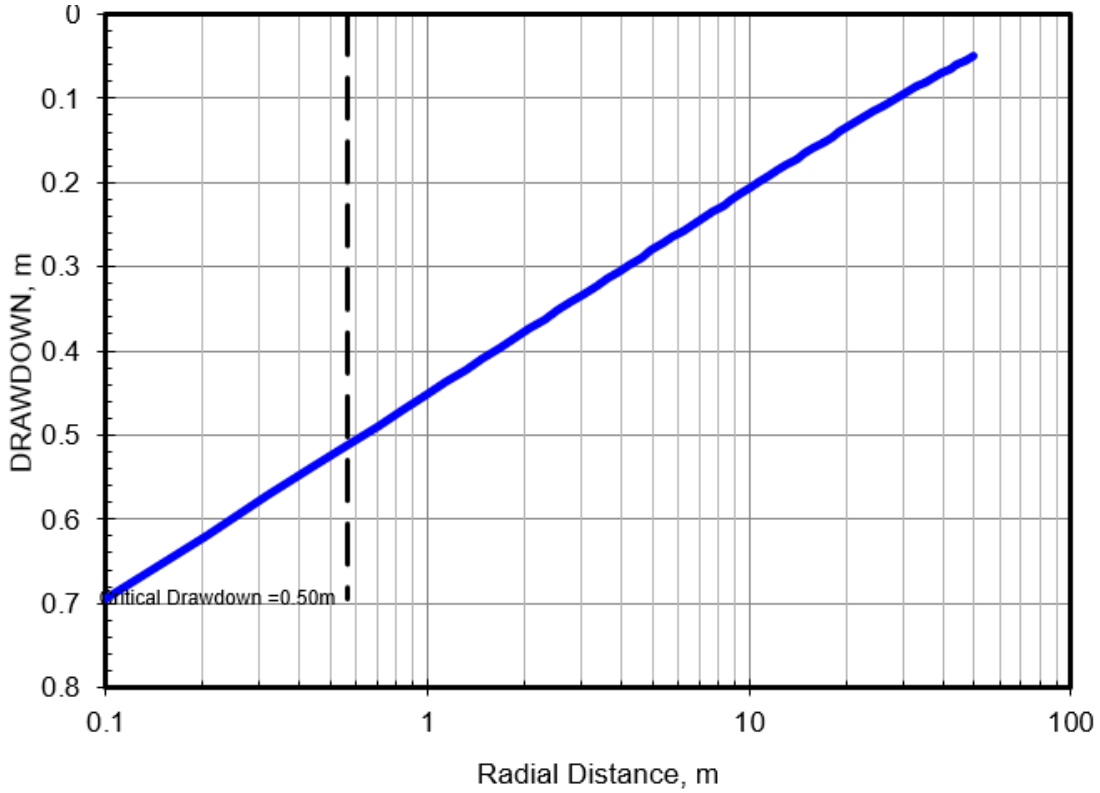
The estimated inflow is <0.001 L/sec for C01 and around 0.003 L/sec for Level 00. For these excavations, the water table depth was assumed to be either the finished slab level (i.e. for Level 00) or just below it (i.e. for C01). The method assumes radial flow however, inflow is likely only from three sides with approximately half the area assumed to be below the water table. The estimated inflow rate for B01 is 0.003 L/sec during construction. For this excavation a normalised water level was used to account for the gradient across the pit. Using the same interpreted water levels and the highest estimated permeability result from the Site testing (i.e. 0.01 m/day), the estimated inflows are approximately 0.001 L/sec for C01 and 0.004 L/sec for Level 00 and B01.

5.1.3.1 Drawdown

A Theis distance drawdown equation (Theis, 1935) was used to assess the radius of influence of distance drawdown (Figure 5–3) for the car park basement B01. The distance is from the edge of the excavation and assumes the following:

- Inflow rate of 0.2 m^3/day
- Radial distance of 50 m
- A time of 365 days
- Storativity of 0.05
- Transmissivity of 0.3 m^2/day.

Drawdown of the water table is steepest closest to the excavation and drawdown is estimated to be less than 1 m directly adjacent to the excavation wall. Figure 5–3 presents the plot of distance drawdown. It is considered unlikely that drawdown greater than 0.5 m would extend beyond 5 m from the edge of the excavation.



