TERRA INSIGHT

Proposed Gas Plant, 340 Bolong Road, Bomaderry NSW

Report on Geotechnical Investigation

Prepared for:

Babbage Pty Ltd / ENRS Pty Ltd

Our Ref: TERRA25-1264.Rep1.Rev1

Prepared for:
Babbage Pty Ltd
C/ ENRS Pty Ltd

13 March 2026

Attention: Mr T Barrett

RE: Proposed Gas Plant, 340 Bolong Road, Bomaderry NSW
Report on Geotechnical Investigation

Dear Tim,

Please find enclosed our revised report for the above site in relation to geotechnical investigations undertaken for the proposed Gas Plant. This report covers the investigations undertaken on the proposed main plant site and the the proposed pipeline.

After the original report dated 2025, the proposed pipeline has been realigned along Bolong Road. Additional test pits have been undertaken in February 2026 along the length of the pipeline. This report includes the updated subsurface conditions along this new northern pipeline alignment. This report should be read in conjunction with the attached document 'About Your Report' in Appendix A. Should you have any questions please contact the undersigned.

For and on behalf of Terra Insight

Karen Gates
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1. Introduction

At the request of ENRS Pty Ltd on behalf of Babbage Pty Ltd (the client), Terra Insight Pty Ltd (Terra) has carried out a geotechnical investigation for the proposed construction of the following:

- A gas plant on No 340 Bolong Road, just east of the operating areas of Manildra Group and adjacent and just South of Bolong Road;
- A proposed under bore below Bolong Road; and
- A proposed pipeline from the proposed plant to the Manildra Group operating area west of the site. This pipeline was initially aligned north of the existing railway line north of the Shoalhaven River. The proposed alignment has been realigned within the former rural residential properties near Bolong Road.

These areas which form the "Site", will hereafter be referred to as the main plant area, the underbore area and the pipeline corridor. The main plant area is located at No 340 Bolong Road, Bomaderry, NSW as shown on Figure 1.

The objective of the geotechnical investigation was to determine the subsurface conditions underlying the Site and provide advice for design for:

- The design of shallow and deep footings for the proposed structures within the main plant area;
- The ease of excavation along the proposed pipeline area;
- The ease of direction drilling for the under bore (direction drilling) and the ground conditions within which this under bore will be undertaken.

2. Scope of work

The proposed 2025 scope of work for this assessment included the following:

- A review of geological maps and aerial photography covering the site;
- A review of existing information which may provide relevant information on site conditions;
- A visit to site make observations of site surface conditions by a Principal Geotechnical Engineer;
- A subsurface investigation comprising:
  - Clearance of services within the proposed test locations;
  - Two deep boreholes (named BH01 and BH02), to depths between 8 and 20m depth or refusal on extremely weathered material if encountered using an all-terrain drill rig.
  - A day of CPT testing allowing four (4) Cone Penetrometer Tests (Named CPT1 to CPT4) to be undertaken to depths between 8 and greater than 20m, to determine the nature of the alluvial sediments underlying the site.
  - Five shallow boreholes (named BH03 to BH07) to 3.0m depth using an excavator with auger attachment located within the plant area;
  - Four shallow boreholes (named BH08 to BH11) to 1.5m depth using an excavator with auger attachment located along the proposed southern pipeline area within the greenfield area west of the proposed plant area. This pipelines alignment is no longer being considered;
  - Standard Penetration Testing (SPT) at regular intervals within the deep boreholes BH01 and BH02.
  - Dynamic Cone Penetrometer Tests (DCPTs) adjacent to the shallow boreholes (BH03 to BH10);
  - Logging and sampling of the materials encountered by a geotechnical engineer;
- Laboratory testing of subgrade material including:
  - Two Atterberg Limits test with linear shrinkage (Four Point – AS 1289.3.1.1, 3.2.1, 3.3.1, 3.4.1) where cohesive soils were encountered to assess the plasticity of the near surface soils; and
  - Field Screen testing for acid sulfate soils;
  - Laboratory testing to assess the potential aggressivity of the underlying soils.
  - California Bearing Ratio testing of the near surface subgrade materials to facilitate the design of pavements within plant area.

- Provision of report providing the findings of the assessment and recommendations in accordance with the objectives outlined above.

The 2025 scope of work undertaken was in general accordance with the above.

Additional subsurface investigation were undertaken in 2026, along the new proposed pipeline alignment adjacent to Bolong Road. This is here after referred to as the northern pipe line corridor. This investigation included the following:

- A subsurface investigation comprising:
  - Clearance of services within the proposed test locations;
  - Non destructive testing to ensure the test locations were clear of services,
  - Eight test pits (named TP01 to TP08), to depths of 1.5m using a 1.8t excavator with auger attachment.
  - Dynamic Cone Penetrometer Tests (DCPTs) adjacent to the test pits;
  - Logging and sampling of the materials encountered by a geotechnical engineer;
- Laboratory testing of subgrade material including:
  - Field Screen testing for acid sulfate soils;
  - Laboratory testing to assess the potential aggressivity of the underlying soils including potential for salinity.
  - California Bearing Ratio testing of the near surface subgrade materials to facilitate the design of pavements within the pipeline area.

3. Desk Study Findings

3.1. Site details

The Site is to the east of the current Shoalhaven Paper Mill operational area of Manildra Group located at No 340 Bolong Road, Bomaderry. The location of the main plant area is shown in Figure 1. The site is bounded by Bolong Road to the north and vacant land adjacent the Shoalhaven River to the south. The site is bounded by industrial land use to the east (Manildra Group's Shoalhaven Paper Mill) and farmland to the west not in current active use. To the south of the farmland, is an operational railway owned and operated by Manildra Group which links the Paper Mill site to the Starches and Ethanol operation areas of the Manildra Group to the west. The proposed pipeline was to be located in farmland, north of the railway corridor, but has now been relocated to along Bolong Road. The site has a surface level of about RL3-4m AHD.

3.2. Geology

Reference to the Soil Landscape Mapping, Shoalhaven code 9017sf accessed using eSpade, indicates the site is underlain by alluvium comprising gravel, sand, silt and clay derived mainly from sandstone and shale overlying buried estuarine deposits. Dominant soils materials include a hard setting brownish black topsoil, brown sandy clay loam, dull yellow brown massive sandy clay, dull red brown medium clay, with pH in the 4.5 to 5.0 range.

Reference to the online geological mapping Minview (an excerpt is shown on Figure 1) indicates the site is underlain by "Alluvial Levee/Overbank Deposits" comprising fluvially deposited fine- to medium-grained lithic to quartz-rich sand, silt, clay.

Based on observations made of the site, surrounding topography, and proximity of the nearby Shoalhaven River, groundwater is expected to be located at a depth of about 3m to 4m and will flow to the south towards the river.

3.3. Historical Aerial Photography

Historical aerial photography of the site has been reviewed and presented in Figure 2.

The 1970 imagery shows the site as undeveloped but in agricultural use, likely a mixture of cropping and grazing. To the east of the site is the Shoalhaven Paper Mill and to the south is the Shoalhaven River. Most of the surrounding land is in use for agriculture with several residences along the banks of the Shoalhaven River.

Throughout the 1980s and 1990s, several additions were made to the paper mill, including new sheds to the south of the site. Localised filing may have occurred on the site as part of these works.

By the early 2000s, trees had grown around most of the site boundaries. The 2002 imagery also showed a series of ponds to the north of the site. The site has remained relatively unchanged to present day, other than a small recreational vehicle track to the southeast. The site's surface appears tilled in the 2025 imagery. In the surrounding area, industrial developments to the south of Bolong Road have continued to spread eastward.

3.4. Acid Sulfate Soil

Acid Sulfate Soils (ASS) is naturally occurring soil and sediment containing iron sulfides which when exposed to oxygen can generate sulfuric acid.

Reference to SEED mapping data, indicates that the main plant site is located in an area with a low probability of ASS occurrence. The area is mapped as ASS risk L2, which is described as elevated alluvial plains and levees. If present, ASS is considered to be at depths between 1 and 3m below the ground surface, with the site having surface elevations between 2 and 4m. Therefore ASS is expected at RLs below 1.0m to -1m AHD.

The SEED map shows areas immediately to the south of the site adjacent the river and along most of the proposed pipeline corridor, as mapped as ASS risk AL4. AL4 indicates a low risk of ASS being present and is described as elevated alluvial plains and levees with ASS if present at depths greater than 3m, with corridor having surface elevations >4m. Therefore ASS along the pipeline corridor is expected at RLs below 1.0m AHD.

3.5. Review of nearby investigations

Terra has undertaken investigation for a site located west of the proposed main plant site. This included boreholes drilled to depths of at least 15m. Regular in situ testing and disturbed sampling was undertaken within the boreholes. One borehole was extended to TC bit refusal on weathered material (rock) at a depth of 38.6m.

Standard penetration testing was undertaken in the boreholes. Samples were taken to allow laboratory testing to assess geotechnical and environmental behaviours.

In situ dynamic cone penetrometer testing was also undertaken to shallow depths. The DCP testing on this sites indicates the following:

- Higher DCP resistance was encountered in the near surface soils to about 1.0m depth. This is typical for fill soils which has compacted and/or near surface drying of soils.
- Below 1.0m depth the DCP results were in the soft to stiff range, and generally increased thereafter to stiff or better.
- Some soft bands were encountered to depths of about 2.0m.
- There were variances in DCP testing undertaken in 2018 and in 2014. This was attributed to the differences in climatic conditions and in situ moisture regime at the time of testing.

The results of Standard Penetration Testing (SPT) were assessed. This testing indicated the following:

- The clay soils were in the firm to stiff range to depths of about 4.5m; underlain by
- Very Stiff clays (N*>15) to depths of 15.0m; underlain by
- Stiff clays(M*>12) to the target depth of 20m.

The investigation did encounter saturated soils associated with a groundwater table. Groundwater was encountered at depths of 4.0m to 4.5m. Soils recovered in the SPT were typically in a moist condition above the plastic limit.

The results of laboratory testing indicate the near surface fill soils underlying the site are of low plasticity. This is due to a high component of fine sand within the sandy clayey fill soils. The sandy clayey fill has maximum dry density of about 1.8t/m^3 and CBR of 10%. A slight swell (1.0%) was also detected during CBR testing.

Samples taken from deeper depths, 1.6m and 12.0m indicated the clays had very similar Atterberg Limits and were of intermediate or medium plasticity (CI). Field moisture contents at these depths indicated the soils were wet of the plastic limit.

Soil aggressivity testing indicated the soils were typically slightly acidic, with field pH in the range of 6.4 to 7.0.

Acid Sulfate soil testing was undertaken on the site. The field screening results for this site located to the west, indicate the following:

- Actual acid sulfate soils are unlikely to be present on the western site as the pH was generally above 8.0.
- The field screens were indicative of low potential for PASS to be present on the western site with the pHfox values ranging between 4.3 and 8.9.
- Reaction ratings were variable, but typically moderate within the natural clayey soils.
- The drop between pH and pHfox was greater than 1.0 in all samples except BH01 S1 (0.0-0.5m).

Based on the above, the results were deemed inconclusive. No further testing was deemed necessary for this site to the west, as the soils encountered were primarily alkaline, and unlikely to cause ASS generation based on the expected depth of excavation for the proposed works.

A summary of the geotechnical and soil aggressivity laboratory test results is provided with the results of testing undertaken for the plant and pipeline corridor investigation in the following sections where relevant.

4. Site Investigation Findings

4.1. Site Observations

Observations of the site were made at the time of the site inspection. Photographs taken of the general site conditions are provided in Appendix B. Observations of each part of the site have been summarised in Table 4-1.

Table 4-1: Summary of site observations

Area	Observations
Gas plant area	• The area is near level and grassed. Trees grow along most of the site boundaries. • Near the northern part of the site, there was a grassed stockpile.
Underbore	• The pavement of Bolong Road appeared to be in fair condition. • In the proposed underbore location, Bolong Road is a single carriageway road. At the approximate underbore location, a third lane has been added to permit turning into the former paper mill. • Ponded water was observed to the north of Bolong Road and the near-surface soils were waterlogged. • On the neighbouring property north of Bologn Road, there were several young pine trees growing.
Northern Pipeline corridor 2026 Investigation	• The proposed pipeline corridor is situated along the northern boundaries of former rural residential properties and south of Bolong Road. • The alignment is near level, with slight undulations. • Some areas along the alignment were saturated on the surface at the time of the investigation. • Towards the existing Supagas property to the west, the area is slightly elevated from filling activities.

In addition to the above, the site images in appendix B also show the site conditions along the former southern pipeline corridor which is no longer being considered.

4.2. Subsurface findings – Plant and Underbore area

The locations of the boreholes and CPT test locations are shown on Figure 4. The findings of these investigations are summarised in the following sections.

4.2.1. Subsurface observations in boreholes

Engineering logs of the materials encountered are provided in Appendix C and summarised in Table 4.3 on page 6. The following was undertaken:

- Boreholes BH01, BH03 to BH07 were undertaken with an excavator with an auger attachment typically to depths of 3.0m, borehole BH01 was undertaken to 8.0m depth. Borehole BH01 was originally to be undertaken with a drill rig, however, due to overhead powerlines could not be undertaken.
- Borehole BH02 was undertaken with an all terrain drill rig to 27m depth. Standard Penetration Testing (SPT) testing was undertaken at regular intervals.

4.2.2. Subsurface Observation in CPT tests

The CPT test results are provided in appendix D along with summaries of the graphs and material assessments. The testing shows a layered profile of cohesive from Silty CLAYs to sandy CLAYs and Sandy SILTS, and non cohesive soils from Silty SANDS to SANDS.

The transition from one layer to the next will generally not be registered at the cone tip as a sharp change, with the cone likely to detect a change in material type before the cone enters the different soil layer but still register the overlying soil mass as it penetrates the next layer. Correcting results for layer thickness can help reduce this incorrect classification. Similarly, friction along the sleeve is generally measured over 100 to 150mm and will tend to smooth out any effects of thin layers. So, care needs to be taken in reviewing CPT logs in relation to determine material types.

The CPT should be able to detect soft thin clay layers between 75 and 100mm within a thicker soil mass, but stiff clayey layers generally need to be round 750mm thick to be detected. Thin sand layers in soft clays can also often be incorrectly classified as silty sands based on CPT results.

A review of the pore pressures encountered within the CPTS is summarised in the following table:

Table 4-2: Summary of Pore pressure observations in CPTS

Pore pressure characteristics	Test location, depth of porepressure measurements, m			
	CPT1	CPT2	CPT3	CPT4
Generally positive readings deemed to be associated with soft to medium stiff cohesive soils	0-16	0-13.0	0-16 17-19.5	0-10
Low negative to low positives generally associated with stiff (likely over consolidated clay soils) or dense to very dense fine silty sands	16-30	18.3-18.33*	16-17, 19.5-22 29-30.8	10-18
High positives likely to be associated with contractive Sandy silts	30-43.1	13-18.3	22-29	18-21.2

The pore water pressures were used in conjunction with the tip and sleeve resistance and the visual findings in the boreholes, to assess the likely nature of the soils underlying the site. The interpreted subsoil profile is summarised in Table 4.3 on page 6. A review of Over consolidation ratio (Robertson 2009) where $OCR=0.25Q_t^{1.25}$ and relationship between the pore pressure ratio Bq and the normalised Cone tip resistance was also undertaken. These graphs are plotted on Figure 5.

The assessment found that at around 16 m depth, there are sandy bands across the site. These generally persists to around 21m depth and are loose to medium dense.

Below about 22m depth, the CPTS indicate that the soils could be a sand, silty sand or sandy silt. However, the CPTs plots were not consistent with the sampling in borehole BH01 which detected some cohesive soils below around 21m depth. The porewater pressures also within the sandy silts were reported as high and more indicative of a cohesive soil then a clean sand. The over consolidation ratio (OCR) within these silts was also about or just less than 1 and the CPT tip cone resistant (if the soils are cohesive), would indicate they are stiff. Consequently, the materials below about 23m in CPT1 have been conservatively assessed as cohesive and more likely a silt with fine sands rather than a clean sand. Sand bands are however present within these silts. Below 30m depth there is again a notable increase in porewater pressure during testing which is more indicative of a sensitive contracting silt.

Table 4-3: Summary of subsurface investigation – plant site

Subsurface conditions *(Soil name, plasticity or particle characteristics, colour, secondary components and minor components)*	Origin	Consistency /Density	Depth encountered in test pit/exposure (m)													
			West BH02	West BH201	West BH204	BH01	BH02	BH03	BH04	BH05	BH06	BH07	CPT1	CPT2	CPT3	CPT4
Organic Silty CLAY (Site), Sandy CLAY to Silty CLAY: low to medium plasticity, brown, dark brown to black, fine to medium grained sand	Topsoil / Fill	Very Soft to Soft	0.0-0.4	0.0-0.4	0.0-0.8	0.0-1.7	0.0-0.3	0.0-0.3	0.0-0.2	0.0-0.2	0.0-0.4	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3	0.0-0.3
Sandy CLAY, Clayey SILT, Sandy Silty CLAY Clayey SAND, Silty SAND and SAND	Fill	Firm to Stiff, medium dense	0.4-4.5	0.4-0.8	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
SLAG FILL – SAND/GRAVEL: fine angular gravel, black coarse sand		Loose	NE	NE	NE	NE	NE	0.3-0.6	0.2-0.5	NE	NE	NE	NE	NE	0.3-0.5	NE
Sandy CLAY to Sandy Silt and Silty CLAY to Clayey SILT: low to medium plasticity fines, brown, dark grey with orange mottling,	Alluvium	Soft to firm	NE	0.8-2.2	NE	NE	0.3-1.5	0.6-1.0	0.5-1.5	0.2-1.2	0.4-1.2	0.3-1.0	0.3-2.5	0.3-2.0	0.5-2.0	0.3-3.0
Sandy SILT/ Silty Sand to Clayey SILT:		Firm	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	2.5-5.0	2.0-3.5	NE	3.0-6.0
Sandy CLAY, Sandy Silty CLAY, Silty CLAY and CLAYs: medium to high plasticity, red, orange and grey mottled, pale brown, pale grey some yellow/orange mottling, fine to medium grained sand		Firm to Stiff	NE	2.2-5.5	0.8-5.5	1.7-3.0	1.5-4.5	1.0-3.0*	1.5-3.0*	1.2-3.0*	1.2-3.0*	1.0-3.0*	5.0-9.5	3.5-13.0	2.0-8.0	NE
		Stiff to Very Stiff	4.5-16.5	5.5-15.0	5.5-16.0	3.0-8.0*	4.5-10.0						NE	NE	8-16.0	6.0-18.0-
Silty SAND to Sandy SILT, cohesive		Firm to Stiff	NE	NE	NE		NE						9.5-12.5	13.0-15.0		
Sandy CLAY, Sandy Silty CLAY, Silty CLAY to Clayey SILT: Variable plasticity, pale brown to pale grey with some yellow/orange mottling, fine to medium grained sand with sandier bands throughout		Stiff to Very Stiff	16.5-37.8	15.0-20.0*	16.0-17.5*		10.0-16.0 17.5-21.0						12.5-16.0	NE	NE	NE
Predominantly Silty SAND, Clayey Silty SAND, and SAND with occasional silts and/or clay bands, fine to medium sand, low to medium plasticity	Marine Sediments	Loose to Medium Dense	NE	NE			16.0-17.0						16.0-23.0 25.0-27.0 28.5-29.50	15.0-18.1*	16.0-17.5 20.0-25.0 29.0-30.1*	18.0-21.1*
Predominantly Silty SAND to Sandy Silt with occasional Silty CLAY to clayey SILT bands, fine sands, low to medium plasticity fines		Stiff	NE	NE			21.5-26.95						23.0-25.0 27.0-28.5 29.5-43.1		17.5-20.0 25.0-29	
SANDSTONE: grey, low to medium strength, hard.	XW Rock	Hard	37.8r	37.8r									**43.1***			

Notes * - End of hole at target depth; ^{r} – TC bit refusal on rock, VR- Virtual refusal, NE – not encountered

4.2.3. Review of in situ tests results

The SPT test results for this site were added to those for the site to the west and have been plotted on Figure 6.

These show the following:

- The clay soils are in the firm to stiff range from a depth of around 1.5 to about 4.5m;
- The clay soils between 4.5 to depths of about 9.0m are generally very stiff (N*>15);
- The clay soils between 9 and 24m depth are generally slightly lower in strength, being stiff to very stiff. It is noted that several SPT result at depth were affected by fall in, resulting in an initial seating blow count of '0'. These were at 13.0m, and 20.5m depth. The subsequent blow counts to 0.45m depth were recorded. One very low result at 24m depth was likely caused by fall in during the drilling and prior to the testing.
- The SPT testing encountered sandier layers to which were generally assessed as loose to medium dense.

The SPT results generally correlated with the CPT Cone tip resistance, which showed the clay soils being firm to stiff to around 3 to 5m depth and then very stiff to stiff thereafter. A slight reduction in strength to the firm to stiff range, was observed in the CPT cone tip resistance results at around 10 to 15m depth. Below this the alluvium is underlain by marine sediments which are comprised of sands, and silty sands which are initially loose to medium dense but become very loose to loose and more silty with depth. There is a notable increase in pore pressure measurements with the silty sands below around 25m depth.

4.2.4. Subsurface observations in DCP test locations

The DCP testing indicates the following:

- The near surface soils were typically soft to firm to depths of 1.0m and firm to stiff thereafter.

4.2.5. Groundwater Conditions

The elevation of the test locations varied from 2.5m to 3.1m within the proposed plant, increasing to 4.5m along the proposed pipeline alignment. Groundwater was not readily observed within the boreholes due to the clayey nature of the subsurface soils. Increases in moisture conditions were observed around 2.5m depth within the plant area corresponding to sea level. Some boreholes encountered perched groundwater seepage around 1.5m depth and at the time of the investigation.

4.3. Subsurface conditions along Southern pipeline corridor

The locations of the boreholes and DCP test locations along the southern pipeline corridor are shown on Figure 4. The subsurface conditions encountered can be summarised as follows:

Table 4-4: Summary of subsurface investigation – pipeline corridor northern section

Subsurface conditions *(Soil name, plasticity or particle characteristics, colour, secondary components and minor components)*	Origin	Consistency /Density	Depth encountered in test pit/exposure (m)			
			BH08	BH09	BH10	BH011
Organic Silty CLAY: low plasticity, dark brown to black	Topsoil	Soft	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Silty CLAY, Sandy Silty CLAY: medium plasticity, brown with yellow tinge/mottling grading to brown with red/orange mottles, to red and light grey mottled	Alluvial Soil	Soft to Firm becoming stiff below 1.0m, very stiff below 1.5m	0.5-3.0	0.5-3.0	0.5-3.0	0.5-3.0

Notes * - End of hole at target depth; ^{r} – TC bit refusal on rock, VR- Virtual refusal, NE – not encountered

4.4. Subsurface conditions along Northern pipeline corridor 2026 Investigation

The locations of the boreholes and DCP test locations along the pipeline corridor are shown on Figure 4. The subsurface conditions encountered can be summarised as follows:

Table 4-5: Summary of subsurface investigation – pipeline corridor northern section

Subsurface conditions *(Soil name, plasticity or particle characteristics, colour, secondary components and minor components)*	Origin	Consistency /Density	Depth encountered in test pit/exposure (m)							
			TP01	TP02	TP03	TP04	TP05	TP06	TP07	TP08
Organic Silty CLAY, organic Clayey SILT: low to medium plasticity, dark brown	Topsoil	Very Soft	0.0-0.3	0.0-0.4	0.0-0.4	0.0-0.4	0.0-0.25	0.0-0.3	0.0-0.25	0.0-0.2
Sandy Silty CLAY: medium plasticity, dark brown, grey and orange mottled, with fine to medium grey angular gravel, trace fine organics and rootlets, trace angular cobbles (up to 150mm)	Fill	Stiff to Very Stiff	NE	NE	NE	NE	NE	NE	0.25-0.8*	0.2-0.8
Sandy Silty CLAY: low to medium plasticity, brown with dull orange and dark grey mottling, fine to medium sand Sandy Clayey SILT band at base in parts	Alluvial Soil	Soft to Firm Stiff below 1.0m	0.3-1.2	0.4-0.9	0.4-1.3	0.4-1.2	0.25-1.3	0.3-0.8		0.8-1.2*
Silty CLAY: medium to high plasticity, light grey, orange and red mottled, with fine sand		Stiff	1.2-1.5*	0.9-1.4*	1.3-1.5*	1.2-1.5*	1.3-1.5	0.8-1.5*		

Notes * - End of hole at target depth; ^{r} – TC bit refusal on rock, VR- Virtual refusal, NE – not encountered

4.5. Summary of Geotechnical Laboratory test Results

The laboratory test certificates are provided in Appendix E and summarised in Table 4.6. The results of laboratory testing indicate the near surface fill soils underlying the site are of low plasticity. This is due to a high component of fine sand within the sandy clayey fill soils. The sandy clayey fill has maximum dry density of about 1.8t/m^3 and CBR of 8 to 10%. A slight swell (0.5 to 1.0%) was also detected during CBR testing. It should be noted that this CBR was undertaken on a sample compacted to 98% of the maximum dry density and soaked for 4 days. The in situ DCP results can be used to correlate to insitu CBR values for soil which have not been compacted.

The natural alluvial soils varied from Sandy Silty CLAY and Silty CLAY with maximum dry densities of 1.56 to 1.79tm^3 and CBRs of 3.0 to 6.0%. CBR swells were slight (0.5 to 1.0%).

Samples taken from deeper depths, 1.6m and 12.0m indicated the clays had very similar Atterberg Limits and were of intermediate or medium plasticity (CI). Field moisture contents at these depths indicated the soils were wet of the plastic limit.

4.6. Summary of Laboratory testing – Soil Aggressivity

Soil Aggressivity testing was undertaken by a NATA-accredited laboratory. Laboratory certificates are attached in Appendix F. These results are summarised in Table 4-6.

The aggressivity test results indicate the soils on site are slightly acidic, with field pH in the range of 5.1 to 6.7. A similar range was reported for the nearby site to the west.

4.7. Summary of Laboratory testing – Acid Sulfate Soils

Acid sulfate soils (ASS) are grouped into two types:

- **Actual (Active) Acid Sulfate Soils (AASS)** where the soils are oxidising, and acid is already being produced. These soils are typically identified because the pH of the soil when mixed with water is low (e.g. pHf < 4);
- **Potential (Passive) Acid Sulfate Soils (PASS)** where there is the potential for acid to be generated but the soil is not yet exposed to oxidizing conditions. In this case, a low pH is produced when the soil is mixed with an oxidizing solution resulting in a low pH (e.g. pH_{fox} < 3). Other indicators of PASS soils are a notable reaction when the oxidizing solution is applied and a pH_{fox} is at least one unit lower than pH_f.

Several boreholes were sampled and tested to determine if ASS was present in the soils underlying the site. Samples were collected at 0.5m to 1.5m intervals down to a total depth of 8.5m. This sampling was done in general accordance with the NSW EPA and QASSIT guidelines for ASS sampling, whilst also considering the small scale of the proposed development and the proposed works.

All samples were screened using the ASS Field Screening Procedure outlined in the ASSMAC (1998) Acid Sulfate Soils Manual. A summary of the results of acid sulfate soils field screening tests undertaken is summarised in Table 4-7 and provided in Appendix E. The field screening results indicate the following:

- Actual acid sulfate soils are unlikely to be present on the site as the pH was generally greater than or equal to 5.0.
- The field screens were inconclusive regarding PASS potential on the site with the pH_{fox} values ranging between 3.6 and 5.9. A high risk of ASS is generally associated with a pH_{fox} of less than 3.
- Lower pH_{fox} values <4 was typically encountered in the topsoils. This acidity is associated with organic/humic material rather than PASS.
- Reaction ratings were highly variable, with higher values in the topsoil due to humic/organic based reactions. Reactions were moderate or greater in the underbore location, typically slight to moderate within the gas plant area and strong in the proposed pipeline area, particularly in BH09.
- The drop between pH and pH_{fox} was greater than 1.0 in all samples except BH02 S1 (1.0m), BH02 S2 (2.5m), BH02 S4 (5.5m) and BH06 S3 (1.0-1.5m).

Based on the above, the site is not underlain by AASS. Some PASS may be present at depth but these soils are unlikely to be disturbed by the proposed works. Consequently, no further testing was deemed necessary.

Table 4-6: Summary of laboratory testing results

Sample	Depth (m)	Material	FMC (%)	OMC (%)	MDD (t/m³)	Swell (%)	CBR	LL (%)	PL (%)	PI	LS (%)	pH	Electrical conductivity (µS/cm)	Resistivity at 25°C (ohm cm)	Soluble sulphate (mg/kg)	Chloride (mg/kg)
2025 Investigation																
BH03 A2	1.5-2.5	Si CLAY (CI)	19.8					40	15	25	11.0					
BH04 B1	0.5-1.0	Si CLAY (CL-CI)	28.0	22.0	1.59	1.0	4.5									
BH04 S1	2.0-3.0	Sa Si CLAY (CI)										5.7	15	66,000	27	<10
BH05 S1	0.5-1.0	Si CLAY (CL-CI)										6.7	<10	370,000	11	<10
BH05 S2	1.2-1.6	Si CLAY (CI)	25.6					41	15	26	11.0					
BH06 B1	0.5-1.0	Si CLAY (CL-CI)	27.6	21.0	1.63	1.0	5.0	33	22	11	6.0					
2026 Investigation																
TP02 B1	0.4-0.9	Si CLAY (CL-CI)	16.0	16.0	1.79	1.0	6.0									
TP03 S3	1.3-1.5	Si CLAY (CI-CH)										5.3	120	8,500	54	110
TP06 S2	0.3-1.0	Sa Si CLAY (CI)										6.7	31	32,000	14	30
TP06 B1	0.8-1.3	Si CLAY (CI-CH)	26.2	25.0	1.56	0.5	3.0									
TP07 B1	0.5-0.8	Sa Si CLAY fill	12.7	15.0	1.80	0.5	8.0					6.6	15	65,000	15	<10
Nearby Site to the west																
BH03	4.0-4.5	Sandy CLAY	21.5									7.0	445	2,250	380	410
BH03	6.0-6.5	Sandy Clay	21.1									6.9	576	1,740	290	920
TP01 -B1	0.2-0.5	Sandy CLAY						28	17	11	4.0					
TP01 -B1	0.2-0.5	Sandy Clay fill		14.0	1.80	1.0	10									
BH201 SPT5	12.0-12.45	Silty CLAY	21.5					35	15	21	7.0					
BH201 SPT4	10.0-10.45	Silty CLAY	21.0									6.4	60	17,000	<10	12
BH203 S2	1.6-2.3	Silty CLAY	19.0					37	15	22	7.5					
BH204 SPT4	5.5-5.95	Silty CLAY	17.0									6.6	160	6,300	52	150

Table 4-7: Laboratory results summary for potential acid sulfate soils

Borehole Number	Sample Depth (m)	$pH_{(f)}$	$pH_{(fox)}$[C]	Reaction[A] (X slight, XX Moderate, XXX strong, to XXXX extreme)	ΔpH[C] $pH_{(f)} - pH_{(Fox)}$	AASS indicator ($pH_f < 4$)[B]	PASS indicators pHfox[D] (<3)	PASS indicators ΔpH[C] (>1)	PASS indicators Strong or very strong reaction[A]	Potential for ASS[E]
BH01	1.5	6.1	4.7	XX	1.4	✗	✗	✓	✓	LOW
	3.0	6.7	5.1	XXXX	1.6	✗	✗	✓	✗	LOW
	4.0	6.3	5.0	XXX	1.3	✗	✗	✓	✗	LOW
	5.5	6.2	4.9	XXX	1.3	✗	✗	✓	✗	LOW
	6.5	5.8	4.6	XX	1.2	✗	✗	✓	✓	LOW
	7.5	6.1	4.8	XX	1.3	✗	✗	✓	✓	LOW
BH02	1.0	5.6	4.8	XX	0.8	✗	✗	✗	✓	LOW
	2.5	5.3	4.5	XXXX	0.8	✗	✗	✗	✗	LOW
	4.0	5.6	**3.9**	XX	1.7	✗	✗	✓	✓	MODERATE
	5.5	5.3	4.4	XX	0.9	✗	✗	✗	✓	LOW
	7.0	5.1	4.0	XX	1.1	✗	✗	✓	✓	LOW
	8.5	5.0	**3.9**	XX	1.1	✗	✗	✓	✓	MODERATE
BH03	0.0-0.5	5.9	**3.8**	X	2.1	✗	✗	✓	✓	LOW (Humic)
	0.5-1.0	5.9	4.5	X	1.4	✗	✗	✓	✓	LOW
	1.0-1.5	5.6	4.6	X	1.0	✗	✗	✗	✓	LOW
BH04	2.0-3.0	5.6	4.4	X	1.2	✗	✗	✓	✓	LOW
BH05	0.5-1.0	6.4	4.8	X	1.6	✗	✗	✓	✓	LOW
BH06	0.0-0.5	6.7	4.3	XX	2.4	✗	✗	✓	✓	LOW
	0.5-1.0	6.6	4.6	XX	2.0	✗	✗	✓	✓	LOW
	1.0-1.5	5.8	5.0	X	0.8	✗	✗	✗	✓	LOW
BH08	0.0-0.5	6.2	**3.6**	XXX	2.6	✗	✗	✓	✗	LOW (Humic)
	0.5-1.0	6.8	5.2	X	1.6	✗	✗	✓	✓	LOW
	1.0-1.5	6.6	5.3	X	1.3	✗	✗	✓	✓	LOW
BH09	0.0-0.5	6.6	4.3	XXX	2.3	✗	✗	✓	✗	LOW
	0.5-1.0	7.1	5.4	XXX	1.7	✗	✗	✓	✗	LOW
	1.0-1.5	6.2	5.1	XXX	1.1	✗	✗	✓	✗	LOW
BH10	0.0-0.5	7.1	4.3	XXX	2.8	✗	✗	✓	✗	LOW
	0.5-1.0	7.4	5.4	XXX	2.0	✗	✗	✓	✗	LOW
	1.0-1.5	7.1	5.9	X	1.2	✗	✗	✓	✓	LOW
BH11	0.0-0.5	6.6	4.3	XXX	2.3	✗	✗	✓	✗	LOW
	0.5-1.0	6.7	4.9	X	1.8	✗	✗	✓	✓	LOW
	1.0-1.5	5.9	4.9	X	1.0	✗	✗	✗	✓	LOW
TP01	0.0-0.3	6.5	3.5	XXX	3.0	✗	✗	✓	✓	LOW (Humic)
	0.3-0.9	6.7	4.2	XX	2.5	✗	✗	✓	✗	LOW
	0.9-1.5	5.9	4.5	X	1.4	✗	✗	✓	✗	LOW
TP03	0.0-0.4	6.0	3.1	XXXX	2.9	✗	✗	✓	✓	LOW (Humic)
	0.4-1.3	6.5	5.1	X	1.4	✗	✗	✓	✗	LOW
	1.3-1.5	5.3	4.4	X	0.9	✗	✗	✗	✗	LOW
TP06	0.0-0.3	6.3	3.5	XXX	2.8	✗	✗	✓	✓	LOW (Humic)
	0.3-1.0	6.7	4.9	XX	1.8	✗	✗	✓	✗	LOW
	1.0-1.5	5.1	4.4	X	0.7	✗	✗	✗	✗	LOW

Notes to table:

A) This indicator is not used on its own as soils with high organic content can contain humic acid or manganese oxides which also produce a reaction;
B) where the pH(f) values is lower than 4, this is typically indicative of AASS being present on a site
C) As the ΔpH increases, there is an increased probability that PASS is present.
D) The lower the pH_{fox} the greater the potential for PASS to be present. Where $pH_{fox} < 3$ and there is a strong reaction and high ΔpH, there is a high probability that PASS is present. Where the $pH_{fox} < 4$ the result is less positive and further laboratory testing is required to determine the source of acid generation. Where $pH_{fox} < 5$ the test is inconclusive, sulphides may be present either in small quantities or may be poorly reactive under quick field test conditions or the sample may contain carbonate which neutralises some or all acid production by oxidation. Equally the low value may be due to weak organic acids and there may be no sulphides present. Further testing to identify the cause of acid generation is recommended.
E) Samples which meet all the QASSIT indicators for PASS are assigned a high potential. Samples which meet some of the indicators for PASS are assigned a moderate potential. Samples which show an inconclusive result are assigned a low potential. It is noted that it is possible for some 'non-ASS soils' to generate acid and have all or some of the indicators of ASS. Further testing is required to assess the nature of acid generation.

