Whitehaven

Blackwater North Extension Project

Appendix A
Soils and Land Suitability Assessment



Soils and Land Suitability Assessment

BLACKWATER NORTH EXTENSION PROJECT

Prepared for Whitehaven Blackwater Pty Ltd

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EXECUTIVE SUMMARY

GT Environmental Pty Ltd was commissioned by Resource Strategies Pty Ltd on behalf of the Proponent, Whitehaven Blackwater Pty Ltd, to complete a Soils and Land Suitability (SALS) Assessment for the Blackwater North Extension Project (the Project). Whitehaven Blackwater is a wholly owned subsidiary of Whitehaven Coal Limited.

The Project would comprise an extension of open cut mining operations into Surface Area (SA) 7 on Mining Lease (ML) 1762 and SA 10 on ML 1759 herein referred to as the study area. The study area covers an area of approximately 6,907.60 hectares (ha) and is located wholly within the Central Highlands Regional Council Local Government Area.

The Project would allow mining of additional coal reserves of approximately 200 million tonnes (Mt) until 2055 with an approximate start date of 2030, at a rate of up to 19 million tonnes per annum (Mtpa) run-of-mine coal.

The key conclusions of the SALS Assessment are as follows:

- 22 Soil Profile Classes (SPCs) across 83 Unique Mapping Areas (UMAs) are present in the study area.
    - Soils range from shallow clay loam soils, sodic subsoil clays texture contrast soils to structured, moderate to very deep clay soils to clays with microrelief on limited to completely cleared, level to gently undulating plains and rises.
    - SPCs have been classified in four of the 14 Australian Soil Classification orders including Dermosol, Kandosols, Sodosol and Vertosols.
- The suitability framework for each SPC was assessed against the nominated Regional Frameworks (Department of Science, Information Technology, Innovation and the Arts and Department of Natural Resources and Mines, 2013) for the Inland Fitzroy and Southern Burdekin Area land uses. These land uses include dryland and furrow irrigated barley, chickpea, cotton, maize, millet, mungbean, oat, safflower, sorghum, soybean, sunflower, triticale and wheat.
    - One SPC, 18Bl(Ro), has been identified as being able to support crop land uses for cotton, maize, mungbean, safflower, sorghum, soybean and sunflower.
    - Three SPCs, SPCs 2Dn(Te), 8Dn(Te) and 20Bl(Ro), can support cotton.
    - All remaining SPCs and UMAs as follows are unsuitable and presented severe or extreme limitations with respect to supporting crop land uses. 2Dn(Te) (UMA 5), 3Bl(Te), 4Bl(Te), 8Dn(Te) (UMA 12), 9Dn(Ro), 10Ct(Ro), 11Bl(Ta), 12Da(Te), 14Bl(Ro), 15Bl(Ro), 17Bl(Ro), 19Bl(Ro), (UMAs 50,51) 16Bl(Ta), 21Bl(Ta) and 22Bl(Wy)

- The SPCs were assessed against Suitability for Beef Cattle Grazing Land Suitability Assessment Techniques (Department of Minerals and Energy, 1995) with reference for beef cattle grazing in the *Land resource survey and evaluation of the Kilcummin area, Queensland* (Shields and Williams, 1991). Beef cattle grazing was assessed across the SPCs and specific UMAs with the following results:
    - SPCs 11Bl(Ta), 12Da(Te), 18Bl(Ro) and 22Bl(Wy) were assessed as Class 3, suitable land which is moderately suited to beef cattle grazing but which requires significant inputs to ensure sustainable use.
    - SPCs 2Dn(Te), 3Bl(Te), 4Bl(Te), 8Dn(Te), 9Dn(Ro), 10Ct(Ro), 11Bl(Ta) (UMAs 50,51) 14Bl(Ro), 15Bl(Ro), 16Bl(Ta), 17Bl(Ro), 19Bl(Ro) and 20Bl(Ro) were assessed as Class 4, marginally suited for beef cattle grazing and would require major inputs to ensure sustainability.
    - SPCs 2Dn(Te) (UMA 7) and 21Bl(Ta) were assessed as Class 5, unsuitable land with extreme limitations in which the land is unsuited and cannot be sustainably used for a proposed agricultural use.
- The assessment of Agricultural Land Classes (ALCs) across the study area based on the Regional Frameworks, additional land use limitations and beef cattle grazing classes indicated the following:
    - Approximately 73.36 ha is ALC A1, assessed as suitable for a wide range of current and potential broadacre and horticultural crops.
    - Approximately 810.11 ha is ALC B, assessed as land that is suitable for a narrow range of crops. The land is suitable for sown pastures and may be suitable for a wider range of crops with changes to knowledge, economics or technology including the availability of water for spray or furrow irrigation.
    - Approximately 3,755.39 ha is ALC C1, assessed as suitable for grazing sown pastures requiring ground disturbance for establishment; or native pastures on higher fertility soils.
    - Approximately 2,081.02 ha is ALC C2, assessed as suitable for grazing native pastures, with or without the introduction of pasture species, and with lower fertility soils than C1.
    - Approximately 184.72 ha is ALC C3, assessed as suitable for light grazing of native pastures in accessible areas.
    - ALC A, A2, and D were not mapped within the study area. No areas were designated as disturbed.
    - Soil assessed as suitable for potential cropping land may be impacted as part of the disturbance (approximately 492.86 ha, 7.6 percent of the disturbance footprint), however the assessed cropping land is currently been used as cattle grazing (pre mine land use). The rehabilitation of soils to support the post mine land use (PMLU) of beef cattle grazing indicates that soils are likely to still support the potential agricultural land uses such as cropping in the future, if agricultural land uses were to change.
- The *Regional Planning Interests Act 2014* and *Regional Planning Interests Regulation 2014* identify and protect areas of Queensland that are of regional interest. The study area was

assessed against Strategic Cropping Area (SCA) and Priority Agricultural Area (PAA) requirements.

  - Desktop review of the study area compared to Queensland Government Development Assessment Mapping System (Queensland Globe, 2026) confirmed that no SCA was located within the study area.
  - Desktop review of the study area compared to Queensland Government Development Assessment Mapping System (Queensland Globe, 2026) confirmed that no PAA was located within the study area.

- An Acid Sulfate Soil field assessment was undertaken during the SALS Assessment. The field observations were reviewed and the result (i.e., very low field indicators for potential acid sulfate soils [PASS]) is consistent with the desktop review against the Atlas of Australian Acid Sulfate Soils mapping which showed the study area as "Extremely low probability of occurrence."
  - It is assessed as highly unlikely the study area includes actual acid sulfate soils and / or PASS, however, environmental management plans should consider proactive procedures to visually monitor and identity acid sulfate soils during the Project's lifespan.
- In summary, topsoil resources from the majority of SPCs contain soils that are suitable for reuse in rehabilitation activities.
  - Topsoil in the study area consisted of fair to poorly structured, low fertility, shallow to deep soils which are indicative of the area, however, all are suitable for reuse in rehabilitation. Approximately 3,519,715 cubic metres is available as topsoil within the disturbance area.
  - Subsoils for six SPCs (1Dn(Te), 2Dn(Te), 12Da(Te), 18Bl(Ro), 20Bl(Ro)and 22Bl(Wy)) had no limitations and were similar in physical and chemical attributes where the subsoil may be stripped to depth and used as topsoil.

    Nine of the SPCs (3Bl(Te), 4Bl(Te), 5Dn(Ro), 7Bl(Pg), 8Dn(Te), 13Bl(Ta), 14Bl(Ro), 15Bl(Ro) and 19Bl(Ro)), were similar, however did have sodic subsoils at depth. Separation of the five SPCs with no limitations and the eight SPCs with sodic subsoils would be recommended with respect to stockpiling. This would prevent impacts to the five subsoils and the need for any additional amelioration treatment.
  - Soil amelioration recommendations such as gypsum application may benefit some of the deeper sodic subsoils as well as organic matter and fertiliser application. These amelioration recommendations are only for situations where the PMLU of beef cattle grazing is not being achieved. General management, storage and handling recommendations have been provided to retain and improve the quality of topsoil for rehabilitation reuse.

1 INTRODUCTION

1.1 Project Title and Proponent

The Blackwater North Extension Project, (herein referred to as the Project) involves an extension of open-cut mining operations into areas located within Surface Area (SA) 7 on Mining Lease (ML) 1762 and SA 10 on ML 1759. The Blackwater Mine (BWM) is a joint venture between Whitehaven Coal Limited (Whitehaven) (70 percent [%]), Nippon Steel Corporation (20%) and JFE Steel Corporation (10%). Whitehaven Blackwater Pty Ltd (Whitehaven Blackwater), a wholly owned subsidiary of Whitehaven, is the operator of the BWM and Proponent for the Project.

1.2 Project Commission

GT Environmental Pty Ltd (GTE) was commissioned by Resource Strategies Pty Ltd on behalf of the Proponent to complete a Soils and Land Suitability (SALS) Assessment for the Project.

1.3 Project Overview

The existing BWM comprises a series of open-cut mining pits along an approximate 80 km long strike length. The BWM extracts coal using drill and blast methods, draglines, dozers and truck and shovel fleets for overburden removal and haulage. Existing infrastructure at BWM includes two rail spurs and balloon loops from the Bauhinia Railway Line, a coal handling and preparation plant (CHPP), thermal coal plant (TCP), product stockpiles, run-of-mine (ROM) coal stockpiles, tailings storage facility, in-pit spoil (i.e. waste rock) dumps, train-load out facilities, water management infrastructure and other supporting infrastructure (e.g. haul roads, access roads, laydown areas, electricity transmission lines, workshops and offices).

Whitehaven Blackwater proposes to develop the Project, which would extend the current open cut mining development at the BWM to within SA 7 on ML 1762 and SA 10 on ML 1759 (Figure 1). The Project is expected to optimise mining operations at BWM allowing ongoing employment and economic benefits from the BWM to the local area, region, and State of Queensland.

The Project would include the following activities:

- extension of open cut operations into SA 7 on ML 1762 and SA 10 on ML1759 to allow mining of additional coal reserves to approximately 2055;
- extraction of an additional 200 million tonnes (Mt) (approximately) of ROM coal;
- continued extraction of up to 19 million tonnes per annum (Mtpa) of ROM coal;
- continued use of existing BWM infrastructure (e.g. CHPP, TCP, ROM and product coal stockpiles, train load-out, water management, tailings management and other supporting infrastructure);
- construction and operation of new water management and water storage infrastructure in support of extended mining operations;
- development of waste rock emplacement areas;
- continued co-disposal of coarse rejects with waste rock and disposal of tailings into an approved tailings storage facility or in-pit void;
- construction of semi-permanent tailings cells to be utilised for the disposal of fine rejects;
- progressive rehabilitation activities of the Project;

- ongoing exploration activities in the Project area; and
- other associated infrastructure, equipment and activities.

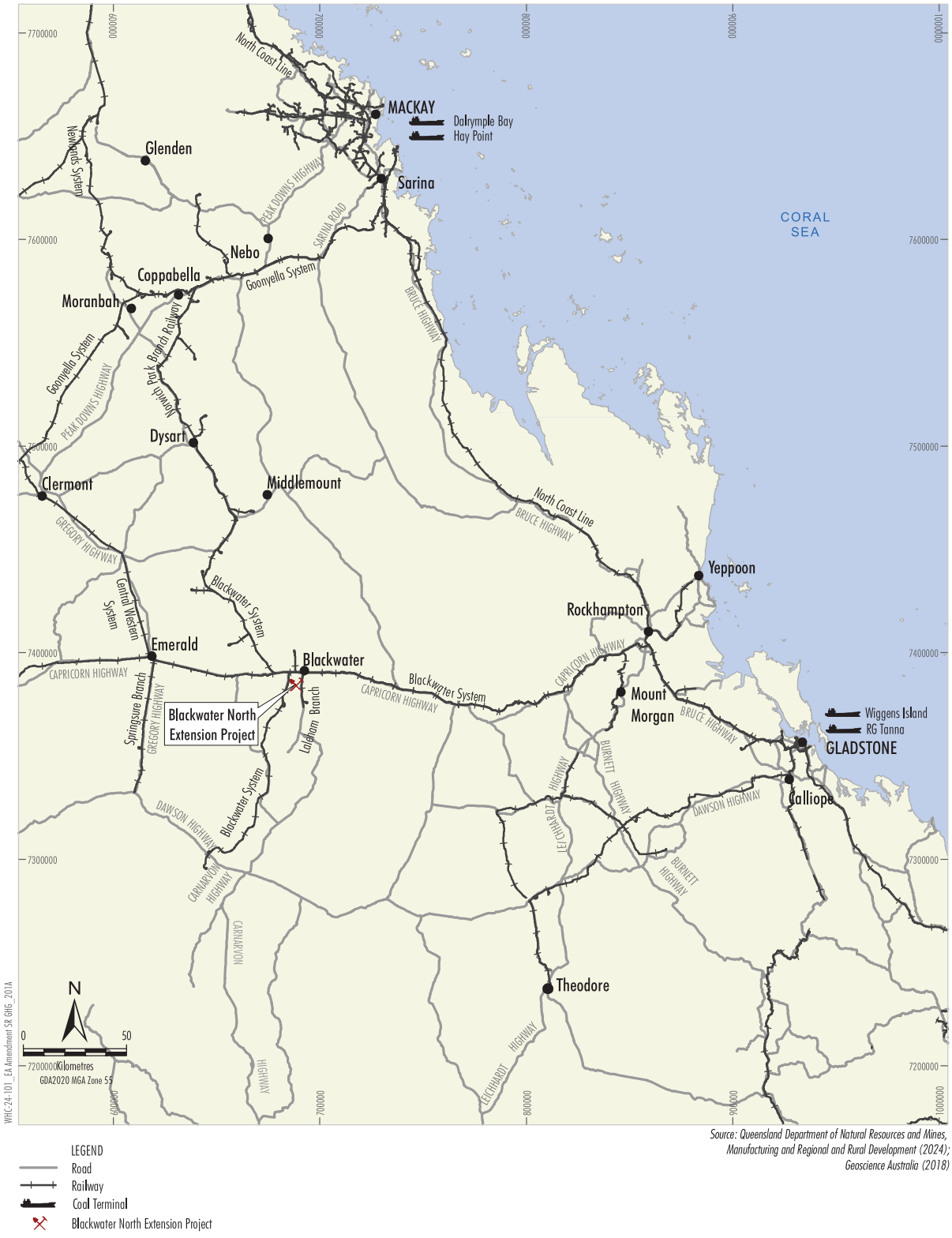
The Project layout is shown on Figure 2.

1.4 Scope of Report

This report provides a baseline assessment, agricultural land assessment and topsoil materials balance assessment as part of the SALS Assessment for the study area including:

- a description of the study area setting (Section 2),
- a description of the assessment methods and relevant guidelines (Sections 3 and 4),
- identification and description of soil profile classes (SPCs) and their distribution across the study area (Section 5),
- an assessment of the selected cropping land uses and Agricultural Land Classes / Classifications (ALCs) for each SPC (Section 6),
- an assessment of the Regional Planning Interests (RPI) for the study area (Section 7),
- an assessment of field and laboratory indicators for potential and actual acid sulfate soils (PASS / AASS) (Section 8), and
- an assessment of the soil values and suitability of each SPC for reuse in mine rehabilitation activities and soil management requirements, including soil stripping, storage, placement and amelioration (Section 9).

Figure 1: Regional Context



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Geoscience Australia (2018)

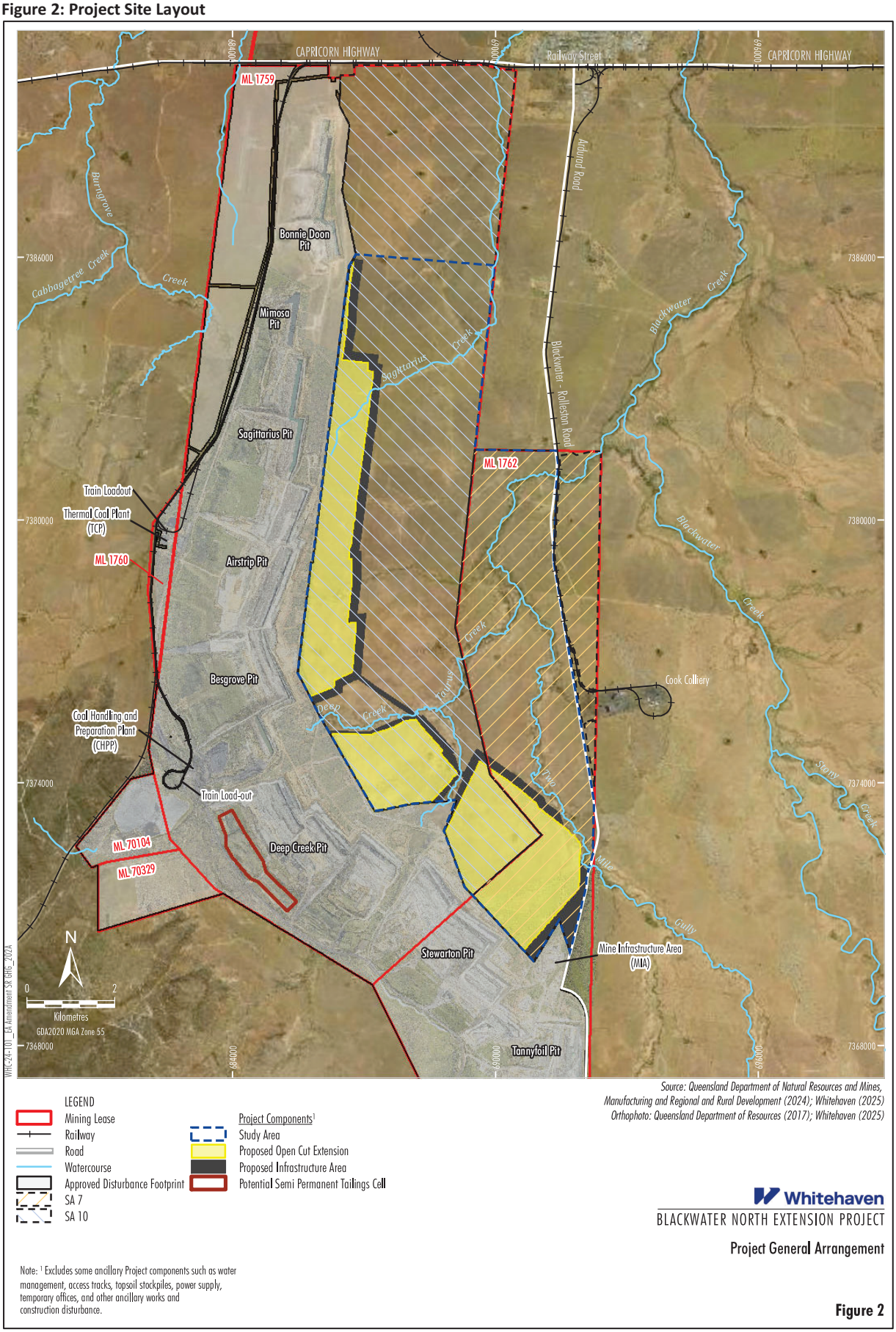
LEGEND
- Road
- Railway
- Coal Terminal
- Blackwater North Extension Project

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BLACKWATER NORTH EXTENSION PROJECT

Regional Location

Figure 1

Figure 2: Project Site Layout



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2025)
Orthophoto: Queensland Department of Resources (2017); Whitehaven (2025)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Approved Disturbance Footprint
- SA 7
- SA 10

Project Components[1]

- Study Area
- Proposed Open Cut Extension
- Proposed Infrastructure Area
- Potential Semi Permanent Tailings Cell

Note: [1] Excludes some ancillary Project components such as water management, access tracks, topsoil stockpiles, power supply, temporary offices, and other ancillary works and construction disturbance.

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BLACKWATER NORTH EXTENSION PROJECT

Project General Arrangement

Figure 2

2 PROJECT SETTING

2.1 Local and Regional Context

The Project is located in the Central Highlands Regional Council LGA, approximately 20 kilometres (km) south-west of Blackwater in the Bowen Basin, Queensland (shown in Figure 1).

2.2 Land Use

The dominant land use observed within the study area includes beef cattle grazing, agricultural activities on sown pastures and native pastures on high fertility soils (Queensland Globe, 2026).

2.3 Climate

The nearest Bureau of Meteorology (BoM) weather station able to provide all required data is located at Blackwater airport (BoM Station Number 035134), approximately 3.5 km north-west of the study area. A summary of weather statistics (BoM, 2024) is provided below in Table 2-1.

Table 2-1: Climate Summary Information, BoM weather station - Blackwater Airport

Climate Statistic	Value
Mean Maximum Temperature (May 2013- September 2024)	30.3 degrees Celsius (°C)
Mean Minimum Temperature (May 2013- September 2024)	16.3 °C
Mean Annual Rainfall (May 2013- September 2024)	548.4 millimetres (mm)

2.4 Topography and Hydrology

The topography of the study area includes level and gently undulating plains. The elevation across the study area ranges from approximately 188 metres (m) Australian Height Datum (AHD) to 230 m AHD.

Drainage lines, from north to south of the Project include Sagittarius creek, Taurus Creek and Two Mile Gully, all are tributaries of Blackwater Creek. Several unnamed tributaries associated with these Creeks transect the study area. These local tributaries generally drain in a northeasterly direction and join Blackwater Creek to the east of the Project area.

2.5 Regional Geology

The study area is located within the Bowen Basin. Detailed surface geology (Queensland Globe, 2026) indicates the study area is underlain by four major surface geologies. These are summarised in Table 2-2.

Table 2-2: Regional Surface Geology of the Study Area

Rock Unit Name	Lithological Summary	Age	Dominant Rock
Rangal Coal Measures	Calcareous sandstone, calcareous shale, mudstone, coal, concretionary limestone	Late permian	Arenite-midrock
Rewan Group	Lithic sandstone, pebbly lithic sandstone, green to reddish brown mudstone and minor volcanilithic pebble conglomerate (at base)	Early Triassic – middle triassic	Arenite-midrock
TQa-QLD	Locally red-brown mottled, poorly consolidated sand, silt, clay, minor gravel; high-level alluvial deposits (generally related to present stream valleys but commonly dissected)	Late tertiary - quaternary	Alluvium
Qa-QLD	Clay, silt, sand and gravel; flood-plain alluvium	Quaternary	Alluvium

2.6 Vegetation

The composition of vegetation communities is generally associated with the topography, soils and geologic material. The dominant vegetation observed across the study area included *Acacia harpophylla* (Brigalow) and *Lysiphyllum hookeri* (Bauhinia).

3 OVERVIEW OF STUDY METHODS AND GUIDELINES

An overview of the study methods and supporting guidelines and standards is provided below.

3.1 General Soil Survey

This soil survey was scoped and conducted in accordance with the *Guidelines for Surveying Soil and Land Resources* (McKenzie et al., 2008), *Queensland Soil and Land Resource Survey Information Guideline* (Department of Resources [DoR], 2021) and *Queensland Land Resource Assessment Guidelines, Volume 1: Soil and Land Resource Assessment* (Department of Environment and Science [DES], 2021a).

3.2 Soil Type Classification

Soil characteristics and soil profiles have been described in accordance with the *Australian Soil and Land Survey Field Handbook, Fourth Edition* (National Committee on Soil and Terrain [NCST], 2024), DoR (2021) and DES (2021a).

Soils have been grouped according to their parent material and position in the landscape and classified in accordance with the *Australian Soil Classification* (ASC) (Isbell, 2021). Soils have also been correlated to soils mapped in Commonwealth Scientific and Industrial Research Organisation land system boundaries, such as *Lands of the Isaac-Comet Area, Queensland* (Story et al., 1967) over the study area.

3.3 Soil Type Collection and Assessment

Collection of soil samples for laboratory analysis was undertaken based on Land Suitability Assessment Techniques (LSAT) outlined in the *Technical Guidelines for Environmental Management of Exploration and Mining in Queensland* (Department of Minerals and Energy [DME], 1995), DoR (2021) and DES (2021a).

The physical and chemical properties of soils relevant to the potential for erosion has been determined for analysed site samples within the soil profile based on field and laboratory assessment of dispersive attributes including, but not limited to, texture, R1 dispersion and Emerson Aggregate Test (EAT) results.

Interpretation of the field and analytical results were undertaken with review against the following documents:

- *Analytical methods and interpretations used by the Agricultural Chemistry Branch for soil and land use surveys* (Bruce and Rayment, 1982),
- *Interpreting Soil Analysis for Agricultural Use in Queensland* (Baker and Eldershaw, 1993),
- *Interpreting Soil Test Results, Third Edition* (Hazelton and Murphy, 2016),
- *Soil Survey Standard Test Method Emerson Aggregate Test* (Department of Sustainable Natural Resources, n.d),
- *Soil Analysis, an Interpretation Manual* (Peveril et al., 1999),
- *Soil Chemical Methods – Australia* (Rayment and Lyons, 2011),
- *Soil Physical Measurement and Interpretation for Land Evaluation* (McKenzie et al., 2002),
- *Soil Testing and Some Test Interpretations used by the Queensland Department of Primary Industries (QDPI)* (Bruce and Rayment, 1984), and

- *Understanding Soils and Soil Data*, pp 109–133 (Shaw, 1988).

3.4 Land Capability, Suitability and Agricultural Land Classification

Land classification is based on the Land Capability Classification (LCC) in Queensland, outlined in the *Guidelines for Agricultural Land Evaluation* (GALE) (Department of Science, Information Technology and Innovation [DSITI] and Department of Natural Resources and Mines [DNRM], 2015), QDPI (1994) and DME (1995).

This land classification covers the evaluation of land attributes for arable, pastoral and other agricultural land uses. It is appropriate where evaluation for a limited range of agricultural land uses is required at a broadscale intensity over a large area.

Determination of land suitability for the study area has been conducted based on the GALE (DSITI and DNRM, 2015), *Regional Land Suitability Frameworks for Queensland* (Department of Science, Information Technology, Innovation and the Arts [DSITIA] and DNRM, 2013), DoR (2021) and DES (2021a).

The suitability of soils for rehabilitation has been assessed using field and laboratory assessment of texture, fertility, dispersive and structural attributes.

Groupings of soils with similar attributes are described as soil types in DES *Application requirements for activities with impacts to land* (DES, 2025). Soil types are defined either as the ASC suborder or SPC within *Queensland Soil and Land Resource Survey Information Guideline* (DoR, 2021). For this assessment and to adhere to the more relevant DES (2021a), SPC terminology and assessment has been used.

Other guidelines and reports that have assisted in soil classification, nominating criterions and assessing effective rooting depth (ERD) include the *Salinity Management Handbook, Second Edition* (Department of Environment and Resource Management [DERM], 2011) and '*Soil salinity – electrical conductivity and chloride*' in *Soil Analysis: an interpretation manual* (Shaw, 1999).

The soil assessment comprised a desktop study, field surveys and data analysis and interpretation. Section 4 provides a detailed description of the soil assessment methodology.

3.5 Topsoil Resource Assessment

Assessment of the topsoil resource was undertaken with the soil assessment and land suitability assessment. This assessed the available topsoil resource, its suitability, limitations and recommendations for reuse in mine rehabilitation and seeks to provide information for inclusion in the Progressive Rehabilitation and Closure Plan (PRC Plan).

The assessment of the impacts on land and topsoil resources will also include review of the DES *Application requirements for activities with impacts to land* (DES, 2025)*, Mine Rehabilitation, Leading Practice Sustainable Development Program for the Mining Industry* (Australian Government, 2016), Perry et al., (1964), and *Mine Rehabilitation Handbook* (Minerals Council of Australia, 1998) were reviewed with the field and laboratory results in assessing topsoil resource quality and quantity.

3.6 Regional Planning Interests Assessment

The *Regional Planning Interests Act 2014* (RPI Act) and *Regional Planning Interests Regulation 2014* (RPI Regulation) identifies and protects areas of Queensland that are of regional interest. The RPI Act protects each of the following areas of regional interest:

- Priority Living Areas (PLAs),
- Strategic Environmental Areas (SEAs),
- Priority Agricultural Areas (PAAs), and,
- Strategic Cropping Areas (SCAs).

The study area was assessed against the SCAs and PAAs.

3.7 Acid Sulfate Soil Assessment

Assessment of Acid Sulfate Soils (ASS) was undertaken with the SALS Assessment. This included review of available desktop resources such as Queensland Globe and Australian Soil Resource Information System (ASRIS) including Atlas of Australian Acid Sulfate Soils mapping (ASRIS, 2025).

Fieldworks included field observations for indicators for ASS materials of observation sites for SPCs. These observations have been reviewed against Table 5-1 of the *National Acid Sulfate Soils Guidance, National acid sulfate soils sample and identification methods manual* (Sullivan et al., 2018).

4 DETAILED METHODOLOGY

4.1 Desktop Study

GTE reviewed the available soils and land resources information for the study area to develop preliminary distributions of SPCs to inform the development of the field survey program.

4.1.1 Regional Land and Soils Report References and Documentation

The following soils studies and publicly available information were reviewed to identify available data and recommendations relevant to the study area, and to determine potential field sampling locations:

- *Land Resources Assessment Report, Blackwater Mine - North Extension Project* (SLR Consulting Australia [SLR], 2023).
    - This study encompasses the entire study area. Soil survey and mapping was conducted to a survey density of 1 site per 11 ha, exceeding 1:125,000 survey intensity and includes 43 detailed sites, 20 analysed and 37 check sites. Detailed and analysed sites were conducted to a maximum of 1.20 metres below ground level (mbgl) with soil testing to a depth of 1.00 mbgl consisting of pH, electrical conductivity (EC), cation exchange capacity (CEC), exchangeable sodium percentage (ESP), particle size analysis (PSA) and EAT.
    - This SLR (2023) report, including field and laboratory data, was extensively reviewed and incorporated into this SALS Assessment.
- *Lands of the Isaac-Comet Area, Queensland* (Story et al., 1967).
    - The area of Isaac-Comet encompasses the study area. Based on Story et al. (1967), a potential of over 40 soil types across the various land systems may be present including gently undulating plains of Poplar Box woodlands to Brigalow downs, undulating country with cracking clays.
- *Land Resource Survey and Evaluation of the Kilcummin Area, Queensland* (Shields and Williams, 1991).
    - This survey area is to the west, outside of the study area. However, it provides a practical application of land evaluation of the Land Resources Branch (*Guidelines for Agricultural Land Evaluation in Queensland*, Land Resource Branch, Department of Primary Industries, 1990) LSAT.
- Soil and Land Information (SALI) (Queensland Globe, 2026).
    - Review of the available soils information on Queensland Globe, SALI, existing soils sites and varying degrees of information. The information included the following observation sites for Project Central West Region Salinity Investigations Site SALTC293 and SALTC294. These two sites are presented in Figure 3 and in Appendix G. Soil sites observed located to the east of the study area associated with The Survey of the Isaac-Comet Area (Story et al., 1967) included ZDK170, ZDK172, ZDK173 and Fitzroy Soil Erodibility Mapping Project, site FSE194. Other information reviewed included detailed surface geology, contours, water courses, ALCs and ASSs.

- Queensland Agricultural Land Audit, Central Queensland (Department of Agricultural, Fisheries and Forestry, 2013).
    - The Queensland Agricultural Land Audit for Central Queensland covers the Project site. The audit outlines the regional agricultural profile, the current and potential agricultural land use, data confidence and mapping for the region.

      The general findings and key regional issues of the region state there is a good soil resource base and rainfall with productive agricultural and pastoral land that supports agricultural industry. Reliable water resources are present for irrigation. The central Queensland area is a major cattle breeding region for northern Australia with major abattoirs and cattle saleyards.

      Weaknesses of the region consist of invasive plants and animals, infrastructure funding, road transport infrastructure through declining road conditions, access to skilled labour throughout the area due to competing mining industry and unreliable and inadequate telecommunications.

4.1.2 Satellite Imagery

Satellite Imagery from Google Earth and Queensland Globe (viewed January 2026) was reviewed as part of the desktop study. The satellite imagery assisted with creating preliminary boundaries, site locations and access on site.

4.2 Field Work

4.2.1 Survey Timing

Five field surveys were undertaken across the study area between the following dates:

- 7 July 2025,
- 8 to 10 September 2025,
- 13 to 16 October 2025,
- 20 to 23 October 2025, and
- 3 to 7 November 2025.

4.2.2 Survey Team

All fieldwork trips were led by Reece McCann, Associate Environmental Scientist with a degree in Environmental Technology and over 15 years' experience in conducting SALS and Strategic Cropping Land (SCL) assessments over a 20-year plus professional career as a consultant in contaminated land and environmental soil science.

Reece was assisted in the field by environmental consultants Greg Tuck, Matthew Mooney and Lewis Arnold. Project assistance during the fieldworks was provided by Project Director Greg Tuck.

4.2.3 Survey Techniques

Preliminary sampling locations were derived from the desktop review of background information, existing available soils information and an examination of satellite imagery patterns. The specific locations of the survey sites were further refined in the field based on available site access, and whether the location was likely representative of the SPC being described. An SPC may be defined as a three-dimensional soil body such that any profile within the body has a similar number and arrangement of horizons whose attributes are within a defined range (Donnollan et al., 1998).

Free, integrated survey, and gradient-oriented transect (Gradsect) techniques (McKenzie et al., 2008) were used to verify SPCs and assign boundaries to each. Free survey is a commonly used method in land assessment as it enables flexibility in site selection (over grid mapping techniques), to achieve a more accurate and time effective result. It is well suited to detailed-scale surveys and is commonly used in soil surveys for resource projects in Queensland. Gradsect techniques were utilised across accessible tracks of varying topography. This provided a detailed cross section of the landscape and assisted in identifying patterns of soil variation.

Surveyed polygons were identified as individual mapped polygons, referred to as Unique Mapping Areas (UMAs).

4.2.4 Soil Survey Intensity

A medium intensity (McKenzie et al., 2008 and DES, 2021a) soil survey was selected for the study area based on previously submitted and approved SALS assessments for recent comparable projects. The survey intensity outlined below has been submitted previously for areas in central and north Queensland regions and is deemed acceptable based on the complexity of the landscape.

The nominated soil survey intensity considered the layout of the study area while being in accordance with the relevant guidelines for the proposed mine site components for the study area.

The soil survey considered available information within the *Land Resources Assessment Report, Blackwater Mine - North Extension Project* (SLR, 2023). In conducting the soil survey, GTE were able to leverage existing sites (SLR, 2023) to meet targeted soil survey intensities for disturbance and non-disturbance areas. Every observation site class exceeded the minimum percentage required numbers, as outlined in DES (2021a). Every UMA identified contains at least one observation site to assist in soil classification.

New Class IV(a) and Class IV(b) sites are generally placed in the proposed disturbance areas as SLR (2023) sites generally satisfy Class IV(a) and IV(b) site density requirements for non-disturbance areas.

The following soil survey intensities for proposed disturbance and non-disturbance components of the study area were achieved, with totals for each class of site exceeding the minimum required by DES (2021a):

- Areas planned for mining disturbance – 1:25,000, McKenzie et al. (2008) and DES (2021a).
- Areas not planned for mining disturbance – 1:100,000, McKenzie et al. (2008) and DES (2021a).

4.2.5 Soil Survey Observation Sites

Soil survey sites were conducted in accordance with McKenzie et al. (2008), DES (2021a) and DoR (2021):

- Detailed sites:
  - Class I - detailed profile description with no laboratory analysis.
  - Class II (a) - deep bore (greater than [>] 2.00 m) detailed profile description with no laboratory analysis.
- Analysed sites:
  - Class II (b) - deep bore (> 2.00 m) detailed profile description with limited or non-standard laboratory analysis,
  - Class III (a) - profile with limited or non-standard laboratory analysis:
    - these profiles are associated with the nominated laboratory analysis for existing SLR analysed sites.
  - Class III (b) - profile with standard laboratory analysis:
    - these profiles are associated with the nominated laboratory analysis for GTE analysed sites.
- Brief Mapping Observation sites:
  - Class IV (a) - brief profile description with some soil morphological data recorded.
  - Class IV (b) - brief mapping observation with no soil morphological data recorded.

Detailed site locations were assessed prior to fieldworks and placed across the study area. If an area was observed to benefit from additional detailed sites, these were conducted. Class IV sites were conducted at either regular intervals, to either define SPC boundaries or to confirm an area based on the landform, vegetation, surface conditions or soil morphological conditions.