Parameter	Min	Max	Value	Unit	ADJUST
S =	0.0001	0.1	0.050119	d'less	
T =	0.01	1	0.3	m²/d	
Time =	0	365	365	d	
Q =	0	4	0.2	m³/d	
Radial Distance =	0.1	50		m	
Critical Drawdown =			0.50	m	

Figure 5–3: Theis distance drawdown

The method assumes inflow is radially from the sides however this basement has inflow from only three sides, with approximately 50 % of the area likely to be below the water table. Estimated inflows represent steady state conditions. Initial inflows may be higher as the cone of depression develops and more permeable units dewater in proximity to the excavation. Drawdown is not anticipated for C01 and L00 if the excavation base it at the water table level. If the excavation base is just into the water table, drawdown is anticipated to be minor and be less than that of B01.

The estimated total construction dewatering volume estimated to be less than 0.5 ML/year. This volume is below the 3ML per any 12-month period.

5.1.3.2 Dewatering and discharges

Where excavation activities are deep enough to intercept groundwater, dewatering will be required, either by discharged to the environment or offset disposal, depending on the nature and volume of the groundwater. Any aquifer interference that takes groundwater will require a Water Supply Works Approval from Water NSW for taking groundwater under the Water Management Act 2000. The Dewatering Management Protocol (DMP) is part of the Water Supply Works Approval. If the project is determined to be State Significant Infrastructure, then the project would be excepted from requiring a Water Supply Works Approval for the construction phase. This exemption does not cover the ongoing take of groundwater during operation.

Under Schedule 4, Part 1, clause 2 of the WM Regulation, public authorities are exempt from the requirement to hold a Water Access Licence where the proposal has a below 3 ML / annum active or passive groundwater take.

The estimated inflows for the proposed basement are anticipated to be less than 0.5 ML/annum and the project is exempt from a WAL.

5.1.4 Foundation piling

Piled foundations to support the multistorey building are anticipated to penetrate the water table during boring activities. Inflows rates would be similar to those estimated for the basement excavation and dewatering of the excavations is not anticipated to be required.

5.1.5 Building construction, utilities trenching, concrete and asphalt activities

The proposal would require utilities and services relocation within the footprint of the Site and at the interface with the new connections for the internal roads with French Ave and Chapel Road. Trenching for services is not anticipated to be of significant depths and therefore unlikely to intersect the water table.

The concept design suggests a similar area of impermeable surfaces would be constructed as the existing Site conditions. Concrete would be used for the construction of building foundations, basement excavation support, pathways, curbing and drainage structures and asphalt used for internal roads.

5.2 Summary of potential construction impacts

A summary of the potential construction impacts for groundwater is provided in Table 5–2. Refer to Section 8 for mitigation measures.

Table 5–2: Summary of potential construction risks and potential impacts for groundwater

Activity / Event	Description of Impact	Receptors	Significance	Mitigation measures (see Table 8–1)	Residual impacts
Ancillary facilities and stockpiling	Leaching of metals and salts from materials stored because of interaction with water infiltrating through the soil may cause pollution to groundwater.	Groundwater	Medium	*Water pollution due to stockpiles*	Low
Leak, spills and waste	Potentially harmful chemicals (e.g. hydrocarbons, oil, grease, heavy metals, nutrients) could accidently be released during construction spills, refuelling and due to inappropriate storage and handling. Leakage from construction worker facilities or wastewater collection points could runoff into soils. This could potentially contaminate exposed soils and there is potential to leach into groundwater sources and contaminate the aquifer.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	Medium	*Water pollution from accidental spills*	Low
Vegetation removal	Clearing of vegetation in the southern part of the site exposing the underlying soil to rainfall which may leach nutrients, metals and salts to the groundwater aquifer causing pollution. Clearing of vegetation and topsoil would increase the risk of soil erosion.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	Medium	*Water pollution*	Low
Earthworks	The use of water for dust suppression during earthworks works has the potential to increase recharge to the groundwater to groundwater and this may result in temporary localised mounding of the water table. The interaction of concrete dust with water can lead to soil and water pollution (e.g. change in pH, total dissolved solids, total suspended solids and minor levels of aluminium, iron and manganese oxides) from surface water infiltration to groundwater. This may lead to pollution of the groundwater aquifer.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	Medium	*Water pollution* *and* *Water quality monitoring*	Low
Earthworks – recently disturbed soils	Disturbance of the soil has the potential to leach nutrients, metals and salts to the groundwater aquifer causing pollution.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	Medium	*Water pollution* *and* *Water quality monitoring*	Low
Leak spills and waste - basement excavation	Leaks and spills from plant and equipment operating in the basement excavation could leach into the groundwater sources and cause pollution of the aquifer.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	High	*Water pollution from accidental spills*	Low
Trenching	Exposed open excavations have the potential for surface runoff to enter the trench. Water entering the trench would increase recharge to the groundwater and this may result in temporary localised mounding of the water table. Pollutants from the surface runoff into the trench could potentially contaminate the soil and leach into groundwater. The impact of localised water table mounding is considered to be low given the time the trench is likely to be open for a short time, the depth to the water table	Groundwater	Low	*Water pollution*	Low

