
Report on Geotechnical Investigation

Sturt Plateau Compression Facility (SPCF)

Dunmarra, NT

Prepared for Tamboran Resources Limited

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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Report on Geotechnical Investigation Sturt Plateau Compression Facility (SPCF) Dunmarra, NT

1. Introduction

This report prepared by Douglas Partners Pty Ltd (Douglas) presents the results of a geotechnical investigation undertaken for the Sturt Plateau Compression Facility SPCF, Dunmarra NT (the site). The investigation was commissioned by email instructing Douglas to proceed dated 30 July 2023 from Mike Jacobsen of Tamboran Resources Limited and was undertaken in accordance with Douglas' proposal 229166.01.P.001.Rev2 dated 7 May 2024.

It is understood the proposed SPCF is located about 30 km southeast of Dunmarra and will serve as pilot facility to prove shale gas reserves from four wells at the Shenandoah South 2 Wellsite (SS2) about 3.5 km south of the SPCF. The proposed SPCF facility covers an area of about 400 m by 400 m and comprises a Well Pad, Water Treatment Area and Laydown Area. Infrastructure at the SPCF comprises storage tanks, basins, compressors, TEG package, flare stack, hardstands, control rooms and other related elements. The site location is shown on Drawing 1, Appendix A.

The aim of the investigation was to assess the subsurface soil and groundwater conditions at the site to provide comments and recommendations on the following geotechnical items:

- Site classification in accordance with AS 2870 (2011), including comments on soil reactivity;
- Erosion characteristics of the site soils;
- Excavatability and re-use potential of site materials;
- Site preparation and earthworks requirements, including topsoil identification and treatment options;
- Site sub-soil classification and earthquake hazard factor in accordance with AS 1170.4 (2007);
- Soil aggressivity in accordance with AS 2159 (2009);
- Allowable bearing pressures and estimated settlements for shallow footings (including modulus of subgrade reaction);
- Soil dynamic properties, including shear modulus and Poisson's ratio;
- Allowable vertical bearing and shaft adhesion and end bearing pressures for the design of bored and driven piles, together with recommended geotechnical strength reduction factor;
- Recommended subgrade California bearing ratio (CBR) values (including modulus of subgrade reaction) for pavement design by others;
- Factual reporting of electrical resistivity and thermal conductivity test results;
- Comments on recommended design loading rates (DLRs) for secondary treated effluent in accordance with AS1547 (2012) and the NT Code of Practice for Wastewater Management (2020) for the potential disposal areas across the site; and
- Other identified geotechnical related hazards and possible solutions.

The investigation included the drilling of five boreholes, the excavation of five test pits, field resistivity testing and laboratory testing of selected samples. The details of the field work are presented in this report, together with comments and recommendations on the items listed above.

This report must be read in conjunction with all appendices including the notes provided in Appendices A and B.

2. Site Description

The Sturt Plateau Compression facility (SPCF) site is located about 30 km southeast of Dunmarra, and about 22.5 km the east of the Stuart Highway. The proposed SPCF facility covers an area of about 400 m by 400 m. The locality and layout of the project of the site is shown on Drawing 1 in Appendix A.

Post European settlement, the site has been used for cattle grazing and until recently was largely undeveloped bushland except for some fencing, unformed track, water bore and tank installations near the boundaries of the site. The site had been cleared of vegetation shortly prior to the investigation, as shown on Figure 1.

The topography of the site is generally flat with a very slight downward grade to the south. The area experiences a wet temperate climate, characterized by seasonal rainfall and moderate temperatures. Well defined creeks and other drainage features do not appear to be present on site. The soils predominantly support Eucalyptus mid woodland, Erythrophleum low open woodland and spinifex grasses.



Figure 1: Typical conditions in the central part of the site at time of the investigation, looking southeast. Excavator is positioned at test pit TP02.

3. Published Information

3.1 Surface Geology

Reference to the Australian Geoscience Website indicates that the site regolith comprises ferruginised duricrust materials from Cenozoic origin and residual soils developed from the underlying Cretaceous sandstone and siltstone.

Similarly, the 1:250,000 Tanumbirini Geology Sheet (Sheet SE 53-2) indicates the site is underlain by Cenozoic laterites and lateritic rubble (symbol Czl) then by lower Cretaceous bedrock (symbol Kl) comprising laterised claystone, soft grey claystone, impure sandstone, white quartz sandstone and conglomerate. An excerpt from the geology sheet is shown on Figure 2.

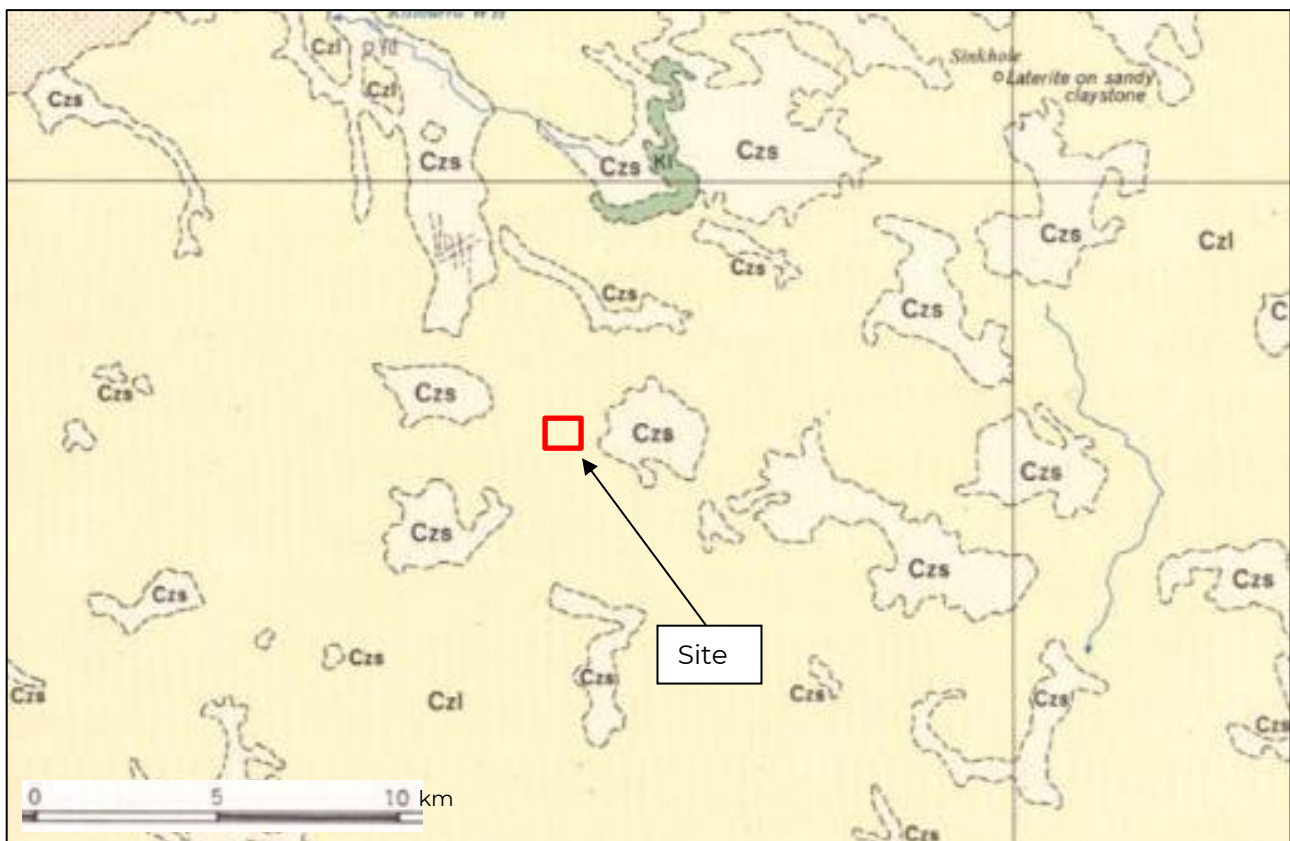


Figure 2: Excerpt of 1:250,000 Tanumbirini Geology Sheet showing site location.

3.2 Land System

Online NT Government Natural Resources mapping indicates the site is characterised with the Sturt Plateau land system as summarised in Table 1 overleaf.

Table 1: Summary of Land System Information

System Name	System Description	Landform	Soils	Acid Sulphate Soils
Sturt Plateau	Lateritic plains and rises	Plains and rises associated with deeply weathered profiles (laterite) including sand sheets and other depositional products; sandy and earth soils.	Lateritic	No occurrence.

4. Field Work Methods

4.1 Boreholes and Test Pits

Field work was undertaken between 29 June and 7 July 2024 and comprised the drilling of five boreholes (designated BH01 to BH05) and excavation of five test pits (designated TP01 to TP05) at client nominated locations. Table 2 summarises the borehole and test pit spatial and depth information. The test locations are shown on Drawing 1 in Appendix A.

- Boreholes were drilled using a crawler mounted soil sampling and rock coring geotechnical drilling rig, using 125 mm diameter spiral flight augers initially, then rotary drilling methods using a blade bit with mud stabilisation. Standard penetration tests (SPTs) were conducted at about 1 m depth intervals, commencing at 1 m depth.
- The test pits were excavated using a 20 tonne Komatsu hydraulic excavator provided by the client, which was fitted with a 1200 mm wide rock toothed bucket.

Table 2: Summary of Test Location Information

Test	Infrastructure Element	Easting (m)	Northing (m)	Surface level AHD (m)	Testing Depth bgl (m)
TP01	APA COMPOUND	355069.4	8141412.6	264.3	3.40
TP02	HP COMPRESSOR AREA	355203.7	8141339.9	264.3	3.30
TP03	CHEMICAL STORAGE AREA	355256.9	8141281.6	264.3	3.00
TP04	FUTURE PIG RECEIVER AREA	355309.4	8141407.4	264.1	3.00
TP05	ADMINISTRATION / WORKSHOP AREA (NOTE 4)	355232.9	8141260.6	264.1	3.00
BH01	APA COMPOUND	355069.4	8141412.6	264.3	10.82

Test	Infrastructure Element	Easting (m)	Northing (m)	Surface level AHD (m)	Testing Depth bgl (m)
BH02	HP COMPRESSOR AREA	355203.7	8141339.9	264.3	11.71
BH03	FLARE AREA	355111.2	8141329.8	264.1	11.26
BH04	FUTURE PIG RECEIVER AREA	355309.4	8141407.4	264.3	16.01
BH05	TEG AREA	355197.9	8141390.1	264.3	11.51

Notes: bgl – below ground level

The test pits and boreholes were logged by an engineering geologist from Douglas Partners, who also collected representative bulk samples for geotechnical laboratory testing. Following sampling, the test pits were photographed prior to backfilling. The pits were backfilled with excavated spoil, lightly tamped with the bucket in layers. The bores were also backfilled with drill spoil and lightly tamped with hand tools at the surface.

Dynamic cone penetrometer (DCP) tests were carried out adjacent to or progressively within each test pit to provide an indication of the density and in situ strength of the soils encountered. Blow counts were recorded for each 100 mm penetration or until refusal, refusal being defined as 15 blows per 100 mm of penetration.

The UTM coordinates at the test locations were determined using a hand held GPS unit, using MGA2020 as the datum, accurate to about 5 m. Survey information detailing relative levels for the test locations was not available at the time of reporting.

4.2 Resistivity Testing

Field electrical resistivity (ER) testing was carried out at the ground surface at four locations across the site shown on Drawing 1 in Appendix A, on 4 and 5 July 2024.

A Megger earth tester (model DET4TCR2) was used to undertake vertical electrical soundings (VES), in accordance with the four point “Wenner” soil resistivity method, as summarised in Appendix C of AS/NZS 1768 (2007). Electrodes were spaced at intervals of 0.5 m, 1 m, 2 m, 4 m, 8 m, 16 m, 20 m and 32 m.

Perpendicular sounding pairs were carried out to assess any anisotropy in the results, which would indicate lateral variations in site conditions contrary to the assumptions of the sounding method (ie horizontal, homogeneous and isotropic layering).

5. Field Work Results

5.1 Stratigraphy

Ground conditions encountered in the boreholes and test pits are summarised below and detailed logs including DCP test results are presented in Appendix B, together with notes on sampling methods, soil descriptions and symbols and abbreviations.

The subsurface conditions encountered in the bore holes and test pits are summarized below.

SURFACE LAYER: (Unit 1)	The surface layer ranged in thickness from 0.2 m to 0.4 m, and comprised Silty Sand; low plasticity silt with some roots, noting that surface vegetation had been stripped.
RESIDUAL SAND: (Unit 2)	Encountered in all boreholes and test pits underlying the topsoil, between 2 m and 4 m thickness (details in Table 3 overleaf), and comprising Clayey Sand (SC), with gravel: red-brown; fine to coarse grained; loose to medium dense; fine to medium grained, sub-rounded, pisolitic gravel.
LATERITIC SANDS AND GRAVELS: (Unit 3a)	Extremely weathered, lateritic materials were encountered beneath the residual sand layer, comprising Clayey sandy GRAVEL (GC) with sand and gravel, loose to dense and partially cemented in places, with medium plasticity. The soil contains fine to coarse sand, and fine to coarse sub-rounded to rounded gravel. Scattered cobbles and boulders were found in this horizon in test pits TP03 and TP05. This unit is interpreted to be an extremely weathered laterised conglomerate, and has soil like properties.
LATERITIC SILT: (Unit 3b)	Underlying the Unit 3a in all boreholes except BH02 were lateritic silt materials, generally as very stiff to hard Clayey SILT (ML)/Silty CLAY (CL), with brown and pale orange colours, slickensided surfaces on old joints, medium to high plasticity. This unit is interpreted to be an extremely weathered laterised siltstone, and has soil like properties.
KAOLINISED SILTSTONE: (Unit 4)	Encountered in all boreholes as highly weathered, off-white with purple mottling and red staining, very low rock strength, fractured kaolinised siltstone, from depths of between 6 m and 13 m at the test locations.

Table 3 overleaf summarises the depth and thickness for each unit.

5.2 Groundwater

This investigation was carried out during of the dry season in July 2024, and groundwater seepage was not encountered in any test pit or boreholes. It should be noted that groundwater and ground moisture conditions are affected by factors such as climatic conditions, soil permeability and human influences, and will therefore vary with time.

Table 3: Summary of Depths and Thicknesses of Units.

Test Location	Unit 1 Surface Soils	Unit 2 Residual Sand Soils		Unit 3a EW Material – Gravels and Sands		Unit 3b EW Material – Silts		Unit 4 Kaolinised Siltstone
	Thickness (m)	Depth to Top of Unit (m)	Thickness (m)	Depth to Top of Unit (m)	Thickness (m)	Depth to Top of Unit (m)	Thickness (m)	Depth to Top of Unit (m)
TP01	0.40	0.40	>3.4	Ne	Ne	Ne	Ne	Ne
TP02	0.30	0.30	>3.3	Ne	Ne	Ne	Ne	Ne
TP03	0.25	0.25	2.45	2.70	>0.3	Ne	Ne	Ne
TP04	0.50	0.50	>2.50	Ne	Ne	Ne	Ne	Ne
TP05	0.25	0.25	1.85	2.10	>0.90	Ne	Ne	Ne
BH01	0.40	0.40	2.60	3.00	4.00	7.00	1.22	8.20
BH02	0.25	0.25	3.05	3.30	4.00	Ne	Ne	7.30
BH03	0.30	0.30	3.20	3.50	1.70	5.20	1.10	6.30
BH04	0.40	0.40	2.80	3.20	2.00	5.20	7.80	13.00
BH05	0.30	0.30	4.00	4.30	1.00	5.30	4.50	9.80

Notes: Ne – Not encountered

5.1 Electrical Resistivity

Electrical Resistivity test results are presented in Appendix C.

6. Laboratory Testing

6.1 Geotechnical Testing

Geotechnical laboratory testing was performed on selected soil samples at Douglas' NATA registered laboratory in Darwin, and comprised the following:

- Atterberg limits and linear shrinkage tests;
- Particle size distribution (PSD) tests;
- Emerson Crumb tests;
- Shrink-Swell index tests on re-moulded samples at either 90% or 92% of modified maximum dry density; and
- California bearing ratio (CBR) tests, compacted to 95% of Modified maximum dry density and soaked for four days prior to penetration.

The results of the laboratory testing are provided in detail in the test report sheets in Appendix D and are summarised in Tables 4 to 6.

Table 4: Laboratory Test Results, including PSD and Atterberg Limit Tests.

ID	Depth (m)	Sample Description	EC	Fines (%)	Sand (%)	Gravel (%)	LL (%)	PI (%)	LS (%)	WPI
TP01	0.1-0.2	Silty SAND	Nt	15	85	0	Nt	Nt	Nt	Nt
TP01	0.5-0.7	Clayey SAND	4	30	70	0	22	8	4	672
TP02	2-2.2	Clayey gravelly SAND	4	21	48	31	23	11	5.5	605
TP03	1.5-1.7	Clayey SAND	Nt	29	70	1	Nt	Nt	Nt	Nt
TP03	2.4-2.5	Clayey Sandy Gravel	4	19	38	43	23	10	5	
TP05	2.5-2.7	Clayey Sandy GRAVEL	Nt	20	59	21	Nt	Nt	Nt	Nt
TP05	2.5-2.7	Clayey Sand with Gravel	Nt	20	59	21	Nt	Nt	Nt	Nt
BH03	5.2-6.0	Sandy Silty Clay	4	52	45	3	32	18	5.5	Nt
BH03	7.2-7.7	Kaolinised Siltstone	Nt	79	1	20	Nt	Nt	Nt	Nt

Legend:

Fines = % passing the 0.075mm sieve
 Sand = % passing the 2.36mm sieve minus Fines
 Gravel = % passing the 75mm sieve minus Sand and Fines
 WPI = % passing the 0.425 mm sieve x PI

PI = Plastic Index
 LL = Liquid Limit
 LS = Linear Shrinkage
 Nt = Not tested

Table 5: Summary of CBR Testing

ID	Depth (m)	Soil Description	FMC (%)	OMC (%)	MMDD (t/m ³)	CBR (%)	Swell (%)
TP01	0.5-0.7	Clayey SAND, trace gravel	6.2	8.0	2.22	50	0.0
TP02	2-2.2	Clayey gravelly SAND	7.9	10.0	2.05	19	0.0
TP03	2.4-2.5	Clayey Sandy Gravel	8.1	10.5	2.05	40	0.0
TP05	0.8-1.0	Clayey SAND	6.5	8.5	2.07	25	0.0

Legend:

FMC - Field Moisture Content OMC - Optimum Moisture Content MMDD – Modified Maximum Dry Density

CBR – California bearing ratio at 95% MMDD

Table 6: Results of Shrink-Swell Testing

Test Pit	Top Depth (m)	Bottom Depth (m)	Soil Description	Moisture Content of Remoulded Sample	Modified Density Ratio of Remoulded Sample	Shrink-Swell Index (%)
TP02	2.0	2.2	Clayey gravelly SAND	11.4	2.4	0.8
TP03	2.4	2.5	Clayey Sandy Gravel	10.6	1.95	0.6

Notes:

(1) Re-constituted at 95% MMDD, as undisturbed samples unable to be taken in the field.

6.2 Soil Aggressivity

Soil aggressivity laboratory testing was performed on selected soil samples at a NATA registered laboratory in Perth, WA, and comprised the following:

- Chloride and Sulphate and pH;
- Electrical Conductivity (EC); and
- Resistivity.

The results of the laboratory testing are provided in detail in the test report sheets in Appendix D and are summarised in Table 7.

Table 7: Results of Soil Aggressivity Testing

Test pit	Depth (m)	Soil Description	Chloride (mg/kg)	Sulphate (mg/kg)	pH	EC (µS/cm)	Resistivity (ohm m)
TP01	0.1-0.2	Silty SAND	<10	<10	5.9	9	1100
TP01	0.5-0.7	Clayey SAND	<10	<10	6.4	9	1100
TP02	1.0-1.3	Clayey SAND	<10	<10	6.4	6	1800
TP02	2.0-2.2	Clayey gravelly SAND	<10	<10	6.2	4	2600
TP03	1.5-1.7	Clayey SAND	<10	<10	6.0	3	3400

Test pit	Depth (m)	Soil Description	Chloride (mg/kg)	Sulphate (mg/kg)	pH	EC (μS/cm)	Resistivity (ohm m)
TP03	2.0-2.5	Clayey Sandy Gravel	<10	<10	5.9	3	3100
TP05	0.8-1.0	Clayey SAND	<10	<10	5.9	5	1900
BH03	5.2-6.0	Sandy Silty Clay	<10	<10	6.1	14	720

Notes: EC - Electrical Conductivity

6.3 Soil Effluent Related Tests

Soil effluent related laboratory testing was performed on selected soil samples at a NATA registered laboratory in Perth, WA, and comprised the following:

- Phosphorus Sorption (mg/kg); and
- Cation Exchange Capacity.

The results of the laboratory testing are provided in detail in the test report sheets in Appendix D and are summarised in Table 8.

Table 8: Results of Soil Effluent Related Tests

Test pit	Depth (m)	Soil Description	Phosphorus Sorption (mg/kg)	Cation Exchange Capacity (meq/100g)
TP03	1.5-1.7	Clayey SAND	170	1.5
TP05	0.8-1.0	Clayey SAND	140	1.3

6.4 Thermal Resistivity Testing

Thermal resistivity (TR) testing was performed on thirty selected samples at a NATA accredited specialist laboratory in Sydney, NSW. The results of the laboratory testing, including the compaction and dry-out curves, are provided in detail in the test report sheets in Appendix E and are summarised in Table 9.

Table 9: Results of Thermal Resistivity Laboratory Testing

Test Pit	Depth (m)	Soil Description	Max. Dry Density ⁽¹⁾ (t/m ³)	Density Ratio	Pre Dry-Out TR (Km/W) ⁽²⁾	Fully Dry-Out TR (Km/W) ⁽³⁾
TP01	0.5-0.7	Clayey SAND	TBA	TBA	TBA	TBA
TP02	1-1.3	Clayey SAND	TBA	TBA	TBA	TBA
TP03	1.5-1.7	Clayey SAND	TBA	TBA	TBA	TBA

Notes: (1) Standard compaction. (3) At Standard Optimum Moisture Content. (2) At zero moisture content.
TBA: To Be Advised

7. Comments

7.1 Appreciation of Ground Conditions

Based on the conditions encountered in the test pits and boreholes, in addition to the published information and past experience in the region of the site, the following discussion points are provided in relation to the subsurface conditions:

- The site is characterised with a surface layer of silty sand (Unit 1) that represents a leached mantle derived from the underlying residual sand soils, with elevated organic content and roots. At the time of the investigation, the vegetation and possible upper 20 mm to 50 mm of soil had been stripped to expose the surface soils, as shown on Figure 1. The surface layer gradationally transitions into the underlying residual clayey sand soils (Unit 2) over depths of about 200 mm to 500 mm. The underlying residual soils have been ferruginised by laterisation with minor cementing observed in places. Figure 3 overleaf shows the side wall of test pit TP05 and the layer of red-brown, loose to medium dense residual clayey sand extending to about 3 m depth. As a general rule, during the dry season, strength of these upper soils (ie Units 1 and 2) tends towards the dense/very stiff range, and during the wet season, soil strengths can reduce to the loose/firm range.
- The bedrock profile is deeply weathered through a combination of physical weathering and laterisation. Whilst 'bedrock' was encountered at depths of about 3 m to 4 m, the rock has weathered to the extent that it possesses soil like properties and is therefore described as such from a geotechnical perspective. SPT-N value blow counts are typically in the range of 8 to 36. Figures 4 and 5 overleaf show the variability in presentation of this unit, ranging from cobbly accumulations at the base of the test pit in Figure 4 and as laterised conglomerate at 3 m depth in borehole BH02 in Figure 5. The upper zone of the weathered bedrock has been subdivided into Unit 3a which includes the observed laterised conglomerate and cobbly gravel logged as 'extremely weathered material' and Unit 3b which comprises laterised siltstone logged as a hard silt.
- Underlying these extremely weathered material is a mottled 'off-white', kaolinised, saprolitic, fractured siltstone (Unit 4) of very low rock strength. It was encountered at depths ranging from 6.3 m to 13.0 m and appears to be consistently present across the site, with some variation in depth. It is unknown if this rock unit becomes more competent with depth.
- Groundwater conditions are expected to be highly dependent on seasonal variations associated with rainfall patterns. Soil moisture contents can reach near saturation during the wet season, and then reduce significantly during the dry season.