The detailed sites for the mine site were generally conducted to 1.50 mbgl, in line with current expectations of SALS assessments referenced against McKenzie at al. (2008), DoR (2021) and DES (2021a) guidelines.

Naming conventions for soil survey sites are as follows:

- Detailed sites with “D” prefix indicate a detailed, analysed and detailed (deep boring) including Class I, Class II (a), Class II (b), Class III (a) and Class III (b) sites described as part of the assessment.
- Brief mapping observation sites with “C” prefix indicate Class IV (a) and Class IV (b) sites described as part of the assessment.
- SLR (2023) sites with “B” prefix indicate Class IV (a) sites and with “C” prefix indicate Class IV (b) sites.

The soil survey site types are labelled separately with unique colour identifiers on Figure 3.

Class I, II (a), II (b) and III Sites

Class I and II (a) (herein known as detailed sites) were undertaken at 44 locations, Class II (b) and Class III (herein known as analysed sites) were undertaken at 22 locations (Figure 3).

The sites were used to describe the range of soil profile morphological attributes as per the NCST (2024) including landforms, slope, surface conditions, rock cover, major vegetation and soil colour (as per Munsell Color [2009] Soil Colour Charts). At each detailed site, an assessment was also made of the quality, depth and quantities of reusable soil resources.

The soil profile at each detailed site was exposed using the excavator test pit method and where not possible, 100 mm hand auger (with various attachments) where access dictated, as well as shovel, crowbar and picks for exposing the A horizon. Soil profiles were undertaken in accordance with the *Guidelines for Surveying Soil and Land Resources* (McKenzie et al., 2008).

The information recorded from detailed sites included:

- location (Geocentric Datum of Australia [GDA] 2020) and type of soil observation (e.g., erosion exposed cutting or hand auger),
- major vegetation types,
- landform type, position of the site and slope gradient,
- surface condition (e.g., presence of cracks, surface crust, rocks, stones and cobbles, erosion status, microrelief),
- types and vertical extent of soil horizons,
- colour (as per Munsell Color [2009] Soil Colour Charts) and mottling of each horizon,
- observations of field texture, pH, presence and abundance of segregations, coarse fragments, structure, consistence and pedality and moisture content for each horizon,
- the presence of organic matter, roots and prevalence of biological activity,
- the presence of gleyed horizons, iron staining and jarosite presence, and
- photographs of the soil profile and surrounding landscape.

Class II (a), II (b), III (a) and III (b) including soil sampling of profiles was conducted as per McKenzie et al. (2008), with samples taken at standard depths incorporating the surface and every horizon change in the soil profile (typically at depths of 0.00-0.10 m, 0.20-0.30 m, 0.50-0.60 m, 0.80-0.90 m, 1.10-1.20 m and 1.40-1.50 m). Two additional soil samples were collected for depths below 1.50 m, generally at 1.70-1.80 m and 1.90-2.00 m pending soil horizons observed.

These depths were modified for sites in which field observations revealed soil horizons intersecting at these nominated depths, to ensure samples were collected in each separate horizon, and not across multiple horizons or in sub-horizon boundaries. These analysed sites were assessed against a nominated laboratory suite, as outlined in Section 4.3.

The data collected from the detailed sites are shown in Appendix A.

Class II sites were undertaken at 9 locations (Figure 3). The sites were randomly selected within SPCs that allowed augering beyond 1.50 mbgl.

Class IV (a) and IV (b) Sites

Class IV (a) and IV (b) sites were undertaken at 40 and 53 locations respectively (Figure 3). These sites were used to confirm SPC type and refine mapped soil boundaries.

For Class IV (a) and IV (b) sites, basic soil attributes were recorded at each observation site to confirm the SPC, and surface conditions including rock, slope percentage, landform type and position, major vegetation and land condition were also noted. Class IV(a) sites were augered to a nominal depth in which salient features for soil and SPC classification could be undertaken (i.e., depth of A horizon, exposing the B21 horizon). The data collected from the Class IV (a) and IV (b) sites is shown in Appendix B.

4.2.6 Laboratory Analysis

Soil samples were collected from all dominant SPCs present in the study area. For each site selected as an analysed site, the soil samples were collected from a detailed site that was representative of that SPC.

Laboratory analysis was undertaken to assist in determining the overall characterisation of the soils and to establish any physical and chemical limitations of soils. Laboratory analysis was also used to identify soils that may require specific management measures.

Samples were analysed at Environmental Analysis Laboratory who are accredited by the National Association of Testing Authority and certified by the Australasian Soil and Plant Analysis Council.

Soil samples were analysed for a laboratory suite, based on recommended standard suites within guidelines DoR (2021), DES (2021a), the Suitability Frameworks for the Gulf Plains area (DSITIA and DNRM, 2013) and indicators for soil resource quality for mine rehabilitation (Australian Government, 2016).

Existing SLR (2023) sites were reviewed with existing laboratory data to be utilised within this SALS Assessment Report. Applicable new sites where SLR (2023) data was chosen to be leveraged, were conducted at SLR (2023) site locations. Identified gaps within the existing SLR (2023) site laboratory analysis was completed to meet the nominated GTE laboratory suite for the Project.

The laboratory analysis parameters and rationale for soil horizons of each analysed site are shown in Table 4-1.

Table 4-1: Analytical Program and Number of Samples

Test	Soil Profile Horizon	Justification
Field measurements pH	All	Used for 'on the spot' estimates of pH to assist in initially categorizing soils, potential chemical barriers, general health and ERD. This field measurement is based on the Standard Operating Procedure (SOP) outlined in *Queensland Land Resource Assessment Guidelines – Volume 2: Field tests Version 1.0* (DES, 2021b).
Field measurements Dispersion	All	Used for 'on the spot' indicators of dispersion and slaking of soil, specifically peds of soils. This field measurement is based on the SOP outlined in *Queensland Land Resource Assessment Guidelines – Volume 2: Field tests Version 1.0* (DES, 2021b).
pH	All	Measurement of pH is a useful indicator of various soil properties (e.g., values > 8.5 usually indicate high exchangeable sodium levels and the presence of carbonates and nutrient availability limitations).
EC	All	The measure of EC is used as a means of appraising soil salinity. The electrical conductance increases with soluble salt content and thus allows simple interpretation of salinity.
Chloride (Cl^-)	All	The chloride anion is usually present in soil associated with sodium. It is highly mobile making it a valuable indicator of salt and water movement. It provides additional confirmation of soil salinity.
Effective Cation Exchange Capacity (ECEC), Exchangeable Cations, Calcium : Magnesium ratio (Ca:Mg), ESP	All	The amounts and relative proportions of the exchangeable cations in soil have important effects on both physical and chemical properties. High levels of exchangeable sodium cause dispersion and increased swelling, reducing water movement and affecting near surface aeration, whereas exchangeable calcium flocculates colloids and would reduce swelling tendencies. Excessively high or low concentrations of one or the other of the cations may impact buffering capacity and, as a result, soil nutrient availability.
PSA (less than [<] 2 mm)	All	PSA data provides an assessment of the composition of a soil (based on the dominant grain size in a soil). This assists with confirmation of field observations as well as providing better grounds for identification of SPC and water holding capacity.
R1 Dispersion	All	The measure of R1 dispersion is useful when used in conjunction with ESP and the Ca:Mg for predicting soil physical behaviour.
EAT	All	The measure of EAT is useful when determining soil physical behaviour.
Available Nitrogen (N), Total N and Nitrate	Topsoil	Testing provides an indication of the general fertility of soils and thus their suitability as a topdressing agent.
Extractable Potassium	Topsoil	Testing provides an indication of the general fertility of soils and thus their suitability as a topdressing agent.
Phosphorus (P) / Phosphorus Buffering Index (PBI)	Topsoil	Testing provides an indication of the general fertility of soils and thus their suitability as a topdressing agent.
Organic Matter / Carbon	Topsoil	Testing for soil organic matter provides an indication of the general fertility of soils and thus suitability as a topdressing agent. It also assists in interpretation of soil structural properties and provides information on stored nutrients which may not yet be accessible to plants but may become available in the future.
Sulfur	Topsoil	Total levels of sulfur help identify whether organic matter or gypsum are present in a soil profile.
Selected Trace Elements	Topsoil	The analysis of copper, zinc, manganese and iron will assess extractable concentrations of these micronutrients in the soil, potential deficiencies (copper, zinc, manganese and iron) as well as any potential phytotoxicity issues that may exist (all elements).

The laboratory results assessments are provided in Section 5 for each SPC, with the laboratory summary for each SPC provided in Appendix C and laboratory certificates in Appendix L.

4.3 Interpretation of Key Field and Laboratory Soils Data

Key field and laboratory data for each SPC was assessed based on the following guidelines. These guidelines assisted with the classification of the SPCs, land suitability and topsoil resource for mine rehabilitation. The basis for the assessment is provided in Appendix D which outlines the key assessed attributes and nominated criteria.

4.4 Effective Rooting Depth

ERD is defined by the depth in which approximately 90% of plant roots will extract water and is defined by physical or chemical attributes (barriers) within the subsoil that restrict growth and affect Plant Available Water Capacity (PAWC).

Land Resource Assessment of the Windeyers Hill Area (Burgess, 2003) and RPI Guideline 08/14 (Department of State Development, Manufacturing, Infrastructure and Planning [DSDMIP], 2019) outline ERD criteria with respect to physical and chemical barriers. Burgess (2003) includes a catchment area of the Isaac-Connors and Mackenzie River which cover an area of approximately 35,404 kilometres squared (km^2), where the Project site is located within. DSDMIP (2019), which includes criteria relevant to cropping land uses, was also considered.

Based on this document and guideline, Table 4-2 outlines the nominated physical and chemical barrier criteria for ERD.

Table 4-2: Initial Nominated Effective Rooting Depth Criteria

Physical/Chemical Value	Criteria
pH	≤ 5 and ≥ 9 for rigid soils (non-shrink swell soils, such as Dermosols, and Sodosols). ≤ 5 for non-rigid soils (Shrink swell clays, Vertosols)
EC (1:5 water)	> 0.8 deciSiemens per metre (dS/m)
Cl^-	> 1,000 milligrams per kilogram (mg/kg)[1]
Strongly Sodic Conditions	ESP > 15% (where clay content was 20% and CEC is > 3.0 centimoles per kilogram [cmol(+)/kg])
Extremely low exchangeable Ca:Mg	≤ 0.1
Depth to C or R horizons	Physical barrier presence at depth including hard pans, gravel layers, bedrock or other hard materials

1- Chloride levels are reviewed against EC and Exchangeable Calcium levels where if EC / Chloride levels are high to very high then chloride levels are not high enough to be a limiting property i.e., high EC is influenced by calcium sulfate (gypsum).

Shaw (1999) was reviewed in conjunction with DERM (2011) against nominated land uses for the Project site. The SALFPREDICT model assesses the water uptake weighted profile mean EC, saturated extract (ECse) throughout the rootzone of the soil to determine a likely salt load that will affect a crop. It also calculates the likely leaching fraction of the soil to help determine the likelihood of salt removal from the rootzone to deeper in the soil profile. It predicts a potential impact of salinity on a range of crops, indicating likely yield responses.

To assess a yield percentage, available nominated crop land uses and Class II(b) / III site laboratory data was entered within the SALFPREDICT model. Nine crop land uses (Barley, Cotton, Maize [Corn], Oat, Safflower, Sorghum, Soybean, Sunflower and Wheat were identified as having data available within the SALFPREDICT model and were assessed. To minimise any outside influence of saline waters, 'rainfall – irrigation water' (DERM, 2011) was utilised as the water input. The SALFPREDICT Quick Calculator and Predictive Calculator were completed and provided results, including PAWC.

Plant salt-tolerance data was also assessed against based on the ECse (SALFPREDICT) values from the SALFPREDICT model with Class III laboratory data. This assessed the depth of the soil of which the ECse against 90, 75 and 50% yield criteria were exceeded. This would assist in identifying any low yields based on a nominated rooting depth of 0.60 m. The proposed depth was based on seedling and root establishment, not germination or early seedling establishment (DERM, 2011). A total of 13 crop land uses were assessed.

Any physical barrier that prevented further excavation or augering of a test pit or borehole respectively, including bedrock, coarse gravel layer or regolith were recorded as refusal.

During discussions with the regulator regarding EC, Chloride and Sodium as ERD as outlined in Burgess (2003), it was advised that these attributes are transient and will change following disturbance, stockpiling, mixing (with other less salty subsoil) and weather exposure as well as application of good quality irrigation water.

Table 4-3 outlines the nominated physical and chemical barrier criteria for ERD. Assessment of plant yield and plant salt-tolerance data for the available crop land uses is presented for each SPC in Section 5.

Table 4-3: Proposed Effective Rooting Depth Criteria

Physical / Chemical Value	Criteria
pH	≤ 5 and ≥ 9 for rigid soils (non-shrink swell soils, such as Dermosols, and Sodosols). ≤ 5 for non-rigid soils (Shrink swell clays, Vertosols)
Extremely low exchangeable Ca:Mg	≤0.1
Plant yield based on SALFPREDICT modelling for the following crop land uses; Barley, chickpea, cotton, maize, millet, mungbean, oat, safflower, sorghum, soybean, sunflower, triticale and wheat.	A yield response > 65% for any particular crop is considered suitable.
Plant Salt-Tolerance Data (DERM, 2011) for the following crop land uses; Barley, chickpea, cotton, maize, millet, mungbean, oat, safflower, sorghum, soybean, sunflower, triticale and wheat.	A yield response > 65% for any particular crop is considered suitable within a nominated root zone of 0.60 m.
Depth to C or R horizons	Physical barrier presence at depth including regolith, gravel layers, bedrock or other hard materials

4.5 Land Suitability and Agricultural Land Assessment

Land suitability is primarily based on classifications provided within the GALE (DSITI and DNRM, 2015) and Regional Frameworks (DSITIA and DNRM, 2013).

ALC is based on a simple hierarchical scheme that is applicable across Queensland. It allows the interpreted land evaluation data to indicate the location and extent of agricultural land that can be used for a wide range of land uses with minimal land degradation.

This evaluation scheme has evolved through various guidelines and state planning policies and is currently referenced in regional or shire council planning schemes. ALC assessment guidelines are shown in Section 6.

4.6 Regional Planning Interests

The RPI Act and RPI Regulation identify and protect areas of Queensland that are of regional interest. The RPI Act protects PLAs, SEAs, PAAs and SCAs.

As part of the SALS desktop study, applicability for assessments for PAA and SCA was conducted.

4.7 Acid Sulfate Soils Assessment

Review of the ASRIS including the Atlas of Australian Acid Sulfate Soils mapping (ASRIS, 2025) was undertaken. The ASS mapping is classified with a nationally consistent legend that includes a risk assessment.

5 SOIL AND LAND SUITABILTY RESULTS

The following sections outline the SPCs observed across the study area, the land suitability, ALC and soil resources.

5.1 Soil Profile Classes Summary

A total of 22 SPCs have been observed and mapped encompassing 83 UMAs within the study area (shown in Figure 3).

Table 5-1 lists the SPCs identified in the study area and provides a description of each SPC concept including basic soil morphology, position in the landscape, and applicable UMAs and sites.

SPCs have been classified in accordance with the ASC (Isbell, 2021) in which four of the 14 ASC Soil Orders have been observed (shown in Figure 4). The UMAs, detailed sites, ALC, topsoil thickness and areas are presented in Table 5-1.

Detailed descriptions of each SPC and their Class III analysed site are provided in the following sections (Sections 5.1.2 to 5.1.23). Appendix A presents Class I, II and III site descriptions.

5.1.1 SLR Soil Summary and Associated GTE Sites and SPCs Summary

As discussed in Section 4.1.1, sites from a previous Land Resource Assessment (SLR, 2023) was available for review and use across the study area. A review of the report and all associated observation sites were undertaken to assess their potential use in the SALS Assessment.

On review, GTE decided to reference the observation sites and include them to assist in meeting the nominated survey scale. A review of the check sites indicated generally surface observation sites, which were nominated as Class IV(b) within this SALS Assessment. Detailed sites were assessed in greater detail where attributes to soil classification, observations of microrelief and inclusion of laboratory data were considered. These were nominated as Class IV(a) sites due to test pit depths of 1.20 mbgl and a nominal depth description up to 1.00 mbgl. A further review of this detailed and check site data is presented in Appendix E and F.

The key data from the SLR (2023) report was the reuse of detailed sites used for analysis. Seven soil mapping units were located within the study area with six SLR (2023) sites identified, where the intent was for GTE to re-visit the location, conduct an analysed site and complete the field and laboratory data gaps where required. Table 5-2 provides a summary of these sites.

Table 5-1: Land Summary of SPCs in the Study Area as per the SALS Assessment

SPC map code[1] / Report No.	SPC Concept	ASC (Dominant to sub-order)	UMAs (*Analysed)	Detailed sites (*Analysed)	SLR (2023) Analysed Site relevant to GTE Analysed site	Regional Frameworks / Limitations Suitability	Beef Cattle Grazing / Limitations Suitability	ALC	Topsoil Thickness for Use in Mine Rehabilitation (mbgl)	Total Area (ha)
1Dn(Te)	Deep, reddish brown clay soil with a soft surface and strongly structured, sodic subsoils and is associated with flat to gently undulating plains with Bauhinia.	Brown Vertosol	1*	D1*	-	Cotton (Class 4). Remaining land uses (Class 5)	Class 4	Class C2	0.20-0.40	139.54
2Dn(Te)	Deep, dark grey clay soil with a self-mulching surface and moderately to strong structured subsoil and is associated with flat to gently undulating plains with cleared Bauhinia vegetation.	Black Vertosol	2, 3*, 4, 5, 6, 7, 8	D3*, D55	B25	UMAs 2, 3, 4, 6, and 8: Cotton (Class 3). Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5) UMA 5: Cotton (Class 4). Remaining land uses (Class 5) UMA 7: All land uses (Class 5)	UMA 7: Class 5 UMAs 2, 3, 4, 5, 6, 7, and 8: Class 4	UMAs 2, 3, 4, 6, and 8: Class B UMA 5: Class C2 UMA 7: Class C3	0.20-1.00	414.16
3Bl(Te)	Very deep, brown clay sandy soil with a firm surface and strong structured subsoils and is associated with flat to gently undulating rises with sparse woodlands of whitewood vegetation and grasslands	Black Dermosol	9*	D5*	-	All land uses (Class 4)	Class 4	Class C2	0.20-0.80	12.39
4Bl(Te)	Very deep, grey clay soil overlying weathered substrate with self-mulching/flake surface and strong structured subsoils and is associated with gently undulating plains with grasslands.	Grey Dermosol	10, 11	D6*, D20	-	Cotton (Class 4). Remaining land uses (Class 5)	Class 4	Class C1	0.20-0.60	46.17

SPC map code[1] / Report No.	SPC Concept	ASC (Dominant to sub-order)	UMAs (*Analysed)	Detailed sites (*Analysed)	SLR (2023) Analysed Site relevant to GTE Analysed site	Regional Frameworks / Limitations Suitability	Beef Cattle Grazing / Limitations Suitability	ALC	Topsoil Thickness for Use in Mine Rehabilitation (mbgl)	Total Area (ha)
5Dn(Ro)	Deep, grey clay soils with a cracking surface and strong structured subsoils and is associated with gently undulating rises with drainage and depressions with sparse acacia vegetation and grasslands.	Grey Vertosol	13, 14*, 15, 16, 17	D7*, D26, D33, D42, D50	-	Cotton (Class 3). Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	Class 4	Class B	0.20-0.45	239.28
6Bl(Pg)	Gilgaied, deep, brown clay soils with a cracking surface and strong structured, sodic and salinity impacted subsoils and is associated with gently undulating plains with open Brigalow scrub vegetation.	Brown Vertosol	18*, 19, 20, 21, 22, 23	D12m/d*, D9m/d	-	All land uses (Class 4)	Class 5	Class C2	-	141.38
7Bl(Pg)	Very deep, grey clay soil with a cracking surface and strong structured subsoils and is associated with gently undulating plains with sparse Brigalow scrub.	Grey Vertosol	24, 25*, 26, 27, 28	D14m/d*, D15	-	All land uses (Class 4)	Class 5	Class C2	0.00-0.50	304.18
8Dn(Te)	Moderately deep, grey clay soil with a self-mulching and moderate structured subsoils and is associated with gently undulating rises with lower lying and drainage areas.	Grey Dermosol	12, 29, 30*, 31	D19*, D34	-	UMA 12: Cotton (Class 4). Remaining land uses (Class 5) UMAs 29, 30 and 29: Cotton (Class 3). Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	Class 4	UMA 12: Class C2 UMAs 29, 30 and 29: Class B	0.00-0.50	180.85
9Dn(Ro)	Very deep, black on grey, brown clay soil with a self-mulching, sometimes cracking surface and strong structured subsoils and is associated with flat plains with Mitchell grasslands and sparse Prickly Acacia vegetation.	Black Vertosol	33*, 34, 36, 37, 38, 39, 40, 41, 42	D21*, D28	-	All land uses (Class 4)	Class 4	Class C1	-	589.65

SPC map code[1] / Report No.	SPC Concept	ASC (Dominant to sub-order)	UMAs (*Analysed)	Detailed sites (*Analysed)	SLR (2023) Analysed Site relevant to GTE Analysed site	Regional Frameworks / Limitations Suitability	Beef Cattle Grazing / Limitations Suitability	ALC	Topsoil Thickness for Use in Mine Rehabilitation (mbgl)	Total Area (ha)
10Ct(Ro)	Very deep, grey on clay soil with self-mulching, no coarse fragment surface and strong structured subsoils and is associated with flat and gently undulating plains associated with drainage and low-lying areas with sparse bauhinia and brigalow.	Grey Vertosol	43, 44*, 45, 46, 47, 48	D16, D17, D22*, D23, D25, D27, D30, D31, D35, D40, D47, D48, D51, D53, D54, D56, D57, D60	B10	All land uses (Class 4)	Class 4	Class C1	-	1773.82
11Bl(Ta)	Moderately deep, texture contrast loam on medium clay soil with a hard-setting, with coarse fragments on the surface and sodic subsoils on shallow substrate and is associated with flat plains with sparse Prickly Acacia and Vine tree.	Brown Sodosol	49, 50, 51, 52*, 53, 54, 55, 56	D24*	-	UMAs 50 and 51: Cotton (Class 4). Remaining land uses (Class 5) UMAs 49, 52, 53, 54, 55 and 56: Cotton, Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	UMAs 50 and 51: Class 4 UMAs 49, 52, 53, 54, 55 and 56: Class 3	UMAs 50 and 51: Class C2 UMAs 49, 52, 53, 54, 55 and 56: Class C1	-	218.42
12Da(Te)	Very deep clay loam on structured clay soil with a firm surface and is associated with residual rises with sparse brigalow.	Grey Dermosol	57, 58	D4, D32*	B12	Cotton, Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	Class 3	Class C1	0.20-0.90	203.00
13Bl(Ta)	Very deep, clay soil with a firm surface, with coarse fragments, mottled subsoils and is associated with flat, gently undulating plains with sparse current bush.	Brown Dermosol	59, 60, 61*	D36*	-	Cotton, Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	Class 4	Class C2	0.20-1.40	111.47

SPC map code[1] / Report No.	SPC Concept	ASC (Dominant to sub-order)	UMAs (*Analysed)	Detailed sites (*Analysed)	SLR (2023) Analysed Site relevant to GTE Analysed site	Regional Frameworks / Limitations Suitability	Beef Cattle Grazing / Limitations Suitability	ALC	Topsoil Thickness for Use in Mine Rehabilitation (mbgl)	Total Area (ha)
14Bl(Ro)	Very deep, black on grey-brown clay soil with a cracking surface and strong structured subsoils and is associated with low lying areas and drainage depressions located near residual rises with sparse bauhinia vegetation.	Black Vertosol	35*	D37*	B05	All land uses (Class 4)	Class 4	Class C2	0.20-0.50	64.20
15Bl(Ro)	Moderately deep clay soil with a self-mulching surface deep bedrock and is associated with gently undulating plains with sparse bauhinia	Brown Vertosol	62, 63, 64, 65*, 66	D2, D8, D10, D11, D13, D39*, D61, D66	-	All land uses (Class 4)	Class 4	Class C2	0.20-0.60	1040.57
16Bl(Ta)	Very shallow; clay loam surfaced on clay subsoils with a hard-setting on shallow bedrock and is associated with hillslopes and Bauhinia.	Grey Sodosol	32, 67*, 68, 69	D43*	-	Cotton (Class 4). Remaining land uses (Class 5)	Class 4	Class C2	-	38.52
17Bl(Ro)	Deep clay uniform soil with a cracking surface and is associated with gently undulating plains and is associated with sparse bauhinia and brigalow	Grey Vertosol	70, 71, 72, 73*	D29, D38, D41, D44*, D46	B01	All land uses (Class 4)	Class 4	Class C1	-	348.24
18Bl(Ro)	Very deep, grey clay uniform soil with self-mulching surface and is associated with gently undulating plains with sparse bauhinia and brigalow.	Grey Vertosol	74*	D45*	-	Cotton, Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 3). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 4)	Class 3	Class A1	0.20-1.00	76.36
19Bl(Ro)	Very deep, brown clay soils with a surface flake and strong structured subsoils and is associated with gently undulating plains and rises with sparse bauhinia and brigalow vegetation.	Brown Vertosol	75*, 76, 77, 78, 79, 80	D18, D49, D52*, D62, D63, D64	-	Cotton, Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	Class 4	Class C1	0.20-1.40	756.86

SPC map code[1] / Report No.	SPC Concept	ASC (Dominant to sub-order)	UMAs (*Analysed)	Detailed sites (*Analysed)	SLR (2023) Analysed Site relevant to GTE Analysed site	Regional Frameworks / Limitations Suitability	Beef Cattle Grazing / Limitations Suitability	ALC	Topsoil Thickness for Use in Mine Rehabilitation (mbgl)	Total Area (ha)
20Bl(Ro)	Moderately deep, uniform grey clay soils with surface flake and strong structured clay subsoils and is associated with gently undulating plains with open woodland including brigalow vegetation	Grey Vertosol	81*	D58*	-	Cotton (Class 3). Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	Class 4	Class B	0.20-0.80	27.81
21Bl(Ta)	Very deep, texture contrast brown sandy loams on grey and yellow brown mottled clay subsoils with hard-setting surface and is associated with gently undulating plains with sparse Brigalow vegetation on grasslands.	Grey Sodosol	82*	D59*	B21	All land uses (Class 5)	Class 5	Class C3	0.20-0.45	167.19
22Bl(Wy)	Deep, gradational textured, weakly structured soils with firm surfaces loamy subsoils and is associated with gently undulating plains with sparse brigalow and bauhinia vegetation.	Brown Kandosol	83*	D65*	-	Cotton (Class 4). Remaining land uses (Class 5)	Class 4	Class C1	0.45-1.00	13.54

1 - SPC name codes are based on the dominant land system in which they occupy. The letters in the brackets are based on the soil type within the landscape it resembles. The number is an internal number ordering system used by GTE.

Figure 3: Soil Profile Classes

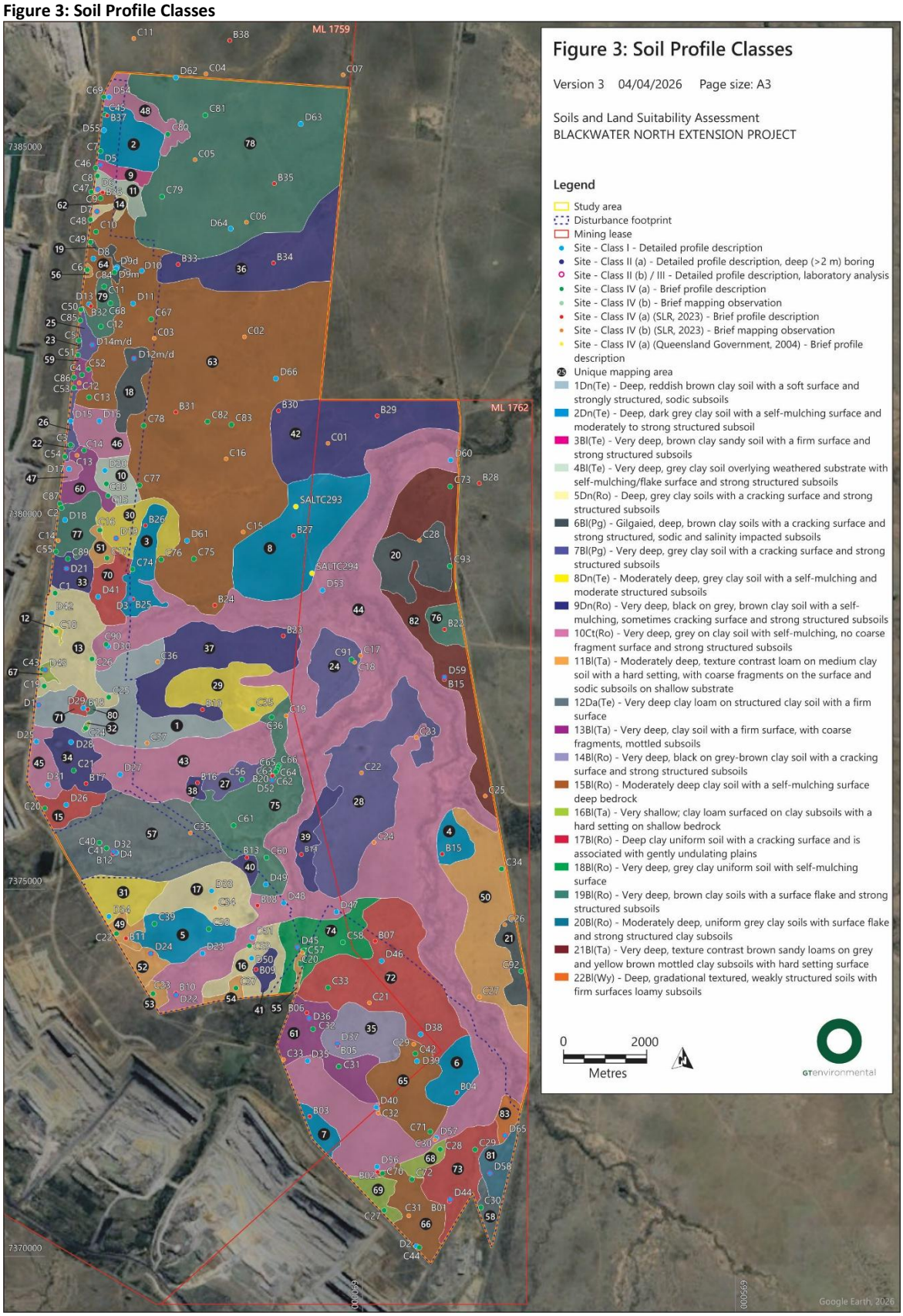


Figure 4: Australian Soil Classification

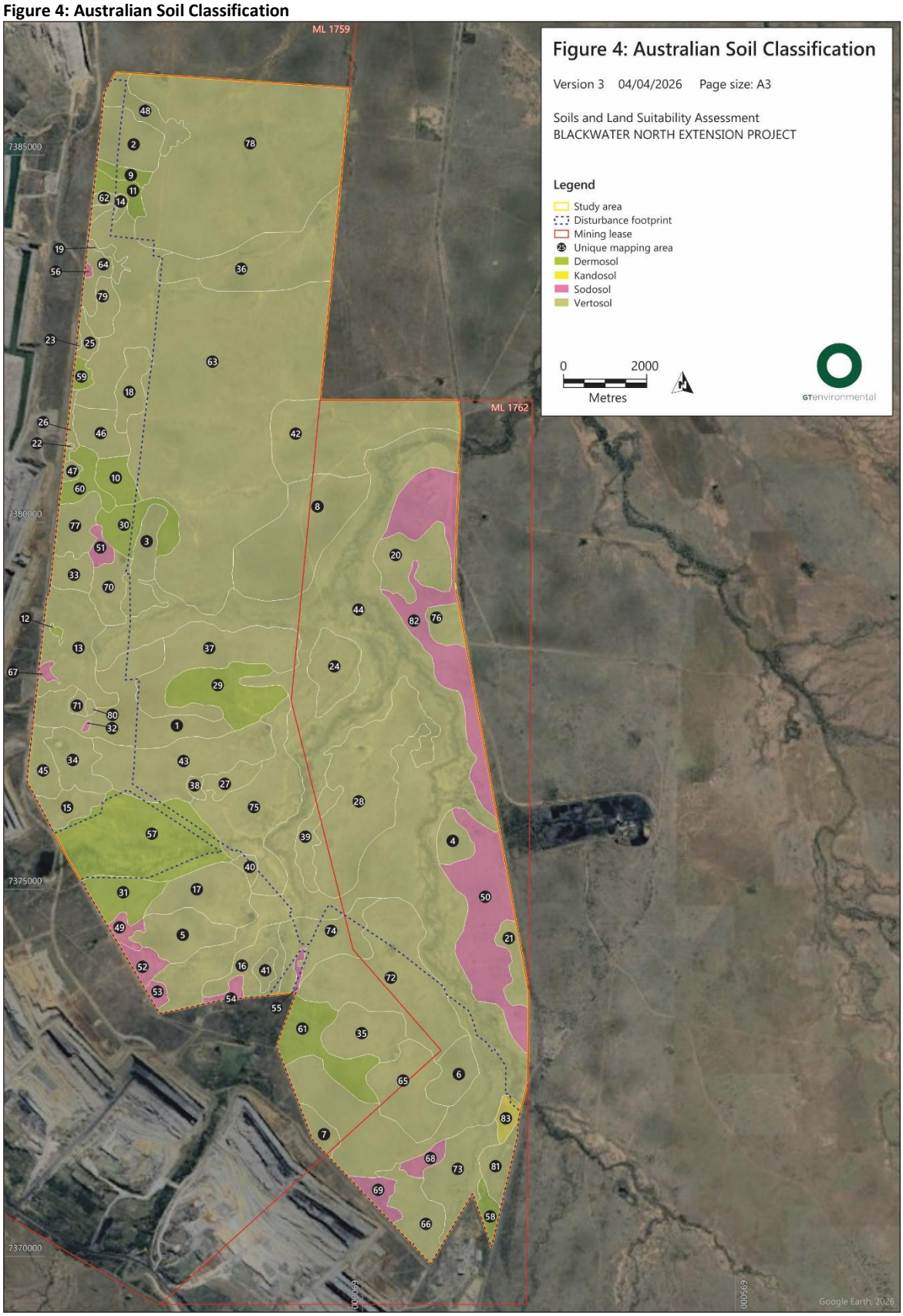


Table 5-2: SLR (2023) Detailed (Analysed) Sites Review for GTE SALS Assessment Summary

SLR Soil Mapping Unit	SLR Classification / Soil Types	Nominated SLR Detailed (Analysed) Site	Samples Analysed	Number of Samples	GTE Review	Nominated GTE Class III(a) Sites
2B	Eutrophic Red Dermosol	B01	Yes	4	No profile to review	D44
1	Self-Mulching Black Vertosol	B05	Yes	4	Gilgai observed as present	D37
1	Self-Mulching Red Vertosol	B10	Yes	4	Gilgai observed as present	D22
3	Eutrophic Red Chromosol	B12	Yes	4	No profile to review	D32
1	Subnatric Brown Sodosol	B21	Yes	4	No gilgai observed	D59
1	Self-Mulching Brown Vertosol	B25	Yes	4	Gilgai observed as present	D3
2A	Eutrophic Red Dermosol	B28	Yes	4	Soil Map Unit (SMU) appears to be similar if not the same as SMU 2B. GTE do not recommend this is separated based on SLR description.	-

5.1.2 Soil Profile Class 1Dn(Te): Brown Vertosol

Overview and Concept

1Dn(Te) is characterised by deep, reddish brown clay soil with a soft surface and strongly structured, sodic subsoils. The SPC is associated with flat to gently undulating plains with Bauhinia. The SPC is situated in the centre-west portion of the study area over an area of 139.54 ha.