Activity / Event	Description of Impact	Receptors	Significance	Mitigation measures (see Table 8–1)	Residual impacts
	typically being below the base of the trench and the likely hydraulic conductivity of the soils.				
Basement excavation - dewatering	Dewatering would result in localised impact to the water table level which may extend away from the excavation and cause an increase in the depth to groundwater. Water table drawdown, if more than the natural variation, could lead to oxic conditions within the dewatered portion within the area of drawdown and may result in a reduction in water quality within the groundwater aquifer.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	Medium	*Groundwater dewatering during excavation*	Low
Discharges	During excavation of the basement if the groundwater table is encountered and dewatering is required, the water would have to be collected, stored and disposed of. If water is discharged via infiltration to groundwater this would result in localised mounding of the water table and potential salt scalding at the infiltration site. The low hydraulic conductivity of the soil and shale indicates low suitability for disposal via infiltration.	Groundwater	Medium	*Water pollution* *and* *Water quality monitoring*	Low
Disturbance of salinity, ASS or contaminants of concern	Construction activities have the potential to interact with soils where there may be localised areas of moderate to high salinity potential and construction could disturb soils in areas with unidentified salinity / ASS potential. Disturbance of the soil has the potential to leach salts and mobilise ASS and contaminants of concern to groundwater that could lead to pollution of the aquifer.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	Medium	*Water pollution*	Low
Construction	Concrete / asphalt transportation and pouring operations can lead to soil and water pollution (e.g. increase in pH, total dissolved solids, total suspended solids and minor levels of aluminium, iron and manganese oxides) from cement laden runoff not being properly contained. This may lead to pollution of the groundwater aquifer.	Groundwater Sensitive Receptors: Terrestrial and Aquatic GDE	Medium	*Water pollution* *and* *Water quality monitoring*	Low

5.3 Aquifer Interference Policy Review

The proposal is assessed to have aquifer interference activities that require review against the Level 1 minimum impact considerations of the NSW Aquifer Interference Policy (AIP). The proposal is located within the Bankstown HGL, which typically includes saline regional groundwater systems that flow through the Wianamatta Group shales. The Wianamatta Group Shales are classed as a 'less productive groundwater source' under the AIP. A less productive groundwater source is defined by the AIP as a groundwater source having total dissolved solids greater than 1500 mg/L or does not contain water supply works that can yield water at a rate greater than five litres per second.

The basement excavation has the potential to intersect the water table, potentially requiring dewatering for the purpose of constructing the feature. The predicted groundwater inflows are low and the radius of influence, that is the distance away from the centre of the excavation, is generally less than 10 m. The drawdown of the groundwater table is greatest at the excavation and reduces away from it. Drawdown at the excavation will be permanent following construction assuming a drained basement.

The excavation does not intercept the water table uniformly on all sides and therefore an assumption of 50 % interaction has been assumed to assess stead state inflows and radius of drawdown. Further investigations during detailed design would be conducted. The risk of occurrence and impacts are based on assumed water levels, percentage of interception and excavation size.

5.3.1 Water supply works

Based on analytical assessment, the potential radius of influence estimated in Section 0 is not likely to extend more than 10 m from the proposed basement excavation. Water table drawdown due to dewatering for construction activities would not exceed one meter. Changes to the water table would be highly localised and within the 2m drawdown criteria of the AIP Level 1 minimum impact consideration. The nearest water supply works (GW107854, refer to Figure 4–8) is approximately 1.9 km south-east of the Site. The following findings are made in relation to water supply works:

- The risk of changes to groundwater level impacting groundwater users within the same aquifer is considered to be low.
- The risk of impact to groundwater quality of the water supply work from salinity from the proposal is considered to be low. The water supply works is located cross gradient from the Site.
- The risk of change to groundwater quality as a result of this impact and groundwater becoming unsuitable for groundwater users is considered to be low. This is due to limited areas of interaction with groundwater, low volumes and the Site being located within a groundwater discharge area. The proposal is considered unlikely to result in a change in beneficial use category.

5.3.2 High priority culturally significant sites

There are no high priority culturally significant groundwater dependant sites listed in the WSP for the Greater Metropolitan Region Groundwater Sources.