In summary, the site is considered suitable for the intended development. Designs will also need to ensure good surface and subsurface drainage to prevent saturation of building pads and pavement subgrades, as well as mitigate risk of seasonal perched groundwater. These issues are expected to be overcome with standard civil engineering design and construction practice.

Further comments regarding design and construction practices are provided in the following sections of this report.

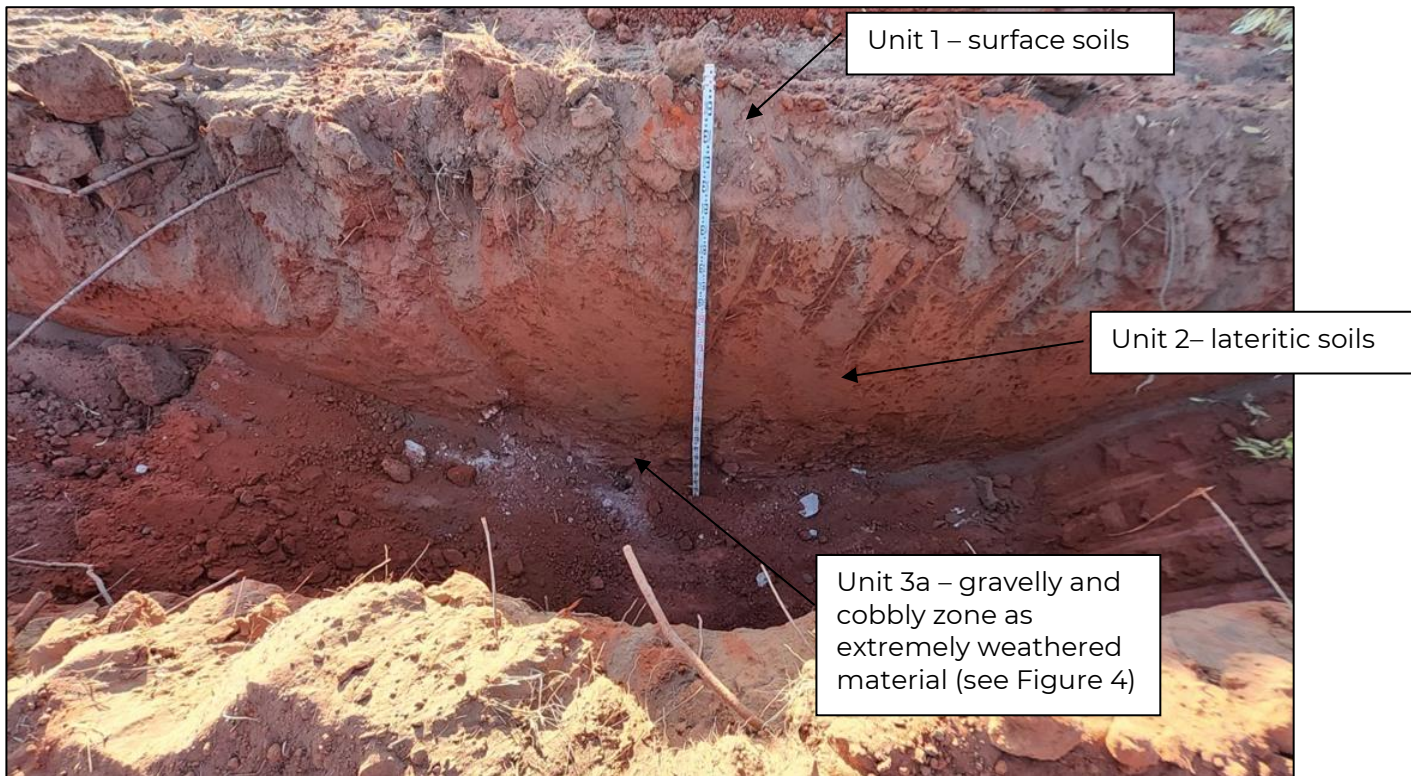


Figure 3: Test pit TP05 showing 'bleached' surface soils, overlying red-brown residual lateritic soils, overlying off-white cobbles and gravels correlated to weathered conglomerate shown in Figures 4 and 5.



Figure 4: Base of test pit TP05 showing close-up of interpreted laterised conglomerate at depth of about 2.5 m, logged as 'extremely weathered material'.



Figure 5: Borehole BH02, SPT sample at 3.0m, showing laterised conglomerate, logged as 'extremely weathered material'.

7.2 Site Preparation and Earthworks

The geotechnical properties of the shallow silty sandy soil will dictate the method of site preparation for the range of different infrastructure elements for the project. For example, site preparation for a building pad to support heavy structures will likely differ from site preparation for pavements. It is expected that different site preparation strategies will be adopted for different infrastructure elements depending on the performance requirements of those elements, with adoption of method specifications and compliance (compaction) specification as applicable.

The surface silty sand can present construction challenges, as they are usually highly moisture sensitive. Successful compaction requires the moisture content to be at optimum for the plant being used onsite (rather than nominally at modified or standard optimum). If dry of plant optimum, the sand will often stay loose and not 'tighten up', whereas if it is wet of plant optimum, it can easily heave and exhibit plastic behaviour. Moisture conditioning the silty sand to the plant optimum moisture content therefore becomes a critical component of the site preparation operations, particularly if a compaction criteria is specified. Water supply and application method then becomes a critical site management issue.

However, when confined by compacted engineered fill, silty sand can provide a very stable foundation. The critical aspect is therefore to 'tighten' the surface to an extent that allows the first layer of fill to be placed and compacted. The following general guidelines are provided:

- Remove all surface vegetation beneath all new buildings, infrastructure, sealed hardstand, and layered pavement areas. The surface materials encountered in the test pits and boreholes may be retained, as the organic content was visually assessed to be very low, and its engineering properties assessed as being equivalent to the underlying silty sand. All

stumps and tree roots larger than about 30 mm diameter should be grubbed out at this stage.

- Rip the upper 200 mm of the exposed surface and moisture condition to the plant optimum moisture content. It is possible that the exposed soils will be softer in places if exposed to rainfall or following the wet season and cause heaving under earthmoving machinery. This is particularly the case if earthworks commence soon after the wet season when moisture content levels will be elevated. For this reason, it is recommended that site preparation and exposure of the foundation soils occur during the dry season when conditions are favourable, and drying out of the exposed foundation soils will permit them to be prepared for construction of the fill platforms and pavement subgrades. Wet season construction may require the use of rockfill platforms to support earthworks equipment which can be costly.
- Roll and compact the exposed surface with a minimum six passes with a 12 tonne smooth drum or pad foot roller in static mode (to be confirmed following road trials), with a final test roll pass accompanied by careful visual inspection by an experienced independent specialist to ensure that any deleterious materials such as soft, wet or highly compressible soil and organics are identified for removal and replacement.
- Place suitable granular fill material to meet Select Fill requirements as per the DIPL Standard Specification for Small Building Works (2018), in near horizontal layers of maximum 200 mm loose thickness. In confined working areas or in situations where compaction may be difficult to achieve, thinner layers would be required. Recommended compaction requirements for controlled fill are presented below.

Purpose	Minimum Dry Density Ratio
Building Pad generally	98% Standard
Embankments and Pavements	95% Modified

- Maintain moisture contents of fill materials to within 1% dry to 2% wet of optimum moisture content during construction.
- Seal or cover any natural or compacted clay foundation soil, at or close to formation level, as soon as practicable, to reduce the opportunity for desiccation, cracking, swelling or softening.

Filling placement and compaction should be undertaken under 'Level 1' inspection and testing arrangements, in accordance with Section 8 of AS3798-2007, with preparation of a 'Level 1' report at the conclusion of earthworks.

7.3 Excavation Conditions

It is anticipated that soils encountered during the investigation to depths of about 3 m will be readily excavated with conventional earthmoving equipment such as hydraulic excavators and backhoes. Where weakly to moderately cemented soils are encountered, these may require heavier machinery such as 22 tonne excavators fitted with a rock toothed bucket, noting the 20 t excavator used during the excavation could excavate this material where encountered. If trench excavations are carried out in the wet season, there is potential for groundwater inflow from shallow perched groundwater, but it is expected that it could be controlled by sump and pump arrangements, although excessive water inflow would possibly result in trench wall instability.

Deep and shallow bored pile excavations would be expected to be self-supporting for short periods depending on the presence of groundwater. However, it is recommended that for planning purposes, casing be allowed for to ensure sidewall stability if carried out during or just after the wet season. Groundwater inflow and excavation instability is expected during and after typical wet season inundation.

Boring for piles are expected to be accomplished by conventionally sized pile piling rigs.

7.4 Trafficability

The exposed surface soils are expected to provide good trafficability for most of the year as was experienced during the investigation in July 2024, although moderately to highly trafficked areas will rapidly deteriorate and would require gravelling. Treatment to control dust 'kicked up' by moving vehicles needs consideration also. Some difficulty may also arise where localised deposits of clayey soils may be present. For low trafficked areas, some rolling and compaction of the sandy soils (with moisture conditioning to aid compaction) may assist where infrequent maintenance access is required.

Trafficability is expected to decline during the wet season as surface soils become saturated. As noted previously, earthworks are recommended to be carried out during the dry season. If access to the site is required during the wet season, then gravel pavements with appropriate water shedding would be required.

7.5 Site Classification

Site classification in accordance with AS 2870 (2011) can be used to assess reactive movements of founding soils below residential structures up to two storeys high with high level footings, and indicates the potential for cracking to occur in brittle materials such as concrete, blockwork and tiles. It is strictly not applicable to this development, but can also be used to assist pavement and in-ground services design.

Classification of the site has been determined by estimating the characteristic surface movements (y_s), using the following input:

- The following soil shrink-swell index (I_{ss}) based on laboratory results and in-house correlations:
 - o 0.5% per ΔpF for the low plasticity Unit 1 surficial soil.
 - o 0.8% per ΔpF for Unit 2 Clayey Sand, Unit 3a Clayey Sandy Gravel, and Unit 3b Silty Clay.
- A change in soil suction (Δu) of 1.2 pF at ground level in accordance with the Australian Standard (AS 2870, 2011).
- Depth of suction (H_s) of >4 m based on a 'Arid' climatic zone, from Jackson (2022).
- Cracking depth of 2.5 m.

Using the methods outlined in the Australian Standard (AS 2870, 2011), characteristic ground surface movement (y_s) values of less than 25 mm were assessed for the site, corresponding to a 'Class M' classification.

This classification does not consider tree effects, which is not likely to be relevant based on existing conditions, but could be if new more reactive fill is placed, and depending on landscaping and proximity to any future trees at the site. The building designer should refer to the standard (AS 2870, 2011) for additional guidance on footing design to accommodate tree effects.

If clay fill is used as controlled fill at the sites (which Douglas does not recommend), y_s values would increase and a more severe site classification may apply because of the reactive nature of the fill and need to consider uncracked ground conditions. Select Fill, which is more granular and less reactive, or granular General Fill is considered preferable at this site to prevent reactive movements. If fill is placed, it would be more appropriate to assess the site classification once filling operations are complete.

It should be noted that the above estimate of y_s does not take into account settlement induced by footing loading of the foundation soils (discussed in Section 7.9).

7.6 Soil Aggressivity

The results of laboratory testing of soil aggressivity collected during the field work have been compared to the exposure classifications for steel and concrete as outlined in the piling standard (AS 2159,2009). Table 10 summarises the exposure classifications for each of the samples tested.

Table 10: Soil aggressivity assessment.

Pit	Depth (m)	Description	Soil Condition	pH (concrete)	pH (steel)	Resistivity ⁽¹⁾ (Ω .cm) (steel)	SO ₄ (ppm) (concrete)	Cl (ppm) (steel)
TP01	0.1-0.2	Silty SAND	A	5.9	5.9	110000	<10	<10
TP01	0.5-0.7	Clayey SAND	A	6.4	6.4	110000	<10	<10
TP02	1.0-1.3	Clayey SAND	A	6.4	6.4	180000	<10	<10
TP02	2.0-2.2	Clayey gravelly SAND	A	6.2	6.2	260000	<10	<10
TP03	1.5-1.7	Clayey SAND	A	6.0	6.0	340000	<10	<10
TP03	2.0-2.5	Clayey Sandy Gravel	A	5.9	5.9	310000	<10	<10
TP05	0.8-1.0	Clayey SAND	A	5.9	5.9	190000	<10	<10
BH03	5.2-6.0	Sandy Silty Clay	A	6.1	6.1	72000	<10	<10

Notes to Table

	Non-aggressive
	Mildly aggressive
	Moderately aggressive
	Severely Aggressive
	Very Severe

NT

1 Resistivity calculated based on inverse of conductivity in aqueous solution results

Scale of aggressivity based on threshold values given in AS 2159 – 2009: Piling – Design and Installation.

Based on the results in Table 10, an aggressivity exposure classification of 'mild' for concrete and 'non aggressive' for steel are recommended in accordance with the standard (AS 2159, 2009) for piles and other components of the proposed structures anticipated to be exposed to groundwater during wet periods.

7.7 Effluent Disposal Assessment

The design of an effluent disposal system for the proposed development at the site will be dependent on the number of people using the facility, the duration these people will be staying at the facility, the storage and/or disposal methods adopted and the ability of the site to accommodate the effluent.

At the time of preparation of this report details of the proposed system and the design loading were not available

7.7.1 Site & soil Assessment

The suitability of the site to accept effluent is dependent on a number of factors:

- The soil profile within the proposed application area;
- The type and output nutrient quality of the treatment system utilised;
- The physical characteristics such as topography, landform and distances to water bodies etc; and
- Prevailing climatic conditions.

The receiving soils for effluent disposal will vary according to the specific area of the site used and the disposal method adopted (drip or spray irrigation, or trenches and beds etc). Table 11 below provides soil category, indicative permeability, design loading rate (DLR) and design irrigation rate (DIR) for the soils encountered within TP 3 and TP 5, with reference to Table L1 of AS/NZS 1547 (2012).

Table 11: Indicative Permeability, Design Loading Rates and Design Irrigation Rates for the Sites Receiving Soils

Receiving Soils	Soil Category	Indicative Permeability (K_{sat}) (m/d)	DLR – Trenches and Beds (mm/day)	DIR – Drip or Spray Irrigation (mm/day)
Unit 1 – Silty Sand	1	>3	15 to 20	5
Unit 2 – Clayey Sand	2	1.4 – 3.0	15 to 25	5
Unit 3a – Clayey Sandy Gravel	3	0.5 – 1.5	10 to 15	4

Legend: DLR = design loading rate DIR = design irrigation rate

The observations made during the field work indicate that the site generally meets the minimum standard required for effluent disposal by ground absorption. Specifically, the site is not located within a watercourse, floodplain, or swampy area (no hydrophytes were observed). The soil typically exhibits consistent horizons to a depth greater than 1.2 meters.

The ground is relatively flat and does not exceed 1 in 4 (25%) slope. Unfragmented or impervious rock is present at depths greater than 1.0 meter from the ground surface.

7.7.2 Cation Exchange Capacity (CEC)

The Cation Exchange Capacity (CEC) results of 1.5 meq/100g and 1.3 meq/100g for the subgrade samples tested at the site indicate a significant limitation. These low CEC values suggest that the soils have a reduced capacity to retain plant nutrients and immobilize cations from effluent solutions, which can lead to nutrient leaching and inadequate treatment of effluent. To address this limitation, the application of gypsum could be beneficial, as it can improve soil structure and increase the CEC, thereby enhancing the soil ability to retain nutrients and manage effluent more effectively.

7.8 Preliminary Contamination Testing

Preliminary contamination testing was undertaken on samples collected during this geotechnical investigation

As requested by the client, six samples were collected during the geotechnical investigation (from three test pits at target depths of 0.25 m and 0.5 m) at client nominated locations without assessment, commentary or interpretation.

The following testing was carried out on samples collected

- Metals/metalloids (Aluminium, Arsenic, barium, boron, Cadmium, chromium, copper, fluoride, iron, lead, Manganese, mercury nickel, Strontium, zinc);
- Leachability (Aluminium, Arsenic, barium, boron, Cadmium, chromium, copper, fluoride, iron, lead, Manganese, mercury nickel, Strontium, zinc)
- Total recoverable hydrocarbons (TRH);
- Benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN);
- Polycyclic aromatic hydrocarbons (PAH);
- Major ions (sodium, magnesium, potassium, calcium, chloride, carbonate, sulphate, borate, bicarbonate, Cation Exchange capacity (calc), SAR (calc));
- Physical Chemistry(pH, EC and TDS-(1:5 and SE), dispersity);
- Per- and polyfluoroalkylated substances (PFAS);
- Nutrients; and
- Monocyclic Aromatic hydrocarbons (MAH).

The results are presented in Appendix F

7.9 Geotechnical Design Parameters

Material properties were derived from the results of field assessments, utilising both published data and in-house correlations. These properties are intended for use in the preliminary design of proposed structures. Table 12 presents suggested indicative drained and undrained strength parameters for the range of soils encountered during the investigation. It is recommended that specific shear wave velocity testing be conducted to onsite to confirm the damping ratio, if required.

Table 12: Geotechnical Design Parameters

Unit	Material	Effective Friction Angle, Φ' (degrees)	Undrained Cohesion, c_u (kPa)	Bulk Unit Weight above groundwater (kN/m ³)	ν	Static		Dynamic	
						E (MPa)	G (MPa)	E_{dyn} (MPa)	G_{dyn} (MPa)
Unit 1 and 2	Loose to medium dense sand	30	-	17	0.3	15	6	19	7
Unit 3a	Lateritic sand and gravel (medium dense)	32	-	19	0.3	20	8	25	10
Unit 3b	Lateritic clay (very stiff to hard silt/clay)	-	200	19	0.3	50	19	63	24
Unit 4	Kaolinised siltstone 'saprolite'	-	300	20	0.25	60	24	75	30

E = Static Young's Modulus
 E_{dyn} = Dynamic Young's Modulus
 ν = Poisson's Ratio

G = Static Shear Modulus
 G_{dyn} = Dynamic Shear Modulus

7.10 Shallow Foundations

Below the top 300 mm deep rootzone, the soil profile is considered a suitable supporting stratum for buildings and other structures. Shallow pad and strip footings for lightweight building structures that are embedded at a minimum depth of 0.3 m, may for preliminary purposes be proportioned on an allowable bearing pressure of 150 kPa. Estimated settlements for a range of footing sizes, applied bearing pressures and a water table assumed at a depth of 1 m below ground surface, are presented in Table 13, based on the following general soil profile:

- 0.5 m thick layer of surficial silty sand ($E' = 15$ MPa); overlying
- 2.0 m thick layer of loose/ medium dense clayey sand ($E' = 15$ MPa); overlying
- 1.0 m thick layer of medium dense to dense clayey gravel ($E' = 20$ MPa).

Table 13: Estimated Settlements for Shallow Footings.

Load	Design Bearing Pressure	Footing Size	Minimum Depth of Embedment	Estimated Settlements (mm)
75 kN/m	150 kPa	500 mm strip	0.3 m	5
150 kN	150 kPa	1 m square	0.3 m	5 - 10
430 kN	150 kPa	1.7 m square	0.3 m	30 - 35

Differential settlements may be up to 50% of the total settlements. Most settlement should occur during construction, with post-construction settlement anticipated to be about 10% of the aforementioned settlement value.

The base of all footings should be prepared, compacted and tested by dynamic cone penetrometer (DCP) with inspection by an experienced engineer to confirm that design bearing pressures are suitably achieved during construction.

7.11 Driven Piled Foundations

It is understood that the piling system considered by the piling contractor comprises driven steel piles. The suitability of a pile types is governed by the loads applied and lengths. Displacement piles, such as driven piles (also driven cast-in-situ piles) have the particular benefit at this site in that minimal, if any, spoil is generated during their installation.

The preliminary pile parameters presented in the following report sections are unfactored ultimate values. A basic geotechnical strength reduction factor (ϕ_{gb}) of 0.45 is recommended for a low redundancy system in accordance with AS 2159 if no pile testing is undertaken during construction. This is based on the data presented in this report, the method of soil strength assessment used in this investigation and after assessing the overall design average risk rating (ARR) for the site, design and installation risk factors. The equivalent factor for a high redundancy system would be approximately 0.5 to 0.55 without pile testing. Depending upon the percentage of piles tested, and the number that meet the acceptance criteria, the geotechnical strength reduction factor is anticipated to increase to about $\phi_g = 0.6$ to 0.7 (subject to confirmation) based on the standard (AS 2159, 2009).

The ultimate parameters shown in Table 14 are suggested for the preliminary static design of driven piles subject to vertical compressive and uplift loads, with at least four pile diameters embedment into the founding strata (likely very low strength siltstone, or possibly the overlying weaker hard extremely weathered material ie, Units 3b or 4) and a consistent founding stratum extending to at least four pile diameters below the toe of the pile, as proven by comparison with investigation boreholes. It is also noted that the cobbles and gravelly soils encountered in Unit 3a may cause driving resistance and may need some construction provisions (eg pre-drilling) to achieve targeted embedment depths required for lateral, uplift and dynamic loads.

Table 14: Ultimate Unfactored Pile Design Parameters – Vertical Load, Driven Steel Tube Piles

Founding Material	Ultimate Unfactored Pressure, $R_{d,ug}$ (kPa)		
	End Bearing Pressure f_b	Average Shaft Friction $f_{m,s}$ (compression)	Average Shaft Friction $f_{m,st}$ (tension)
Unit 2 – Loose to medium dense sand	-	35	25
Unit 3a – Loose to dense sand/gravel	-	45	30
Unit 3 b – silty clay, very stiff to hard	1800 (assuming hard soils with $N_{SPT} > 30$) ^[1]	50	35
Unit 4 - Very low strength kaolinised siltstone	2500	90	60

Note: ^[1] At some locations, the upper zone of Unit 3b included some weaker soils not meeting $N_{SPT} > 30$ criteria. A penetration of 2 m below the surface of Unit3b should ensure a hard consistency with $N_{SPT} > 30$ and a ultimate end bearing of 1800 kPa.

Driven piles should be installed to a predetermined resistance or set, with measurements recorded during pile installation. The capacity of driven piles should then be further checked using a pile driving formulae, such as the Hiley equation, or preferably more sophisticated dynamic testing methods such as PDA testing with CAPWAP interpretation.

Bore logs should be checked when a founding set has been achieved to verify sufficient thickness of adequate founding material beneath the pile toe (at least four pile diameters).

For design purposes it is accepted practice to adopt lower bound values for the soil strengths to be conservative. When driving however, the pile behaviour will be governed by the actual soil strength. Therefore, the possibility of the pile refusing before the target depth defined by calculation is reached, must be recognised. This will be especially true if an undersized hammer is used. To minimize this risk, a hammer capable of driving against the minimum required capacity (including testing requirements) should be selected such that if premature refusal occurs, adequate capacity should still be obtained (at least for compressive criteria). Nevertheless, selection of an appropriate piling hammer should be the responsibility of the piling contractor.