5. Engineering Assessment for Plant area

5.1. Geotechnical Site Model

The main plant site is expected to be underlain by the following materials:

- Recent Alluvium: Comprised of topsoil and alluvium generally sandy CLAY, silty CLAY, and sandy silty CLAY with fines of low plasticity, brown, to grey with some orange mottling, soft to firm to depths between 2.5 to 3.0m depth, then becoming firm to stiff. Generally, present to around 4 to 5.5m depth. Underlain by
- Older Alluvium soils: comprised of stiff to very stiff mixtures of Sandy CLAYS, Sandy Silty CLAYS, Silty CLAYS to Clayey SILTS: of variable plasticity, pale brown to pale grey with some yellow/orange mottling, fine to medium grained sand with sandier bands throughout, very stiff between 5.5 to 20m and then generally stiff. Present to depths of around 16m; underlain by
- Marine Deposits: generally comprised of silty SANDS, clayey SANDS and SANDS, of loose to medium density initially, which then grade into Silty SAND of very loose to loose density generally at around 25m depth, interbedded with some sandy SILTS to Sandy Clays; underlain by.
- Weathered sandstone rock at depths generally below 40m. It is expected that the sandstone will be of low to medium strength, increase to high strength with depth.

Design parameters for these materials are provided in Table 5.1 following on Page 6.

5.2. Geotechnical Considerations of the site

Based on the field observations and laboratory results, Terra considers there to be a very low risk of acid sulfate soils being present on the Site. Rock is at depths below 40m and is unlikely to be a cost-effective foundation stratum. Terra observed strength inversions at around 10m depth and at around 25m depth. Between 5.5 and 10 m depth, the clayey soils are recovered with very stiff consistency. Below 10 m depth the clayey soils are of stiff consistency. Below around 16m depth, the site is underlain by loose to medium dense silty sands that are underlain generally below 25m by very loose to loose silty sands at depths. These inversions will need to be considered in pile design.

5.3. Footings Engineering recommendations

As the depth to rock is greater than 40m, it is expected that footings for the heavier loaded structures will comprise piles founded into one of the following:

- the very stiff residual soils at depths of at least 5.5m and not greater than 8m respectively below current ground surface levels. The bearing in this layer will need to account for the strength inversion below 10m depth into a less stiffer clay soil; or
- Around 16m to 17m depth into the loose to medium dense sands. The bearing in the sands to silty sands will also need to consider a strength inversion at depths below about 22m.

Generally, the ultimate end bearing (Queb) can be based on the CPT cone tip resistance for 1.5D above and below the base of the pile. The ultimate bearing is usually derived as follows:

- Displacement piles Queb = $0.55Qt_{ave}$. in clays and = $0.5Qt_{ave}$ in sands; and
- Non-displacement piles Queb = $0.4Qt_{ave}$. in clays and = $0.15Qt_{ave}$ in sands.

However, it should be noted that this bearing will need to be reduced to consider the layered profile and strength inversions. A lower weaker laker will generally influence a stronger upper layer, if it is present within a depth of 10D of the base of a pile (where D is the pile diameter). However, on this site, a 10D clearance is not likely to be achieved. Consequently, reduced bearing have been recommended for piles at depths of 5.5 to 8m in the very stiff clays and at 16m to 17m depth in the loose to medium dense sands. Table 5.2 on page 7 provides footing design parameters for the materials encountered on the site.

Table 5-1: Material Behaviour Parameters

Material	Likely Strata Depth (m BGSL)	Undrained Shear Strength (kPa)	Youngs Modulus Esv' (MPa)	Shear Modulus G (MPa)	Effective Friction Angle (deg)	Cohesion (kPa)	Bulk Unit Weight (kN/m^3)	Poisson's ratio
Fill/Alluvial – locally soft to 2.0, firm thereafter	0.0 to 3.0	25-50[a]	3-4	2	25	1	18	0.40
Alluvial Firm to stiff	3.0 to 5.5	50-100	6-8	3	25	1	18	0.40
Alluvial Soil Very Stiff (OCR>2<5)	5.5 to 10	100 to 150	12-15	6 to 7.5	25	2-5	19	0.40
Alluvial Soil Stiff	10 to 16	50 to 100	8-10	3 to 4	25	1-2	18	0.40
Estuarine Sands and Silty Sands Loose to medium dense	16 to 25	NA	10-12	4-6	30-32	0	19	0.3
Estuarine silty sands to Sandy Silts, Stiff (OCR<=1)	22 to 43	100	8-10	3 to 4	25-28	0	18	0.3
Highly weathered sandstone	Generally Deeper than 43m	Not Applicable	20-40	10 to 20	28	100	22	0.3

Notes :

Table 5-2: Foundation Design Parameters

Material	Likely Strata Depth (m BGSL)	Allowable bearing capacity (kPa)	Ultimate End bearing (MPa)	Ultimate Shaft Adhesion (kPA)	Limiting Lateral Pressure, Pv (MPa
Fill/Alluvial – locally soft to 2.0, firm thereafter	0.0 to 3.0	20[a]	Ignore	Ignore	Refer Section 5.4
Alluvial Firm to stiff	3.0 to 5.5	50[a]	0.7	30	Refer Section 5.4
Alluvial Soil Very Stiff	5.5 to 8 8 to 10	NA	1.4[b] 1.0[b]	50	0.9
Alluvial Soil Stiff	10 to 16	NA	1.0	40	0.7
Estuarine Sands and Silty Sands Loose to medium dense	16 to 21 21 to 22 22 to 25	NA	2.0 increasing to 3 decreasing to 1.2[c]	Ignore	$0.8K_p^2$ + KoTan(δ) Where K_p is a function of the effective friction angle Ø' and δ is the a constant value related to the friction between the pile and soil. Generally δ is equal to 0.8Ø'
Estuarine silty sands to sandy Silt, stiff	22 to 43m	NA	1.0	Ignore	
Highly weathered sandstone	Generally Deeper than 43m	NA	5.0	150	2

Note :

a) *Light weight structures only - please refer to Section 5.3 of this report. These soft zones, where within building footprints, shall be removed and replaced, compacted in situ, or footings shall be located below these soft soils. The allowable bearing capacities recommended for light weight structures supported on footings within the uncontrolled fill materials have been significantly reduced to minimise the potential for increased total and differential settlement when structural loads are applied. These allowable bearing capacities are based on reducing potential settlements to less than 25mm for most cases. Dynamic cone penetrometer testing shall be undertaken in each footprint to confirm the soils are or of firm or better consistency.*

b) The base depth of the piers will need to consider the effects of the underlying stiff clay soil layer. The ultimate bearing capacity will reduce as the distance between the base of the pier and the underlying stiff clay soil layer reduces.

c) The base depth of the piers will need to consider the effects of the underlying stiff clay soil layer. The ultimate bearing capacity will reduce as the distance between the base of the pier and the underlying stiff clay soil layer reduces.

For the parameters in Table 5.2 following, we recommend a geotechnical strength reduction factor (ω_g) of 0.45 unless pile load testing is carried out to justify higher values. Settlements should be assessed to confirm serviceability conditions are met. If uplift loads are to be considered, we recommend that the ultimate shaft adhesion values be multiplied by 0.38. Piles subject to uplift should also be checked for the inverted cone pull out failure mechanism using an included angle (at the apex) of 60° for soil mass within the inverted cone.

The final pile depths could vary and will need to be confirmed on site for each pile, especially ig taken to below 16m depth, to take into account the depth of the sands. Deeper piles can be adopted but this will likely result in reduced end bearing capacity but greater length of pile along which shaft friction can be generated. The final embedment depths for piles will be dependent on the proposed pile dimensions, design loads and the total number of piles proposed to support the proposed structures. Pile design may involve grouped piles or a spread of closely spaced piles beneath the reinforced concrete raft slabs.

The borehole SPT and CPT testing generally indicates that bored and driven piles founded in the stiff residual soils at around 6 to 8m depth can be designed on a nominal ultimate end bearing pressure of 1.4MPa and ultimate skin friction of 40kPa adopted below 2.0m depth. Piles at around 20 m depth could be designed based on 3MPa but will need to target the upper part of the loose to medium dense sand layer encountered on the site. Shaft adhesion in the sands with be a function of effective stress and will generally be in the order of 3to 5Z (kPa) where Z is the pile depth.

We note that for bored piers, the ultimate end bearing provided is dependent on a clean base of hole. Inspection of high level or pier footings excavations should be undertaken to confirm the founding conditions and the base should be cleared of fall-in prior to the formation of the footing.

5.4. Lateral and allowable bearing capacity of shallow footings

It is understood that several light structures will be constructed on the site with applied bearing pressures of less than 50kPa. It is recommended that these structures are founded on the firm to stiff or better soils which underlie the site at around 2 to 3m depth. It is noted that some areas of soft soils were locally encountered between 0.5m and 2.0m depth. Consequently, for structures sensitive to settlement, the foundations may need to be taken to firmer materials below the near surface soft soils.

Proof rolling of building footprints should be undertaken to identify these soft spots for removal and replacement with controlled fill or for further compaction in situ. Alternatively, footings can be located in firm or better uncontrolled fill / alluvial soils at depths of about 2.0m. Consequently, we recommend adoption of short screw piles or similar for light weight low height structures founded at around 2m to 5m depth with an ultimate end bearing of 0.7MPa.

It is noted that any fill soils, if encountered on the site, are likely to have been placed in an uncontrolled manner, resulting in increased total and differential settlement when structural loads are applied. However, we note that minimal evidence of filling was observed on the site. A reduced bearing capacity is also recommended for light weight structures founded in uncontrolled fills to minimise the potential for increased total and differential settlement to typically less than 25mm and 1 in 200 respectively or that the filling is removed and controlled fill is replaced. The footprint for each structure should be tested by proof rolling and DCP testing to confirm the soils are of firm or better consistent to a depth of at least 2m.

Lateral capacity in the near surface soils will also be limited. It is recommended that lateral capacity for shallow footings is based on the design methods adopted for retaining wall foundations as follows:

- The at rest earth pressure developed on the face of the footing adopting a Ko of 0.55 and a unit weight of 16kN/m^3;
- The frictional resistance to sliding developed on the base of the footing adopting friction angle between the concrete footing and soil of 0.8Tanδ where Tanδ is 25 degrees in the near surface soils.

Additional lateral resistance can be provided by adoption of short piers or keys within the high-level footings.

5.5. Durability

Many factors can affect the corrosion potential of soil including soil moisture content, resistivity, permeability and pH, as well as chloride and sulfate concentration.

In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor. Based on classification developed by William J. Ellis (1978), the soils have resistivity in the range of greater than 20,000ohm-cm would be assessed as essentially non-corrosive. However, Terra notes that nearby sites had a greater range of resistivity which indicates near surface alluvial soils may be mildly to highly corrosive.

Chloride and sulfate ion concentrations and pH appear to play secondary roles in affecting corrosion potential. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried metallic improvements or reinforced concrete structures. Sulfate ions in the soil can lower the soil resistivity and can be highly aggressive to Portland Cement Concrete (PCC) by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. Soils containing high sulfate content could also cause corrosion of the reinforcing steel in concrete. The level of sulfates detected are less than 1000ppm and are therefore negligible. The pH of the soils is within the slightly acidic range but the pH is generally greater than 5.0.

Table 6.4.2(C) of the Australian Standard AS2159-2009 Piling – Design and installation defines the exposure conditions for the design of concrete piles based on the level of sulfates and pH of the soil. This indicates based on the laboratory results and the clayey nature of the soils on the site, an exposure classification of non-aggressive. For piles taken to the sands, this increase to Moderate.

Table 6.5.2(C) of the Australian Standard AS2159-2009 Piling – Design and installation defines the exposure conditions for the design of steel piles based on the level of chlorides, pH, and resistivity. This indicates based on the laboratory results, an exposure classification of non-aggressive. However, it is noted that on nearby sites the soil aggressivity testing indicates the potential for mild conditions to also be encountered. As the CPT test results indicate some of the soils area sandy, Terra recommends Mild conditions are adopted.

5.6. Seismic design parameter

In accordance with AS1170.4 the site is assessed as with a Class of C and a site factor of 1.25. A hazard design factor of 0.09 is recommended.

5.7. subgrade conditions for pavement design

The subgrade within the proposed pavement areas typically comprises Silty CLAY natural soils. The laboratory testing indicates moderate laboratory 4 day soaked CBR values of 4.5 to 5.0%.

In addition to laboratory CBR values, dynamic cone penetrometer testing was undertaken. The blow counts recorded during the DCP tests were converted to inferred CBR values by referencing Figure 5.3 in Austroads AGPT02 and are attached in Appendix G. The DCP test results indicate insitu CBRs in the 2 to 4 range. Weak bands as low a CBR 2 were encountered to depths of 0.6m to 1.0m below the ground surface, CBRs as low as 4 were encountered to 1.5m depth. Below 1.5m depth the insitu CBRs improved to the 5 to 8 range, generally increasing with depth.

Where the exposed subgrade is significantly moisture affected and it is unlikely to pass a proof roll test, a select working layer will be required to achieve an initial working surface. This is likely to occur where the silty clay are exposed at the subgrade design elevation and are exposed to moisture. To mitigate this, a layer of Bidim A34 or similar, should be placed at the ground surface and a working platform established, comprising well graded geo wrapped granular fill at least 300mm to 350mm thickness. This could be used as a temporary trafficable surface during construction, with the design pavement layers then being placed to complete the pavement.

Recommended design CBR values are summarised in Table 4-6.

Table 5-3: Design Subgrade CBR Values

Material	Adopted CBR Value
Existing Silty CLAY subgrade exposed on site – no improvement to depths of 1.0m	2
Existing Silty CLAY subgrade exposed on site – no improvement below depths of 1.0m	3
0.35m minimum Controlled Fill with soaked CBR >10% and 15 over CBR 2	Equivalent CBR 5
1.0m Full Depth Controlled Fill with soaked CBR >10%	10
1.0m Full Depth Controlled Fill with soaked CBR >15%	15

A subgrade modulus of 20MPa, 30MPa, 50MPa, 100MPa and 150MPa is recommended for design purposes respectively. It is noted that the above subgrade moduli of reactions provided are for pavement design. They are not appropriate for footing design where the modulus of subgrade reaction is highly variable depending on geometry and load.

The subgrade will require preparation to achieve the required compaction prior to the pavement being laid. It is our recommendation that the subgrade be inspected by a suitably qualified engineer prior to placement of select fill or base materials. Where the subgrade fails a proof roll test, a working platform described in the following sections is to be adopted to achieve an initial working surface.

5.8. Earthworks

5.8.1. Surface preparation

Ground preparation should allow for the stripping of topsoil from structural footprints. Stripped soil would not be suitable for structural fill and must be processed to exclude cobbles (if present) and then used for landscape applications if determined to be suitable for this purpose. Surplus excavated materials may need to be exported or disposed of off the site, subject to waste classification.

5.8.2. Placement of Fill

It is expected that structural fill will need to be placed on the site. General fill placed within pavement and structural footprints should be compacted in layers not exceeding 200mm compacted thickness. Structural fill and pavement materials should be placed in layers not exceeding 150mm compacted thickness. Fill and pavement materials should be compacted to the density ration requirements detailed in table 5.2.

Table 5-4: Fill density requirements

Description	Density Ratio Requirements
Pavement – Base	Minimum 98% Modified
Pavement - Sub-base	Minimum 95% Modified
Subgrade (top 300mm)	Minimum 100% Standard
General Fill Zone (deeper than 300mm below top of subgrade)	Minimum 98% Standard

5.8.3. Ease of excavation

This ease with which materials can be excavated onsite has been assessed using the Kirsten eight-point classification system provided in Table 5.3. The topsoil, alluvial, residual and weathered materials encountered on both sites are expected to be readily excavated using conventional earthmoving equipment such as hydraulic excavators, backhoes, and dozers.

Table 5-5: Kirsten's eight point excavation classification system

Class	Material Type	Description of Excavatability
1	Soil / Detritus	Hand spade (Dozer D3)
2		Hand pick and spade
3		Power tools
4	Rock	Easy ripping (Dozer D7)
5		Hard ripping (Dozer D8)
6		Very hard ripping (Dozer D9)
7		Extremely hard ripping / blasting (Dozer D10)
8		Blasting

6. Engineering Assessment for Pipeline Corridor

6.1. Geotechnical Site Model

The pipeline corridor is expected to be underlain by the following materials:

- Recent Alluvium: Comprised of topsoil and alluvium generally sandy clays, silty clays, and sandy silty clays with fines of low plasticity, brown, to grey with some orange mottling, soft to firm to 2.0m depth, then becoming stiff to very stiff below 2.5m depth. Generally present to around 5.5m depth.

6.2. Geotechnical Considerations of the site

Based on the field observations and laboratory results, Terra considers there to be a very low risk of acid sulfate soils being present along the pipeline corridor.

6.3. Durability of Buried Structures

Table 6.4.2(C) of the Australian Standard AS2159-2009 Piling – Design and installation defines the exposure conditions for the design of concrete piles based on the level of sulfates and pH of the soil. This indicates based on the laboratory results and the clayey nature of the soils on the site, an exposure classification of non-aggressive.

Table 6.5.2(C) of the Australian Standard AS2159-2009 Piling – Design and installation defines the exposure conditions for the design of steel piles based on the level of chlorides, pH, and resistivity. This indicates based on the laboratory results, an exposure classification of mild.

6.4. Shallow foundations

Generally, along the pipeline corridor, soft soils are present to depths of 1.0m, underlain by firm clays to 1.5m and stiff clays thereafter.

We recommended that footings of any anchor or jacking blocks are founded into firm or better alluvial soil. The block will need to be design for lateral and vertical resistance.

In the case of clays, the ultimate unit lateral bearing capacity under static loads, pu, has a value that varies from 8cu to 12cu. These values are not valid for shallow depths, because the failure occurs in a different mode due to minimum overburden pressure. Design of shallow foundations for lateral capacity is typically based on active and passive pressures and lateral resistance along the base of the footing as per Section 5.4. However, for short term loading conditions, presumptive lateral bearing capacities of 5kpa/m can be adopted for the firm or better soils.

High level footings in the soft alluvial soils, can be designed based on an allowable bearing capacity of 20kPa this can be increased to 50kPa in the firm clayey soils. Temporary footings for pipe jacking can be designed based on an allowable bearing of 100kPa in stiff or better soils. It is noted that softening will occur where the foundation is

exposed, or ponding occurs and can result in insufficient bearing capacities. Where additional capacity is required, piers can be adopted and taken to the stiffer soils at depth.

6.5. Earthworks

6.5.1. Surface preparation

Ground preparation should allow for the stripping of topsoil from the trench location to be stockpiled for reuse. Stripped soil would not be suitable for structural fill and must be processed to exclude cobbles (if present) and then used for landscape applications if determined to be suitable for this purpose.

Surplus excavated materials may need to be exported or disposed of off the site, subject to waste classification.

6.5.2. Ease of excavation

This ease with which materials can be excavated onsite has been assessed using the Kirsten eight-point classification system provided in Table 5.3. The topsoil and alluvial materials encountered on both sites are expected to be readily excavated using conventional earthmoving equipment such as hydraulic excavators, backhoes, and dozers.

7. Engineering Assessment for Underbore

7.1. Geotechnical Site Model

The underbore is expected to be underlain by similar materials to those found in the main plant area.

7.2. Geotechnical Considerations of the site

Based on the field observations and laboratory results, Terra considers there to be a very low risk of acid sulfate soils being present within the location of the underbore. No acid sulfate soil plan is therefore deemed required.

7.3. Durability of Buried Structures

Table 6.4.2(C) of the Australian Standard AS2159-2009 Piling – Design and installation defines the exposure conditions for the design of concrete piles based on the level of sulfates and pH of the soil. This indicates based on the laboratory results and the clayey nature of the soils on the site, an exposure classification of non-aggressive to mild.

Table 6.5.2(C) of the Australian Standard AS2159-2009 Piling – Design and installation defines the exposure conditions for the design of steel piles based on the level of chlorides, pH, and resistivity. This indicates based on the laboratory results, an exposure classification of mild.

7.4. Shallow foundations and Lateral capacity

The recommendations made in Section 6.0 for the plant area should be followed for the design of shallow footings in the location of the under bore.

7.5. Earthworks

The recommendations made in Section 6.0 for the plant area should be followed for the design of shallow footings in the location of the under bore.

8. Salinity Assesment

8.1. Assessment for salinity on the site

During the walkover of the site, no salinity indicators (such as salt-stressed vegetation, scalding or corrosion on structures) were observed.

Soil sampling on the site did not identify any soil horizons which would be deemed to be saline.

Saline areas may occur in zones which have not yet been identified or may occur if risk factors change adversely.

A summary of the soil aggressivity results and classifications are shown in the following Table. Terra notes that all samples that was tested were deemed to be fine grained, however, some sandy bands are known to be present within the subsurface profile. Where footings are taken below the water table and potentially encounter sandy bands, the next higher classification is to be adopted for the design of footings. The laboratory results indicate that the soil underlying the site are typically 'non-saline to slightly saline'. One sample was 'moderately saline' at 6.0m depth in BH03. This sample would have been taken from below the water table where the watet is likely tidally influenced.

Table 8-1: Salinity Laboratory Results and Classifications

Sample Details	Depth	Chloride (mg/kg)	Conductivity (uS/cm)	pH	Resistivity (ohm.m)	ECe (dS/m)	Sulfate (mg/kg)	Classifications		
								AS2870	Concrete	Steel
BH04 S1	2.0-3.0	<10	15	5.7	66,000	0.13	27	A1	N-A	N-A
BH05 S1	0.5-1.0	<10	<10	6.7	370,000	0.09	11	A1	N-A	N-A
TP03 S3	1.3-1.5	110	120	5.3	8,500	1.02	54	A2	Mild	N-A
TP06 S2	0.3-1.0	30	31	6.7	32,000	0.26	14	A1	N-A	N-A
TP07 B1	0.5-0.8	<10	15	6.6	65,000	0.13	15	A1	N-A	N-A
BH03	4.0-4.5	410	445	7.0	2,250	3.78	380	A1	N-A	N-A
BH03	6.0-6.5	920	576	6.9	1,740	4.90	290	A2	N-A	Mild
BH201 SPT4	10.0-10.45	12	60	6.4	17,000	0.51	<10	A1	N-A	N-A
BH204 SPT4	5.5-5.95	150	160	6.6	6,300	1.36	52	A1	N-A	N-A
Field Screen Samples	0.0-8.5	<10	15	5.0-7.4	66,000	0.13	27	A2	Mild	N-A

Notes: N-A: non-aggressive

8.2. General salinity management

General practices to mitigate the risk of salinity on the site have been derived from the Western Sydney Salinity Code of Practice (2004) and are as follows:

- Practise soil management techniques during construction
- Use all soils and landscapes within their urban capability
- Minimise water inputs, maintain natural water balance, use caution in implementing infiltration techniques
- Carefully manage areas of existing salinity or likely discharge areas; and
- Avoid clearing, retain and establish significant native vegetation

Specific recommendations are given for sites as follows:

- Avoid exposure and disturbance of saline subsoil material, minimise cut and fill
- Avoid reversing soil profile materials during essential cut and fill, replace soils in original order

- Consider soil management and exposure of material when placing services and during construction
- Consider exposure of building materials and infrastructure to saline soil materials, use salt-resistant materials where necessary or consider alternative construction techniques
- Stabilise existing areas of erosion, treat existing salinity with gypsum
- Establish salt-tolerant species in existing or potential salinity problem areas
- Retain vegetation and avoid construction/disturbance in riparian zones and poorly drained areas
- Retain and establish vegetation in areas susceptible to erosion or disturbance

8.3. Construction materials and techniques

Basic principles for building in areas with salinity are provided within this section, but for more specific information, a structural engineer should be consulted. General advice is as follows:

- Slab design should consider ventilation and the transport of moisture from the soils during evaporation processes. This may include the installation of damp proof membranes beneath the slab, extending up to ground level to move evaporated moisture away from the structure
- Future building additions should not breach any existing damp proofing
- Salt resistant bricks and concrete may be suitable to use on the site, as they are more resistant to salt damage
- Plastic pipes should be adopted where possible, as metal piping is more susceptible to corrosion

8.4. Landscaping

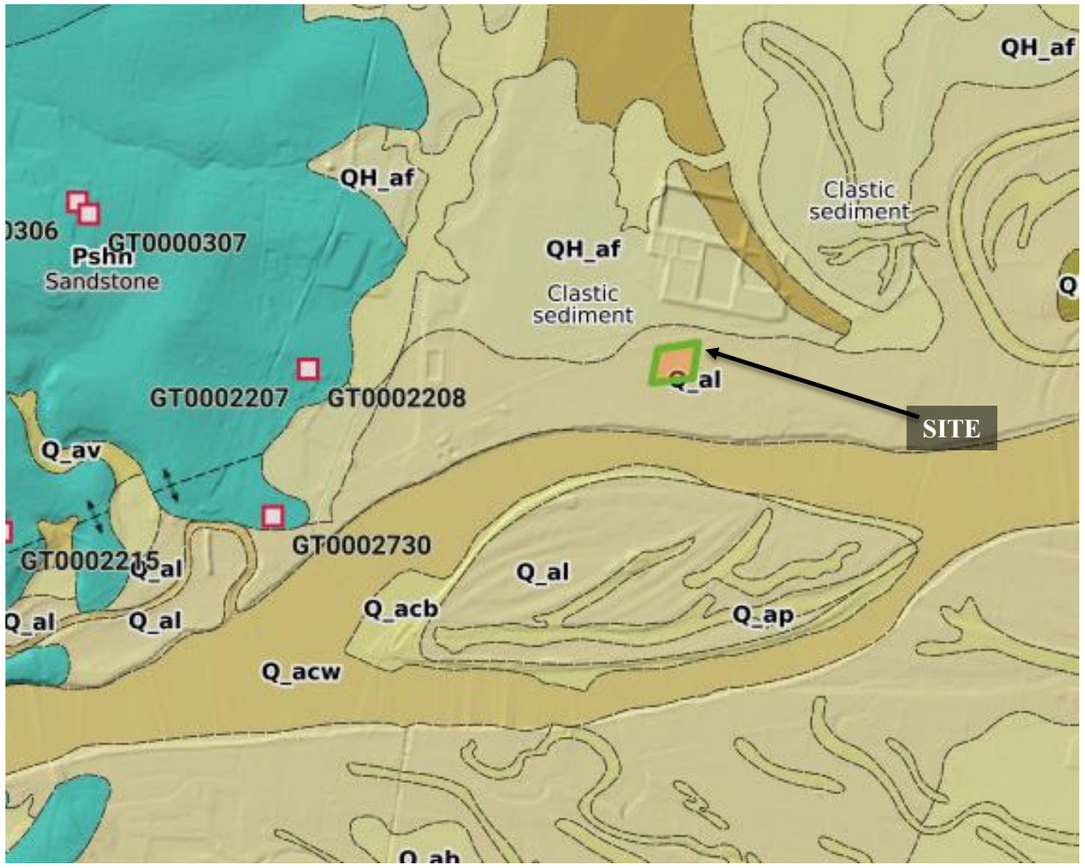
- Removal of vegetation in potentially saline areas can cause soils to become susceptible to erosion and may increase salinity problems. Rehabilitation can prove difficult. Recommendations for landscaping on the site are as follows:
- Preference should be given to native, salt-tolerant plant species.
- Any irrigation systems installed should be ‘smart’ or manually controlled to prevent overwatering, and to control application areas.
- Plants with similar water needs should be grouped together during planting
- Garden beds should be mulched to reduce evaporation

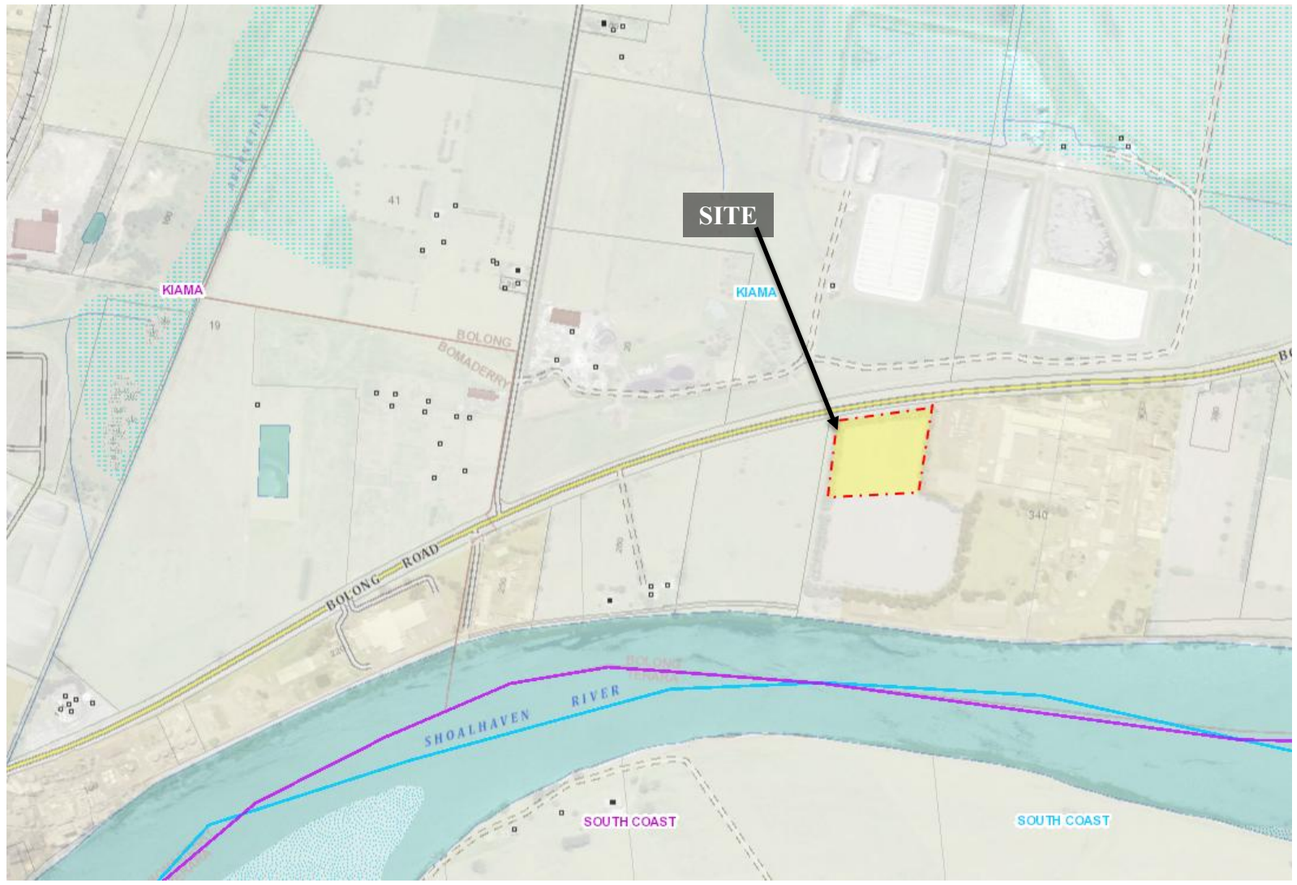
8.5. Stormwater and drainage

Salinity generally occurs in areas where water accumulates, or areas subjected to continuous wetting and drying cycles. The following measures should be implemented:

- Water pipes should be monitored for any possible leaks.
- Any proposed on-site stormwater or wastewater treatment structures should be reviewed by a suitably qualified environmental consultant to confirm its suitability with regards to potential salinity impacts.
- Stormwater detention structures should be constructed with impermeable lining to prevent infiltration of water into the surrounding soils and the groundwater table.

Figures





Site Geology

Symbol	Group	Sub-group	Unit	Lithology
Q_al	-	-	Alluvial levee/overbank deposits	Fluvially deposited fine- to medium-grained lithic to quartz-rich sand, silt, clay.
Pshn	Shoalhaven Group	-	Nowra Sandstone	Fine- to very coarse-grained quartzose sandstone, with a three-fold subdivision: a very coarse-grained base with minor pebbly lenses, a central siltstone zone and a cross-bedded medium-grained quartz sandstone up-sequence.