5.3.3 Groundwater dependent ecosystems

There are several potential terrestrial GDEs located within 2km of the Site. They are dominated by woodland / forest species and are hydraulically up-gradient of the Site. The WSP lists one GDE within Salt Pan Creek which is around 4.7 km to the south-west of the Site. The following findings are made:

- Potential high priority aquatic GDEs are more than 40 m from the Site and considered to be outside the radius of influence for potential impacts.
- The risk of changes to groundwater level impacting a potentially high priority GDE are considered to be low based on the distance to the GDE and drawdown of the groundwater table being less than one meter which would be within the range of natural climatic fluctuations. The groundwater hydrographs show natural variations in the groundwater level appears to be between 0.2 m and 0.5 m.

6. Operational Impact Assessment

Operational activities that may potentially impact groundwater are:

- Reduction in aquifer recharge
- Water table drawdown
- Changes to flow paths
- Leaks and spills.

The proposal is anticipated to have limited operational impacts. The Site currently consists of buildings and impermeable surfaces over a significant percentage and there is not anticipated to be a considerable increase in impermeable surfaces that would result in a reduction in overall recharge. The main groundwater receptor is considered baseflow to watercourses such as Salt Pan Creek to the South of the Site. Any reduction in rainfall infiltration is likely to have negligible effect on recharge to groundwater and is unlikely to produce an effect that would constitute aquifer interference, and the potential impacts such as changes to groundwater level or quality, are considered to be low.

The proposal is in a groundwater discharge area, where groundwater levels naturally fluctuate. The proposal basement is likely to permanently intercept groundwater resulting. The inflow rates, based on the hydraulic permeability and depth of water table penetration, are low (i.e. less than 0.003 L/sec) and drawdown of the water table is estimated to be less than one meter. The long-term steady state groundwater inflows to the car par basement B01 are likely to be less than 0.5 ML/annum on average. The operational stage drainage system is anticipated to be a lined collection system to direct discharge to a storage / disposal pathway. C01 and L00 have finished slabs that are anticipated to be above the water table and ongoing seepage is anticipated to be minimal.

Long-term dewatering would require adherence to the requirements of the Water Management Act 2000 and may require a specific operational DMP. Leaks and spills of the discharge water could impact groundwater through localised mounding of the water table from recharge, due to the low permeability of the aquifer.

Changes to the water level from the operation of the car park basement B01 are unlikely to result in drawdown exceeding 2 m and impacts are anticipated to be within the range of natural climatic fluctuations of the aquifer. Groundwater flow would continue towards discharge areas off Site however there may be some slight changes to the groundwater flow paths as a result of the basement drainage structure intersecting the water table. This is not anticipated to significantly alter the volume of groundwater reporting to the natural discharge zone or the location of the groundwater discharge zone.

Operational Site activities that have the potential to impact groundwater are leaks and spills from onsite chemical storage. Long-term leaks that immigrate through the soil into the aquifer have the potential to pollute the groundwater. The risk is considered to be low as storage areas would be constructed with appropriate bunding. Long-term leaks that immigrate through the soil into the aquifer have the potential to pollute the groundwater. Design considerations would be applied to manage the likelihood of leaks and the location of storage areas would consider the depth to groundwater and potential flow pathways at that location. Spills have a lower risk of migration through the soil to infiltrate the groundwater due to the duration of the event. The risk to groundwater is considered to be low, with operational response procedures to be in place, and the low permeability of the material.

The proposal has been assessed against the Level 1 minimal impact considerations for the construction phase. The potential impacts during the operational phase are less than it would be for construction. Overall, the groundwater impacts from the proposal would be less than the Level 1 minimal impact considerations specified in the AIP.

The proposal is not predicted to result in any decline in groundwater head and is not predicted to alter the beneficial use of the groundwater at any water supply work, culturally significant groundwater dependant sites or GDEs.

7. Cumulative Impact Assessment

Cumulative impacts are those that result from successive, incremental and/or combined effects of a proposal when added to other existing, planned and/or reasonably anticipated future projects. The proposal is part of the Bankstown Local Government Area (LGA). Much of the land surrounding the Site area is urbanised residential and industrial developments.

Cumulative water quality impacts from potential urban redevelopments around the proposal would be managed in accordance with the Canterbury-Bankstown Control Plan (DCP) which outline objectives and controls for developments within the LGA. In accordance with the objectives and controls of the DCPs future developments would include measures to minimise impacts on water quality. Cumulative impacts of the proposal are expected to be low risk with projects utilising appropriate soil and water controls. The proposal is not considered to result in long-term changes to groundwater and is not considered to present a significant risk of cumulative impacts within the broader catchment.