Analysed site

The nominated analysed site, site D1, is summarised in Table 5-3. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-4. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-3: Land Summary 1Dn(Te) - Analysed Site D1

Item	Description
Analysed Site	D1
UMAs	1

Representative Landscape Photograph



Soil Profile Photograph



(Profile viewed top to bottom, 0.60 m)

Location GDA2020 ZONE 55	685633 7377526
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Bauhinia
Disturbance	Extensive clearing
Landform pattern / pattern	Simple slope, gently undulating plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Moderate well / Moderate
Slope (%) / Erosion	2.0 / 3.0, No erosion observed

Table 5-3: Land Summary 1Dn(Te) - Analysed Site D1 (continued)

Surface condition / Surface coarse fragments or segregations		Self-mulching, no coarse fragments					
SPC ASC Order / Suborder		Brown Vertosol					
Associated Land System / Soil		Daunia / Teviot					
Total area (ha)		139.54					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Light medium clay	Moderate / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	2.5Y5 / 2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 8.0 No dispersion after 10 minutes No slaking
B21 0.20-0.40 Abrupt 5-20 mm	Light clay	Moderate / Firm Angular blocky 20-50 mm Slickensides	< 2% calcium carbonate 2-6 mm	2.5Y5 / 3 Light olive brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine < 1 mm Few	0.30 / 7.5 No dispersion after 10 minutes Partial slaking
BC 0.40-0.60 End of borehole (EOBH)	Medium clay	Massive / Loose Angular blocky 20-50 mm Slickensides	20-50% coarse fragments 20-60 mm 20-50% coarse fragments 6-20 mm	10YR5 / 3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.50 / 9.0 No dispersion after 10 minutes No slaking
	Refusal on cemented pan						

Table 5-4: Soil Chemistry and Assessment for 1Dn(Te), Analysed Site D1

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is moderately alkaline. Subsoils increase from moderately alkaline to strong alkaline
EC	Topsoil is low in EC levels. Subsoil increases from high to very high
ECEC	High throughout the profile
ESP	Non-sodic levels in topsoil. Subsoil is non-sodic and increase below 0.40 mbgl
Ca:Mg	Very high throughout the profile
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Light medium clay in topsoil. Subsoils consist of medium clays with silty clay loam in BC horizon
EAT	Topsoil is non-dispersive with carbonate and gypsum present. Subsoil in B21 disperses after remoulding. BC horizon has indicated some dispersion.
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.018
SALFPREDICT PAWC (PAWCER) Total (mm/60cm)	72.7
ERD	Soil Depth on BC horizon is 0.40 mbgl and 0.60 mbgl on refusal

Key Analysis	Assessment Summary
	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where no value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90 to 75% for all crop land uses. The limitation for ERD is soil depth of 0.40 m.
Summary of limitations and management	The soil has less than favourable PAWC, very low nutrient levels, fertility status and moderate soil structure. Topsoil pH is moderately alkaline with low EC non-sodic levels and favourable surface conditions with shallow subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

5.1.3 Soil Profile Class 2Dn(Te): Black Vertosol

Overview

2Dn(Te) is characterised by deep, dark grey clay soil with a self-mulching surface and moderately to strong structured subsoils. The SPC is associated with flat to gently undulating plains with cleared Bauhinia vegetation. The SPC is situated across the Project site in the centre and south portion of the study area over an area of 414.16 ha.

Analysed site

The nominated analysed site, site D3, is summarised in Table 5-5. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-6. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-5: Land Summary 2Dn(Te), Analysed Site D3

Item	Description
Analysed Site	D3
UMAs	2, 3, 4, 5, 6, 7, 8
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.00 m)
Location GDA2020 ZONE 55	686900 7378950
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Bauhinia
Disturbance	Limited clearing
Landform pattern / pattern	Simple slope, gently undulating plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Moderate well / Moderate
Slope (%) / Erosion	1.0 / 1.0, No erosion observed
Surface condition / Surface coarse fragments or segregations	Self-mulching (Flake), no coarse fragments

Table 5-5: Land Summary 2Dn(Te), Analysed Site D3 (continued)

SPC ASC Order / Suborder		Black Vertosol					
Associated Land System / Soil		Blackwater, Daunia / Teviot					
Total area (ha)		414.16					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.10 Clear 20-50 mm	Light clay	Strong / Very firm Subangular blocky 5-10 mm No Slickensides	< 2% coarse fragments 6-20 mm	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2 mm Common	0.05 / 8.0 No dispersion after 10 minutes Partial slaking
B21 0.10-0.30 Clear 20-50 mm	Light clay	Moderate / Very firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.20 / 8.0 No dispersion after 10 minutes Partial slaking
B22 0.30-0.65 Clear 20-50 mm	Medium clay	Strong / Firm Angular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR2 / 2 No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Few	0.45 / 8.0 No dispersion after 10 minutes Complete slaking
B23 0.65-0.84 Clear 20-50 mm	Medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.75 / 8.5 No dispersion after 10 minutes Complete slaking
BC 0.84-1.00 EOBH	Light medium clay Silty	Massive / loose Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20 mm	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	No roots	0.92 / 9.0 No dispersion after 10 minutes Partial slaking
	Refusal on weathered substrate						

Table 5-6: Soil Chemistry for 2Dn(Te), Analysed Site D3

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils range from slightly acid to neutral to strongly alkaline
EC	Topsoil is low in EC levels. Subsoil remains low.
ECEC	High throughout the profile
ESP	Non-sodic levels in topsoil. Subsoils are non-sodic
Ca:Mg	Very high throughout the profile
P	High in topsoil. Low in the B21 horizon of subsoil
PSA	Topsoil is clay loam. Subsoil consists of light clay increasing to medium heavy clay with clay loam in BC horizon
EAT	Topsoil disperses after remoulding. Subsoil in B21 is non-dispersive with carbonate and gypsum present
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.030
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	78.80
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% yield was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all crop land uses. The limitation for ERD is soil depth of 1.00 m.
Summary of limitations and management	The soil has less than favourable PAWC, high nutrient levels, fertility status and moderate to strong soil structure. Topsoil pH is neutral alkaline with low EC, non-sodic levels and favourable surface conditions with deep subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil to 0.50 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

Associated SLR (2023) Site Assessment

The analysed site undertaken by SLR (2023) was site B25, described as a Self-Mulching Brown Vertosol within Soil Unit 1 (Self-Mulching Black Brown Vertosol) with incipient gilgai.

GTE conducted site D3 within 5.50 m of B25 (SLR, 2023) and the classification indicated it was a Black Vertosol with no gilgai observed at or within the area. Based on the D3 profile observation, GTE are confident that this site should be classified as a Black Vertosol, therefore site B25 (SLR, 2023) is considered an unmappable sub-dominant soil type within this SPC.

The laboratory analysis was utilised with D3 laboratory providing additional data and completing data gaps based on the nominated laboratory suite.

5.1.4 Soil Profile Class 3Bl(Te): Black Dermosol

Overview

3Bl(Te) is characterised by very deep, brown clay sandy soil with a firm surface and strong structured subsoils. The SPC is associated with flat to gently undulating rises with sparse woodlands of whitewood vegetation and grasslands. The SPC is situated in the north western portion of the study area over an area of 12.39 ha.

Analysed site

The nominated analysed site, site D5, is summarised in Table 5-7. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-8. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-7: Land Summary 3Bl(Te), Analysed Site D5

Item	Description
Analysed Site	D5
UMAs	9
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.00 m)
Location GDA2020 ZONE 55	686565 7384805
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Whitewood, grassland
Disturbance	Limited clearing
Landform pattern / pattern	Hillslope, flat, gently undulating rises
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Moderately well / Slow
Slope (%) / Erosion	2.0 / 2.0, No erosion observed
Surface condition / Surface coarse fragments or segregations	Firm, no coarse fragments

Table 5-7: Land Summary 3Bl(Te), Analysed Site D5 (continued)

SPC ASC Order / Suborder		Black Dermosol					
Associated Land System / Soil		Blackwater / Teviot					
Total area (ha)		12.39					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 6.5 No dispersion after 10 minutes No slaking
B21 0.20-0.40 Clear 20-50 mm	Medium clay	Strong / Very firm Subangular blocky 5-10 mm Slickensides	No inclusions or segregations	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Few	0.30 / 8.0 Slight Dispersion after 10 minutes Partial slaking
B22 0.40-0.80 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 5-10 mm Slickensides	No inclusions or segregations	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Few	0.60 / 8.0 Slight Dispersion after 10 minutes Partial slaking
B23 0.80-1.30 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 5-10 mm Slickensides	No inclusions or segregations	10YR3 / 3 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Few	1.05 / 6.0 Slight Dispersion after 10 minutes Partial slaking
B24 1.30-1.60 Clear 20-50 mm	Medium heavy clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	5YR5 / 6 Yellowish red Mottles: 10YR4 / 2 Dark greyish brown Few 2%-10% Few < 5 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.45 / 5.5 No dispersion after 10 minutes Partial slaking
C 1.60-2.00 End of test pit (EOTP)	-	-	-	-	-	-	1.80 / 5.5 No dispersion after 10 minutes Partial slaking
	Refusal on bedrock						

Table 5-8: Soil Chemistry for 3Bl(Te), Analysed Site D5

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils range from moderately alkaline to strongly alkaline
EC	Topsoil is low in EC levels. Subsoil increases from moderate to very high
ECEC	High throughout the profile
ESP	Non-sodic levels in topsoil. Subsoils range from non-sodic to strongly sodic
Ca:Mg	Topsoil is very high. Subsoil decreases to high and moderate at depth
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is medium clay Subsoil consists of medium heavy clay to medium clay
EAT	Topsoil has some dispersion Subsoil has some dispersion throughout the profile
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	125.10
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% yield was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all crop land uses. There are no limitations for ERD
Summary of limitations and management	The soil has favourable PAWC, very low nutrient levels, fertility status and strong soil structure. Topsoil pH is neutral alkaline with low EC, non-sodic levels and favourable surface conditions with deep subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below this 0.80 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 15.1 tonnes per hectare (t/ha)for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.40 mbgl

5.1.5 Soil Profile Class 4Bl(Te): Grey Dermosol

Overview

4Bl(Te) is characterised by very deep, grey clay soil overlying weathered substrate with self-mulching / flake surface and strong structured subsoils. The SPC is associated with gently undulating plains with grasslands. The SPC is situated in the east-west portion of the study area over an area of 46.17 ha.

Analysed site

The nominated analysed site, site D6, is summarised in Table 5-9. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-10. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-9: Land Summary 4Bl(Te), Analysed Site D6

Item	Description
Analysed Site	D6
UMAs	10, 11, 12
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.60 m)
Location GDA2020 ZONE 55	686529 7384441
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Grassland
Disturbance	Complete clearing, not cultivated
Landform pattern / pattern	Simple slope, gently undulating rises
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	2.0 / 1.0, No erosion observed
Surface condition / Surface coarse fragments or segregations	Surface flake, no coarse fragments

Table 5-9: Land Summary 4Bl(Te), Analysed Site D6 (continued)

SPC ASC Order / Suborder		Grey Dermosol					
Associated Land System / Soil		Daunia / Teviot					
Total area (ha)		46.17					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Light medium clay Silty	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 6.5 No dispersion after 10 minutes No slaking
B21 0.20-0.60 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2 mm Common	0.40 / 7.5 Slight Dispersion after 10 minutes No slaking
B22 0.60-0.90 Clear 20-50 mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4 / 4 Dark yellowish brown Mottles: Pale orange-brown, Few 2%-10%	Dry Imperfect drained	Fine 1-2 mm Few	0.75 / 7.5 Slight Dispersion after 10 minutes Partial slaking
B3 0.90-1.20 Clear 20-50 mm	Clay Loam	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4 / 4 Dark yellowish brown Mottles: Pale orange-brown, Few 10%-20%	Very poorly drained	No roots	-
C 1.20-1.60 EOTP	-	-	-	-	Very poorly drained	No roots	-
	Refusal on weathered substrate						

Table 5-10: Soil Chemistry for 4Bl(Te), Analysed Site D6

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils range from moderate alkaline to strongly alkaline
EC	Topsoil is very low. Subsoil increases from moderate to very high
ECEC	Topsoil is moderate. Subsoil ranges from high to moderate with depth
ESP	Non-sodic levels in topsoil. Subsoils range from non-sodic to strongly sodic
Ca:Mg	High throughout soil profile
P	Low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is light clay Subsoil consists of medium heavy clay to clay loam in the BC horizon
EAT	Topsoil disperses after remoulding Subsoil disperses after remoulding with some dispersion below 0.80 m
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.025

Key Analysis	Assessment Summary
SALFPREDICT PAWC (PAWCER) Total (mm/50cm)	65.80
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where no value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all crop land uses. The SPC is assessed as a Dermosol. As such, it has been assessed against the pH limitations. It was assessed from 0.50 mbgl, pH was > 9.0, therefore the PAWC based on the SALFPREDICT modelling has been assessed at this depth. There are limitations for ERD, relating to subsoil pH.
Summary of limitations and management	The soil has favourable PAWC, low nutrient levels, fertility status and strong soil structure. Topsoil pH is neutral alkaline with very low EC, non-sodic levels and favourable surface conditions with deep subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil to 0.60 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below this 0.60 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 12.6 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.00 mbgl

5.1.6 Soil Profile Class 5Dn(Ro): Grey Vertosol

Overview

5Dn(Ro) is characterised by deep, grey clay soils with a cracking surface and strong structured subsoils. The SPC is associated with gently undulating rises with drainage and depressions with sparse acacia vegetation and grasslands. The SPC is situated in the centre and south-west portions of the study area over an area of 239.29 ha.

Analysed site

The nominated analysed site, site D7 is summarised in Table 5-11. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-12. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-11: Land Summary 5Dn(Ro), Analysed Site D7

Item	Description
Analysed Site	D7
UMAs	13, 14, 15, 16, 17
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.20 m)
Location GDA2020 ZONE 55	686513 7384178
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Grassland
Disturbance	Complete clearing, not cultivated
Landform pattern / pattern	Simple slope, gently undulating rises
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Moderate well / Slow
Slope (%) / Erosion	1.0 / 1.0, No erosion observed

Table 5-11: Land Summary 5Dn(Ro), Analysed Site D7 (continued)

Surface condition / Surface coarse fragments or segregations	Cracking, no coarse fragments						
SPC ASC Order / Suborder	Grey Vertosol						
Associated Land System / Soil	Blackwater, Daunia / Rolleston						
Total area (ha)	239.28						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-015 Clear 20-50 mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 20-60 mm	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking
B21 0.15-0.45 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	2-10% coarse fragments 20-60mm	10YR4 / 2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2 mm Common	0.30 / 7.5 No dispersion after 10 minutes Partial slaking
B22 0.45-0.60 Clear 20-50 mm	Medium clay	Strong / Firm Subangular blocky 50-100 mm Slickensides	< 2% coarse fragments and nodules 2-6 mm	10YR4 / 2 Dark greyish brown Mottles: 10YR4 / 3 Brown Very few < 2% Medium 5-15 mm	Moderately moist Imperfectly drained	Fine 1-2 mm Common	0.60 / 7.5 Moderate dispersion after 10 minutes Complete slaking
C 0.60-1.20 EOTP	-	-	-	-	-	-	-
	Refusal on weathered substrate						

Table 5-12: Soil Chemistry for 5Dn(Ro), Analysed Site D7

Key Analysis	Assessment Summary
Soil pH (H_20)	Moderately alkaline throughout soil profile
EC	Topsoil is low. Subsoil increases from low to high
ECEC	High throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils range from non-sodic to strongly sodic
Ca:Mg	High throughout soil profile
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is medium clay Subsoil is medium heavy clay
EAT	Topsoil is non-dispersive with carbonate and gypsum present Subsoil has some dispersion
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015

Key Analysis	Assessment Summary
SALFPREDICT PAWC (PAWCER) Total (mm/60cm)	86.0
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all crop land uses except Maize at 75%. The limitation for ERD is soil depth of 0.60 m.
Summary of limitations and management	The soil has unfavourable PAWC, very low nutrient levels, fertility status, strong soil structure and moderately deep soils. Topsoil pH is moderately alkaline with low EC, non-sodic levels and favourable surface conditions with deep subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil to 0.45 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.45 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 9.1 t/ha for each 0.10 m to achieve ESP of 5.5 based on the highest sodic levels at 0.50 mbgl.

5.1.7 Soil Profile Class 6Bl(Pg): Brown Vertosol (Gilgai)

Overview

6Bl(Pg) is characterised by gilgaied, deep, brown clay soils with a cracking surface and strong structured, sodic and salinity impacted subsoils. The SPC is associated with gently undulating plains with open Brigalow scrub vegetation. The SPC is situated in small areas across the study area over an area of 141.38 ha.

Analysed site

The nominated analysed site, site D12 mound (m), is summarised in Table 5-13 with D12 depression (d) in Appendix A. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-14. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-13: Land Summary 6Bl(Pg), Analysed Site D12m

Item	Description
Analysed Site	D12m (Mound position)
UMAs	18, 19, 20, 21, 22, 23
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.20 m)
Location GDA2020 ZONE 55	687003 7382185
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Open Brigalow Scrub
Disturbance	Extensive clearing
Landform pattern / pattern	Plain, gently undulating rises
Microrelief / Rock outcrop	Normal microrelief, no rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / 1.0, No erosion observed

Table 5-13: Land Summary 6Bl(Pg), Analysed Site D12m (continued)

Surface condition / Surface coarse fragments or segregations	Cracking, no coarse fragments						
SPC ASC Order / Suborder	Grey Vertosol						
Associated Land System / Soil	Blackwater, Daunia / Pegunny						
Total area (ha)	141.38						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 8.0 No dispersion after 10 minutes Partial slaking
B21 0.20-0.60 Gradual 50-100 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5 / 3 Brown Mottles: Pale Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2 mm Common	0.40 / 5.5 No dispersion after 10 minutes Partial slaking
B22 0.60-1.80 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm Slickensides	No inclusions or segregations	10YR5 / 4 Yellowish brown Mottles: Pale Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2 mm Few	1.20 / 6.5 No dispersion after 10 minutes Complete slaking

Table 5-14: Soil Chemistry for 6Bl(Pg), Analysed Site D12m

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly acidic. Subsoils are moderately acid to slightly alkaline below 1.20 m
EC	Topsoil is moderate. Subsoil increases from very high to extreme
ECEC	Topsoil is high. Subsoil is moderate to high throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are sodic
Ca:Mg	Topsoil is high. Subsoils are moderate to high
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is medium heavy clay Subsoil is medium heavy clay throughout
EAT	Topsoil is non-dispersive with carbonate and gypsum present Subsoil has some dispersion
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	131 (115.2 Depression location)

Key Analysis	Assessment Summary
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for barley and cotton crop land uses. Maize, oat, sorghum, soybean, sunflower and wheat present 50% yield. There are no limitations for ERD.
Summary of limitations and management	Topsoil recovery may be difficult with the undulating nature of gilgai areas. Care is recommended when stripping the topsoil as to avoid mixing with sodic subsoils. Otherwise, gypsum application may be required, refer to Subsoil recommendation below. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.20 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 14.7 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels of the depression location at 0.80 mbgl.

5.1.8 Soil Profile Class 7Bl(Pg): Grey Vertosol (Gilgai)

Overview

7Bl(Pg) is characterised by very deep, grey clay soil with a cracking surface and strong structured subsoils. The SPC is associated with gently undulating plains with sparse Brigalow scrub. The SPC is situated mainly in the eastern and centre portions of the study area over an area of 304.18 ha.

Analysed site

The nominated analysed site, site D14m, is summarised in Table 5-15. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-16. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-15: Land Summary 7Bl(Pg), Analysed Site D14m

Item	Description
Analysed Site	D14m (Mound position)
UMAs	24, 25, 26, 27, 28
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 2.20 m)
Location GDA2020 ZONE 55	686471 7382392
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Open Brigalow scrub
Disturbance	Limited clearing
Landform pattern / pattern	Plain, gently undulating plains
Microrelief / Rock outcrop	Normal microrelief, no rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / 1.0, No erosion observed
Surface condition / Surface coarse fragments or segregations	Cracking, no coarse fragments

Table 5-15: Land Summary 7Bl(Pg), Analysed Site D14m (continued)

SPC ASC Order / Suborder		Grey Vertosol					
Associated Land System / Soil		Blackwater, Daunia / Pegunny					
Total area (ha)		304.18					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Gradual 50-100 mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking
B21 0.20-0.40 Gradual 50-100 mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	< 2% coarse fragments 20-60 mm	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.30 / 7.0 No dispersion after 10 minutes Partial slaking
B22 0.40-0.60 Gradual 50-100 mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	< 2% coarse fragments 20-60 mm	10YR5 / 2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Few	0.50 / 6.5 Moderate dispersion after 10 minutes Complete slaking
B23 0.60-1.90 Gradual 50-100 mm	Medium heavy clay	Strong / Strong Subangular blocky 100-200 mm Slickensides	< 2% coarse fragments 20-60 mm	10YR5 / 2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Few	1.00 / 7.0 1.50 / 7.0 No dispersion after 10 minutes Complete slaking
B24 1.90-2.20 EOTP	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm Slickensides	10-20% coarse fragments 20-60mm 2-10% coarse fragments 6-20mm	10YR5 / 2 Greyish brown Mottles: Brown Few 2%-10% Few < 5 mm	Moderately moist Imperfectly drained	Very fine < 1 mm Few	2.00 / 7.0 No dispersion after 10 minutes Complete slaking

Table 5-16: Soil Chemistry for 7Bl(Pg), Analysed Site D14m

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly acidic. Subsoils are moderately alkaline to slightly alkaline below 1.20 m
EC	Topsoil is low. Subsoil varies from moderate to extreme throughout soil profile
ECEC	Topsoil is moderate. Subsoil is moderate to high throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are non-sodic increasing to sodic below 0.50 m
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to moderate with depth
P	Moderate in topsoil. Very low in the B21 horizon of subsoil

Key Analysis	Assessment Summary
PSA	Topsoil is medium heavy clay Subsoil is medium heavy clay throughout
EAT	Topsoil is non-dispersive with carbonate and gypsum present Subsoil has some dispersion
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	110.9 (106.8 Depression location)
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all crop land uses except Maize at 75%. There are no limitations for ERD.
Summary of limitations and management	Topsoil recovery may be difficult with the undulating nature of gilgai areas. Care is recommended when stripping the topsoil as to avoid mixing with sodic subsoils. Otherwise, gypsum application may be required, refer to Subsoil recommendation below. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below this 0.40 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 17.9 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels of the mound location at 0.80 mbgl.

5.1.9 Soil Profile Class 8Dn(Te): Grey Dermosol

Overview

8Dn(Te) is characterised by moderately deep, grey clay soil with a self-mulching and moderate structured subsoils. The SPC is associated with gently undulating rises with lower lying and drainage areas. The SPC is situated in the centre and centre-south portions of the study area over an area of 180.85 ha.

Analysed site

The nominated analysed site, site D19, is summarised in Table 5-17. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-18. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-17: Land Summary 8Dn(Te), Analysed Site D19

Item	Description
Analysed Site	D19
UMAs	29, 30, 31, 32
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.10 m)
Location GDA2020 ZONE 55	686719 7379753
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse shrubbery including ruby salt bush and emu apple
Disturbance	Extensive clearing
Landform pattern / pattern	Drainage depression, gently undulating plains
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Moderate
Slope (%) / Erosion	3.0 / 3.0, No erosion observed

Table 5-17: Land Summary 8Dn(Te), Analysed Site D19 (continued)

Surface condition / Surface coarse fragments or segregations	Surface flake, < 2% coarse fragments 6-20mm						
SPC ASC Order / Suborder	Grey Dermosol						
Associated Land System / Soil	Daunia / Teviot						
Total area (ha)	180.85						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.05 Clear 20-50 mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	< 2% coarse fragments 2-6 mm	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.03 / 7.0 No dispersion after 10 minutes Partial slaking
B21 0.05-0.30 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	< 2% coarse fragments 6-20 mm	10YR5 / 2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.18 / 7.5 No dispersion after 10 minutes Partial slaking
B22 0.30-0.50 Gradual 50-100 mm	Medium heavy clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20 mm	10YR5 / 2 Greyish brown Mottles: Brown Common 10%-20% Few < 5 mm	Dry Imperfectly drained	Very fine < 1 mm Common	0.40 / 7.5 No dispersion after 10 minutes Partial slaking
B3 0.50-0.60	Clay Loam Coarse	Massive / Weak No Slickensides	20-50% coarse fragments 6-20 mm	10YR5 / 4 Yellowish brown Mottles: Brown Many 20%-50% Few < 5 mm	Dry Imperfectly drained	No roots	0.55 / 7.0 Slight Dispersion after 10 minutes Partial slaking
BC 0.60-0.90	Clay Loam Coarse	Massive / Weak No Slickensides	50-90% coarse fragments 6-20 mm	10YR5 / 4 Yellowish brown Mottles: Brown Many 20%-50% Few < 5 mm	Dry Imperfectly drained	No roots	0.55 / 7.0 Slight Dispersion after 10 minutes Partial slaking
C 0.90-1.10 EOTP	-	-	-	-	-	-	-
	Refusal on cemented pan						

Table 5-18: Soil Chemistry for 8Dn(Te), Analysed Site D19

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is moderately alkaline. Subsoils are moderately alkaline with neutral to slightly alkaline below 0.50 m
EC	Topsoil is very low. Subsoil varies from low to high throughout soil profile
ECEC	Topsoil is high. Subsoil is high to moderate throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are non-sodic increasing to strongly sodic below 0.50 m
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to high at 0.50 m
P	Low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is medium clay Subsoil is light medium clay to clay loam and light clay to depth
EAT	Topsoil disperses after remoulding Subsoil indicates disperses after remoulding and some dispersion below 0.40 m
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	95.90
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for barley, cotton, sorghum and wheat crop land uses. Maize, oat, soybean and sunflower present 75 and 50% yield. The limitation for ERD is soil depth of 0.60 m.
Summary of limitations and management	The soil has favourable PAWC, low nutrient levels, fertility status and moderately deep soils. Topsoil pH is moderately alkaline with very low EC, non-sodic levels and favourable surface conditions with moderately deep, sodic subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Topsoil horizon is shallow, however, refer to subsoil for additional recommendations. Subsoil to 0.50 mbgl may be stripped to this depth and utilised as topsoil. Subsoil below 0.50 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 11.2 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.50 mbgl.

5.1.10 Soil Profile Class 9Dn(Ro): Black Vertosol

Overview

9Dn(Ro) is characterised by very deep, black on grey, brown clay soil with a self-mulching, sometimes cracking surface and strong structured subsoils. The SPC is associated with flat plains with Mitchell grasslands and sparse Prickly Acacia vegetation. The SPC is situated across the majority of the study area, over an area of 589.65 ha.

Analysed site

The nominated analysed site, site D21, is summarised in Table 5-19. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-20. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-19: Land Summary 9Dn(Ro), Analysed Site D21

Item	Description
Analysed Site	D21
UMAs	33, 34, 36, 37, 38, 39, 40, 41, 42
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 2.10 m)
Location GDA2020 ZONE 55	686057 7379329
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Flat plain, gently undulating plains
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / < 1.0, No erosion observed

Table 5-19: Land Summary 9Dn(Ro), Analysed Site D21 (continued)

Surface condition / Surface coarse fragments or segregations	Cracking, < 2% coarse fragments 6-20 mm						
SPC ASC Order / Suborder	Black Vertosol						
Associated Land System / Soil	Blackwater, Daunia / Rolleston						
Total area (ha)	589.65						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.10 Clear 20-50 mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	< 2% coarse fragments 6-20 mm	10YR3 / 1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.05 / 8.0 No dispersion after 10 minutes Complete slaking
B21 0.10-0.60 Gradual 50-100 mm	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR3 / 1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.35 / 7.5 No dispersion after 10 minutes Partial slaking
B22 0.60-1.00 Gradual 50-100 mm	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.80 / 7.5 No dispersion after 10 minutes Complete slaking
B23 1.00-1.90 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5 / 2 Greyish brown Mottles: Brown Common 10%-20% Few < 5 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.40 / 7.0 No dispersion after 10 minutes Complete slaking
C 1.90-2.10 EOTP	-	-	-	-	-	-	-

Table 5-20: Soil Chemistry for 9Dn(Ro), Analysed Site D21

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is moderately alkaline. Subsoils are moderately alkaline with neutral to slightly alkaline below 1.40 m
EC	Topsoil is very low. Subsoil varies from high to moderate throughout soil profile
ECEC	Topsoil is high. Subsoil is high to moderate throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are sodic increasing to strongly sodic below 1.40 m
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to high at 1.40 m
P	Low in topsoil. Very low in the B21 horizon of subsoil

Key Analysis	Assessment Summary
PSA	Topsoil is light medium clay Subsoil is medium heavy clay to medium clay to depth
EAT	Topsoil indicates no dispersion. Carbonates and gypsum may be present Subsoil indicates disperses after remoulding and some dispersion below 0.50 m
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	124.80
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for barley and cotton crop land uses. Maize, oat, sorghum, soybean, sunflower and wheat present 75 and 50% yield. There are no limitations for ERD.
Summary of limitations and management	The soil has favourable PAWC, low nutrient levels, fertility status and very deep soils. Topsoil pH is moderately alkaline with very low EC, non-sodic levels and favourable surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.10 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 16.3 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.80 mbgl.

5.1.11 Soil Profile Class 10Ct(Ro): Grey Vertosol

Overview

10Ct(Ro) is characterised by very deep, grey clay soil with self-mulching, no coarse fragment surface and strong structured subsoils. The SPC is associated with flat and gently undulating plains associated with drainage and low-lying areas with sparse bauhinia and brigalow. The SPC is situated across the majority of the study area, over an area of 1,773.82 ha.

Analysed site

The nominated analysed site, site D22, is summarised in Table 5-21. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-22. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-21: Land Summary 10Ct(Ro), Analysed Site D22

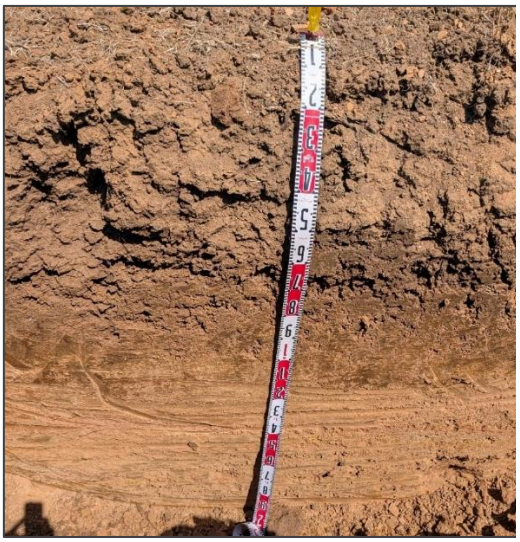
Item	Description
Analysed Site	D22
UMAs	43, 44, 45, 46, 47, 48
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 2.10 m)
Location GDA2020 ZONE 55	687457 7373577
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Flat plain, gently undulating plains
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / 1.0, No erosion observed

Table 5-21: Land Summary 10Ct(Ro), Analysed Site D22 (continued)

Surface condition / Surface coarse fragments or segregations	Surface flake, No coarse fragments						
SPC ASC Order / Suborder	Grey Vertosol						
Associated Land System / Soil	Blackwater, Daunia / Rolleston						
Total area (ha)	1,773.82						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.10 Clear 20-50 mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.05 / 7.0 No dispersion after 10 minutes Partial slaking
B21 0.10-0.50 Gradual 50-100 mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.30 / 7.5 No dispersion after 10 minutes Partial slaking
B22 0.50-0.80 Diffuse > 100 mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4 / 4 Dark yellowish brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2 mm Few	0.65 / 7.5 No dispersion after 10 minutes Complete slaking
B23 0.80-1.10 Diffuse > 100 mm	Medium clay Sandy	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR5 / 4 Reddish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Few	0.95 / 5.5 Slight Dispersion after 10 minutes Complete slaking
B24 1.10-1.80 Gradual 50-100 mm	Medium clay	Strong / Firm Angular blocky 20-50 mm No Slickensides	< 2% coarse fragments 6-20 mm	7.5YR4 / 4 Brown Mottles: Pale brown Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.45 / 5.5 No dispersion after 10 minutes Complete slaking
C 1.80-2.00 EOTP	-	-	-	-	-	-	-

Table 5-22: Soil Chemistry for 10Ct(Ro), Analysed Site D22

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is moderately alkaline. Subsoils vary between moderately alkaline and neutral to slightly alkaline
EC	Topsoil is low. Subsoil varies from moderate to very high with depth
ECEC	Topsoil is high. Subsoil is high to moderate throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are sodic increasing to extremely strongly sodic below 0.50 m
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to high at 0.50 m
P	Low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is medium clay Subsoil is medium heavy clay to light clay to depth
EAT	Topsoil indicates disperses after remoulding Subsoil indicates disperses after remoulding and some dispersion below 1.00 m
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	116.70
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for barley, cotton, oat, sorghum, sunflower and wheat crop land uses. Maize and soybean present 75 and 50% yield. There are no limitations for ERD.
Summary of limitations and management	The soil has favourable PAWC, low nutrient levels, fertility status and very deep soils. Topsoil pH is moderately alkaline with low EC, non-sodic levels and favourable surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.10 mbgl may benefit from gypsum application due to extremely sodic levels. SodiCalc (2026) recommends approximately 15 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.90 mbgl.

Associated SLR (2023) Site Assessment

The analysed site undertaken by SLR (2023) was site B10, a Self-Mulching Red Vertosol within Soil Unit 1 (Self-Mulching Black Brown Vertosol) with incipient gilgai.

GTE conducted site D22 within 1.7 m of B10 and the classification indicated it was a Grey Vertosol with no gilgai observed at or within the area. Based on the observation sites undertaken by GTE, no Red Vertosol was encountered, therefore, this is considered an anomaly, more so than a sub-dominant soil type.

The laboratory analysis was utilised with D22 laboratory providing additional data and completing data gaps based on the nominated laboratory suite.

5.1.12 Soil Profile Class 11Bl(Ta): Brown Sodosol

Overview

11Bl(Ta) is characterised by moderately deep, texture contrast loam on medium clay soil with a hard-setting, with coarse fragments on the surface and sodic subsoils on shallow substrate. The SPC is associated with flat plains with sparse Prickly Acacia and Vine tree. The SPC is situated in the centre and centre-east portions of the study area, over an area of 218.42 ha.

Analysed site

The nominated analysed site, site D24, is summarised in Table 5-23. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-24. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-23: Land Summary 11Bl(Ta), Analysed Site D24

Item	Description
Analysed Site	D24
UMAs	49, 50, 51, 52, 53, 55,
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.20 m)
Location GDA2020 ZONE 55	687133 7374146
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Simple slope, gently undulating plains
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Moderate well / Slow
Slope (%) / Erosion	2.0 / < 1.0, No erosion observed

Table 5-23: Land Summary 11Bl(Ta), Analysed Site D24 (continued)

Surface condition / Surface coarse fragments or segregations	Hard-setting, < 2% coarse fragments 6-20 mm						
SPC ASC Order / Suborder	Brown Sodosol						
Associated Land System / Soil	Blackwater, Daunia / Taurus						
Total area (ha)	218.42						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Gradual 50-100 mm	Loam	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 6.0 No dispersion after 10 minutes Complete slaking
B21 0.20-0.60 Gradual 50-100 mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Few	0.40 / 7.5 No dispersion after 10 minutes Partial slaking
B22 0.60-1.00 Clear 20-50 mm	Medium clay	Strong / Firm Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	10YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Few	0.80 / 7.5 No dispersion after 10 minutes Complete slaking
C 1.00-1.20 EOTP	-	-	-	-	-	-	-

Table 5-24: Soil Chemistry for 11Bl(Ta), Analysed Site D24

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils vary between neutral to slightly alkaline to strongly alkaline
EC	Topsoil is very low. Subsoil is high
ECEC	Topsoil is low. Subsoil is moderate throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are strongly sodic
Ca:Mg	Topsoil is high. Subsoils are moderate throughout soil profile
P	Low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is loam Subsoil is medium clay to light clay to depth
EAT	Topsoil indicates disperses after remoulding Subsoil indicates some dispersion
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.040

Key Analysis	Assessment Summary
SALFPREDICT PAWC (PAWCER) Total (mm/80cm)	78.40
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where no value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for barley, cotton, sorghum, sunflower and wheat crop land uses. Maize and oat present 75 and 50% yield. The SPC is assessed as a Sodosol. As such, it has been assessed against the pH limitations. It was assessed from 0.80 mbgl, pH was > 9.0, therefore the PAWC based on the SALFPREDICT modelling has been assessed at this depth. There are limitations for ERD, relating to subsoil pH.
Summary of limitations and management	The soil has less than favourable PAWC, low nutrient levels, fertility status, moderately deep sodic soils and hard-setting surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.20 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 11.1 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.90 mbgl.