Site Location

revision	description	drawn	approved	date
	Site location	KEG	XJ	09/09/2024

N

TERRA INSIGHT

client:	**Babagge**
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**
scale	NTS
title:	**Site Location**
original size	**A3**
project no:	**TERRA25-1264**
figure no:	**FIGURE 1**

1970

1984

2002

2016

2018

2025

Historical Aerial Imagery

revision

description	drawn	approved	date
Historical Aerial Imagery	JH	KEG	28/07/2025

N

TERRA INSIGHT

scale	NTS
original size	**A3**

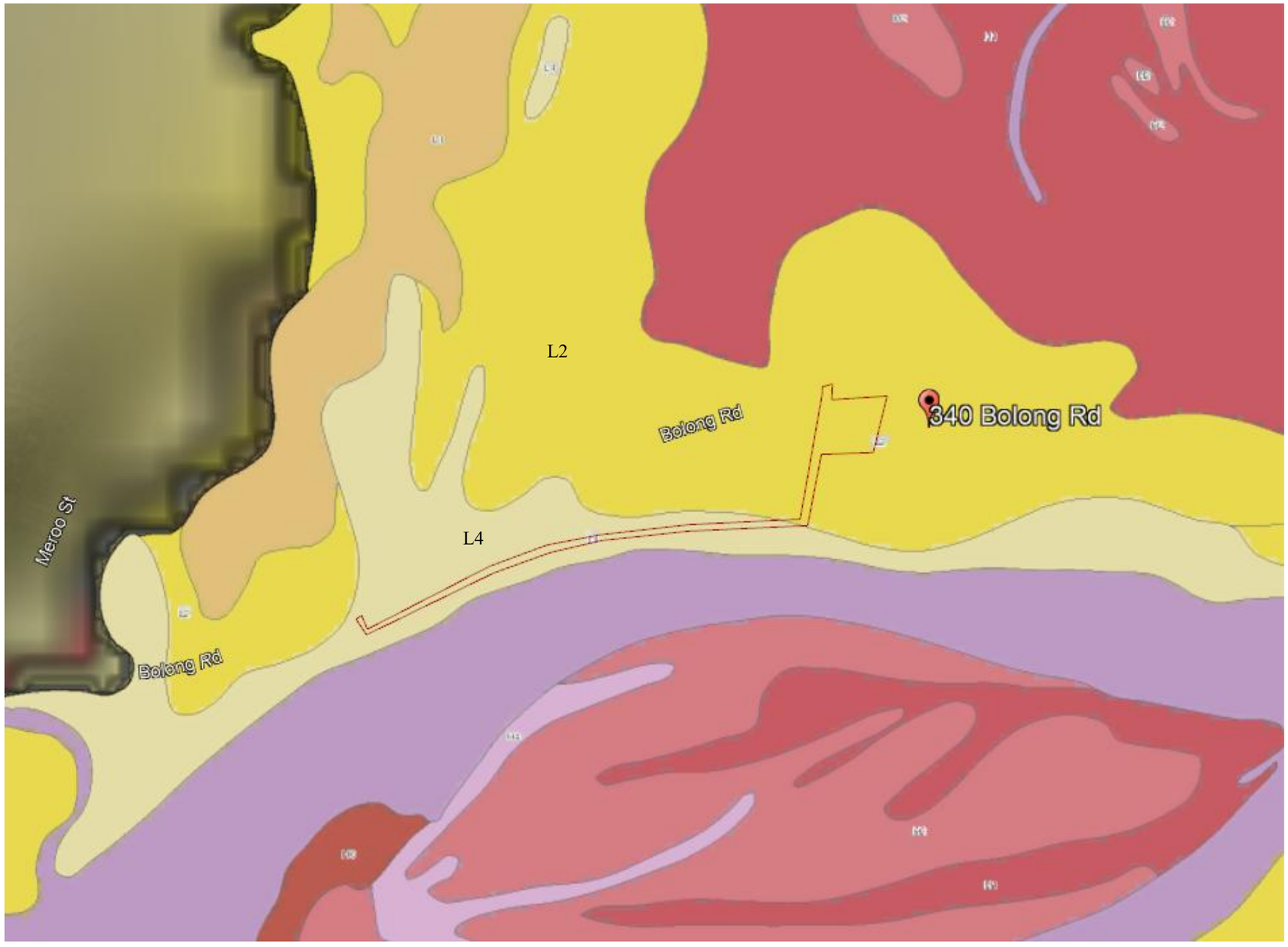
client: **Babbage**

project: **C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**

title: **Historical Aerial Imagery**

project no: **TERRA25-1264**

figure no: **FIGURE 2**



Acid Sulfate Soil Risk Mapping – SEED Maps

revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	1/10/2024

TERRA INSIGHT

scale	NTS
original size	**A3**

client:	**Babagge**
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**
title:	**ASS mapping**
project no: **TERRA25-1264**	figure no: **FIGURE 3A**

KEY

Map Class Description	Depth to Acid Sulfate Soil Materials		Environmental Risk	Typical Landform Types
HIGH PROBABILITY High probability of occurrence of acid sulfate soil material within the soil profile. The environment of deposition has been suitable for the formation of acid sulfate soil materials. Acid sulfate soil materials are widespread or sporadic and may be buried by alluvium or windblown sediments.		Bottom sediments.	Severe environmental risk if bottom sediments are disturbed by activities such as dredging.	Bottom sediments of lakes, lagoons, tidal creeks, rivers and estuaries.
		At or near the ground surface.	Severe environmental risk if acid sulfate soil materials are disturbed by activities such as shallow drainage, excavation or clearing.	Estuarine swamps, intertidal flats and supratidal flats.
		Within 1 metre of the ground surface.	Severe environmental risk if acid sulfate soil materials are disturbed by activities such as shallow drainage, excavation or clearing.	Low alluvial plains, estuarine sandplains, estuarine swamps, backswamps, and supratidal flats.
		Between 1 and 3 metres below the ground surface.	Environmental risk if acid sulfate soil materials are disturbed by activities such as deep excavation for pipelines, dams or deep drains.	Alluvial plains, alluvial swamps, alluvial levees and sandplains.
		Greater than 3 metres below the ground surface.*	Environmental risk if acid sulfate soil materials are disturbed by activities such as deep excavations, eg, large structure foundations or deep dams.	Elevated levees and sandplains, alluvial plains and alluvial swamps in estuarine reaches of catchments.
LOW PROBABILITY Low probability of occurrence of acid sulfate soil materials within the soil profile. The environment of deposition has generally not been suitable for the formation of acid sulfate soil materials. Soil materials are often Pleistocene in age. Acid sulfate soil materials, if present, are sporadic and may be buried by alluvium or windblown sediments.		Bottom sediments.	The majority of these landforms are not expected to contain acid sulfate soil materials. Therefore, land management is generally not affected by acid sulfate soils. However, highly localised occurrences may be found, especially near boundaries with environments with a high probability of occurrence. Disturbance of these soil materials will result in an environmental risk that will vary with elevation and depth of disturbance.	Elevated alluvial plains and levees dominated by fluvial sediments. Plains and dunes dominated by aeolian soils. Pleistocene plains. Lacustrine and alluvial bottom sediments.
		At or near the ground surface.		
		Within 1 metre of the ground surface.		
		Between 1 and 3 metres below the ground surface.		
		Greater than 3 metres below the ground surface.*		
NO KNOWN OCCURRENCE Acid sulfate soils are not known or expected to occur in these environments.		No known occurrences of acid sulfate soil materials.	Land management activities not likely to be affected by acid sulfate soils.	Bedrock slopes, elevated Pleistocene and Holocene dunes and elevated alluvial plains.
DISTURBED TERRAIN		Disturbed terrain may include filled areas, which often occur during reclamation of low lying swamps for urban development. Other disturbed terrain includes areas which have been mined or dredged, or have undergone heavy ground disturbance through general urban development or construction of dams or levees. Soil investigations are required to assess these areas for acid sulfate potential.		

*Deep occurrences of acid sulfate soil materials not able to be confirmed by field inspection and sampling

Landform Process Class		Landform Element			
W	Aeolian	b	Backplain	t	Levee toe
A	Alluvium	k	Backswamp	o	Ox-bow
B	Beach	m	Bottom sediments	p	Plain
E	Estuarine	n	Channel	a	Sandplain
L	Lacustrine	d	Dune	s	Swamp
S	Swamp	r	Interbarrier swamp	y	Splay
		i	Intertidal flat	u	Supratidal flat
		g	Lagoon	w	Swale
X	Disturbed Terrain*	l	Levee	c	Tidal creek

Elevation#	
0	0-1 m
1	1-2 m
2	2-4 m
4	>4 m

Additional Descriptive Codes	
(p)	Pleistocene
(s)	Acidic scald

*Elevation levels given on the map refer to the elevation of the ground surface at the time of mapping. Depending on the nature of the disturbance, these elevation levels may or may not represent the original ground surface elevation.

#Approximate AHD

Acid Sulfate Soil Mapping Key

revision	description	drawn	approved	date
	ASS Key	XJ	KEG	1/10/2024

N

TERRA INSIGHT

scale	NTS
original size	**A3**

client: **Babagge**

project: **C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**

title: **Acid Sulfate Soil Mapping**

project no: **TERRA25-1264**

figure no: **FIGURE 3B**

Legend

Terra Test BH site

Terra Test CPT

Test Site Locations

revision	description	drawn	approved	date
	Test Site Locations	JH	KEG	13/03/2026

N

TERRA INSIGHT

scale	NTS
original size	**A3**

client: **Babagge**

project: **C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**

title: **Site Plan and Test Locations – plant area**

project no: **TERRA25-1264**

figure no: **FIGURE 4**

Legend

Terra Test site

Test Site Locations

revision	description	drawn	approved	date
	Test Site Locations	JH	KEG	13/03/2026

N

TERRA INSIGHT

scale	NTS
original size	**A3**

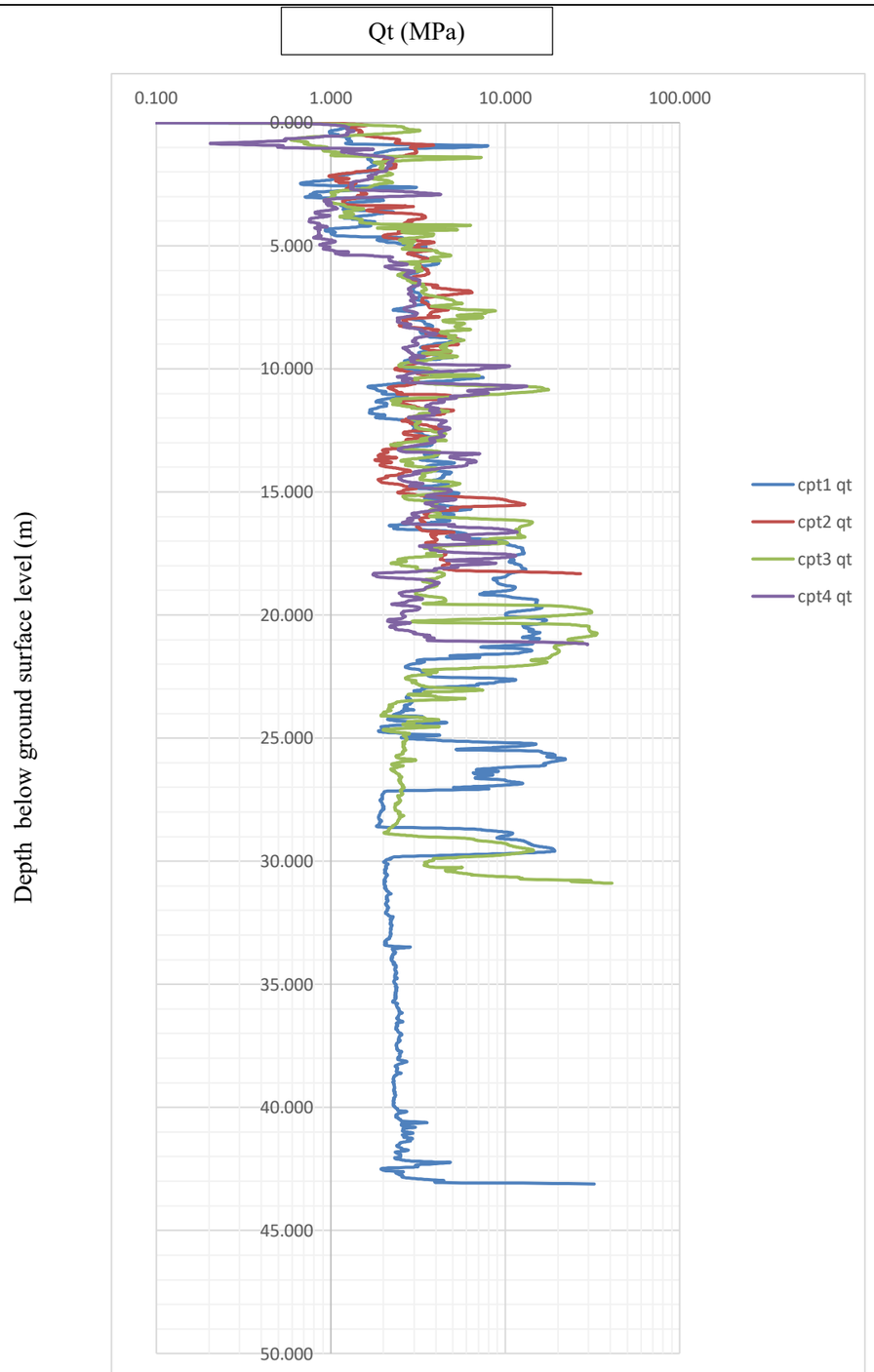
client: **Babagge**

project: **C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**

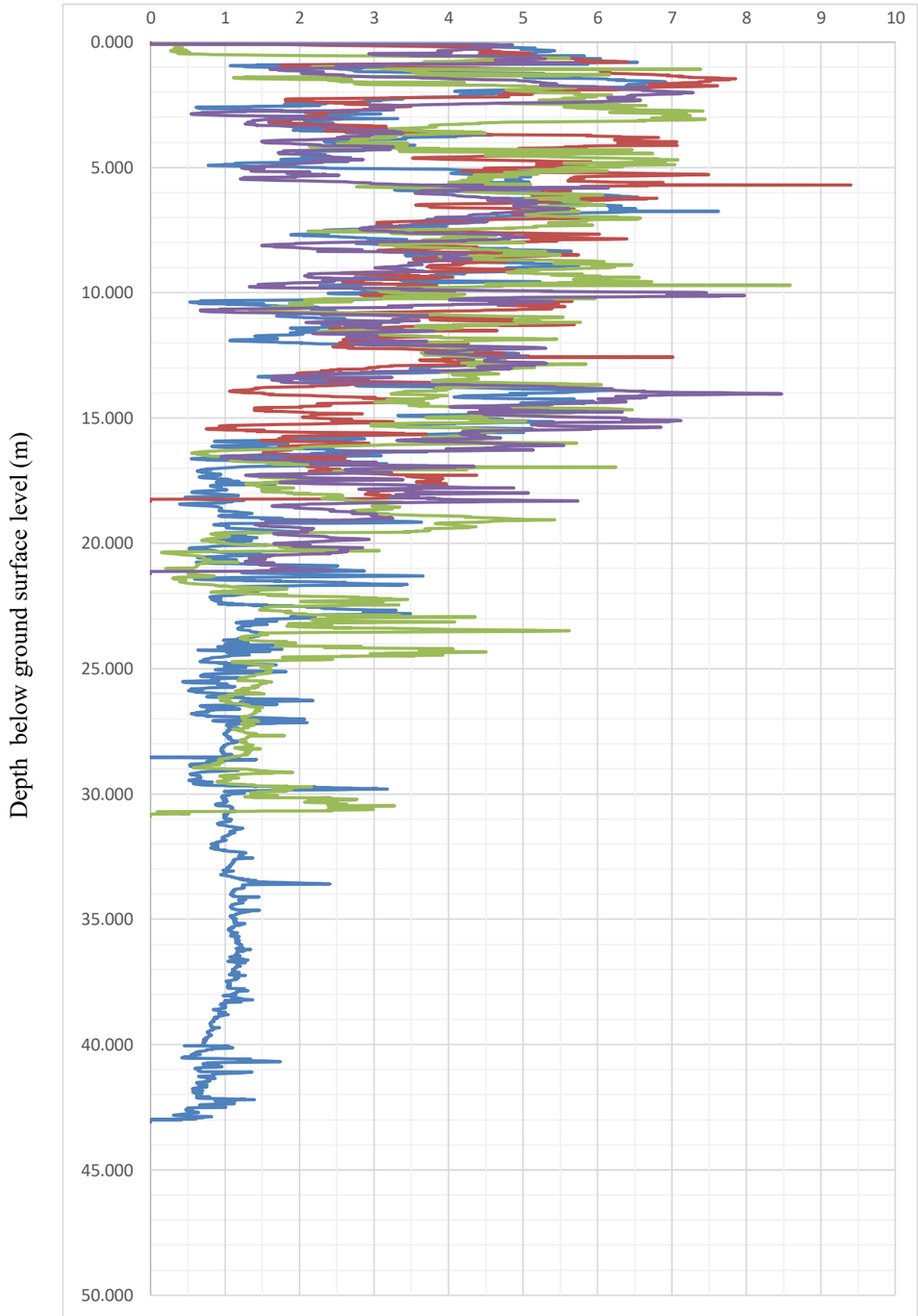
title: **Site Plan and Test Locations – service corridor**

project no: **TERRA25-12647**

figure no: **FIGURE 4**



Qt (MPa) vs depth

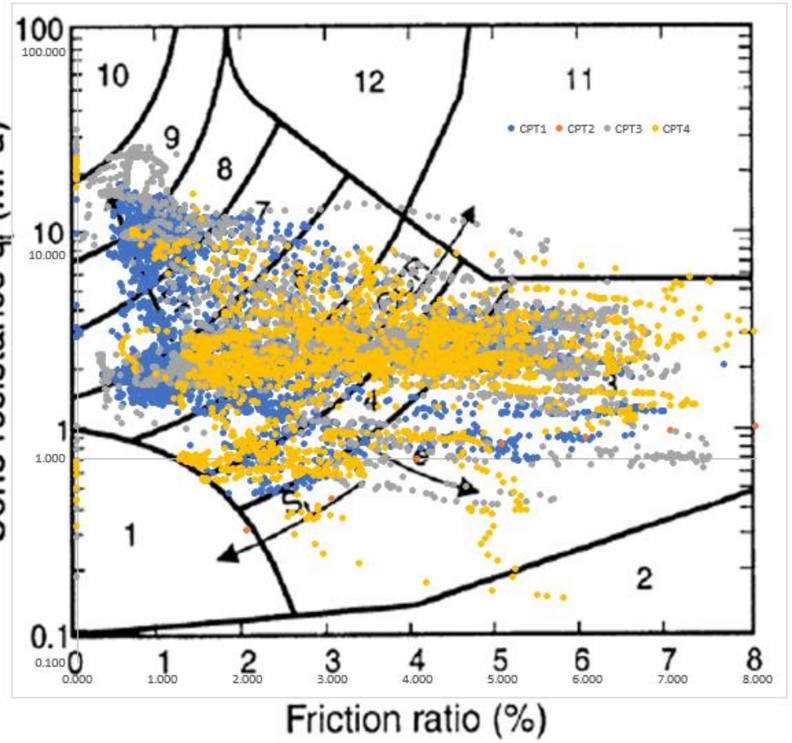


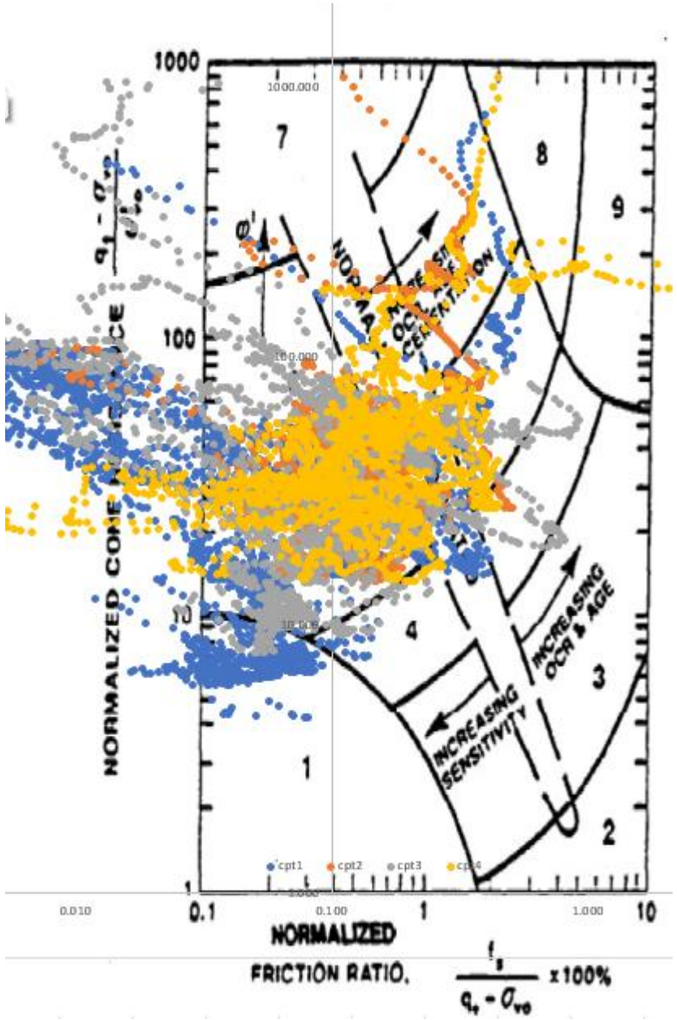
Friction Ratio

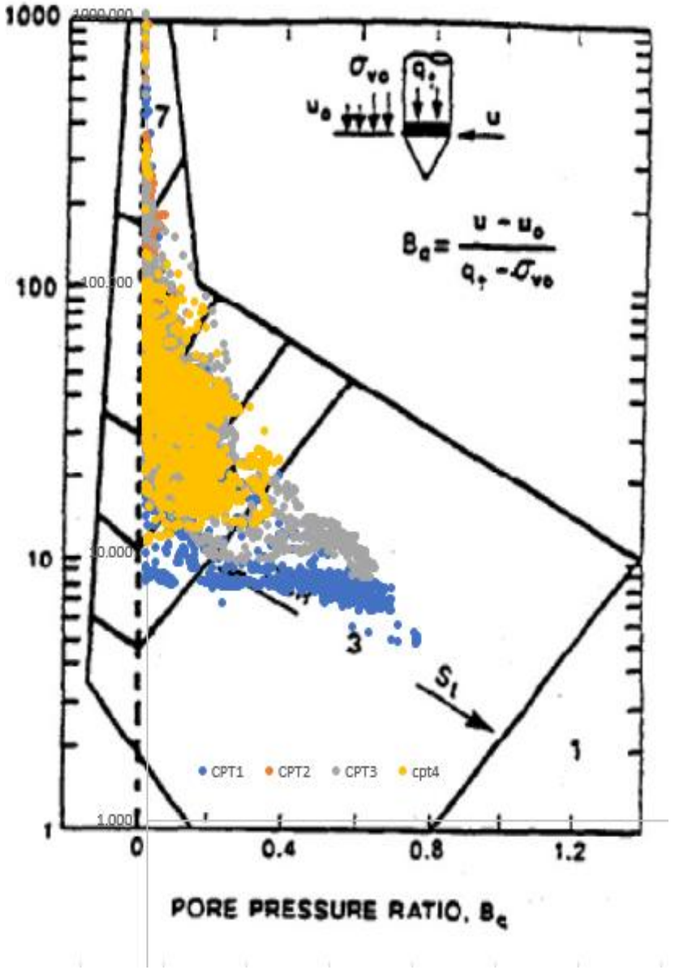
revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	10/10/24

TERRA INSIGHT

client:	**Babbage**		
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**		
scale	NTS	title:	**In situ CPT Test Results**
original size	**A3**	project no: **TERRA25-1264**	figure no: **FIGURE 5A**



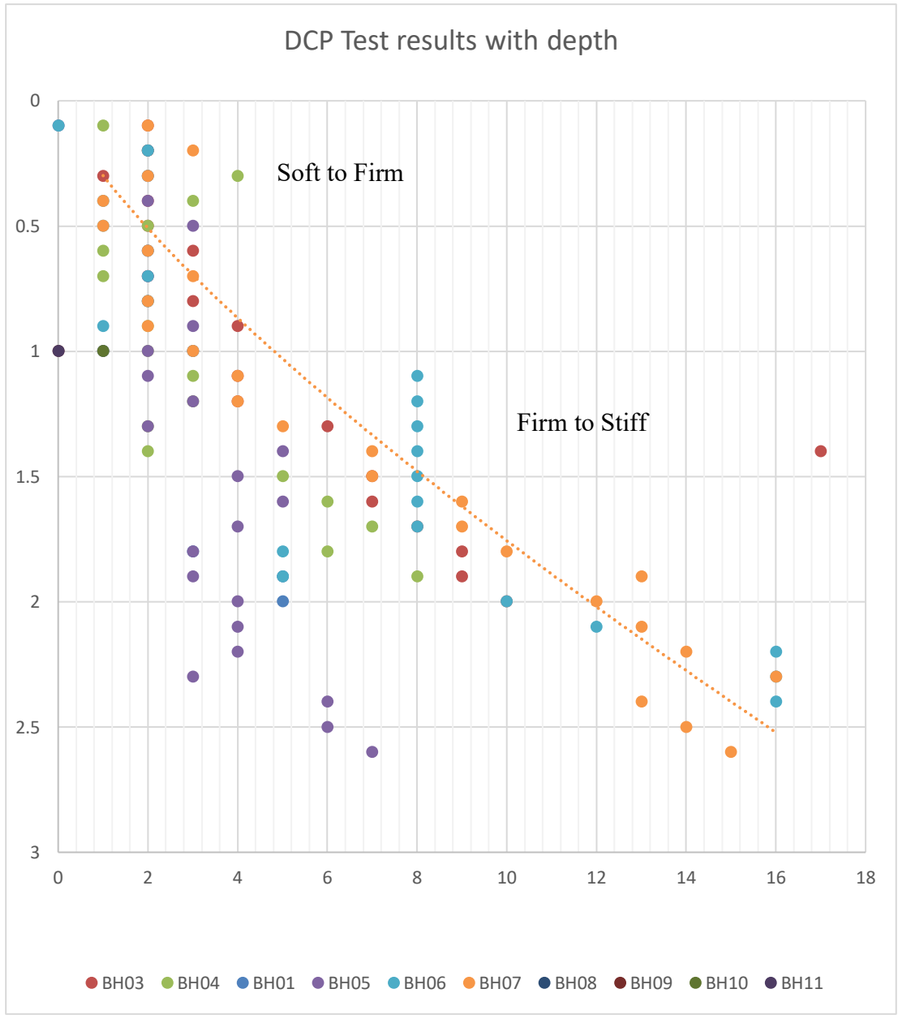




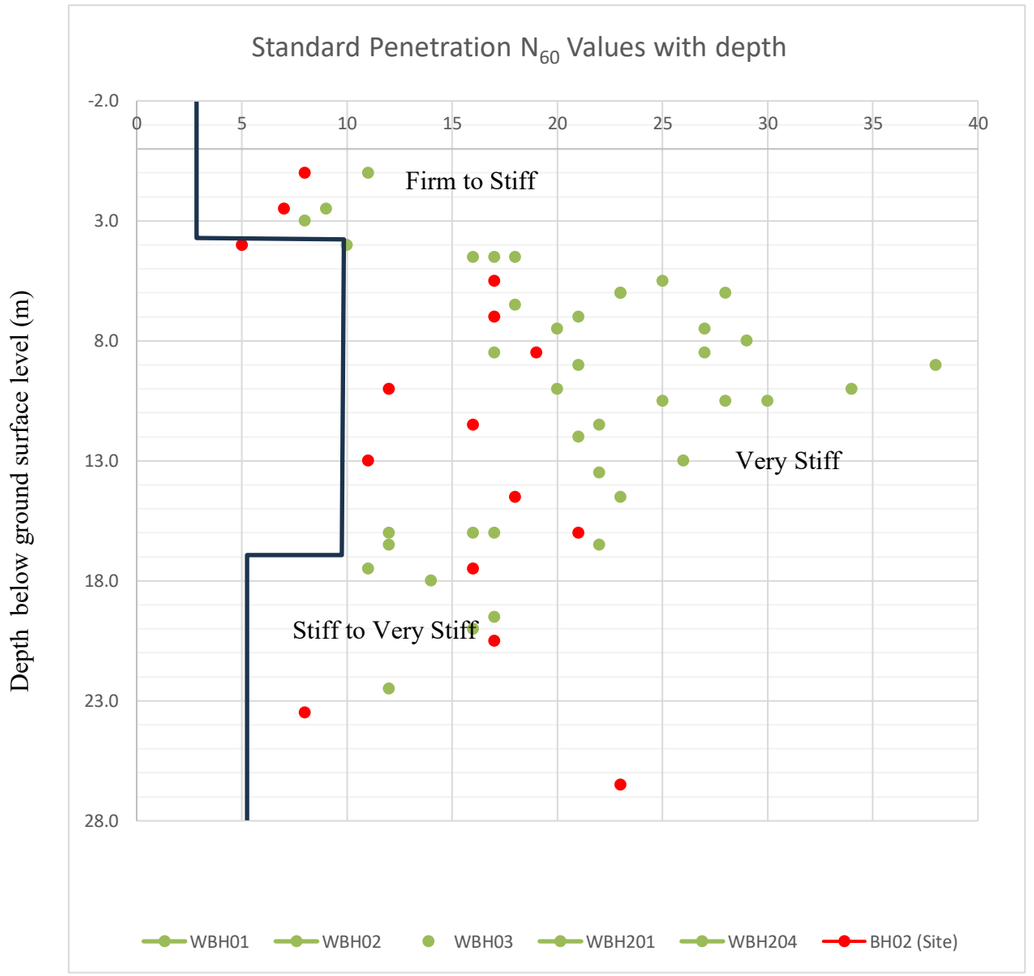
revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	10/10/24

TERRA INSIGHT

client:	**Babbage**
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**
scale	NTS
title:	**In situ CPT Test Results**
original size	**A3**
project no: **TERRA25-1264**	figure no: **FIGURE 5B**



DCP - Value - Blows per 100mm



N - Value - Blows per 300mm

revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	10/10/24

TERRA INSIGHT

scale	NTS
original size	**A3**

client: **Babbage**

project: **C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**

title: **In situ SPT and DCP Test Results**

project no: **TERRA25-1264**

figure no: **FIGURE 6**

Appendix A: Your Report

TERRA INSIGHT

Your Report

These notes have been prepared to help you understand the advice provided in Your Report and its limitations.

Your Report is based on what you tell us

Your Report has been developed based on the information you have provided such as the scope and size of your project. It applies only to the site investigated. If there are changes to the proposed works, then the advice provided within Your Report may need to be reviewed

Your Report is written with your needs in mind

The advice provided within Your Report is also not relevant to another purpose other than that originally specified at the time the report was issued. Please seek advice from Terra Insight before you share Your Report with another third party – except for the purpose for which the report was written.

Terra Insight assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in Your Report.

Your Report is based on what we observed

The advice provided within Your Report assumes that the site conditions, revealed through selective point sampling (undertaken in accordance with normal practices and standards) at a particular point in time, are indicative of the actual conditions on your site. However, the nature of the materials underlying your site is affected by natural processes and the activity of man. Under no circumstances can it be considered that these findings represent the actual state at all points. The subsurface conditions may vary significantly on the other parts of the site, particularly where no nearby sampling and testing work has been carried out.

As a result conditions on your site can change with time; they can also vary spatially. As a result, the actual conditions encountered may differ from those detailed within Your Report. Although nothing can be done to change the actual site conditions which exist, steps can be taken to gain a better understanding of the subsurface conditions underlying your site and reduce the potential for unexpected conditions to be encountered

The advice within Your Report also relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it. Only Terra Insight is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If the details of your project have changed, the site conditions have changed or a significant amount of time as elapsed since our report was written, the advice provided within Your Report may need to be reviewed.

Your Report has been written by a Professional

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

Your Report is better when it is kept together

Your Report presents all the findings of the site assessment and should not be copied in part or altered in any way. Keeping Your Report intact reduces the potential for yourself or other design professionals to misinterpret the report.

Your Geo-Environmental Report

If Your Report is for geotechnical purposes only, it will not relate any findings, conclusions, or recommendations about the potential for hazardous materials to exist at the site unless you have specifically asked us to do so. If your report is written for Geo-Environmental purposes the following should be noted in addition to the above:

- Advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in Your Report should be verified if you propose to use this report more than 6 months after its date of issue;
- Your Report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. The assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, which includes budget and timing;
- The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice. Any interpretation in Your Report is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment.
- We may have relied on data and other information provided by you and other qualified individuals in preparing Your Report. We have not verified the accuracy or completeness of such data or information except as otherwise stated in Your Report. For these reasons Your Report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.
- For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination posed in the context of the agreed purpose. If the proposed use of the site changes, the assessment may no longer be valid and will need to be reviewed.

* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical information in Construction Contracts" published by the Institution of Engineers Australia, National headquarters, Canberra, 1987.

Appendix B: Site Images

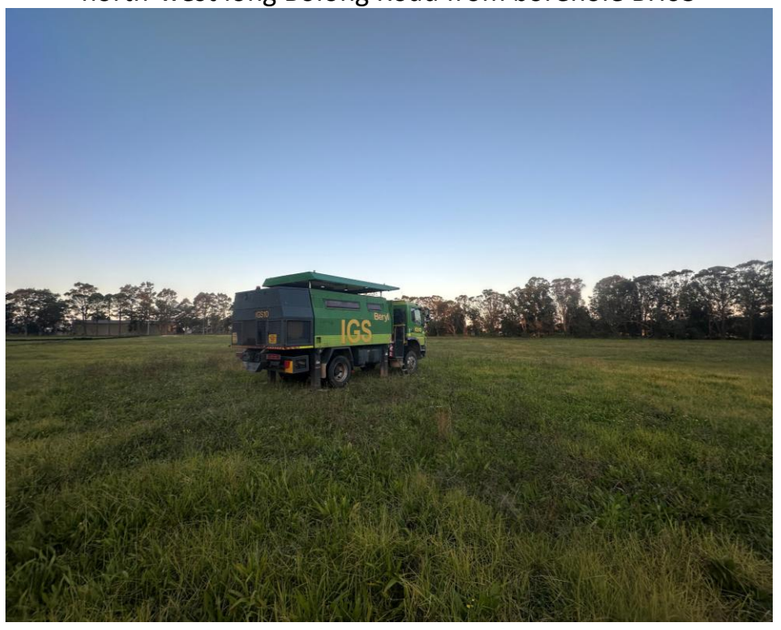
Photograph 1: View of Bolong Road and proposed location of underbore. Borehole BH01 on northern side of road

Photograph 2: View of north eastern corner of main plant site looking south towards borehole BH03

Photograph 3: View of northern part of the site looking north-west long Bolong Road from borehole BH03

Photograph 4: View north-western boundary of site looking roughly north-west along Bolong Road from borehole BH07

Photograph 5: View of north-western part of the site looking north towards from BH02 towards CPT1



Photograph 6: View of central part of plant site, looking towards CPT test site CPT3. Looking north-east

revision	description	drawn	approved	date
	Plate1	XJ	KEG	13/03/2026

TERRA INSIGHT

scale	NTS
original size	**A3**

client:	**Babagge**
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**
Title	**Images of the site**
project no: **TERRA25-1264**	Plate no:**1**

Photograph 7: View of the northern part of main plant site looking south with CPT3 being done (right of picture).

Photograph 8: View llooking west from BH08 to BH09

Photograph 9: View looking east from BH09 to BH08

Photograph 10: View looking west towards BH10

Photograph 11: 2025 View looking north towards Bolong Road from dwellings

Photograph 12: 2025 View looking east, from borehole BH10 towards BH09

revision	description	drawn	approved	date
	Plate2	XJ	KEG	13/03/2026

TERRA INSIGHT

client:	**Babagge**
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**
scale	NTS
Title	**Images of the site**
original size	**A3**
project no: **TERRA25-1264**	Plate no:**2**

Photograph 13: 2025 View looking west, from borehole BH10 towards BH11.

Photograph 14: 2025 View looking east from borehole BH11 towards BH10

Photograph 15: 2026 View of pipeline corridor looking east from TP02.

Photograph 16: 2026 View of pipeline corridor looking west from TP02.

Photograph 17: 2026 View of pipeline corridor looking west from TP03.

Photograph 18: 2026 View of pipeline corridor looking west from TP05.

revision	description	drawn	approved	date
	Plate3	XJ	KEG	13/03/2026

TERRA INSIGHT

client:	**Babagge**		
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**		
scale	NTS	Title	**Images of the site**
original size	**A3**	project no: **TERRA25-1264**	Plate no:**3**

Photograph 19: 2026 View of pipeline corridor looking east from TP07.

Photograph 20: 2026 View of pipeline corridor looking west from TP07.