8. Management Measures and Safeguards

8.1 Overview of mitigation measures

The proposal has the potential to impact groundwater during construction and operation. To manage these potential impacts during construction a Water Management Plan (WMP) will be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). The WMP would assess reasonably foreseeable risks relating groundwater and describe how these risks will be addressed during construction. Due to the potential for groundwater impacts a groundwater monitoring plan would be prepared and implemented as part of the GMP. The plan would be prepared in accordance with the Approved Methods for the sampling and analysis of water pollutants in NSW (EPA, 2022).

Groundwater levels are generally below the base of proposed works, with the exception of the car park basement which is anticipated to intercept groundwater during construction and operation. The estimated volume of groundwater discharge into basement excavation and operational drainage system is not anticipated to exceed the 3 ML/annum.

A Construction Dewatering Management Protocol (DMP), if required, would be prepared at detailed design to assess the groundwater volumes and the dewatered quality, and will provide an outline of the details for disposal and possible licencing requirements. During detailed design, opportunities to manage the operational phase groundwater take will be explored and the possible licensing requirements which may include an Operational Dewatering Management Protocol (DMP).

A summary of mitigation measures and the impacts addressed by those measures are presented in Table 8–1.

Table 8–1: Summary of mitigation measures

Impact	Mitigation measure	Responsibility	Timing
Water pollution	Water Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will identify all reasonably foreseeable risks relating to groundwater pollution and describe how these risks will be addressed during construction. These plan/s will include but are not limited to: • arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather • erosion and sediment controls • locations of bunded areas and storage requirements • dust suppression requirements	HI / Contractor	Detailed design/ Pre-construction/ Construction
Water quality monitoring	A water quality monitoring program will be developed and implemented as part of the WMP in the CEMP in accordance with the Approved Methods for the sampling and analysis of water pollutants in NSW (EPA, 2022). The program will define: • monitoring parameters • monitoring locations • frequency (including provision for wet weather and specific construction activities) and duration of monitoring The monitoring program will include monitoring prior to the commencement of construction and during construction to inform the implementation of the CEMP.	HI / Contractor	Pre-construction/ Construction
Water pollution due to stockpiles	Stockpile site locations would be confirmed during detailed design and where applicable managed in accordance with the Stockpile Site Management Guideline (RMS, 2015). This would consider measures to manage cross contamination within a stockpile area. Consideration of how to manage stockpiles, materials laydown and chemical storage with respect to groundwater would be undertaken by the construction contractor.	Contractor	Pre-construction/ Construction
Water pollution from accidental spills	A site-specific emergency spill plan would be developed and will include spill management measures in accordance with relevant EPA guidelines. The plan would address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including HI and EPA offices).	Contractor	Pre-construction/ Construction

Impact	Mitigation measure	Responsibility	Timing
	An emergency spill kit will be kept on site at all times. Spill kits will be located at all ancillary facilities and main construction work areas with all staff made aware of the locations of spill kits and trained in their use.	Contractor	Construction
	The refuelling and maintenance of plant and equipment will be undertaken in a designated sealed bunded area at ancillary facilities and/or off-site where possible. Vehicle wash downs and concrete washouts will be carried out within designated sealed bunded areas at construction ancillary facilities or carried out off-site.	Contractor	Construction
Groundwater dewatering during excavation	A Dewatering Management Protocol would be developed if groundwater/aquifer dewatering is required to lower the groundwater table to reduce or prevent groundwater ingress into the excavation. Assessment must include the volume of groundwater, dewatered quality and disposal procedure and monitoring. Relevant approvals and permits must be obtained prior to groundwater dewatering. Qualitative assessment must include assessment of the magnitude and duration of the drawdown and whether impacts are likely to adversely affect the habitat conditions and ecological communities within the GDEs.	HI / Contractor	Detailed Design/ Pre-construction
Construction groundwater impacts	Impacts on groundwater during construction will be minimised as far as practicable by: • avoiding the need to extract groundwater • minimising groundwater inflows and volumes into the excavation • managing any groundwater encountered during the excavation in accordance with the Technical Guideline – Environmental Management of Construction Site Dewatering (RMS, 2011)	Contractor	Pre-construction/ Construction
Groundwater dewatering - operational	A Dewatering Management Protocol would be developed if ongoing groundwater take is required as a result of the basement operation. Assessment must include the volume of groundwater, dewatered quality and disposal procedure and monitoring. Relevant approvals and permits must be obtained.	HI / Operator	Operation
Water pollution from accidental spills	A site-specific emergency spill plan would be developed and will include spill management measures in accordance with relevant EPA guidelines. The plan would address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including HI and EPA offices).	HI / Operator	Operation

9. Conclusion

This report includes a desktop review of available information to assess the potential risks groundwater during the construction and operation of the proposal. This report has assessed that impacts could occur as a result of the construction and operation of the proposal. Most of the impacts are expected to occur during the construction phase.