5.1.13 Soil Profile Class 12Da(Te): Grey Dermosol

Overview

12Da(Te) is characterised by very deep clay loam on structured clay soil with a firm surface. The SPC is associated with residual rises with sparse brigalow. The SPC is situated in two UMAs located centre west and to the south east of the study area, over an area of 203.00 ha.

Analysed site

The nominated analysed site, site D32, is summarised in Table 5-25. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-26. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-25: Land Summary 12Da(Te), Analysed Site D32

Item	Description
Analysed Site	D32
UMAs	57, 58
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.80 m)
Location GDA2020 ZONE 55	686675 7375468
Current Use	Beef Cattle Grazing
Geology (Dominant)	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Residual rise, gently undulating rises
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / 2.0, No erosion observed
Surface condition / Surface coarse fragments or segregations	Firm, < 2% coarse fragments 6-20 mm

Table 5-25: Land Summary 12Da(Te), Analysed Site D32 (continued)

SPC ASC Order / Suborder	Grey Dermosol						
Ass. Land System / Soil	Blackwater, Daunia / Teviot						
Total area (ha)	203.00						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abund-ance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Clay loam Sandy	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking
B21 0.20-0.50 Gradual 50-100 mm	Medium clay Sandy	Moderate / Very strong Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	7.5YR4 / 2 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.35 / 6.5 No dispersion after 10 minutes Partial slaking
B22 0.50-0.80 Clear 20-50 mm	Medium clay Sandy	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.65 / 8.0 Moderate dispersion after 10 minutes Partial slaking
B23 0.80-1.20 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm No Slickensides	2-10% calcium carbonate 2-6mm	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	1.00 / 8.0 Slight Dispersion after 10 minutes Partial slaking
B24 1.20-1.80 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	10YR3 / 1 Very dark grey Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.50 / 7.0 No dispersion after 10 minutes Complete slaking

Table 5-26: Soil Chemistry for 12Da(Te), Analysed Site D32

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils vary between neutral to slightly alkaline to moderately alkaline
EC	Topsoil is very low. Subsoil increases from very low to very high below 1.10 m
ECEC	Topsoil is low. Subsoil is moderate throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are strongly sodic
Ca:Mg	Topsoil is very high. Subsoils are high decreasing to moderate at depth
P	Low in topsoil. Low in the B21 horizon of subsoil
PSA	Topsoil is loam Subsoil varies between clay loam and light medium clay at depth
EAT	Topsoil indicates disperses after remoulding Subsoil indicates dispersion after remoulding some dispersion to 1.10 m, with no dispersion to 1.40 m with some dispersion to 1.80 m

Key Analysis	Assessment Summary
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.040
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	77.50
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where no value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all land uses. There are no limitations for ERD.
Summary of limitations and management	The soil has less than favourable PAWC, low nutrient levels, fertility and firm surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil to 0.90 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

Associated SLR (2023) Site Assessment

The analysed site undertaken by SLR (2023) was site B12, a Eutrophic Red Chromosol within Soil Unit 3 (Eutrophic Black Brown Dermosols). No soil profile was provided within the SLR (2023) report, therefore, no review of the fieldwork data or photos could be assessed.

GTE conducted site D32 within 1.7 m of B12 and the classification indicated it was a Grey Dermosol. Based on the observation sites undertaken by GTE, no Red Chromosol was encountered, therefore, this is considered an anomaly, more so than a sub-dominant soil type.

The laboratory analysis was utilised with D32 laboratory providing additional data and completing data gaps based on the nominated laboratory suite.

5.1.14 Soil Profile Class 13Bl(Ta): Brown Dermosol

Overview

13Bl(Ta) is characterised by very deep, clay soil with a firm surface, with coarse fragments, mottled subsoils. The SPC is associated with flat, gently undulating plains with sparse current bush. The SPC is located within three UMAs situated in the north west and south of the study area, over an area of 111.47 ha.

Analysed site

The nominated analysed site, site D36, is summarised in Table 5-27. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-28. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-27: Land Summary 13Bl(Ta), Analysed Site D36

Item	Description
Analysed Site	D36
UMAs	59, 60, 61

Representative Landscape Photograph



Soil Profile Photograph



(Profile viewed top to bottom, 1.20 m)

Location GDA2020 ZONE 55	689214 73732
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Flat plain, gently undulating plains
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	2.0 / 2.0, No erosion observed

Table 5-27: Land Summary 13Bl(Ta), Analysed Site D36 (continued)

Surface condition / Surface coarse fragments or segregations	Firm, 2-10% coarse fragments 20-60 mm
SPC ASC Order / Suborder	Brown Dermosol
Associated Land System / Soil	Blackwater, Daunia / Taurus
Total area (ha)	111.47
Phases and / or variants	None

Soil Profile Morphology Summary

Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Medium heavy clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	< 2% coarse fragments 20-60 mm	7.5YR4 / 2 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking
B21 0.20-0.40 Gradual 50-100 mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4 / 2 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.30 / 6.5 No dispersion after 10 minutes Partial slaking
B22 0.40-0.70 Gradual 50-100 mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6 mm 2-10% calcium carbonate 6-20 mm	7.5YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.55 / 7.0 No dispersion after 10 minutes Partial slaking
B23 0.70-0.90 Gradual 50-100 mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6 mm 2-10% calcium carbonate 6-20 mm	7.5YR5 / 4 Reddish brown Mottles: Pale brown Very few < 2% Medium 5-15 mm	Dry Moderately well drained	Very fine < 1 mm Few	0.80 / 8.0 No dispersion after 10 minutes Partial slaking
B24 0.90-1.70 Gradual 50-100 mm	Medium clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6 mm 2-10% coarse fragments 6-20 mm	10YR5 / 6 Yellowish brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.30 / 7.5 No dispersion after 10 minutes Complete slaking
BC 1.70-2.00 EOTP	Sandy loam	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20 mm 20-50% coarse fragments 2-6 mm	10YR5 / 6 Yellowish brown No mottles or bleaching	Dry Moderately well drained	No roots	1.85 / 7.5 No dispersion after 10 minutes Complete slaking

Table 5-28: Soil Chemistry for 13Bl(Ta), Analysed Site D36

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is moderately alkaline. Subsoils vary between moderately alkaline to strongly alkaline
EC	Topsoil is very low. Subsoil is low increasing to high throughout the soil profile
ECEC	Topsoil is moderate. Subsoil is high decreasing to low throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are non-sodic increasing to sodic below 1.40 m
Ca:Mg	Topsoil is very high. Subsoils are high reducing to moderate
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is light medium clay Subsoil is medium clay to clay loam and light clay at depth
EAT	Topsoil reports dispersion after remoulding Subsoil reports no dispersion with carbonates and gypsum present to 1.40 m. Some dispersion below 1.40 m is reported
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.018
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	97.8
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where no value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all land uses. The SPC is assessed as a Dermosol. As such, it has been assessed against the pH limitations. It was assessed from 0.50 mbgl, pH was < 9.0, therefore the PAWC based on the SALFPREDICT modelling has been assessed at this depth. There are limitations for ERD, relating to subsoil pH.
Summary of limitations and management	The soil has less than favourable PAWC, very low nutrient levels, fertility status and firm setting surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 1.40 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 6.8 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.40 mbgl.

5.1.15 Soil Profile Class 14Bl(Ro): Black Vertosol

Overview

14Bl(Ro) is characterised by very deep, black on grey-brown clay soil with a cracking surface and strong structured subsoils. The SPC is associated with low lying areas and drainage depressions located near residual rises with sparse bauhinia vegetation. The SPC is situated in one UMA located to the centre south over an area of 64.20 ha.

Analysed site

The nominated analysed site, site D37, is summarised in Table 5-29. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-30. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-29: Land Summary 14Bl(Ro), Analysed Site D37

Item	Description
Analysed Site	D37
UMAs	35
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.90 m)
Location GDA2020 ZONE 55	689679 7372849
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse bauhinia
Disturbance	Extensive clearing
Landform pattern / pattern	Gently undulating rises, drainage depression
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	2.0 / 2.0, No erosion observed

Table 5-29: Land Summary 14Bl(Ro), Analysed Site D37 (continued)

Surface condition / Surface coarse fragments or segregations		Cracking, < 2% coarse fragments 20-60 mm					
SPC ASC Order / Suborder		Black Vertosol					
Associated Land System / Soil		Blackwater, Daunia / Rolleston					
Total area (ha)		64.20					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	< 2% coarse fragments 6-20 mm	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking
B21 0.20-0.60 Gradual 50-100 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3 / 1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.35 / 8.0 No dispersion after 10 minutes Partial slaking
B22 0.60-1.30 Diffuse > 100 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown Mottles: Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	0.95 / 7.5 No dispersion after 10 minutes Complete slaking
B23 1.30-1.90 EOTP	Medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20 mm	10YR5 / 3 Brown Mottles: Orange, 10-20%, 5-15 mm Dark grey, 10%-20% 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.55 / 7.5 No dispersion after 10 minutes Complete slaking

Table 5-30: Soil Chemistry for 14Bl(Ro), Analysed Site D37

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is moderately alkaline. Subsoils are generally moderately alkaline
EC	Topsoil is low. Subsoil varies from low to very high throughout soil profile
ECEC	Topsoil is high. Subsoil is very high to high throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are non-sodic to 0.50 m. Increases to sodic below 0.50 m
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to high at 1.10 m
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is medium heavy clay Subsoil is medium heavy clay to light clay to depth

Key Analysis	Assessment Summary
EAT	Topsoil reports no dispersion. Carbonates and gypsum may be present Subsoil reports no dispersion. Carbonates and gypsum may be present. Below 1.40 m, some dispersion is reported
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.040
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	124.30
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where no value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is above 90% for all crop land uses. There are no limitations for ERD.
Summary of limitations and management	The soil has favourable PAWC, very low nutrient levels, fertility status. Topsoil pH is moderately alkaline with low EC, non-sodic levels and favourable surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 0.50 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 0.00 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.00 mbgl. Based on this calculation result, if visual observations of sodic soils are observed, an application of 2.5 t/ha may be adequate.

Associated SLR (2023) Site Assessment

The analysed site undertaken by SLR (2023) was site B05, a Self-Mulching Black Vertosol within Soil Unit 1 (Self-Mulching Black Brown Vertosol). No soil profile was provided within the SLR (2023) report, therefore, no review of the fieldwork data or photos could be assessed.

GTE conducted site D37 within 3.0 m of B05 and the classification indicated it was a Black Vertosol.

The laboratory analysis was utilised with D37 laboratory providing additional data and completing data gaps based on the nominated laboratory suite.

5.1.16 Soil Profile Class 15BI(Ro): Brown Vertosol

Overview

15BI(Ro) is characterised by moderately deep clay soil with a self-mulching surface, deep bedrock. The SPC is associated with gently undulating plains with sparse bauhinia. The SPC is situated within five UMAs, the majority to the north of the study area, over an area of 1,040.57 ha.

Analysed site

The nominated analysed site, site D39, is summarised in Table 5-31. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-32. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-31: Land Summary 15BI(Ro), Analysed Site D39

Item	Description
Analysed Site	D39
UMAs	62, 63, 64 ,65, 66
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.65 m)
Location GDA2020 ZONE 55	690706 7372655
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse bauhinia
Disturbance	Extensive clearing
Landform pattern / pattern	Gently undulating plain, flat plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	2.0 / 1.0, No erosion observed
Surface condition / Surface coarse fragments or segregations	Self-mulching, < 2% coarse fragments 20-60 mm

Table 5-31: Land Summary 15Bl(Ro), Analysed Site D39 (continued)

SPC ASC Order / Suborder		Brown Vertosol					
Associated Land System / Soil		Blackwater, Daunia / Rolleston					
Total area (ha)		1,040.57					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Medium clay Sandy Fine	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking
B21 0.20-0.50 Gradual 50-100 mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 20-50 mm Slickensides	< 2% coarse fragments 2-6 mm	7.5YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Medium 2-5 mm Common	0.35 / 8.0 No dispersion after 10 minutes Partial slaking
B22 0.50-0.90 Clear 20-50 mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	50-90% coarse fragments 200-600 mm 50-90% coarse fragments 0.6m-2.0 m	10YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Few	0.70 / 8.0 No dispersion after 10 minutes Partial slaking
BC 0.90-1.40 Gradual 50-100 mm	Medium heavy clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20 mm	10YR4 / 4 Dark yellowish brown Mottles: Yellow Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.15 / 8.0 No dispersion after 10 minutes Partial slaking
R 1.40-1.65 EOTP	-	-	-	-	-	-	-
	Refusal on bedrock						

Table 5-32: Soil Chemistry for 15Bl(Ro), Analysed Site D39

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils are moderately alkaline increasing to strongly alkaline
EC	Topsoil is very low. Subsoil increases from low to very high throughout soil profile
ECEC	Topsoil is moderate. Subsoil is generally high throughout soil profile
ESP	Topsoil is non-sodic. Subsoils are non-sodic to 0.80 m. Increases to sodic and strongly sodic below 1.10 m
Ca:Mg	Topsoil is very high. Subsoils are generally very high
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is medium clay

Key Analysis	Assessment Summary
	Subsoil is medium clay, clay loam to light clay to depth
EAT	Topsoil reports dispersion after remoulding Subsoil reports no dispersion. Carbonates and gypsum may be present. Subsoil below 0.80 m, some dispersion is reported
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.040
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	100.90
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at or above 90% for all crop land uses. There are no limitations for ERD.
Summary of limitations and management	The soil has favourable PAWC, very low nutrient levels, favourable surface conditions with moderately deep subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 0.60 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 17.1 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.80 mbgl.

5.1.17 Soil Profile Class 16Bl(Ta): Grey Sodosol

Overview

16Bl(Ta) is characterised by very shallow clay loam surfaced on clay subsoils with a hard-setting on shallow bedrock. The SPC is associated with hillslopes and Bauhinia. The SPC is situated in three UMAs located in the centre west and southern portions of the study area, over an area of 38.52 ha.

Analysed site

The nominated analysed site, site D43, is summarised in Table 5-33. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-34. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-33: Land Summary 16Bl(Ta), Analysed Site D43

Item	Description
Analysed Site	D43
UMAs	67, 68, 69
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 0.35 m)
Location GDA2020 ZONE 55	685753 7378011
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse bauhinia
Disturbance	Extensive clearing
Landform pattern / pattern	Gently undulating plain, flat plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / 1.0, Scald erosion observed
Surface condition / Surface coarse fragments or segregations	Hard-setting, < 2% coarse fragments 20-60 mm

Table 5-33: Land Summary 16Bl(Ta), Analysed Site D43 (continued)

SPC ASC Order / Suborder		Grey Sodosol					
Associated Land System / Soil		Blackwater, Daunia / Taurus					
Total area (ha)		38.52					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.10 Clear 20-50 mm	Clay Loam Sandy Fine	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR4 / 2 Brown No mottles or bleaching	Dry Well drained	Fine 1-2 mm Common	0.05 / 6.0 Moderate dispersion after 10 minutes Partial slaking
B21 0.10-0.20 Clear 20-50 mm	Medium heavy clay	Moderate / Very firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Few	0.15 / 6.0 Slight Dispersion after 10 minutes Partial slaking
B22 0.20-0.40 EOBH	Medium clay	Strong / Very firm Subangular blocky 5-10 mm No Slickensides	< 2% coarse fragments 6-20 mm	2.5Y4 / 1 Dark grey No mottles or bleaching	Dry Imperfectly drained	Very fine < 1 mm Few	0.25 / 8.0 No dispersion after 10 minutes Partial slaking
	Refusal on bedrock						

Table 5-34: Soil Chemistry for 16Bl(Ta), Analysed Site D43

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils are moderately alkaline
EC	Topsoil is low. Subsoil is moderate
ECEC	Topsoil is low. Subsoil is moderate
ESP	Topsoil is non-sodic. Subsoils are sodic
Ca:Mg	Topsoil is high. Subsoils are high
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is clay loam Subsoil is medium clay
EAT	Topsoil reports some dispersion Subsoil reports some dispersion
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.030
SALFPREDICT PAWC (PAWCER) Total (mm/40cm)	60.3

Key Analysis	Assessment Summary
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is above 90% for all crop land uses. The limitation for ERD is soil depth of 0.35 m.
Summary of limitations and management	The soil has unfavourable PAWC, low nutrient levels, unfavourable surface conditions and shallow subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.40 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 4.6 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.10 mbgl.

5.1.18 Soil Profile Class 17Bl(Ro): Grey Vertosol

Overview

17Bl(Ro) is characterised by a deep clay uniform soil with a cracking surface. The SPC is associated with gently undulating plains with sparse bauhinia and brigalow. The SPC is situated in four UMAs located in the centre and southern areas of the study area, over an area of 348.24 ha.

Analysed site

The nominated analysed site, site D44, is summarised in Table 5-35. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-36. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-35: Land Summary 17Bl(Ro), Analysed Site D44

Item	Description
Analysed Site	D44
UMAs	70, 71, 72, 73
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.60 m)
Location GDA2020 ZONE 55	691122 7370776
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse Bauhinia and Brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Gently undulating plain, flat plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / 1.0, No erosion observed
Surface condition / Surface coarse fragments or segregations	Cracking, no coarse fragments

Table 5-35: Land Summary 17Bl(Ro), Analysed Site D44 (continued)

SPC ASC Order / Suborder		Grey Vertosol					
Associated Land System / Soil		Blackwater, Daunia / Rolleston					
Total area (ha)		348.24					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.10 Clear 20-50 mm	Light clay Sandy	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	< 2% coarse fragments 6-20 mm	7.5YR3 / 2 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.05 / 6.0 No dispersion after 10 minutes Partial slaking
B21 0.10-0.20 Clear 20-50 mm	Light medium clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	< 2% coarse fragments 20-60 mm	7.5YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.15 / 6.5 No dispersion after 10 minutes Partial slaking
B22 0.20-0.40 Gradual 50-100 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	< 2% coarse fragments 2-6 mm	7.5YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.30 / 8.0 No dispersion after 10 minutes Partial slaking
B23 0.40-0.80 Diffuse > 100 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	< 2% coarse fragments 2-6 mm < 2% calcium carbonate 2-6 mm	7.5YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.60 / 8.0 No dispersion after 10 minutes Complete slaking
B24 0.80-1.20 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	2-10% coarse fragments 2-6 mm < 2% calcium carbonate 2-6 mm Manganese nodules	7.5YR4 / 4 Brown Mottles: Pale Grey Few 2%-10% Few < 5 mm	Dry Moderately well drained	Very fine < 1 mm Few	1.00 / 7.5 No dispersion after 10 minutes Complete slaking
C 1.20-1.60 EOTP	-	-	-	-	-	-	-

Table 5-36: Soil Chemistry for 17Bl(Ro), Analysed Site D44

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is slightly acidic to neutral. Subsoils are neutral to slightly alkaline increasing to strongly alkaline
EC	Topsoil is low. Subsoil increases from low to high throughout the profile
ECEC	Topsoil is low. Subsoil is moderate to high

Key Analysis	Assessment Summary
ESP	Topsoil is non-sodic. Subsoils are sodic
Ca:Mg	Topsoil is very high. Subsoils are very high to high at 1.10 m below
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is clay loam Subsoil is light clay increasing to medium heavy clay
EAT	Topsoil reports dispersion after being remoulded Subsoil reports dispersion after being remoulded and increases to some dispersion below 1.40 m
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.015
SALFPREDICT PAWC (PAWCER) Total (mm/30cm)	114.40
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at or above 90% for all crop land uses. There are no limitations for ERD.
Summary of limitations and management	The soil has a favourable PAWC, very low nutrient levels, and unfavourable surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below 0.10 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 5.0 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.50 mbgl

Associated SLR (2023) Sites Assessment

The analysed site undertaken by SLR (2023) was site B01, a Eutrophic Red Dermosol within Soil Unit 2B (Eutrophic Red Dermosols). No soil profile was provided within the SLR (2023) report, therefore, no review of the fieldwork data or photos could be assessed.

GTE conducted site D44 within 5.1 m of B01 and the classification indicated it was a Grey Vertosol. Based on the observation sites undertaken by GTE, no Red Dermosol was encountered, therefore, this is considered an anomaly, more so than a sub-dominant soil type.

The laboratory analysis was utilised with D44 laboratory providing additional data and completing data gaps based on the nominated laboratory suite.

SLR (2023) site B07 reported a Self-Mulching Vertosol. Based on GTE field observations across UMA 72, and generally across the project site, no ASC of Red Vertosol was observed. It is therefore, aggregated within the larger observed ASC of Grey Vertosol.

5.1.19 Soil Profile Class 18Bl(Ro): Grey Vertosol

Overview

18Bl(Ro) is characterised by a very deep, grey clay uniform soil with a self-mulching surface. The SPC is associated with gently undulating plains with sparse bauhinia and brigalow. The SPC is situated in one UMA located in the centre-southern portion of the study area, over an area of 76.36 ha.

Analysed site

The nominated analysed site, site D45, is summarised in Table 5-37. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-38. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-37: Land Summary 18Bl(Ro), Analysed Site D45

Item	Description
Analysed Site	D45
UMAs	74

Representative Landscape Photograph



Soil Profile Photograph



(Profile viewed top to bottom, 1.60 m)

Location GDA2020 ZONE 55	689137 7374206
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse Bauhinia and Moreton Bay Ash
Disturbance	Extensive clearing
Landform pattern / pattern	Gently undulating plain, flat plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Moderate
Slope (%) / Erosion	< 1.0 / < 1.0, Scald erosion observed
Surface condition / Surface coarse fragments or segregations	Surface flake, no coarse fragments

Table 5-37: Land Summary 18Bl(Ro), Analysed Site D45 (continued)

SPC ASC Order / Suborder		Grey Vertosol					
Associated Land System / Soil		Blackwater, Daunia / Rolleston					
Total area (ha)		76.36					
Phases and / or variants		None					
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Medium heavy clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2 mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking
B21 0.20-0.40 Gradual 50-100 mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.30 / 8.0 No dispersion after 10 minutes Partial slaking
B22 0.40-0.80 Diffuse > 100 mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.60 / 7.5 No dispersion after 10 minutes Partial slaking
B23 0.80-1.40 Diffuse > 100 mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3 / 1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Few	1.10 / 7.5 No dispersion after 10 minutes Complete slaking
B24 1.50-2.00 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3 / 1 Very dark grey Mottles: Brown Few 2%-10% Few < 5 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.75 / 6.0 No dispersion after 10 minutes Partial slaking
	Refusal on cemented soil						

Table 5-38: Soil Chemistry for 18Bl(Ro), Analysed Site D45

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils are moderately alkaline decreasing to slightly acidic to neutral
EC	Topsoil is low. Subsoil levels reported at very low increasing to moderate
ECEC	Topsoil is moderate. Subsoil is high to moderate at depth
ESP	Topsoil is non-sodic. Subsoils are non-sodic
Ca:Mg	Topsoil is very high. Subsoils are very high

Key Analysis	Assessment Summary
P	Low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is clay loam Subsoil is light medium clay increasing to medium heavy clay
EAT	Topsoil reports dispersion after being remoulded Subsoil reports no dispersion, carbonate and gypsum present to 1.10 m. Some dispersion is reported below 1.10 m
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.030
SALFPREDICT PAWC (PAWCER) Total (mm/30cm)	104.50
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is above 90% for all crop land uses. There are no limitations for ERD.
Summary of limitations and management	The soil has a favourable PAWC, very low nutrient levels and favourable surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil to 2.00 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

5.1.20 Soil Profile Class 19Bl(Ro): Brown Vertosol

Overview

19Bl(Ro) is characterised by very deep, brown clay soils with a surface flake and strong structured subsoils. The SPC is associated with gently undulating plains and rises with sparse bauhinia and brigalow vegetation. The SPC is situated across six UMAs, the majority in the northern portion of the study area, over an area of 756.86 ha.

Analysed site

The nominated analysed site, site D52 is summarised in Table 5-39. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-40. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-39: Land Summary SPC 19Bl(Ro), Analysed Site D52

Item	Description
Analysed Site	D52
UMAs	75, 76, 77, 78, 79, 80
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 2.20 m)
Location GDA2020 ZONE 55	688782 7376440
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse Bauhinia and brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Flat plain, gently undulating rises
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	1.0 / 1.0, No erosion observed

Surface condition / Surface coarse fragments or segregations	Surface flake, < 2% coarse fragments 6-20 mm
SPC ASC Order / Suborder	Brown Vertosol
Associated Land System / Soil	Blackwater, Daunia / Rolleston
Total area (ha)	756.86
Phases and / or variants	None

Soil Profile Morphology Summary

Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Light clay Sandy	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 6-20 mm	10YR3 / 2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.10 / 6.5 No dispersion after 10 minutes No slaking
B21 0.20-0.40 Clear 20-50 mm	Medium clay Sandy	Strong / Strong Subangular blocky 20-50 mm Slickensides	< 2% coarse fragments 2-6 mm	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0..30 / 7.0 No dispersion after 10 minutes No slaking
B22 0.40-1.00 Gradual 50-100 mm	Medium clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% calcium carbonate 6-20 mm < 2% coarse fragments 2-6 mm	10YR4 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.70 / 8.0 No dispersion after 10 minutes Complete slaking
B23 1.00-1.70 Diffuse > 100 mm	Medium heavy clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	< 2% coarse fragments 2-6 mm	10YR5 / 3 Brown Mottles: Dark Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.35 / 7.5 No dispersion after 10 minutes Partial slaking
B24 1.70-2.20 EOTP	Medium clay Sandy Coarse	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6 mm	10YR4 / 3 Brown Mottles: Dark Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	1.95 / 7.5 No dispersion after 10 minutes Partial slaking

Table 5-40: Soil Chemistry for 19Bl(Ro), Analysed Site D52

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils vary between moderately alkaline and neutral to slightly alkaline
EC	Topsoil is very low. Subsoil varies from very low to very high throughout soil profile
ECEC	Topsoil is low. Subsoil varies from very low to very high throughout soil profile
ESP	Non-sodic levels in topsoil. Subsoils are non-sodic, increasing to sodic below 1.40 m
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to moderate at 1.40 m

Key Analysis	Assessment Summary
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is clay loam Subsoil is clay loam to light clay
EAT	Topsoil disperses after remoulding Subsoil reports no dispersion. Carbonates and gypsum may be present. Some dispersion below 0.80 m
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.030
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	83.6
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all crop land uses except Maize. Maize was reported at 75% yield within 0.60 m. There are no limitations for ERD.
Summary of limitations and management	The soil has less than favourable PAWC, low nutrient levels, fertility status. Topsoil pH is neutral with very low EC, non-sodic levels and favourable surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 1.40 mbgl may benefit gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 9.3 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.70 mbgl.

SLR (2023) Sites associated with 19Bl(Ro)

SLR (2023) site B22 reported a Self-Mulching Black Vertosol. On review of the major colours within the upper 0.50 m of the B21 horizon, the soil profile was classified as a Brown Vertosol. This fits in with the SPC and associated UMA 76, which includes this site.

5.1.21 Soil Profile Class 20Bl(Ro): Grey Vertosol

Overview

20Bl(Ro) is characterised by moderately deep, uniform grey clay soils with surface flake and strong structured clay subsoils. The SPC is associated with gently undulating plains with open woodland including brigalow vegetation. The SPC is situated in one UMA, located in the southern portion of the study area, over an area of 27.81 ha.

Analysed site

The nominated analysed site, site D58 is summarised in Table 5-41. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-42. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-41: Land Summary 20Bl(Ro), Analysed Site D58

Item	Description
Analysed Site	D58
UMAs	81

Representative Landscape Photograph



Soil Profile Photograph



(Profile viewed top to bottom, 0.80 m)

Location GDA2020 ZONE 55	691692 7371103
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Open woodland including brigalow
Disturbance	Limited clearing
Landform pattern / pattern	Flat plain, gently undulating plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Moderate well / moderate
Slope (%) / Erosion	2.0 / 1.0, No erosion observed

Surface condition / Surface coarse fragments or segregations	Surface flake, < 2% coarse fragments 6-20 mm
SPC ASC Order / Suborder	Grey Vertosol
Associated Land System / Soil	Blackwater/ Rolleston
Total area (ha)	27.81
Phases and / or variants	None

Soil Profile Morphology Summary

Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Medium clay	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking
B21 0.20-0.40 Clear 20-50 mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4 / 1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.30 / 7.5 Slight Dispersion after 10 minutes Partial slaking
B22 0.40-0.80 EOBH	Medium heavy clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm Slickensides	< 2% calcium carbonate 2-6 mm	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Common	0.60 / 8.0 No dispersion after 10 minutes Complete slaking
	Refusal on bedrock						

Table 5-42: Soil Chemistry for 20Bl(Ro), Analysed Site D58

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is moderately alkaline. Subsoils vary between moderately alkaline and strongly alkaline
EC	Topsoil is very low. Subsoil increases from low to high throughout soil profile
ECEC	Topsoil is high. Subsoil decreases from high to moderate throughout soil profile
ESP	Topsoil is non-sodic. Subsoils are non-sodic
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to high from 0.70 m
P	Very low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is light medium clay Subsoil is light medium clay to light clay
EAT	Topsoil disperses after remoulding Subsoil reports no dispersion. Carbonates and gypsum may be present. Some dispersion below 0.80 m
Surface K-Factor (GTE)	Low (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.018
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	98.7

Key Analysis	Assessment Summary
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is at 90% for all crop land uses except Maize. Maize was reported at 75% yield within 0.60 m. There are no limitations for ERD.
Summary of limitations and management	The soil has favourable PAWC, very low nutrient levels and fertility status. Topsoil pH is neutral with very low EC, non-sodic levels, very high cation exchange and favourable surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil to 0.80 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

5.1.22 Soil Profile Class 21Bl(Ta): Grey Sodosol

Overview

21Bl(Ta) is characterised by very deep, texture contrast brown sandy loams on grey and yellow brown mottled clay subsoils with a hard-setting surface. The SPC is associated with gently undulating plains with sparse Brigalow vegetation on grasslands. The SPC is situated in one UMA, located in the centre-east portion of the study area, over an area of 167.19 ha.

Analysed site

The nominated analysed site, site D59, was undertaken to complete data gaps in the existing SLR (2023) site, B21, and is summarised in Table 5-43. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-44. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-43: Land Summary 21Bl(Ta), Analysed Site D59

Item	Description
Analysed Site	D59
UMAs	82
Representative Landscape Photograph	**Soil Profile Photograph**
	 (Profile viewed top to bottom, 1.80 m)
Location GDA2020 ZONE 55	691156 7377835
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse brigalow
Disturbance	Extensive clearing
Landform pattern / pattern	Simple slope, gently undulating plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Imperfect / Slow
Slope (%) / Erosion	2.0 / 1.0, No erosion observed

Table 5-43: Land Summary 21Bl(Ta), Analysed Site D59 (continued)

Surface condition / Surface coarse fragments or segregations	Hard-setting, no coarse fragments						
SPC ASC Order / Suborder	Grey Sodosol						
Associated Land System / Soil	Blackwater / Taurus						
Total area (ha)	167.19						
Phases and / or variants	None						
Soil Profile Morphology Summary							
Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A1 0.00-0.20 Clear 20-50 mm	Sandy loam	Weak / Weak Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR3 / 2 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2 mm Many	0.10 / 6.0 No dispersion after 10 minutes Complete slaking
A2 0.20-0.45 Abrupt 5-20 mm	Sandy loam	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4 / 2 Brown No mottles or bleaching	Dry Well drained	Fine 1-2 mm Common	0.33 / 6.5 No dispersion after 10 minutes Complete slaking
B21 0.45-0.90 Gradual 50-100 mm	Medium heavy clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	< 2% coarse fragments 2-6 mm	7.5YR4 / 1 Dark grey Mottles: Brown Many 20%-50% Medium 5-15 mm	Dry Imperfectly drained	Very fine < 1 mm Few	0.65 / 8.5 Slight Dispersion after 10 minutes Partial slaking
B22 0.90-1.80 EOTP	Medium heavy clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	10-20% calcium carbonate 20-60 mm 10-20% calcium carbonate 6-20 mm Coarse fragments < 2%, 2-6 mm	10YR5 / 4 Yellowish brown Mottles: Dark Grey Common 10%-20% Few < 5 mm	Dry Imperfectly drained	No roots	1.35 / 8.5 No dispersion after 10 minutes Complete slaking

Table 5-44: Soil Chemistry for 21Bl(Ta), Analysed Site D59

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils vary between moderately alkaline and strongly alkaline
EC	Topsoil is low. Subsoil increases from low to very high throughout soil profile
ECEC	Topsoil is low. Subsoil varies between low and high throughout soil profile
ESP	Topsoil is non-sodic. Subsoils are sodic to strongly sodic, decreasing below 1.10 m
Ca:Mg	Topsoil is very high. Subsoils very between moderate to very high
P	Very low in topsoil. Very low in the B21 horizon of subsoil

Key Analysis	Assessment Summary
PSA	Topsoil is sandy loam Subsoil is light clay
EAT	Topsoil disperses after remoulding Subsoil reports some dispersion throughout the soil profile
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.030
SALFPREDICT PAWC (PAWCER) Total (mm/50cm)	43.7
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is above 90% for all crop land uses. The SPC is assessed as a Sodosol. As such, it has been assessed against the pH limitations. It was assessed from 0.50 mbgl, pH was > 9.0, therefore, the PAWC based on the SALFPREDICT modelling has been assessed at this depth. There are limitations for ERD, relating to subsoil pH.
Summary of limitations and management	The soil has less than favourable PAWC, very low nutrient levels, fertility status, low cation exchange, hard-setting surface conditions and sodic subsoils. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below 0.45 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 7.4 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.90 mbgl.

SLR (2023) Sites associated with 21Bl(Ta)

SLR (2023) site B21 reported a Subnatric Brown Sodosol within Soil Unit 1 (Self-Mulching Black Brown Vertosols). GTE conducted site D59 within 5.1 m of the original site and colour graded a Grey Sodosol. Based on the experience of two of GTE field personnel at the time, review of the SLR profile and observations onsite, the assessment is the area is a Grey Sodosol.

The laboratory analysis was utilised with D59 laboratory providing additional data and completing data gaps based on the nominated laboratory suite.

5.1.23 Soil Profile Class 22Bl(Wy): Brown Kandosol

Overview

22Bl(Wy) is characterised by deep, gradational textured, weakly structured soils with firm surfaces and loamy subsoils. The SPC is associated with gently undulating plains with sparse brigalow and bauhinia vegetation. The SPC is situated in one UMA, located in the southern portion of the study area, over an area of 13.54 ha.

Analysed site

The nominated analysed site, site D65, is summarised in Table 5-45. A summary of site key laboratory analysis assessment and summary of limitations and management is available in Table 5-46. Detailed site descriptions, Class IV site descriptions and the laboratory analysis summary are available in Appendix A, B and C, respectively.