Photograph 21: 2026 View of pipeline corridor looking east from TP08.

Photograph 22: : 2026 View of pipeline corridor looking west

revision	description	drawn	approved	date
	Plate4	XJ	KEG	13/03/2026

TERRA INSIGHT

client:	**Babagge**		
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**		
scale	NTS	Title	**Images of the site**
original size	**A3**	project no: **TERRA25-1264**	Plate no:**4**

Appendix C: Engineering logs

TERRA INSIGHT

How to interpret the engineering logs in Your Report

FIELD DECRIPTIONS OF SOILS

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)				USC	PRIMARY NAME
COARSE GRAINED SOILS More than 65% of materials less than 63 mm is larger than 0.075 mm	GRAVELS More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes	GW	GRAVEL
			Predominantly one size or a range of sizes with more intermediate sizes missing.	GP	GRAVEL
		GRAVELS WITH FINES Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)	GM	SILTY GRAVEL
			Plastic fines (for identification procedures see CL below)	GC	CLAYEY GRAVEL
	SANDS More than half of coarse fraction is smaller than 2.36 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes	SW	SAND
			Predominantly one size or a range of sizes with some intermediate sizes missing.	SP	SAND
		SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).	SM	SILTY SAND
			Plastic fines (for identification procedures see CL below).	SC	CLAYEY SAND

FINE GRAINED SOILS More than 35% of material less than 63 mm is smaller than 0.075 mm	IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm (Note a 75Um particle is about the smallest particle that is visible to the naked eye.)				
		DRY STRENGTH	DILATANCY	TOUGHNESS	USC	PRIMARY NAME
	SILTS & CLAYS Liquid limit less than 50	None to Low	Quick to slow	None	ML	SILT
		Medium to High	None	Medium	CL	CLAY
		Low to medium	Slow to very slow	Low	CL	ORGANIC SILT
	SILTS & CLAYS Liquid limit greater than 50	Low to medium	Slow to very slow	Low to medium	MH	SILT
		High	None	High	CH	CLAY
		Medium to High	None	Low to medium	OH	ORGANIC CLAY
HIGHLY ORGANIC	Readily identified by colour, odour, spongy feel and frequently by fibrous texture by fibrous texture.				PT	PEAT

● Low plasticity – Liquid Limit w_L less than 35%. ● Medium plasticity – w_L between 35% and 50%. ● High plasticity – w_L greater than 50%.

Particle size descriptive terms

NAME	SUBDIVISION	SIZE
Boulders Cobbles		>200 mm 63 mm to 200 mm
Gravel	coarse medium fine	20 mm to 63 mm 6 mm to 20 mm 2.36 mm to 6 mm
Sand	coarse medium fine	600 µm to 2.36 mm 200 µm to 600 µm 75 µm to 200 µm

Minor components

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

TERRA INSIGHT

How to interpret the engineering logs in Your Report

Moisture condition

TERM	DEFINITION
Dry	Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.
Moist	Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.
Wet	As for moist but with free water forming on hands when handled.

Soil structure

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

Consistency of cohesive soils

TERM	UNDRAINED STRENGTH s_u (kPa)	VISUAL OBSERVATION IN FIELD
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 – 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 – 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 – 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 – 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	–	Crumbles or powders when scraped by thumbnail.

Density of granular soils

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 – 35
Medium Dense	35 – 65
Dense	65 – 85
Very Dense	Greater than 85

Geological origin

TRANSPORTED SOILS

Fill	Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.
Aeolian soil	Deposited by wind.
Alluvial soil	Deposited by streams and rivers.
Colluvial soil	Deposited on slopes (transported downslope by gravity).
Lacustrine soil	Deposited by lakes.
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.

WEATHERED IN PLACE SOILS

Extremely weathered material	Structure and fabric of parent rock visible.
Residual soil	Structure and fabric of parent rock not visible.

TERRA INSIGHT

How to interpret the engineering logs in Your Report

FIELD DESCRIPTIONS OF ROCK

The descriptive terms used by Terra Insight are given below. They are broadly consistent with Australian Standard AS1726-1993.

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

Defect — **Discontinuity or break in the continuity of a substance or substances.**

Mass — **Any body of material which is not effectively homogeneous. It can consist of two or more substances without defects, or one or more substances with one or more defects.**

Classification of weathering products

Term	Abbreviation	Definition
Residual Soil	RS	Soil derived from the weathering of rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
Extremely Weathered Material	XW	Material is weathered to such an extent that it has soil properties, ie, it either disintegrates or can be remoulded in water. Original rock fabric still visible.
Highly Weathered Rock	HW	Rock strength is changed by weathering. The whole of the rock substance is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Some minerals are decomposed to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of minerals in pores.
Moderately Weathered Rock	MW	The whole of the rock substance is discoloured, usually by iron staining or bleaching , to the extent that the colour of the fresh rock is no longer recognisable.
Slightly Weathered Rock	SW	Rock substance affected by weathering to the extent that partial staining or partial discolouration of the rock substance (usually by limonite) has taken place. The colour and texture of the fresh rock is recognisable; strength properties are essentially those of the fresh rock substance.
Fresh Rock	FR	Rock substance unaffected by weathering.

Notes on Weathering:

AS1726 suggests the term "Distinctly Weathered" (DW) to cover the range of substance weathering conditions between XW and SW. For projects where it is not practical to delineate between HW and MW or it is judged that there is no advantage in making such a distinction. DW may be used with the definition given in AS1726.

Where physical and chemical changes were caused by hot gasses and liquids associated with igneous rocks, the term "altered" may be substituted for "weathering" to give the abbreviations XA, HA, MA, SA and DA.

Rock substance strength terms

Term	Abbreviation	UCS (MPa)	Point Load Index, $I_{s(50)}$ (MPa)	Field Guide
Very Low	**VL**	<2	Less than 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; pieces up to 30mm thick can be broken by finger pressure.
Low	**L**	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show with firm bows of a pick point; has a dull sound under hammer. Pieces of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium	**M**	6 to 20	0.3 to 1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High	**H**	20 to 60	1 to 3	A piece of core 150mm long by 50mm can not be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High	**VH**	60 to 200	3 to 10	Hand specimen breaks after more than one blow of a pick; rock rings under hammer.
Extremely High	**EH**	>200	More than 10	Specimen requires many blows with geological pick to break; rock rings under hammer.

Notes on Rock Substance Strength:

In anisotropic rocks the field guide to strength applies to the strength perpendicular to the anisotropy. High strength anisotropic rocks may break readily parallel to the planar anisotropy. The term "extremely low" is not used as a rock substance strength term. While the term is used in AS1726-1993, the field guide therein makes it clear that materials in that strength range are soils in engineering terms. The unconfined compressive strength for isotropic rocks (and anisotropic rocks which fall across the planar anisotropy) is typically 10 to 25 times the point load index Is(50). The ratio may vary for different rock types. Lower strength rocks often have lower ratios than higher strength rocks.

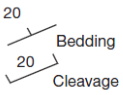
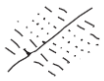
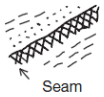
SUBSTANCE DESCRIPTIVE TERMS:

ROCK NAME	Simple rock names are used rather than precise geological classification.
PARTICLE SIZE	Grain size terms for sandstone are:
Coarse grained	Mainly 0.6mm to 2mm
Medium grained	Mainly 0.2mm to 0.6mm
Fine grained	Mainly 0.06mm (just visible) to 0.2mm
FABRIC	Terms for layering of penetrative fabric (eg. bedding, cleavage etc.) are:
Massive	No layering or penetrative fabric.
Indistinct	Layering or fabric just visible. Little effect on properties.
Distinct	Layering or fabric is easily visible. Rock breaks more easily parallel to layering of fabric.

TERRA INSIGHT

How to interpret the engineering logs in Your Report

Common defects observed in rock

Term	Definition	Diagram	Map Symbol	Graphic Log (Note 1)
Parting	A surface or crack across which the rock has little or no tensile strength. but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance. May be open or closed.			 (Note 2)
Joint	A surface or crack across which the rock has little or no tensile strength. but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance. May be open or closed.			 (Note 2)
Sheared Zone (Note 3)	Zone of rock substance 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.			
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.			
Crushed Seam (Note 3)	Seam with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock substance which may be more weathered than the host rock. The seam has soil properties			
Infilled Seam	Seam of soil substance usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1mm thick may be described as veneer or coating on joint surface.			
Extremely Weathered Seam	Seam of soil substance, often with gradational boundaries. Formad by weathering of the rock substance in place.			

Notes on Defects:

1. Usually borehole logs show the true dip of defects and face sketches and sections the apparent dip.
2. Partings and joints are not usually shown on the graphic log unless considered significant.

Sheared zones, sheared surfaces and crushed seams are faults in geological terms.

DEFECT SHAPE TERMS

Planar	The defect does not vary in orientation
Curved	The defect has a gradual change in orientation
Undulating	The defect has a wavy surface
Stepped	The defect has one or more well defined steps
Irregular	The defect has many sharp changes of orientation

Note: The assessment of defect shape is partly influenced by the scale of the observation.

ROUGHNESS TERMS

Slickensided	Grooved or striated surface, usually polished
Polished	Shiny smooth surface
Smooth	Smooth to touch. Few or no surface irregularities
Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.

COATING TERMS

Clean	No visible coating
Stained	No visible coating but surfaces are discoloured
Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
Veneer	A visible coating up to 1mm thick. Thicker soil material is usually described using appropriate defect terms (eg, infilled seam). Thicker rock strength material is usually described as a vein.

TERRA INSIGHT

Borehole No.
BH201
Page 1 of 2

Engineering Log - Borehole

Project No.: TERRA24-805

Client:	Supagas	Commenced:	06/09/2024
Project Name:	Geotechnical Investigation	Completed:	06/09/2024
Hole Location:	Supagas Bomaderry	Logged By:	JH
Hole Position:	282631.8 m E 6140712.6 m N MGA94 Zone 56	Checked By:	JH
Drill Model and Mounting:	Drill Rig	Inclination: -90°	RL Surface: 4.30 m
Hole Diameter:		Bearing:	Datum: AHD Operator: SC

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description: Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm	Structure and Additional Observations
AS						4.30	0		CL	Silty CLAY: low plasticity fines, brown, with organics and medium subangular grey gravels to 0.2m Possibly silt, appears powdery	D	F		TOPSOIL / FILL
									CL	Sandy Silty CLAY: low plasticity fines, orange brown to brown, fine sands	D - M	F		ALLUVIAL / FILL
						2.3	2		CL-CI	Sandy Silty CLAY: low to medium plasticity fines, orange brown with trace grey mottling, fine sands SPT1: as above, light grey and orange brown mottled, moist to west at base of SPT	D - M	F - St		
				SPT 3.00 m 3, 4, 4 N=8		0.3	4		CL-CI	Sandy Silty CLAY: low to medium plasticity fines, light grey brown/light orange brown, fine sands	M - W			4.50: Wet recovery, possibly perched groundwater above 5.5m
			06/09/24			-1.7	6		CI-CH	Silty CLAY: medium to high plasticity fines, light grey, red and orange brown mottled Grey bands of clay, with silty material in red/orange bands. Some wet recovery from mixing with above layers	M			RESIDUAL SOIL
AS				SPT 6.00 m 6, 9, 14 N=23					CI-CH	SPT2: Silty CLAY: high plasticity, light grey and orange brown Silty CLAY: medium to high plasticity fines, light grey, red and orange brown mottled				
				SPT 8.00 m 7, 12, 17 N=29		-3.7	8			SPT3: as above		VSt		
				SPT 10.00 m 8, 15, 19 N=34		-5.7	10			SPT4: as above				

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
BH201
Page 2 of 2

Engineering Log - Borehole

Project No.: TERRA24-805

Client:	Supagas	Commenced:	06/09/2024
Project Name:	Geotechnical Investigation	Completed:	06/09/2024
Hole Location:	Supagas Bomaderry	Logged By:	JH
Hole Position:	282631.8 m E 6140712.6 m N MGA94 Zone 56	Checked By:	JH

Drill Model and Mounting:	Drill Rig	Inclination:	-90°	RL Surface:	4.30 m		
Hole Diameter:		Bearing:		Datum:	AHD	Operator:	SC

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm	Structure and Additional Observations
AS						-7.7	12		CI-CH	Silty CLAY: medium to high plasticity fines, light grey, red and orange brown mottled *(continued)*				RESIDUAL SOIL
				SPT 12.00 m 10, 9, 12 N=21						SPT5: Sandy Silty CLAY: medium to high plasticity fines, light grey and orange brown mottled, very low strength rock in mottles		VSt		
						-9.7	14							
				SPT 16.00 m 5, 8, 9 N=17		-11.7	16			SPT6: Silty CLAY: high plasticity fines, grey and orange brown, trace of carbonaceous material		St		
				SPT 18.00 m 7, 7, 7 N=14		-13.7	18			SPT7: Silty CLAY: medium to high plasticity fines, grey brown to brown				18.00: Trace fine rounded gravels on tip of 18m auger
				SPT 20.00 m 4, 7, 9 N=16		-15.7	20			SPT8: Silty CLAY: high plasticity fines, dark grey, SPT dropped 50mm from own weight Hole Terminated at 20.00 m Target				

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
BH202
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA24-805

Client:	Supagas	Commenced:	05/09/2024
Project Name:	Geotechnical Investigation	Completed:	05/09/2024
Hole Location:	Supagas Bomaderry	Logged By:	XJ
Hole Position:	282624.6 m E 6140737.4 m N MGA94 Zone 56	Checked By:	JH
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: 4.30 m
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm Target	Structure and Additional Observations
						4.3	0.0		CL-CI	Sandy Silty CLAY: low to medium plasticity fines, light brown, fine sands, trace organics	D	F		TOPSOIL
						3.8	0.5		CI	Sandy Silty CLAY: medium plasticity fines, yellow brown with light brown and orange brown mottling, fine sands Possibly silt, appears powdery (dry)	D	VSt	3 9 11 14 10 10	ALLUVIAL / FILL
			Not Encountered			3.3	1.0						8 6 6	
						2.8	1.5		CI-CH	Silty CLAY: medium to high plasticity fines, yellow brown, orange red, light brown and red brown mottled becoming yellow brown and light grey mottled	M	St - VSt	6 5 4 5 5 6 6 6 6 6 6 7 6 8 8	
						2.3	2.0							
						1.8	2.5							
						1.3	3.0			Hole Terminated at 3.00 m Target				

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
BH203
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA24-805

Client:	Supagas	Commenced:	05/09/2024
Project Name:	Geotechnical Investigation	Completed:	05/09/2024
Hole Location:	Supagas Bomaderry	Logged By:	XJ
Hole Position:	282627.7 m E 6140765.8 m N MGA94 Zone 56	Checked By:	JH
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: 4.70 m
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
						4.2	0.5		CL-CI	Sandy Silty CLAY: low to medium plasticity fines, brown/dark brown grading to light brown, fine sands, trace organics to 0.2m		F	3	TOPSOIL / FILL
													4	
													8	
											D		8	
										Possibly silt		St - VSt	10	
													16	
													13	
													10	
						3.7	1.0		CI-CH	Silty CLAY: medium to high plasticity fines, light brown with orange mottling and some red/orange mottling			7	ALLUVIAL
													5	
											D - M		4	
													5	
													5	
													4	
						3.2	1.5						3	
									CI-CH	Silty CLAY: medium to high plasticity fines, red brown and light grey mottled		F - St	4	
													4	
													4	
											M		8	
						2.7	2.0						9	
													8	
													6	
									CI-CH	Silty CLAY: medium to high plasticity fines, light red brown/orange brown and light grey mottled			7	RESIDUAL SOIL
													10	
						2.2	2.5						10	
											M	St - VSt	10	
														2.80: Yellow brown mottled
						1.7	3.0			Hole Terminated at 3.00 m Target				

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
BH204
Page 1 of 2

Engineering Log - Borehole

Project No.: TERRA24-805

Client:	Supagas	Commenced:	05/09/2024
Project Name:	Geotechnical Investigation	Completed:	05/09/2024
Hole Location:	Supagas Bomaderry	Logged By:	JH
Hole Position:	282627.2 m E 6140789.6 m N MGA94 Zone 56	Checked By:	JH
Drill Model and Mounting:	Drill Rig	Inclination: -90°	RL Surface: 4.20 m
Hole Diameter:		Bearing:	Datum: AHD Operator: SC

Drilling Information									Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm	Structure and Additional Observations
AS									CI	Silty CLAY: medium plasticity fines, dark brown, with organics, trace fine sand	D	F		TOPSOIL / FILL
									CI	Silty CLAY: medium plasticity fines, brown and orange mottled, trace fine sand	D - M			ALLUVIAL / FILL
				SPT 1.00 m 4, 5, 6 N=11					CI-CH	Silty CLAY: medium to high plasticity fines, brown and orange mottled, trace fine sand				
						2.2	2				M			
				SPT 2.50 m 3, 3, 6 N=9					CH	Silty CLAY: high plasticity fines, light grey with orange mottling and trace red mottling		St		
			05/09/24								W			
				SPT 4.00 m 3, 4, 6 N=10		0.2	4			SPT3: as above, wet material recovered in SPT				
										Trace fine red rounded gravels from 4.5-5.0m	M			4.50: Material coming up as wet ribbons
														5.00: Low recovery
				SPT 5.50 m 4, 11, 14 N=25		-1.8	6		CI-CH	SPT4: as above, wet material recovered in SPT Silty CLAY: high plasticity fines, light grey with orange mottling and trace red mottling				RESIDUAL SOIL
AS				SPT 7.00 m 7, 9, 12 N=21						SPT5: as above		VSt		
						-3.8	8							8.00: Softer material
				SPT 8.50 m 5, 7, 10 N=17						SPT6: as above, light grey with orange brown mottling				
						-5.8	10							9.80: Harder material
				SPT 10.00 m 5, 8, 12 N=20						SPT7: as above, orange brown bands, possible rock fabric				
									CI-CH					

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
BH204
Page 2 of 2

Engineering Log - Borehole

Project No.: TERRA24-805

Client:	Supagas	Commenced:	05/09/2024
Project Name:	Geotechnical Investigation	Completed:	05/09/2024
Hole Location:	Supagas Bomaderry	Logged By:	JH
Hole Position:	282627.2 m E 6140789.6 m N MGA94 Zone 56	Checked By:	JH
Drill Model and Mounting:	Drill Rig	Inclination: -90°	RL Surface: 4.20 m
Hole Diameter:		Bearing:	Datum: AHD Operator: SC

Drilling Information									Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm	Structure and Additional Observations
AS									CI-CH	Silty CLAY: medium to high plasticity fines, grey with orange ironstaining *(continued)*				RESIDUAL SOIL
				SPT 11.50 m 7, 10, 12 N=22		-7.8	12			SPT8: as above				
				SPT 13.00 m 8, 11, 15 N=26		-9.8	14			SPT9: as above, pocket penetrometer reads 2.5		VSt		
				SPT 14.50 m 6, 8, 15 N=26						SPT10: as above				
				SPT 16.00 m 5, 5, 7 N=12		-11.8	16			SPT11: as above		St		
				SPT 17.50 m 2, 4, 7 N=11		-13.8	18			SPT12: as above Hole Terminated at 17.50 m Target				
						-15.8	20							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
BH205
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA24-805

Client:	Supagas	Commenced:	05/09/2024
Project Name:	Geotechnical Investigation	Completed:	05/09/2024
Hole Location:	Supagas Bomaderry	Logged By:	XJ
Hole Position:	282583.7 m E 6140766.9 m N MGA94 Zone 56	Checked By:	JH
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: 4.90 m
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description: Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
			Not Encountered			4.4	0.5		CL-CI	Sandy Silty CLAY: low to medium plasticity fines, light brown, fine sands	D	F	2	TOPSOIL / FILL
													4	
										Possibly silt		St - VSt	6	
													8	
													6	
													8	
												F - St	3	
													3	
													3	
						3.9	1.0		ML/CL	Clayey SILT/Silty CLAY: low plasticity fines, dark grey with orange mottling	M - W	VS - S	6	ALLUVIAL / FILL
													1	
									CL-CI	Silty CLAY: low to medium plasticity fines, yellow brown, light grey and orange			2	
													0	
													1	
						3.4	1.5				M - W		1	
												F	3	
													3	
													2	
													7	
						2.9	2.0		CI-CH	Silty CLAY: medium to high plasticity fines, yellow brown and light grey with orange/red mottling	M	St - VSt	4	RESIDUAL SOIL
													6	
													8	
													8	
													10	
						2.4	2.5		CI-CH	Silty CLAY: medium to high plasticity fines, light red brown/orange brown			12	2.80: Becoming yellow brown and light grey mottled
											M		12	
						1.9	3.0			Hole Terminated at 3.00 m Target				

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

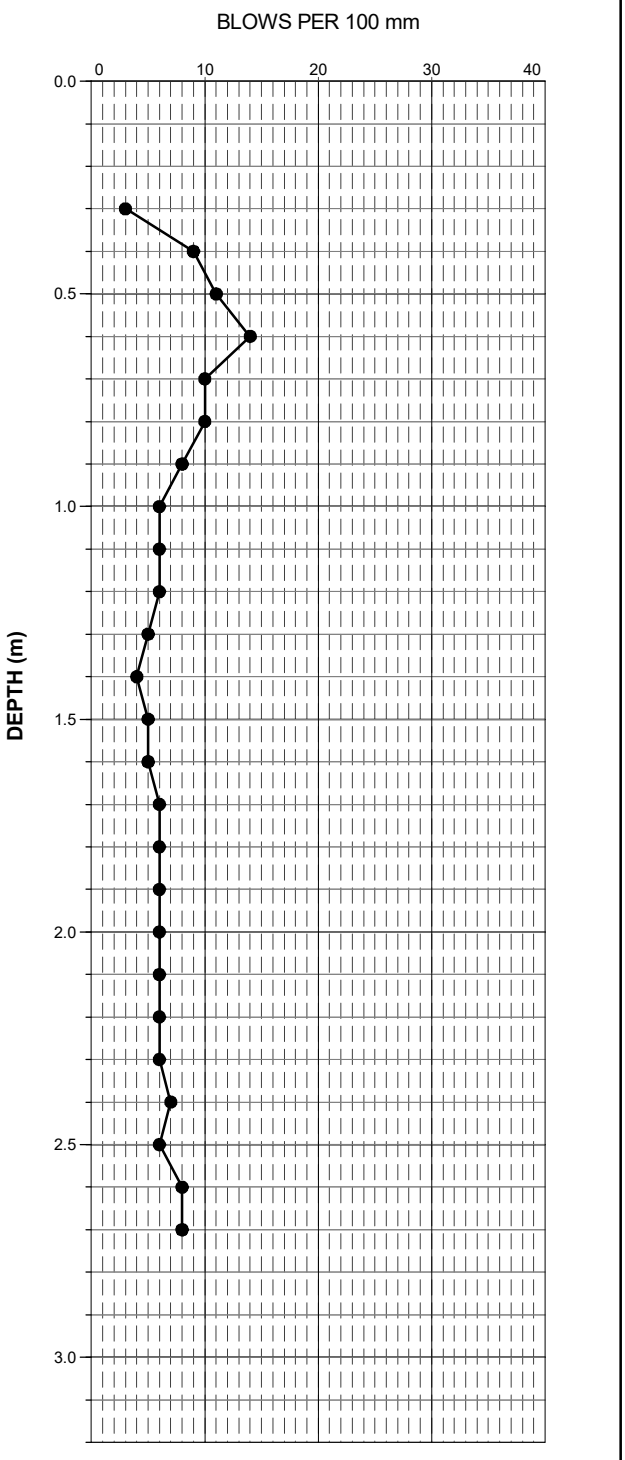
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **BH202**

CLIENT	: Supagas	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282624.6 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140737.4 m	LOGGED BY	: XJ
LOCATION	: Supagas Bomaderry	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 05/09/2024
PROJECT No.	: TERRA24-805	GROUND RL	: 4.30 m AHD		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.30	3
0.40	9
0.50	11
0.60	14
0.70	10
0.80	10
0.90	8
1.00	6
1.10	6
1.20	6
1.30	5
1.40	4
1.50	5
1.60	5
1.70	6
1.80	6
1.90	6
2.00	6
2.10	6
2.20	6
2.30	6
2.40	7
2.50	6
2.60	8
2.70	8



Final Depth (m)	2.60

RIG	:	CHECKED BY	: JH	REMARK
INCLINATION	:	CHECKED DATE	: 05/09/2024	Target
AZIMUTH	:	APPROVED BY	: KG	
HOLE DIA.	:	APPROVED DATE	: 05/09/2024	

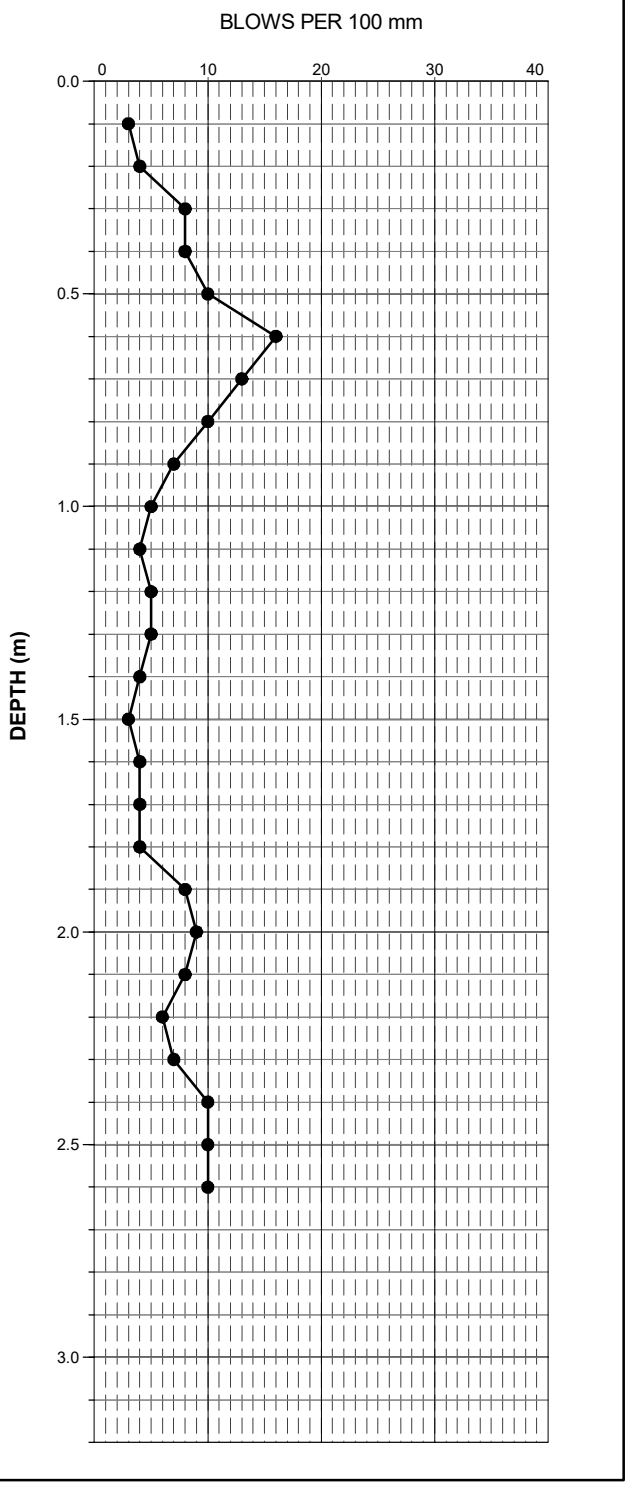
TERRA INSIGHT

9 KG DYNAMIC CONE PENETROMETER

Hole ID **BH203**

CLIENT	: Supagas	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282627.7 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140765.8 m	LOGGED BY	: XJ
LOCATION	: Supagas Bomaderry	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 05/09/2024
PROJECT No.	: TERRA24-805	GROUND RL	: 4.70 m AHD		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	3
0.20	4
0.30	8
0.40	8
0.50	10
0.60	16
0.70	13
0.80	10
0.90	7
1.00	5
1.10	4
1.20	5
1.30	5
1.40	4
1.50	3
1.60	4
1.70	4
1.80	4
1.90	8
2.00	9
2.10	8
2.20	6
2.30	7
2.40	10
2.50	10
2.60	10



Final Depth (m)	2.50

RIG	:	CHECKED BY	: JH	REMARK
INCLINATION	:	CHECKED DATE	: 05/09/2024	Target
AZIMUTH	:	APPROVED BY	: KG	
HOLE DIA.	:	APPROVED DATE	: 05/09/2024	

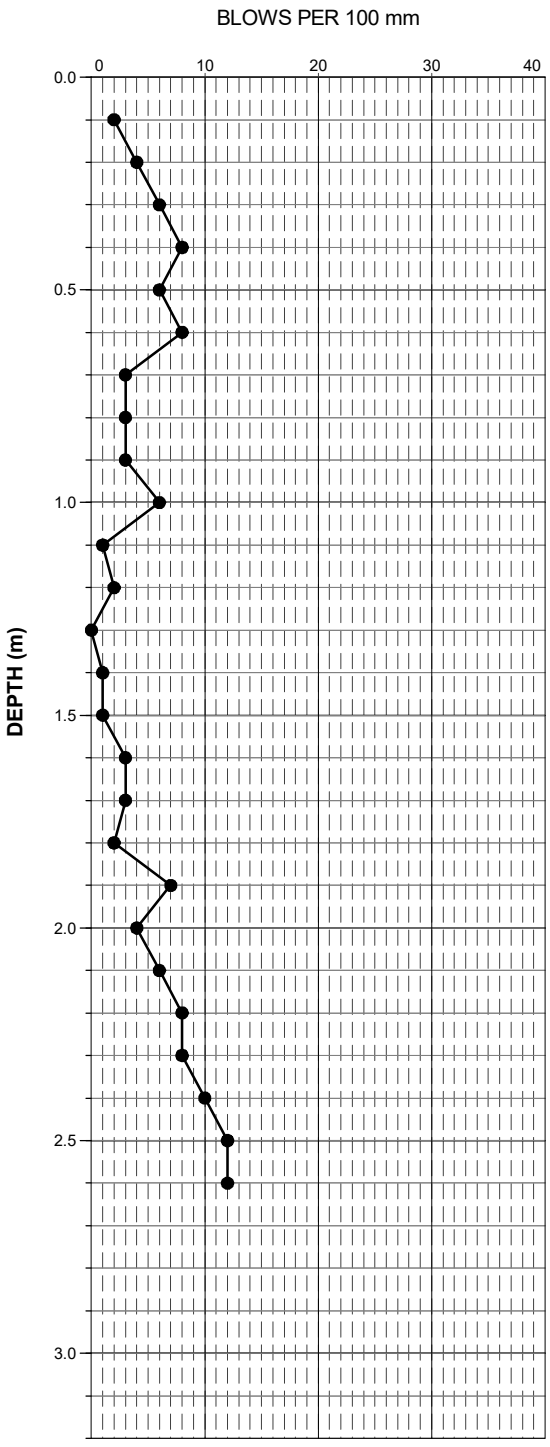
TERRA INSIGHT

9 KG DYNAMIC CONE PENETROMETER

Hole ID **BH205**

CLIENT	: Supagas	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282583.7 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140766.9 m	LOGGED BY	: XJ
LOCATION	: Supagas Bomaderry	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 05/09/2024
PROJECT No.	: TERRA24-805	GROUND RL	: 4.90 m AHD		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	2
0.20	4
0.30	6
0.40	8
0.50	6
0.60	8
0.70	3
0.80	3
0.90	3
1.00	6
1.10	1
1.20	2
1.30	0
1.40	1
1.50	1
1.60	3
1.70	3
1.80	2
1.90	7
2.00	4
2.10	6
2.20	8
2.30	8
2.40	10
2.50	12
2.60	12



Final Depth (m)	2.50

RIG	:	CHECKED BY	: JH	REMARK
INCLINATION	:	CHECKED DATE	: 05/09/2024	Target
AZIMUTH	:	APPROVED BY	: KG	
HOLE DIA.	:	APPROVED DATE	: 05/09/2024	

TERRA INSIGHT

Borehole No.
TP01
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	283193.5 m E 6141015.3 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
X				S1 0.00-0.30 m			0		CL-Cl	Organic Silty CLAY: low to medium plasticity, dark brown	M - W	VS	0 0	TOPSOIL
				S2 0.30-0.90 m			0.5		CL-Cl	Sandy Silty CLAY: low to medium plasticity, brown with dull orange and dark grey mottling, fine to medium sand	M	S	1 1 2 2 2 3	ALLUVIAL SOIL 0.40: PP=1.5-1.75
			▽	S3 0.90-1.50 m			1.0		ML	Sandy Clayey SILT/Clayey Silty SAND: fine to medium sand, light grey and orange mottled, low plasticity	W	St	2 3 5 5	
									CI-CH	Silty CLAY: medium to high plasticity, light grey, orange and red mottled, with fine sand	M	St - VSt	5 7	1.30: PP=1.25-1.5
							1.5			Hole Terminated at 1.50 m Target			10 10 11	
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
TP02
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	283101.4 m E 6140987.2 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
X							0		ML	Organic Clayey SILT: low plasticity, dark brown, with fine sand, coarse angular gravels and rootlets Cobbles up to 200mm near surface	M	VS - S	0 2 4	TOPSOIL
				B1 0.40-0.90 m			0.5		CL-Cl	Sandy Silty CLAY: low to medium plasticity, dull brown, grey and orange mottled, fine to medium sand Grading into following layer	D	St	3 5 5 7 7	ALLUVIAL SOIL 0.50: PP=2.0-3.5
							1.0		Cl-CH	Silty CLAY: medium to high plasticity, light grey, orange and red mottled, with fine sand	M	St	5 5 5 4 5	1.10: PP=2.0-2.5
							1.5			Hole Terminated at 1.40 m Target			5 9 8 8 8	
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
TP03
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	283032.9 m E 6140969.4 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description: Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
X				S1 0.00-0.40 m					ML	Organic SILT: low plasticity, dark brown to grey brown, with fine to medium sand	D - M	VS - S	0 1 2	TOPSOIL
				S2 0.40-1.30 m			0.5		Cl	Sandy Silty CLAY: medium plasticity, dull brown, grey and orange mottled, fine sand	D - M	St	2 4 3 4 4 3 4 4 4	ALLUVIAL SOIL 0.50: PP=2.0-4.0
							1.0			Grading into following layer			4	
				S3 1.30-1.50 m					Cl-CH	Silty CLAY: medium to high plasticity, light brown with grey, orange and red mottling, with fine to medium sand	M	St	5	1.40: PP=3.0-3.5
							1.5			Hole Terminated at 1.50 m Target			5 5 8 7	
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
TP04
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	282936.7 m E 6140932.8 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
X							0.0		ML	Organic Sandy SILT: low plasticity, dark brown, with rootlets	D - M	S	1 2 2 2	TOPSOIL
										Grading into following layer				
							0.5		CL-Cl	Sandy Silty CLAY: low to medium plasticity, brown with grey and orange mottling, fine sand, trace black flecks	D - M	St	5 5 6 7 6 7 6	ALLUVIAL SOIL 0.60: PP>4.0
							1.0							
									Cl-CH	Silty CLAY: medium to high plasticity, grey, orange and red mottled	M	St	7 6 6	1.20: PP>4.0
							1.5			Hole Terminated at 1.50 m Target			5 5 5 9 6	
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
TP05
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	282851.9 m E 6140895.0 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description: Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
X			▽				0.0		ML	Organic Clayey SILT: low plasticity, dark brown, with fine sand	M	S	1 1	TOPSOIL
							0.5		CL-CI	Sandy Silty CLAY: low to medium plasticity, dull brown with yellow brown and orange mottling, fine to medium sand	M	S - F	1 2 1 3 2 2 2 5	ALLUVIAL SOIL 0.50: PP=1.5-2.0
							1.0		CL	Clayey SILT/Silty CLAY: low plasticity, light grey with yellow mottling	W	St	6 4	1.10: Slow seepages
									CI-CH	Silty CLAY: medium to high plasticity, light grey with yellow/orange mottling, some red mottling	M	St - VSt	6 6	
							1.5			Hole Terminated at 1.50 m Target			10 12 13	
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
TP06
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	282779.4 m E 6140866.1 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm (Target)	Structure and Additional Observations
X				S1 0.00-0.30 m					ML	Organic Clayey SILT: low plasticity, dark brown, with fine sand	M	S	1 2	TOPSOIL
				S2 0.30-1.00 m			0.5		CL-Cl	Sandy Silty CLAY: low to medium plasticity, dull brown with yellow brown and orange mottling, fine to medium sand	D - M	S - F	1 2 2 2 3	ALLUVIAL SOIL 0.50: PP=2.0-2.5
				B1 0.80-1.30 m S3 1.00-1.50 m			1.0		CL	Silty CLAY: medium to high plasticity, light grey with yellow/orange mottling, some red mottling	M	St - VSt	2 3 3 4 4 6 8	0.80: PP=2.0-2.5 1.20: PP=2.0-3.0
							1.5			Hole Terminated at 1.50 m Target			10 15 17	
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
TP07
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	282564.0 m E 6140762.9 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm Target	Structure and Additional Observations
X							0.0		ML	Organic Sandy SILT: low plasticity, dark brown, fine to medium sand, with fine to coarse angular gravel, with clay and rootlets	M	S	1 3	TOPSOIL
				B1 0.50-0.80 m			0.5		CI	Sandy Silty CLAY: medium plasticity, dark brown, grey and orange mottled, with fine to medium grey angular gravel, trace fine organics and rootlets, trace angular cobbles (up to 150mm) trace foreign material (brick fragment)	D	St - VSt	5 6 8 11 14	FILL
							1.0			Hole Terminated at 0.80 m Possible services			8 9 8 8 8	0.80: TP terminated due to possible service nearby
							1.5							
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