With respect to the ultimate end bearing parameters presented for rock, the ultimate end bearing pressure limit should be subject to structural verification of the maximum working compressive stress for the proposed pile type.

Pile settlements under working loads are expected to be less than 1% of the pile width.

Pile capacities should be designed based on the specific ground conditions at the pile locations, and as such, further investigation during detailed pile design may be required for individual piles.

7.11.1 Lateral Deflection

The design parameters listed in Table 15 below together with those listed in Table 12 in Section 7.9 suggested for the assessment of pile behaviour under lateral loading. Such analyses are typically undertaken using 'p-y' methods (e.g softwares 'L-pile', 'Pygmy' or equivalent) or finite element analyses (e.g software Plaxis or equivalent).

The suggested lateral moduli of subgrade reaction (k_h) given in Table 15 are dependent on the pile width, B (unit in mm).

Table 15: Ultimate Unfactored Parameters for Pile Lateral Design

Founding Material	Horizontal Deformation Modulus E_h (MPa)	Passive Earth Pressure Coefficient K_p	Ultimate Limiting Pressure (kPa)	Lateral Modulus of Subgrade Reaction, k_h (kPa/mm, width B in mm)
Unit 2 – Loose to Medium dense sand	10	3	$3K_p\sigma'_v = 150z^{(3)}$	11,000/B
Unit 3a – Loose to Dense sand/gravel	15	3.6	$3K_p\sigma'_v = 180z^{(3)}$	16,000/B
Unit 3 b – Very stiff to Hard silty clay	30	2.4 ⁽¹⁾	500 ⁽²⁾	32,000/B
Unit 4 - Very low strength kaolinised siltstone	40	3 ⁽¹⁾	600 ⁽²⁾	43,000/B

Where σ'_v = average vertical overburden pressure, z = depth along pile, B = pile width/diameter of the pile

Notes:

(1) sustained long term loading

(2) short duration loading

(3) applicable for pile spacing greater than 5xD (diameter); reduction factors should be applied for pile spacing less than 5xD

(4) For soil, the above modulus values are valid for a typical range of operating strains (i.e. <1% strain) under static loading and within the elastic stress range; no effect of pile interaction is taken into account and larger modulus values (say 25% greater) would be more representative for small strain cyclic loading (e.g. earthquake loading).

(5) For the rock, modulus values are only appropriate over linear elastic range and with a maximum strain of 1% and should only be used when there is no interaction between piles.

It should be noted that the above stiffness parameters are for a uniform, isotropic strata with no trenches or steel slopes nearby. In cohesive soils (and rock), the stiffness may be assumed as constant (i.e. uniform with depth).

7.12 Earthquake Site Factor

The site is considered to be located in an area of low seismic activity, noting that Tennant Creek which is about 300 km south of the site, is an area of higher seismic risk.

The design procedure contained within AS 1170.4:2007 “Structural Design Actions Part 4: Earthquake Actions in Australia” Section 2 sets out the design procedure for earthquake loadings. For a 1 / 500 annual probability of exceedance, the probability factor (k_p) from Table 3.1 is 1.0, and the Hazard Factor (Z) for the site from Figure 3.2(E) is 0.08 giving a ($k_p Z$) of 0.08. The site sub-soil class from Section 4 of the Standard is C_e .

7.13 Design Subgrade CBR

The results of laboratory testing for this investigation indicated soaked CBR values of between 19% and 50% for samples remoulded to 95% of the modified maximum dry density and tested under laboratory conditions.

Based on above and Douglas’ experience with similar soils, and allowing for site variability in the subgrade, it is recommended that a subgrade design CBR value of no more than 10% be adopted for the natural soils (or for site won fill, or imported fill with similar properties) for the design of hardstands at the site.

The above suggested design subgrade CBR value is based on the assumption that all pavement and hardstand construction will incorporate appropriately designed and maintained surface and subsurface drainage, to prevent moisture ingress into the pavement materials and subgrade.

7.14 Material Re-Use Potential

7.14.1 DIPL Material Specifications

Table 16 presents the DIPL (2024) grading specification for Type 2 and Type 3 Base gravel, Type 4 Sub-Base gravel, Select Fill and General Fill. Table 17, indicates the plasticity and strength specifications for pavement and fill materials.

Table 16: DIPL Type 2 and 3, Select Fill and General Fill Grading Specification

Particle Size or Australian Standard Sieve Size (mm)	Percentage Passing				
	Type 2 Gravel Base	Type 3 Gravel Base	Type 4 Gravel Sub-Base	Select Fill	General Fill
100.0	100	100	100	100	100
75.0	100	100	100	~	~
37.5	100	100	80 – 100	~	~
19.0	70 – 100	100	60 – 100	~	~
9.5	50 – 80	70 – 100	50 – 95	30 – 100	~

Particle Size or Australian Standard Sieve Size (mm)	Percentage Passing				
	Type 2 Gravel Base	Type 3 Gravel Base	Type 4 Gravel Sub-Base	Select Fill	General Fill
4.75	35 – 65	50 – 80	40 – 80	-	~
2.36	25 – 50	35 – 65	30 – 65	15 – 65	~
0.425	10 – 30	15 – 35	20 – 50	~	~
0.075	4 – 16	6 – 20	5 – 25	5 – 25	~

Table 17: DIPL Gravel Grading Specification for Pavement Material and Fill

Plasticity or Strength Specification	Application				
	Sealed Basecourse	Unsealed Basecourse and Shoulder	Sub-Base	Select Fill	General Fill
Liquid Limit (LL)	25% maximum	35% maximum	30% maximum	~	~
Plasticity Index (PI)	1% to 6%	4% to 12%	1 to 10%	2% to 15%	2% to 15%
Linear Shrinkage (LS)	0% to 3%	2% to 8%	0 to 6%	2% to 6%	~
PI x % Passing 0.425 mm Sieve	180 maximum	400 maximum	400 maximum	~	~
CBR at 95% or 100% of MMDD	80 min at 100% MMDD	50 min at 95% MMDD	30 min at 95% MMDD	30 min at 95% MMDD	20 min at 95% MMDD
Los Angeles Abrasion (LAA) Loss	50 max	60 max	50 max	-	-

7.14.2 Comparison of Laboratory Test Results with DIPL Specification

The laboratory test results undertaken on selected samples from the test pits were compared against the above DIPL material specifications and indicate the following:

- Samples tested from Units 2 (Clayey SAND) do not meet the requirements for base or subbase material, primarily due to the absence of gravel particles;
- Samples tested from Unit 3a (Clayey sandy Gravel) do not meet the requirements for base, but marginally meets the requirements for usage as subbase material;
- Samples from Unit 2 do not meet all the requirements for Select Fill, primarily because of the grading, lack of fines and plasticity; however samples tested from Unit 3a meet the requirements for Select Fill and

- All samples collected from Units 2 and 3a satisfy all the criteria for General Fill and samples from other test pits generally satisfy most requirements for General Fill.
- Samples from unit 3b (Silty Clay) does not meet any of the requirements due high percentage of fines and excessive plasticity index.

8. References

AS1170.4:1993, Minimum Design Loads on Structures, Part 4: Earthquakes loads, Standards Australia.

AS 1726:2017, Geotechnical Site Investigations, Standards Australia.

AS 2159:2009, Piling – Design and Installation, Standards Australia.

AS 2870:2011, Residential Slabs and Footings, Standards Australia.

AS 1547. (2012), On-site domestic wastewater management. Standards Australia.

AS 3798:2007, Guidelines on Earthworks for Commercial and Residential Developments, Standards Australia.

AS/NZS 2566.1:1998 “Buried flexible pipelines - Structural design”, Standards Australia.

Jackson, S. D. (2022). Thornthwaite Moisture Index And Climate Zones In The Northern Territory. *AUSTRALIAN GEOMECHANICS*, 57(3), 69-85.

NT Department of Infrastructure, Planning and Logistics (DIPL), Standard Specification for Roadworks, 2020.

NT Department of Infrastructure, Planning and Logistics (DIPL), Standard Specification for Small Building Works, 2018.

9. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Dunmarra, NT in line with Douglas' proposal dated 7 May 2024 and acceptance received from Mike Jacobsen of Tamboran Resources Limited on 30 July 2024. The work was carried out under the agreed purchase order terms and conditions. This report is provided for the exclusive use of Tamboran Resources Limited for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

About this Report

Drawing 1

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at

the time of construction as are indicated in the report; and

- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

Appendix B

Terminology, Symbols and Abbreviations

Soil Descriptions

Rock Descriptions

Sampling, Testing and Excavation Methodology

Test Pit Logs

Borehole Logs

Core Photographs

Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style **XW**. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

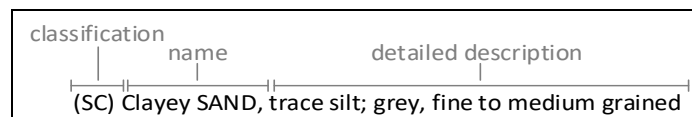
Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Introduction

All materials which are not considered to be “in-situ rock” are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:



The “classification” comprises a two character “group symbol” providing a general summary of dominant soil characteristics. The “name” summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either “fine grained” (also known as “cohesive” behaviour) or “coarse grained” (“non cohesive” behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as “oversize”	
Cobble	63 - 200		
Gravel ¹	2.36 - 63	Coarse	>65%
Sand ¹	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

¹ – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer “component proportions” below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a “Sandy CLAY”, this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a “primary”, “secondary”, or “minor” component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition ¹	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor ²	Present in the soil, but not significant to its engineering properties	All other components	All other components

¹ As defined in AS1726-2017 6.1.4.4

² In the detailed material description, minor components are split into two further sub-categories. Refer “identification of minor components” below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, “INTERBEDDED Silty CLAY AND SAND”.

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component ¹	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

¹ – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type	Particle size (mm)	
	Coarse	Fine
Gravel	19 - 63	6.7 - 19
	Medium	2.36 - 6.7
	Fine	0.6 - 2.36
Sand	0.21 - 0.6	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code **NDF**, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example **(VS)**.

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as “extremely weathered material” in reports and by the abbreviation code **XWM** on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than ‘very low’ as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be “oversize” may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with “MIXTURE OF”.

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Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:

SAMPLE			DEPTH (m)	TESTING	
SAMPLE REMARKS	TYPE	INTERVAL		TEST TYPE	RESULTS AND REMARKS
	SPT		1.0 1.45	SPT	4,9,11 N=20

Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U ¹
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

¹ – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y = x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(L)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD ¹
Air Track	AT
Diatube	DT ¹
Hand auger	HA ¹
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA ¹
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT ¹
Ripping tyne/ripper	R
Rock roller	RR ¹
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON ¹
Mud/blade bucket	MB ¹
Toothed bucket	TB ¹
Vibrocure	VC ¹
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB ¹

¹ – numeric suffixes indicate tool diameter/width in mm

BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355069.4, N:8141412.6
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 229166.01
DATE: 30/06/24 - 01/07/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN(%)	CONSIS. ⁽¹⁾ DENSITY. ⁽²⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
	264	0.40	Silty SAND (SM): brown; fine to medium; low plasticity silt; with roots.		RS	L to MD	D													
	263	1	Clayey SAND (SC), trace gravel: red-brown; fine to coarse; fine to medium, sub-rounded, pisolitic gravel.		RS	MD	M											SPT	3,6,2 N=8	
	262	2			RS	MD	M											SPT	4,3,4 N=7	
	261	3.00	Clayey Gravelly SAND (SC): dark red, speckled; medium to coarse; medium, sub-rounded gravel; partially cemented; inferred extremely weathered laterised conglomerate.		XWM	MD	M											SPT	7,9,12 N=21	
	260	4.25	Clayey Sandy SILT (ML): pale red to light yellow-orange; medium plasticity; inferred extremely weathered laterised conglomerate.		XWM	H	w=PL											SPT	6,22,14 N=36	
	259	5.30	Silty CLAY (ML): pale orange to pale green; low to medium plasticity; slickensided; inferred extremely weathered siltstone.		XWM	H	w=PL											SPT	15,24,25 N=49	

NOTES: ⁽¹⁾Soil origin is "probable" unless otherwise stated. ⁽²⁾Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: (a) Soil origin is "probable" unless otherwise stated. (b) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 8.27 m, NMLC to 10.82 m.
REMARKS: No free groundwater encountered.
 Water loss from 9.7 to 10.82 m

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355069.4, N:8141412.6
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 229166.01
DATE: 30/06/24 - 01/07/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN(%)	CONSIS. ⁽¹⁾	DENSITY. ⁽²⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)						
	258		[CONT] Silty CLAY (ML): pale orange to pale green; low to medium plasticity; slickensided; inferred extremely weathered siltstone.																	
	7		7.00m: becoming extremely weathered ferruginous siltstone		XWM	H	w=PL													
	257																			
	8																			
	8.20		Silty CLAY (ML): purple and off-white; low to medium plasticity; inferred extremely weathered siltstone.		XWM	H	w<PL													
	8.47		CORE LOSS							72	0									
	8.59		Silty CLAY (ML): purple and off-white; low to medium plasticity; inferred extremely weathered siltstone.		XWM	H	w<PL													
	8.82		KAOLINISED SILTSTONE: off-white with purple mottling, fine grained, indistinct, disintegrates in water; highly fractured; stained red																	
	9																			
	255																			
	10																			
	10.26		CORE LOSS																	
	254																			
	11		Borehole discontinued at 10.82m depth.																	

NOTES: ⁽¹⁾Soil origin is "probable" unless otherwise stated. ⁽²⁾Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: (S)Soil origin is "probable" unless otherwise stated. (C)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 8.27 m, NMLC to 10.82 m.
REMARKS: No free groundwater encountered.
 Water loss from 9.7 to 10.82 m

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.1 AHD
COORDINATE: E:355203.7, N:8141339.9
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 229166.01
DATE: 01/07/24 - 02/07/24
SHEET: 1 of 2

[illegible]

NOTES: (a) Soil origin is "probable" unless otherwise stated. (b) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 4.0 m, NMLC coring to 11.71 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

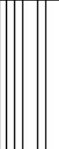


BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.1 AHD
COORDINATE: E:355203.7, N:8141339.9
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 229166.01
DATE: 01/07/24 - 02/07/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN ^(#)	CONSIS. ⁽¹⁾	DENSITY ⁽²⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)						
	258		[CONT] Clayey SILT (ML): dark red-orange; medium to high plasticity; friable with soft spots; inferred extremely weathered laterised conglomerate.		XWM	H	M					81	0							
	6.61		CORE LOSS																	
	7																	7		
	257																			
	7.28		KAOLINISED SILTSTONE: light-brown and off-white, fine grained; with red staining						HW	7.28										
	8											75	0					8		
	256																			
	8.71		CORE LOSS																	
	9																	9		
	255																			
	10																	10		
	254																			
	10.51		KAOLINISED SILTSTONE: light-brown and off-white, fine grained; with red staining						HW	10.51										
	11																	11		
	253																			
			Borehole discontinued at 11.71m depth.																	
NOTES: ^(#) Soil origin is "probable" unless otherwise stated. ⁽¹⁾ Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																				

NOTES: (a) Soil origin is "probable" unless otherwise stated. (b) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 4.0 m, NMLC coring to 11.71 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355111.2, N:8141329.8
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 229166.01
DATE: 01/07/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN ^(#)	CONSIS. ^(*) DENSITY ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
	264	0.30	Silty SAND (SM): light-brown; fine to medium; low plasticity silt; with roots.		RS	VL to L	D													
		1	Clayey SAND (SC), trace gravel: red-brown; fine to coarse; low plasticity clay; fine to coarse, sub-rounded gravel.		RS	L to MD	M											SPT	6,6,7 N=13	
	263																			
		2			RS	L to MD	M											SPT	3,2,2 N=4	
	262																			
		3																SPT	4,4,6 N=10	
	261																			
		3.50	Clayey Sandy GRAVEL (GC): red-orange; medium to coarse; medium to coarse sand; inferred extremely weathered laterised conglomerate.		XWM	L	M											SPT	8,5,3 N=8	
	260																			
		4																		
		5																		
		5.20	Silty Sandy CLAY (CL): pale red to light yellow and orange; low to medium plasticity; inferred extremely weathered siltstone.		XWM	H	w=PL											SPT	15,32,54 N=86	
	259																			

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 6.3 m, NMLC to 11.26 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355111.2, N:8141329.8
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 229166.01
DATE: 01/07/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE						TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
					ORIGIN ^(#)	CONSIS. ⁽¹⁾ DENSITY ⁽²⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS							
	258	6.30	[CONT] Silty Sandy CLAY (CL) : pale red to light yellow and orange; low to medium plasticity; inferred extremely weathered siltstone.		XWM	H	w=PL		6.30										SPT	25 Refusal	
		7	KAOLINISED SILTSTONE: stained dark red-orange; off-white with pink and ferruginous staining																		
	257																				
		8																			
	256																				
		8.71	CORE LOSS																		
		9																			
	255	9.20	KAOLINISED SILTSTONE: stained dark red-orange; off-white with pink and ferruginous staining						9.20												
		10																			
	254																				
		11																			
			Borehole discontinued at 11.26m depth.																		
NOTES: ^(#) Soil origin is "probable" unless otherwise stated. ⁽¹⁾ Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																					

NOTES: °Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 6.3 m, NMLC to 11.26 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

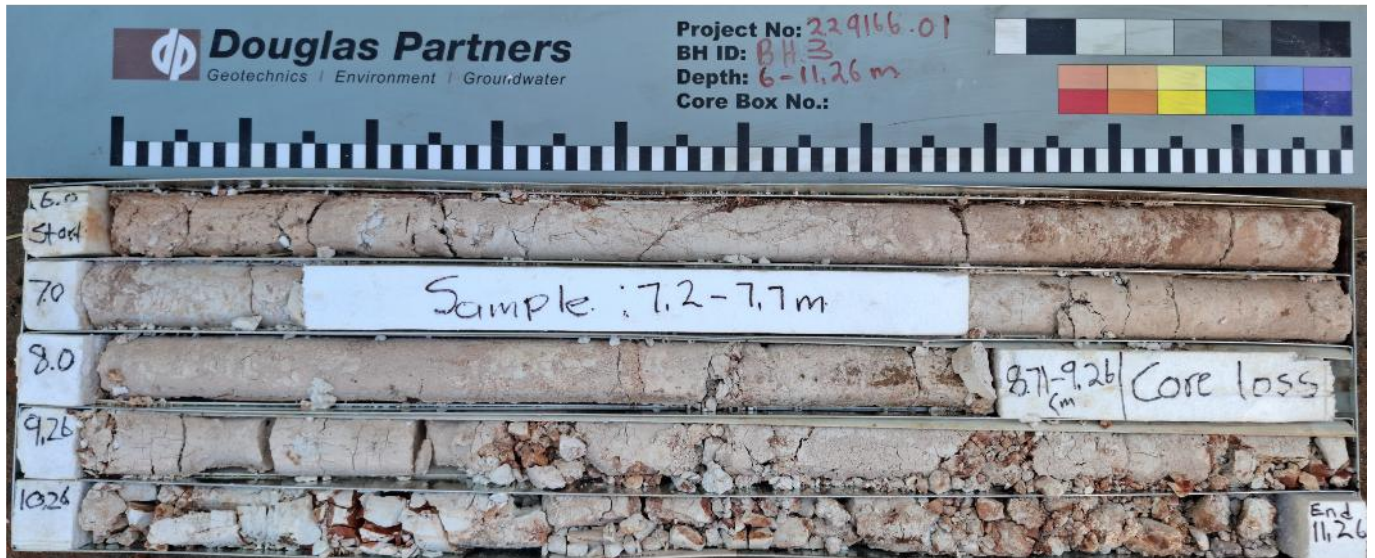
Refer to explanatory notes for symbol and abbreviation definitions

CORE PHOTO LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355111.2, N:8141329.8
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 229166.01
DATE: 01/07/24
SHEET: 1 of 1



6.00-11.26 m depth

BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.1 AHD
COORDINATE: E:355309.4, N:8141407.4
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 229166.01
DATE: 02/07/24 - 03/07/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE			TESTING			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN ^(#)	CONSIS. ^(*) DENSITY ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
	264	0.40	Silty SAND (SM): light-brown; fine; low plasticity silt; with roots.		RS	L	D													
	263	1	Clayey SAND (SC), trace gravel; fine to coarse; medium to coarse gravel.		RS	L to MD	M											1	SPT	5,5,7 N=12
	262	2			RS	L to MD	M											2	SPT	5,3,4 N=7
	261	3																3	SPT	5,5,6 N=11
	260	3.30	Clayey Sandy GRAVEL (GC): light yellow-orange; medium to coarse sand; inferred extremely weathered laterised conglomerate.		XWM	L to MD	M											4	SPT	5,4,6 N=10
	259	5																5		
	258	5.20	Clayey SILT (ML): brown, pale orange; medium to high plasticity; inferred laterised siltstone.			St to VSt												6	SPT	9,9,14 N=13
	257	6			XWM		w=PL											7	SPT	8,8,13 N=21
	256	7				H												8	SPT	9,16,16 N=32
		8																		11,19,30 N=49

Generated with CORE-GS by Geoc - Combined Log

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 9.0 m depth, NMLC to 16.01 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

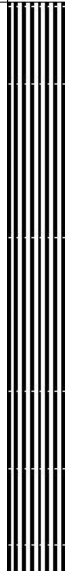


BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.1 AHD
COORDINATE: E:355309.4, N:8141407.4
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 229166.01
DATE: 02/07/24 - 03/07/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE						TESTING	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
					ORIGIN (#)	CONSIS. ^(*) DENSITY. ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L LH H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 100 80 60 40 20 0	DEFECTS & REMARKS							
	255	9	[CONT] Clayey SILT (ML): brown, pale orange; medium to high plasticity; inferred laterised siltstone.														9		14,14,22 N=36		
	254	10			XWM	H	w=PL				100	0					10	SPT			
	253	11															11				
	11.71		CORE LOSS															12			
	252	12																			
	251	13.01	KAOLINISED SILTSTONE: off-white with purple mottling, fine grained; highly fractured							13.01		57	0					13			
	250	14									VL							14			
	249	15																15			
	15.62		CORE LOSS																		
	16		Borehole discontinued at 16.01m depth.																		

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: °Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 9.0 m depth, NMLC to 16.01 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

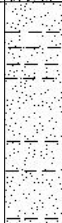
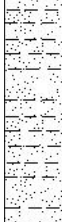
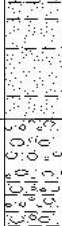


BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355197.9, N:8141390.1
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 229166.01
DATE: 02/07/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE				TESTING		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN ^(#)	CONSIS. ^(*) DENSITY ^(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
	264	0.30	Silty SAND (SM): light-brown; fine to medium; with roots.			L to MD	D													
	263	1	Clayey SAND (SC), trace gravel: red-brown; fine to coarse; low plasticity clay; fine to coarse gravel.																	
	262	2			RS	L	M													
	261	3																		
	260	4.30	Clayey Sandy GRAVEL (GC): orange; medium; inferred extremely weathered laterised conglomerate.		XWM	MD	M													
	259	5.30	Clayey SILT (MH): orange; medium to high plasticity; inferred as laterised siltstone.		XWM	St	w=PL													
NOTES: ^(#) Soil origin is "probable" unless otherwise stated. ^(*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.																				