Table 5-45: Land Summary 22Bl(Wy), Analysed Site D65

Item	Description
Analysed Site	D65
UMAs	83

Representative Landscape Photograph



Soil Profile Photograph



(Profile viewed top to bottom, 0.80 m)

Location GDA2020 ZONE 55	691894 7371606
Current Use	Cattle Grazing
Geology	Stratified Unit dominated by volcanic and metamorphic rock
Vegetation	Sparse brigalow and bauhinia
Disturbance	Extensive clearing
Landform pattern / pattern	Flat plain, gently undulating plain
Microrelief / Rock outcrop	No microrelief or rock outcrop
Drainage / Permeability	Moderate well / moderate
Slope (%) / Erosion	1.0 / 1.0, No erosion observed

Surface condition / Surface coarse fragments or segregations	Firm, < 2% coarse fragments 6-20 mm
SPC ASC Order / Suborder	Brown Kandosol
Associated Land System / Soil	Blackwater / Taurus, Wyesby
Total area (ha)	13.54
Phases and / or variants	None

Soil Profile Morphology Summary

Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH Dispersion Field Test
A11 0.00-0.05 Clear 20-50 mm	Sandy loam	Weak / Weak Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Rapidly drained	Very fine < 1 mm Many	0.03 / 6.5 No dispersion after 10 minutes Partial slaking
A12 0.05-0.20 Clear 20-50 mm	Sandy loam	Weak / Weak Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4 / 2 Dark greyish brown No mottles or bleaching	Dry Rapidly drained	Very fine < 1 mm Common	0.14 / 6.0 No dispersion after 10 minutes No slaking
A2 0.20-0.45 Gradual 50-100 mm	Sandy loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3 / 3 Dark brown No mottles or bleaching	Dry Well drained	Very fine < 1 mm Few	0.32 / 6.0 Slight Dispersion after 10 minutes Partial slaking
B21 0.45-0.80 Gradual 50-100 mm	Clay loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	< 2% coarse fragments 2-6 mm	10YR5 / 3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine < 1 mm Few	0.62 / 7.5 Moderate dispersion after 10 minutes Partial slaking
B21 0.80-1.00 EOBH No recovery	Silty loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	< 2% coarse fragments 2-6 mm	10YR5 / 3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.90 / 7.5 No dispersion after 10 minutes Complete slaking

Table 5-46: Soil Chemistry for 22Bl(Wy), Analysed Site D65

Key Analysis	Assessment Summary
Soil pH (H_20)	Topsoil is neutral to slightly alkaline. Subsoils vary between neutral to slightly alkaline to strongly alkaline at depth
EC	Topsoil is low. Subsoil increases from low to moderate at depth
ECEC	Topsoil is very low. Subsoil increases from very low to low throughout soil profile
ESP	Topsoil is non-sodic. Subsoils are non-sodic
Ca:Mg	Topsoil is very high. Subsoils are very high decreasing to high from 0.50 m

Key Analysis	Assessment Summary
P	Low in topsoil. Very low in the B21 horizon of subsoil
PSA	Topsoil is sandy loam Subsoil is clay loam to sandy clay loam
EAT	Topsoil disperses after remoulding Subsoil disperses after remoulding with some dispersion at 0.50 m, then no dispersion. Carbonates and gypsum may be present from 0.80 m. Some dispersion below 0.80 m
Surface K-Factor (GTE)	Moderate (Rosewell and Loch, 2002). Estimate USLE (Rosewell, 1993) 0.030
SALFPREDICT PAWC (PAWCER) Total (mm/100cm)	73.2
ERD	Review of analytical data in SALFPREDICT, eight crop land uses (Section 4.4) all have 100% plant yield with the inclusion of rainfall, except Safflower where 7% value was provided. Based on calculated ECse value (SALFPREDICT) throughout the soil profile and a nominated rooting depth of 0.60 m, assessment against the plant salt-tolerance data (DERM, 2011) crop land use yield is above 90% for all crop land uses. There are no limitations for ERD.
Summary of limitations and management	The soil has less than favourable PAWC, low nutrient levels, very low cation exchange and unfavourable firm surface conditions. Topsoil resource may be recommended for use on flat to sloped areas. Subsoil to 0.45 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

6 LAND SUITABILITY ASSESSMENT

6.1 Agricultural Land Suitability

The assessment of the study area for agricultural land suitability includes evaluating the potential of the land for land management options such as cropping or grazing.

Agricultural land suitability assessment involves defining the classes to assess against the appropriate land management options (shown in Section 6.2) for the area based on available frameworks (shown in Section 6.3) and the land use requirements and limitations to assess the conditions for the land management options (shown in Section 6.4).

6.2 Land Suitability Classes

GALE (DSITI and DNRM, 2015) was utilised to assess Land Suitability Classes and ALC. GALE defines five Land Suitability Classes for use in Queensland (Table 6-1) in which the land suitability for agriculture (i.e., cropping or grazing) decreases progressively from Land Suitability Class 1 to Class 5, based on the severity of the land use limitations.

Table 6-1: Land Suitability Classes

Land Suitability Class	Suitability	Limitations[1]	Definition[2]
1	Suitable	Negligible	Highly productive land requiring only simple management practices to maintain economic production.
2	Suitable	Minor	Land with limitations that either constrain production or require more than the simple management practices of class 1 land to maintain economic production.
3	Suitable	Moderate	Land with limitations that either further constrain production or require more than those management practices of class 2 land to maintain economic production.
4	Unsuitable	Severe / Marginally suitable	Currently unsuitable land. The limitations are so severe that the sustainable use of the land in the proposed manner is precluded. In some circumstances, the limitations may be surmountable with changes to knowledge, economics or technology.
5	Unsuitable	Extreme	Land with extreme limitations that preclude any possibility of successful sustained use of the land in the proposed manner.

1 - Definitions from GALE (DSITI and DNRM, 2015) and LSAT (DME, 1995) where applicable
2 - Definitions from GALE (DSITI and DNRM, 2015)

Land rated as Land Suitability Classes 1 to 3 is considered suitable for agricultural land use with negligible to moderate limitations. It should be noted that with the use of soil improvement techniques (e.g., fertiliser, amelioration) Class 3 land may be just as productive as Class 1 or 2 land.

Land rated as Land Suitability Class 4 is unsuitable for agricultural land use due to the severity of one or more limitations. However, in some circumstances it may be possible to upgrade Class 4 land to a more suitable class with the implementation of considerable soil improvement measures.

Land rated as Land Suitability Class 5 is considered entirely unsuitable for the specified land use as the limitation(s) are so severe that the inputs required to initiate and maintain the specified land use are not sustainable.

6.3 Land Suitability Use and Assessments

The Regional Frameworks (DSITIA and DNRM, 2013) provides the attributes, limitations and suitability subclass values for land suitability limitations assessment.

In reviewing the Regional Frameworks (DSITIA and DNRM, 2013) suitability subclasses and attributes, the following assessments were undertaken:

- An assessment was undertaken for each SPC for the 13 land management options listed for the Suitability Framework for the Inland Fitzroy Southern Burdekin Area. These included:
    - Dryland cropping land uses, barley, chickpea, maize, millet, mungbean, oat, safflower, sorghum, soybean, sunflower, triticale and wheat.
    - Furrow irrigated cropping land uses, cotton.

It is noted that the Suitability Framework for the Inland Fitzroy and Southern Burdekin Area does not include beef cattle grazing (rainfed) as a subclass for a potential agricultural land use. Therefore, assessment of beef cattle grazing was completed using the LSAT (DME, 1995) beef cattle grazing land suitability frameworks for semi-arid sub tropics of Queensland with additional guidance from Shields and Williams (1991).

The associated limitations have been summarised in Section 6.4.

6.3.1 SLR (2023) Land Suitability Assessment Review

A review of SLR (2023) indicates a land suitability assessment was conducted for cropping and beef cattle grazing in accordance with current guidelines for cropping land use (GALE, DSITI and DNRM, 2015 and Regional Frameworks, DSITIA and DNRM, 2013) and nominated guidelines for beef cattle land use, including *A rule-set for land suitability assessment of sustainable beef cattle grazing on land rehabilitated after open cut coal mining in the Bowen Basin, Queensland.* Highlands Environmental, pp.1-10 (Queensland draft, Short, 2013).

Land use limitations were selected based on these guidelines and assessed against the Regional Frameworks (DSITIA and DNRM, 2013); however, no specific crop land uses were specified. Land suitability and land capability results are provided in Appendix E (SLR, 2023).

GTE's review of these sections and results indicate that although an assessment was conducted, GTE understands that this may not meet current expectations or be in accordance with the guidelines which is stated; for example, but not limited to:

- No individual cropping land uses are nominated for any SMU in Appendix E (SLR, 2023),
- No assessment of limitations for beef cattle grazing is presented (i.e., as per Appendix E) (SLR, 2023), just the results within Figure 5-6,
- No individual UMA assessment is addressed or present within the assessment, however, based on Figure 4-1 (SLR, 2023), only four UMAs were identified, and
- LCC was conducted; however, this is more suited for scales of 1:250,000 or smaller. The SLR (2023) assessment was undertaken exceeding a scale of 1:125,000, in which the LCC was not required.

Based on GTE's review of presented field and laboratory data within SLR's (2023) SALS assessment, GTE have undertaken a Land Suitability Assessment for the project site. Where relevant, field and laboratory data from SLR (2023) has been used, however, no land suitability or capability results have carried over to this SALS Assessment.

6.4 Land Use Limitations and Simple and Complex Diagnostic Attributes

The following land use limitations have been considered and proposed where applicable based on available information from field, laboratory and available report documents. The land use limitations are assessed on simple or complex diagnostic attributes. Simple diagnostic attributes are those that are measured in the field or laboratory and complex diagnostic attributes are made up of several contributing diagnostic attributes and are generally difficult to measure directly or calculate.

6.4.1 Cropping Suitability, Land Use Limitations

The following land use limitations have been considered where applicable based on available information, for the Suitability Framework for the Inland Fitzroy and Southern Burdekin Area:

- water erosion (E),
- erosion hazard, subsoil erodibility (Es),
- soil water availability (M),
- narrow moisture range (Pm),
- surface soil condition (Ps),
- rockiness (R),
- microrelief(Tm), and
- wetness (W).

The remaining limitations have been assessed by review of Table 8 of the GALE (DSITI and DNRM, 2015) where limitations have diagnostic attributes and indicators for the agricultural land uses.

6.4.2 Beef Cattle Grazing, Land Use Limitations

An assessment was undertaken for beef cattle grazing using the LSAT (DME, 1995) beef cattle grazing land suitability frameworks for the semi-arid sub tropics of Queensland. This assessment includes the following land use limitations:

- water availability,
- nutrient deficiency,
- soil physical factors,
- salinity,
- rockiness,
- microrelief,
- pH,
- wetness,
- topography,
- water erosion, and
- flooding.

Vegetation regrowth land use limitation is not assessed as this pertains to a management limitation and is excluded from the assessment.

Guidance was also taken from Shields and Williams (1991) and the expectations of the Queensland DoR with respect to the limitations, specifically water availability and salinity.

6.5 Regional Frameworks, Complex Limitations SPC Assessment Summary

The following sub-sections provide summaries of the Regional Frameworks and complex limitations for the SPCs.

6.5.1 Regional Frameworks SPC Assessment Summary

Desktop, field and laboratory data collected from analysed sites in the study area were reviewed against the Regional Frameworks (DSITIA and DNRM, 2013) limitations for each selected land use.

Table 6-2 providing a detailed description of the land attributes and limitations in the study area and the corresponding Land Suitability Classes providing a summary of the limitations for each SPC.

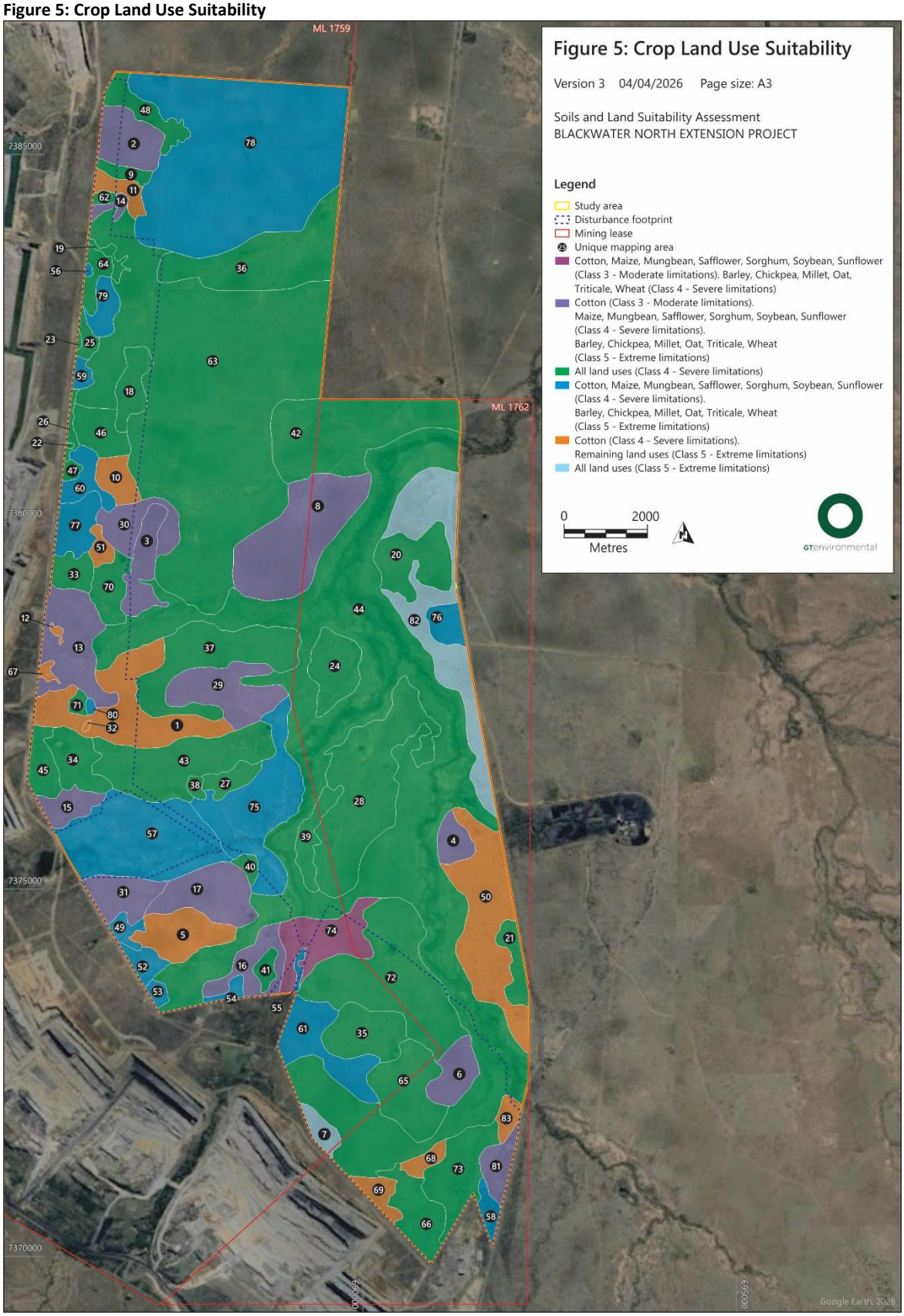
The assessed categories of Land Suitability Classes for each crop land use and associated SPC are detailed in Appendix H, summarised and shown in Table 6-2 and on Figure 5.

Table 6-2: SPCs for Regional Frameworks, Suitability Subclasses for Land Uses

Regional Frameworks Assessment	SPCs	UMAs	Area within the Study area (ha)	Area within the Project area (ha)
Cotton, Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 3). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 4)	18Bl(Ro)	74	76.36	54.59
Cotton (Class 3). Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	2Dn(Te)	2, 3, 4, 6, 8	810.11	438.27
	5Dn(Ro)	13, 14, 15, 16, 17		
	8Dn(Te)	29, 30, 31		
	20Bl(Ro)	81		
All land uses (Class 4)	3Bl(Te)	9	4,245.99	1,265.76
	6Bl(Pg)	18, 19, 20, 21, 22, 23		
	7Bl(Pg)	24, 25, 26, 28		
	9Dn(Ro)	33, 34, 36, 37, 38, 39, 40, 41, 42		
	10Ct(Ro)	43, 44, 45, 46, 47, 48		
	14Bl(Ro)	35		
	15Bl(Ro)	62, 63, 64, 65, 66		
	17Bl(Ro)	70, 71, 72, 73		
Cotton, Maize, Mungbean, Safflower, Sorghum, Soybean, Sunflower (Class 4). Barley, Chickpea, Millet, Oat, Triticale, Wheat (Class 5)	11Bl(Ta)	49, 52, 53, 54, 55	1,123.88	292.3
	12Da(Te)	57, 58		
	13Bl(Ta)	59, 60, 61		
	19Bl(Ro)	75, 76, 77, 78, 79, 80		
Cotton (Class 4). Remaining land uses (Class 5)	1Dn(Te)	1	466.54	247.39
	2Dn(Te)	5		
	4Bl(Te)	10, 11		
	8Dn(Te)	12		
	11Bl(Ta)	50, 51		
	16Bl(Ta)	32, 67, 68, 69		
	22Bl(Wy)	83		

Regional Frameworks Assessment	SPCs	UMAs	Area within the Study area (ha)	Area within the Project area (ha)
All land uses (Class 5)	2Dn(Te)	7	184.72	18.23
	21Bl(Ta)	82		

Figure 5: Crop Land Use Suitability



6.5.2 Beef Cattle Grazing SPC Assessment Summary

The SPCs were assessed against the Suitability for Beef Cattle Grazing LSAT (DME, 1995) (refer to Appendix E) with reference to beef cattle grazing in the *Land resource survey and evaluation of the Kilcummin area, Queensland* (Shields and Williams, 1991).

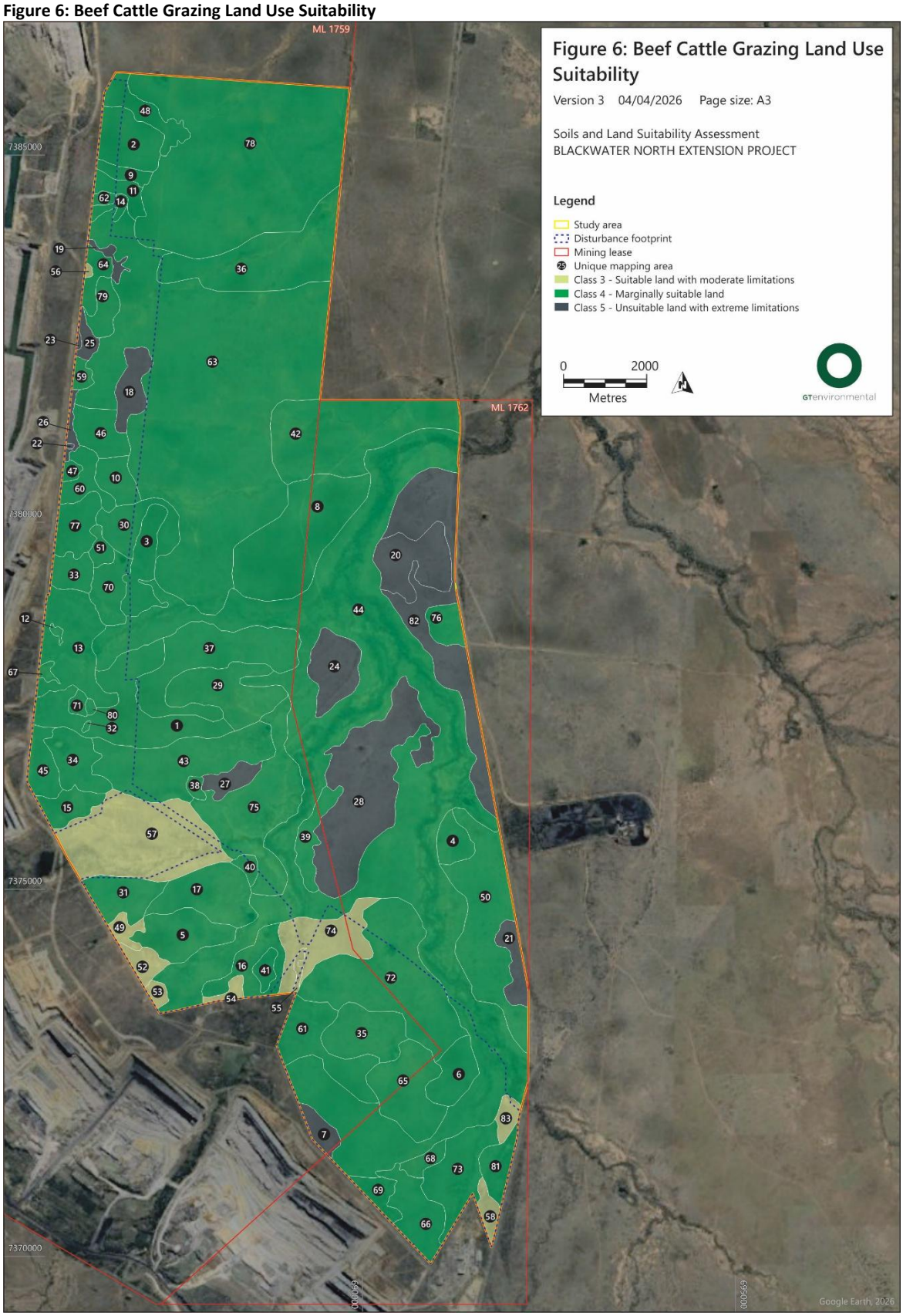
The assessment is presented in Appendix I and summarised in Table 6-3. This assessment will assist in determining the limitations for beef cattle grazing and the ALC with the regional frameworks overall class. Land suitability classes for beef cattle grazing is shown in Figure 6.

Table 6-3: SPCs for Beef Cattle Grazing, Suitability Subclasses for Land Uses

Beef Cattle Grazing Assessment	SPCs	UMAs	Area within the Study area (ha)	Area within the Project area (ha)
Class 3 Agricultural – Suitable land with moderate limitations	11Bl(Ta)	49, 52, 53, 54, 55, 56	345.45	167.23
	12Da(Te)	57, 58		
	18Bl(Ro)	74		
	22Bl(Wy)	83		
Class 4 Agricultural – Marginally suitable land	1Dn(Te),	1	5,931.87	2,065.57
	2Dn(Te)	2, 3, 4, 5, 6, 8		
	3Bl(Te)	9		
	4Bl(Te)	10, 11		
	5Dn(Ro)	13, 14, 15, 16, 17		
	8Dn(Te)	12, 29, 30, 31		
	9Dn(Ro)	33, 34, 36, 37, 38, 39, 40, 41, 42		
	10Ct(Ro)	43, 44, 45, 46, 47, 48		
	11Bl(Ta)	50, 51		
	13Bl(Ta)	59, 60, 61		
	14Bl(Ro)	35		
	15Bl(Ro)	62, 63, 64, 65, 66		
	16Bl(Ta)	32, 67, 68, 69		
	17Bl(Ro)	70, 71, 72, 73		
	19Bl(Ro)	75, 76, 77, 78, 79, 80		
	20Bl(Ro)	81		

Beef Cattle Grazing Assessment	SPCs	UMAs	Area within the Study area (ha)	Area within the Project area (ha)
Class 5 Agricultural – Unsuitable land with extreme limitations	2Dn(Te)	7	630.28	83.74
	6Bl(Pg)	18, 19, 20, 21, 22, 23		
	7Bl(Pg)	24, 25, 26, 28		
	21Bl(Ta)	82		

Figure 6: Beef Cattle Grazing Land Use Suitability



6.5.3 Regional Frameworks Summaries for Non-Analysed UMAs

As land suitability assessments are not conventionally conducted at such a scale in which additional laboratory analysis is available, the assessment of Class III, Class IV(a) and Class IV(b) sites may be undertaken. This assessment includes reviewing surface conditions such as slope, microrelief, rockiness and soil profile depth in SPC associated UMAs, in which the analysed site is not located.

This provides further accuracy for the Regional Frameworks for cropping and beef cattle grazing and ALC assessment across the study area. These may include SPC phases or variants observed in which a change was observed in an SPC e.g., depth to rock.

To allow for this additional information to be used to assess Land Suitability Classes for the Regional Frameworks, all UMAs will remain assessed as per their SPC analysed site land suitability and ALC unless surface conditions and / or soil profile indicated otherwise.

To provide further context to the information used, from this SALS Assessment and SLR (2023), UMA confidence codes (DES, 2021a and DoR, 2021) provide a qualitative statement in the relative confidence in delineating the spatial extent of a UMA and / or describing its attributes. UMA confidence codes range from one to six, depending on the level of desktop and / or fieldwork undertaken. UMA confidence codes have been applied to each UMA. The land use limitation summaries, review and amended assessment with confidence codes is presented in Appendix J as well on Figures 5, 6 and 7 where applicable. Tables 6-2, 6-3 and 6-6 include the amended results, where applicable of these assessments.

6.5.4 Agricultural Land Class

ALC is based on a simple hierarchical scheme that is applicable across Queensland. It allows the interpreted land evaluation data to indicate the location and extent of agricultural land that can be used for a wide range of land uses with minimal land degradation.

This evaluation scheme has evolved through various guidelines and state planning policies and is currently referenced in the GALE (DSITI and DNRM, 2015). The ALC evaluation scheme is shown in Table 6-4.

Table 6-4: Agricultural Land Classes

ALC	Land Suitability	Description	Number of Land Uses	Suitability Class
Crop Land	A	Land that is suitable for a wide range[1] of current and potential crops with nil to moderate limitations to production.	-	-
	A1	Suitable for a wide range of current and potential broadacre and horticultural[2] crops.	>=4	1-3
	A2	Suitable for a wide range of current and potential horticultural crops only.	>=4	1-3
Limited Crop Land	B	Land that is suitable for a narrow range[3] of crops. The land is suitable for sown pastures and may be suitable for a wider range of crops with changes to knowledge, economics or technology.	<=3	1-3
Pasture Land	C	Land that is suitable only for improved or native pastures due to limitations that preclude continuous cultivation for crop production. Some areas may tolerate a short period of ground disturbance for pasture establishment.	-	-
	C1	Suitable for grazing sown pastures requiring ground disturbance for establishment; or native pastures on higher fertility soils.[4]	n/a	4/5
	C2	Suitable for grazing native pastures, with or without the introduction of pasture species, and with lower fertility soils than C1.	n/a	4/5
	C3	Suitable for light grazing of native pastures in accessible areas and includes steep land more suited to forestry or catchment protection.	n/a	5[7]
Non-Agricultural Land[5]	D	Land not suitable for agricultural use, including land alienated from agricultural use.	n/a	5
Complex Classes	A/C A/D B/C C/D	Land that is a complex of class A, B C or D land where it is not possible to delineate the land class at the map scale. The dominant class is the first code in the sequence and is assumed to be > 50% of the area, but <70%[6].	n/a	-

1. A wide range of crops is four or more crop types of local commercial significance.
2. Horticulture includes intensively grown small crops (e.g., vegetables) as well as tree crops (e.g., grown for nuts, seeds or fruit). Silviculture (plantation forestry) is not included.
3. A narrow range of crops is three or fewer crop types (broadacre or horticulture) of local commercial significance. Silviculture (plantation forestry) may be included. Crops with similar agronomic requirements e.g., maize and grain sorghum, peaches and nectarines are not generally regarded as different crop types. Different management regimes (including irrigation strategies) for the same crop do not increase the number of crops.
4. Class C1 includes brigalow and gidgee lands that are not suitable for cropping.
5. Non-agricultural land includes land that cannot be placed in any of the other land classes and includes land alienated from agricultural use (e.g., urban areas) and land with high order conservation tenure (e.g., national parks). It is noted that the State Forests within the study area have been assessed as part of this SALS Assessment.
6. In cases where two or more land classes are equally dominant and none are > 50%, judgement is used to identify the most appropriate ALC for the unit.
7. Include land uses where the majority are class 5 with the exception of only one land use of class 4.

Table 6-5 lists the outcome of the agricultural land assessment using the ALC evaluation scheme as shown in Table 6-4 and the Land Suitability Classes of each SPC. The ALCs within the study area are shown in Figure 7.

Table 6-5: Agricultural Land Classification Assessment Summary

ALC	SPCs	UMAs	Area within the Study area (ha)	Area within the Project area (ha)
A - Crop Land	-		0	0
A1 - Crop Land	18Bl(Ro)	74	76.36	54.59
A2 - Crop Land	-		0	0
B - Limited Crop Land	2Dn(Te)	2, 3, 4, 6, 8	810.11	438.27
	5Dn(Ro)	13, 14, 15, 16, 17		
	8Dn(Te)	29, 30, 31		
	20Bl(Ro)	81		
C - Pasture Land	-		0	0
C1 - Pasture Land	4Bl(Te)	10, 11	3,755.39	1,031.45
	9Dn(Ro)	33, 34, 36, 37, 38, 39, 40, 41, 42		
	10Ct(Ro)	43, 44, 45, 46, 47, 48		
	11Bl(Ta)	49, 52, 53, 54, 55, 56		
	12Da(Te)	57, 58		
	19Bl(Ro)	75, 76, 77, 78, 79, 80		
	22Bl(Wy)	83		
	17Bl(Ro)	70, 71, 72, 73		
C2 - Pasture Land	1Dn(Te)	1	2,081.02	774.00
	2Dn(Te)	5		
	3Bl(Te)	9		
	6Bl(Pg)	18, 19, 20, 21, 22, 23		
	7Bl(Pg)	24, 25, 26, 27, 28		
	11Bl(Ta)	50, 51		
	13Bl(Ta)	59, 60, 61		
	14Bl(Ro)	35		
	15Bl(Ro)	62, 63, 64, 65, 66		

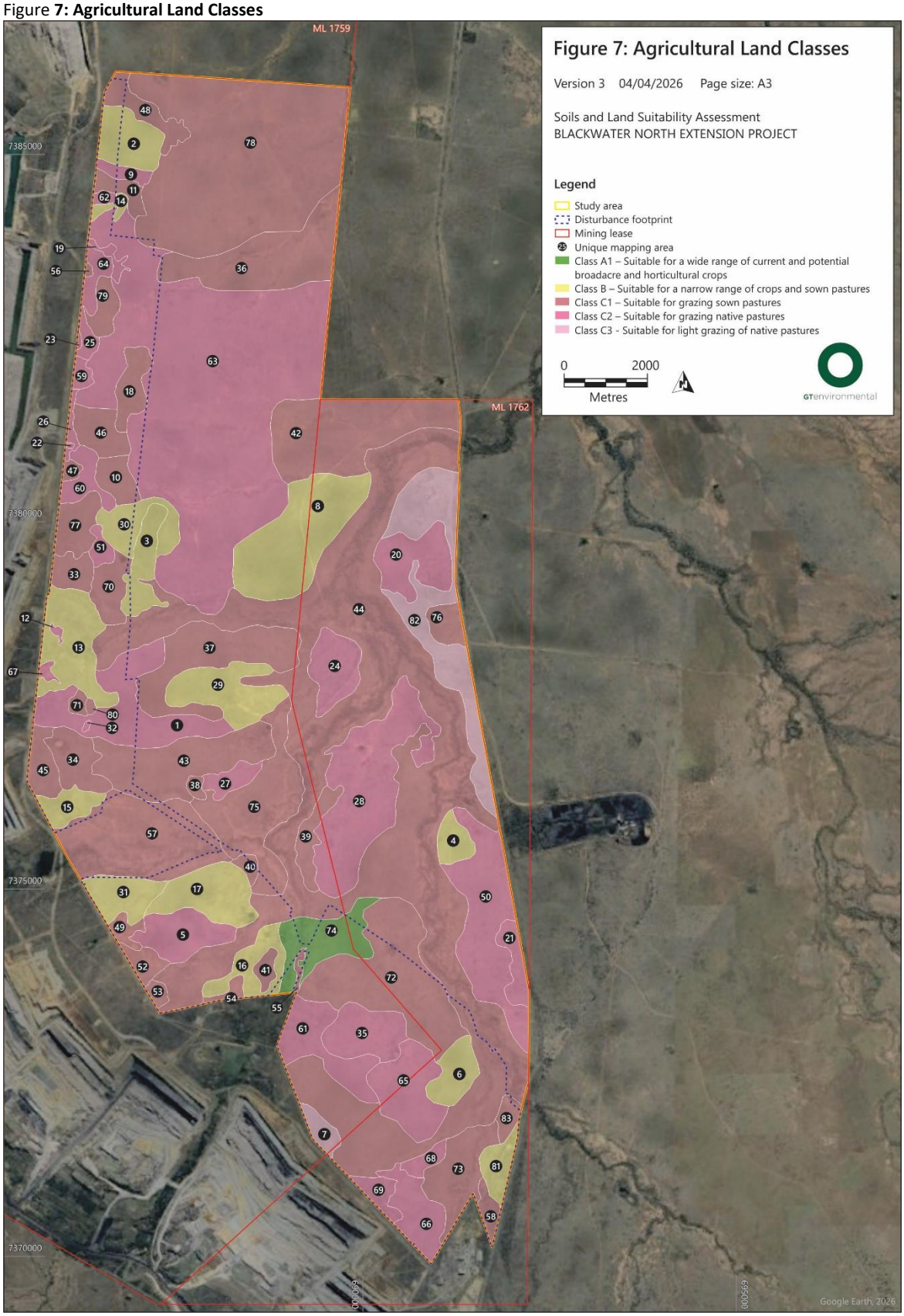
ALC	SPCs	UMAs	Area within the Study area (ha)	Area within the Project area (ha)
	16Bl(Ta)	32, 67, 68, 69		
C3 - Pasture Land	2Dn(Te)	7	184.72	18.23
	21Bl(Ta)	82		
D - Non-Agricultural Land	-		0	0

The assessment of ALC for the study area indicates the following classes:

- Approximately 73.36 ha is ALC A1,
    - Suitable for a wide range of current and potential broadacre and horticultural crops.
- Approximately 810.11 ha is ALC B,
    - Land that is suitable for a narrow range of crops. The land is suitable for sown pastures and may be suitable for a wider range of crops with changes to knowledge, economics or technology including the availability of water for spray or furrow irrigation.
- Approximately 3,755.39 ha is ALC C1,
    - Suitable for grazing sown pastures requiring ground disturbance for establishment; or native pastures on higher fertility soils.
- Approximately 2,081.02 ha is ALC C2,
    - Suitable for grazing native pastures, with or without the introduction of pasture species, and with lower fertility soils than C1.
- Approximately 184.72 ha is ALC C3,
    - Suitable for light grazing of native pastures in accessible areas.

ALC A, A2, and D were not mapped within the study area. No areas were designated as disturbed.

Figure **7: Agricultural Land Classes**



7 REGIONAL PLANNING INTERESTS ASSESSMENT

The RPI Act identifies and protects areas of Queensland that are of regional interest. The RPI Act protects each of the following areas of regional interest:

- PLAs,
- SEAs,
- PAAs, and
- SCAs.

The study area was assessed against the SCAs and PAAs.

7.1 Assessment of Strategic Cropping Areas

SCAs consist of the areas shown on the SCL Trigger Map (Queensland Globe, 2026). Land mapped as a SCA is, or is likely to be, highly suitable for cropping due to a combination of the land's soil, climate and landscape features (RPI Act).

Desktop review of the SCL Trigger Map confirmed that no SCA was mapped within the study area. Therefore, an SCA Assessment in accordance with RPI 08/14 was not undertaken.

7.2 Assessment of Priority Agricultural Areas

PAAs are areas of regionally significant agricultural production that are identified in a regional plan. Identifying PAAs ensures that resource activities that seek to operate in these areas do not unreasonably constrain, restrict or prevent on-going agricultural operation.

Identification of PAAs was undertaken for the study area. Desktop review of the study area compared to Queensland Government Development Assessment Mapping System (Queensland Globe, 2026) confirmed that no PAA was located within the study area.

8 ACID SULFATE SOILS ASSESSMENT

A review of the ASRIS including the Atlas of Australian Acid Sulfate Soils mapping was undertaken. It was identified that most of the study area is shown as the following:

- C4 - Extremely low probability of occurrence, based on very low confidence.

ASS typically naturally occur in low-lying coastal areas below 5 m AHD. The study area is at an elevation of 183 to 227 m AHD and is located approximately 200 km inland from the eastern Queensland coastline.

Fieldworks included field observations for indicators for ASS materials of observation sites for SPCs. These observations have been reviewed against Table 5-1 of the *National Acid Sulfate Soils Guidance, National acid sulfate soils sample and identification methods manual* (Sullivan et al., 2018), and are summarised below in Section 8.1.

8.1 Assessment of Actual and Potential Acid Sulfate Soils

Assessment of study area SPCs for AASS and PASS included the following indicators:

- field pH:
    - AASS, field $pH_F \leq 4$, when field $pH_F > 4$ but < 5 may indicate some existing acidity, and
    - PASS, field $pH_F > 4$ and commonly neutral.
- presence of corroded shell (AASS) or shell (PASS),
- jarositic horizons or substantial iron oxide mottling in surface (AASS),
- a sulfurous smell, e.g., hydrogen sulphide or ‘rotten egg’ gas, and
- dead, dying, stunted vegetation scalded or bare low-lying areas (AASS).

Field pH was initially conducted using a pH indictor kit and meter. Laboratory pH analysis results were also reviewed. All other indicators were visually inspected within the soil profile and field as part of the SALS Assessment. A summary of the SPC assessment is shown in Table 8-1.