TERRA INSIGHT

Borehole No.
TP08
Page 1 of 1

Engineering Log - Borehole

Project No.: TERRA25-1264

Client:	Babagge	Commenced:	18/02/2026
Project Name:	Geotechnical Investigation	Completed:	18/02/2026
Hole Location:	C02 Plant and Gas Pipeline	Logged By:	XJ
Hole Position:	282503.2 m E 6140734.4 m N MGA94 Zone 56	Checked By:	KG
Drill Model and Mounting:	1.8t excavator	Inclination: -90°	RL Surface: No survey
Hole Diameter:		Bearing:	Datum: AHD Operator: GF

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Group Symbol	Material Description Soil name, plasticity/grainsize characteristics, colour, description of secondary component. Minor components, i.e., some/trace . . . other soil substance observations	Moisture Condition	Consistency Relative Density	DCP NO OF BLOWS PER 100 mm Target	Structure and Additional Observations
X							0.0			Organic Sandy SILT: low plasticity, dark brown, fine to medium sand, trace fine to coarse subangular gravel, trace foreign material (tile fragment)	M	S	1 2	TOPSOIL
										Sandy Silty CLAY: low to medium plasticity, orange brown with grey, orange red and orange mottling	D - M	St	6 9	FILL
							0.5			Sandy Silty CLAY/Sandy Clayey SILT: low plasticity, dull brown, with rootlets and brown organic fragments, with medium to coarse subangular shale/siltstone gravels, trace foreign material (brick fragment)	D - M	VSt	8 8 8	
							1.0			Sandy Silty CLAY: low plasticity, brown grading to dull yellow brown with orange mottling, fine to medium sand	M	St	11 6 6 7	OLD TOPSOIL / ALLUVIAL SOIL
										Hole Terminated at 1.20 m Target			9 7	
							1.5							
							2.0							
							2.5							

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
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Consistency/Relative Density
VS - Very Soft
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VSt - Very Stiff
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Fr - Friable
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

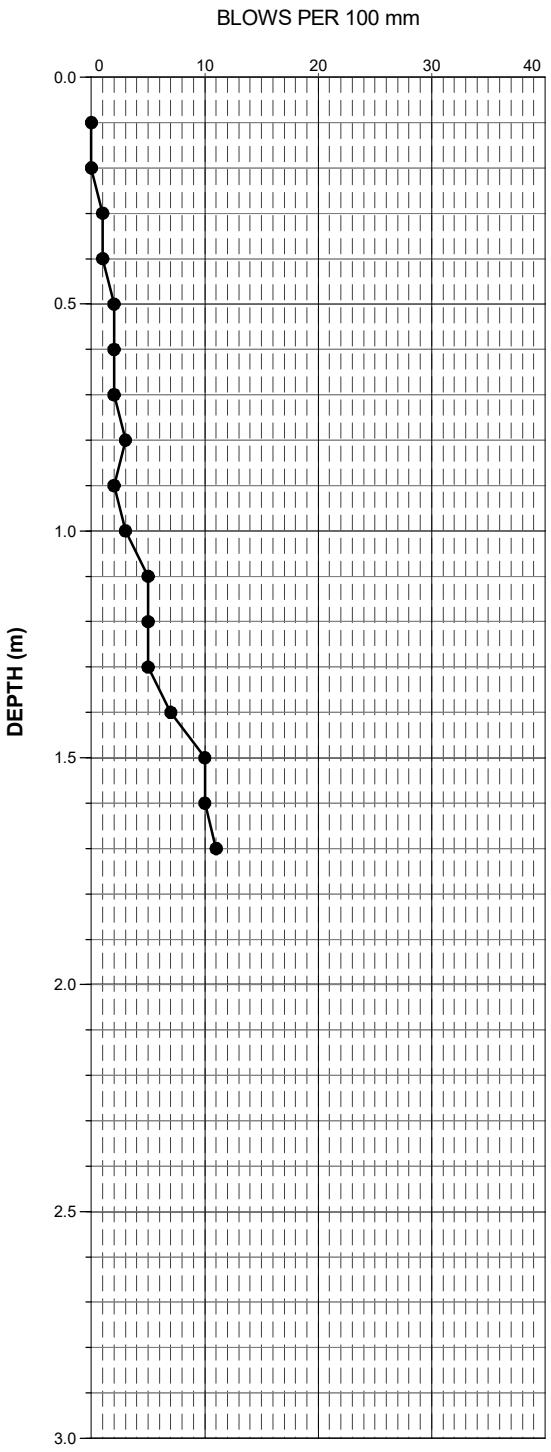
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP01**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283193.5 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6141015.3 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	0
0.20	0
0.30	1
0.40	1
0.50	2
0.60	2
0.70	2
0.80	3
0.90	2
1.00	3
1.10	5
1.20	5
1.30	5
1.40	7
1.50	10
1.60	10
1.70	11



Final Depth (m)	1.60

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

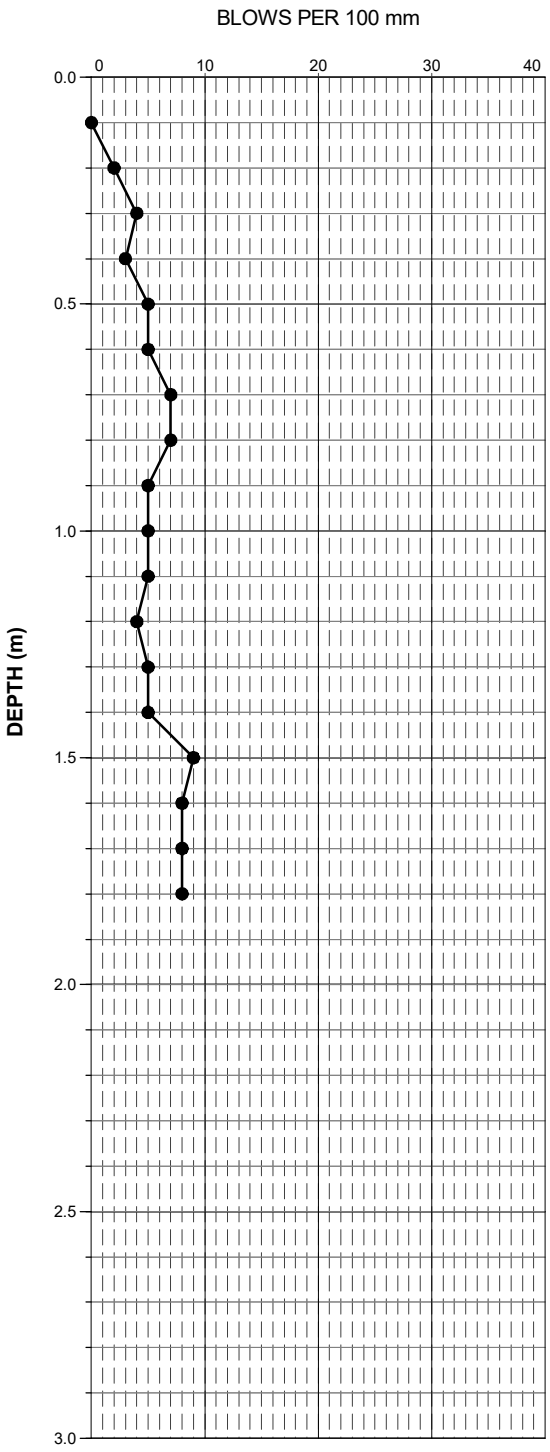
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP02**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283101.4 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140987.2 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	0
0.20	2
0.30	4
0.40	3
0.50	5
0.60	5
0.70	7
0.80	7
0.90	5
1.00	5
1.10	5
1.20	4
1.30	5
1.40	5
1.50	9
1.60	8
1.70	8
1.80	8



Final Depth (m)	1.70

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

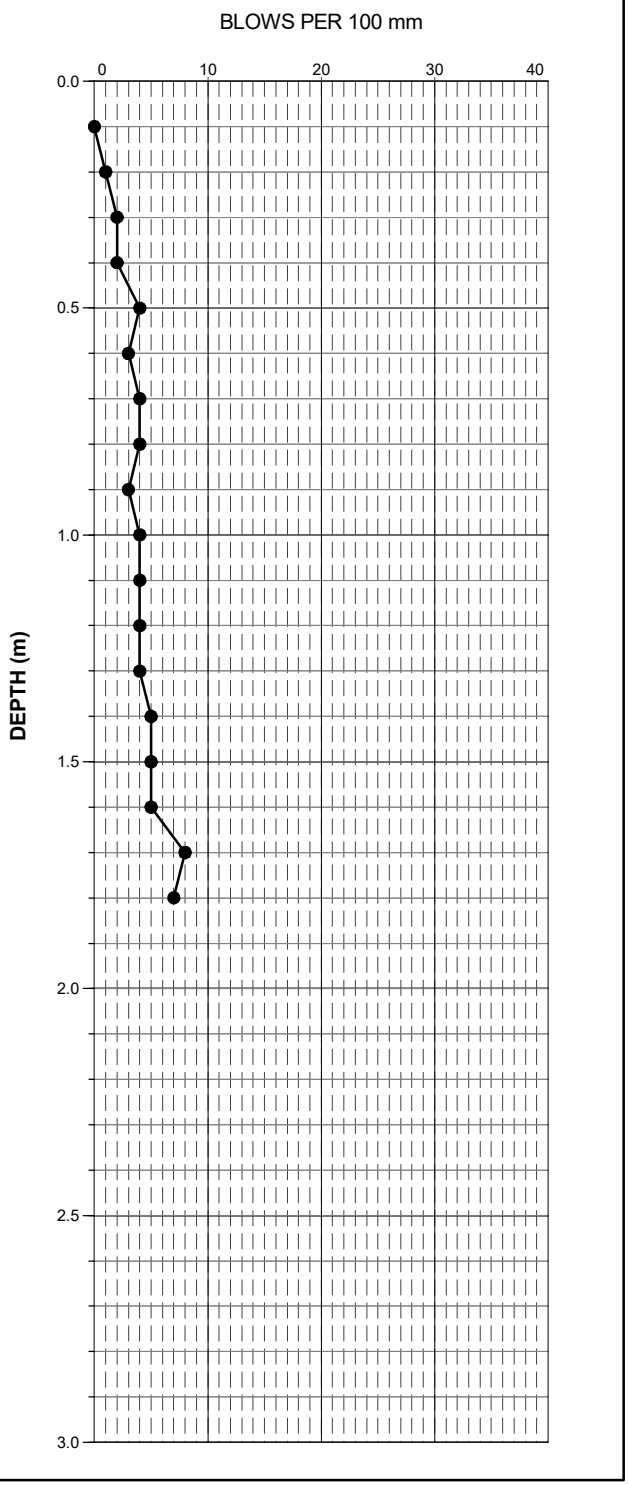
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP03**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283032.9 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140969.4 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	0
0.20	1
0.30	2
0.40	2
0.50	4
0.60	3
0.70	4
0.80	4
0.90	3
1.00	4
1.10	4
1.20	4
1.30	4
1.40	5
1.50	5
1.60	5
1.70	8
1.80	7



Final Depth (m)	1.70

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

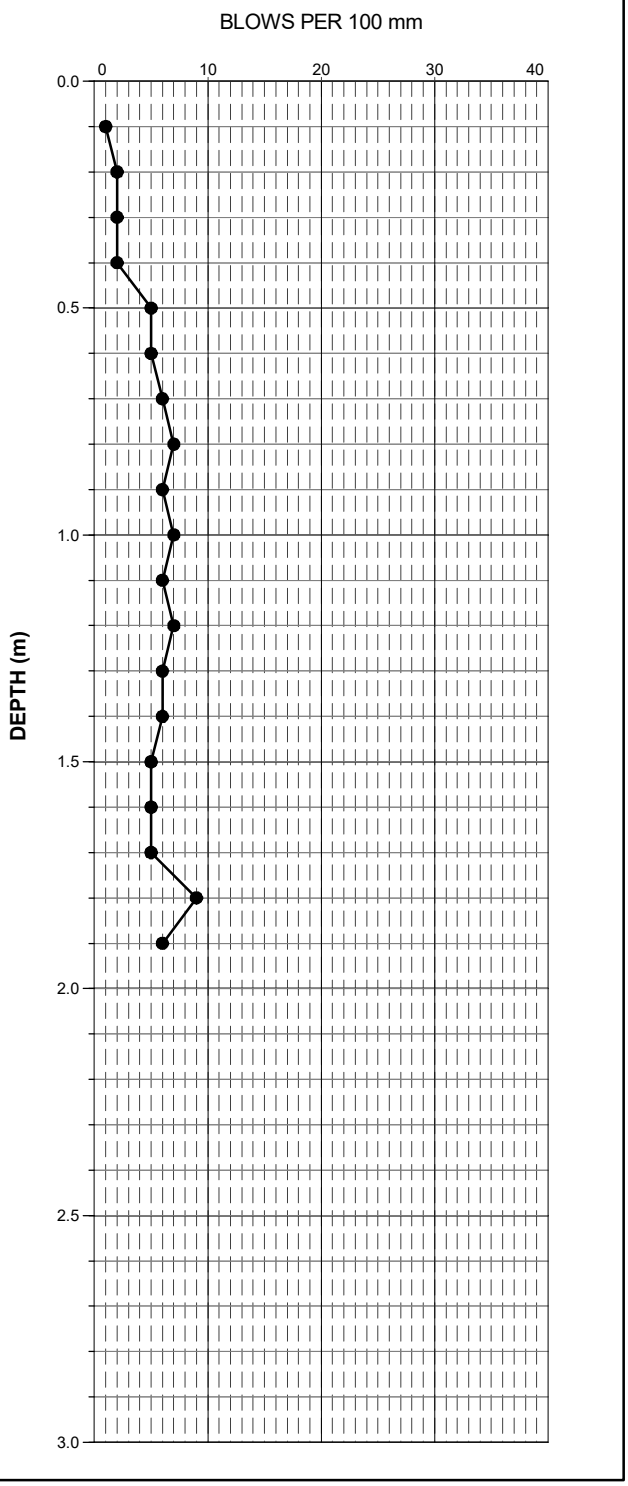
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP04**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282936.7 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140932.8 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	1
0.20	2
0.30	2
0.40	2
0.50	5
0.60	5
0.70	6
0.80	7
0.90	6
1.00	7
1.10	6
1.20	7
1.30	6
1.40	6
1.50	5
1.60	5
1.70	5
1.80	9
1.90	6



Final Depth (m)	1.80

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

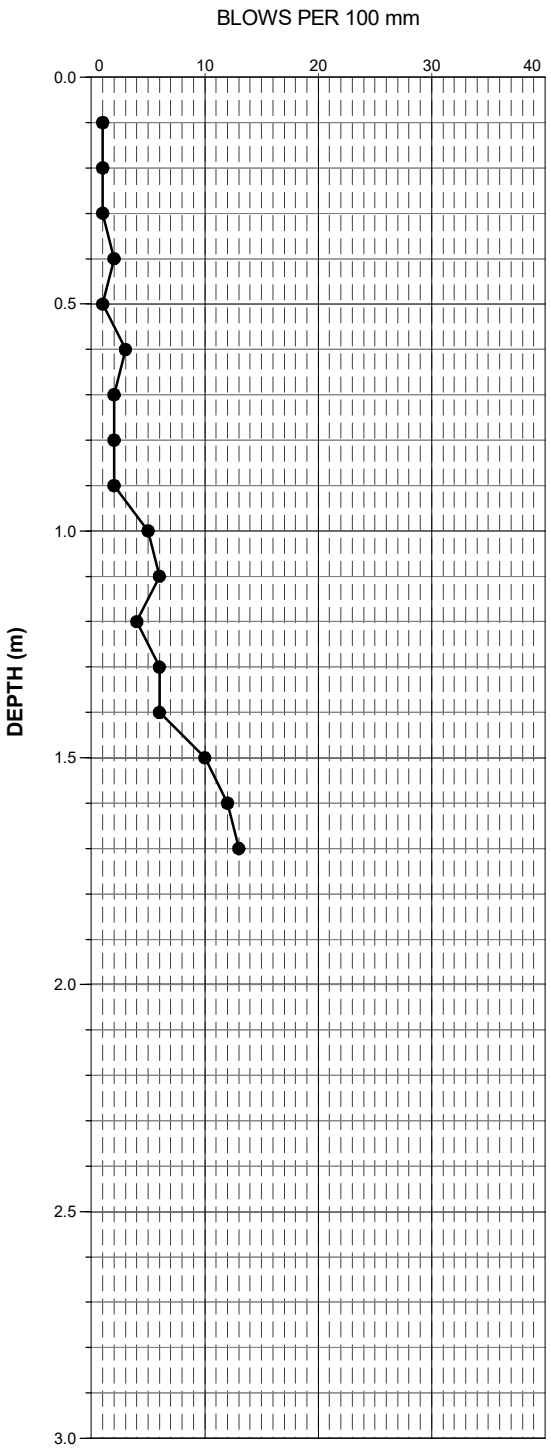
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP05**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282851.9 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140895.0 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	1
0.20	1
0.30	1
0.40	2
0.50	1
0.60	3
0.70	2
0.80	2
0.90	2
1.00	5
1.10	6
1.20	4
1.30	6
1.40	6
1.50	10
1.60	12
1.70	13



Final Depth (m)	1.60

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

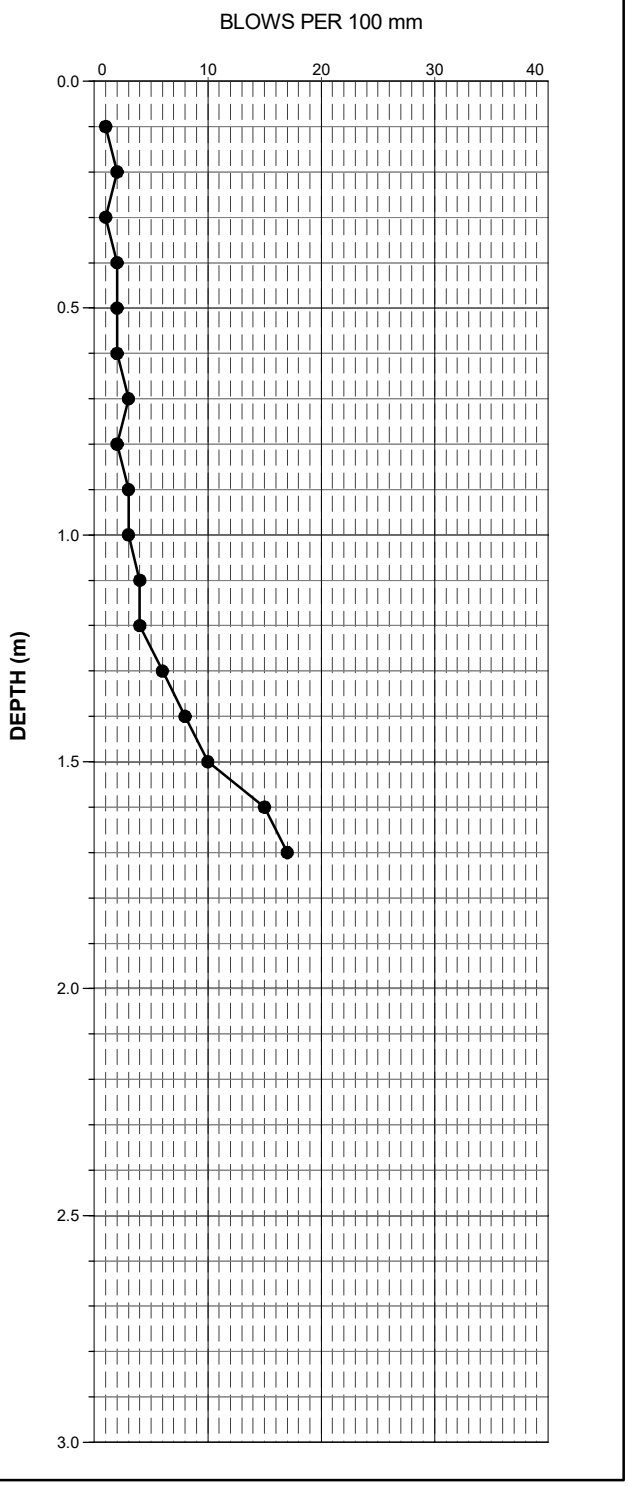
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP06**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282779.4 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140866.1 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	1
0.20	2
0.30	1
0.40	2
0.50	2
0.60	2
0.70	3
0.80	2
0.90	3
1.00	3
1.10	4
1.20	4
1.30	6
1.40	8
1.50	10
1.60	15
1.70	17



Final Depth (m)	1.60

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

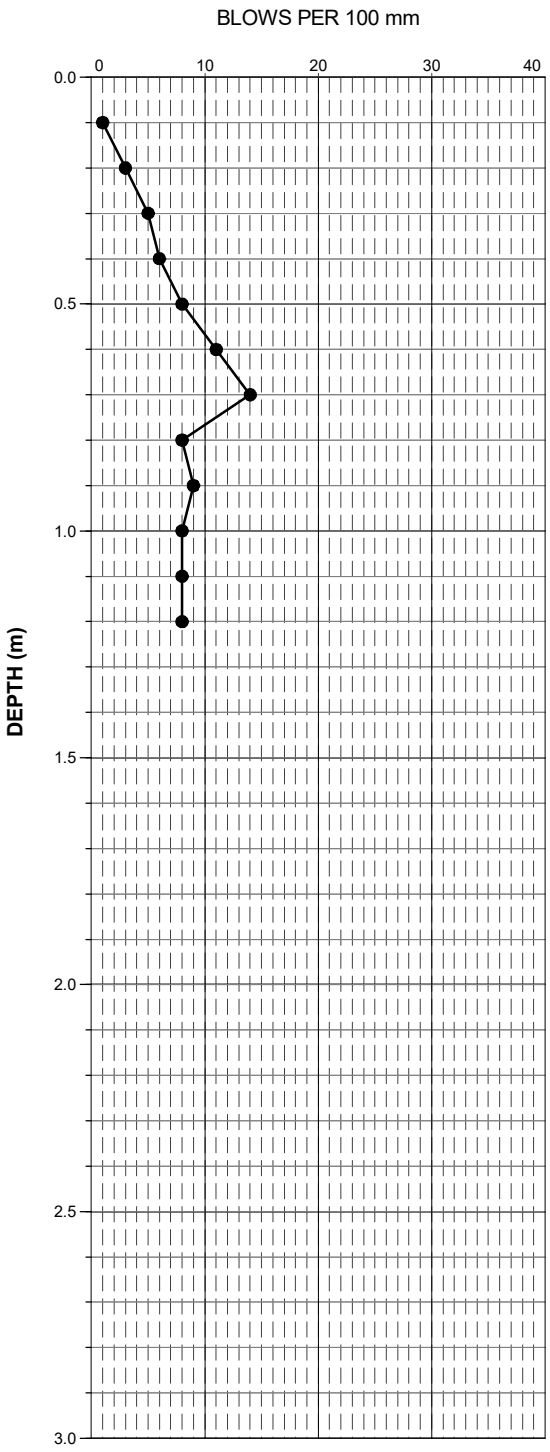
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP07**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282564.0 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140762.9 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	1
0.20	3
0.30	5
0.40	6
0.50	8
0.60	11
0.70	14
0.80	8
0.90	9
1.00	8
1.10	8
1.20	8



Final Depth (m)	1.10

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

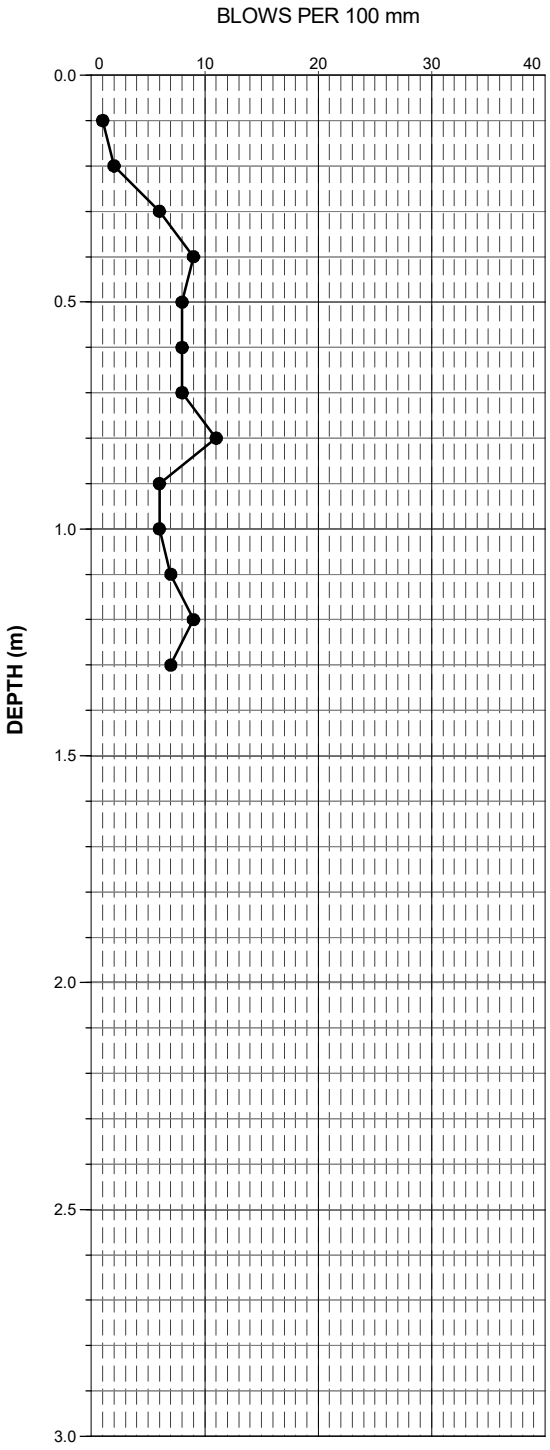
9 KG DYNAMIC CONE PENETROMETER

TERRA INSIGHT

Hole ID **TP08**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 282503.2 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140734.4 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 18/02/2026
PROJECT No.	: TERRA25-1264	GROUND RL	:		

DEPTH (m)	NO OF BLOWS PER 100 mm
0.10	1
0.20	2
0.30	6
0.40	9
0.50	8
0.60	8
0.70	8
0.80	11
0.90	6
1.00	6
1.10	7
1.20	9
1.30	7



Final Depth (m)	1.20

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 11/03/2026	Target
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

TP01

TP02

TP03

TP04

revision	description	drawn	approved	date			client:	Babagge	
	Plate1	XJ	KEG	11/03/2026	TERRA INSIGHT		project:	C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation	
					scale	NTS	Title	Test Pit Template	
					original size	A3	project no: TERRA25-1264		Plate no:1

TP05

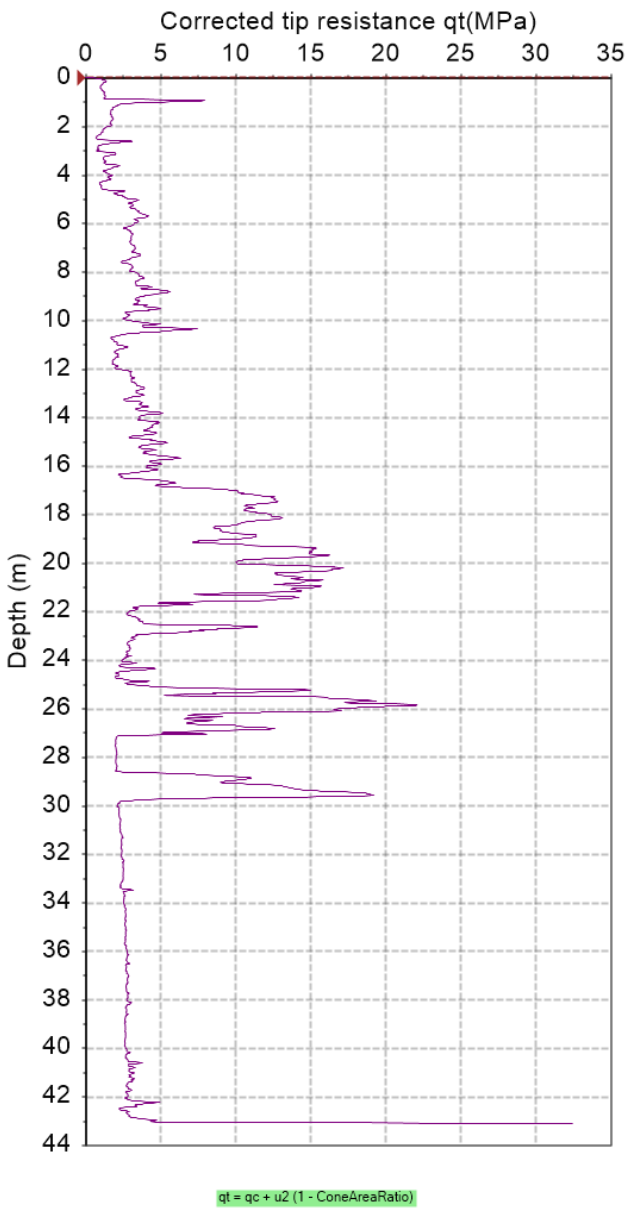
TP06

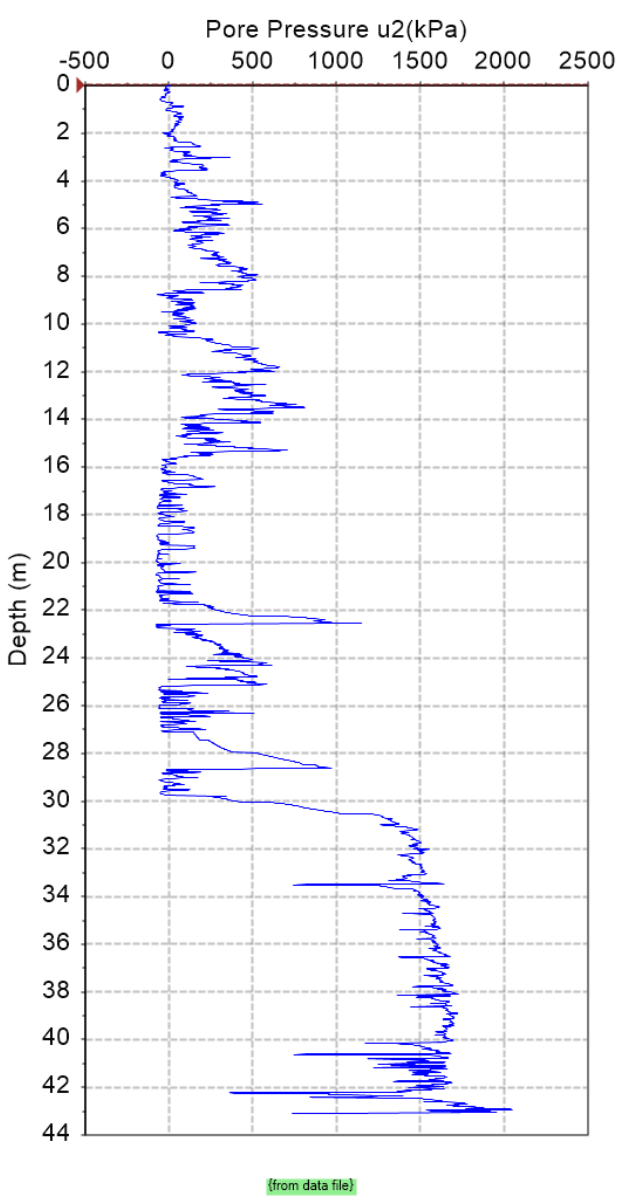
TP07

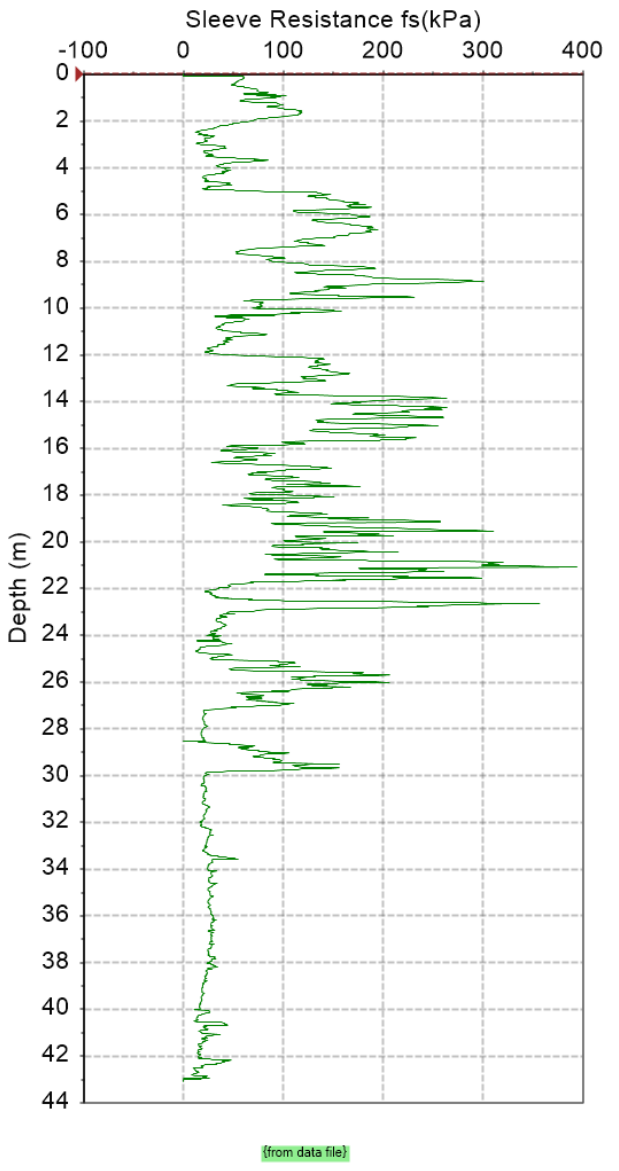
TP08

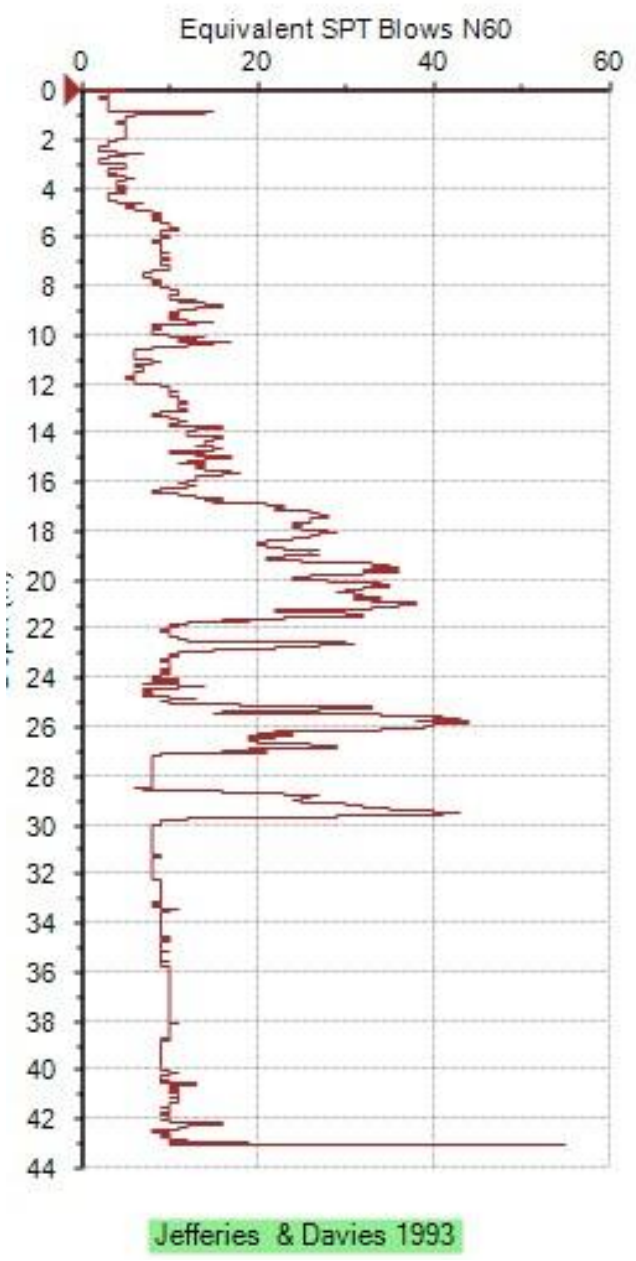
description	drawn	approved	date			client:	Babagge	
Plate2	XJ	KEG	11/03/2026	TERRA INSIGHT		project:	C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation	
				scale	NTS	Title	Test Pit Template	
				original size	A3	project no: TERRA26-1264		Plate no:2