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 6.0 m, NMLC to 11.51 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355197.9, N:8141390.1
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 229166.01
DATE: 02/07/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED													SAMPLE				TESTING		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK						SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN (#)	CONSIS. ⁽¹⁾	DENSITY. ⁽²⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD						
	258	6.00	CORE LOSS															SPT	15,30,49 N=49
	257	7.00	Clayey SILT (MH): orange; medium to high plasticity; inferred as laterised siltstone.							61	0								
	256	8			XWM	H		w=PL											
	255	8.61	CORE LOSS																
	255	9.41	Clayey SILT (MH): orange; medium to high plasticity; inferred as laterised siltstone.																
	254	9.80	KAOLINISED SILTSTONE: offwhite with red staining, fine grained							76	0								
	253	10																	
		11																	
			Borehole discontinued at 11.51m depth.																

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ⁽¹⁾Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: (S) Soil origin is "probable" unless otherwise stated. (C) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Comacchio GEO-305 Track Rig
METHOD: Rotary augering to 6.0 m, NMLC to 11.51 m
REMARKS: No free groundwater

OPERATOR: Proactive (Jason)

LOGGED: SN
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355069.4, N:8141412.6
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP1
PROJECT No: 229166.01
DATE: 06/07/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED							SAMPLE				TESTING AND REMARKS		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(%)	CONSIS. (°) DENSITY. (°)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
264 0.40 1 263 2 262 3.00 261			TOPSOIL / Silty SAND (SM): light-brown; fine to medium; low plasticity silt; with roots.		TOP	L to MD	D		B	0.10		DCP9/100	
			Clayey SAND (SC), trace gravel; fine to coarse; low plasticity clay; fine to medium, sub-rounded gravel.		RS	(L) to (MD)	M		ES	0.20			
										0.25			
									B/ES	0.50			
			Silty SAND (SM), trace gravel: dark red, speckled yellow; medium.		RS	(L)	M				3		
Test Pit discontinued at 3.40m depth. Limit of investigation.													



NOTES: [®]Soil origin is "probable" unless otherwise stated. [©]Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 20 tonne Komatsu excavator
METHOD: 1200 mm rock toothed bucket
REMARKS: No free groundwater encountered.

OPERATOR: AEM

LOGGED: SN

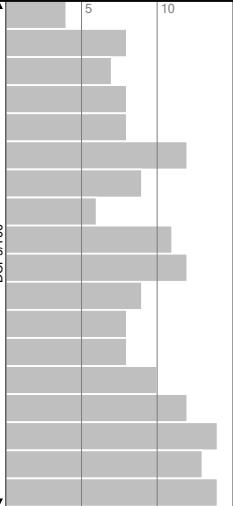
Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.1 AHD
COORDINATE: E:355203.7, N:8141339.9
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP2
PROJECT No: 229166.01
DATE: 06/07/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS				
GROUNDWATER	FL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS. (%)	DENSITY, (g)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
	264	0.30	TOPSOIL / Silty SAND (SM): light-brown; fine to medium; low plasticity silt; with roots.		TOP	L to MD		D							
			Clayey Gravelly SAND (SC): red-brown; fine to coarse; low plasticity clay; sub-rounded gravel.								ES	0.25			
										ES	0.50				
	1														
	263									B	1.00				
	2				RS	MD		M							
	262									B	2.00				



NOTES: "Soil origin is "probable" unless otherwise stated. "Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 20 tonne Komatsu excavator
METHOD: 1200 mm rock toothed bucket
REMARKS: No free groundwater encountered.

OPERATOR: AEM

LOGGED: SN

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355256.9, N:8141281.6
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP3
PROJECT No: 229166.01
DATE: 05/07/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED							SAMPLE			TESTING AND REMARKS			
GROUNDWATER	FL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS. (%) DENSITY. (%)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS



NOTES: *Soil origin is "probable" unless otherwise stated. *Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 20 tonne Komatsu excavator
METHOD: 1200 mm rock toothed bucket
REMARKS: No free groundwater encountered.

OPERATOR: AEM

LOGGED: SN

Refer to explanatory notes for symbol and abbreviation definitions

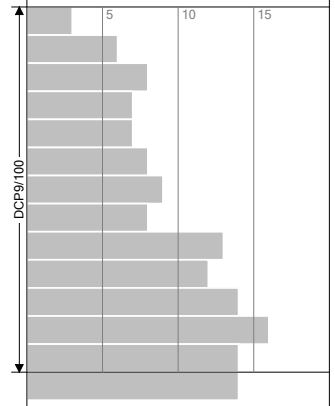
TEST PIT LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.1 AHD
COORDINATE: E:355309.4, N:8141407.4
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP4
PROJECT No: 229166.01
DATE: 06/07/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED						SAMPLE			TESTING AND REMARKS	
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(%)	CONSIS. (%)	DENSITY. (%)	MOISTURE	REMARKS	TYPE	INTERVAL
RL (m)										
264		TOPSOIL / Silty SAND (SM): light-brown; fine to medium; low plasticity silt; with roots.		TOP	L to MD		D			
0.50		Clayey SAND (SC), trace gravel: red-brown; fine to coarse; low plasticity clay; fine to medium, sub-rounded gravel.								
263					MD to D				B	
1										
2				RS			M			
262					(MD)					
3										
261		Test Pit discontinued at 3.00m depth. Limit of investigation.								



NOTES: ^(a)Soil origin is "probable" unless otherwise stated. ^(b)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 20 tonne Komatsu excavator
METHOD: 1200 mm rock toothed bucket
REMARKS: No free groundwater encountered.

OPERATOR: AEM

LOGGED: SN

TEST PIT LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL: 264.3 AHD
COORDINATE: E:355232.9, N:8141260.6
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP5
PROJECT No: 229166.01
DATE: 06/07/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED						SAMPLE			TESTING AND REMARKS				
GROUNDWATER	FL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS. (%) DENSITY. (%)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS



NOTES: *Soil origin is "probable" unless otherwise stated. *Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 20 tonne Komatsu excavator
METHOD: 1200 mm rock toothed bucket
REMARKS: No free groundwater encountered.

OPERATOR: AEM

LOGGED: SN

Refer to explanatory notes for symbol and abbreviation definitions

CORE PHOTO LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL:
COORDINATE: E:355069.4, N:8141412.6
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 229166.01
DATE: 30/06/24 - 01/07/24
SHEET: 1 of 1



8.27-10.82 m depth

CORE PHOTO LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL:
COORDINATE: E:355203.7, N:8141339.9
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 229166.01
DATE: 01/07/24 - 02/07/24
SHEET: 1 of 1



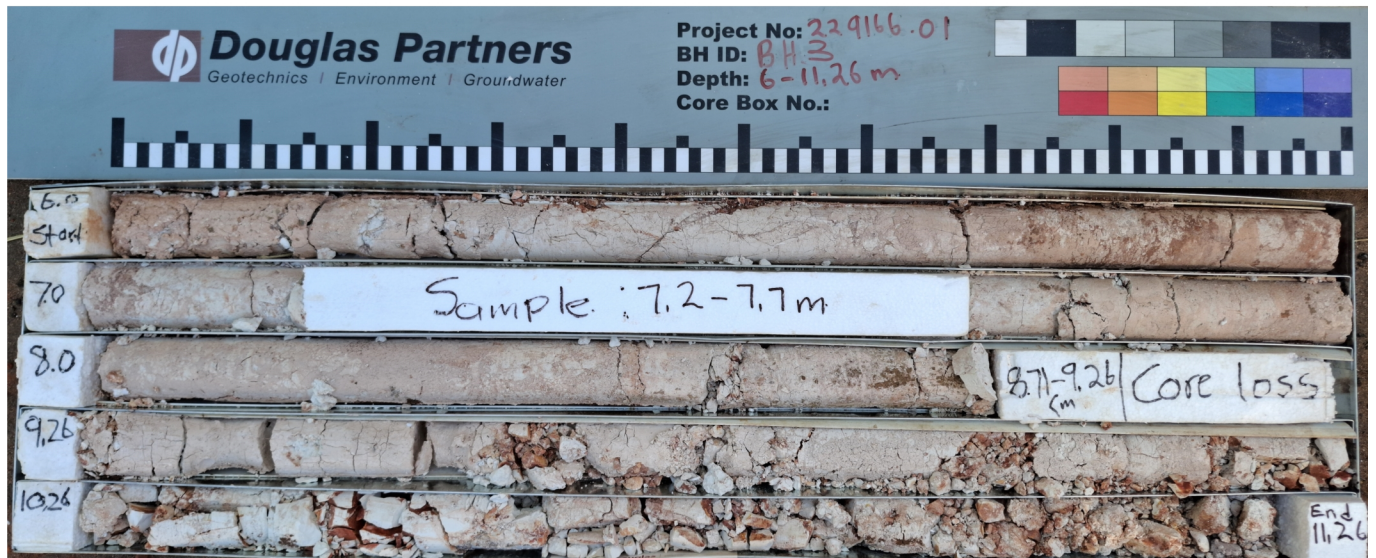
4.00-11.71 m depth

CORE PHOTO LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL:
COORDINATE: E:355111.2, N:8141329.8
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 229166.01
DATE: 01/07/24
SHEET: 1 of 1



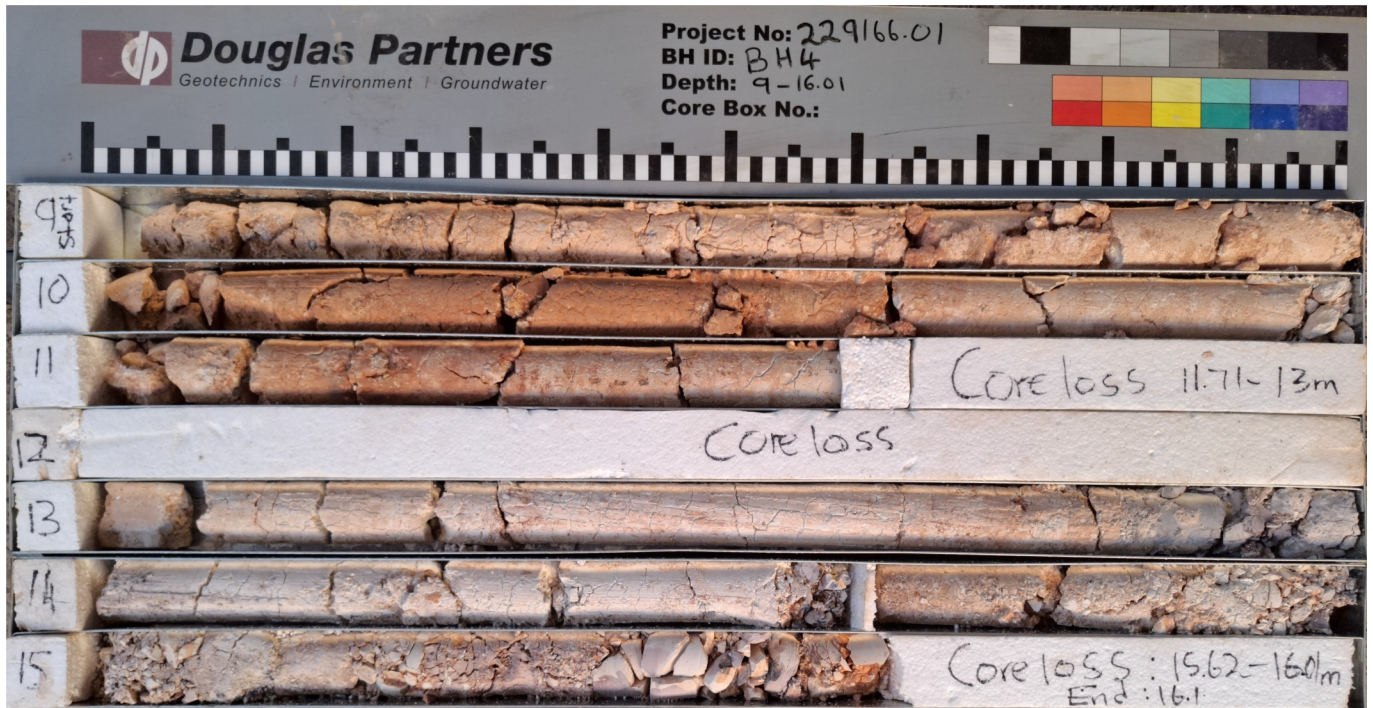
6.00-11.26 m depth

CORE PHOTO LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL:
COORDINATE: E:355309.4, N:8141407.4
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 229166.01
DATE: 02/07/24 - 03/07/24
SHEET: 1 of 1

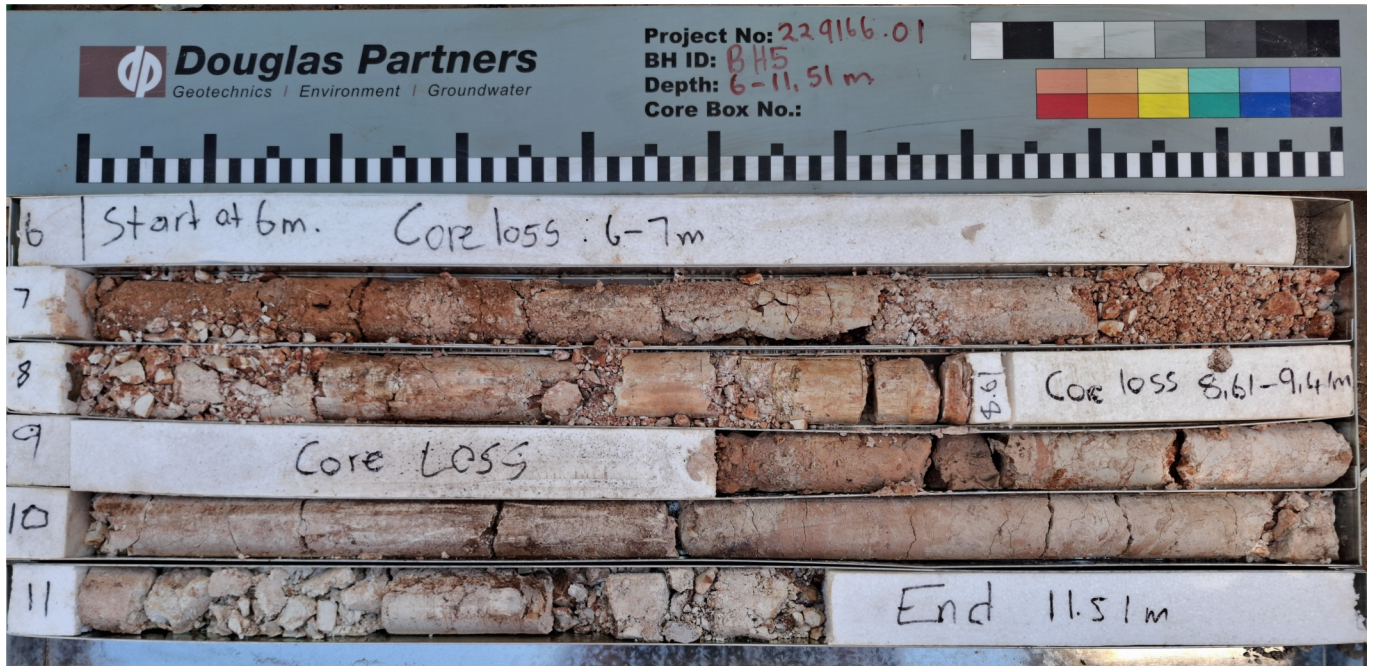


CORE PHOTO LOG

CLIENT: Tamboran Resources Limited
PROJECT: Sturt Plateau Compression Facility SPCF
LOCATION: Sturt Plateau, Dunmarra, NT

SURFACE LEVEL:
COORDINATE: E:355197.9, N:8141390.1
DATUM/GRID: MGA2020
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 229166.01
DATE: 02/07/24
SHEET: 1 of 1



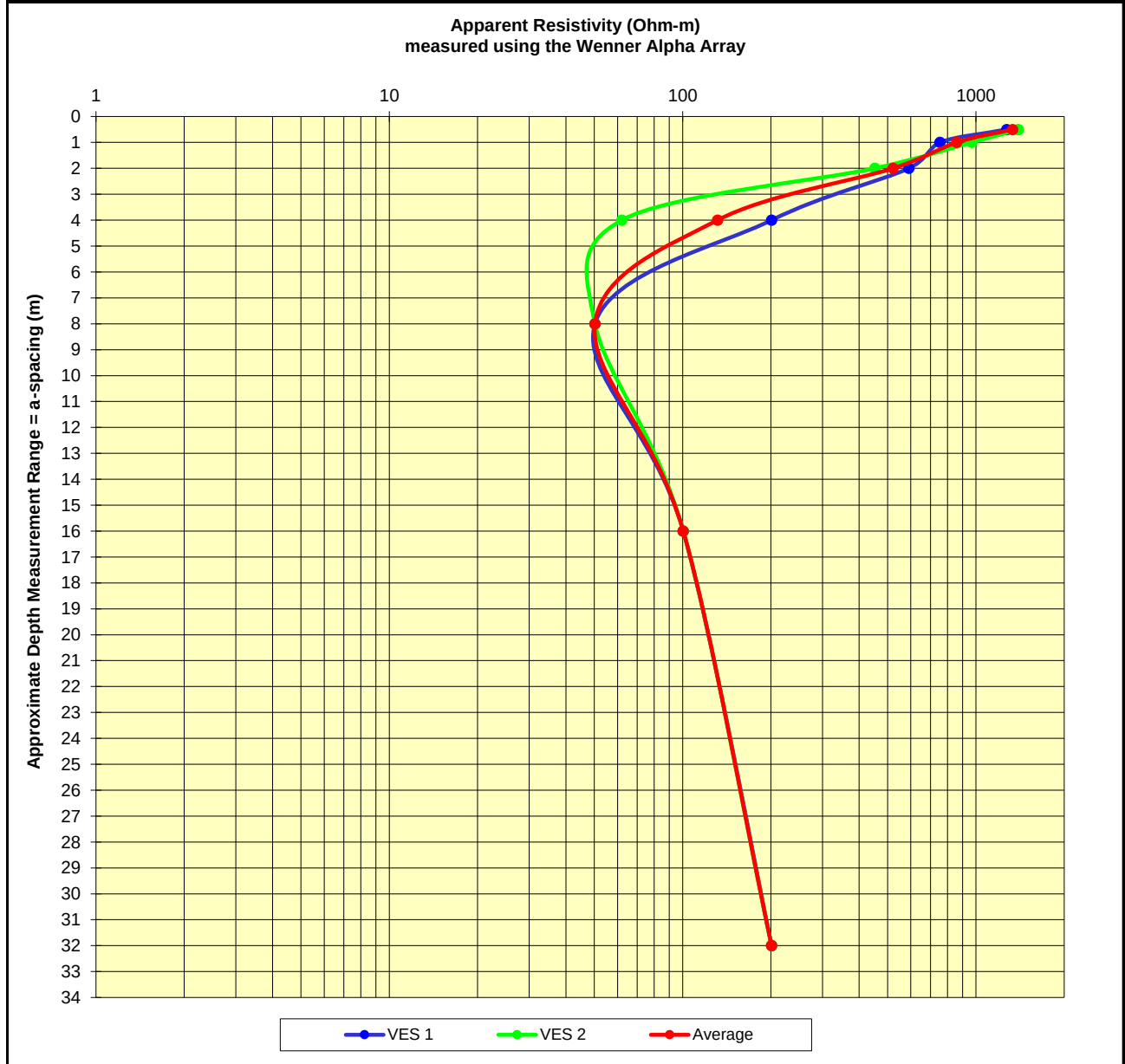
6.00-11.51 m depth

Appendix C

Electrical Resistivity Test Results

Electrode a-spacing (m)	Resistance (R)			Apparent Resistivity ($\rho_a = 2\pi aR$)		
	VES 1 (Ω)	VES 2 (Ω)	Average (Ω)	VES 1 (Ω -m)	VES 2 (Ω -m)	Average (Ω -m)
0.50	405.00	444.00	424.50	1272.35	1394.87	1333.61
1.00	120.00	154.00	137.00	753.98	967.61	860.80
2.00	47.00	36.00	41.50	590.62	452.39	521.50
4.00	8.00	2.47	5.24	201.06	62.08	131.57
8.00	1.00	1.00	1.00	50.27	50.27	50.27
16.00	1.00	1.00	1.00	100.53	100.53	100.53
32.00	1.00	1.00	1.00	201.06	201.06	201.06

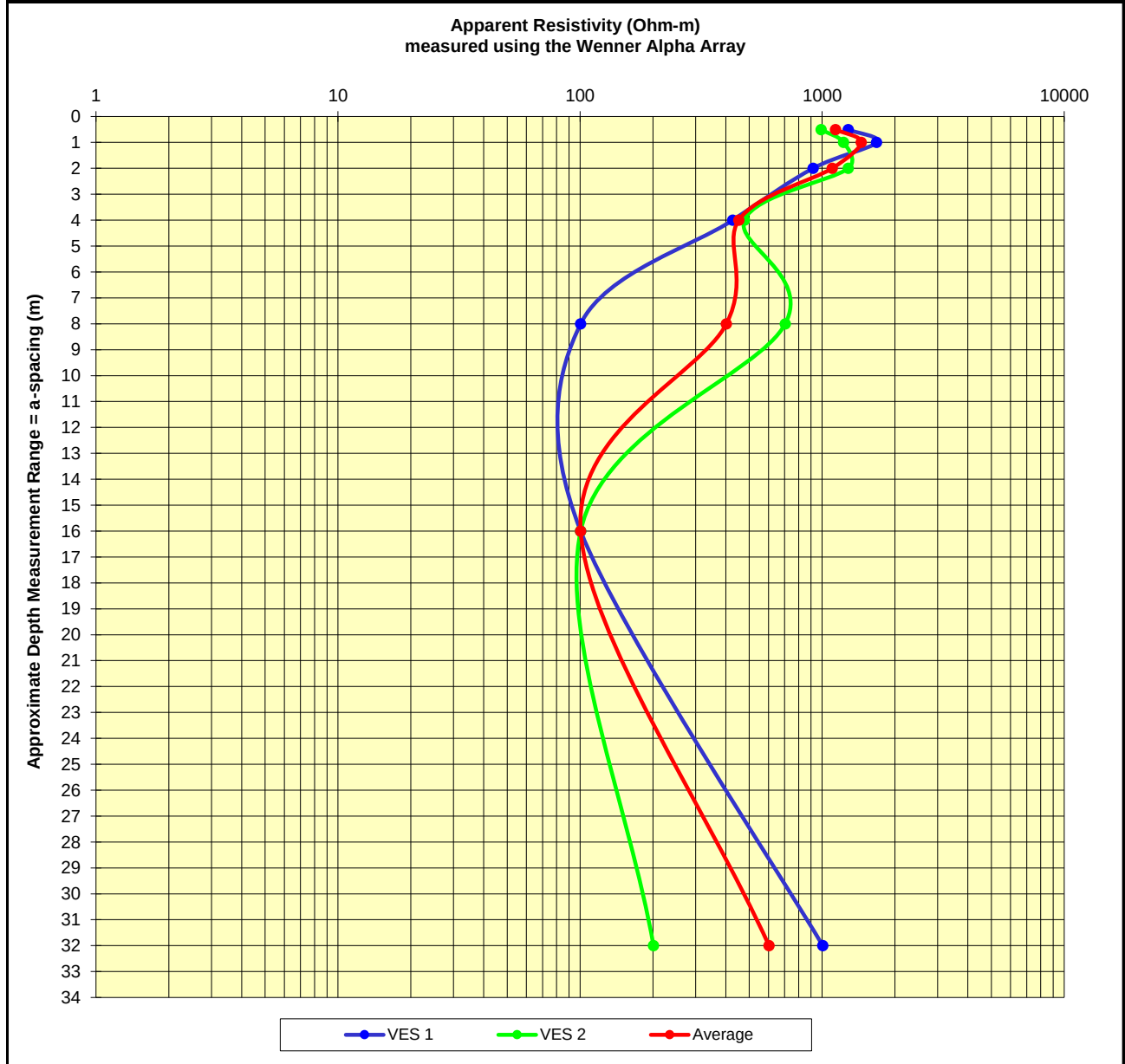
Location:	Sturt Plateau, Dunmarra NT	Centre E, N:	
Operator	SN	Comments:	
Orientations:	N-S	W-E	Equipment: Megger DET4TCR2
Description:			