Table 8-1: Acid Sulphate Soil Assessment

SPC	AASS / PASS Assessment	Assessment
1Dn(Te)	The pH is moderately alkaline to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	No field indication of PASS. No field indicators of AASS.
2Dn(Te)	The pH is slightly acid to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
3Bl(Te)	The pH is neutral to moderately alkaline. One sample at 1.40-1.50 mbgl was reported to be strongly acidic, between moderately alkaline horizons. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
4Bl(Te)	The pH is neutral to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
5Dn(Ro)	The pH is moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	No field indication of PASS. No field indicators of AASS.
6Bl(Pg)	The pH for the mound position is moderately acid to neutral alkaline. The pH for the depression position is neutral to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
7Bl(Pg)	The pH for the mound position is neutral to moderately alkaline. The pH for the depression position is slightly acidic to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
8Dn(Te)	The pH is neutral to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
9Dn(Ro)	The pH is neutral to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
10Ct(Ro)	The pH is slightly acid to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
11Bl(Ta)	The pH is neutral to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
12Da(Te)	The pH is slightly acid to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
13Bl(Ta)	The pH is moderately alkaline to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	No field indication of PASS. No field indicators of AASS.
14Bl(Ro)	The pH is moderately alkaline to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	No field indication of PASS. No field indicators of AASS.
15Bl(Ro)	The pH is neutral to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
16Bl(Ta)	The pH is neutral to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.

SPC	AASS / PASS Assessment	Assessment
17Bl(Ro)	The pH is slightly acid to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
18Bl(Ro)	The pH is slightly acid to moderately alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
19Bl(Ro)	The pH is neutral to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
20Bl(Ro)	The pH is moderately alkaline to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	No field indication of PASS. No field indicators of AASS.
21Bl(Ta)	The pH is neutral to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.
22Bl(Wy)	The pH is neutral to strongly alkaline. No observation of shells, corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils.	Very low field indication of PASS. No field indicators of AASS.

17 of the 22 SPCs, 2Dn(Te), 3Bl(Te), 4Bl(Te), 6Bl(Pg), 7Bl(Pg), 8Dn(Te), 9Dn(Ro), 10Ct(Ro), 11Bl(Ta), 12Da(Te), 15Bl(Ro), 16Bl(Ta), 17Bl(Ro), 18Bl(Ro), 19Bl(Ro), 21Bl(Ta) and 22Bl(Wy), reported pH at slightly acidic to neutral levels within the soil profile.

The remaining indicators (corroded shell, jarosite horizons, iron oxide mottling, sulfurous smell or waterlogged soils) were not observed, therefore, the assessment indicates very low field indication of PASS, if very unlikely.

The remaining five SPCs, 1Dn(Te), 5Dn(Ro), 13Bl(Ta), 14Bl(Ro) and 20Bl(Ro) presented no field indications of AASS and / or PASS.

This result (i.e., very low field indicators for PASS) is consistent with the desktop review against the Atlas of Australian Acid Sulfate Soils mapping which showed the study area as “Extremely low probability of occurrence”.

It is assessed as highly unlikely the study area includes AASS and / or PASS.

9 SOIL MANAGEMENT MEASURES

9.1 Study Area Disturbance

The study area will have areas of disturbance including but not limited to, open cut mining pits, mine infrastructure laydown areas and associated roads and access tracks.

All SPCs in the study area have been assessed to determine their suitability for topsoil resource stripping and reuse for rehabilitation activities. This information may also be used to provide guidance for Soil and Capping Material Assessment requirements outlined within section 3.6.1 of the PRC Plan Guideline.

9.2 Proposed Post Mine Land Uses

Soil management measures are recommended for the rehabilitation of the disturbance area to the proposed post mine land use (PMLU). The Project area would be rehabilitated to land suitable for beef cattle grazing, or woodland habitat, consistent with the PMLUs described in the Blackwater Mine PRC Plan (Whitehaven, 2025).

Rehabilitation for beef cattle grazing would be undertaken in accordance with the PRC Plan and would involve seeding of native and naturised exotic species, including palatable, productive grasses and legumes, consistent with current grazing best management practices. Recommended soil management measures to achieve rehabilitation would include best practice for stripping, stockpiling and re-application of soil resources.

Woodland habitat may be included within the PMLU with the following recommendations and soil management measures assisting to support this re-establishment of vegetation communities.

Further recommendations, as discussed below, have been included to allow additional options such as organic matter and fertiliser application if the initial or ongoing rehabilitation is not achieving the desired outcome.

9.3 Topsoil Resource Assessment and Availability

Topsoil resource stripping depths for growth media have been assessed by depth of surface horizons which includes the quality of soil, nutrients for vegetation establishment and growth, as well as the properties of underlying subsoils (A12, A2 and B horizons) which may be similar, suitable or not suitable to include within the soil resource. This assessment also considers all relevant soil observations and laboratory data collected from the SPCs (e.g., soil texture, soil structure, pH, chloride, CEC, potential for dispersive attributes based on ESP and EAT, and fertility indicators).

Technical Guidelines for Environmental Management of Exploration and Mining in Queensland (DME, 1995), *Mine Rehabilitation, Leading Practice Sustainable Development Program for the Mining Industry* (Australian Government, 2016), Perry et al. (1964), and *Mine Rehabilitation Handbook* (Minerals Council of Australia, 1998) were reviewed with the field and laboratory results in assessing topsoil resource quality and quantity.

In summary, topsoil resources from the majority of SPCs are suitable for reuse as topsoil in rehabilitation activities, as shown in Table 9-1.

Topsoil in the study area in general was moderately structured, with very low to very high fertility consisting of moderately deep to very deep clay soils. 16 of the 22 SPCs had sodic subsoils which may have an impact on soil resource stripping and management.

Topsoil within these SPCs may require additional management and input (including amelioration and selective handling and storage) prior to use during rehabilitation as described in Table 9-1.

9.4 Recommended Topsoil and Subsoil Stripping Depths, Limitations and Volumes

Table 9-1 provides the recommended stripping depth, suitability for reuse in PMLU rehabilitation, identified limitations, management recommendations within each applicable SPC and approximate volume of topsoil available. The volumes of topsoil shown are calculated based on areas of SPC which intersect the disturbance area.

Table 9-2 provides a summary of recommended stripping depths and available topsoil volumes for major project components, which supports the PRC Plan (Whitehaven, 2025) in identifying topsoil quality, quantity and topsoil depth requirements. Topsoil is a valuable growth medium layer for rehabilitation and the establishment of the potential PMLUs. An assessment of the suitability of subsoil for use as a growth medium and capping material was also undertaken.

Further discussion of key limitations and management requirements is provided in Section 9.5. It is recommended that these sections be reviewed in conjunction with Table 9-1. The topsoil stripping depths are shown in Figure 8.

Table 9-1: Recommended Topsoil Stripping Depths, Limitations, Management Measures and Available Volumes

SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
1Dn(Te)	0.00-0.20	0.20-0.40	Yes	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported very low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.
2Dn(Te)	0.00-0.10	0.10-1.00	Yes	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are favourable for topsoil with very high phosphorus levels. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 1.00 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
3Bl(Te)	0.00-0.20	0.20-0.80 / 0.80-1.60	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported very low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.80 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below this 0.80 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 15.1 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.40 mbgl.
4Bl(Te)	0.00-0.20	0.20-0.60 / 0.60-1.20	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.60 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below this 0.60 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 12.6 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.00 mbgl.
5Dn(Ro)	0.00-0.20	0.20-0.45 / 0.45-0.60	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported very low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.45 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.45 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 9.1 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.50 mbgl.

SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
6Bl(Pg)	0.00-0.20	0.20-1.80	Yes / Subsoil has recommendations	Topsoil Topsoil recovery may be difficult with the undulating nature of gilgai areas. Care is recommended when stripping the topsoil as to avoid mixing with sodic subsoils. Otherwise, gypsum application may be required, refer to subsoil recommendation below. Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported very low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.20 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 14.7 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels of the depression location at 0.80 mbgl.
7Bl(Pg)	0.00-0.15	0.15-0.50 / 0.50-1.45	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil recovery may be difficult with the undulating nature of gilgai areas. Care is recommended when stripping the topsoil as to avoid mixing with sodic subsoils. Otherwise, gypsum application may be required, refer to subsoil recommendation below. Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported moderate levels of phosphorus. The soils of this SPC have the highest levels reported at 11 mg/kg. If the PMLU has not been achieved, topsoil may respond to an application of fertiliser. Subsoil Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below this 0.40 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 17.9 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels of the mound location at 0.80 mbgl.

SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
8Dn(Te)	0.00-0.05	0.05-0.50 / 0.50 – 0.90	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Topsoil horizon is shallow, however, refer to subsoil for additional recommendations. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.50 mbgl may be stripped to this depth and utilised as topsoil. Subsoil below 0.50 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 11.2 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.50 mbgl.
9Dn(Ro)	0.00-0.10	0.10-1.40	Yes / Subsoil has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.10 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 16.3 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.80 mbgl.
10Ct(Ro)	0.00-0.10	0.10-1.80	Yes / Subsoil has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.10 mbgl may benefit from gypsum application due to extremely sodic levels. SodiCalc (2026) recommends approximately 15 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.90 mbgl.

SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
11Bl(Ta)	0.00-0.20	0.20-1.00	Yes / Subsoil has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.20 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 11.1 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.90 mbgl.
12Da(Te)	0.00-0.20	0.20-0.90	Yes	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are favourable for topsoil with very high phosphorus levels. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are low, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.90 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.
13Bl(Ta)	0.00-0.20	0.20-1.40 / 1.40-1.70	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are low, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 1.40 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 1.40 mbgl may benefit gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 6.8 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.40 mbgl.

SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
14Bl(Ro)	0.00-0.20	0.20-0.50 / 0.50-1.90	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are low, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.50 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 0.50 mbgl may benefit gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 0.00 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.00 mbgl. Based on this calculation, no treatment is required. If visual observations of sodic soils are observed, an application of 2.5 t/ha may be adequate.
15Bl(Ro)	0.00-0.20	0.20-0.60 / 0.60-0.90	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported very low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are low, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.60 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 0.60 mbgl may benefit gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 17.1 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.80 mbgl.
16Bl(Ta)	0.00-0.10	0.10-0.40	Yes / Subsoil has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below this 0.40 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 4.6 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.10 mbgl.

SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
17Bl(Ro)	0.00-0.10	0.10-1.20	Yes / Subsoil has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below 0.10 mbgl may benefit from gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 5.0 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.50 mbgl.
18Bl(Ro)	0.00-0.20	0.20-1.00	Yes	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 2.00 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.
19Bl(Ro)	0.00-0.20	0.20-1.40 / 1.40-2.20	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported very low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are low, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 1.40 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil. Subsoil below 1.40 mbgl may benefit gypsum application due to sodic levels. SodiCalc (2026) recommends approximately 9.3 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 1.70 mbgl.

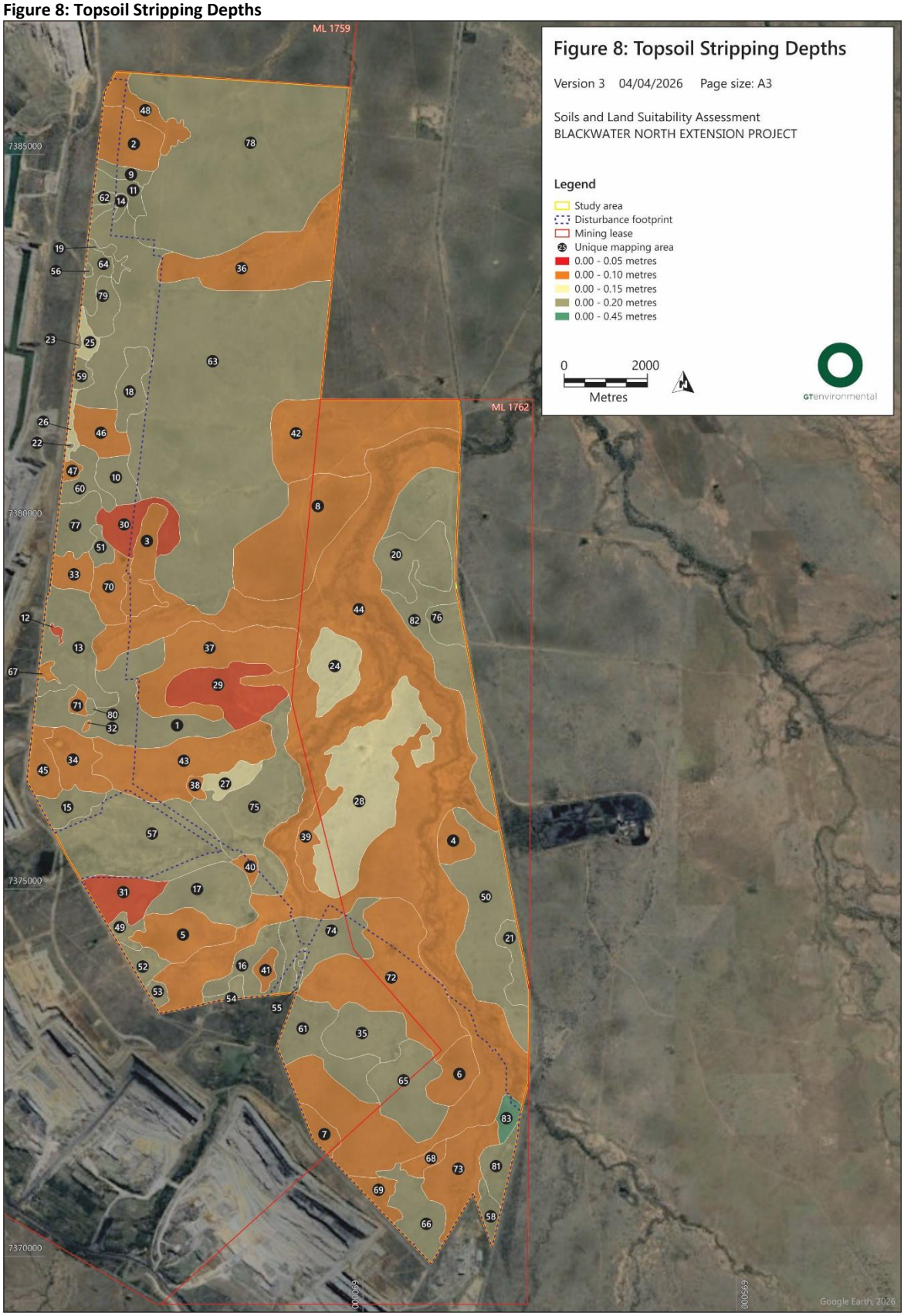
SPC	Topsoil Depth (mbgl)	Subsoil Depths (mbgl)	Suitable for Rehabilitation	Limitations and / or Recommended Amelioration and Management Measures
20Bl(Ro)	0.00-0.20	0.20-0.80	Yes	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.80 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.
21Bl(Ta)	0.00-0.20	0.20-0.45 / 0.45-1.80	Yes / Subsoil second strip depth has recommendations	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil resource may be recommended for use on flat to sloped (may benefit from treatment) areas, to support the placement of topsoil. Subsoil below 0.45 mbgl may benefit from gypsum application due to strongly sodic levels. SodiCalc (2026) recommends approximately 7.4 t/ha for each 0.10 m to achieve ESP of 5.5, based on the highest sodic levels at 0.90 mbgl.
22Bl(Wy)	0.00-0.45	0.45-1.00	Yes	Topsoil Topsoil resource may be recommended for use on flat to sloped areas. Fertility attributes are low for topsoil with reported low levels of phosphorus. Topsoil may respond to an application of fertiliser, if the PMLU has not been achieved. Subsoil Subsoil may be considered as a secondary topsoil, due to minor to no major limitation. Fertility attributes are not favourable, however, mixing with other suitable, fertile soil or treatment with organic matter and / or fertiliser may increase its suitability. Subsoil to 0.45 mbgl may be stripped to this depth and utilised as topsoil. Subsoil resource may be recommended for use on flat to sloped areas, to support the placement of topsoil.

Table 9-2: Available Topsoil and Subsoil Volumes within the Proposed Disturbance Area

SPC	Area (ha) within the proposed disturbance area	Available Topsoil Volume (Cubic metres [m³])	Available Subsoil Volume (m³) Double Stripping[1]	Available Subsoil Volume (m³) Treated Subsoil
1Dn(Te)	82.69	165,380	165,380	0
2Dn(Te)	147.06	147,060	1,323,540	0
3Bl(Te)	4.51	9,020	27,060	36,080
4Bl(Te)	34.47	68,940	137,880	206,820
5Dn(Ro)	242.45	484,900	606,125	363,675
6Bl(Pg)	45.46	90,920	0	727,360
7Bl(Pg)	20.05	30,075	70,175	190,475
8Dn(Te)	73.92	36,960	332,640	295,680
9Dn(Ro)	93.53	93,530	0	1,215,890
10Ct(Ro)	431.00	431,000	0	7,327,000
11Bl(Ta)	63.77	127,540	0	510,160
12Da(Te)	48.03	96,060	336,210	0
13Bl(Ta)	115.90	231,800	1,390,800	347,700
14Bl(Ro)	66.77	133,540	200,310	934,780
15Bl(Ro)	321.19	642,380	1,284,760	963,570
16Bl(Ta)	40.06	40,060	0	120,180
17Bl(Ro)	312.81	312,810	0	3,440,910
18Bl(Ro)	54.59	109,180	436,720	0
19Bl(Ro)	76.56	153,120	918,720	612,480
20Bl(Ro)	28.92	57,840	173,520	0
21Bl(Ta)	0	0	0	0
22Bl(Wy)	12.80	57,600	70,400	0
Total	**2,316.54**	**3,519,715**	**7,474,240**	**17,292,760**

1. Double stripping of the nominated SPC subsoils may be used to bolster topsoil volumes, as assessed in Table 9-1

Figure 8: Topsoil Stripping Depths



9.5 Soil Amelioration and Management

As discussed in Table 9-1, there are identified limitations for some SPCs which will benefit from amelioration and management to improve the topsoil resource quality.

These limitations are linked to generally neutral to moderately alkaline pH, sodic or dispersive soils, poor surface soil structure, low fertility indicators, low CEC or potentially firm to hard-setting surfaces restricting seedling emergence.

Any recommended amelioration undertaken on a topsoil or subsoil resource should be monitored to ensure the objective of the treatment has been met. The following sections look to provide further details for the management of these limitations.

9.5.1 pH Amelioration

Soil pH surface levels across the SPCs are generally neutral to moderately alkaline with subsoils ranging from strongly acid (3Bl(Te), Site D5, 1.40-1.50 mbgl) to moderate to strongly alkaline in general for subsoils. Sites D6, D36 and D59 have alkaline subsoils (pH > 9.0), which based on their soil classification have been assessed as an ERD chemical barrier.

Soils with these pH values in the strongly acidic (pH < 5.5) or strongly alkaline (pH > 9.0) range are associated with reduced availability of nutrients or root growth inhibition. Observations on site indicated vegetation species in the study area appeared to be healthy during all five fieldworks periods.

The Suitability of Beef Cattle Grazing (DME, 1995) limitation for pH indicates that surface soils are suitable (Class 2 and 3) with none assessed as unsuitable (Class 4 or 5).

Overall, pH amelioration is not recommended for the SPCs in the study area for the reestablishment of native vegetation, however, any use of organic matter and / or fertilisers for rehabilitation activities may alter a soils' pH.

9.5.2 Salinity Amelioration

Salinity within soils and potential crop land uses has been presented in Appendix K as plant yield % and plant salt-tolerance data (DERM, 2011). Based on the application of rainfall to all nine crop land uses (Section 4.4), SPCs have 100% plant yield, except for Safflower where results provided were assessed as not consistent when compared to all other land uses, which were. The plant salt-tolerance data comparison does show that 22 SPCs have potential reduced yield % within a rooting depth of 0.60 m.

It is noted that elements such as EC, Chloride and Sodium are transient and will change following disturbance, stockpiling, mixing (with other less salty subsoil) and weather exposure as well as application of good quality irrigation water.

Based on this assessment, no amelioration is recommended.

9.5.3 Sodicity / Dispersion Amelioration

ESP indicates the proportion of the CEC occupied by exchangeable sodium cations. Soils with elevated ESP may be prone to disperse on contact with water and can provide unfavourable soil conditions such as surface crusting, low infiltration, hard and dense subsoils and susceptibility to erosion.

The general rating for ESP, as outlined in Appendix D, indicates that 6 to 15 are sodic, 15 to 20 are strongly sodic and > 20 are extremely sodic. The nominated topsoil stripping depths, include recommended soil management measures (application of gypsum) for soil resources that are observed as sodic to extremely sodic.

ESP results are assessed in conjunction with ECEC and clay content (%), where if a result reports ECEC < 3 cmol(+)/kg or < 15% clay, ESP results could not be relied upon as an indicator for sodicity.

Table 9-3 summaries the ESP of subsoils for each SPC.

Table 9-3: SPC Topsoil and Subsoil ESP Assessment

Subsoil Sodicity	Subsoil Profile – Lowest EAT Class
Non-Sodic Subsoils	1Dn(Te), 2Dn(Te), 12Da(Te), 18Bl(Ro), 20Bl(Ro) and 22Bl(Wy)
Sodic Subsoils	5Dn(Ro), 6Bl(Pg), 7Bl(Pg), 13Bl(Ta), 14Bl(Ro), 16Bl(Ta) and 17Bl(Ro)
Strongly Sodic Subsoils	3Bl(Te), 4Bl(Te), 8Dn(Te), 9Dn(Ro), 11Bl(Ta), 15Bl(Ro), 19Bl(Ro) and 21Bl(Ta)
Extremely Sodic Subsoils	10Ct(Ro)

It is recommended that these soil resources, where suitable, may benefit from an application of fine grade gypsum to be used on sloped surfaces and stockpiling of these SPC's subsoils be kept separate from the remaining SPC's subsoil stockpiles. Additional information is recommended in Section 9.6.

A review of the SPCs for EAT classes indicated some SPCs had dispersion throughout the soil profile. The following indicates the SPCs and their lowest EAT classes for topsoil and subsoil, as summarised below in Table 9-4.

Table 9-4: SPC Topsoil and Subsoil EAT Assessment

SPC	Topsoil – EAT Class	Subsoil Profile – Lowest EAT Class
1Dn(Te)	Class 4 – No dispersion. Carbonate and Gypsum present	Class 2 – Some Dispersion
2Dn(Te)	Class 3 – Dispersion after remoulding	Class 4 – No dispersion. Carbonate and Gypsum present
3Bl(Te)	Class 2 – Some Dispersion	Class 2 – Some Dispersion
4Bl(Te)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
5Dn(Ro)	Class 4 – No dispersion. Carbonate and Gypsum present	Class 2 – Some Dispersion
6Bl(Pg)	Class 2 – Some Dispersion	Class 2 – Some Dispersion
7Bl(Pg)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
8Dn(Te)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
9Dn(Ro)	Class 4 – No dispersion. Carbonate and Gypsum present	Class 2 – Some Dispersion
10Ct(Ro)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion

SPC	Topsoil – EAT Class	Subsoil Profile – Lowest EAT Class
11Bl(Ta)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
12Da(Te)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
13Bl(Ta)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
14Bl(Ro)	Class 4 – No dispersion. Carbonate and Gypsum present	Class 2 – Some Dispersion
15Bl(Ro)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
16Bl(Ta)	Class 2 – Some Dispersion	Class 2 – Some Dispersion
17Bl(Ro)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
18Bl(Ro)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
19Bl(Ro)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
20Bl(Ro)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
21Bl(Ta)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion
22Bl(Wy)	Class 3 – Dispersion after remoulding	Class 2 – Some Dispersion

Further information for SPCs, amelioration and recommended soil depths is provided in Table 9-1.

9.5.4 Fertiliser Amelioration

SPCs were observed in general to have low to very high fertility indicators of macronutrients phosphorus and varying levels of available nitrogen, potassium, calcium, magnesium and sulfur levels.

Native vegetation and some introduced pasture species are adapted to low nutrient levels and in general, it may not be required to apply fertiliser where the PMLU relies on native vegetation establishment.

As detailed in Table 9-1, SPCs which may benefit from an application of fertiliser include all SPCs except 2Dn(Te), however, fertiliser application would be more appropriate during final soil replacement and seed bed preparation and any of the following recommendations are a guide only. It is recommended that appropriate fertiliser rates be determined through rehabilitation trials prior to the commencement of full-scale rehabilitation.

If an application of fertiliser is required, it is recommended that the laboratory analysed nutrient levels be reviewed against target nutrient levels for the nominated PMLU prior to removal of soils from stockpiles.

Typical application rates indicate that levels of nitrogen fertiliser of between 100 to 450 kilograms per hectare (kg/ha) may be appropriate, however, for native woodlands an initial application of 20 kg/ha may be more suitable. Nitrogen fertilisers such as Urea, Monoammonium phosphate (MAP) and Diammonium phosphate (DAP) are considered general fertilisers to use to boost nutrient levels.

Neutralising lime may be recommended with these fertilisers if pH levels reduce to 5.5 or below, however, this is unlikely based on pH rates of the SPCs of the study area. Typical application rates of neutralising lime for fertilisers such as MAP and DAP may be approximately 5.4 and 3.6 kilograms (kg) for every 1 kg of Nitrogen (Fertiliser Industry Federation of Australia Inc., 2006).

Phosphorus fertilisers which may not require any additional amelioration include single and triple super phosphate.

As stated above, application of any fertiliser should be approached with caution as it may be costly and create limitations such as acidic soil conditions, contaminated runoff or encourage weed growth. Soil sampling and analysis of proposed rehabilitation soil resources throughout the life of the mine to assess potential fertiliser application is recommended. Other variables such as slope of landform, soil texture, structure, surface and vegetation for PMLU may be considered prior to any application of fertiliser.

Amelioration and use of fertilisers is only recommended as an option if the desired outcome of the PMLU has not been achieved with all other avenues undertaken.

9.5.5 Organic Matter Amelioration

Organic matter incorporated into the topsoil would increase organic levels, improve soil structure, increase CEC, reduce erosion as well as increase water holding capacity. SPCs which may benefit from amelioration with organic matter are generally sandier, firm setting soils with low CEC and PAWC such as 22Bl(Wy) (Very low surface CEC), 12Da(Te) (Low surface CEC), 17Bl(Ro) (Low surface CEC) and 21Bl(Ta) (Low surface CEC).

It is recommended, where possible, to utilise an organic matter source generated from land clearing or stripped vegetation, where it is near the rehabilitation area and readily available. The application may depend on the vegetation type whether native species or if the desired PMLU outcome is establishing a pasture or crop, as incorporation of weed seed should be avoided. It is also noted that timing between clearing of vegetation and the commencement of rehabilitation may render organic matter unavailable. The establishment of vegetation cover on stockpiled areas may assist in providing organic matter.

The suppliers and source of material should be reviewed prior to use in the study area. A review of suppliers should include if they comply with Australian Standard (AS) AS 4454-2021 (Composts, soil conditioners and mulches). Suppliers complying with this AS will provide confidence that the product they are supplying will not include the introduction of weeds to the study area.

Where available and cost effective, the following application rates may be considered if the desired PMLU outcome has not been achieved:

- manure may be applied at a rate of between 5-30 t/ha for small to large feedlots for cattle grazing, depending on the type of manure (Tucker et al., 2015),
- compost may be applied at 70-150 t/ha (Kelly, 2006),
- biosolid application may be applied at recommended application rate of 50 dry t/ha for amelioration of compacted soils (Kelly, 2006).

The application of organic matter should be treated as per fertiliser amelioration, where it is only recommended as an option if the desired outcome of the PMLU has not been achieved with all other avenues undertaken.

9.6 Topsoil Recovery, Storage and Placement Recommendations

The following subsections are a general guide to the recovery, storage and placement of topsoil and subsoil resources.

9.6.1 General Topsoil Stripping Management

The following are recommended general management procedures for topsoil stripping activities, which also include handling measures to retain soil attributes for rehabilitation:

- HSE Environmental representatives, supervisors and competent operators should be familiar with the areas to be stripped based on existing soils mapping and recommended topsoil stripping depth.
- Current weather forecast should be checked prior to stripping of soils to reduce exposure of bare sodic, erosive soils and sediment runoff.
- If a Permit to Disturb (PTD) is required, then this shall be compiled and submitted with the proposed plan of disturbance, with approval received before commencing.
- All soil resource stripping shall be undertaken in accordance with relevant Environmental Authority and PTD
- Vegetation clearing should occur immediately prior to stripping. This will reduce the loss of topsoil and mixing with unsuitable soils and potentially reclaimed mulch. Vegetation removed may be stockpiled and reused as mulch if handled as appropriate and depending on the vegetation type with respect to the desired post-mining land use, as well as the presence of any problem weed species.
- Suitable machinery, shall comply with onsite procedures including, but not limited to, weed and feral animal management. Machinery shall be utilised in recovering topsoil and subsoil resources such as GPS assisted scrapers or dozers. Stripping and ripping should be undertaken with care to reduce the mixing of subsoils during topsoil stripping.
- Inspections of the stripped areas should be undertaken to observe any unexpected changes in soils. Inspections should occur where it is suspected that subsoils are present in the stripped topsoil based on a change in texture, soil colour and unexpected change in stripping depth. Stripping of SPCs identified with chemical barriers in subsoil such as sodic impacted subsoils should be supervised. Inspection of the stripped areas should be undertaken and if possible, surveying of the area to obtain volumes removed from the SPC.
- Stripping of topsoil and subsoils shall be undertaken in accordance with the recommendations outlined within this SALS Assessment. The collection of subsoil at increased depths as an alternative growth media may not be allowed due to the possibility of including highly sodic and dispersive subsoils.

- Areas of land upgradient and downgradient of soil stripping activities, low-lying areas or areas of observed runoff should have suitable erosion and sediment control measures in place such as clean water diversion bunds, sediment-affected water diversion bunds and / or sediment fencing prior to construction commencing.
- Topsoil suspected of being mixed with subsoils should be either resampled and analysed as the current stockpile or separated from topsoil and placed with the appropriate subsoil stockpile.
- Application of gypsum may be considered during this phase, as the earlier integration of amelioration will assist in the future reuse of sodic, impacted soils.

9.6.2 Stockpiling Management

The following are recommended general procedures for stockpile management:

- Topsoil and subsoil (not suitable for double stripping) materials should be stockpiled separately with records maintained of the material's origin in a topsoil inventory.
- Stockpile locations should be placed in areas outside the mining activities, as close to the area to be rehabilitated as possible and away from drainage lines. These include, in order of prioritisation, directing into a rehabilitation area, stockpiled on top of dump near rehab slope, low wall close to toe of dump, low wall in available locations or the high wall.
- Any known sloped areas, natural drainage pathways such as overland flow and drainage lines as well as high traffic areas should be avoided.
- The stockpiles should have appropriate measures in place to prevent erosion.
- Where possible, stockpile locations should be placed against existing vegetated areas to function as a buffer, or adjacent to any rise in landscape to provide protection from wind erosion.
- Adequate erosion and sediment control including but not limited to sediment fencing, shall be placed on the down slope area of stockpiles.
- Locations are to be designated off limits by remaining grazing stock, machinery and vehicles.
- Locations should be placed in areas where it may assist future rehabilitation reuse, i.e., near nominated project components to reduce movement of materials, where possible.
- Stockpiles should have a maximum height of 3.0 m, preferably 2.0 m with a batter recommended no steeper than 3 h : 1 v (horizontal run to vertical rise). Stockpiles required to be more than 3.0 m in height shall require additional erosion and sediment controls and ideally be temporary stored.
- The surface of the stockpile should be flat.
- The installation of plastic lined catch drains or runoff areas along the surface edge of waste or elevated landforms may assist in minimising surface runoff on batter slopes.

- Covering of the stockpiles with grasses or groundcover species appropriate to the nominated PMLU would minimise erosion and soil loss, minimise the establishment of weeds, assist in maintaining organic matter, nutrients and microbial activity and rejuvenate native vegetation through existing seedbank.
- Stockpiles consisting of dispersive subsoils (refer Section 9.5.3) may require further management to reduce sediment loss and erosion. Management recommendations may include:
    - reducing the stockpile batter to 2 h : 1 v;
    - application of fine grade gypsum at the recommended 'worst case' amount, as listed for the SPCs to be stockpiled across the surface of the stockpile; and
    - covering of the stockpile surface and batters with a product such as hydro mulch, polymer or coirweb.
- An inspection of the stockpiles should occur once they are completed with scheduled ongoing maintenance as required.

9.6.3 Topsoil Reinstatement and Placement Depth

The following are general procedures recommended for the reinstatement of topsoil:

- Review of the topsoil and subsoil resource material. SPCs that are potentially dispersive or erosive are recommended for placement on flat plains to slopes up to 10% if possible.

  If placement of topsoil or subsoil resources that are potentially dispersive or erosive is on steeper slope or visual observation during the pre-strip indicates erosive attributes such as hard-setting surfaces, an application of gypsum may be recommended.

  However, if clay content percentage is low (< 20%), gypsum may not improve the soil stability.
- Subsoil resource material should be recovered from the subsoil stockpiles and placed initially prior to topsoil resource material.
- Topsoil resource material ideally should be recovered from the stockpiles closest to the disturbance area. This would reduce handling time, haul distance of topsoil resource materials, movement of plant and machinery and ensure that placement work may occur in the shortest period (i.e., reduce exposure to rainfall events).
- Topsoil should be placed in even layers at the recommended depths to ensure enough coverage and soil to re-establish vegetation.
- Sediment and erosion controls are to be utilised to ensure that loss of soil resources is minimal and product can be recovered.
- Inspection and maintenance of rehabilitation areas are to be undertaken to ensure erosion and sediment control measures are performing as constructed. Measures are to be outlined within the Projects Erosion and Sediment Control Plan (ESCP) as detailed in Section 9.6.4.

- Topsoil should be inspected prior to reinstatement for invasive vegetation (plants and weeds) and should be controlled.
- Inspections are to be recorded, including any issues and improvements, to ensure soil resource application is appropriate across all rehabilitated areas.
- Topsoil placement depth across areas requiring rehabilitation is recommended at a depth of 0.15 to 0.20 m with a minimum depth of 0.10 m. In general, subsoils placed underneath and supporting topsoil with a recommended horizon of 0.20-0.60 m. This is to allow sufficient depth for shallow scarifying and ripping of topsoils (if required) and vegetation establishment.
- The preparation of the surface, whether it includes ripping, seeding and / or adding amelioration treatments should occur during one operation to minimise compaction and surface structure degradation.
- The application rate and method if a fertiliser is to be used should be reviewed and understood by the operator and supervisor.
- After the placement of topsoil, additional seeding should be used to assist with encouraging suitable vegetation regrowth.
- The application of good quality, irrigation water to the soil should be used to assist in the leaching of salts throughout the profile. This would assist in the establishment of vegetation, especially in potential future application of pastures or crop land uses.

9.6.4 Erosion and Sediment Control Plan

The *BWM Erosion and Sediment Control Plan* (Whitehaven, 2022) has been prepared for the approved BWM, in accordance with the International Erosion Control Association's (IECA's) 'Best Practice Erosion and Sediment Control' document (IECA, 2008).

The BWM ESCP would be reviewed and updated, where necessary, to ensure the Project achieves:

- no worsening of the existing levels of soil loss from the land in or downslope of the study area;
- no increased risk of erosion, or other land degradation, on land or in waterways downslope of the study area; and
- no net increase in the sediment load leaving the study area and entering waterways and / or watercourses.

The BWM ESCP should be reviewed to accommodate any ongoing need for erosion and sediment control for all aspects of the Project.