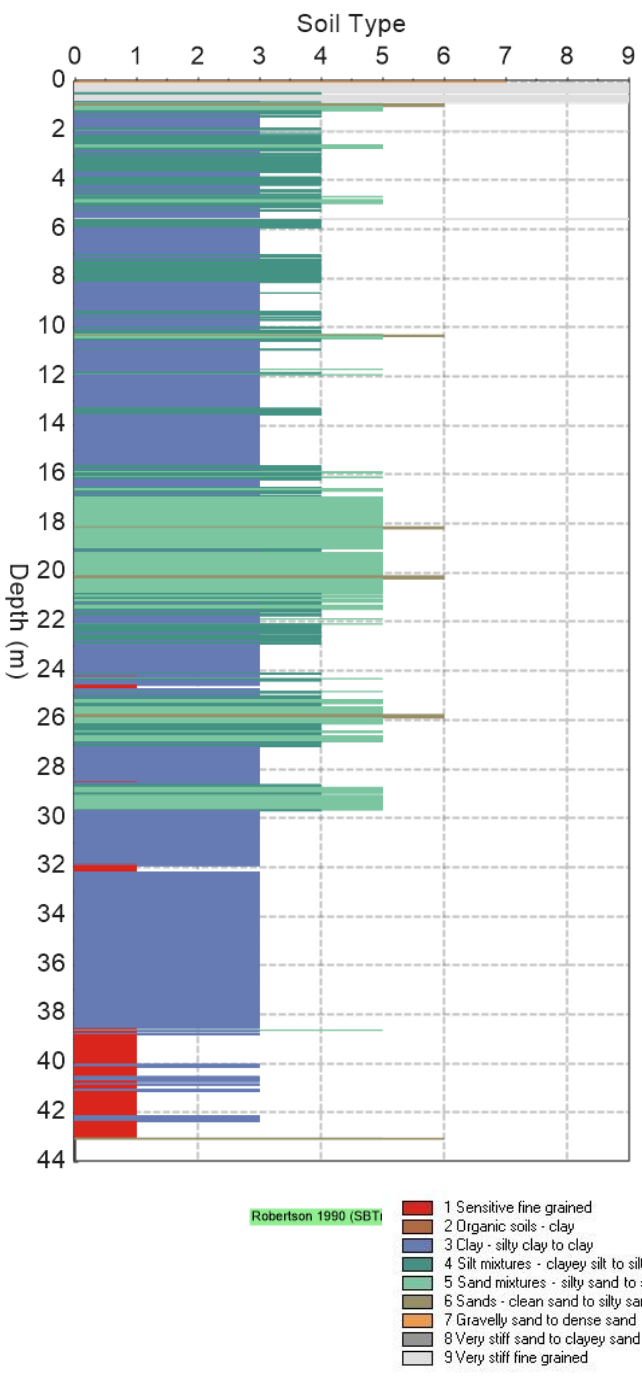
Appendix D: CPT Test Results

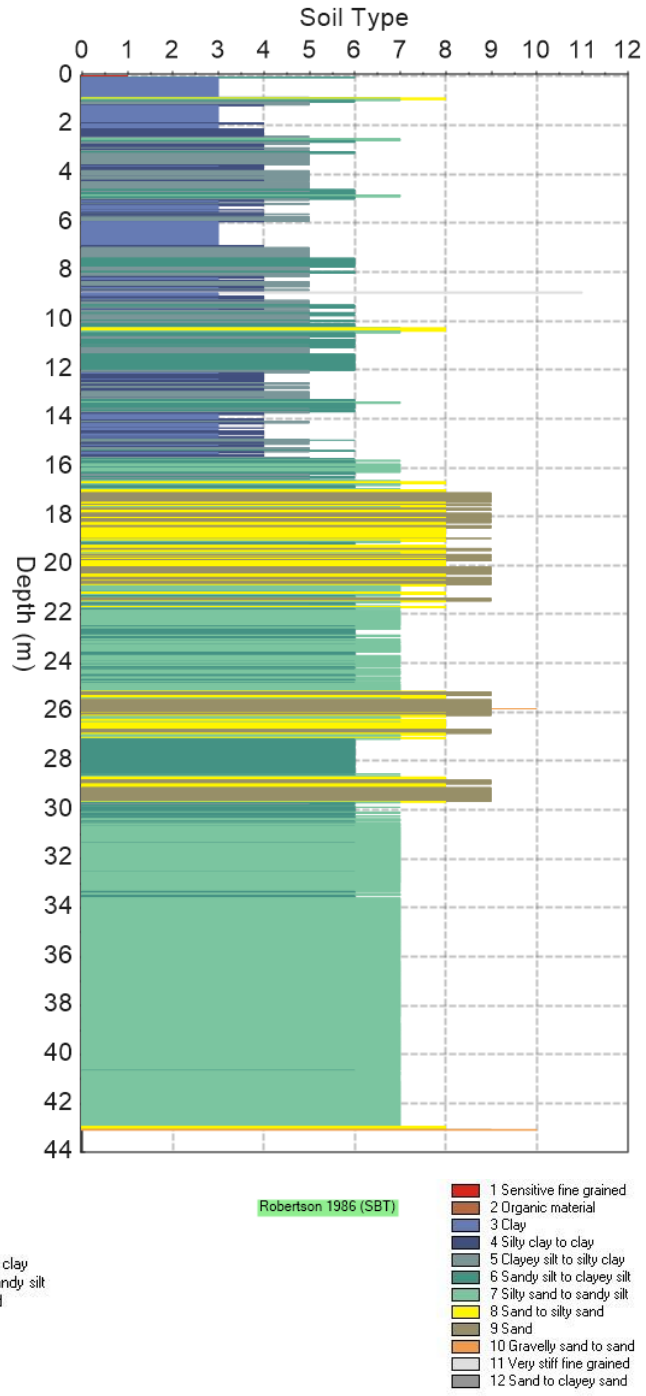








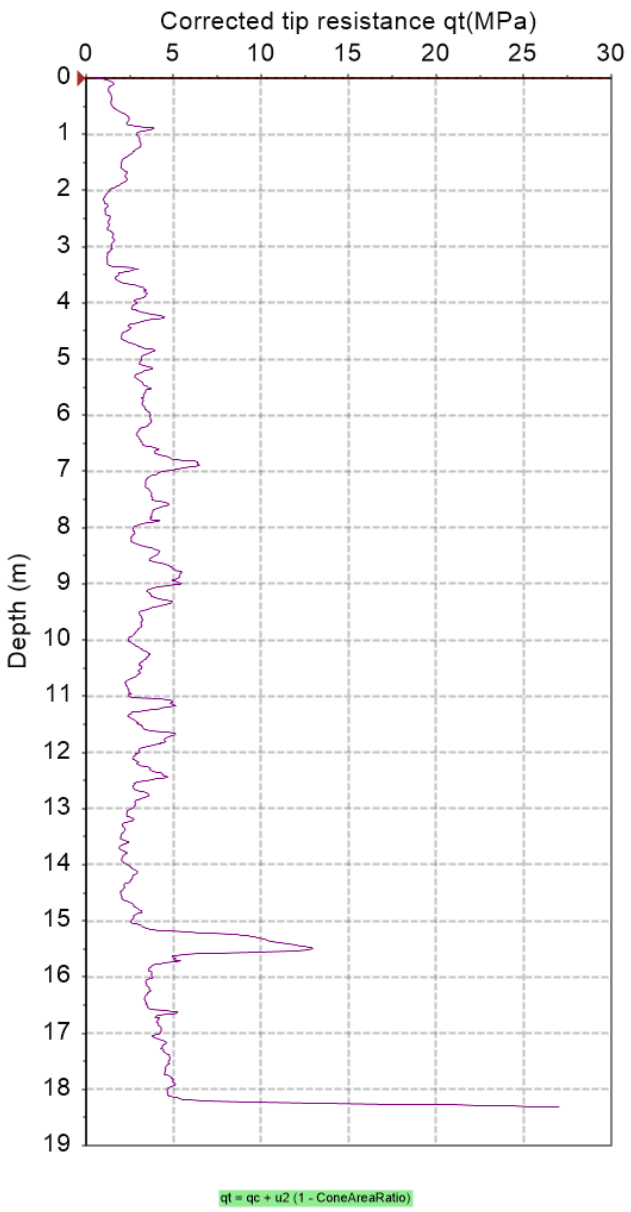


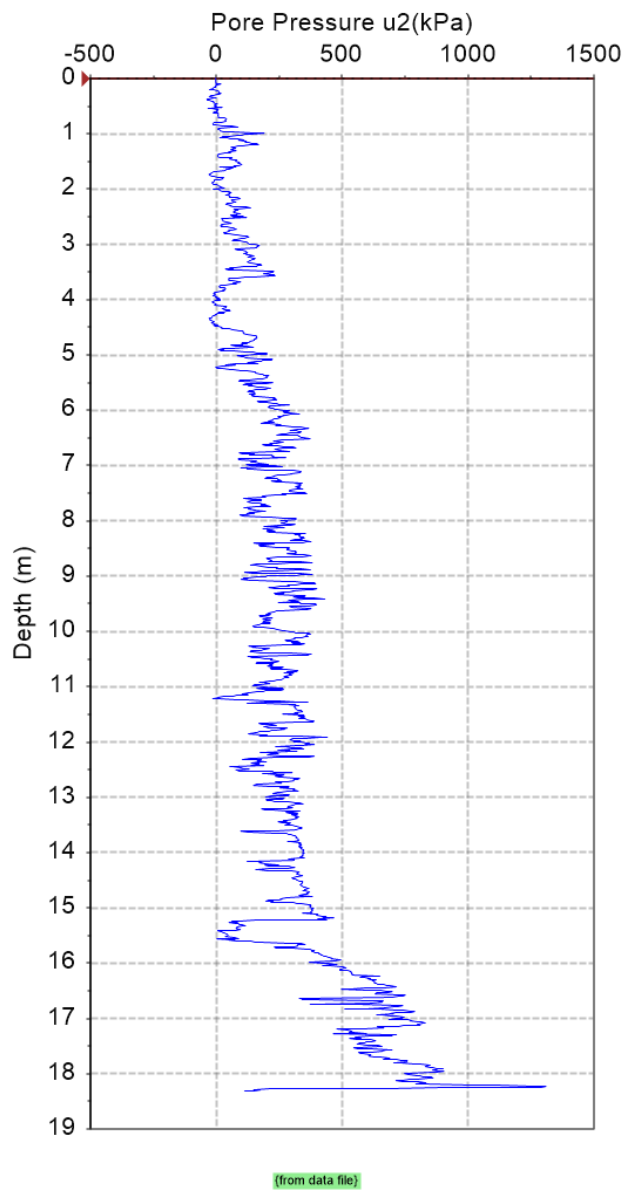


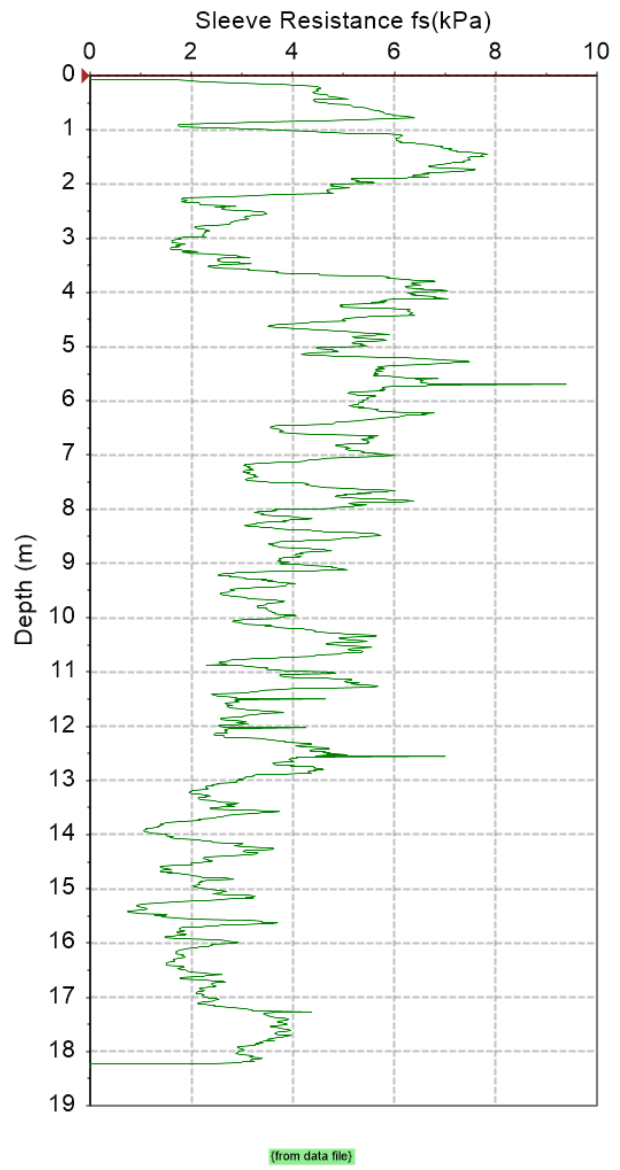
revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	10/10/24

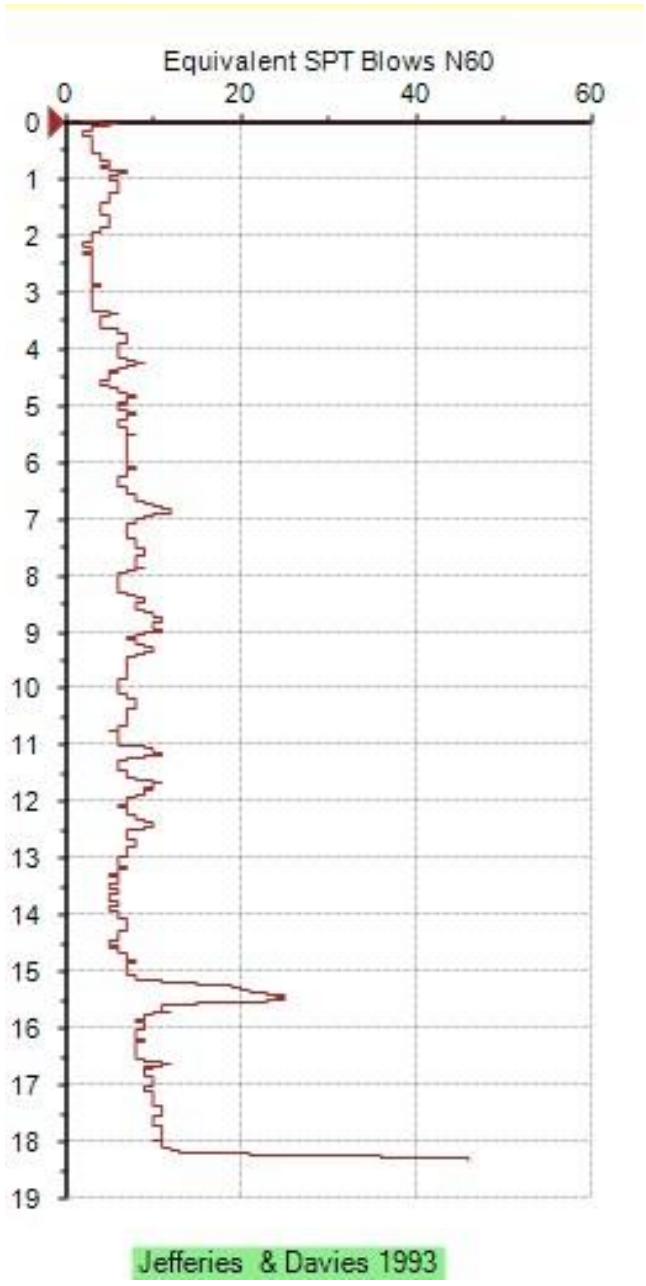
TERRA INSIGHT

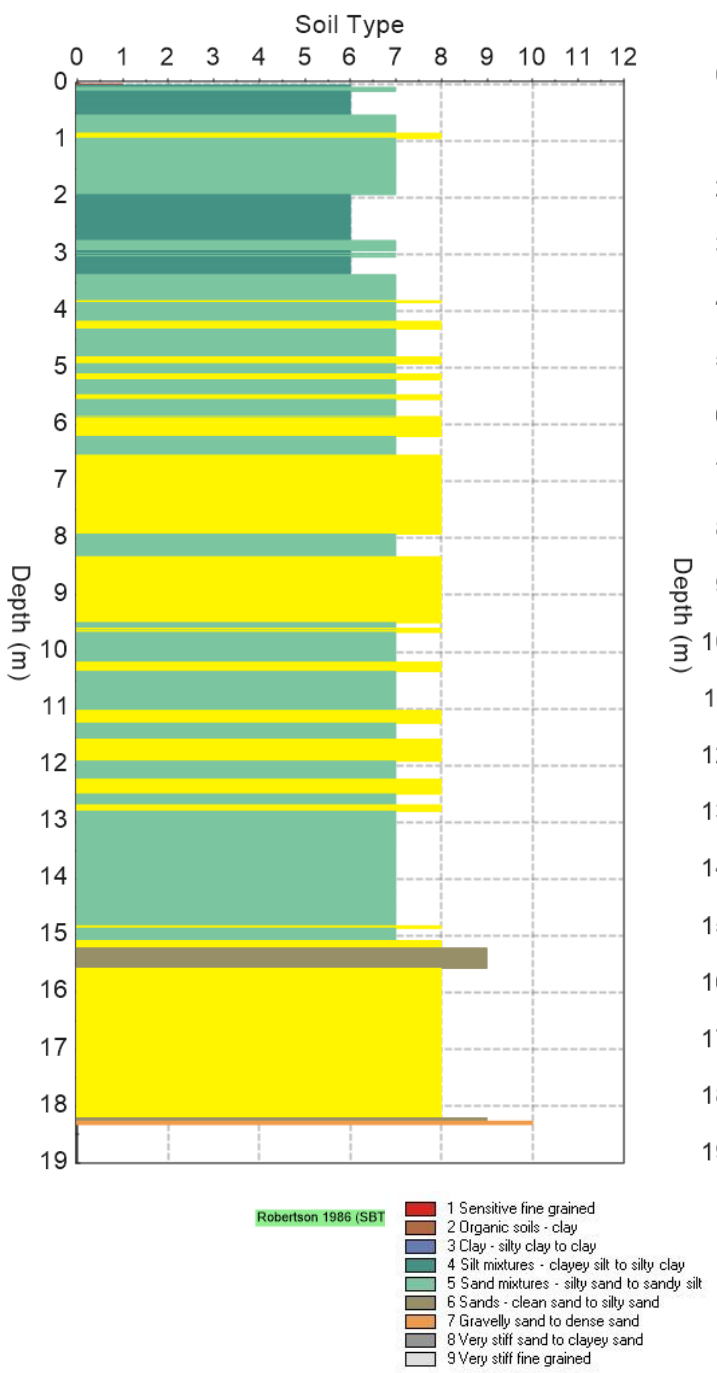
client:	**Babbage**		
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**		
scale	NTS	title:	**In situ CPT Test Results – CPT1**
Original size	**A3**	project no: **TERRA25-1264**	figure no: **FIGURE D1**

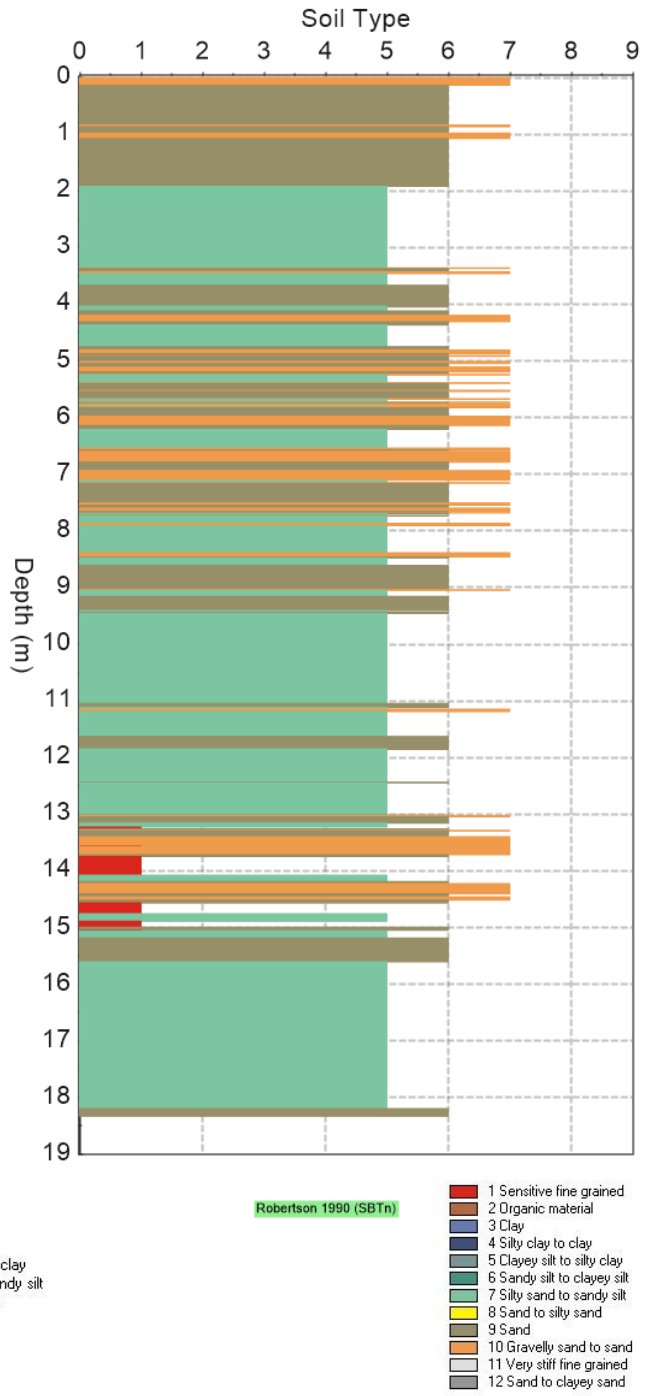








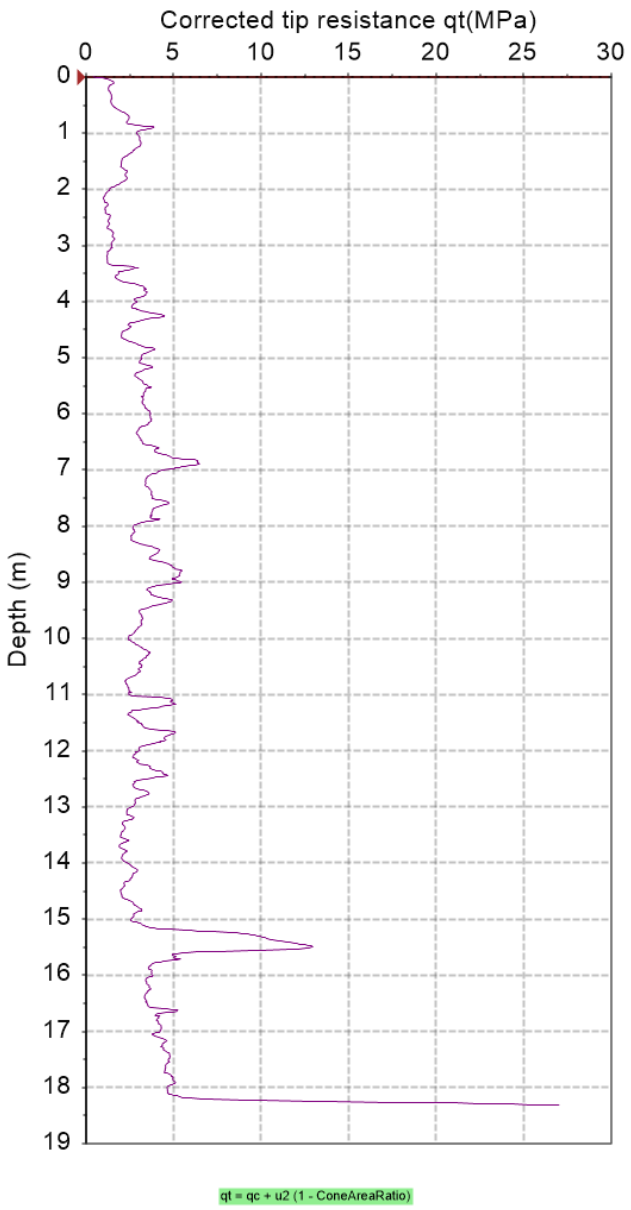


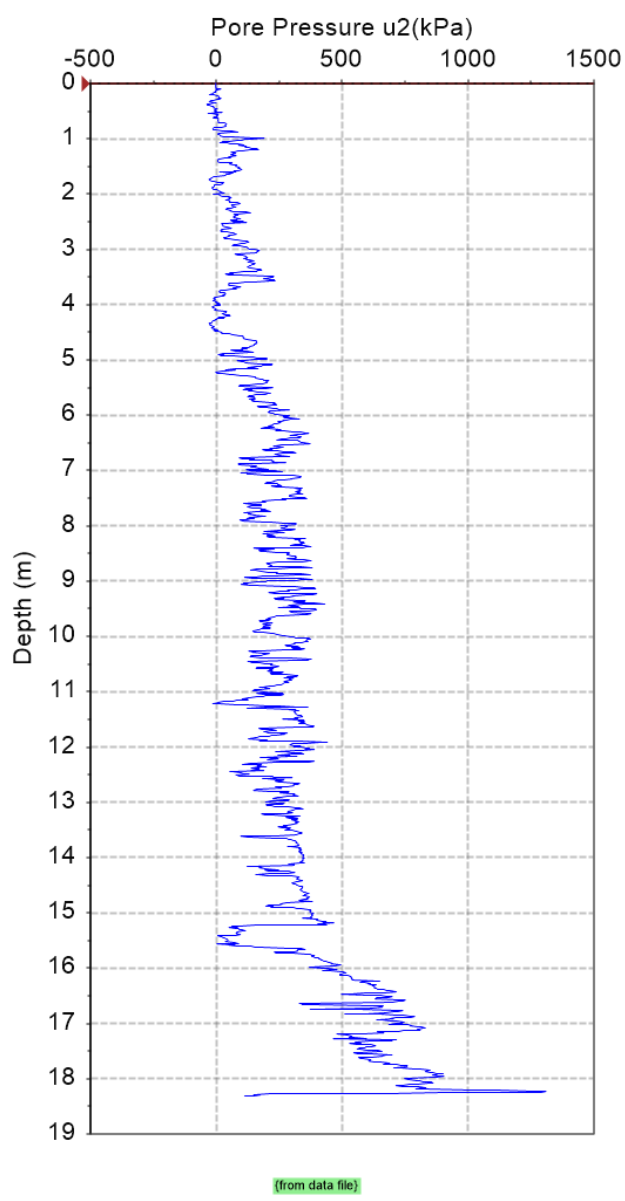


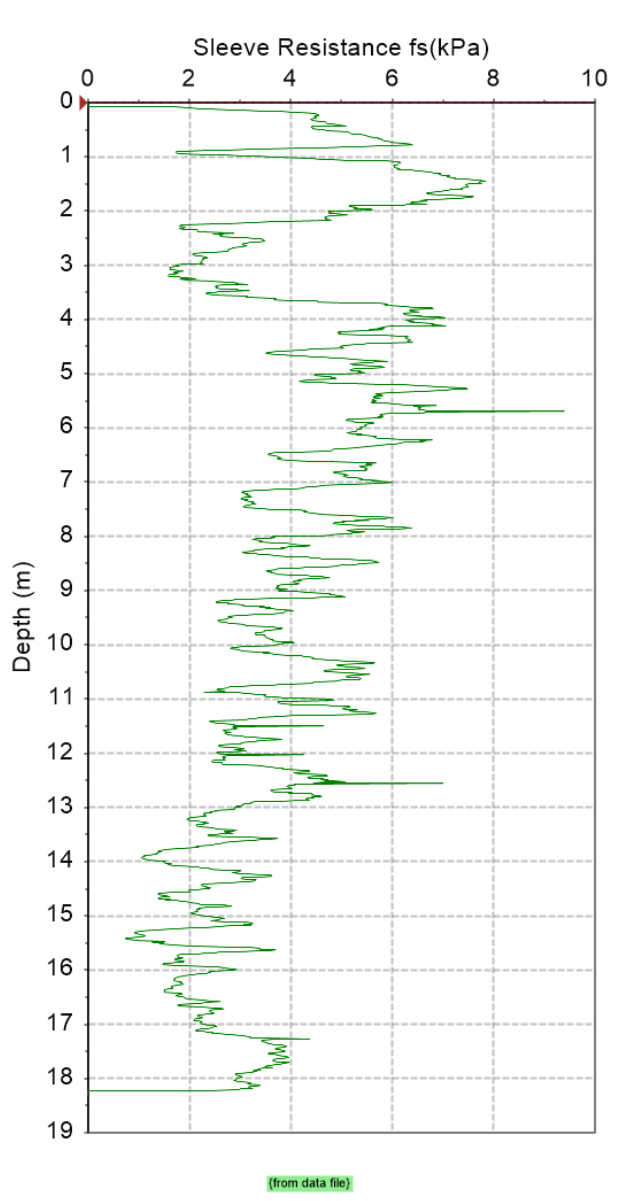
revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	10/10/24