 Douglas Partners Geotechnics Environment Groundwater	Vertical Electrical Sounding (VES)	PROJECT:	229166.01
	Sturt Plateau Compression Facility (SPCF)	DWG No:	ER 1
	Sturt Plateau, Dunmarra NT	REV:	0
	CLIENT: Tamboran Resources Limited	DATE:	4-Jul-24

Electrode a-spacing (m)	Resistance (R)			Apparent Resistivity ($\rho_a = 2\pi aR$)		
	VES 1 (Ω)	VES 2 (Ω)	Average (Ω)	VES 1 (Ω -m)	VES 2 (Ω -m)	Average (Ω -m)
0.50	408.00	315.00	361.50	1281.77	989.60	1135.69
1.00	267.00	195.00	231.00	1677.61	1225.22	1451.42
2.00	73.00	102.00	87.50	917.35	1281.77	1099.56
4.00	17.00	19.00	18.00	427.26	477.52	452.39
8.00	2.00	14.00	8.00	100.53	703.72	402.12
16.00	1.00	1.00	1.00	100.53	100.53	100.53
32.00	5.00	1.00	3.00	1005.31	201.06	603.19

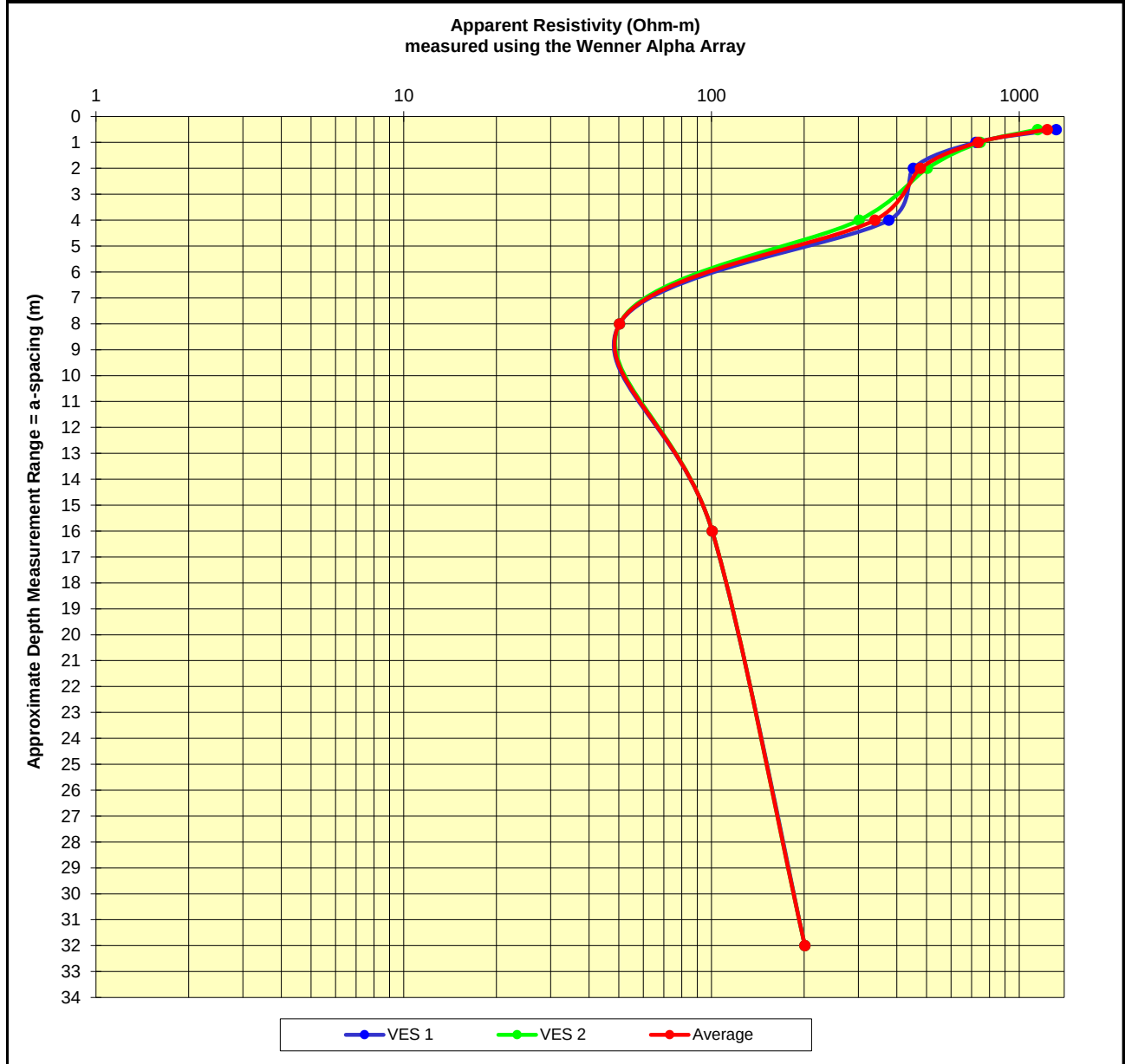
Location:	Sturt Plateau, Dunmarra NT	Centre E, N:	
Operator	SN	Comments:	
Orientations:	N-S	W-E	Equipment: Megger DET4TCR2
Description:			



 Douglas Partners Geotechnics Environment Groundwater	Vertical Electrical Sounding (VES)	PROJECT:	229166.01
	Sturt Plateau Compression Facility (SPCF)	DWG No:	ER 2
	Sturt Plateau, Dunmarra NT	REV:	0
	CLIENT: Tamboran Resources Limited	DATE:	5-Jul-24

Electrode a-spacing (m)	Resistance (R)			Apparent Resistivity ($\rho_a = 2\pi aR$)		
	VES 1 (Ω)	VES 2 (Ω)	Average (Ω)	VES 1 (Ω -m)	VES 2 (Ω -m)	Average (Ω -m)
0.50	420.00	365.00	392.50	1319.47	1146.68	1233.08
1.00	115.00	119.00	117.00	722.57	747.70	735.13
2.00	36.00	40.00	38.00	452.39	502.65	477.52
4.00	15.00	12.00	13.50	376.99	301.59	339.29
8.00	1.00	1.00	1.00	50.27	50.27	50.27
16.00	1.00	1.00	1.00	100.53	100.53	100.53
32.00	1.00	1.00	1.00	201.06	201.06	201.06

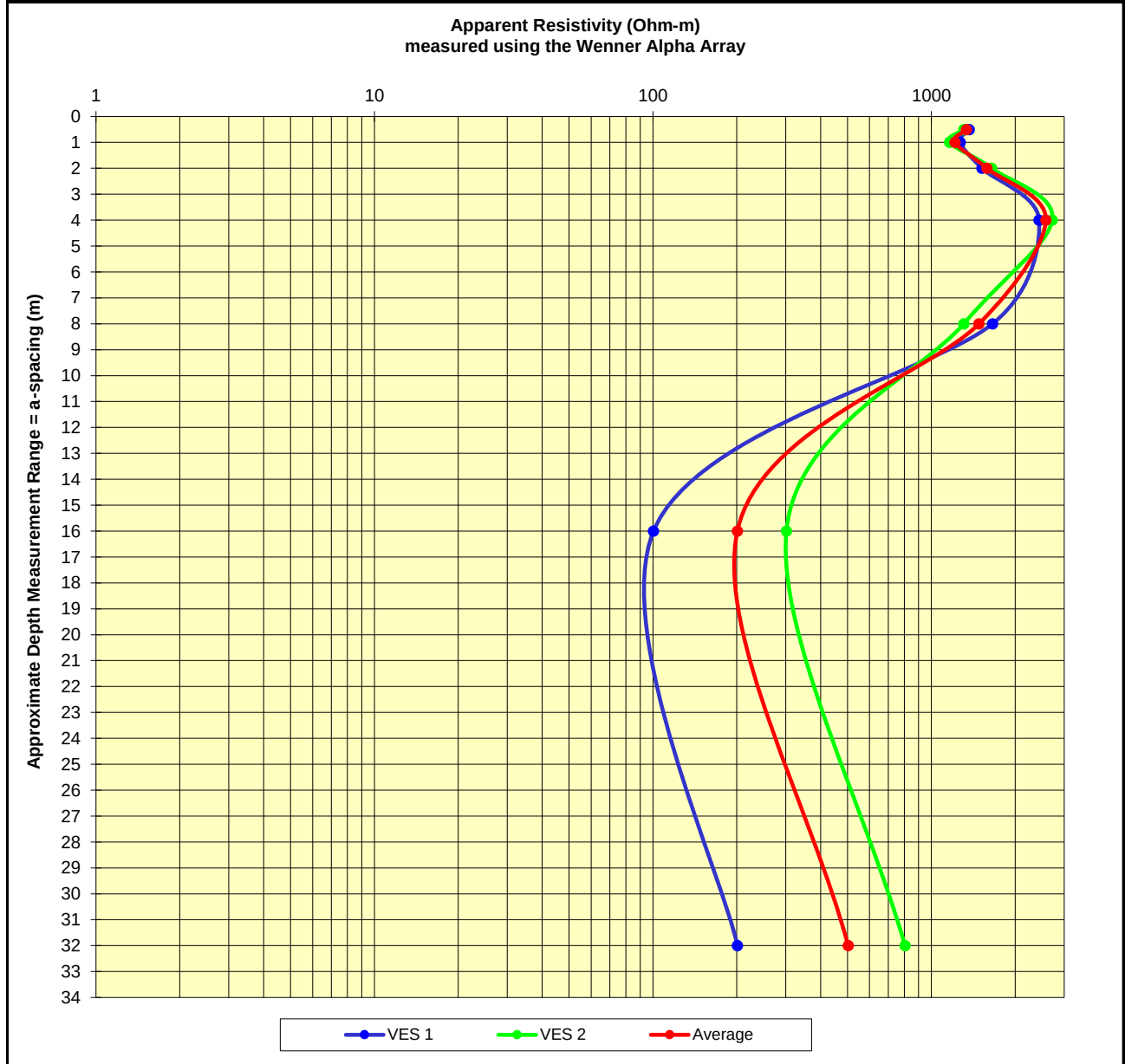
Location:	Sturt Plateau, Dunmarra NT	Centre E, N:	
Operator	SN	Comments:	
Orientations:	N-S	W-E	Equipment: Megger DET4TCR2
Description:			



 Douglas Partners Geotechnics Environment Groundwater	Vertical Electrical Sounding (VES)	PROJECT:	229166.01
	Sturt Plateau Compression Facility (SPCF)	DWG No:	ER 3
	Sturt Plateau, Dunmarra NT	REV:	0
	CLIENT: Tamboran Resources Limited	DATE:	5-Jul-24

Electrode a-spacing (m)	Resistance (R)			Apparent Resistivity ($\rho_a = 2\pi aR$)		
	VES 1 (Ω)	VES 2 (Ω)	Average (Ω)	VES 1 (Ω -m)	VES 2 (Ω -m)	Average (Ω -m)
0.50	435.00	416.00	425.50	1366.59	1306.90	1336.75
1.00	202.00	185.00	193.50	1269.20	1162.39	1215.80
2.00	121.00	131.00	126.00	1520.53	1646.19	1583.36
4.00	97.00	108.00	102.50	2437.88	2714.34	2576.11
8.00	33.00	26.00	29.50	1658.76	1306.90	1482.83
16.00	1.00	3.00	2.00	100.53	301.59	201.06
32.00	1.00	4.00	2.50	201.06	804.25	502.65

Location:	Sturt Plateau, Dunmarra NT	Centre E, N:	
Operator	SN	Comments:	
Orientations:	N-S	W-E	Equipment: Megger DET4TCR2
Description:			



 Douglas Partners Geotechnics Environment Groundwater	Vertical Electrical Sounding (VES)	PROJECT:	229166.01
	Sturt Plateau Compression Facility (SPCF)	DWG No:	ER 4
	Sturt Plateau, Dunmarra NT	REV:	0
	CLIENT: Tamboran Resources Limited	DATE:	5-Jul-24

Appendix D

Geotechnical Laboratory Test Results

Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018A
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 24/07/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP01, Depth: 0.1 - 0.2m
Material: Silty SAND



Douglas Partners Pty Ltd
Darwin Laboratory

Unit 2/14 Caryota Circuit Coconut Grove NT 0810

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Email: darwin@douglaspartners.com.au



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Nathan Kellaway

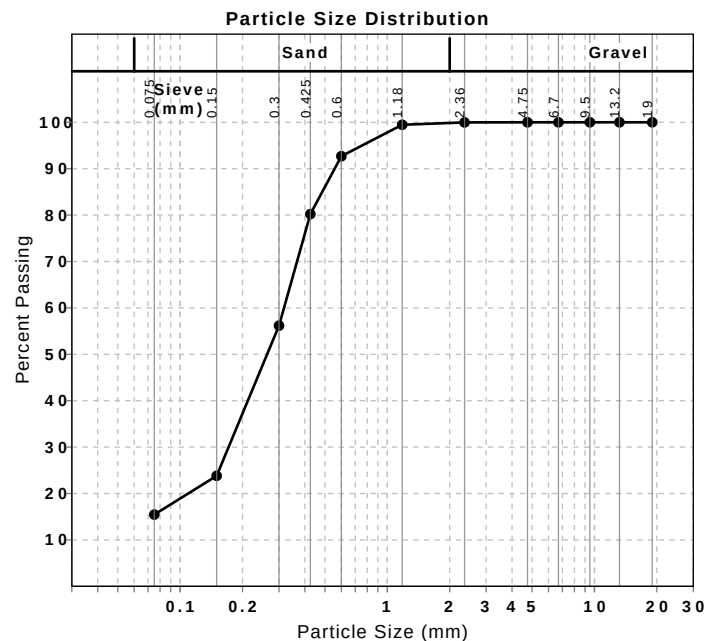
Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Particle Size Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	100	
1.18 mm	99	
0.6 mm	93	
0.425 mm	80	
0.3 mm	56	
0.15 mm	24	
0.075 mm	15	



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018B
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 29/07/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP01 , Depth: 0.5 - 0.7m
Material: Clayey SAND



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Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

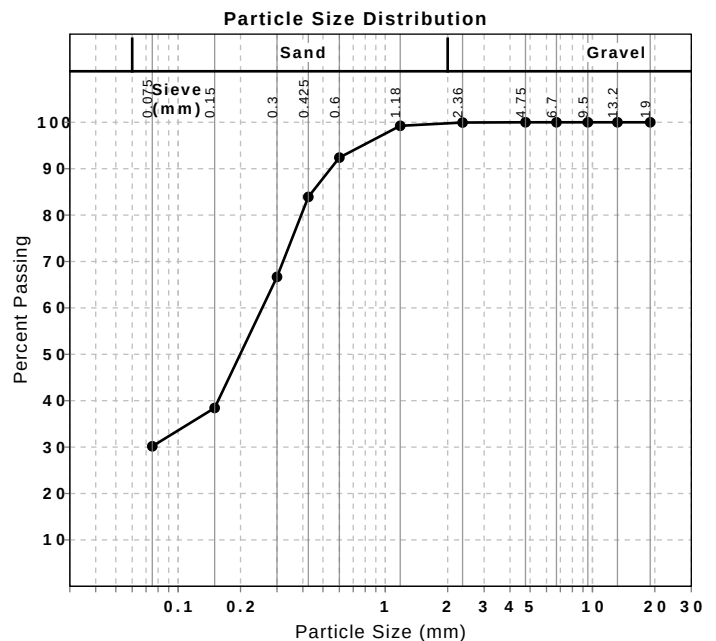
Laboratory Accreditation Number: 828

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	100	
1.18 mm	99	
0.6 mm	92	
0.425 mm	84	
0.3 mm	67	
0.15 mm	38	
0.075 mm	30	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	22		
Plastic Limit (%)	14		
Plasticity Index (%)	8		

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

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Clayey SAND		
Nature of Water	Distilled		
Temperature of Water (°C)	26.5		
* Mineral Present	Gypsum		



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018B
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 06/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP01 , Depth: 0.5 - 0.7m
Material: Clayey SAND



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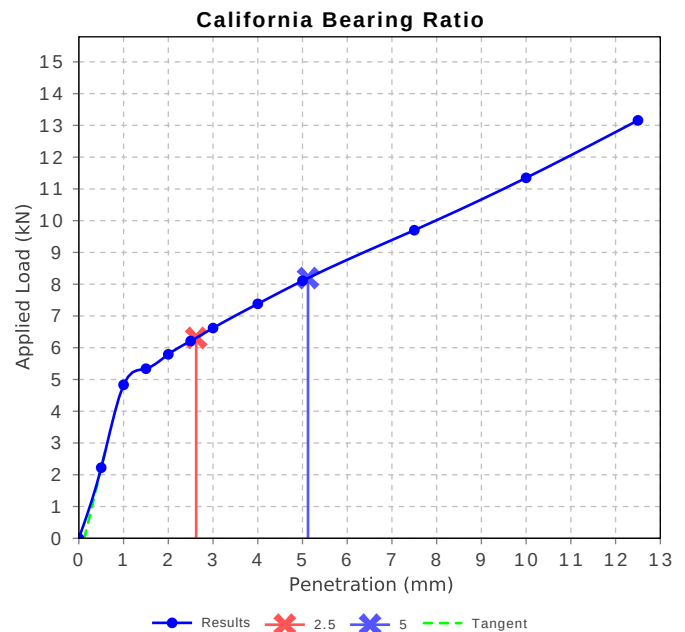
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	50		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.22		
Optimum Moisture Content (%)	8.0		
Laboratory Density Ratio (%)	95.5		
Laboratory Moisture Ratio (%)	95.0		
Dry Density after Soaking (t/m ³)	2.12		
Field Moisture Content (%)	6.2		
Moisture Content at Placement (%)	7.5		
Moisture Content Top 30mm (%)	10.5		
Moisture Content Rest of Sample (%)	8.3		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	114.1		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018D
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 15/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP02 , Depth: 2.0 - 2.2m
Material: Clayey gravelly SAND



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Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	23		
Plastic Limit (%)	12		
Plasticity Index (%)	11		

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

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Clayey gravelly SAND		
Nature of Water	Distilled		
Temperature of Water (°C)	25.5		
* Mineral Present	Gypsum		

Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018D
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 12/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP02 , Depth: 2.0 - 2.2m
Material: Clayey gravelly SAND



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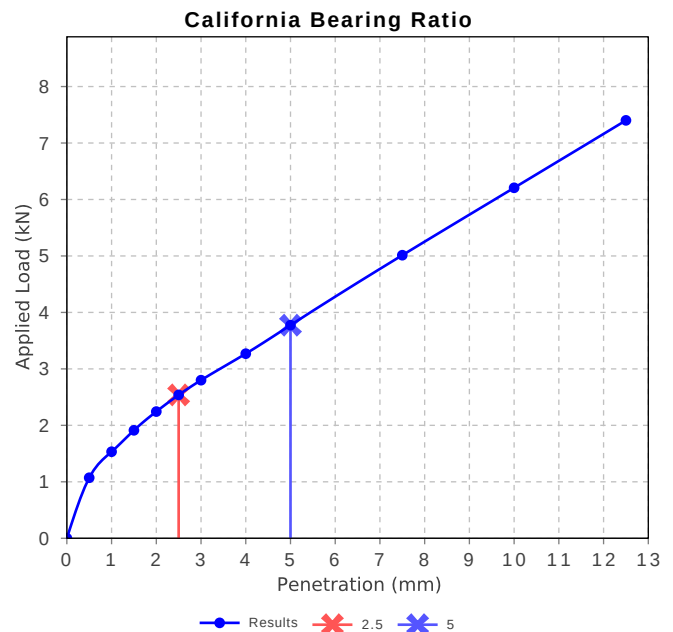
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	19		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.05		
Optimum Moisture Content (%)	10.0		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	102.0		
Dry Density after Soaking (t/m ³)	1.95		
Field Moisture Content (%)	7.9		
Moisture Content at Placement (%)	10.4		
Moisture Content Top 30mm (%)	11.8		
Moisture Content Rest of Sample (%)	11.5		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	29.0		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018E
Date Sampled: 05/07/2024
Dates Tested: 19/07/2024 - 24/07/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP03, Depth: 1.5 - 1.7m
Material: Clayey SAND



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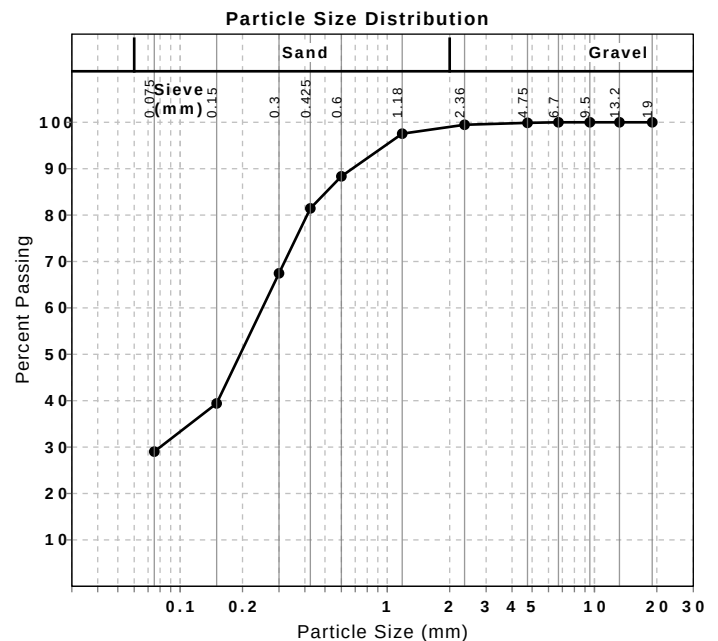
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
19 mm	100		
13.2 mm	100		
9.5 mm	100		
6.7 mm	100		
4.75 mm	100		
2.36 mm	99		
1.18 mm	98		
0.6 mm	88		
0.425 mm	81		
0.3 mm	67		
0.15 mm	39		
0.075 mm	29		



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018F
Date Sampled: 05/07/2024
Dates Tested: 19/07/2024 - 15/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP03 , Depth: 2.4 - 2.5m
Material: Clayey Sandy GRAVEL



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Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	23		
Plastic Limit (%)	13		
Plasticity Index (%)	10		
Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	5.0		
Cracking Crumbling Curling	Cracking		
Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Clayey Sandy GRAVEL		
Nature of Water	Distilled		
Temperature of Water (°C)	25.5		
* Mineral Present	Gypsum		

Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018F
Date Sampled: 05/07/2024
Dates Tested: 19/07/2024 - 12/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP03 , Depth: 2.4 - 2.5m
Material: Clayey Sandy GRAVEL