10 CONCLUSION

The key conclusions of the SALS Assessment are as follows:

- 22 SPCs across 83 UMAs are present in the study area.
    - Soils range from shallow clay loam soils, sodic subsoil clays texture contrast soils to structured, moderate to very deep clay soils to clays with microrelief on limited to completely cleared, level to gently undulating plains and rises.
    - SPCs have been classified in four of the 14 ASC orders including Dermosol, Kandosols, Sodosol and Vertosols.
- The suitability framework of each SPC was assessed against the nominated Regional Frameworks (DSITIA and DNRM, 2013) for the Inland Fitzroy and Southern Burdekin Area land uses. These land uses include dryland and furrow irrigated barley, chickpea, cotton, maize, millet, mungbean, oat, safflower, sorghum, soybean, sunflower, triticale and wheat.
    - One SPC, 18Bl(Ro) has been identified as being able to support crop land uses for cotton, maize, mungbean, safflower, sorghum, soybean and sunflower.
    - Three SPCs, SPCs 2Dn(Te), 8Dn(Te) and 20Bl(Ro) can support cotton.
    - All of the remaining SPCs and UMAs as follows are unsuitable and presented severe or extreme limitations with respect to supporting crop land uses. 2Dn(Te) (UMA 5), 3Bl(Te), 4Bl(Te), 8Dn(Te) (UMA 12), 9Dn(Ro), 10Ct(Ro), 11Bl(Ta), 12Da(Te), 14Bl(Ro), 15Bl(Ro), 17Bl(Ro), 19Bl(Ro), (UMAs 50,51) 16Bl(Ta), 21Bl(Ta) and 22Bl(Wy).
    - The remaining two SPCs, Tm(4Rv) and Tm(11Rv) presented severe or extreme limitations with respect to supporting crop land uses.
    - The suitability of nominated pastures was also assessed, with eight SPCs (Wn(1Rv), Bk(2Rv), Bk(5Rv), Bk(6Rv), Bk(7Rv), Bk(8Rv), Bk(9Rv), Wn(10Rv)) identified as being able to support one pasture land use.
    - The remaining three SPCs, (Nm(3Rv), Tm(4Rv) and Tm(11Rv)) presented severe or extreme limitations with respect to supporting crop land uses.
- The SPCs were assessed against Suitability for Beef Cattle Grazing LSAT (DME, 1995) with reference for beef cattle grazing in the *Land resource survey and evaluation of the Kilcummin area, Queensland* (Shields and Williams, 1991). This assessment assists in determining the limitations for beef cattle grazing. The following SPCs and specific UMAs were assessed:
    - SPCs 11Bl(Ta), 12Da(Te), 18Bl(Ro) and 22Bl(Wy) were assessed as Class 3, suitable land which is moderately suited to beef cattle grazing but which requires significant inputs to ensure sustainable use,
    - SPCs 2Dn(Te), 3Bl(Te), 4Bl(Te), 8Dn(Te), 9Dn(Ro), 10Ct(Ro), 11Bl(Ta) (UMAs 50,51) 14Bl(Ro), 15Bl(Ro), 16Bl(Ta), 17Bl(Ro), 19Bl(Ro) and 20Bl(Ro) were assessed as Class 4,

marginally suited for beef cattle grazing and would require major inputs to ensure sustainability,, and

- SPCs 2Dn(Te) (UMA 7) and 21Bl(Ta) were assessed as Class 5, unsuitable land with extreme limitations in which the land is unsuited and cannot be sustainably used for a proposed agricultural use.

- The assessment of ALCs across the study area based on the Regional Frameworks, additional land use limitations and beef cattle grazing classes indicated the following:
  - Approximately 73.36 ha is ALC A1, assessed as suitable for a wide range of current and potential broadacre and horticultural crops.
  - Approximately 810.11 ha is ALC B, assessed as land that is suitable for a narrow range of crops. The land is suitable for sown pastures and may be suitable for a wider range of crops with changes to knowledge, economics or technology including the availability of water for spray or furrow irrigation.
  - Approximately 3,755.39 ha is ALC C1, assessed as suitable for grazing sown pastures requiring ground disturbance for establishment; or native pastures on higher fertility soils.
  - Approximately 2,081.02 ha is ALC C2, assessed as suitable for grazing native pastures, with or without the introduction of pasture species, and with lower fertility soils than C1.
  - Approximately 184.72 ha is ALC C3, assessed as suitable for light grazing of native pastures in accessible areas.
  - ALC A, A2, and D were not mapped within the study area. No areas were designated as disturbed.
  - Soil assessed as suitable for potential cropping land may be impacted as part of the disturbance (approximately 492.86 ha, 7.6% of the disturbance footprint), however the assessed cropping land is currently been used as cattle grazing (pre mine land use). The rehabilitation of soils to support the PMLU of beef cattle grazing indicates that soils are likely to still support the potential agricultural land uses such as cropping in the future, if agricultural land uses were to change.
- The RPI Act and RPI Regulation identify and protect areas of Queensland that are of regional interest. The study area was assessed against SCA and PAA requirements.
  - Desktop review of the study area compared to Queensland Government Development Assessment Mapping System (Queensland Globe, 2026) confirmed that no SCA was located within the study area.
  - Desktop review of the study area compared to Queensland Government Development Assessment Mapping System (Queensland Globe, 2026) confirmed that no PAA was located within the study area.

- An ASS field assessment was undertaken during the SALS Assessment. The field observations were reviewed and the result (i.e., very low field indicators for PASS) is consistent with the desktop review against the Atlas of Australian Acid Sulfate Soils mapping which showed the study area as "Extremely low probability of occurrence."
    - It is assessed as highly unlikely the study area includes AASS and / or PASS, however, environmental management plans should consider proactive procedures to visually monitor and identity ASS during the Project's lifespan.
- In summary, topsoil resources from the majority of SPCs contain soils that are suitable for reuse in rehabilitation activities.
    - Topsoil in the study area consisted of fair to poorly structured, low fertility, shallow to deep soils which are indicative of the area, however, all are suitable for reuse for rehabilitation.
    - Subsoils for five SPCs (1Dn(Te), 2Dn(Te), 12Da(Te), 18Bl(Ro) and 22Bl(Wy)) had no limitations and were similar in physical and chemical attributes where the subsoil may be stripped to depth and used as topsoil.

      Eight of the SPCs (3Bl(Te), 4Bl(Te), 5Dn(Ro), 8Dn(Te), 13Bl(Ta), 14Bl(Ro), 15Bl(Ro) and 19Bl(Ro)) were similar, however did have sodic subsoils at depth. Separation of the five SPCs with no limitations and the eight SPCs with sodic subsoils would be recommended with respect to stockpiling. This would prevent impacts to the five subsoils with no limitations and the need for any additional amelioration treatment.
    - Soil amelioration recommendations such as gypsum application may benefit some of the deeper sodic subsoils as well as organic matter / fertiliser application pending the PMLU i.e., if cropping land uses were selected. Management, storage and handling recommendations have been provided to retain and improve the quality of topsoil for rehabilitation reuse pending the final PMLU.

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12 GLOSSARY OF ACRONYMS, UNITS AND TERMS

The following acronyms have been used in this report.

Acronym	Description
AASS	Actual Acid Sulfate Soils
AHD	Australian Height Datum
ALC	Agricultural Land Class / Classification
AS	Australian Standard
ASC	Australian Soil Class / Classification
ASRIS	Australian Soil Resource Information System
ASS	Acid Sulfate Soils
BWM	Blackwater Mine
BoM	Bureau of Meteorology
Ca:Mg	Calcium Magnesium Ratio
CEC	Cation Exchange Capacity
CHPP	Coal Handling and Preparation Plant
Cl^-	Chloride
DAP	Diammonium Phosphate
DERM	Department of Environment and Resource Management
DES	Department of Environment and Science (Queensland)
DME	Department of Minerals and Energy (Queensland)
DNRM	Department of Natural Resources and Mines (Queensland)
DoR	Department of Resources (Queensland)
DSDMIP	Department of State Development, Manufacturing, Infrastructure and Planning (Queensland)
DSITI	Department of Science, Information Technology and Innovation
DSITIA	Department of Science, Information Technology, Innovation and the Arts
EAT	Emerson Aggregate Test
EC	Electrical Conductivity
ECEC	Effective Cation Exchange Capacity
ECse	Electrical Conductivity, saturated extract
EOBH	End of Borehole
EOTP	End of Test Pit

Acronym	Description
ERD	Effective Rooting Depth
ESCP	Erosion and Sediment Control Plan
ESP	Exchangeable Sodium Percentage
GALE	Guidelines for Agricultural Land Evaluation in Queensland
GDA	Geocentric Datum of Australia
GradSect	Gradient-oriented Transect
GTE	GT Environmental Pty Ltd
IECA	International Erosion Control Association
LCC	Land Capability Classification
LGA	Local Government Area
LSAT	Land Suitability Assessment Techniques
m AHD	Elevation in metres with respect to the Australian Height Datum
MAP	Monoammonium Phosphate
mbgl	Metres below ground level
ML	Mining lease
NCST	National Committee on Soil and Terrain
P	Phosphorus
PAA	Priority Agricultural Areas
PASS	Potential Acid Sulfate Soils
PAWC	Plant Available Water Capacity
PLA	Priority Living Areas
PMLU	Post Mine Land Use
PRC Plan	Progressive Rehabilitation and Closure Plan
PSA	Particle Size Analysis
PTD	Permit to Disturb
QDPI	Queensland Department of Primary Industries
RPI	Regional Planning Interests
SA	Surface Area
SALI	Soil and Land Information

Acronym	Description
SALS	Soil and Land Suitability
SCA	Strategic Cropping Areas
SCL	Strategic Cropping Land
SEA	Strategic Environmental Areas
SLR	SLR Consulting Pty Ltd
SMU	Soil Map Unit
SPC	Soil profile class
SOP	Standard Operating Procedure
TCP	Thermal Coal Plant
UMA	Unique Mapping Area
Whitehaven Blackwater	Whitehaven Blackwater Pty Ltd
h : v	Horizontal run to vertical rise

The following units of measurement have been used in this report.

Unit	Description
°C	Degrees Celsius. Unit of Measurement, of temperature.
%	Percent. Unit of Measurement, an amount in or for every hundred.
cmol(+)/kg	Centimoles of positive charge per kilogram
dS	deciSiemens. Unit of measurement, the system of units base unit of specific conductance (Electrical conductivity).
dS/m	deciSiemens per metre.
ha	Hectare. Unit of measurement of area. A metric unit of square measure, equal 10,000 square metres.
kg	Kilogram. Unit of measurement, the system of units base unit of mass.
kg/ha	Kilograms per hectare.
km	Kilometres. Unit of measurement of length, equal to 1,000 metres.
km^2	Kilometres squared.
m	Metre. Unit of measurement, the system of units base unit of length.
m^3	Cubic metres.
meq	Milliequivalent. Unit of measurement, a measurement of chemical activity.
meq/100g	Milliequivalents per 100 grams of soil.

Unit	Description
mg	Milligram. Unit of measurement of mass, equal to 1,000 of a gram.
mg/kg	Milligrams per kilogram.
mm	Millimetres. Unit of measurement of length, equal to 1,000 of a metre.
mm/100 cms	Millimetres per 100 cm.
Mtpa	Million tonnes per annum.
t	Tonne. Unit of measurement of mass, equal to 1,000 kilograms.
t/ha	Tonnes per hectare. Unit of volume across an area. 0.1 kg/m^2.
µm	Micrometre. Unit of measurement, equal to equalling 1×10^{-6} of a metre.

The following terms used in this report have been described below.

Term	Description
A horizon	Mineral horizon at or near the surface with some accumulation of humified organic matter, usually darker in colour than underlying horizons and with maximum biological activity for any given soil profile (NCST, 2024).
Analysed Site	A selected detailed site and location assessed as Analysed of the SPC for which characterisation, land suitability and topsoil stripping resource is assessed.
B horizon	Horizons consisting of one or more mineral soil layers characterised by one or more of the following: a concentration of silicate clay, iron, aluminium, organic material or several of these; a structure and / or consistence unlike that of the A horizons above or of any horizons below; stronger colours, usually expressed as higher chroma and / or redder hue, than those of the A horizons above or of those horizons below (The National Committee on Soil and Terrain 2009).
C Horizon	Layers below the solum (AB horizons / profiles) of consolidated or unconsolidated material, usually partially weathered, little affected by pedogenic processes, and either like or unlike the material from which the solum presumably formed.
Calcium Magnesium Ratio (Ca:Mg)	Ratios of exchangeable Calcium (Ca) to exchangeable Magnesium (Mg) are used to support assessments of subsoil dispersibility where Ca:Mg < 0.1 are often associated with highly dispersive subsoils.
Effective Cation Exchange Capacity (ECEC)	The maximum positive charge required to balance the negative charge on colloids (clays and other charged particles). The units are milli-equivalents per 100 grams of material or centimoles of charge per kilogram of exchanger. ECEC is often used as a measure of soil fertility and nutrient retention capacity.
Chromosol	Soils with a clear or abrupt textural contrast B horizon and in which the upper 0.20 m of the B horizon or major part of the entire B2 horizon if it is < 0.20 m thick, is not sodic and not strongly acid.
Clay	A soil material composed of particles finer than 0.002 mm. When used as a soil texture group such soils contain at least 35% clay.
Colluvial	Unconsolidated, poorly sorted soil and rock material transported largely by gravity (i.e., mass movement), deposited on lower slopes.

Term	Description
Colwell P	A laboratory method for the measure of available soil phosphorus using a bicarbonate extractable method.
Compost	Decomposed organic matter.
Dermosol	Soils with structured B2 horizons greater than weak and do not have clear or abrupt textural b horizon.
Dispersion	A process by which species in solution mix with a second solution, thus reducing in concentration. In the case of sodic soils, it will predispose the soil material to lose structure and disseminate into the solution.
Dispersion Ratio (R1)	The measurement of soil dispersion when used in conjunction with ESP and the Ca:Mg ratio for predicting soil physical behaviour.
Effective Rooting Depth (ERD)	The depths of which vegetation roots may readily penetrate the soil profile and have access to water and nutrients. Usually reduced through physical and chemical barriers, for example, refusal on rock or chloride above 800 mg/kg.
Electrical Conductivity (EC)	The EC of water is a measure of its ability to conduct an electric current. The EC of soils will vary depending on the texture and amount of moisture held by the soil particles. Electrical conductance increases with soluble salt content and thus allows simple interpretation of salinity.
Emerson Aggregate Test (EAT)	The test classifies the behaviour of soil aggregates, when immersed, remoulded, their coherence in water and when disturbed.
Erosion	The displacement of soil, rock or dissolved material by wind or water flow from one location on the earth and then travels to another location.
Exchangeable Sodium Percentage (ESP)	The amount of sodium as a proportion of all cations in a soil is termed the Exchangeable Sodium Percentage. It is calculated by dividing the exchangeable sodium by the cation exchange capacity (CEC), multiplied by 100. ESP values > 6% are considered sodic, with values > 15% considered very sodic. ESP = (Exchangeable sodium (meq/100g) / CEC (meq/100g)) x 100.
Field pH	The measurement of the pH in the field by a Manutec Pty Ltd, Soil pH Test Kit. This kit consists of pH dye indicator, Barium Sulphate and reference colour chart. Also known as Raupach pH kit.
Field Texture	The size distribution of particles finer than 2 mm, reflected in the behaviour of a small handful of moistened soil kneaded into a bolus and assessment of ribbon.
Gleyed	Indicative of permanent or periodic intense reduction due to wetness and is characterised by greying, bluish or greenish colour, generally of low chroma. Mottling may be prominent as well as rusty root channel mottling.
Gradient	The rate of inclination of a slope. The degree of deviation from the horizontal.
Gully (Erosion)	The displacement of soil by running water that forms clearly defined, narrow channels that generally carry water only during or after heavy rain.
Horizon	An individual soil layer, based on texture and colour, which differs from those above and below.
Jarosite	Iron sulfate mineral found in Acid Sulfate Soils. Form distinct butter or straw-coloured mottles with a hue of 2.5Y or yellower and a value chroma of 6 or more.

Term	Description
Kandosol	Soils that have well-developed B2 horizons in which the major part if massive or has only a weak grade of structure (compare with tenic B horizon and cemented pans) and have a maximum clay content in some part of the B2 horizon which exceeds 15% (i.e., heavy sandy loam, SL+).
Lithic	Containing large amounts of fragments derived from previously formed rocks.
Loam	A medium textured soil of approximate composition 10-25% clay, 25-50% silt and > 50% sand.
Massive	Refers to the condition of the soil layer in which the layer appears to be as a coherent or solid mass which is largely devoid of peds.
Microrelief	Refers to relief up to a few metres about the plane of the land surface with alternating mounds and depressions formed due to clay horizons shrinking and swelling with alternate drying and wetting cycles.
Mottles	Areas of contrasting colour in the overall soil colour which are caused by anerobic conditions as a result of poor aeration. Usually, an indicator of poor drainage and retention of water.
Ped	An individual natural soil aggregate. In an undisturbed state peds will group together to form larger aggregates.
Pedality	Describes a soil in which some or all of the soil material occurs in the form of peds in the moist state.
pH	A logarithmic index for the concentration of hydrogen ions in an aqueous solution, which is used as a measure of acidity.
Phase, soil	A phase is a subdivision of an SPC based on attributes that have particular significance to the use of the soil (Powell, 2008). Any attribute or combination of attributes can be used to differentiate a phase, as long as the attribute class limits stay within those defined for the SPC. Phases commonly include criteria based on texture, coarse fragments, slope, colour, erosion, depth, microrelief or salinity.
Plant Available Water Capacity (PAWC)	Amount of soil water stored between the field capacity (soil water content where water ceases to drain readily from the soil) and plant wilting point. Usually expressed as an equivalent depth of rainfall in mm.
Profile, soil	Vertical section of soil from the soil surface through all of its horizons to parent material, consolidated substrate or unconsolidated material.
Sand	Soil particles in the size range > 0.02–2.0 mm.
Silt	Soil particles in the size range 0.02–0.002 mm.
Soil Profile Class (SPC)	Soils grouped into a single management unit on the basis of similar morphology, position on the landscape, substrate and chemistry. An SPC is considered a consociation where one class (Australian Soil Class) is dominant.
Sodic	Also commonly referred to as a non-saline alkali soil. It is a soil that contains sufficient exchangeable sodium and does not contain appreciable quantities of soluble salts. A term given to soil with a level of exchangeable sodium cations > 10-15% of the soils cation exchange capacity (CEC), or soluble sodium cations > 10-15 times the square root of soluble calcium and magnesium cations.
Sodosol	Soils with a clear or abrupt textural contrast B horizon and in which the upper 0.20 m of the B horizon or major part of the entire B2 horizon is sodic and not strongly acid.

Term	Description
Solum	The soil profile that includes horizons A and B.
Subsoil	Subsurface material comprising the B and C horizons of soils with distinct profiles. They often have brighter colours and higher clay content than topsoils.
Texture	The size of particles in the soil. Texture is divided into six groups, depending on the amount of coarse sand, fine sand, silt and clay in the soil.
Topsoil	Part of the soil profile, typically the A1 horizon, containing material, which is usually darker, more fertile and better structured than the underlying layers.
Unique Mapping Area (UMA)	When the unique set of soil and land attributes associated with an individual polygon are described and collected, the polygon is referred to as a unique mapping area. UMAs assist in identifying different land attributes such as degree of rockiness and slope which may either be part of the same soil type or not.
UMA Confidence Codes	1 - Visited UMA, one or more observations made, confident in allocation of attributes and delineation of boundary 2 - Visited UMA, one or more observations made, low confidence in allocation of attributes and / or delineation of boundary 3 - Visited UMA, no observations made, confident in allocation of attributes and delineation of boundary 4 - Visited UMA, no observations made, low confidence in allocation of attributes and / or delineation of boundary 5 - Did not visit UMA, no observations made, confident in allocation of attributes and delineation of boundary 6 - Did not visit UMA, no observations made, low confidence in allocation of attributes and / or delineation of boundary
Variant, soil	A variant has one or more profile attributes clearly outside the defined range of any existing SPC, however it has too few profiles described for a complete definition, or it occupies an area too small to warrant its own SPC. Variants also include attributes that do not affect land use, such as colour.
Vertosol	Soils with all of the following, a clay field texture or 35% or more clay throughout the solum except for thin surface crusty horizons 30 mm or less thick, when dry, open cracks occur at some time in most years at least 5 mm wide and extend to the surface or the base of any plough layer peaty horizon self-mulching horizon or thin surface crusty horizon and slickenside and / or lenticular peds occur at some depth in the solum.
Weathered / Weathering	The chemical or physical breakdown of rocks and minerals. It may take the form of disintegration into smaller pieces of rock, or chemical weathering where minerals are converted and removed in soil solution.

13 APPENDICES

Appendix A Detailed Site Descriptions

Site D1	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 685633 7377526 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 1Dn(Te) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Auger	**Survey Date / Described by:** 10/9/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Undulating plain Plain Simple slope Slope 2.0 / 3.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia No microrelief Extensive clearing No erosion	Self-Mulching No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Light medium clay	Moderate / Very firm Subangular blocky 2-5 mm Slickensides	No inclusions or segregations	2.5Y5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 8.0 No dispersion after 10 minutes No slaking	0.00-0.10 0.20-0.30 0.50-0.60
			B21 0.20-0.40 Abrupt 5-20mm	Light clay	Moderate / Firm Angular blocky 5-10 mm Slickensides	<2% calcium carbonate 2-6mm	2.5Y5/3 Light olive brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.30 / 7.5 No dispersion after 10 minutes Partial slaking	
			BC 0.40-0.60 End of borehole (EOBH)	Medium clay	Massive / Loose Angular blocky 5-10 mm Slickensides	20-50% coarse fragments 20-60mm 20-50% coarse fragments 6-20mm	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.50 / 9.0 No dispersion after 10 minutes No slaking	
			Refusal on cemented pan								

Landscape



Surface



Soil Profile



Site D2	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 690677 7370147 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Auger	**Survey Date / Described by:** 11/9/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Simple slope Slope 3.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow scrub Grassland No microrelief Extensive clearing No erosion	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.05 Clear 20-50mm	Light medium clay	Moderate / Strong Angular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.03 / 8.5 No dispersion after 10 minutes Complete slaking	0.00-0.05 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.30-1.40
			B21 0.05-0.30 Clear 20-50mm	Medium clay	Strong / Firm Angular blocky 50-100 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR4/2 Dark greyish brown Mottles: Black Very few <2% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	0.15 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.35-0.70 Clear 20-50mm	Medium clay	Strong / Firm Angular blocky 50-100 mm Slickensides	<2% calcium carbonate 2-6mm	7.5YR4/3 Brown Mottles: Orange and grey Few 2%-10% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	0.45 / 8.5 No dispersion after 10 minutes Partial slaking	
			B23 0.70-1.00 Clear 20-50mm	Medium clay	Strong / Very firm Angular blocky 20-50 mm Slickensides	<2% coarse fragments 6-20mm	7.5YR4/4 Brown Mottles: Black Few 2%-10% Few <5 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	0.85 / 7.0 Slight Dispersion after 10 minutes Complete slaking	
			B24 1.00-1.30 Clear 20-50mm	Medium heavy clay	Strong / Very firm Angular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4/6 Strong brown Mottles: Brown Very few <2% Few <5 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	1.15 / 5.5 Slight Dispersion after 10 minutes Complete slaking	
			BC 1.30-1.40 EOBH	Medium clay	Moderate / Weak Angular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20mm 10-20% coarse fragments 6-20mm	7.5YR4/6 Strong brown Mottles Black Very few <2% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	1.35 / 5.0 Slight Dispersion after 10 minutes Complete slaking	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site D3	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686900 7378950 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 2Dn(Te) / Black Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Auger	**Survey Date / Described by:** 13/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Whitewood, sparse No microrelief Limited clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light clay	Strong / Very firm Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments 6-20mm	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	0.05 / 8.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.70-0.80 0.90-1.00
			B21 0.10-0.30 Clear 20-50mm	Light clay	Moderate / Very firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.20 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.30-0.65 Clear 20-50mm	Medium clay	Strong / Firm Angular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR2/2 No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.45 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 0.65-0.84 Clear 20-50mm	Medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.75 / 8.5 No dispersion after 10 minutes Complete slaking	
			BC 0.84-1.00 EOBH	Light medium clay Silty	Massive / loose Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	No roots	0.92 / 9.0 No dispersion after 10 minutes Partial slaking	
			Refusal on weathered substrate								

Landscape



Surface



Soil Profile



Site D4	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686653 7375479 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 12Da(Te) / Grey Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Auger	**Survey Date / Described by:** 13/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Residual rise Flat Slope 1.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia No microrelief Extensive clearing No erosion	Surface crust <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Clay loam, sandy	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.50 Gradual 50-100mm	Medium clay Sandy	Moderate / Very strong Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.80 EOBH	Medium clay Sandy	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.65 / 8.5 No dispersion after 10 minutes Complete slaking	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site D5	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686565 7384805 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 3Bl(Te) / Black Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 14/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Hillslope Flat Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Whitewood Grassland No microrelief Extensive clearing No erosion	Firm No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 6.5 No dispersion after 10 minutes No slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.00-1.10 1.40-1.50 1.70-1.80
			B21 0.20-0.40 Clear 20-50mm	Medium clay	Strong / Very firm Subangular blocky 5-10 mm Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.30 / 8.0 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.40-0.80 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 5-10 mm Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.60 / 8.0 Slight Dispersion after 10 minutes Partial slaking	
			B23 0.80-1.30 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 5-10 mm Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	1.05 / 6.0 Slight Dispersion after 10 minutes Partial slaking	
			B24 1.30-1.60 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	5YR5/6 Yellowish red Mottles: 10YR4/2 Dark greyish brown Few 2%-10% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	1.45 / 5.5 No dispersion after 10 minutes Partial slaking	
			C 1.60-2.00 End of test pit (EOTP)	-	-	-	-	-	-	1.80 / 5.5 No dispersion after 10 minutes Partial slaking	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site D6	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686529 7384441 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 4Bl(Te) / Grey Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 14/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Complete clearing, not cultivated No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Light medium clay Silty	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 6.5 No dispersion after 10 minutes No slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20
			B21 0.20-0.60 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Common	0.40 / 7.5 Slight Dispersion after 10 minutes No slaking	
			B22 0.60-0.90 Clear 20-50mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown Mottles: Pale orange-brown, Few 2%-10%	Dry Imperfect drained	Fine 1-2mm Few	0.75 / 7.5 Slight Dispersion after 10 minutes Partial slaking	
			B3 0.90-1.20 Clear 20-50mm	Clay Loam	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown Mottles: Pale orange-brown, Common 10%-20%	Very poorly drained	No roots	-	
			C 1.20-1.60 EOTP	-	-	-	-	Very poorly drained	No roots	-	

Landscape



Surface



Soil Profile



Site D7	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686513 7384178 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 5Dn(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 14/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Drainage Depression Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland Acacia No microrelief Complete clearing, not cultivated No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-015 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 20-60mm	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90
			B21 0.15-0.45 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	2-10% coarse fragments 20-60mm	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Common	0.30 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.45-0.60 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 50-100 mm Slickensides	<2% coarse fragments and nodules 2-6mm	10YR4/2 Dark greyish brown Mottles: 10YR4/3 Brown Very few <2% Medium 5-15 mm	Moderately moist Moderately well drained	Fine 1-2mm Common	0.60 / 7.5 Moderate dispersion after 10 minutes Complete slaking	
			C 0.60-1.20 EOTP – Weathered substrate								

Landscape



Surface



Soil Profile



Site D8	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686482 7383509 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Whitewood Grassland No microrelief Complete clearing, not cultivated No erosion	Cracking 2-10% coarse fragments 200-600mm Rock outcrop present <2% flake	A1 0.00-0.15 Clear 20-50mm	Medium clay Silty	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR3/2 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.08 / 7.0 No dispersion after 10 minutes No slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20
			B21 0.15-0.40 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments and nodules 2-6mm	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.25 / 7.5 No dispersion after 10 minutes No slaking	
			B22 0.40-0.70 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm Manganese nodules and rock fragments <2mm	10YR4/4 Dark yellowish brown Mottles: Pale brown Few 2%-10% Medium 5-15 mm	Dry Moderately well drained	Fine 1-2mm Common	0.55 / 8.0 No dispersion after 10 minutes Partial slaking	
			B23 0.70-1.10 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm	2-10% coarse fragments 2-6mm <2% coarse fragments 6-20mm	10YR4/4 Dark yellowish brown Mottles: Pale brown Common 10%-20% Medium 5-15 mm	Dry Moderately well drained	Very fine <1mm Common	0.90 / 8.0 No dispersion after 10 minutes Partial slaking	
			C 1.10-1.20 EOTP	-	-	-	-	-	-	-	
			Refusal on weathered substrate								

Landscape



Surface





Soil Profile



Site D9 Mound	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686755 7383408 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 6Bl(Pg) / Brown Vertosol gilgai	Geology (Dominant): Arenite-Mudrock	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								Sample (m) / Observations
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	
Grazing Gently undulating plain Plain Simple slope Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland Normal gilgai Complete clearing, not cultivated No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Medium clay Silty	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.08 / 8.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.15-0.40 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 6-20mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.28 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-1.00 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm Slickensides	2-10% coarse fragments	10YR4/3 Brown Mottles: Brown and dark brown Few 2%-10% Few <5 mm	Moderately moist Imperfectly drained	Fine 1-2mm Few	0.70 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 1.00-1.50 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 50-100 mm Slickensides	<2% coarse fragments and manganese nodules 2-6mm	7.5YR4/4 Brown Mottles: Brown Very few <2% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Few	1.25 / 6.5 No dispersion after 10 minutes Complete slaking	
			B24 1.50-1.70 EOBH	Medium heavy clay	Strong / Strong Subangular blocky 50-100 mm Slickensides	<2% coarse fragments and manganese nodules 2-6mm	7.5YR4/6 Strong brown Mottles: Brown Few 2%-10% Few <5 mm	Dry Imperfectly drained	No roots	1.60 / 6.0 No dispersion after 10 minutes Complete slaking	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site D9 Depression	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686769 7383420 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 6Bl(Pg) / Brown Vertosol gilgai	Geology (Dominant): Arenite-Mudrock	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Simple slope Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland Normal gilgai Complete clearing, not cultivated No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.40 Clear 20-50mm	Medium heavy clay	Strong / Rigid Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	2.5Y4/2 Weak red No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.20 / 7.0 Slight Dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.70-0.80 1.10-1.20 1.40-1.50 1.80-1.90
			B21 0.40-0.60 Clear 20-50mm	Medium heavy clay	Strong / Very strong Subangular blocky 50-100 mm Slickensides	<2% coarse fragments 6-20mm	2.5Y4/2 Weak red No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.50 / 8.0 Moderate dispersion after 10 minutes Partial slaking	
			B22 0.60-0.80 Gradual 50-100mm	Medium heavy clay	Strong / Very strong Subangular blocky 50-100 mm Slickensides	<2% coarse fragments 6-20mm	2.5Y5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.70 / 8.0 Strong dispersion after 10 minutes Complete slaking	
			B23 0.80-1.30 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments	7.5YR4/4 Brown Mottles: Brown Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.05 / 6.5 No dispersion after 10 minutes Complete slaking	
			B24 1.30-1.70 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 6-20mm	7.5YR4/4 Brown Mottles: Pale brown Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	No roots	1.45 / 6.5 No dispersion after 10 minutes Partial slaking	
			C 1.70-1.90 EOTP	-	-	-	-	-	-	-	

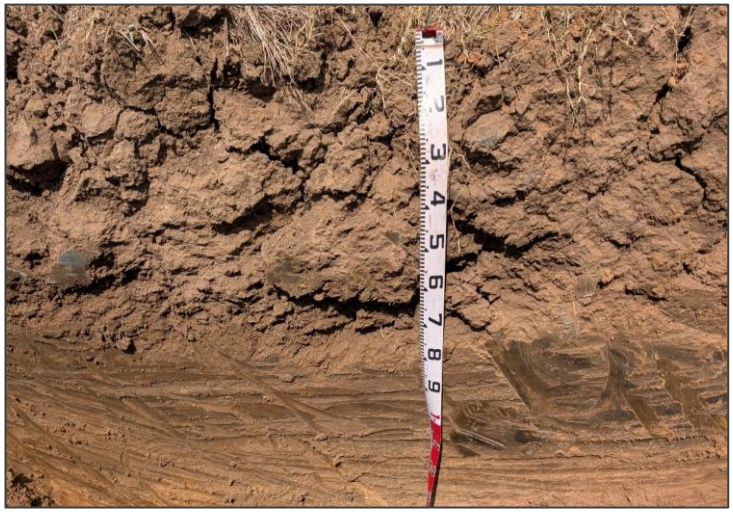
Landscape



Surface



Soil Profile



Site D10	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 687134 7383371 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.45 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 6-20mm <2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.33 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.45-0.80 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	2-10% coarse fragments 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.62 / 8.0 No dispersion after 10 minutes Partial slaking	
			B23 0.80-1.20 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments and manganese nodules	7.5YR5/4 Reddish brown No mottles or bleaching	Dry Moderately well drained	No roots	1.00 / 8.0 Slight Dispersion after 10 minutes Complete slaking	
			C 1.20-1.40	-	-	-	-	-	-	-	
			R 1.40-1.50	-	-	-	-	-	-	-	

Landscape



Surface



Soil Profile



Site D11	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686985 7382892 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Lower slope Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse vegetation No microrelief Complete clearing, not cultivated No erosion	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.20 Abrupt 5-20mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 7.5 No dispersion after 10 minutes Complete slaking	No samples taken
			B21 0.20-0.50 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 6-20mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.35 / 8.0 No dispersion after 10 minutes Complete slaking	
			BC 0.50-0.90 Clear 20-50mm	Medium heavy clay	Moderate / Firm Subangular blocky No Slickensides	10-20% coarse fragments 20-60mm <2% coarse fragments 6-20mm	10YR4/4 Dark yellowish brown Mottles: Pale brown Few 2%-10% Medium 5-15 mm	Dry Moderately well drained	Fine 1-2mm Few	0.70 / 8.0 No dispersion after 10 minutes Complete slaking	
			C 0.90-1.00	-	-	-	-	-	-	-	

Landscape



Surface



Soil Profile



Site D12 Mound	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 687003 7382185 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 6Bl(Pg) / Brown Vertosol gilgai	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow, sparse Normal gilgai Extensive clearing No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 8.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5/3 Brown Mottles: Pale Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Common	0.40 / 5.5 No dispersion after 10 minutes Partial slaking	
			B22 0.60-1.80 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm Slickensides	No inclusions or segregations	10YR5/4 Yellowish brown Mottles: Pale Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Few	1.20 / 6.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D12 Depression	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 687002 7382190 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 6Bl(Pg) / Brown Vertosol gilgai	Geology (Dominant): Arenite-Mudrock	Soil Survey Type / Observation Class / Method: Free / Detailed Class III / Test pit	Survey Date / Described by: 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow, sparse Normal gilgai Extensive clearing No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 7.5 Slight Dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5/3 Brown Mottles: Pale Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Common	0.40 / 6.5 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.60-1.80 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm Slickensides	No inclusions or segregations	10YR5/3 Brown Mottles: Pale Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Few	0.80 / 7.5 1.40 / 7.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D13	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686401 7382909 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 15/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Extensive clearing No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-20 Clear 20-50mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 7.5 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	7.5YR4/3 Brown Mottles: Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Common	0.40 / 8.5 No dispersion after 10 minutes Complete slaking	
			B22 0.60-0.80 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	7.5YR5/3 Mottles: Pale brown Few 2%-10% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Common	0.70 / 8.5 No dispersion after 10 minutes Complete slaking	
			B23 0.80-1.00 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5/6 Yellowish brown Mottles: Grey Few 2%-10% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	0.90 / 8.0 No dispersion after 10 minutes Partial slaking	
			C 1.00-1.70 EOTP	-	-	-	-	-	-	-	