The assessment indicated that the proposal is unlikely to result in serious adverse impacts to groundwater and that the potential construction and operational impacts discussed in this report are common on construction projects and for basements. The main impacts of concern during construction include erosion and sedimentation and contamination.

Construction of the proposal is anticipated to have minimal interception of groundwater with the basement excavation the main groundwater interception. The potential impact to groundwater receptors is localised drawdown of the water table. The volume of groundwater potentially to be dewatered is below 3 ML/annum and an exemption applies. Impacts to groundwater receptors are below the Level 1 minimal impact considerations of the AIP. Operation of the proposal is predicted to intercept groundwater and the impact groundwater receptors is localised drawdown of the water table. Drawdown of the water table is anticipated to be within the range of natural fluctuations for the aquifer and is not anticipated to result in serious adverse impacts to groundwater.

The proposal does not significantly alter the amount of impervious area and is unlikely to result in measurable changes to the water quality of downstream receiving environments of the minor tributaries of the Georges River catchment.

To minimise impacts to groundwater, a range of measures would be implemented during the detailed design, construction and operational phases of the proposal, such as the preparation of:

- WMP as part of the CEMP to mitigate groundwater pollution during construction
- DMP as part of the WMP to mitigate groundwater drawdown and manage disposal impacts from dewatered groundwater
- Site-specific emergency spill plans to address accidental spills and leaks of hydrocarbons, oil and grease.
- Construction methodologies to consider Stockpile site locations, material laydown and chemical storage to prevent water pollution.

With the implementation of the proposed mitigation measures, the proposal is expected to have acceptable and minimal impacts on existing groundwater resources and environmental values during both the construction and operation phases.

10. References

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Appendix A

Registered Private Bore WaterNSW Works Reports

WaterNSW
Work Summary

GW107854

Licence: 10WA108688 **Licence Status:** CURRENT

Authorised Purpose(s): DOMESTIC
Intended Purpose(s): DOMESTIC

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Down Hole Hamm
Owner Type: Private

Commenced Date:
Completion Date: 23/04/2004
Final Depth: 234.00 m
Drilled Depth: 234.00 m

Contractor Name: INTERTEC DRILLING SERVICES
Driller: William Crump
Assistant Driller:

Property: ASSOC OF ISLAMIC DE ' WAH 3 Catherine St PUNCHBOWL 2196 NSW
GWMA:
GW Zone:
Standing Water Level (m): 36.000
Salinity Description:
Yield (L/s): 0.200

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	A//313700
Licensed:	CUMBERLA	BANKSTOW	Whole Lot A//313700

Region: 10 - Sydney South Coast
River Basin: 213 - SYDNEY COAST - GEORGES RIVER
Area/District:
CMA Map: 9130-3S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6244718.000
Easting: 320037.000
Latitude: 33°55'21.4"S
Longitude: 151°03'11.4"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	2.30	210			Rotary Air
1		Hole	Hole	2.30	150.50	165			Down Hole Hammer
1		Hole	Hole	150.50	234.50	155			Down Hole Hammer
1		Annulus	Concrete	-0.10	2.20	210			
1	1	Casing	Pvc Class 9	-0.60	29.40	140			Suspended in Clamps, Screwed and Glued
1	1	Casing	Steel	-0.60	2.20	168			Driven into Hole

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
101.00	102.00	1.00	Unknown			0.05		00:25:00	9500.00
122.00	124.50	2.50	Unknown			0.05		00:25:00	9500.00
186.50	193.00	6.50	Unknown			0.10		00:25:00	8750.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	clay, brown	Clay	
1.50	14.00	12.50	shale, brown	Shale	
14.00	21.00	7.00	shale, grey	Shale	
21.00	21.50	0.50	shale, hard	Shale	
21.50	24.00	2.50	dolerite, very hard	Dolerite	
24.00	77.50	53.50	shale, hard	Shale	
77.50	101.00	23.50	sandstone, grey	Sandstone	
101.00	102.00	1.00	sandstone, fine quartz	Sandstone	
102.00	122.00	20.00	sandstone, grey	Sandstone	
122.00	124.50	2.50	sandstone fine quartz	Sandstone	
124.50	133.50	9.00	sandstone, grey	Sandstone	
133.50	138.00	4.50	sandstone, dark grey	Sandstone	
138.00	180.00	42.00	sandstone, grey	Sandstone	
180.00	186.50	6.50	sandstone, light grey siltstone grey	Sandstone	
186.50	193.00	6.50	sandstone, light grey, & quartz, water bearing	Sandstone	
193.00	207.50	14.50	sandstone, light grey	Sandstone	
207.50	234.00	26.50	sandstone, light grey light brown	Sandstone	