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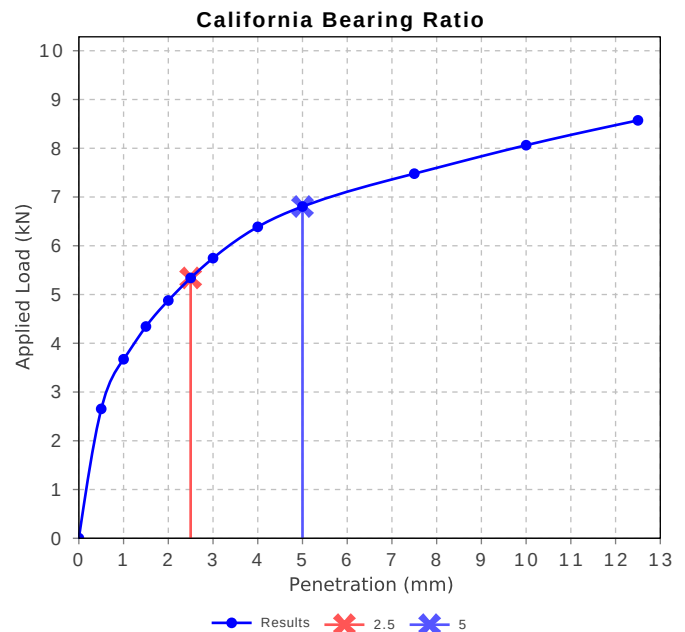
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	40		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.05		
Optimum Moisture Content (%)	10.5		
Laboratory Density Ratio (%)	95.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	1.94		
Field Moisture Content (%)	8.1		
Moisture Content at Placement (%)	10.4		
Moisture Content Top 30mm (%)	12.8		
Moisture Content Rest of Sample (%)	12.3		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	29.7		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018H
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 06/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP05, Depth: 0.8 - 1.0m
Material: Clayey SAND



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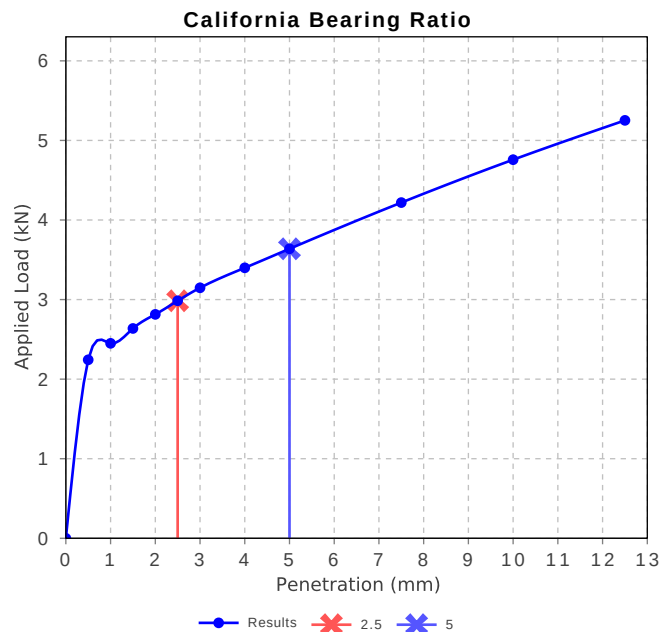
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	25		
Method of Compactive Effort	Modified		
Method used to Determine MDD	AS 1289 5.2.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	2.07		
Optimum Moisture Content (%)	8.5		
Laboratory Density Ratio (%)	95.5		
Laboratory Moisture Ratio (%)	94.5		
Dry Density after Soaking (t/m ³)	1.97		
Field Moisture Content (%)	6.5		
Moisture Content at Placement (%)	8.0		
Moisture Content Top 30mm (%)	11.9		
Moisture Content Rest of Sample (%)	10.5		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours (h)	115.0		
Swell (%)	0.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0.0		



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018I
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 24/07/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP05, Depth: 2.5 - 2.7m
Material: Clayey SAND with gravel



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Unit 2/14 Caryota Circuit Coconut Grove NT 0810

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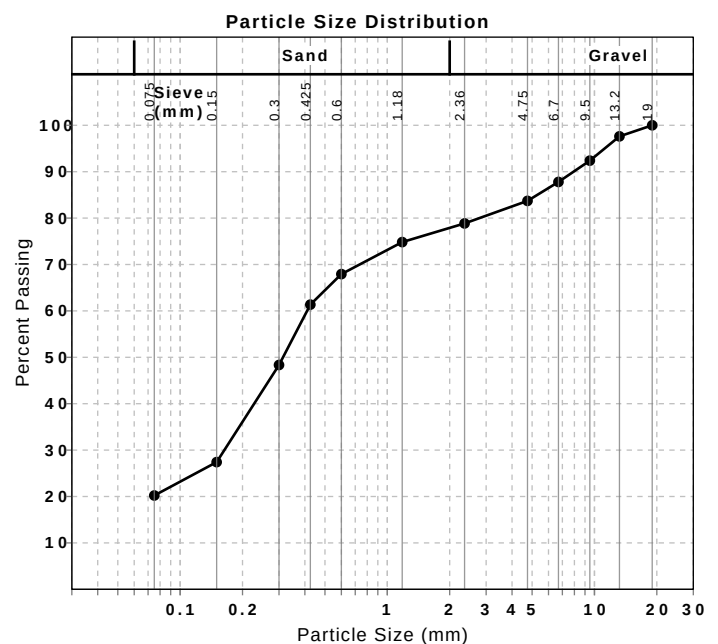
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	98	
9.5 mm	92	
6.7 mm	88	
4.75 mm	84	
2.36 mm	79	
1.18 mm	75	
0.6 mm	68	
0.425 mm	61	
0.3 mm	48	
0.15 mm	27	
0.075 mm	20	



Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018J
Date Sampled: 01/07/2024
Dates Tested: 19/07/2024 - 29/07/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH03 , Depth: 5.2 - 6.0m
Material: Sandy Silty CLAY



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Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	32		
Plastic Limit (%)	14		
Plasticity Index (%)	18		

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

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	4 *		
Soil Description	Sandy Silty CLAY		
Nature of Water	Distilled		
Temperature of Water (°C)	26.5		
* Mineral Present	Gypsum		

Material Test Report

Report Number: 229166.01-1
Issue Number: 2 - This version supersedes all previous issues
Reissue Reason: Material description update
Date Issued: 29/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Dates Tested: 19/07/2024 - 29/07/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Location: ENGINEERING Dept.: Dunmarra, NT (10 Samples - Var tests see summary)



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Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Moisture Content AS 1289 2.1.1

Sample Number	Sample Location	Moisture Content (%)	Min	Max	Material
DW-6018B	TP01 , Depth: 0.5 - 0.7m	6.2 %	**	**	Clayey SAND
DW-6018D	TP02 , Depth: 2.0 - 2.2m	7.9 %	**	**	Clayey gravelly SAND
DW-6018F	TP03 , Depth: 2.4 - 2.5m	8.1 %	**	**	Clayey Sandy GRAVEL
DW-6018J	BH03 , Depth: 5.2 - 6.0m	10.2 %	**	**	Sandy Silty CLAY

Material Test Report

Report Number: 229166.01-1
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Newcastle approve tests
Date Issued: 02/09/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018D
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 15/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP02 , Depth: 2.0 - 2.2m
Material: Clayey gravelly SAND



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Approved Signatory: Peter Gorseski

Laboratory Manager

Laboratory Accreditation Number: 828

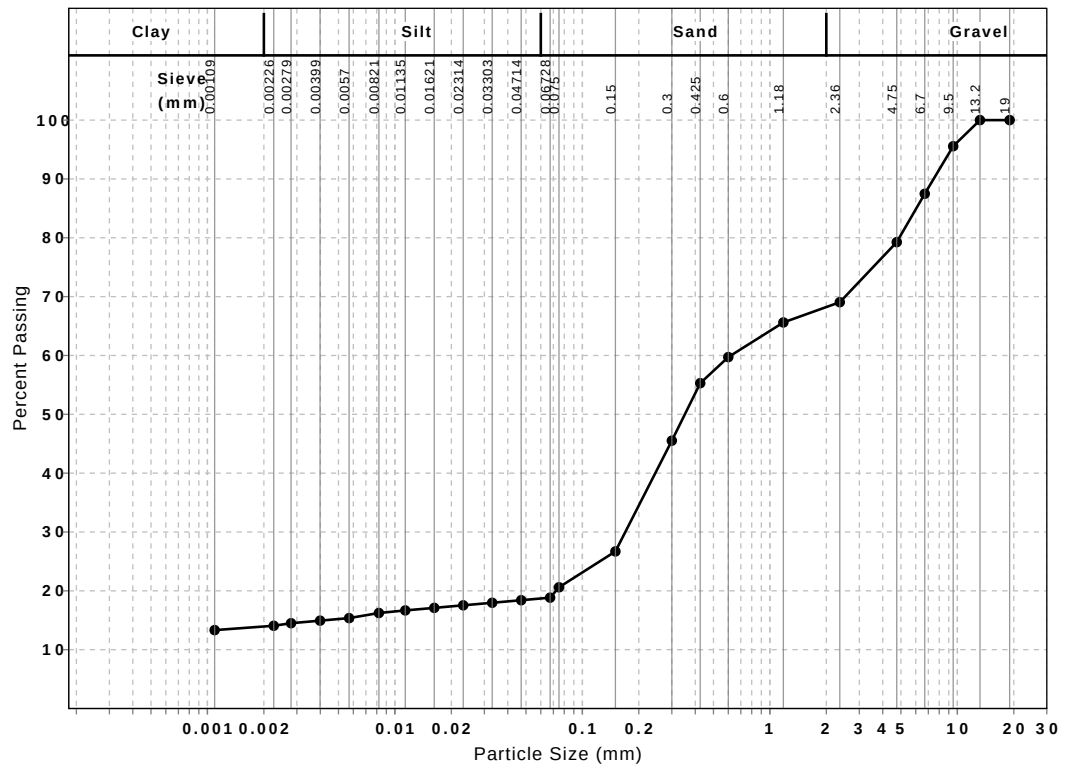
Particle Size Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
75 mm		
63 mm		
53 mm		
37.5 mm		
26.5 mm		
19 mm	100	
13.2 mm	100	
9.5 mm	96	
6.7 mm	87	
4.75 mm	79	
2.36 mm	69	
1.18 mm	66	
0.6 mm	60	
0.425 mm	55	
0.3 mm	46	
0.15 mm	27	
0.075 mm	21	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.0673	18.8
0.0471	18.4
0.0330	18.0
0.0231	17.5
0.0162	17.1
0.0114	16.7
0.0082	16.2
0.0057	15.4
0.0040	14.9
0.0028	14.5
0.0023	14.1
0.0011	13.3

Particle Size Distribution



Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Type of Hydrometer	Bulb
Method of Preparation	7.1
Method of Dispersion	Mortar and Pestle
Loss in Pretreatment	0
Soil Particle Density (t/m^3)	2.60

Material Test Report

Report Number: 229166.01-1
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Newcastle approve tests
Date Issued: 02/09/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018D
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 20/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP02 , Depth: 2.0 - 2.2m
Material: Clayey gravelly SAND



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Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)

Iss (%)	0.8
Visual Description	Clayey gravelly SAND
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	
Sample was tested from a remoulded specimen using DP700.1	

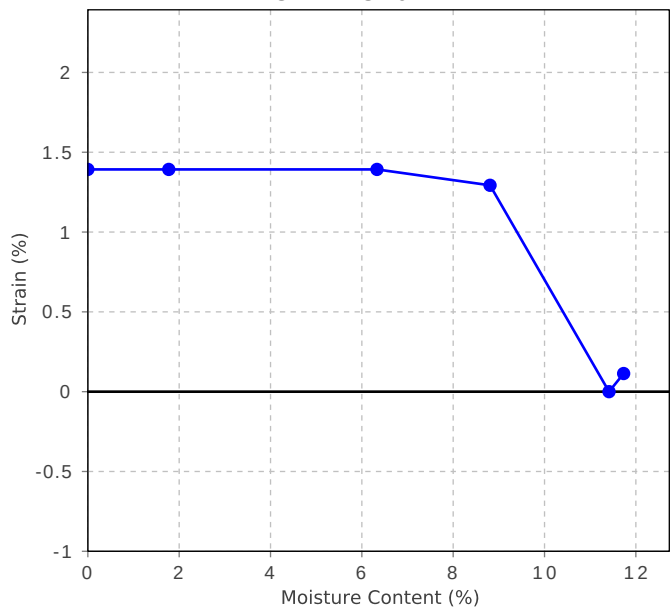
Core Shrinkage Test

Shrinkage Strain - Oven Dried (%)	1.4
Estimated % by volume of significant inert inclusions	0
Cracking	Slightly Cracked
Crumbling	No
Moisture Content (%)	11.4

Swell Test

Initial Pocket Penetrometer (kPa)	600
Final Pocket Penetrometer (kPa)	520
Initial Moisture Content (%)	10.8
Final Moisture Content (%)	11.7
Swell (%)	-0.1
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	

Shrink Swell



Material Test Report

Report Number: 229166.01-1
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Newcastle approve tests
Date Issued: 02/09/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018F
Date Sampled: 05/07/2024
Dates Tested: 19/07/2024 - 15/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP03 , Depth: 2.4 - 2.5m
Material: Clayey Sandy GRAVEL



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Laboratory Manager

Laboratory Accreditation Number: 828

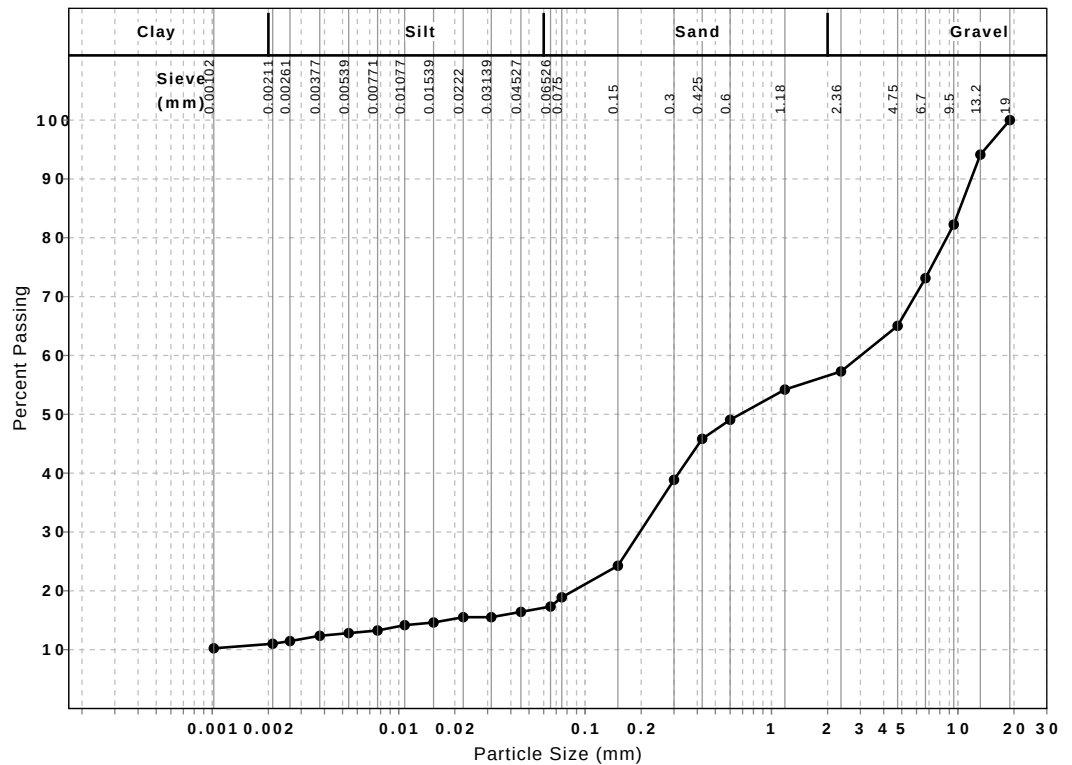
Particle Size Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
75 mm		
63 mm		
53 mm		
37.5 mm		
26.5 mm		
19 mm	100	
13.2 mm	94	
9.5 mm	82	
6.7 mm	73	
4.75 mm	65	
2.36 mm	57	
1.18 mm	54	
0.6 mm	49	
0.425 mm	46	
0.3 mm	39	
0.15 mm	24	
0.075 mm	19	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.0653	17.3
0.0453	16.4
0.0314	15.5
0.0222	15.5
0.0154	14.6
0.0108	14.2
0.0077	13.3
0.0054	12.8
0.0038	12.4
0.0026	11.5
0.0021	11.0
0.0010	10.2

Particle Size Distribution



Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Type of Hydrometer	Bulb
Method of Preparation	7.1
Method of Dispersion	Mortar and Pestle
Loss in Pretreatment	0
Soil Particle Density (t/m^3)	2.54

Material Test Report

Report Number: 229166.01-1
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Newcastle approve tests
Date Issued: 02/09/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018F
Date Sampled: 05/07/2024
Dates Tested: 19/07/2024 - 16/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP03 , Depth: 2.4 - 2.5m
Material: Clayey Sandy GRAVEL



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Laboratory Manager

Laboratory Accreditation Number: 828

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)

Iss (%)	0.6
Visual Description	Clayey Sandy GRAVEL
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	
Sample was tested from a remoulded specimen using DP700.1	

Core Shrinkage Test

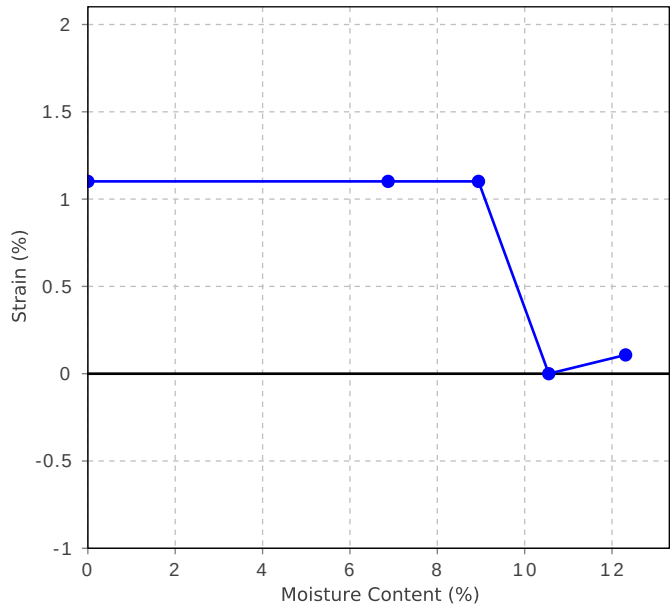
Shrinkage Strain - Oven Dried (%)	1.1
Estimated % by volume of significant inert inclusions	0
Cracking	Uncracked
Crumbling	No
Moisture Content (%)	10.6

Swell Test

Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	600
Initial Moisture Content (%)	11.1
Final Moisture Content (%)	12.3
Swell (%)	-0.1

* NATA Accreditation does not cover the performance of pocket penetrometer readings.

Shrink Swell



Material Test Report

Report Number: 229166.01-1
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Newcastle approve tests
Date Issued: 02/09/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018J
Date Sampled: 01/07/2024
Dates Tested: 19/07/2024 - 15/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH03 , Depth: 5.2 - 6.0m
Material: Sandy Silty CLAY



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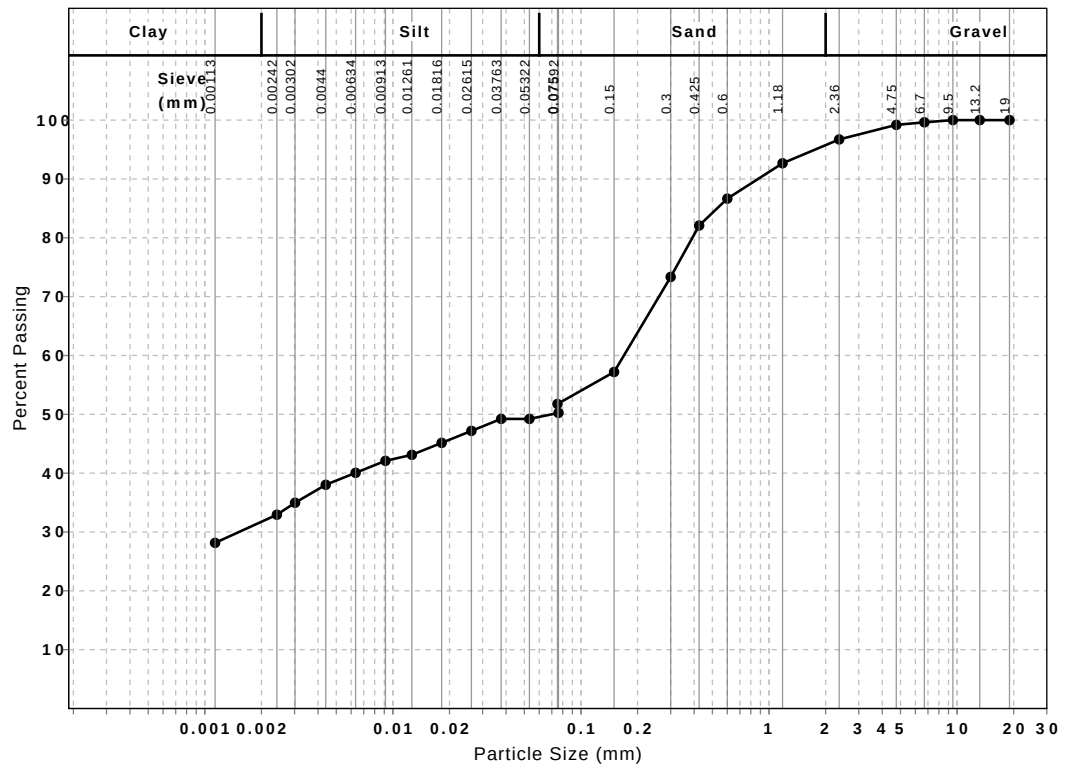
Particle Size Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
75 mm		
63 mm		
53 mm		
37.5 mm		
26.5 mm		
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	99	
2.36 mm	97	
1.18 mm	93	
0.6 mm	87	
0.425 mm	82	
0.3 mm	73	
0.15 mm	57	
0.075 mm	52	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.0759	50.2
0.0532	49.2
0.0376	49.2
0.0261	47.2
0.0182	45.1
0.0126	43.1
0.0091	42.1
0.0063	40.1
0.0044	38.0
0.0030	35.0
0.0024	32.9
0.0011	28.1

Particle Size Distribution



Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Type of Hydrometer	Bulb
Method of Preparation	7.1
Method of Dispersion	Mortar and Pestle
Loss in Pretreatment	0
Soil Particle Density (t/m^3)	2.42

Material Test Report

Report Number: 229166.01-1
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Newcastle approve tests
Date Issued: 02/09/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018K
Date Sampled: 03/07/2024
Dates Tested: 19/07/2024 - 19/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH03, Depth: 7.2 - 7.7m
Material: Kaolinised Siltstone