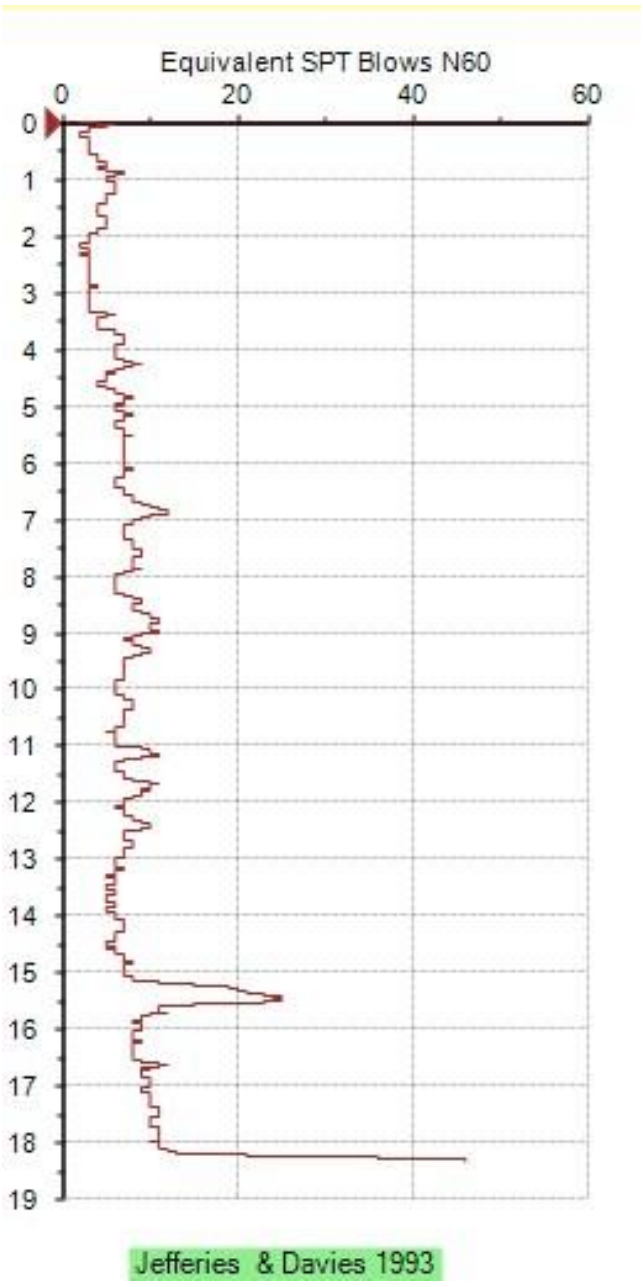
TERRA INSIGHT

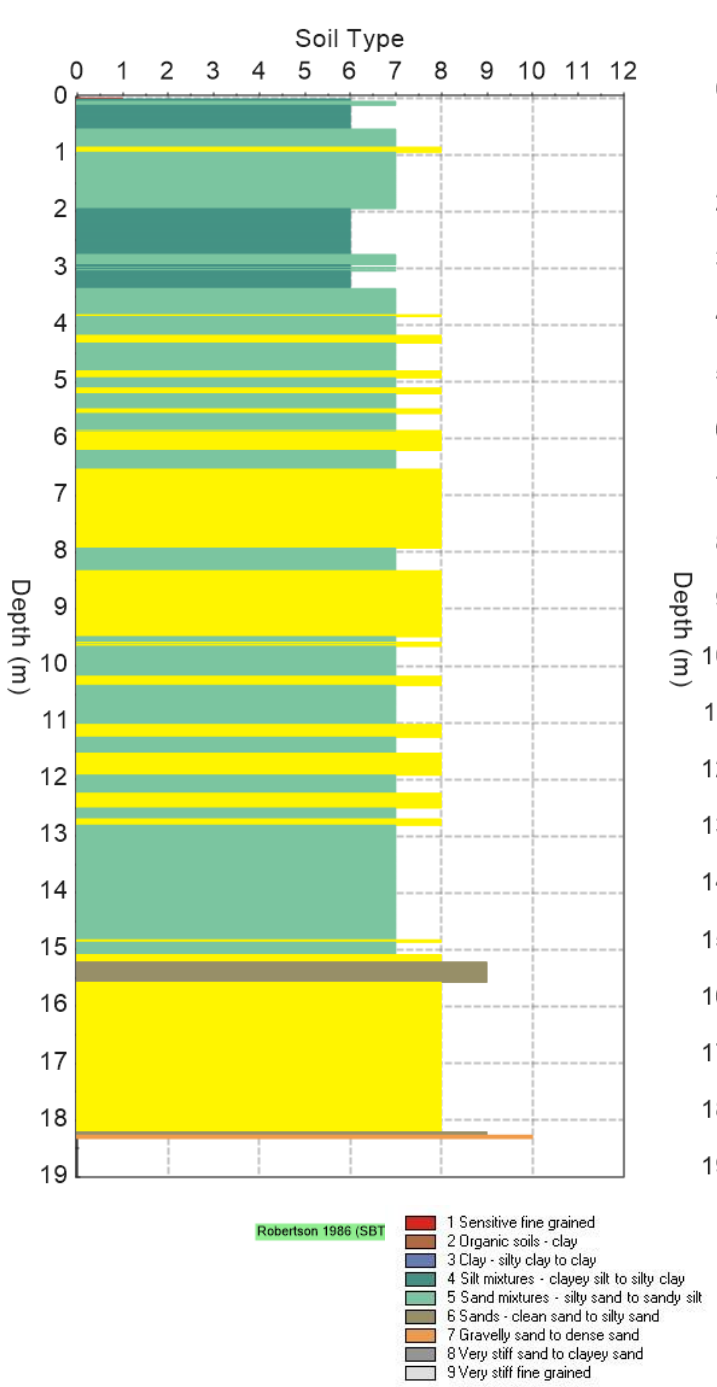
client:	**Babbage**		
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**		
scale	NTS	title:	**In situ CPT Test Results – CPT2**
Original size	**A3**	project no: **TERRA25-1264**	figure no: **FIGURE D2**

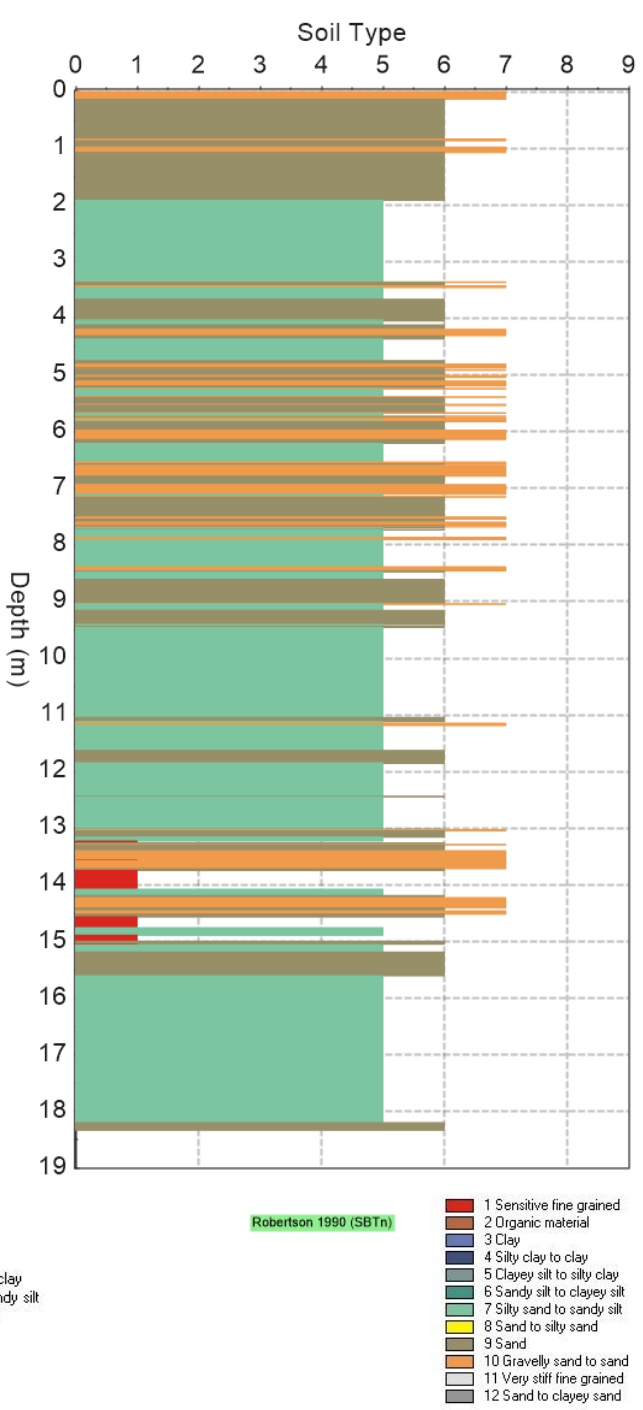








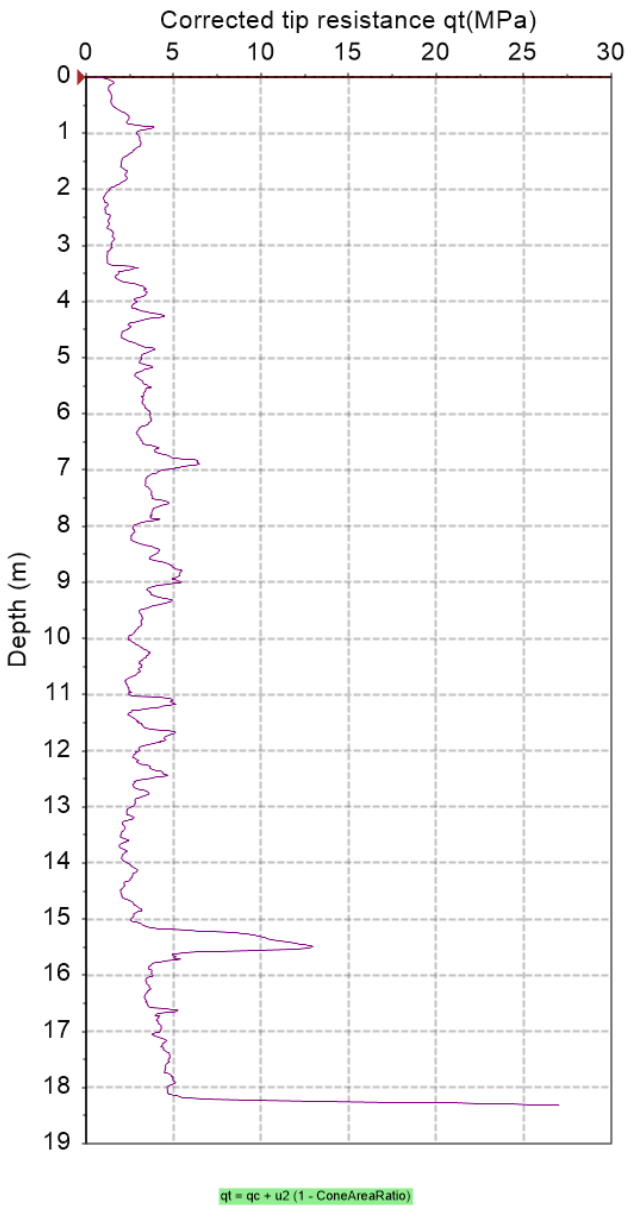


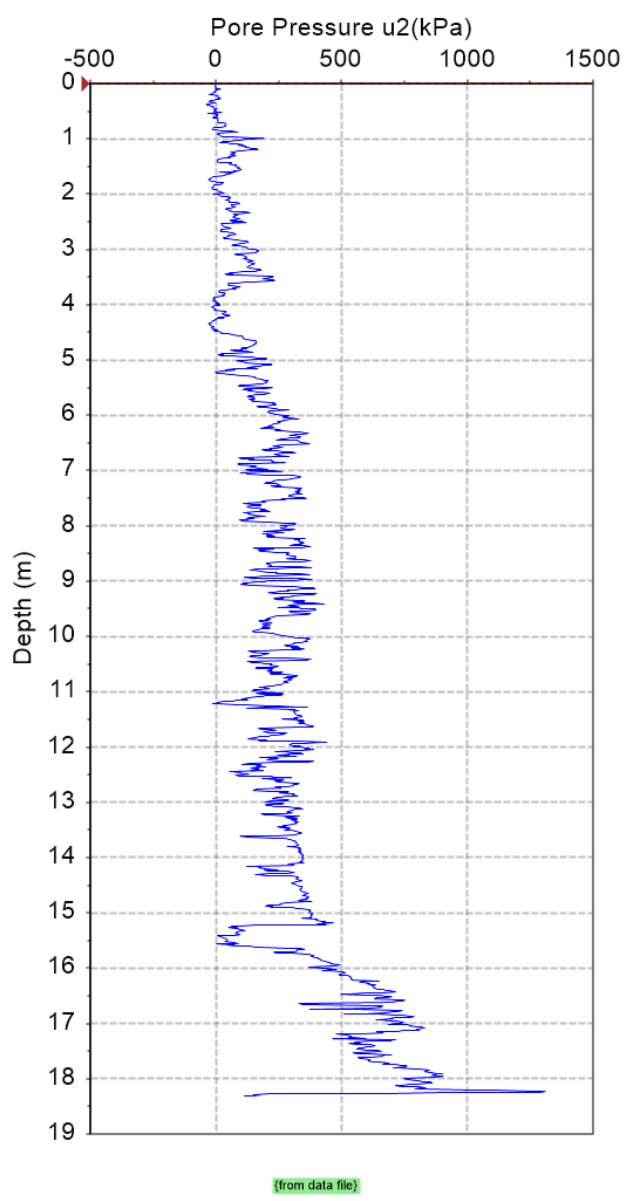


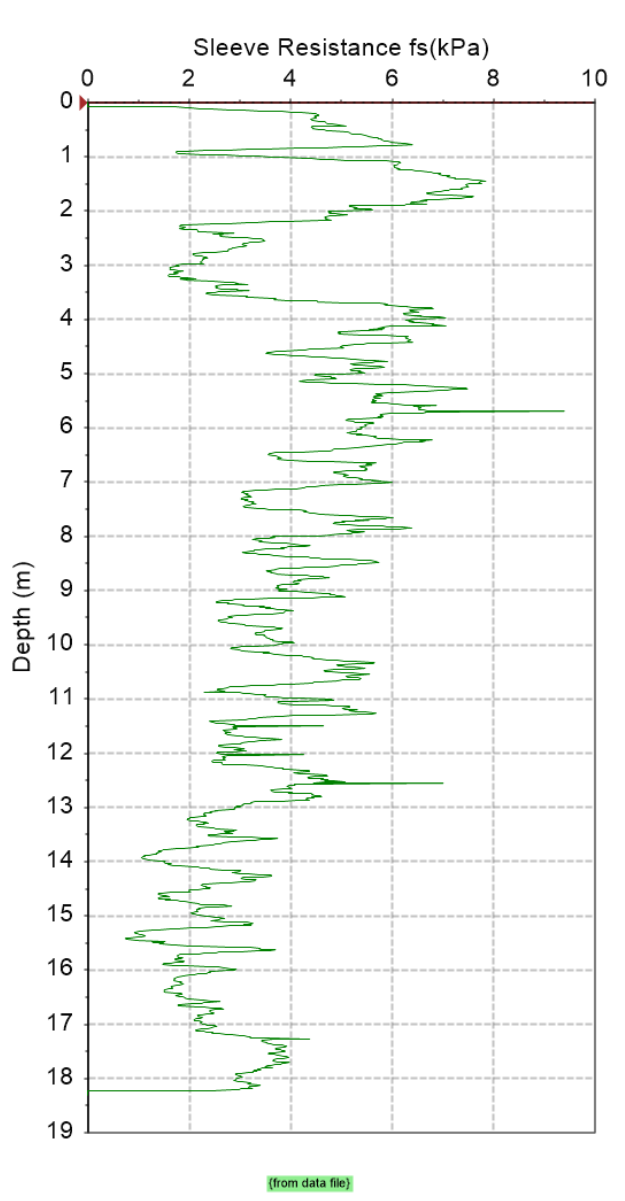
revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	10/10/24

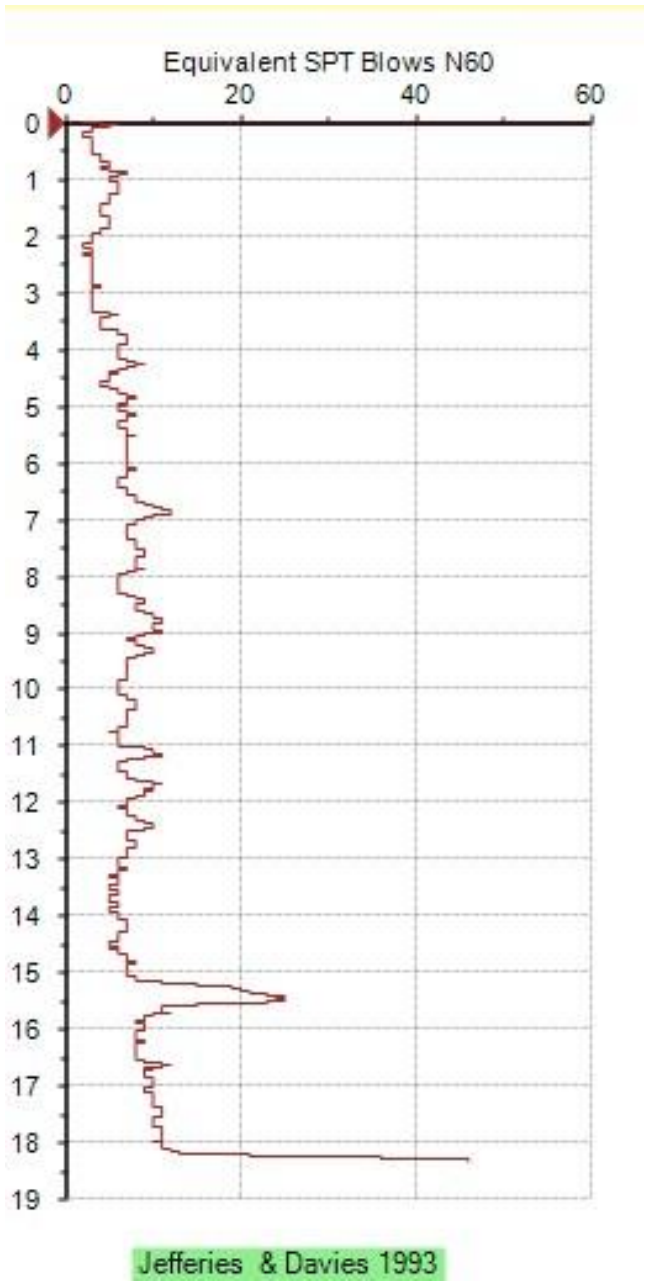
TERRA INSIGHT

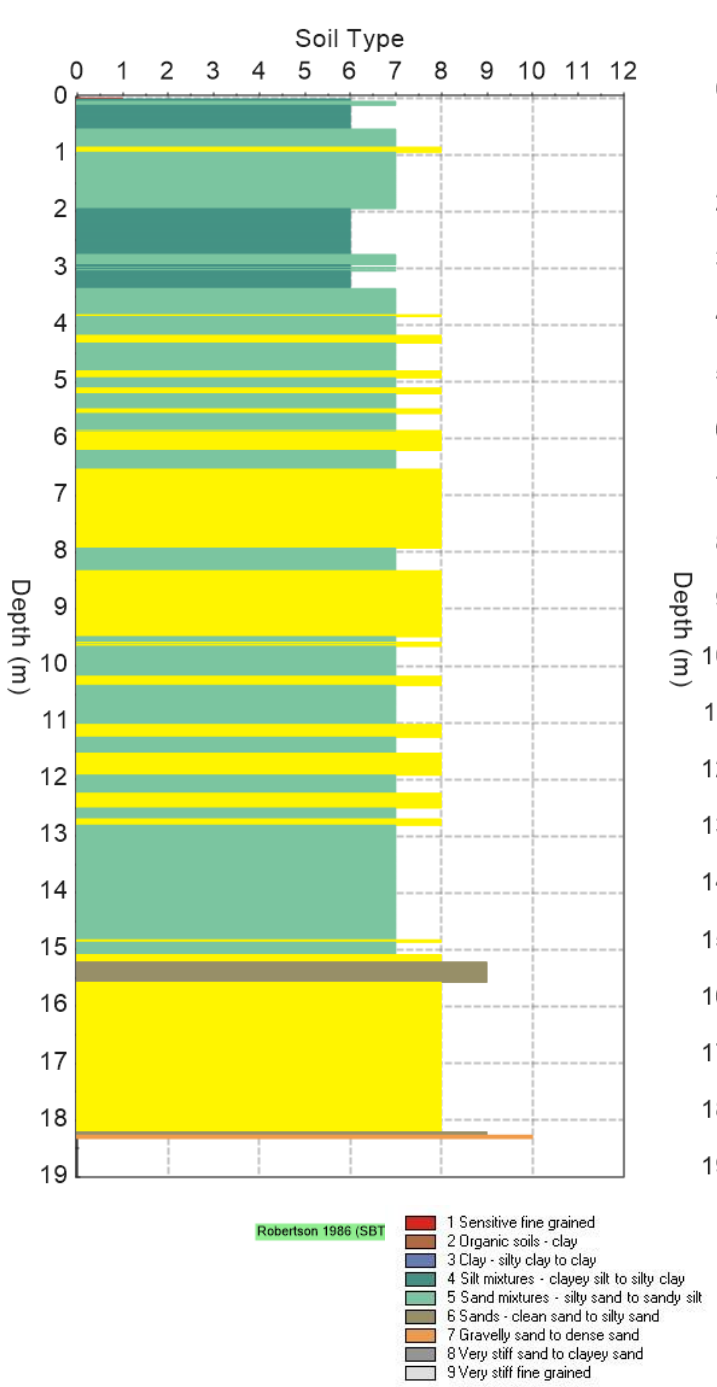
client:	**Babbage**		
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**		
scale	NTS	title:	**In situ CPT Test Results – CPT3**
Original size	**A3**	project no: **TERRA25-1264**	figure no: **FIGURE D3**

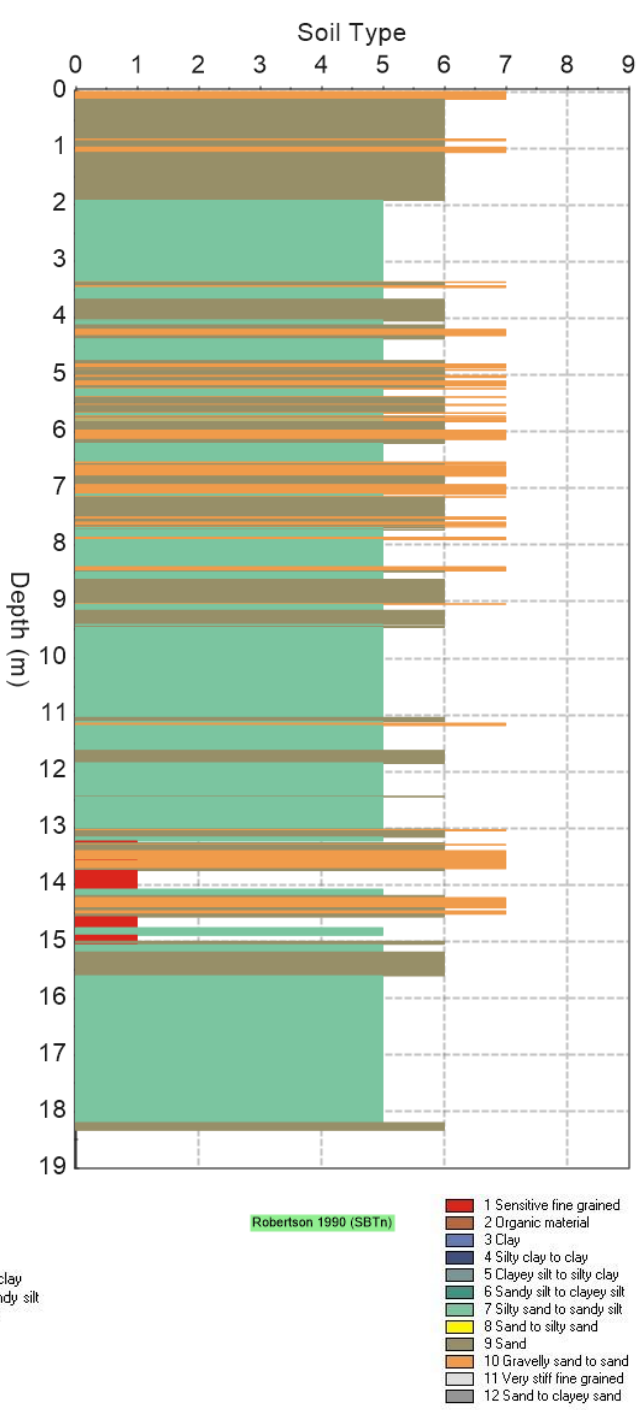












revision	description	drawn	approved	date
	Site Plan and test location	XJ	KEG	10/10/24

TERRA INSIGHT

client:	**Babbage**		
project:	**C02 Plant and Gas Pipeline Bombaderry Road, Bombaderry Geotechnical Investigation**		
scale	NTS	title:	**In situ CPT Test Results – CPT3**
Original size	**A3**	project no: **TERRA25-1264**	figure no: **FIGURE D3**

Appendix E: Geotechnical Laboratory Certificates

Material Test Report

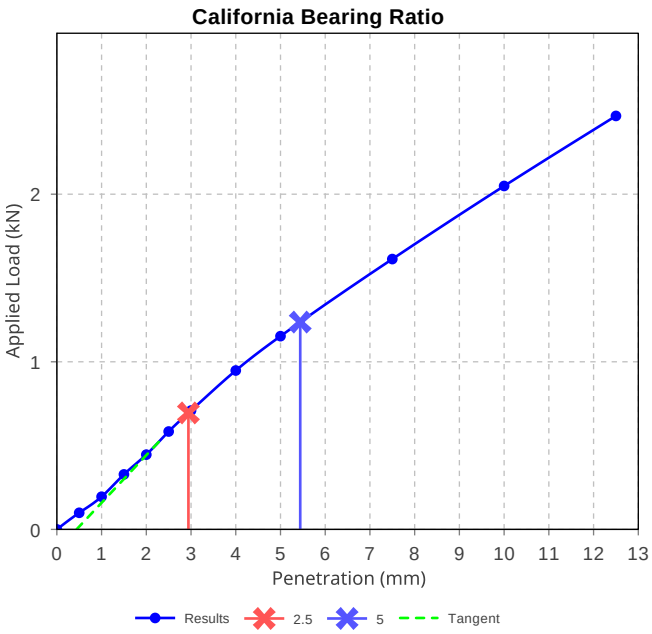
Douglas Partners Pty Ltd
Wollongong Laboratory
Unit 1/1 Luso Drive Unanderra NSW 2526
Phone: (02) 4271 1836
Email: wollongong@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Kevin Spicer
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **206059.00-403**
Issue Number: 1
Date Issued: 10/03/2026
Client: Terra Insight
PO Box 414, Unanderra NSW 2526
Contact: Karen Gates
Project Number: 206059.00
Project Name: Materials Testing - Various Projects
Project Location: Manildra CO^2 Plant
Client Reference: TERRA25-1264
Work Request: 16888
Sample Number: WO-16888A
Date Sampled: 18/02/2026
Dates Tested: 23/02/2026 - 03/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **TP02 B1, Depth: 0.4 - 0.9m**
Material: Sandy Silty Clay, Brown

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**6**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.79		
Optimum Moisture Content (%)	16.0		
Laboratory Density Ratio (%)	97.5		
Laboratory Moisture Ratio (%)	101.0		
Dry Density after Soaking (t/m^3)	1.74		
Field Moisture Content (%)	16.0		
Moisture Content at Placement (%)	16.0		
Moisture Content Top 30mm (%)	17.8		
Moisture Content Rest of Sample (%)	17.3		
Mass Surcharge (kg)	4.5kg		
Soaking Period (days)	4		
Curing Hours (h)	74.7		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Douglas Partners Pty Ltd
Wollongong Laboratory
Unit 1/1 Luso Drive Unanderra NSW 2526
Phone: (02) 4271 1836
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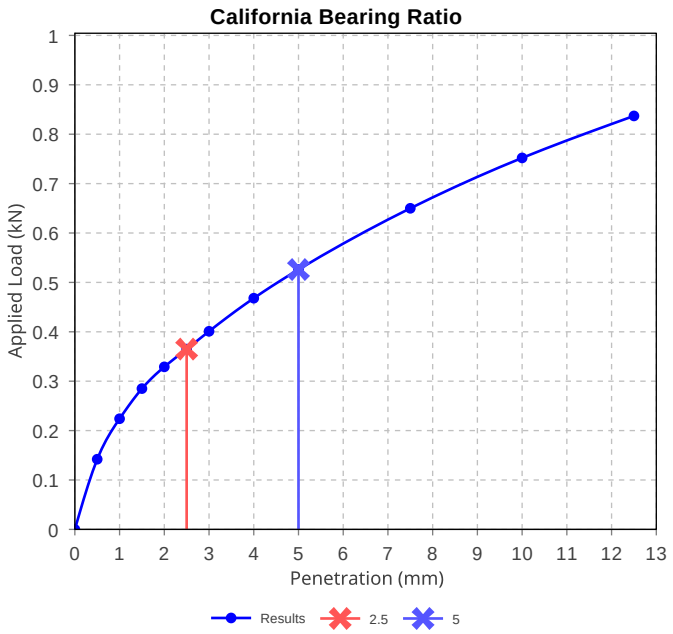
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Kevin Spicer
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **206059.00-403**
Issue Number: 1
Date Issued: 10/03/2026
Client: Terra Insight
PO Box 414, Unanderra NSW 2526
Contact: Karen Gates
Project Number: 206059.00
Project Name: Materials Testing - Various Projects
Project Location: Manildra CO^2 Plant
Client Reference: TERRA25-1264
Work Request: 16888
Sample Number: WO-16888B
Date Sampled: 18/02/2026
Dates Tested: 23/02/2026 - 06/03/2026
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **TP06 B1, Depth: 0.8 - 1.3m**
Material: Silty Clay, Red

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**3.0**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.56		
Optimum Moisture Content (%)	25.0		
Laboratory Density Ratio (%)	98.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m^3)	1.52		
Field Moisture Content (%)	26.2		
Moisture Content at Placement (%)	25.2		
Moisture Content Top 30mm (%)	31.6		
Moisture Content Rest of Sample (%)	30.1		
Mass Surcharge (kg)	4.5kg		
Soaking Period (days)	4		
Curing Hours (h)	143		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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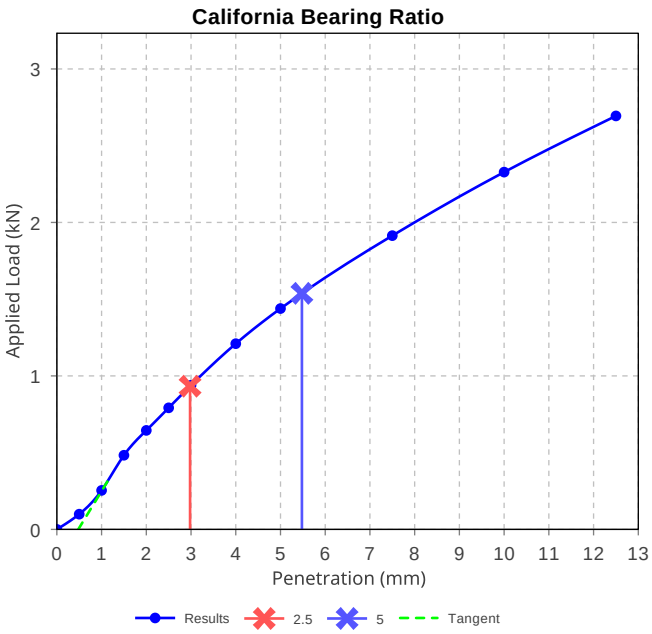
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Kevin Spicer
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number:	**206059.00-403**
Issue Number:	1
Date Issued:	10/03/2026
Client:	Terra Insight
	PO Box 414, Unanderra NSW 2526
Contact:	Karen Gates
Project Number:	206059.00
Project Name:	Materials Testing - Various Projects
Project Location:	Manildra CO^2 Plant
Client Reference:	TERRA25-1264
Work Request:	16888
Sample Number:	WO-16888C
Date Sampled:	18/02/2026
Dates Tested:	23/02/2026 - 06/03/2026
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**TP07 B1, Depth: 0.5 - 0.8m**
Material:	Sandy Silty Clay, Brown

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**8**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.80		
Optimum Moisture Content (%)	15.0		
Laboratory Density Ratio (%)	98.5		
Laboratory Moisture Ratio (%)	99.5		
Dry Density after Soaking (t/m^3)	1.76		
Field Moisture Content (%)	12.7		
Moisture Content at Placement (%)	15.1		
Moisture Content Top 30mm (%)	18.3		
Moisture Content Rest of Sample (%)	17.6		
Mass Surcharge (kg)	4.5kg		
Soaking Period (days)	4		
Curing Hours (h)	143.2		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	3.1		



Material Test Report

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Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Kevin Spicer
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **206059.00-326**
Issue Number: 1
Date Issued: 21/07/2025
Client: Terra Insight
PO Box 414, Unanderra NSW 2526
Contact: Karen Gates
Project Number: 206059.00
Project Name: Materials Testing - Various Projects
Project Location: Manildra - Bolong Rd, Bomaderry
Client Reference: TERRA25-1264
Work Request: 14963
Sample Number: WO-14963A
Date Sampled: 26/06/2025
Dates Tested: 27/06/2025 - 13/07/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **BH03 A2, Depth: 1.5 - 2.5m**

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	40		
Plastic Limit (%)	15		
Plasticity Index (%)	**25**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**11.0**		
Cracking Crumbling Curling	None		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	19.8		

Material Test Report

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Wollongong Laboratory
Unit 1/1 Luso Drive Unanderra NSW 2526
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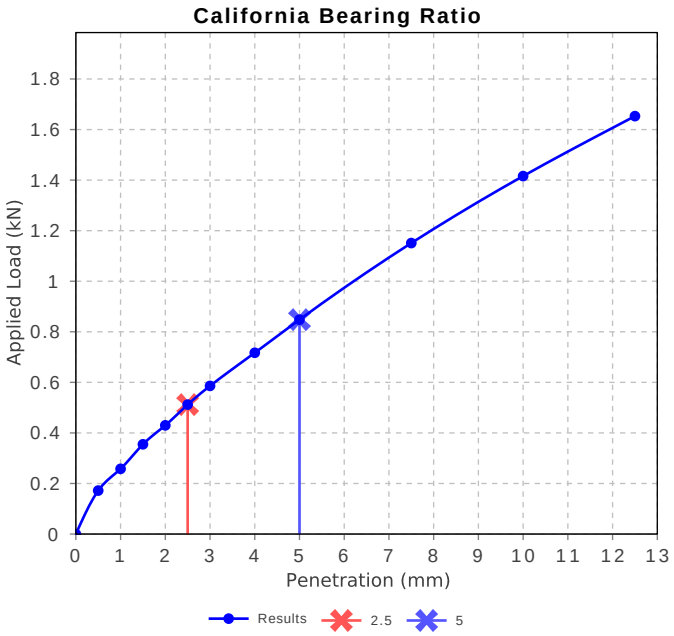
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Kevin Spicer
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number:	**206059.00-326**
Issue Number:	1
Date Issued:	21/07/2025
Client:	Terra Insight
	PO Box 414, Unanderra NSW 2526
Contact:	Karen Gates
Project Number:	206059.00
Project Name:	Materials Testing - Various Projects
Project Location:	Manildra - Bolong Rd, Bomaderry
Client Reference:	TERRA25-1264
Work Request:	14963
Sample Number:	WO-14963B
Date Sampled:	26/06/2025
Dates Tested:	27/06/2025 - 15/07/2025
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location:	**BH04 B1, Depth: 0.5 - 1.0m**
Material:	Silty Clay

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**4.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.59		
Optimum Moisture Content (%)	22.0		
Laboratory Density Ratio (%)	97.5		
Laboratory Moisture Ratio (%)	101.5		
Dry Density after Soaking (t/m^3)	1.54		
Field Moisture Content (%)	28.0		
Moisture Content at Placement (%)	22.4		
Moisture Content Top 30mm (%)	24.9		
Moisture Content Rest of Sample (%)	24.2		
Mass Surcharge (kg)	4.5kg		
Soaking Period (days)	4		
Curing Hours (h)	195.7		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

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Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **206059.00-326**
Issue Number: 1
Date Issued: 21/07/2025
Client: Terra Insight
PO Box 414, Unanderra NSW 2526
Contact: Karen Gates
Project Number: 206059.00
Project Name: Materials Testing - Various Projects
Project Location: Manildra - Bolong Rd, Bomaderry
Client Reference: TERRA25-1264
Work Request: 14963
Sample Number: WO-14963C
Date Sampled: 26/06/2025
Dates Tested: 27/06/2025 - 11/07/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **BH05 S2, Depth: 1.2 - 1.6m**

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	41		
Plastic Limit (%)	15		
Plasticity Index (%)	**26**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**11.0**		
Cracking Crumbling Curling	None		