Remarks

19/04/2010: updated from original form A

***** End of GW107854 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW109734

Licence: 10BL162770 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status:
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 03/11/2003
Final Depth: 4.00 m
Drilled Depth: 4.00 m

Contractor Name: Macquarie Drilling
Driller: Bryan Patrick Clancy
Assistant Driller:

Property: MOBIL OIL Cnr Hume Highway & Boronia Rd GREENACRE 2190 NSW
GWMA:
GW Zone:
Standing Water Level (m): 1.800
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246624.000
Easting: 318933.000
Latitude: 33°54'18.9"S
Longitude: 151°02'29.8"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	P.V.C.	0.00	1.00	60			Screwed
1	1	Opening	Screen	1.00	4.00	60		0	PVC, Screwed

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Conglomerate	
0.20	2.40	2.20	FILL	Fill	
2.40	4.00	1.60	CLAY	Clay	

***** End of GW109734 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW109735

Licence: 10BL162770 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status:
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 04/12/2003
Final Depth: 11.00 m
Drilled Depth: 11.00 m

Contractor Name: IT ENVIRONMENTAL
Driller: Bryan Patrick Clancy
Assistant Driller:

Property: MOBIL OIL Cnr Hume Highway & Boronia Rd GREENACRE 2190 NSW
GWMA:
GW Zone:
Standing Water Level (m): 9.100
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246624.000
Easting: 318969.000
Latitude: 33°54'18.9"S
Longitude: 151°02'31.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	11.00	100			Unknown
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.30	50	49		
1	1	Opening	Screen	6.20	11.00	50		0	PVC

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.15	0.15	CONCRETE	Conglomerate	
0.15	2.10	1.95	FILL	Fill	
2.10	4.30	2.20	CLAY	Clay	
4.30	11.00	6.70	SHALE	Shale	

***** End of GW109735 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW111476

Licence: 10BL604594 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 14/04/2011
Final Depth: 11.00 m
Drilled Depth: 11.00 m

Contractor Name: Macquarie Drilling
Driller: Craig Emme
Assistant Driller:

Property: COLES GROUP PROPERTY 13 Boronia Rd GREENACRE 2190 NSW
GWMA:
GW Zone:
Standing Water Level (m): 3.500
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	3//14864
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 3//14864

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246534.000
Easting: 320314.000
Latitude: 33°54'22.6"S
Longitude: 151°03'23.5"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	11.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	2.00	60	50		
1	1	Opening	Slots - Horizontal	2.00	11.00	60		0	Casing - Machine Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 5.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.50	11.00	7.50	Unknown	3.50					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	SHALE ORANGE BROWN,AND GREY	Shale	
1.50	11.00	9.50	SHALE,LIGHT BROWN TO GREY	Shale	

***** End of GW111476 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112130

Licence: 10BL161854
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 28/01/2003
Final Depth: 10.50 m
Drilled Depth: 10.50 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: 7-ELEVEN 301 Hume Hwy BANKSTOWN 2200 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1 575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246623.000
Easting: 318932.000
Latitude: 33°54'18.9"S
Longitude: 151°02'29.8"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112130 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112131

Licence: 10BL161854
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 28/01/2003
Final Depth: 13.00 m
Drilled Depth: 13.00 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: 7-ELEVEN 301 Hume Hwy BANKSTOWN 2200 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246623.000
Easting: 318968.000
Latitude: 33°54'18.9"S
Longitude: 151°02'31.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112131 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112132

Licence: 10BL161854
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 02/04/2013
Final Depth: 10.00 m
Drilled Depth: 10.00 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: 7-ELEVEN 301 Hume Hwy BANKSTOWN 2200 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246645.000
Easting: 318958.000
Latitude: 33°54'18.2"S
Longitude: 151°02'30.8"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated work type, status, drill method & drilled depth.

***** End of GW112132 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112133

Licence: 10BL161854 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 29/01/2003
Final Depth: 4.00 m
Drilled Depth: 4.00 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: 7-ELEVEN 301 Hume Hwy BANKSTOWN 2200 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246625.000
Easting: 318963.000
Latitude: 33°54'18.8"S
Longitude: 151°02'31.0"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated work type, status, drill method & drilled depth.