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Laboratory Manager

Laboratory Accreditation Number: 828

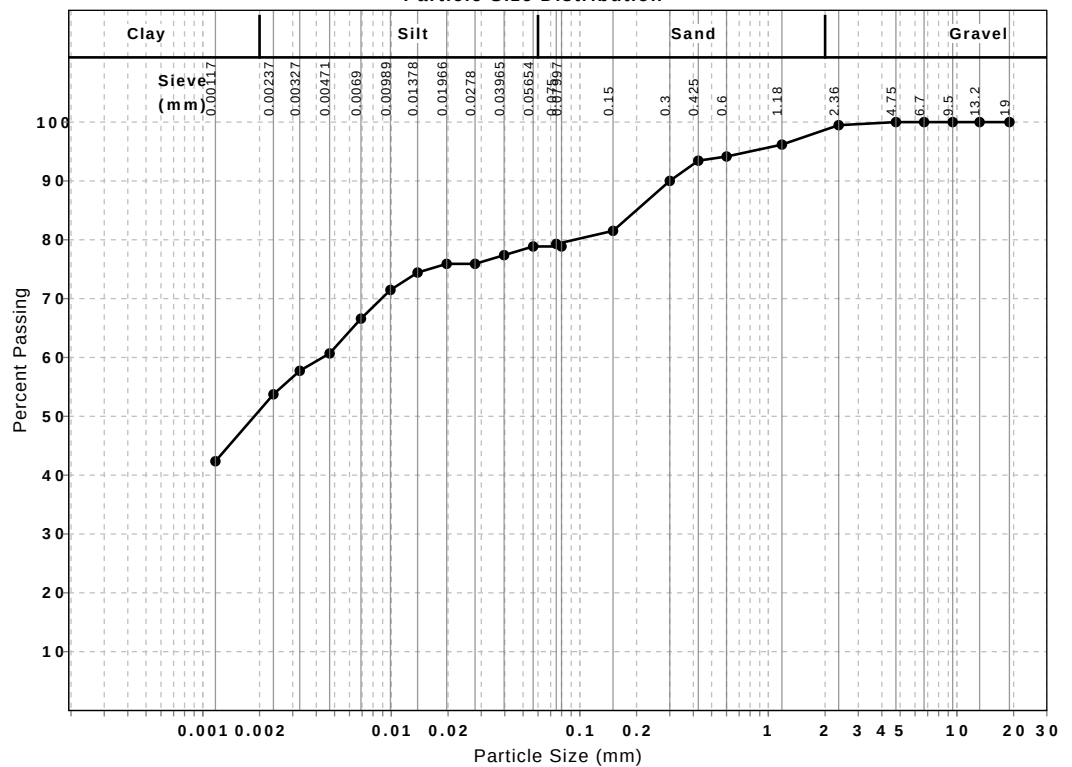
Particle Size Distribution (AS 1289 3.6.1)

Sieve	Passed %	Passing Limits
75 mm		
63 mm		
53 mm		
37.5 mm		
26.5 mm		
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	99	
1.18 mm	96	
0.6 mm	94	
0.425 mm	93	
0.3 mm	90	
0.15 mm	82	
0.075 mm	79	

Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Particle Size (mm)	Passed %
0.0800	78.9
0.0565	78.9
0.0397	77.4
0.0278	75.9
0.0197	75.9
0.0138	74.4
0.0099	71.5
0.0069	66.6
0.0047	60.7
0.0033	57.7
0.0024	53.7
0.0012	42.4

Particle Size Distribution



Fine Analysis Using a Hydrometer (AS 1289 3.6.3)

Type of Hydrometer	Bulb
Method of Preparation	7.1
Method of Dispersion	Mortar and Pestle
Loss in Pretreatment	0
Soil Particle Density (t/m^3)	2.36

Material Test Report

Report Number: 229166.01-1
Issue Number: 3 - This version supersedes all previous issues
Reissue Reason: Newcastle approve tests
Date Issued: 02/09/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018K
Date Sampled: 03/07/2024
Dates Tested: 19/07/2024 - 14/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH03, Depth: 7.2 - 7.7m
Material: Kaolinised Siltstone



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Approved Signatory: Peter Gorseski

Laboratory Manager

Laboratory Accreditation Number: 828

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	38		
Plastic Limit (%)	20		
Plasticity Index (%)	18		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	7.0		
Cracking Crumbling Curling	None		

Material Test Report

Report Number: 229166.01-1B
Issue Number: 1
Date Issued: 26/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018G
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 21/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP04, Depth: 1.0 - 1.2m
Material: SAND



Douglas Partners Pty Ltd

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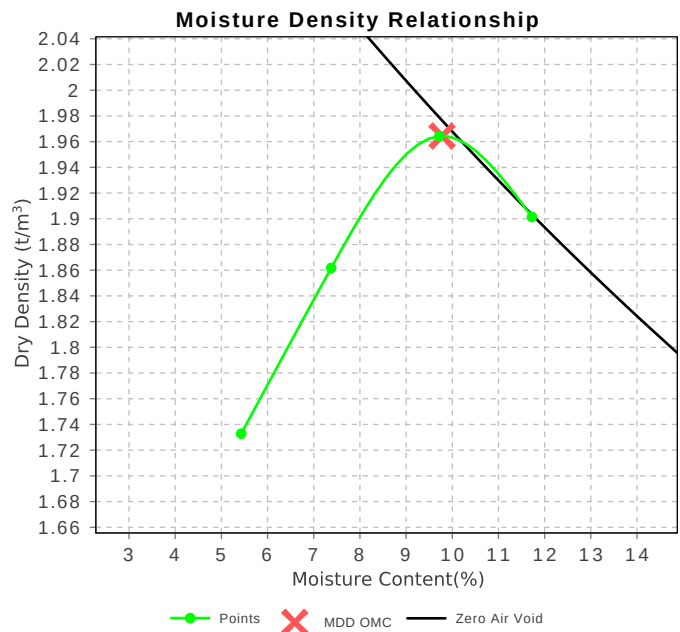
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Dry Density - Moisture Relationship (AS 1289 5.1.1 & 2.1.1)		Min	Max
Mould Type	1 LITRE MOULD A		
Compaction	Standard		
Maximum Dry Density (t/m ³)	1.96		
Optimum Moisture Content (%)	10.0		
Oversize Sieve (mm)	19.0		
Oversize Material Wet (%)	0		
Method used to Determine Plasticity	Visual Assessment		
Curing Hours (h)	24.0		
Moisture Content (AS 1289 2.1.1)			
Moisture Content (%)		5.5	



Material Test Report

Report Number: 229166.01-1B
Issue Number: 1
Date Issued: 26/08/2024
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Sample Number: DW-6018B
Date Sampled: 06/07/2024
Dates Tested: 19/07/2024 - 20/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: TP01 , Depth: 0.5 - 0.7m
Material: Silty SAND, trace gravel



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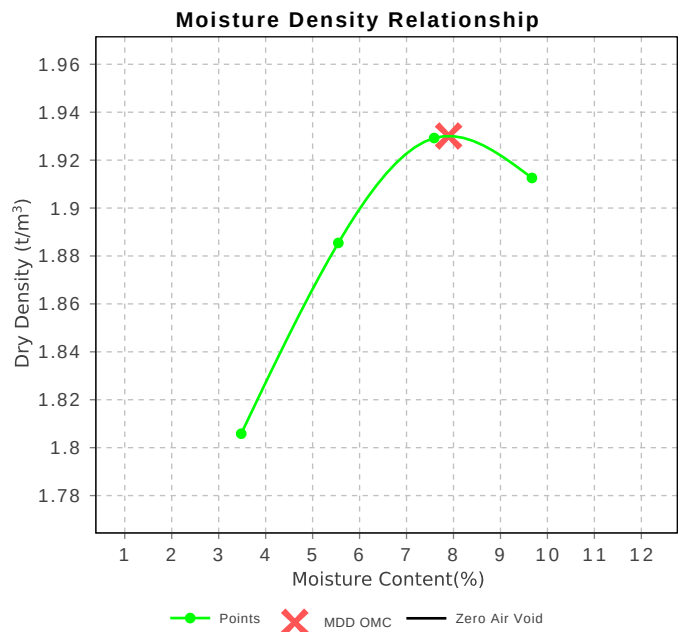
Nathan Kellaway

Approved Signatory: Nathan Kellaway

Laboratory Manager

Laboratory Accreditation Number: 828

Dry Density - Moisture Relationship (AS 1289 5.1.1 & 2.1.1)		Min	Max
Mould Type	1 LITRE MOULD A		
Compaction	Standard		
Maximum Dry Density (t/m ³)	1.93		
Optimum Moisture Content (%)	8.0		
Oversize Sieve (mm)	19.0		
Oversize Material Wet (%)	0		
Method used to Determine Plasticity	Visual Assessment		
Curing Hours (h)	24.0		
Moisture Content (AS 1289 2.1.1)			
Moisture Content (%)		1.6	



Material Test Report



Report Number: PREVIEW
Issue Number:
Date Issued:
Client: Tamboran Resources Limited
Tower 1, level 39 Suite 01, Sydney NSW
Project Number: 229166.01
Project Name: Sturt Plateau Compression Facility SPCF
Project Location: Sturt Plateau, Dunmarra NT
Work Request: 6018
Dates Tested: 19/07/2024 - 20/08/2024
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Location: ENGINEERING Dept.: Dunmarra, NT (10 Samples - Var tests see summary)

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Newcastle Laboratory
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Phone: (02) 4960 9600
Email: newcastle@douglaspartners.com.au

Shrink Swell Index AS 1289 7.1.1 & 2.1.1					
Sample Number	DW-6018D	DW-6018F			
Date Sampled	06/07/2024	05/07/2024			
Date Tested	20/08/2024	16/08/2024			
Material Source	Sandy Clay	**			
Sample Location	TP02 (2.0 - 2.2m)	TP03 (2.0 - 2.5m)			
Inert Material Estimate (%)	0	**			
Pocket Penetrometer before (kPa)	600	>600			
Pocket Penetrometer after (kPa)	520	600			
Shrinkage Moisture Content (%)	11.4	10.6			
Shrinkage (%)	1.4	1.1			
Swell Moisture Content Before (%)	10.8	11.1			
Swell Moisture Content After (%)	11.7	12.3			
Swell (%)	-0.1	-0.1			
Shrink Swell Index Iss (%)	0.8	0.6			
Visual Description	Silty SAND, trace gravel	Sandy Gravelly SILT (ML)			
Cracking	SC	SC			
Crumbling	No	No			
Remarks	**	**			

Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.
Cracking Terminology: UC Uncracked, SC Slightly Cracked, MC Moderately Cracked, HC Highly Cracked, FR Fragmented.
NATA Accreditation does not cover the performance of pocket penetrometer readings.

CERTIFICATE OF ANALYSIS 357329

Client Details

Client	Douglas Partners NT
Attention	Darwin Admin, Sbo Ntanz
Address	PO Box 36858, Winnellie, NT, 0821

Sample Details

Your Reference	<u>ES1415 Sturt Plateau Compression Facility Dunmarra</u>
Number of Samples	8 Soil
Date samples received	24/07/2024
Date completed instructions received	24/07/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	31/07/2024
Date of Issue	31/07/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Giovanni Agosti, Group Technical Manager
Nancy Zhang, Laboratory Manager, Sydney

Authorised By

Nancy Zhang, Laboratory Manager

Client Reference: ES1415 Sturt Plateau Compression Facility Dunmarra

Misc Inorg - Soil						
Our Reference		357329-1	357329-2	357329-3	357329-4	357329-5
Your Reference	UNITS	TP01	TP01	TP02	TP02	TP03
Depth		0.1-0.2	0.5-0.7	1.0-1.3	2.0-2.2	1.5-1.7
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	25/07/2024	25/07/2024	25/07/2024	25/07/2024	25/07/2024
Date analysed	-	25/07/2024	25/07/2024	25/07/2024	25/07/2024	25/07/2024
pH 1:5 soil:water	pH Units	5.9	6.4	6.4	6.2	6.0
Electrical Conductivity 1:5 soil:water	µS/cm	9	9	6	4	3
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	<10	<10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	<10	<10	<10	<10	<10
Resistivity in soil*	ohm m	1,100	1,100	1,800	2,600	3,400
Phosphorus Sorption	mg/kg	[NA]	[NA]	[NA]	[NA]	170

Misc Inorg - Soil				
Our Reference		357329-6	357329-7	357329-8
Your Reference	UNITS	TP03	TP05	BH03
Depth		2.0-2.5	0.8-1.0	5.2-6.0
Date Sampled		05/07/2024	06/07/2024	01/07/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	25/07/2024	25/07/2024	25/07/2024
Date analysed	-	25/07/2024	25/07/2024	25/07/2024
pH 1:5 soil:water	pH Units	5.9	5.9	6.1
Electrical Conductivity 1:5 soil:water	µS/cm	3	5	14
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	<10
Sulphate, SO4 1:5 soil:water	mg/kg	<10	<10	<10
Resistivity in soil*	ohm m	3,100	1,900	720
Phosphorus Sorption	mg/kg	[NA]	140	[NA]

CEC			
Our Reference		357329-5	357329-7
Your Reference	UNITS	TP03	TP05
Depth		1.5-1.7	0.8-1.0
Date Sampled		05/07/2024	06/07/2024
Type of sample		Soil	Soil
Date prepared	-	29/07/2024	29/07/2024
Date analysed	-	30/07/2024	30/07/2024
Exchangeable Ca	meq/100g	0.7	0.7
Exchangeable K	meq/100g	<0.1	0.1
Exchangeable Mg	meq/100g	0.7	0.4
Exchangeable Na	meq/100g	<0.1	<0.1
Cation Exchange Capacity	meq/100g	1.5	1.3

Method ID	Methodology Summary
Ext-006	Analysis subcontracted to Watertest. NATA Accreditation No: 1884.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA 22nd ED 2510 and Rayment & Lyons. Resistivity is calculated from Conductivity (non NATA). Resistivity (calculated) may not correlate with results otherwise obtained using Resistivity-Current method, depending on the nature of the soil being analysed.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	357329-7
Date prepared	-			25/07/2024	6	25/07/2024	25/07/2024		25/07/2024	25/07/2024
Date analysed	-			25/07/2024	6	25/07/2024	25/07/2024		25/07/2024	25/07/2024
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	6	5.9	5.9	0	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	6	3	3	0	102	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	6	<10	<10	0	111	98
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	6	<10	<10	0	110	98
Resistivity in soil*	ohm m	1	Inorg-002	<1	6	3100	3200	3	[NT]	[NT]

QUALITY CONTROL: CEC					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			29/07/2024	5	29/07/2024	29/07/2024		29/07/2024	[NT]
Date analysed	-			30/07/2024	5	30/07/2024	30/07/2024		30/07/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	5	0.7	0.7	0	94	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	5	<0.1	<0.1	0	101	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	5	0.7	0.6	15	95	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	5	<0.1	<0.1	0	104	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Samples were out of the recommended holding time for this analysis pH/EC.

Phosphorus Sorption analysed by East West. Report no. EW241415.

CERTIFICATE OF ANALYSIS 357329-A

Client Details

Client	Douglas Partners NT
Attention	Sbo Ntanz
Address	PO Box 36858, Winnellie, NT, 0821

Sample Details

Your Reference	<u>ES1415 Sturt Plateau Compression Facility Dunmarra</u>
Number of Samples	Additional analysis
Date samples received	24/07/2024
Date completed instructions received	29/08/2024

Analysis Details

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

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	30/08/2024
Date of Issue	30/08/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Loren Bardwell, Development Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Client Reference: ES1415 Sturt Plateau Compression Facility Dunmarra

CEC						
Our Reference	UNITS	357329-A-1	357329-A-2	357329-A-3	357329-A-4	357329-A-6
Your Reference		TP01	TP01	TP02	TP02	TP03
Depth		0.1-0.2	0.5-0.7	1.0-1.3	2.0-2.2	2.0-2.5
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024
Date analysed	-	30/08/2024	30/08/2024	30/08/2024	30/08/2024	30/08/2024
Exchangeable Ca	meq/100g	1.0	1	0.8	0.7	0.6
Exchangeable K	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1
Exchangeable Mg	meq/100g	0.2	0.3	0.7	0.8	0.8
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	1.3	1.4	1.6	1.5	1.4

CEC		
Our Reference	UNITS	357329-A-8
Your Reference		BH03
Depth		5.2-6.0
Date Sampled		01/07/2024
Type of sample		Soil
Date prepared	-	30/08/2024
Date analysed	-	30/08/2024
Exchangeable Ca	meq/100g	0.7
Exchangeable K	meq/100g	<0.1
Exchangeable Mg	meq/100g	1.1
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	1.9

Method ID	Methodology Summary
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: CEC					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	357329-A-2
Date prepared	-			30/08/2024	1	30/08/2024	30/08/2024		30/08/2024	30/08/2024
Date analysed	-			30/08/2024	1	30/08/2024	30/08/2024		30/08/2024	30/08/2024
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	1	1.0	0.7	35	100	104
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	1	<0.1	<0.1	0	104	102
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	1	0.2	0.2	0	100	105
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	1	<0.1	<0.1	0	94	99

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
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LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
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Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Appendix F

Laboratory Contamination Results

CERTIFICATE OF ANALYSIS 356362

Client Details

Client	Douglas Partners NT
Attention	Sbo Ntanz
Address	PO Box 36858, Winnellie, NT, 0821

Sample Details

Your Reference	<u>ES1415 Sturt Plateau Compression Facility, NT</u>
Number of Samples	6 Soil
Date samples received	12/07/2024
Date completed instructions received	12/07/2024

Analysis Details

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

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	19/07/2024
Date of Issue	19/07/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Diego Bigolin, Inorganics Supervisor
 Dragana Tomas, Senior Chemist
 Giovanni Agosti, Group Technical Manager
 Greta Petzold, Operation Manager
 Jack Wallis, Chemist (FAS)
 Sean McAlary, Chemist (FAS)
 Timothy Toll, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Volatile Fatty Acids

Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Extracted	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
Date analysed	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
Volatile Fatty Acids* in Soil	mg/kg	220	<100	200	140	200

Volatile Fatty Acids

Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date Extracted	-	16/07/2024
Date analysed	-	16/07/2024
Volatile Fatty Acids* in Soil	mg/kg	<100

VOCs in soil						
Our Reference	UNITS	356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference		TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Extracted	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Date Analysed	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloroethane	mg/kg	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	mg/kg	<1	<1	<1	<1	<1
Bromochloromethane	mg/kg	<1	<1	<1	<1	<1
Chloroform	mg/kg	<1	<1	<1	<1	<1
2,2-Dichloropropane	mg/kg	<1	<1	<1	<1	<1
1,2-Dichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloropropene	mg/kg	<1	<1	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1	<1	<1
Carbon Tetrachloride	mg/kg	<1	<1	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromomethane	mg/kg	<1	<1	<1	<1	<1
1,2-Dichloropropane	mg/kg	<1	<1	<1	<1	<1
Trichloroethene	mg/kg	<1	<1	<1	<1	<1
Bromodichloromethane	mg/kg	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	mg/kg	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	mg/kg	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	mg/kg	<1	<1	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropane	mg/kg	<1	<1	<1	<1	<1
Dibromochloromethane	mg/kg	<1	<1	<1	<1	<1
1,2-Dibromoethane	mg/kg	<1	<1	<1	<1	<1
Tetrachloroethene	mg/kg	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
Chlorobenzene	mg/kg	<1	<1	<1	<1	<1

VOCs in soil						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
Bromoform	mg/kg	<1	<1	<1	<1	<1
m+p-Xylene	mg/kg	<2	<2	<2	<2	<2
Styrene	mg/kg	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	mg/kg	<1	<1	<1	<1	<1
Isopropylbenzene	mg/kg	<1	<1	<1	<1	<1
Bromobenzene	mg/kg	<1	<1	<1	<1	<1
n-Propylbenzene	mg/kg	<1	<1	<1	<1	<1
2-Chlorotoluene	mg/kg	<1	<1	<1	<1	<1
4-Chlorotoluene	mg/kg	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	mg/kg	<1	<1	<1	<1	<1
tert-Butylbenzene	mg/kg	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	mg/kg	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
sec-Butylbenzene	mg/kg	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
4-Isopropyltoluene	mg/kg	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
n-Butylbenzene	mg/kg	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	mg/kg	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
Hexachlorobutadiene	mg/kg	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	108	105	108	107	105
Surrogate aaa-Trifluorotoluene	%	109	124	110	121	118
Surrogate Toluene-d ₈	%	109	108	110	103	104
Surrogate 4-Bromofluorobenzene	%	95	96	98	98	98

VOCs in soil		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date Extracted	-	15/07/2024
Date Analysed	-	16/07/2024
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-Dichloroethene	mg/kg	<1
1,1-Dichloroethane	mg/kg	<1
cis-1,2-Dichloroethene	mg/kg	<1
Bromochloromethane	mg/kg	<1
Chloroform	mg/kg	<1
2,2-Dichloropropane	mg/kg	<1
1,2-Dichloroethane	mg/kg	<1
1,1,1-Trichloroethane	mg/kg	<1
1,1-Dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
Carbon Tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
Dibromomethane	mg/kg	<1
1,2-Dichloropropane	mg/kg	<1
Trichloroethene	mg/kg	<1
Bromodichloromethane	mg/kg	<1
trans-1,3-Dichloropropene	mg/kg	<1
cis-1,3-Dichloropropene	mg/kg	<1
1,1,2-Trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-Dichloropropane	mg/kg	<1
Dibromochloromethane	mg/kg	<1
1,2-Dibromoethane	mg/kg	<1
Tetrachloroethene	mg/kg	<1
1,1,1,2-Tetrachloroethane	mg/kg	<1
Chlorobenzene	mg/kg	<1

VOCs in soil		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Ethylbenzene	mg/kg	<1
Bromoform	mg/kg	<1
m+p-Xylene	mg/kg	<2
Styrene	mg/kg	<1
1,1,2,2-Tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-Trichloropropane	mg/kg	<1
Isopropylbenzene	mg/kg	<1
Bromobenzene	mg/kg	<1
n-Propylbenzene	mg/kg	<1
2-Chlorotoluene	mg/kg	<1
4-Chlorotoluene	mg/kg	<1
1,3,5-Trimethylbenzene	mg/kg	<1
tert-Butylbenzene	mg/kg	<1
1,2,4-Trimethylbenzene	mg/kg	<1
1,3-Dichlorobenzene	mg/kg	<1
sec-Butylbenzene	mg/kg	<1
1,4-Dichlorobenzene	mg/kg	<1
4-Isopropyltoluene	mg/kg	<1
1,2-Dichlorobenzene	mg/kg	<1
n-Butylbenzene	mg/kg	<1
1,2-Dibromo-3-chloropropane	mg/kg	<1
1,2,4-Trichlorobenzene	mg/kg	<1
Hexachlorobutadiene	mg/kg	<1
1,2,3-Trichlorobenzene	mg/kg	<1
Surrogate Dibromofluoromethane	%	107
Surrogate aaa-Trifluorotoluene	%	108
Surrogate Toluene-d ₈	%	101
Surrogate 4-Bromofluorobenzene	%	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Date analysed	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	109	124	110	121	118

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date extracted	-	15/07/2024
Date analysed	-	16/07/2024
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	108

svTRH (C10-C40) in Soil						
Our Reference	UNITS	356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference		TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Date analysed	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	78	79	77	75	79

svTRH (C10-C40) in Soil		
Our Reference	UNITS	356362-6
Your Reference		TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date extracted	-	15/07/2024
Date analysed	-	16/07/2024
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	79

PAHs in Soil						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Date analysed	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	83	82	91	85	93

PAHs in Soil		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date extracted	-	15/07/2024
Date analysed	-	16/07/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	90

Acid Extractable metals in soil						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Date analysed	-	17/07/2024	17/07/2024	17/07/2024	17/07/2024	17/07/2024
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	67	47	50	44	46
Copper	mg/kg	4	2	2	2	2
Lead	mg/kg	6	5	4	5	4
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	2	2	2	2
Zinc	mg/kg	1	<1	<1	<1	<1
Phosphorus	mg/kg	40	30	30	20	30
Aluminium	mg/kg	2,100	2,800	2,600	3,200	2,500
Barium	mg/kg	62	25	14	12	16
Boron	mg/kg	<10	<10	<10	<10	<10
Iron	mg/kg	13,000	10,000	12,000	10,000	11,000
Manganese	mg/kg	140	71	84	57	120
Strontium	mg/kg	10	5	3	3	2