Moisture Content (AS 1289 2.1.1)		Min	Max
Moisture Content (%)	25.6		

Material Test Report

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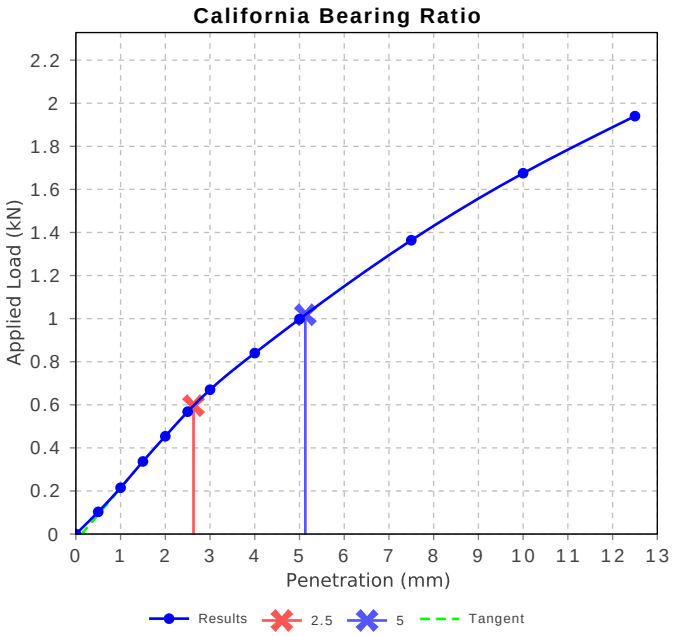
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Kevin Spicer
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **206059.00-326**
Issue Number: 1
Date Issued: 21/07/2025
Client: Terra Insight
PO Box 414, Unanderra NSW 2526
Contact: Karen Gates
Project Number: 206059.00
Project Name: Materials Testing - Various Projects
Project Location: Manildra - Bolong Rd, Bomaderry
Client Reference: TERRA25-1264
Work Request: 14963
Sample Number: WO-14963D
Date Sampled: 26/06/2025
Dates Tested: 27/06/2025 - 18/07/2025
Sampling Method: Sampled by Client
The results apply to the sample as received
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Sample Location: **BH06 B1, Depth: 0.5 - 1.0m**
Material: Silty Clay

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	**5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m^3)	1.63		
Optimum Moisture Content (%)	21.0		
Laboratory Density Ratio (%)	97.5		
Laboratory Moisture Ratio (%)	103.5		
Dry Density after Soaking (t/m^3)	1.57		
Field Moisture Content (%)	27.6		
Moisture Content at Placement (%)	21.6		
Moisture Content Top 30mm (%)	24.3		
Moisture Content Rest of Sample (%)	23.3		
Mass Surcharge (kg)	4.5kg		
Soaking Period (days)	4		
Curing Hours (h)	195.8		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		
Target and Moisture Content should be within 0.5% of standard optimum moisture content (OMC). The placement moisture content was 0.8% from OMC			



Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	33		
Plastic Limit (%)	22		
Plasticity Index (%)	**11**		

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

Appendix F: Environmental Laboratory Certificates

Terralnsight Pty Ltd
U34 no 10-12 Sylvester Ave
Unanderra
NSW 2626

Attention: **Karen Gates (cc results/SRAs)**

Report **1238392-S**
Project name MANILDRA BOLONG RD BOMADERRY
Project ID TERRA25-1264
Received Date Jun 26, 2025

Client Sample ID			**BH09_S1_(0.0-0.5M)**	**BH09_S2_(0.5-1.0M)**	**BH09_S3_(1.0-1.5M)**	**BH10_S1_(0.0-0.5M)**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W25-Jn0082264**	**W25-Jn0082265**	**W25-Jn0082266**	**W25-Jn0082267**
Date Sampled			**Jun 26, 2025**	**Jun 26, 2025**	**Jun 26, 2025**	**Jun 26, 2025**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.6	7.1	6.2	7.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	5.4	5.1	4.3
Reaction Ratings*[S05]	0	comment	3.0	3.0	3.0	3.0

Client Sample ID			**BH10_S2_(0.5-1.0M)**	**BH10_S3_(1.0-1.5M)**	**BH11_S1_(0.0-0.5M)**	**BH11_S2_(0.5-1.0M)**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W25-Jn0082268**	**W25-Jn0082269**	**W25-Jn0082270**	**W25-Jn0082271**
Date Sampled			**Jun 26, 2025**	**Jun 26, 2025**	**Jun 26, 2025**	**Jun 26, 2025**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.4	7.1	6.6	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.4	5.9	4.3	4.9
Reaction Ratings*[S05]	0	comment	3.0	1.0	3.0	1.0

Client Sample ID			**BH11_S3_(1.0-1.5M)**	**BH04_S1_(2.0-3.0M)**	**BH06_S1_(0.0-0.5M)**	**BH06_S2_(0.5-1.0M)**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W25-Jn0082272**	**W25-Jn0082273**	**W25-Jn0082274**	**W25-Jn0082275**
Date Sampled			**Jun 26, 2025**	**Jun 26, 2025**	**Jun 26, 2025**	**Jun 26, 2025**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.9	5.6	6.7	6.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.9	4.4	4.3	4.6
Reaction Ratings*[S05]	0	comment	1.0	1.0	2.0	2.0
Chloride	10	mg/kg	-	< 10	-	-
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	15	-	-
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	5.7	-	-
Resistivity*	0.5	ohm.m	-	660	-	-
Sulphate (as SO4)	10	mg/kg	-	27	-	-

Client Sample ID			BH11_S3_(1.0-1.5M)	BH04_S1_(2.0-3.0M)	BH06_S1_(0.0-0.5M)	BH06_S2_(0.5-1.0M)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W25-Jn0082272	W25-Jn0082273	W25-Jn0082274	W25-Jn0082275
Date Sampled			Jun 26, 2025	Jun 26, 2025	Jun 26, 2025	Jun 26, 2025
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	-	20	-	-

Client Sample ID			BH06_S3_(1.0-1.5M)	BH03_S1_(0.0-0.5M)	BH03_S2_(0.5-1.0M)	BH03_S3_(1.0-1.5M)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W25-Jn0082276	W25-Jn0082277	W25-Jn0082278	W25-Jn0082279
Date Sampled			Jun 26, 2025	Jun 26, 2025	Jun 26, 2025	Jun 26, 2025
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	5.9	5.9	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.0	3.8	4.5	4.6
Reaction Ratings*[S05]	0	comment	1.0	1.0	1.0	1.0

Client Sample ID			BH08_S1_(0.0-0.5M)	BH08_S2_(0.5-1.0M)	BH08_S3_(1.0-1.5M)	BH05_S1_(0.5-1.0M)
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			W25-Jn0082280	W25-Jn0082281	W25-Jn0082282	W25-Jn0082283
Date Sampled			Jun 26, 2025	Jun 26, 2025	Jun 26, 2025	Jun 26, 2025
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.8	6.6	6.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	5.2	5.3	4.8
Reaction Ratings*[S05]	0	comment	3.0	1.0	1.0	1.0
Chloride	10	mg/kg	-	-	-	< 10
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	-	-	< 10
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	-	-	6.7
Resistivity*	0.5	ohm.m	-	-	-	3700
Sulphate (as SO4)	10	mg/kg	-	-	-	11
Sample Properties						
% Moisture	1	%	-	-	-	22

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
Acid Sulfate Soils Field pH Test	Sydney	Jul 01, 2025	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
Chloride	Sydney	Jul 01, 2025	28 Days
- Method: In-house method LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Jul 01, 2025	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Jul 01, 2025	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Jul 01, 2025	28 Days
- Method: In-house method LTM-INO-4110 Sulphate by Discrete Analyser			
% Moisture	Sydney	Jun 30, 2025	14 Days
- Method: LTM-GEN-7080 Moisture			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: TerraInsight Pty Ltd
Address: U34 no 10-12 Sylvester Ave
Unanderra
NSW 2626

Project Name: MANILDRA BOLONG RD BOMADERRY
Project ID: TERRA25-1264

Order No.:
Report #: 1238392
Phone: 0458 008 030
Fax:

Received: Jun 26, 2025 3:30 PM
Due: Jul 3, 2025
Priority: 5 Day
Contact Name: Karen Gates (cc results/SRAs)

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Acid Sulfate Soils Field pH Test	Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH09_S1_(0.0 -0.5M)	Jun 26, 2025		Soil	W25-Jn0082264	X		
2	BH09_S2_(0.5 -1.0M)	Jun 26, 2025		Soil	W25-Jn0082265	X		
3	BH09_S3_(1.0 -1.5M)	Jun 26, 2025		Soil	W25-Jn0082266	X		
4	BH10_S1_(0.0 -0.5M)	Jun 26, 2025		Soil	W25-Jn0082267	X		
5	BH10_S2_(0.5 -1.0M)	Jun 26, 2025		Soil	W25-Jn0082268	X		
6	BH10_S3_(1.0 -1.5M)	Jun 26, 2025		Soil	W25-Jn0082269	X		
7	BH11_S1_(0.0 -0.5M)	Jun 26, 2025		Soil	W25-Jn0082270	X		
8	BH11_S2_(0.5 -1.0M)	Jun 26, 2025		Soil	W25-Jn0082271	X		
9	BH11_S3_(1.0	Jun 26, 2025		Soil	W25-Jn0082272	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

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NSW 2626

Project Name: MANILDRA BOLONG RD BOMADERRY
Project ID: TERRA25-1264

Order No.:
Report #: 1238392
Phone: 0458 008 030
Fax:

Received: Jun 26, 2025 3:30 PM
Due: Jul 3, 2025
Priority: 5 Day
Contact Name: Karen Gates (cc results/SRAs)

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Acid Sulfate Soils Field pH Test	Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
	-1.5M)							
10	BH04_S1_(2.0 -3.0M)	Jun 26, 2025		Soil	W25-Jn0082273	X	X	X
11	BH06_S1_(0.0 -0.5M)	Jun 26, 2025		Soil	W25-Jn0082274	X		
12	BH06_S2_(0.5 -1.0M)	Jun 26, 2025		Soil	W25-Jn0082275	X		
13	BH06_S3_(1.0 -1.5M)	Jun 26, 2025		Soil	W25-Jn0082276	X		
14	BH03_S1_(0.0 -0.5M)	Jun 26, 2025		Soil	W25-Jn0082277	X		
15	BH03_S2_(0.5 -1.0M)	Jun 26, 2025		Soil	W25-Jn0082278	X		
16	BH03_S3_(1.0 -1.5M)	Jun 26, 2025		Soil	W25-Jn0082279	X		
17	BH08_S1_(0.0 -0.5M)	Jun 26, 2025		Soil	W25-Jn0082280	X		
18	BH08_S2_(0.5 -1.0M)	Jun 26, 2025		Soil	W25-Jn0082281	X		
19	BH08_S3_(1.0	Jun 26, 2025		Soil	W25-Jn0082282	X		

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Received: Jun 26, 2025 3:30 PM
Due: Jul 3, 2025
Priority: 5 Day
Contact Name: Karen Gates (cc results/SRAs)

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Acid Sulfate Soils Field pH Test	Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
19	BH08_S3_(1.0 -1.5M)	Jun 26, 2025		Soil	W25-Jn0082282			
20	BH05_S1_(0.5 -1.0M)	Jun 26, 2025		Soil	W25-Jn0082283	X	X	X
Test Counts						20	2	2

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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							
Chloride	mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	106			70-130	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	96			70-130	Pass	
Sulphate (as SO4)	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	W25-Jn0082283	CP	%	101			70-130	Pass	
Sulphate (as SO4)	W25-Jn0082283	CP	%	101			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S25-Jl0001917	NCP	mg/kg	290	290	<1	30%	Pass	
Sulphate (as SO4)	S25-Jl0001917	NCP	mg/kg	130	140	3.0	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S25-Jn0082484	NCP	%	7.4	7.7	3.0	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	W25-Jn0082282	CP	pH Units	6.6	6.5	pass	20%	Pass	
pH-FOX (Field pH Peroxide test)*	W25-Jn0082282	CP	pH Units	5.3	5.2	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	W25-Jn0082283	CP	pH Units	6.4	6.4	pass	20%	Pass	
pH-FOX (Field pH Peroxide test)*	W25-Jn0082283	CP	pH Units	4.8	4.7	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	W25-Jn0082283	CP	uS/cm	< 10	< 10	<1	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	W25-Jn0082283	CP	pH Units	6.7	6.6	pass	30%	Pass	
Resistivity*	W25-Jn0082283	CP	ohm.m	3700	2900	24	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Adam Bateup	Analytical Services Manager
Ryan Phillips	Senior Analyst-Inorganic
Ryan Phillips	Senior Analyst-Sample Properties

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.

TerraInsight Pty Ltd
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Attention: **Karen Gates (cc results/SRAs)**

Report **1241577-S**
Project name PAPERMILL MANICORA
Project ID TERRA25-1264
Received Date Jul 08, 2025

Client Sample ID			**BH01_1.5-2.0**	**BH01_3.0**	**BH01_4.0-4.5**	**BH01_5.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W25-JI0020353**	**W25-JI0020354**	**W25-JI0020355**	**W25-JI0020356**
Date Sampled			**Jul 04, 2025**	**Jul 04, 2025**	**Jul 04, 2025**	**Jul 04, 2025**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.1	6.7	6.3	6.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.7	5.1	5.0	4.9
Reaction Ratings*[S05]	0	comment	2.0	4.0	4.0	4.0

Client Sample ID			**BH01_6.5**	**BH01_7.5**	**BH02_SPT1_1.0**	**BH02_SPT2_2.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W25-JI0020357**	**W25-JI0020358**	**W25-JI0020359**	**W25-JI0020360**
Date Sampled			**Jul 04, 2025**	**Jul 04, 2025**	**Jul 04, 2025**	**Jul 04, 2025**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.8	6.1	5.6	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.8	4.8	4.5
Reaction Ratings*[S05]	0	comment	2.0	2.0	2.0	4.0

Client Sample ID			**BH02_SP3_4.0**	**BH02_SP4_5.5**	**BH02_SP5_7.0**	**BH02_SP6_8.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W25-JI0020361**	**W25-JI0020362**	**W25-JI0020363**	**W25-JI0020364**
Date Sampled			**Jul 04, 2025**	**Jul 04, 2025**	**Jul 04, 2025**	**Jul 04, 2025**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.3	5.1	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	4.4	4.0	3.9
Reaction Ratings*[S05]	0	comment	2.0	2.0	2.0	2.0

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
Acid Sulfate Soils Field pH Test	Sydney	Jul 09, 2025	7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

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Eurofins Environment Testing Australia Pty Ltd
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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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Penrose	Mount Wellington	Rolleston	Gate Pa
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: TerraInsight Pty Ltd
Address: U34 no 10-12 Sylvester Ave
Unanderra
NSW 2626

Project Name: PAPERMILL MANICORA
Project ID: TERRA25-1264

Order No.:
Report #: 1241577
Phone: 0458 008 030
Fax:

Received: Jul 8, 2025 10:45 AM
Due: Jul 15, 2025
Priority: 5 Day
Contact Name: Karen Gates (cc results/SRAs)

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Acid Sulfate Soils Field pH Test
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH01_1.5-2.0	Jul 04, 2025		Soil	W25-JI0020353	X
2	BH01_3.0	Jul 04, 2025		Soil	W25-JI0020354	X
3	BH01_4.0-4.5	Jul 04, 2025		Soil	W25-JI0020355	X
4	BH01_5.5	Jul 04, 2025		Soil	W25-JI0020356	X
5	BH01_6.5	Jul 04, 2025		Soil	W25-JI0020357	X
6	BH01_7.5	Jul 04, 2025		Soil	W25-JI0020358	X
7	BH02_SPT1_1.0	Jul 04, 2025		Soil	W25-JI0020359	X
8	BH02_SPT2_2.5	Jul 04, 2025		Soil	W25-JI0020360	X
9	BH02_SP3_4.0	Jul 04, 2025		Soil	W25-JI0020361	X
10	BH02_SP4_5.5	Jul 04, 2025		Soil	W25-JI0020362	X
11	BH02_SP5_7.0	Jul 04, 2025		Soil	W25-JI0020363	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

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Order No.:
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Received: Jul 8, 2025 10:45 AM
Due: Jul 15, 2025
Priority: 5 Day
Contact Name: Karen Gates (cc results/SRAs)

Eurofins Analytical Services Manager : Adam Bateup

Sample Detail						Acid Sulfate Soils Field pH Test
Sydney Laboratory - NATA # 1261 Site # 18217						X
12	BH02_SP6_8.5	Jul 04, 2025		Soil	W25-Jl0020364	X
Test Counts						12

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	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	W25-Jl0020353	CP	pH Units	6.1	6.0	pass	20%	Pass	
pH-FOX (Field pH Peroxide test)*	W25-Jl0020353	CP	pH Units	4.7	4.7	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	W25-Jl0020363	CP	pH Units	5.1	5.1	pass	20%	Pass	
pH-FOX (Field pH Peroxide test)*	W25-Jl0020363	CP	pH Units	4.0	4.0	pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Nileshni Goundar — Analytical Services Manager

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.

Terralnsight Pty Ltd
U34 no 10-12 Sylvester Ave
Unanderra
NSW 2626

Attention: **Karen Gates (cc results/SRAs)**

Report **1326145-S**
Project name MANILDRA CO2 PLANT
Project ID TERRA25-1264
Received Date Feb 20, 2026

Client Sample ID			**TP01_S1_0.0-0.3**	**TP01_S2_0.3-0.9**	**TP01_S3_0.9-1.5**	**TP03_S1_0.0-0.4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W26-Fe0060987**	**W26-Fe0060988**	**W26-Fe0060989**	**W26-Fe0060990**
Date Sampled			**Feb 18, 2026**	**Feb 18, 2026**	**Feb 18, 2026**	**Feb 18, 2026**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.5	6.7	5.9	6.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	4.2	4.5	3.1
Reaction Ratings*[S05]	0	-	3.0	2.0	1.0	4.0

Client Sample ID			**TP03_S2_0.4-1.3**	**TP03_S3_1.3-1.5**	**TP06_S1_0.0-0.3**	**TP06_S2_0.3-1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**W26-Fe0060991**	**W26-Fe0060992**	**W26-Fe0060993**	**W26-Fe0060994**
Date Sampled			**Feb 18, 2026**	**Feb 18, 2026**	**Feb 18, 2026**	**Feb 18, 2026**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.5	5.3	6.3	6.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.1	4.4	3.5	4.9
Reaction Ratings*[S05]	0	-	1.0	1.0	3.0	2.0
Chloride	10	mg/kg	-	110	-	30
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	120	-	31
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	5.3	-	6.4
Resistivity*	0.5	ohm.m	-	85	-	320
Sulphate (as SO4)	10	mg/kg	-	54	-	14
Sample Properties						
% Moisture	1	%	-	18	-	14

Client Sample ID			TP06_S3_1.0-1.5	TP07_S1_0.5-0.8
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**W26-Fe0060995**	**W26-Fe0060996**
Date Sampled			**Feb 18, 2026**	**Feb 18, 2026**
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	5.1	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.4	-
Reaction Ratings*[S05]	0	-	1.0	-
Chloride	10	mg/kg	-	< 10
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	15
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	6.6
Resistivity*	0.5	ohm.m	-	650
Sulphate (as SO4)	10	mg/kg	-	15
Sample Properties				
% Moisture	1	%	-	12

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
Acid Sulfate Soils Field pH Test	Sydney	Feb 24, 2026	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
Chloride	Sydney	Feb 24, 2026	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Feb 24, 2026	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Feb 24, 2026	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Feb 24, 2026	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
% Moisture	Sydney	Feb 20, 2026	14 Days
- Method: LTM-GEN-7080 Moisture			

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NSW 2626

Project Name: MANILDRA CO2 PLANT
Project ID: TERRA25-1264

Order No.:
Report #: 1326145
Phone: 0458 008 030
Fax:

Received: Feb 20, 2026 1:00 PM
Due: Feb 27, 2026
Priority: 5 Day
Contact Name: Karen Gates (cc results/SRAs)

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Acid Sulfate Soils Field pH Test	Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	TP01_S1_0.0-0.3	Feb 18, 2026		Soil	W26-Fe0060987	X		
2	TP01_S2_0.3-0.9	Feb 18, 2026		Soil	W26-Fe0060988	X		
3	TP01_S3_0.9-1.5	Feb 18, 2026		Soil	W26-Fe0060989	X		
4	TP03_S1_0.0-0.4	Feb 18, 2026		Soil	W26-Fe0060990	X		
5	TP03_S2_0.4-1.3	Feb 18, 2026		Soil	W26-Fe0060991	X		
6	TP03_S3_1.3-1.5	Feb 18, 2026		Soil	W26-Fe0060992	X	X	X
7	TP06_S1_0.0-0.3	Feb 18, 2026		Soil	W26-Fe0060993	X		
8	TP06_S2_0.3-1.0	Feb 18, 2026		Soil	W26-Fe0060994	X	X	X
9	TP06_S3_1.0-	Feb 18, 2026		Soil	W26-Fe0060995	X		

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Eurofins Environment Testing Australia Pty Ltd
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Address: U34 no 10-12 Sylvester Ave
Unanderra
NSW 2626

Project Name: MANILDRA CO2 PLANT
Project ID: TERRA25-1264

Order No.:
Report #: 1326145
Phone: 0458 008 030
Fax:

Received: Feb 20, 2026 1:00 PM
Due: Feb 27, 2026
Priority: 5 Day
Contact Name: Karen Gates (cc results/SRAs)

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Acid Sulfate Soils Field pH Test	Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
	1.5							
10	TP07_S1_0.5-0.8	Feb 18, 2026		Soil	W26-Fe0060996		X	X
Test Counts						9	3	3

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Internal Quality Control Review and Glossary

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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							
Chloride	mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	107			70-130	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	101			70-130	Pass	
Sulphate (as SO4)	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	S26-Fe0070656	NCP	%	107			70-130	Pass	
Sulphate (as SO4)	S26-Fe0070656	NCP	%	111			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	W26-Fe0060987	CP	pH Units	6.5	6.5	pass	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S26-Fe0070655	NCP	mg/kg	480	480	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	S26-Fe0070655	NCP	uS/cm	380	350	9.0	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	S26-Fe0070655	NCP	pH Units	5.2	5.2	Pass	30%	Pass	
Resistivity*	S26-Fe0070655	NCP	ohm.m	26	29	9.0	30%	Pass	
Sulphate (as SO4)	S26-Fe0070655	NCP	mg/kg	46	45	1.0	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	W26-Fe0060992	CP	%	18	20	10	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
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
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Nileshni Goundar	Analytical Services Manager
Dilani Samarakoon	Senior Analyst-SPOCAS
Ryan Phillips	Senior Analyst-Inorganic
Ryan Phillips	Senior Analyst-Sample Properties

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.

Appendix G: CBRS interpretated from DCPs

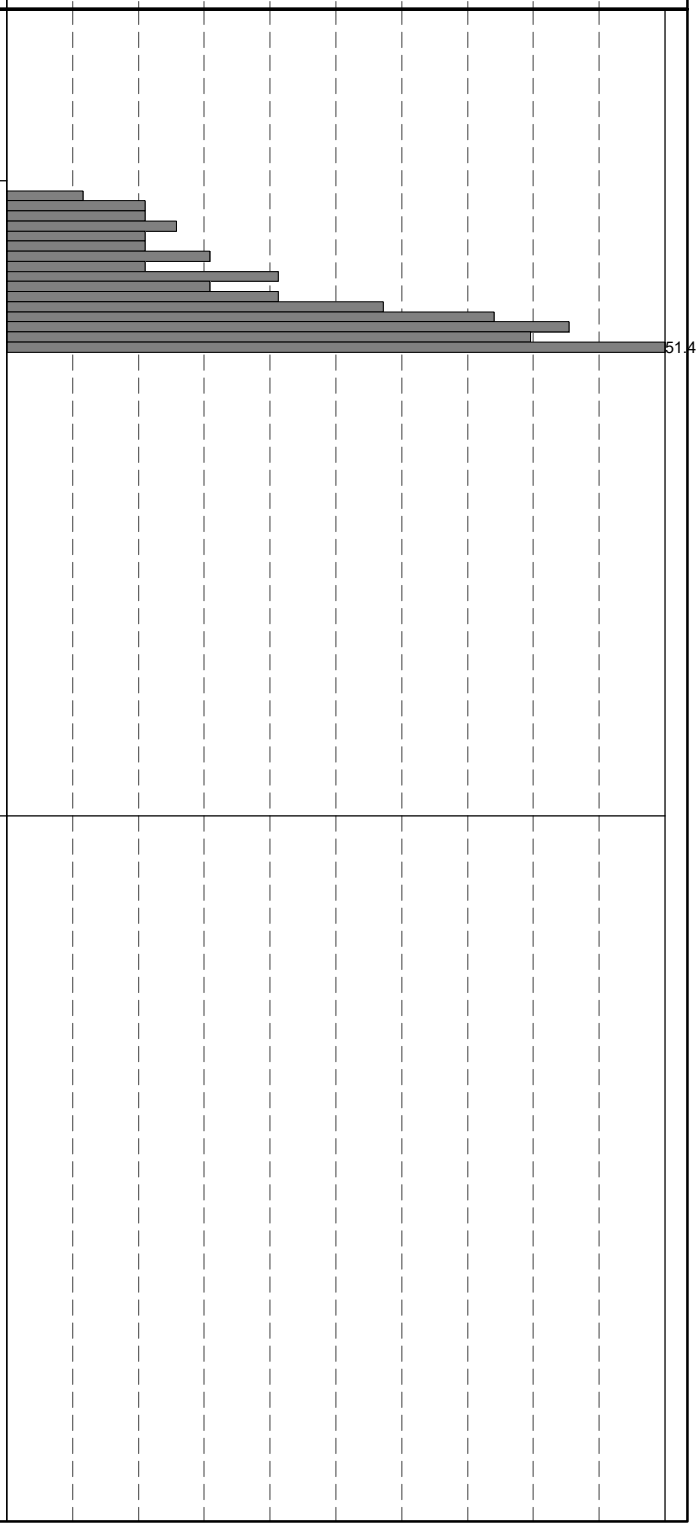
TERRA INSIGHT

Hole ID **BH01**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283271.0 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6141063.0 m	LOGGED BY	: JH
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 04/07/2025
PROJECT No.	: TERRA25-1264	GROUND RL	: 3.10 m AHD		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T		0	3		Surficial topsoil and fill on surface to depths of approximately 1.0m, underlain as per below
		2	2		Silty CLAY: medium to high plasticity, red and grey mottled, with fine sand, grading to grey and orange mottled, colour
		4	0		
		6	-2		
		8	-4		Hole Terminated at 8.00 m Target
		10	-6		
		12	-8		
		14	-10		

Interpreted CBR Results from Austroads



RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 21/07/2025	
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

TERRA INSIGHT

Hole ID **BH03**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283366.0 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6141022.0 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 26/06/2025
PROJECT No.	: TERRA25-1264	GROUND RL	: 2.80 m AHD		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T		0.0	2.5		Organic Silty CLAY: low plasticity, dark brown
		0.5	2.0		Slag fill (coalwash rejects)- SAND/GRAVEL: fine angular gravel, black, coarse sand
		1.0	1.5		Silty CLAY: low to medium plasticity, brown
		1.5	1.0		Silty CLAY: medium to high plasticity, light brown, light grey orange mottled
		2.0	0.5		Silty CLAY: medium to high plasticity, red light grey mottled
		2.5	0.0		Sandy Silty CLAY: medium plasticity, red with light grey mottling
		3.0	-0.5		Hole Terminated at 3.00 m Target

Interpreted CBR Results from Austroads

0 5 10 15 20 25 30 35 40 45 50

RIG	:	CHECKED BY	: KG
INCLINATION	:	CHECKED DATE	: 21/07/2025
AZIMUTH	:	APPROVED BY	:
HOLE DIA.	:	APPROVED DATE	:

REMARK

TERRA INSIGHT

Hole ID **BH04**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283362.0 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140983.0 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 26/06/2025
PROJECT No.	: TERRA25-1264	GROUND RL	: 3.00 m AHD		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T		0.0	3.0		Organic Silty CLAY: low plasticity, dark brown
		0.5	2.5		Slag fill (coalwash rejects)- SAND/GRAVEL: fine angular gravel, black, coarse sand
					Silty CLAY: low to medium plasticity, brown
		1.5	1.5		Silty CLAY: medium to high plasticity, light brown with orange mottling
		2.0	1.0		Sandy Silty CLAY: medium plasticity, light grey, red and orange mottled, grading to red and light grey mottled
		3.0	0.0		Hole Terminated at 3.00 m Target

Interpreted CBR Results from Austroads

0 5 10 15 20 25 30 35 40 45 50

RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 21/07/2025	
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

TERRA INSIGHT

Hole ID **BH05**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283329.0 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140938.0 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 26/06/2025
PROJECT No.	: TERRA25-1264	GROUND RL	: 2.90 m AHD		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T		0.5	2.5		Organic Silty CLAY: low plasticity, brown
		1.0	2.0		Silty CLAY: low to medium plasticity, brown
		1.5	1.5		Silty CLAY: medium to high plasticity, light brown and orange mottled
		2.0	1.0		Silty CLAY: medium plasticity, light grey and red mottled
		2.5	0.5		Sandy Silty CLAY: low to medium plasticity, red, fine sand
		3.0	0.0		Hole Terminated at 3.00 m Target
			-0.5		

Interpreted CBR Results from Austroads

0 5 10 15 20 25 30 35 40 45 50

RIG	:	CHECKED BY	: KG	REMARK	
INCLINATION	:	CHECKED DATE	: 21/07/2025		
AZIMUTH	:	APPROVED BY	:		
HOLE DIA.	:	APPROVED DATE	:		

TERRA INSIGHT

Hole ID **BH06**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283280.0 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6140931.0 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 26/06/2025
PROJECT No.	: TERRA25-1264	GROUND RL	: 2.70 m AHD		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T		0.0	2.5		Organic Silty CLAY: low plasticity, brown
		0.5	2.0		Silty CLAY: low to medium plasticity, brown, blue/grey tinge
		1.0	1.5		Sandy Clayey SILT: low plasticity, light grey, fine sand
		1.5	1.0		Silty CLAY: medium to high plasticity, light grey, orange and red mottled
		2.0	0.5		
		2.5	0.0		Silty CLAY: medium to high plasticity, red and light grey mottled
		3.0	-0.5		Hole Terminated at 3.00 m Target

Interpreted CBR Results from Austroads

0 5 10 15 20 25 30 35 40 45 50

RIG	:	CHECKED BY	: KG	REMARK	
INCLINATION	:	CHECKED DATE	: 21/07/2025		
AZIMUTH	:	APPROVED BY	:		
HOLE DIA.	:	APPROVED DATE	:		

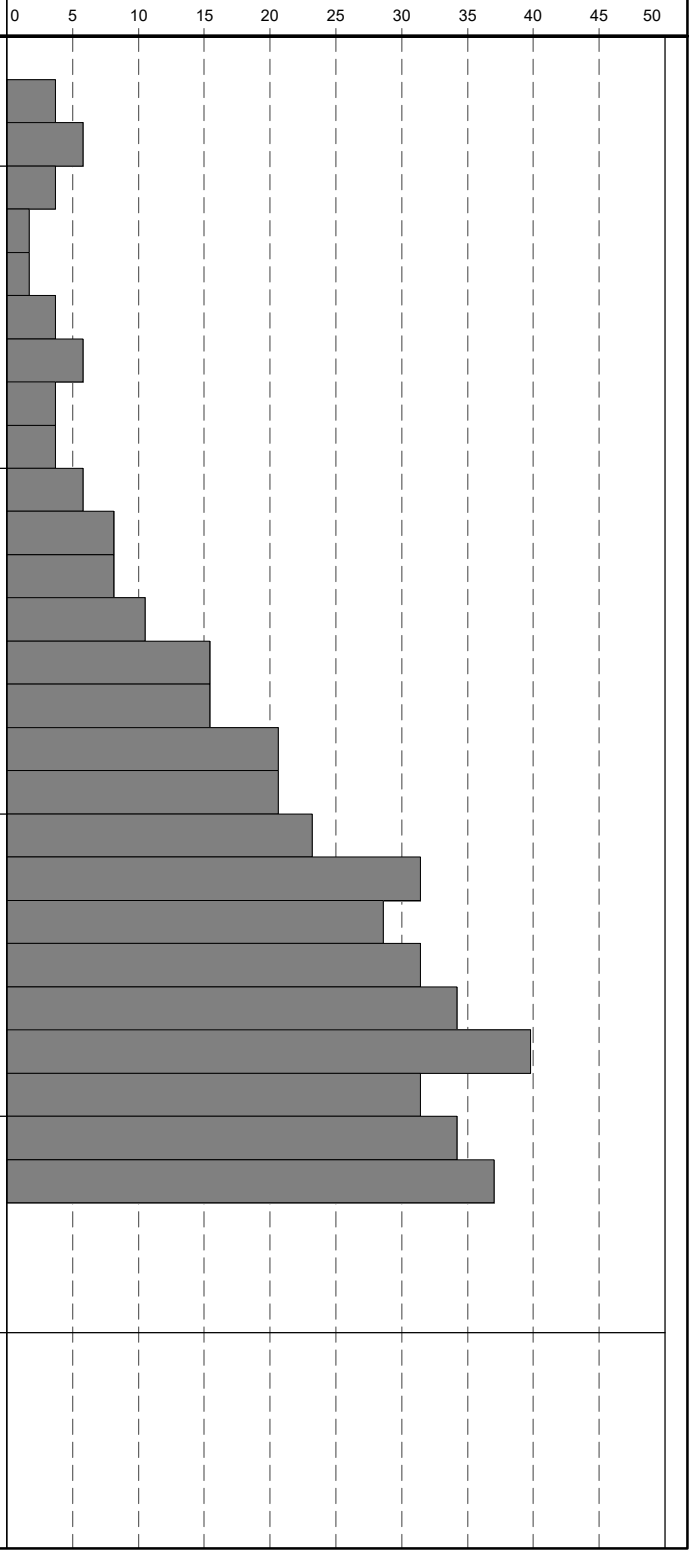
TERRA INSIGHT

Hole ID **BH07**

CLIENT	: Babagge	POSITION	:	SHEET	: 1 OF 1
CONTRACTOR	:	EASTING	: 283315.0 m	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	: 6141016.0 m	LOGGED BY	: XJ
LOCATION	: C02 Plant and Gas Pipeline	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 26/06/2025
PROJECT No.	: TERRA25-1264	GROUND RL	: 2.60 m AHD		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T		0.0	2.5		Organic Silty CLAY: low plasticity, brown
		0.5	2.0		Silty CLAY: low to medium plasticity, brown
		1.0	1.5		Silty CLAY: medium to high plasticity, light grey with orange and red mottling
		1.5	1.0		Silty CLAY: medium to high plasticity, red and grey mottled
		2.0	0.5		Sandy Silty CLAY: medium plasticity, red and light grey, fine sand
		2.5	0.0		
		3.0	-0.5		Hole Terminated at 3.00 m Target

Interpreted CBR Results from Austroads



RIG	:	CHECKED BY	: KG	REMARK
INCLINATION	:	CHECKED DATE	: 21/07/2025	
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	