***** End of GW112133 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112134

Licence: 10BL161854
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 29/01/2003
Final Depth: 3.70 m
Drilled Depth: 3.70 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: 7-ELEVEN 301 Hume Hwy BANKSTOWN 2200 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246619.000
Easting: 318958.000
Latitude: 33°54'19.0"S
Longitude: 151°02'30.8"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated work type, status, drill method & drilled depth.

***** End of GW112134 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112135

Licence: 10BL161854 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 28/11/2001
Final Depth: 4.50 m
Drilled Depth: 4.50 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: 7-ELEVEN 301 Hume Hwy BANKSTOWN 2200 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246635.000
Easting: 318961.000
Latitude: 33°54'18.5"S
Longitude: 151°02'30.9"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated work type, status, drill method & drilled depth.

***** End of GW112135 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112136

Licence: 10BL161854 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 30/01/2003
Final Depth: 13.00 m
Drilled Depth: 13.00 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: 7-ELEVEN 301 Hume Hwy BANKSTOWN 2200 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	1//575922
Licensed:	CUMBERLA	BANKSTOW	Whole Lot 1//575922

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246651.000
Easting: 318953.000
Latitude: 33°54'18.0"S
Longitude: 151°02'30.6"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated work type, status, drill method & drilled depth.

***** End of GW112136 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112863

Licence: 10BL604595 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date: **Final Depth:** 10.00 m
Completion Date: 14/04/2011 **Drilled Depth:** 10.00 m

Contractor Name: Macquarie Drilling
Driller: Craig Emme
Assistant Driller:

Property: COLES GROUP PROPERTY 19 Boronia Rd GREENACRE 2190 NSW
Standing Water Level (m): 2.960
GWMA:
GW Zone:
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	100//1172261
Licensed:	CUMBERLA	BANKSTOW	Whole Lot A//403152

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6246553.000 **Latitude:** 33°54'22.0"S
Elevation Source: Unknown **Easting:** 320331.000 **Longitude:** 151°03'24.2"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Unknown

Remarks

23/07/2014: Nat Carling, 23-July-2014; Added status, drill method & depth, updated work type.

***** End of GW112863 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112864

Licence: 10BL604595 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/04/2011
Final Depth: 10.50 m
Drilled Depth: 10.50 m

Contractor Name: Macquarie Drilling
Driller: Craig Emme
Assistant Driller:

Property: COLES GROUP PROPERTY 19 Boronia Rd GREENACRE 2190 NSW
GWMA:
GW Zone:
Standing Water Level (m): 4.250
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	100//1172261
Licensed:	CUMBERLA	BANKSTOW	Whole Lot A//403152

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6246537.000
Easting: 320247.000
Latitude: 33°54'22.5"S
Longitude: 151°03'20.9"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

23/07/2014: Nat Carling, 23-July-2014; Added status, drill method & depth, updated work type.

***** End of GW112864 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112865

Licence: 10BL604595 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date: **Final Depth:** 11.00 m
Completion Date: 14/04/2011 **Drilled Depth:** 11.00 m

Contractor Name: Macquarie Drilling
Driller: Craig Emme
Assistant Driller:

Property: COLES GROUP PROPERTY 19 Boronia Rd GREENACRE 2190 NSW
Standing Water Level (m): 4.900
GWMA:
GW Zone:
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	100//1172261
Licensed:	CUMBERLA	BANKSTOW	Whole Lot A//403152

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6246569.000 **Latitude:** 33°54'21.5"S
Elevation Source: Unknown **Easting:** 320251.000 **Longitude:** 151°03'21.1"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Unknown

Remarks

23/07/2014: Nat Carling, 23-July-2014; Added status, drill method & depth, updated work type.

***** End of GW112865 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112866

Licence: 10BL604595 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date: **Final Depth:** 11.50 m
Completion Date: 14/04/2011 **Drilled Depth:** 11.50 m

Contractor Name: Macquarie Drilling
Driller: Craig Emme
Assistant Driller:

Property: COLES GROUP PROPERTY 19 Boronia Rd GREENACRE 2190 NSW **Standing Water Level (m):** 4.400
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	BANKSTOWN	100//1172261
Licensed:	CUMBERLA	BANKSTOW	Whole Lot A//403152

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6246603.000 **Latitude:** 33°54'20.4"S
Elevation Source: Unknown **Easting:** 320271.000 **Longitude:** 151°03'21.9"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Unknown

Remarks

23/07/2014: Nat Carling, 23-July-2014; Added status, drill method & depth, updated work type.

***** End of GW112866 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

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