Acid Extractable metals in soil		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date prepared	-	15/07/2024
Date analysed	-	17/07/2024
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	43
Copper	mg/kg	2
Lead	mg/kg	4
Mercury	mg/kg	<0.1
Nickel	mg/kg	2
Zinc	mg/kg	<1
Phosphorus	mg/kg	20
Aluminium	mg/kg	3,000
Barium	mg/kg	10
Boron	mg/kg	<10
Iron	mg/kg	9,100
Manganese	mg/kg	55
Strontium	mg/kg	3

Moisture						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Date analysed	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
Moisture	%	49	4.8	3.2	4.5	4.8

Moisture		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date prepared	-	15/07/2024
Date analysed	-	16/07/2024
Moisture	%	3.4

CEC						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/07/2024	17/07/2024	17/07/2024	17/07/2024	17/07/2024
Date analysed	-	17/07/2024	17/07/2024	17/07/2024	17/07/2024	17/07/2024
Exchangeable Ca	meq/100g	1.4	1	0.6	0.6	0.4
Exchangeable K	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1
Exchangeable Mg	meq/100g	0.3	0.3	0.2	0.3	0.2
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	1.8	1.3	<1	<1	<1

CEC		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date prepared	-	17/07/2024
Date analysed	-	17/07/2024
Exchangeable Ca	meq/100g	0.6
Exchangeable K	meq/100g	0.1
Exchangeable Mg	meq/100g	0.2
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	<1

Misc Inorg - Soil						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/07/2024	17/07/2024	17/07/2024	17/07/2024	17/07/2024
Date analysed	-	17/07/2024	17/07/2024	17/07/2024	17/07/2024	17/07/2024
pH 1:5 soil:water	pH Units	6.7	6.7	6.3	6.2	6.0
Electrical Conductivity 1:5 soil:water	µS/cm	9	6	4	4	4
Chloride, Cl 1:5 soil:water	mg/kg	<10	<10	<10	<10	<10
Sulphate, SO ₄ 1:5 soil:water	mg/kg	<10	<10	<10	<10	<10
Fluoride (1:5 soil:water)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Estimated Salinity*	mg/kg	30	19	13	13	12
Date prepared	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
Date analysed	-	16/07/2024	16/07/2024	16/07/2024	16/07/2024	16/07/2024
Ammonia as N in soil	mg/kg	1.6	0.5	<0.5	0.6	<0.5
Nitrate as N in soil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrite as N in soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
NO _x as N in soil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
TKN in soil	mg/kg	220	170	97	88	100
Total Nitrogen in soil	mg/kg	220	170	97	88	100
Phosphate as P in soil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Organic Nitrogen as N	mg/kg	220	170	100	90	100
Sodium Adsorption Ratio	-	0.14	0.10	0.12	0.11	0.25
Soluble Bicarb as CaCO ₃ *	mg/kg	120	120	100	90	85
Soluble Carbonate as CaCO ₃ *	mg/kg	<25	<25	<25	<25	<25
Soluble Hydroxide as CaCO ₃ *	mg/kg	<25	<25	<25	<25	<25
Soluble Alkalinity as CaCO ₃ *	mg/kg	120	120	100	90	85
Presence of Sulphides in soil*	-	Absent	Absent	Absent	Absent	Absent

Misc Inorg - Soil		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date prepared	-	17/07/2024
Date analysed	-	17/07/2024
pH 1:5 soil:water	pH Units	6.2
Electrical Conductivity 1:5 soil:water	µS/cm	4
Chloride, Cl 1:5 soil:water	mg/kg	<10
Sulphate, SO4 1:5 soil:water	mg/kg	<10
Fluoride (1:5 soil:water)	mg/kg	<0.5
Estimated Salinity*	mg/kg	15
Date prepared	-	16/07/2024
Date analysed	-	16/07/2024
Ammonia as N in soil	mg/kg	<0.5
Nitrate as N in soil	mg/kg	<0.5
Nitrite as N in soil	mg/kg	<0.1
NOx as N in soil	mg/kg	<0.5
TKN in soil	mg/kg	130
Total Nitrogen in soil	mg/kg	130
Phosphate as P in soil	mg/kg	<0.5
Organic Nitrogen as N	mg/kg	130
Sodium Adsorption Ratio	-	0.29
Soluble Bicarb as CaCO ₃ *	mg/kg	88
Soluble Carbonate as CaCO ₃ *	mg/kg	<25
Soluble Hydroxide as CaCO ₃ *	mg/kg	<25
Soluble Alkalinity as CaCO ₃ *	mg/kg	88
Presence of Sulphides in soil*	-	Absent

PFAS in Soils Extended						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Date analysed	-	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
Perfluorobutanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorobutanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	0.3
Perfluoropentanoic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorohexanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorononanoic acid	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorododecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Perfluorotetradecanoic acid	µg/kg	<5	<5	<5	<5	<5
4:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
10:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctanesulfonamide	µg/kg	<1	<1	<1	<1	<1
N-Me perfluorooctanesulfonamidethanol	µg/kg	<1	<1	<1	<1	<1
N-Et perfluorooctanesulfonamidethanol	µg/kg	<5	<5	<5	<5	<5
MePerfluorooctanesulfonamidacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EtPerfluorooctanesulfonamidacetic acid	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate ¹³ C ₈ PFOS	%	103	101	108	110	110
Surrogate ¹³ C ₂ PFOA	%	107	103	107	103	104
Extracted ISTD ¹³ C ₃ PFBS	%	79	93	91	91	91
Extracted ISTD ¹⁸ O ₂ PFHxS	%	57	72	65	67	67
Extracted ISTD ¹³ C ₄ PFOS	%	64	71	67	68	68

PFAS in Soils Extended						
Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Extracted ISTD ¹³ C ₄ PFBA	%	81	94	90	89	88
Extracted ISTD ¹³ C ₃ PFPeA	%	106	121	122	117	119
Extracted ISTD ¹³ C ₂ PFHxA	%	113	132	131	120	122
Extracted ISTD ¹³ C ₄ PFHpA	%	73	80	82	76	79
Extracted ISTD ¹³ C ₄ PFOA	%	75	85	86	80	79
Extracted ISTD ¹³ C ₅ PFNA	%	79	94	88	78	88
Extracted ISTD ¹³ C ₂ PFDA	%	74	75	76	72	77
Extracted ISTD ¹³ C ₂ PFUnDA	%	96	104	103	89	93
Extracted ISTD ¹³ C ₂ PFDoDA	%	95	95	92	85	92
Extracted ISTD ¹³ C ₂ PFTeDA	%	83	92	95	80	90
Extracted ISTD ¹³ C ₂ 4:2FTS	%	89	99	99	88	90
Extracted ISTD ¹³ C ₂ 6:2FTS	%	85	86	91	78	85
Extracted ISTD ¹³ C ₂ 8:2FTS	%	94	91	91	78	85
Extracted ISTD ¹³ C ₈ FOSA	%	75	86	83	83	81
Extracted ISTD d ₃ N MeFOSA	%	71	85	81	84	83
Extracted ISTD d ₅ N EtFOSA	%	67	78	76	78	79
Extracted ISTD d ₇ N MeFOSE	%	64	76	74	83	77
Extracted ISTD d ₉ N EtFOSE	%	77	89	89	91	88
Extracted ISTD d ₃ N MeFOSAA	%	81	76	80	72	81
Extracted ISTD d ₅ N EtFOSAA	%	96	100	95	83	101
Total Positive PFHxS & PFOS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PFOS & PFOA	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PFAS	µg/kg	<0.1	<0.1	<0.1	<0.1	0.3

PFAS in Soils Extended		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Date prepared	-	15/07/2024
Date analysed	-	15/07/2024
Perfluorobutanesulfonic acid	µg/kg	<0.1
Perfluoropentanesulfonic acid	µg/kg	<0.1
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1
Perfluoroheptanesulfonic acid	µg/kg	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1
Perfluorodecanesulfonic acid	µg/kg	<0.2
Perfluorobutanoic acid	µg/kg	<0.2
Perfluoropentanoic acid	µg/kg	<0.2
Perfluorohexanoic acid	µg/kg	<0.1
Perfluoroheptanoic acid	µg/kg	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1
Perfluorononanoic acid	µg/kg	<0.1
Perfluorodecanoic acid	µg/kg	<0.5
Perfluoroundecanoic acid	µg/kg	<0.5
Perfluorododecanoic acid	µg/kg	<0.5
Perfluorotridecanoic acid	µg/kg	<0.5
Perfluorotetradecanoic acid	µg/kg	<5
4:2 FTS	µg/kg	<0.1
6:2 FTS	µg/kg	<0.1
8:2 FTS	µg/kg	<0.2
10:2 FTS	µg/kg	<0.2
Perfluorooctane sulfonamide	µg/kg	<1
N-Methyl perfluorooctane sulfonamide	µg/kg	<1
N-Ethyl perfluorooctanesulfonamide	µg/kg	<1
N-Me perfluorooctanesulfonamid oethanol	µg/kg	<1
N-Et perfluorooctanesulfonamid oethanol	µg/kg	<5
MePerfluorooctanesulf- amid oacetic acid	µg/kg	<0.2
EtPerfluorooctanesulf amid oacetic acid	µg/kg	<0.2
Surrogate ¹³ C ₈ PFOS	%	108
Surrogate ¹³ C ₂ PFOA	%	109
Extracted ISTD ¹³ C ₃ PFBS	%	89
Extracted ISTD ¹⁸ O ₂ PFHxS	%	68
Extracted ISTD ¹³ C ₄ PFOS	%	72

PFAS in Soils Extended		
Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Extracted ISTD ¹³ C ₄ PFBA	%	89
Extracted ISTD ¹³ C ₃ PFPeA	%	117
Extracted ISTD ¹³ C ₂ PFHxA	%	124
Extracted ISTD ¹³ C ₄ PFHpA	%	77
Extracted ISTD ¹³ C ₄ PFOA	%	76
Extracted ISTD ¹³ C ₅ PFNA	%	79
Extracted ISTD ¹³ C ₂ PFDA	%	76
Extracted ISTD ¹³ C ₂ PFUnDA	%	94
Extracted ISTD ¹³ C ₂ PFDoDA	%	90
Extracted ISTD ¹³ C ₂ PFTeDA	%	87
Extracted ISTD ¹³ C ₂ 4:2FTS	%	87
Extracted ISTD ¹³ C ₂ 6:2FTS	%	77
Extracted ISTD ¹³ C ₂ 8:2FTS	%	81
Extracted ISTD ¹³ C ₈ FOSA	%	85
Extracted ISTD d ₃ N MeFOSA	%	82
Extracted ISTD d ₅ N EtFOSA	%	79
Extracted ISTD d ₇ N MeFOSE	%	79
Extracted ISTD d ₉ N EtFOSE	%	90
Extracted ISTD d ₃ N MeFOSAA	%	73
Extracted ISTD d ₅ N EtFOSAA	%	87
Total Positive PFHxS & PFOS	µg/kg	<0.1
Total Positive PFOS & PFOA	µg/kg	<0.1
Total Positive PFAS	µg/kg	<0.1

Emerson Aggregate Test (Dispersibility)

Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Emerson Aggregate Test (Dispersibility)	mg/kg	3b	7.0	5.0	5.0	3b

Emerson Aggregate Test (Dispersibility)

Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
Emerson Aggregate Test (Dispersibility)	mg/kg	5.0

TCLP Preparation - Acid

Our Reference		356362-1	356362-2	356362-3	356362-4	356362-5
Your Reference	UNITS	TP1A	TP1B	TP2A	TP2B	TP3A
Depth		0.25	0.5	0.25	0.5	0.25
Date Sampled		06/07/2024	06/07/2024	06/07/2024	06/07/2024	05/07/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	5.7	5.9	5.8	5.7	5.7
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.7	1.7	1.7
Extraction fluid used		1	1	1	1	1
pH of final Leachate	pH units	4.9	4.9	4.9	4.9	4.9

TCLP Preparation - Acid

Our Reference		356362-6
Your Reference	UNITS	TP3B
Depth		0.5
Date Sampled		05/07/2024
Type of sample		Soil
pH of soil for fluid# determ.	pH units	5.7
pH of soil TCLP (after HCl)	pH units	1.7
Extraction fluid used		1
pH of final Leachate	pH units	4.9

Method ID	Methodology Summary
Ext-062	Analysed by East West Enviroag
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA latest edition, 4500-F-C.
Inorg-034	Soil samples are extracted and measured using a conductivity cell and dedicated meter.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-062	TKN - determined colourimetrically based on APHA latest edition 4500 Norg. Alternatively, TKN can be derived from calculation (Total N - NOx).
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-111	VFA determined by distillation and titration.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-020	Calcium and Magnesium analysed by ICP-AES and SAR calculated.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40). Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Method ID	Methodology Summary
Org-029 TAIAUS-TS-0100RTA	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER. A qualitative colour test for presence or absence of sulphides in soil based on Method from the Reinforced Earth Company Document No: TAIAUS-TS-0100RTA.

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: Volatile Fatty Acids					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date Extracted	-			16/07/2024	[NT]	[NT]	[NT]	[NT]	16/07/2024	[NT]
Date analysed	-			16/07/2024	[NT]	[NT]	[NT]	[NT]	16/07/2024	[NT]
Volatile Fatty Acids* in Soil	mg/kg	100	Inorg-111	<5	[NT]	[NT]	[NT]	[NT]	85	[NT]

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: VOCs in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	356362-2
Date Extracted	-			15/07/2024	3	15/07/2024	15/07/2024		15/07/2024	15/07/2024
Date Analysed	-			16/07/2024	3	16/07/2024	16/07/2024		16/07/2024	16/07/2024
Dichlorodifluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
trans-1,2-Dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1-Dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	124	133
cis-1,2-Dichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chloroform	mg/kg	1	Org-023	<1	3	<1	<1	0	119	128
2,2-Dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-Dichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	114	121
1,1,1-Trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	106	114
1,1-Dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Carbon Tetrachloride	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	102	107
Dibromomethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-Dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Trichloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	96	100
Bromodichloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	104	110
trans-1,3-Dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
cis-1,3-Dichloropropene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2-Trichloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	115	116
1,3-Dichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Dibromochloromethane	mg/kg	1	Org-023	<1	3	<1	<1	0	95	95
1,2-Dibromoethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Tetrachloroethene	mg/kg	1	Org-023	<1	3	<1	<1	0	107	101
1,1,1,2-Tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Chlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	105	110
Bromoform	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
m+p-Xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	106	112
Styrene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: VOCs in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	356362-2
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	104	111
1,2,3-Trichloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Isopropylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Bromobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-Propylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
2-Chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-Chlorotoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3,5-Trimethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
tert-Butylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-Trimethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,3-Dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
sec-Butylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,4-Dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
4-Isopropyltoluene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-Dichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
n-Butylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2-Dibromo-3-chloropropane	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,4-Trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
1,2,3-Trichlorobenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
<i>Surrogate</i> Dibromofluoromethane	%		Org-023	107	3	108	107	1	101	102
<i>Surrogate</i> aaa-Trifluorotoluene	%		Org-023	124	3	110	116	5	112	114
<i>Surrogate</i> Toluene-d ₈	%		Org-023	110	3	110	109	1	102	99
<i>Surrogate</i> 4-Bromofluorobenzene	%		Org-023	91	3	98	98	0	100	103

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	356362-2
Date extracted	-			15/07/2024	3	15/07/2024	15/07/2024		15/07/2024	15/07/2024
Date analysed	-			16/07/2024	3	16/07/2024	16/07/2024		16/07/2024	16/07/2024
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	3	<25	<25	0	107	111
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	3	<25	<25	0	107	111
Benzene	mg/kg	0.2	Org-023	<0.2	3	<0.2	<0.2	0	102	107
Toluene	mg/kg	0.5	Org-023	<0.5	3	<0.5	<0.5	0	115	116
Ethylbenzene	mg/kg	1	Org-023	<1	3	<1	<1	0	105	110
m+p-xylene	mg/kg	2	Org-023	<2	3	<2	<2	0	106	112
o-Xylene	mg/kg	1	Org-023	<1	3	<1	<1	0	104	111
Naphthalene	mg/kg	1	Org-023	<1	3	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	124	3	110	116	5	112	114

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			15/07/2024	[NT]	[NT]	[NT]	[NT]	15/07/2024	[NT]
Date analysed	-			16/07/2024	[NT]	[NT]	[NT]	[NT]	16/07/2024	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	82	[NT]	[NT]	[NT]	[NT]	88	[NT]

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			15/07/2024	[NT]	[NT]	[NT]	[NT]	15/07/2024	[NT]
Date analysed	-			16/07/2024	[NT]	[NT]	[NT]	[NT]	16/07/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	82	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	92	[NT]	[NT]	[NT]	[NT]	90	[NT]

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			15/07/2024	[NT]	[NT]	[NT]	[NT]	15/07/2024	[NT]
Date analysed	-			17/07/2024	[NT]	[NT]	[NT]	[NT]	17/07/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	113	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	111	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Phosphorus	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
Aluminium	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
Barium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Boron	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	109	[NT]
Iron	mg/kg	10	Metals-020	<10	[NT]	[NT]	[NT]	[NT]	118	[NT]
Manganese	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Strontium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	123	[NT]

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: CEC					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			17/07/2024	[NT]	[NT]	[NT]	[NT]	17/07/2024	[NT]
Date analysed	-			17/07/2024	[NT]	[NT]	[NT]	[NT]	17/07/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	356362-3
Date prepared	-			17/07/2024	1	17/07/2024	17/07/2024		17/07/2024	17/07/2024
Date analysed	-			17/07/2024	1	17/07/2024	17/07/2024		17/07/2024	17/07/2024
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	6.7	[NT]		100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	9	[NT]		99	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	<10	[NT]		112	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	<10	[NT]		111	[NT]
Fluoride (1:5 soil:water)	mg/kg	0.5	Inorg-026	<0.5	1	<0.5	[NT]		96	[NT]
Estimated Salinity*	mg/kg	5	Inorg-034	<5	1	30	[NT]		[NT]	[NT]
Date prepared	-			16/07/2024	1	16/07/2024	16/07/2024		16/07/2024	16/07/2024
Date analysed	-			16/07/2024	1	16/07/2024	16/07/2024		16/07/2024	16/07/2024
Ammonia as N in soil	mg/kg	0.5	Inorg-057	<0.5	1	1.6	1.6	0	105	[NT]
Nitrate as N in soil	mg/kg	0.5	Inorg-055	<0.5	1	<0.5	<0.5	0	107	[NT]
Nitrite as N in soil	mg/kg	0.1	Inorg-055	<0.1	1	<0.1	<0.1	0	108	[NT]
NOx as N in soil	mg/kg	0.5	Inorg-055	<0.5	1	<0.5	<0.5	0	107	[NT]
TKN in soil	mg/kg	10	Inorg-062	<10	1	220	[NT]		[NT]	[NT]
Total Nitrogen in soil	mg/kg	10	Inorg-055/062/127	<10	1	220	[NT]		102	[NT]
Phosphate as P in soil	mg/kg	0.5	Inorg-060	<0.5	1	<0.5	<0.5	0	112	[NT]
Organic Nitrogen as N	mg/kg	10		<10	1	220	[NT]		[NT]	[NT]
Sodium Adsorption Ratio	-	0.01	Metals-020	[NT]	1	0.14	0.14	0	81	88
Soluble Bicarb as CaCO ₃ *	mg/kg	25	Inorg-006	<25	1	120	[NT]		[NT]	[NT]
Soluble Carbonate as CaCO ₃ *	mg/kg	25	Inorg-006	<25	1	<25	[NT]		[NT]	[NT]
Soluble Hydroxide as CaCO ₃ *	mg/kg	25	Inorg-006	<25	1	<25	[NT]		[NT]	[NT]
Soluble Alkalinity as CaCO ₃ *	mg/kg	25	Inorg-006	<25	1	120	[NT]		104	[NT]
Presence of Sulphides in soil*	-		TAIAUS-TS-0100RTA	[NT]	1	Absent	[NT]		[NT]	[NT]

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: PFAS in Soils Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	356362-2
Date prepared	-			15/07/2024	3	15/07/2024	15/07/2024		15/07/2024	15/07/2024
Date analysed	-			15/07/2024	3	15/07/2024	15/07/2024		15/07/2024	15/07/2024
Perfluorobutanesulfonic acid	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	99	100
Perfluoropentanesulfonic acid	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	102	90
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	99	121
Perfluoroheptanesulfonic acid	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	100	130
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	101	104
Perfluorodecanesulfonic acid	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	102	124
Perfluorobutanoic acid	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	96	112
Perfluoropentanoic acid	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	97	98
Perfluorohexanoic acid	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	100	99
Perfluoroheptanoic acid	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	100	108
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	97	107
Perfluorononanoic acid	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	98	121
Perfluorodecanoic acid	µg/kg	0.5	Org-029	<0.5	3	<0.5	<0.5	0	88	118
Perfluoroundecanoic acid	µg/kg	0.5	Org-029	<0.5	3	<0.5	<0.5	0	88	101
Perfluorododecanoic acid	µg/kg	0.5	Org-029	<0.5	3	<0.5	<0.5	0	99	94
Perfluorotridecanoic acid	µg/kg	0.5	Org-029	<0.5	3	<0.5	<0.5	0	98	91
Perfluorotetradecanoic acid	µg/kg	5	Org-029	<5	3	<5	<5	0	97	121
4:2 FTS	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	90	95
6:2 FTS	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	93	87
8:2 FTS	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	87	96
10:2 FTS	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	91	114
Perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	3	<1	<1	0	96	104
N-Methyl perfluorooctane sulfonamide	µg/kg	1	Org-029	<1	3	<1	<1	0	98	120
N-Ethyl perfluorooctanesulfon amide	µg/kg	1	Org-029	<1	3	<1	<1	0	94	102
N-Me perfluorooctanesulfonamid oethanol	µg/kg	1	Org-029	<1	3	<1	<1	0	103	95
N-Et perfluorooctanesulfonamid oethanol	µg/kg	5	Org-029	<5	3	<5	<5	0	97	97
MePerfluorooctanesulf- amid oacetic acid	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	94	114
EtPerfluorooctanesulf amid oacetic acid	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	89	94
Surrogate ¹³ C ₈ PFOS	%		Org-029	102	3	108	107	1	103	105
Surrogate ¹³ C ₂ PFOA	%		Org-029	104	3	107	108	1	100	109

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: PFAS in Soils Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	356362-2
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	100	3	91	92	1	97	94
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	93	3	65	70	7	100	70
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	101	3	67	68	1	98	69
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	101	3	90	91	1	100	91
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	105	3	122	124	2	101	122
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	105	3	131	123	6	99	125
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	95	3	82	79	4	99	78
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	97	3	86	82	5	100	80
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	101	3	88	91	3	99	87
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	106	3	76	77	1	102	74
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	103	3	103	100	3	106	103
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	104	3	92	97	5	105	91
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	113	3	95	93	2	102	90
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	103	3	99	97	2	100	94
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	102	3	91	87	4	100	89
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	103	3	91	89	2	102	88
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	103	3	83	86	4	104	82
Extracted ISTD d ₃ N MeFOSA	%		Org-029	107	3	81	83	2	99	81
Extracted ISTD d ₅ N EtFOSA	%		Org-029	104	3	76	78	3	101	76
Extracted ISTD d ₇ N MeFOSE	%		Org-029	109	3	74	72	3	102	72

Client Reference: ES1415 Sturt Plateau Compression Facility, NT

QUALITY CONTROL: PFAS in Soils Extended					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	356362-2
Extracted ISTD d ₉ N EtFOSE	%		Org-029	103	3	89	88	1	103	90
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	103	3	80	76	5	94	76
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	107	3	95	103	8	104	89

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Emerson Aggregate Test analysed by East West Geo Ag Enviro. Report No. ES241371