Landscape



Surface



Soil Profile



Site D14 Mound	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686471 7382392 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 7Bl(Pg) / Grey Vertosol	Geology (Dominant): Arenite-Mudrock	Soil Survey Type / Observation Class / Method: Free / Detailed Class II/III / Test pit	Survey Date / Described by: 16/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Whitewood Normal gilgai Limited clearing No erosion	Cracking <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Gradual 50-100mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.40 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 20-60mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.30 / 7.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 20-60mm	10YR5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.50 / 6.5 Moderate dispersion after 10 minutes Complete slaking	
			B23 0.60-1.90 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 100-200 mm Slickensides	<2% coarse fragments 20-60mm	10YR5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	1.00 / 7.0 1.50 / 7.0 No dispersion after 10 minutes Complete slaking	
			B24 1.90-2.20 EOTP	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm Slickensides	10-20% coarse fragments 20-60mm 2-10% coarse fragments 6-20mm	10YR5/2 Greyish brown Mottles: Brown Few 2%-10% Few <5 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	2.00 / 7.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D14 Depression	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686466 7382399 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 7Bl(Pg) / Grey Vertosol	Geology (Dominant): Arenite-Mudrock	Soil Survey Type / Observation Class / Method: Free / Detailed Class III / Test pit	Survey Date / Described by: 16/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Whitewood Normal gilgai Limited clearing	Cracking <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.15 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.08 / 6.0 Slight Dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.30-1.40
			B21 0.15-0.50 Gradual 50-100mm	Medium heavy clay	Strong / Very strong Subangular blocky 100-200 mm Slickensides	<2% coarse fragments 6-20mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.30 / 8.5 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.50-1.00 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Moderately well drained	Very fine <1mm Few	0.75 / 7.0 No dispersion after 10 minutes Partial slaking	
			B23 1.00-1.30 Clear 20-50mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	2-10% coarse fragments 6-20mm	10YR5/2 Greyish brown Mottles: Pale Grey Many 20%-50% Coarse 15-30 mm	Dry Imperfectly drained	Very fine <1mm Few	1.15 / 8.0 No dispersion after 10 minutes Complete slaking	
			BC 1.30-1.45 EOTP	Light medium clay, sandy	Moderate / Firm Subangular blocky 20-50 mm No Slickensides	20-50% coarse fragments 20-60mm	10YR5/2 Greyish brown Mottles: Yellow Many 20%-50% Coarse 15-30 mm	Dry Imperfectly drained	No roots	1.38 / 7.0 No dispersion after 10 minutes Complete slaking	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site D15	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686130 7381355 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 7Bl(Pg) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class II(a) / Test pit	**Survey Date / Described by:** 16/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Normal gilgai Limited clearing No erosion	Cracking <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Medium heavy clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 6-20mm	10YR5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.08 / 7.0 No dispersion after 10 minutes Complete slaking	No samples taken
			B21 0.15-0.30 Clear 20-50mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.22 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.30-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR5/2 Greyish brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Few	0.45 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 0.60-1.70 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Moderately moist Moderately well drained	Fine 1-2mm Few	0.90 / 7.0 1.40 / 7.0 No dispersion after 10 minutes Complete slaking	
			B24 1.70-2.20 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown Mottles: Brown Many 20%-50% Coarse 15-30 mm	Moderately moist Moderately well drained	Very fine <1mm Few	2.00 / 6.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site D16	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686472 7381335 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 10Ct(Ro) / Grey Vertosol	**Geology (Dominant): Alluvium**	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 16/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Ruby Salt Bush, medium height No microrelief, nearby gilgai observed but not in immediate area of this site No erosion	Surface flake <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.05 Clear 20-50mm	Light medium clay Silty	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR5/4 Yellowish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.03 / 7.5 No dispersion after 10 minutes Complete slaking	0.00-0.05 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.05-0.45 Clear 20-50mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 6-20mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Coarse >5mm Common	0.30 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.45-1.30 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm Slickensides	<2% coarse fragments 6-20mm	7.5YR5/4 Reddish brown Mottles: Red Many 20%-50% Few <5 mm	Dry Imperfectly drained	Medium 2-5mm Few	0.90 / 5.5 No dispersion after 10 minutes Complete slaking	
			B23 1.30-1.90 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm Slickensides	<2% coarse fragments 6-20mm	10YR6/1 Grey Mottles: Red 10-20%, 5-15mm Brown, many 20%-50% Very coarse >30 mm	Moderately moist Imperfectly drained	No roots	1.30 / 5.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site D17	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686079 7380691 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 16/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Mid-slope Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia, sparse No microrelief Limited clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.05 Clear 20-50mm	Light medium clay Silty	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.03 / 8.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.05-0.60 Clear 20-50mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Medium 2-5mm Common	0.30 / 7.0 No dispersion after 10 minutes Partial slaking	
			B22 0.60-1.35 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR5/4 Yellowish brown Mottles: Pale brown Very few <2% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Few	1.00 / 7.5 Moderate dispersion after 10 minutes Complete slaking	
			BC 1.35-1.50 EOTP	Medium clay	Strong / Very firm Subangular blocky 50-100 mm No Slickensides	2-10% coarse fragments 2-6mm	2.5Y5/3 Light olive brown Mottles: Pale Grey, 10-20%, 5-15mm Dark brown, common 10%-20%, Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Few	1.42 / 7.5 Slight Dispersion after 10 minutes Complete slaking	
			Refusal on weathered substrate								

Landscape



Surface



Soil Profile



Site D18	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686034 7379970 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 16/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Mid-slope Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia, sparse No microrelief Extensive clearing No erosion	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Light medium clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 20-60mm 2-10% coarse fragments 6-20mm	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.08 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 015-0.40 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	2-10% coarse fragments 6-20mm 2-10% coarse fragments 20-60mm	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.28 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.60 Gradual 50-100mm	Light medium clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 6-20mm 10-20% calcium carbonate 20-60mm	7.5YR4/4 Brown Mottles: Brown Very few <2% Few <5 mm	Dry Imperfectly drained	Fine 1-2mm Few	0.50 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 0.60-1.80 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 6-20mm	7.5YR5/4 Reddish brown Mottles: Grey Few 2%-10% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	1.40 / 8.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D19	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686719 7379753 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 8Dn(Te) / Grey Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 20/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Drainage Depression Open depression Slope 3.0 / 3.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Ruby Salt Bush Emu Apple No microrelief Extensive clearing No erosion	Surface flake <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.05 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.03 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.05 0.20-0.30 0.40-0.50 0.50-0.60 0.80-0.90
			B21 0.05-0.30 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 6-20mm	10YR5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.18 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.30-0.50 Gradual 50-100mm	Medium heavy clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20mm	10YR5/2 Greyish brown Mottles: Brown Common 10%-20% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Common	0.40 / 7.5 No dispersion after 10 minutes Partial slaking	
			B3 0.50-0.60	Clay Loam Coarse	Massive / Weak No Slickensides	20-50% coarse fragments 6-20mm	10YR5/4 Yellowish brown Mottles: Brown Many 20%-50% Few <5 mm	Dry Imperfectly drained	No roots	0.55 / 7.0 Slight Dispersion after 10 minutes Partial slaking	
			BC 0.60-0.90	Clay Loam Coarse	Massive / Weak No Slickensides	50-90% coarse fragments 6-20mm	10YR5/4 Yellowish brown Mottles: Brown Many 20%-50% Few <5 mm	Dry Imperfectly drained	No roots	0.55 / 7.0 Slight Dispersion after 10 minutes Partial slaking	
			C 0.90-1.10 EOTP – Refusal on cemented pan								

Landscape



Surface



Soil Profile



Site D20	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686578 7380646 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 4Bl(Te) / Grey Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 20/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Hillslope Upper slope Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 60-200mm No rock outcrop	A1 0.00-0.05 Clear 20-50mm	Medium heavy clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.03 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.05 0.05-0.15 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.80-1.90
			B21 0.05-0.15 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.15-0.70 Clear 20-50mm	Medium heavy clay	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm <2% coarse fragments 20-60mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.40 / 7.5 No dispersion after 10 minutes Partial slaking	
			B3 0.70-0.90 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20mm	10YR4/3 Brown Mottles: Brown Common 10%-20% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	0.80 / 7.5 No dispersion after 10 minutes Complete slaking	
			BC 0.90-1.80 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20mm 10-20% coarse fragments 20-60mm	10YR4/3 Brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	No roots	1.35 / 7.0 No dispersion after 10 minutes Partial slaking	
			C 1.80-2.00 EOTP	-	-	-	-	Dry	No roots	1.90 / 7.0 Slight Dispersion after 10 minutes Partial slaking	
			Refusal on weathered substrate								

Landscape



Surface



Soil Profile



Site D21	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686057 7379329 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 9Dn(Ro) / Black Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class II/III / Test pit	**Survey Date / Described by:** 20/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 1.0 / <1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow, sparse No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 6-20mm	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 8.0 No dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.10-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.60-1.00 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.80 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 1.00-1.90 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5/2 Greyish brown Mottles: Brown Common 10%-20% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	1.40 / 7.0 No dispersion after 10 minutes Complete slaking	
			C 1.90-2.10								

Landscape



Surface



Soil Profile



Site D22	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 687457 7373577 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class III / Test pit	Survey Date / Described by: 20/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Brigalow No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 7.0 No dispersion after 10 minutes Partial slaking	Site indicated as Red Vertosol in SLR (2023), however in this instance site was observed as Brown Vertosol 0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.00-1.10 1.30-1.40 1.60-1.70
			B21 0.10-0.50 Gradual 50-100mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.30 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.80 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Few	0.65 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 0.80-1.10 Diffuse >100mm	Medium clay Sandy	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR5/4 Reddish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.95 / 5.5 Slight Dispersion after 10 minutes Complete slaking	
			B24 1.10-1.80 Gradual 50-100mm	Medium clay	Strong / Firm Angular blocky 20-50 mm No Slickensides	<2% coarse fragments 6-20mm	7.5YR4/4 Brown Mottles: Pale brown Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.45 / 5.5 No dispersion after 10 minutes Complete slaking	
			C 1.80-2.00 EOTP								

Landscape



Surface



Soil Profile



Site D23	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 687800 7374140 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 20/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Gradual 50-100mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.5 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.70 Gradual 50-100mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.45 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.70-1.20 Clear 20-50mm	Medium heavy clay Sandy Fine	Moderate / Strong Subangular blocky 20-50 mm Slickensides	2-10% coarse fragments 6-20mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.95 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 1.20-1.80 Clear 20-50mm	Medium clay Sandy Fine	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/1 Dark grey Mottles: Pale brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.60 / 8.0 Moderate dispersion after 10 minutes Complete slaking	
			B24 1.80-2.00 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% calcium carbonate 6-20mm	2.5Y5/3 Light olive brown Mottles: Pale brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	No roots	1.90 / 7.5 Moderate dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D24	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 687133 7374146 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 11Bl(Ta) / Brown Sodosol	**Geology (Dominant):** Alluvium	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 20/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Brigalow Emu Apple No microrelief Extensive clearing Scald erosion	Hard setting <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.20 Gradual 50-100mm	Loam	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 6.0 No dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20
			B21 0.20-0.60 Gradual 50-100mm	Medium clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.40 / 7.5 Slight dispersion after 10 minutes Partial slaking	
			B22 0.60-1.00 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.80 / 7.5 Slight dispersion after 10 minutes Complete slaking	
			C 1.00-1.20 EOTP								

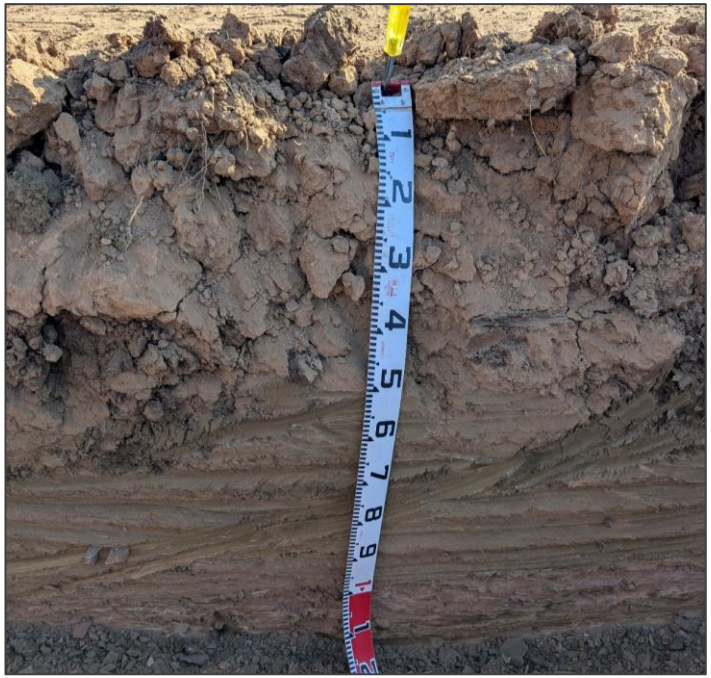
Landscape



Surface



Soil Profile



Site D25	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 685606 7377041 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 21/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 3.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia Eremophila No microrelief Extensive clearing Gully erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 6-20mm	10YR5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.40 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.60-1.00 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.80 / 7.5 Slight Dispersion after 10 minutes Partial slaking	
			B23 1.00-1.50 Clear 20-50mm	Medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	7.5YR5/4 Reddish brown Mottles: Brown Common 10%-20% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	1.25 / 6.5 Slight Dispersion after 10 minutes Partial slaking	
			C 1.50-1.80 EOTP	-	-	-	-	-	-	1.65 / 5.5	

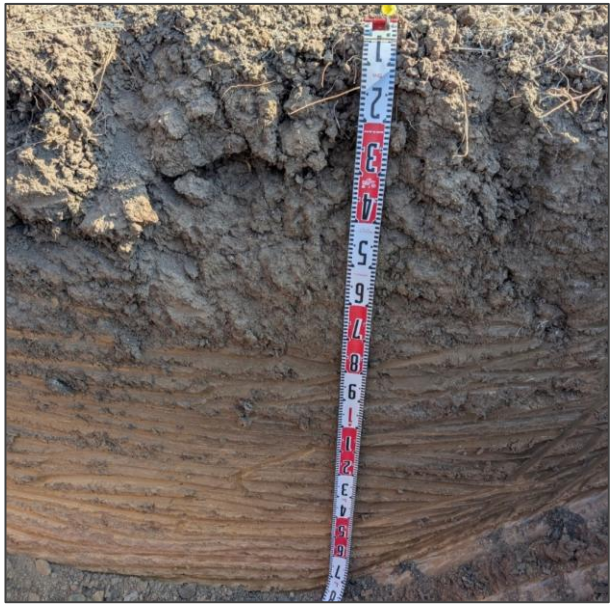
Landscape



Surface



Soil Profile



Site D26	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 685987 7376160 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 21/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.05 / 6.5 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.10-0.50 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey Mottles: Brown Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Common	0.30 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.80 Clear 20-50mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm 2-10% coarse fragments 6-20mm	2.5Y4/2 Weak red Mottles: Brown Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	0.65 / 7.5 Moderate dispersion after 10 minutes Complete slaking	
			BC 0.80-1.30 Clear 20-50mm	Medium clay	Massive / Firm Subangular blocky 20-50 mm No Slickensides	20-50% coarse fragments 2-6mm 20-50% coarse fragments 20-60mm	2.5Y4/3 Reddish brown Mottles: Pale brown Few 2%-10%	Dry Moderately well drained	No roots	1.05 / 6.0 No dispersion after 10 minutes Complete slaking	
			C 1.30-1.80 EOTP	-	-	-	-	-	-	1.55 / 6.0 Slight Dispersion after 10 minutes Partial slaking	
			Refusal on weathered substrate								

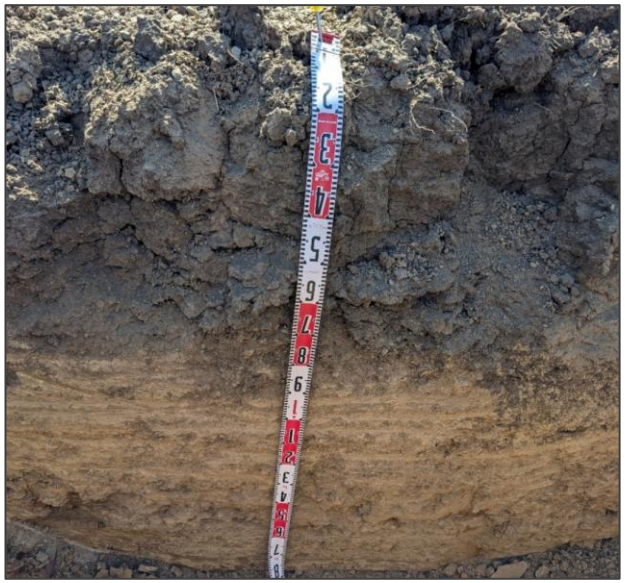
Landscape



Surface



Soil Profile



Site D27	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686688 7376571 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 21/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Medium height No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 6-20mm <2% coarse fragments 20-60mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 8.0 No dispersion after 10 minutes Complete slaking	No samples taken
			B21 0.10-0.60 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.40 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.60-0.90 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 20-60mm	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.75 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 0.90-1.30 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4/4 Brown Mottles: Black Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Fine 1-2mm Few	1.10 / 6.0 Slight Dispersion after 10 minutes Complete slaking	
			B24 1.30-2.00 EOTP	Medium heavy clay	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	10-20% coarse fragments 6-20mm	7.5YR5/4 Reddish brown Mottles: Red Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.65 / 5.5 Slight Dispersion after 10 minutes Complete slaking	

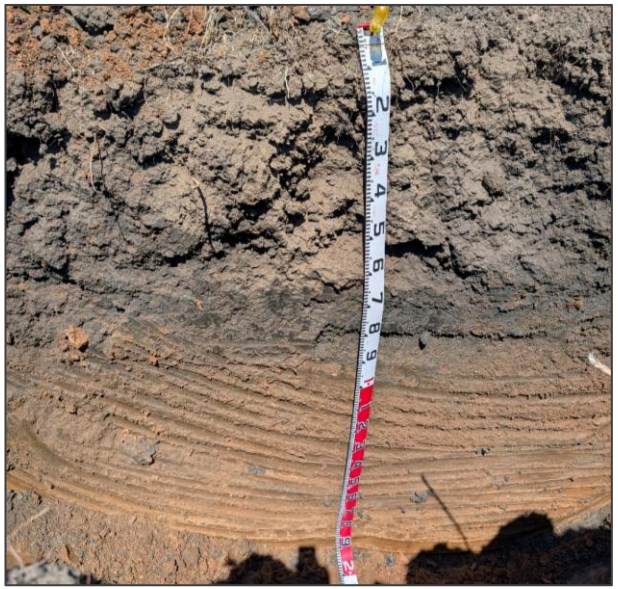
Landscape



Surface



Soil Profile



Site D28	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686087 7377007 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 9Dn(Ro) / Black Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class II(a) / Test pit	**Survey Date / Described by:** 22/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow. sparse No microrelief Extensive clearing	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay	Moderate / Strong Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 20-60mm 2-10% coarse fragments 6-20mm	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.60 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR2/1 Black No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.40 / 8.0 No dispersion after 10 minutes Complete slaking	
			B22 0.60-1.00 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.80 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 1.00-1.30 Diffuse >100mm	Medium heavy clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/3 Brown Mottles: Black Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.15 / 7.5 No dispersion after 10 minutes Complete slaking	
			B24 1.30-1.90 Gradual 50-100mm	Medium heavy clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/3 Brown Mottles: Black Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.50 / 6.0 No dispersion after 10 minutes Partial slaking	
			B24 1.90-2.20 EOTP	Medium heavy clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/3 Brown Mottles: Black Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	2.05 / 6.0 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site D29	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686269 7377476 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro) / Grey vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 21/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia, sparse No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.10-0.45 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.30 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.45-0.70 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 200-600mm <2% coarse fragments 2-6mm	2.5Y4/3 Reddish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.58 / 7.5 No dispersion after 10 minutes Complete slaking	
			BC 0.70-1.00 Gradual 50-100mm	Medium clay Sandy	Weak / Firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 20-60mm 20-50% coarse fragments 6-20mm	2.5Y4/3 Reddish brown Mottles: Orange dark grey 10-20%, <5mm Common 10%-20% Few <5 mm	Dry Imperfectly drained	No roots	0.85 / 7.5 No dispersion after 10 minutes Partial slaking	
			C 1.00-1.85 EOTP	-	-	-	-	-	-	-	

Landscape



Surface



Soil Profile



Site D30	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686573 7378317 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class II(a) / Test pit	Survey Date / Described by: 21/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Poplar Box Bauhinia, sparse No microrelief Extensive clearing Gully erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80 2.00-2.10
			B21 0.20-0.50 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown Mottles: Brown Few 2%-10% Medium 5-15 mm	Dry Moderately well drained	Very fine <1mm Common	0.35 / 7.0 No dispersion after 10 minutes Complete slaking	
			B22 0.50-0.80 Clear 20-50mm	Light medium clay Sandy	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.65 / 7.5 No dispersion after 10 minutes Partial slaking	
			B23 0.80-1.20 Clear 20-50mm	Light medium clay Silty	Strong / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR2/1 Black Mottles: Brown Few 2%-10% Medium 5-15 mm	Dry Moderately well drained	Very fine <1mm Few	1.00 / 6.0 Slight dispersion after 10 minutes Complete slaking	
			B24 1.20-2.10 EOTP	Light medium clay Sandy Coarse	Moderate / Firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	1.60 / 7.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D31	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 685743 7376460 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 21/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow, sparse No microrelief Extensive clearing No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay Silty	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 20-60mm	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 20-60mm <2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.40 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.60-0.90 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm <2% coarse fragments 6-20mm	10YR3/3 Dark brown Mottles: Black Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	0.75 / 7.5 No dispersion after 10 minutes Partial slaking	
			B23 0.90-1.80 EOTP	Medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20mm	10YR5/4 Yellowish brown Mottles: Red - 10-20%, <5mm Common Black - 10%-20% Coarse 15-30 mm	Dry Imperfectly drained	Very fine <1mm Few	1.35 / 6.0 Slight Dispersion after 10 minutes Partial slaking	

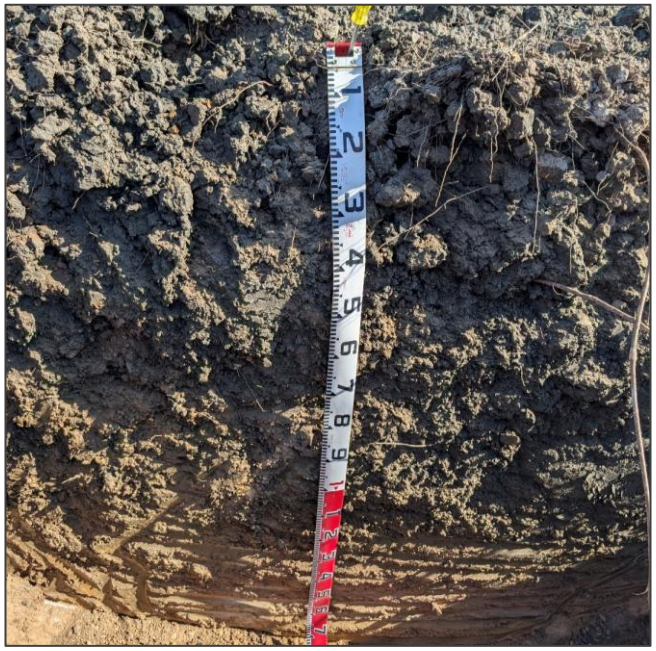
Landscape



Surface



Soil Profile



Site D32	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686675 7375468 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 12Da(Te) / Grey Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 22/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Residual rise Flat Slope 1.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia No microrelief Extensive clearing No erosion	Firm <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Clay loam Sandy	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80 Similar location as D4 (auger site), revisited for D32 using test pit method
			B21 0.20-0.50 Gradual 50-100mm	Medium clay Sandy	Moderate / Very strong Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	7.5YR4/2 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 6.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.80 Clear 20-50mm	Medium clay Sandy	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.65 / 8.0 Moderate dispersion after 10 minutes Partial slaking	
			B23 0.80-1.20 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm No Slickensides	2-10% calcium carbonate 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	1.00 / 8.0 Slight Dispersion after 10 minutes Partial slaking	
			B24 1.20-1.80 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 50-100 mm No Slickensides	No inclusions or segregations	10YR3/1 Very dark grey Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.50 / 7.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D33	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 687993 7374979 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 5Dn(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 22/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Extensive clearing Scald erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 0.90-1.00
			B21 0.20-0.50 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.70 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	10-20% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.60 / 7.0 No dispersion after 10 minutes Partial slaking	
			BC 0.70-0.90 Gradual 50-100mm	Medium clay	Moderate / Firm Angular blocky 10-20 mm No Slickensides	20-50% coarse fragments	2.5Y4/4 Olive brown Mottles: Orange 10-20%, 5-15mm Grey, Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	No roots	0.80 / 7.0 No dispersion after 10 minutes Partial slaking	
			C 0.90-1.00 EOTP	-	-	-	-	-	-	-	

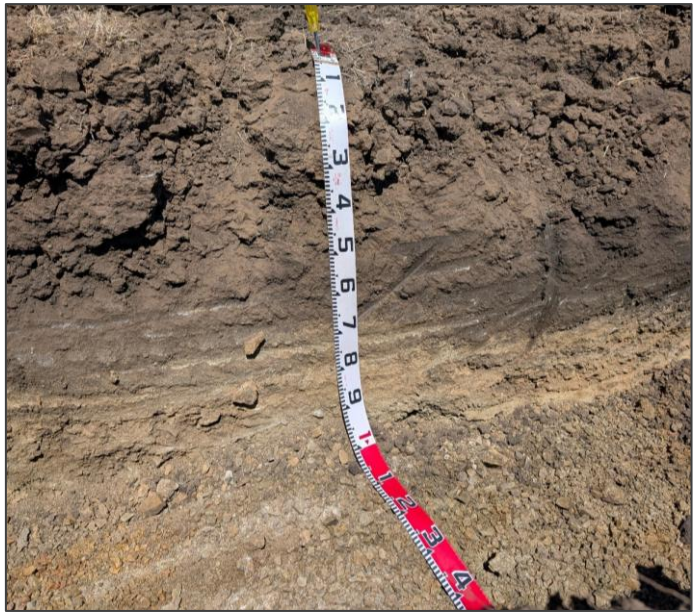
Landscape



Surface



Soil Profile



Site D34	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686564 7374628 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 8Dn(Te) / Grey Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 22/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat drainage line Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Extensive clearing Gully erosion	Surface flake <2% coarse fragments 60-200mm Rock outcrop present <2%	A1 0.00-0.20 Clear 20-50mm	Light clay Sandy	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 2-6mm <2% coarse fragments 60-200mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 Slight Dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.55 Gradual 50-100mm	Light medium clay Sandy	Moderate / Firm Subangular blocky 20-50 mm No Slickensides	10-20% coarse fragments 2-6mm 2-10% coarse fragments 6-20mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.38 / 7.0 No dispersion after 10 minutes Partial slaking	
			BC 0.55-0.90 Clear 20-50mm	Medium clay	Moderate / Firm Angular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20mm	2.5Y4/4 Olive brown Mottles: Orange 10-20%, 5-15mm Grey, Common 10%-20%, Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	0.78 / 8.0 No dispersion after 10 minutes Partial slaking	
			C 0.90-1.10 EOTP	-	-	-	-	-	-	-	
			Refusal on weathered substrate								

Landscape



Surface



Soil Profile



Site D35	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 689238 7372672 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 22/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Simple slope Slope 3.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow, sparse No microrelief Limited clearing No erosion	Cracking <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Complete slaking	Site indicated as Red Vertosol in SLR (2023), however site was observed as Grey Vertosol. Red subsoil horizon coverage not enough. No samples taken
			B21 0.20-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.40 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.60-0.90 Diffuse >100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	7.5YR4/4 Brown Mottles: Black Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	0.75 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 0.90-1.40 Clear 20-50mm	Medium heavy clay	Strong / Firm Angular blocky 5-10 mm No Slickensides	<2% coarse fragments 2-6mm	5YR4/6 Yellowish red Mottles: Black Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.15 / 6.0 No dispersion after 10 minutes Partial slaking	
			BC 1.40-1.70 EOTP	Medium heavy clay	Strong / Firm Angular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20mm	5YR5/6 Yellowish red Mottles: Pale Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.55 / 6.0 No dispersion after 10 minutes Partial slaking	

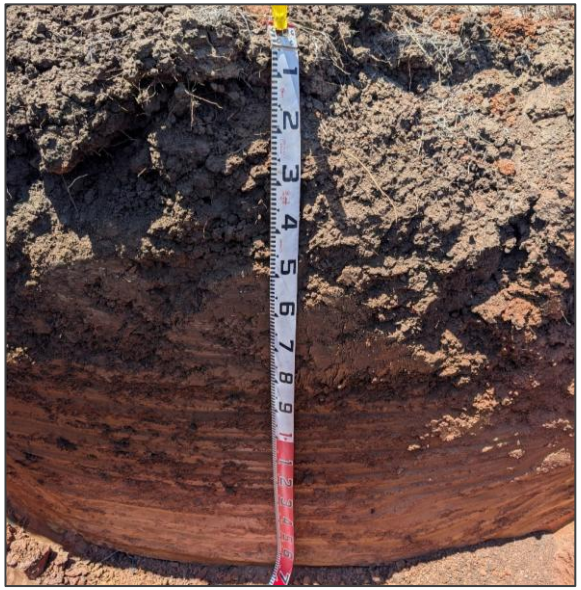
Landscape



Surface



Soil Profile



Site D36	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 689214 7373261 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 13BL(TA) / Brown Dermosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 22/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Current Bush No microrelief Extensive clearing No erosion	Firm 2-10% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 20-60mm	7.5YR4/2 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.40 Gradual 50-100mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4/2 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.30 / 6.5 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.70 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm 2-10% calcium carbonate 6-20mm	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.55 / 7.0 No dispersion after 10 minutes Partial slaking	
			B23 0.70-0.90 Gradual 50-100mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm 2-10% calcium carbonate 6-20mm	7.5YR5/4 Reddish brown Mottles: Pale brown Very few <2% Medium 5-15 mm	Dry Moderately well drained	Very fine <1mm Few	0.80 / 8.0 No dispersion after 10 minutes Partial slaking	
			B24 0.90-1.70 Gradual 50-100mm	Medium clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm 2-10% coarse fragments 6-20mm	10YR5/6 Yellowish brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.30 / 7.5 No dispersion after 10 minutes Complete slaking	
			BC 1.70-2.00 EOTP	Sandy loam	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20mm 20-50% coarse fragments 2-6mm	10YR5/6 Yellowish brown No mottles or bleaching	Dry Moderately well drained	No roots	1.85 / 7.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D37	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 689679 7372849 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 14Bl(Ro) / Black Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 21/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Drainage Depression Open depression Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Bauhinia Open woodland No microrelief Extensive clearing Gully erosion	Cracking <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 6-20mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.60 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.60-1.30 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown Mottles: Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	0.95 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 1.30-1.90 EOTP	Medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20mm	10YR5/3 Brown Mottles: Orange, 10-20%, 5-15mm Dark grey, 10%-20% 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.55 / 7.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D38	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 690733 7372998 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class II(a) / Test pit	**Survey Date / Described by:** 23/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia, sparse No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm, No Slickensides	No inclusions or segregations	2.5Y4/2 Weak red No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 7.5 No dispersion after 10 minutes, Partial slaking	No samples taken
			B21 0.10-0.20 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 10-20 mm, Slickensides	2-10% coarse fragments 2-6mm	2.5Y4/2 Weak red No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.15 / 7.5 No dispersion after 10 minutes, Partial slaking	
			B22 0.20-0.50 Gradual 50-	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm, Slickensides	2-10% coarse fragments 2-6mm	2.5Y4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 7.5 No dispersion after 10 minutes, Partial slaking	
			B23 0.50-0.80 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm, Slickensides	2-10% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or	Dry Moderately well drained	Very fine <1mm Common	0.65 / 8.0 No dispersion after 10 minutes, Complete slaking	
			B3 0.80-1.00 Gradual 50-100mm	Medium clay	Moderate / Firm Subangular blocky 10-20 mm, No Slickensides	10-20% coarse fragments 20-60mm 20-50% coarse fragments 6-20mm	2.5Y4/3 Reddish brown No mottles or bleaching	Dry Imperfectly drained	Fine 1-2mm Few	0.90 / 7.0 No dispersion after 10 minutes, Partial slaking	
			BC 1.00-1.20 Gradual 50-100mm	Light medium clay	Weak / Firm Angular blocky 5-10 mm, No Slickensides	50-90% coarse fragments 6-20mm	10YR5/3 Brown Mottles: Orange Few 2%-10% <5 mm	Dry Imperfectly drained	No roots	1.10 / 6.5 No dispersion after 10 minutes, Partial slaking	
			C 1.20-2.10 EOTP	-	-	-	-	-	-	-	

Landscape



Surface



Soil Profile



Site D39	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 690706 7372655 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 23/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Bauhinia No microrelief Extensive clearing No erosion	Self-mulching <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Sandy Fine	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20
			B21 0.20-0.50 Gradual 50-100mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Medium 2-5mm Common	0.35 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.90 Clear 20-50mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	50-90% coarse fragments 200-600mm 50-90% coarse fragments 0.6m-2.0m	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.70 / 8.0 No dispersion after 10 minutes Partial slaking	
			BC 0.90-1.40 Gradual 50-100mm	Medium heavy clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20mm	10YR4/4 Dark yellowish brown Mottles: Yellow Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.15 / 8.0 No dispersion after 10 minutes Partial slaking	
			R 1.40-1.65 EOTP	-	-	-	-	-	-	-	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site D40	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 690167 7372041 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 23/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia, sparse No microrelief Extensive clearing No erosion	Surface flake <2% coarse fragments 2-6mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay Sandy Fine	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 8.0 No dispersion after 10 minutes Complete slaking	No samples taken
			B21 0.10-0.60 Gradual 50-100mm	Medium clay Sandy Fine	Strong / Strong Subangular blocky 10-20 mm Slickensides	2-10% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.60-0.80 Gradual 50-100mm	Medium clay Sandy Fine	Strong / Strong Subangular blocky 10-20 mm Slickensides	2-10% coarse fragments 2-6mm	7.5YR4/4 Brown Mottles: Black Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Common	0.70 / 8.0 No dispersion after 10 minutes Partial slaking	
			B23 0.80-1.30 Gradual 50-100mm	Medium clay Sandy Fine	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm 2-10% calcium carbonate 2-6mm	7.5YR4/4 Brown Mottles: Orange Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	No roots	1.05 / 8.0 No dispersion after 10 minutes Complete slaking	
			BC 1.30-2.00 EOTP	Medium clay Sandy Fine	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 6-20mm 2-10% calcium carbonate 2-6mm	7.5YR5/6 Strong brown Mottles: Orange Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	No roots	1.65 / 8.0 No dispersion after 10 minutes Complete slaking	
			Refusal on weathered substrate								

Landscape



Surface



Soil Profile



Site D41	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686462 7378980 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Auger	**Survey Date / Described by:** 23/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Open depression adjacent Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Bottle Tree Brigalow Tall height No microrelief Limited clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR4/2 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 7.5 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.10-0.30 Gradual 50-100mm	Light medium clay Sandy Fine	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.20 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.30-0.70 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.50 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 0.70-1.00 Clear 20-50mm	Medium clay	Moderate / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.85 / 7.5 No dispersion after 10 minutes Complete slaking	
			B24 1.00-1.20 EOTP	Medium heavy clay	Moderate / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	2.5Y3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	1.10 / 7.5 No dispersion after 10 minutes Complete slaking	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site D42	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 685856 7378774 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 5Dn(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Auger	**Survey Date / Described by:** 23/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Scrub No microrelief Limited clearing No erosion	Surface flake <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	0.08 / 8.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.15-0.65 Gradual 50-100mm	Medium heavy clay	Moderate / Very firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Coarse >5mm Common	0.40 / 8.5 No dispersion after 10 minutes Complete slaking	
			BC 0.65-0.85 EOBH	Medium heavy clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	2-10% coarse fragments 6-20mm	10YR5/3 Brown Mottles: Black Few 2%-10% Few <5 mm	Dry Imperfectly drained	No roots	0.75 / 8.5 No dispersion after 10 minutes Partial slaking	
			Refusal on weathered substrate								

Landscape



Surface



Soil Profile



Site D43	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 685753 7378011 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 16Bl(Ta) / Grey Sodosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Auger	**Survey Date / Described by:** 23/10/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Hillslope Simple slope Slope 3.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Bauhinia No microrelief Extensive clearing Scald erosion also sheet erosion, rills	Hard setting <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Clay Loam Sandy Fine	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR4/2 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	0.05 / 6.0 Moderate dispersion after 10 minutes Partial slaking	0.00-0.10 0.10-0.20 0.20-0.30
			B21 0.10-0.20 Clear 20-50mm	Medium heavy clay	Moderate / Very firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.15 / 6.0 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.20-0.40 EOBH	Medium clay	Strong / Very firm Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments 6-20mm	2.5Y4/1 Dark grey No mottles or bleaching	Dry Imperfectly drained	Very fine <1mm Few	0.25 / 8.0 No dispersion after 10 minutes Partial slaking	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site D44	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 691122 7370776 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 03/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Lower slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Bauhinia and Brigalow Current Bush No microrelief Extensive clearing No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light clay Sandy	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 6-20mm	7.5YR3/2 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.05 / 6.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.10-0.20 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50
			B21 0.10-0.20 Clear 20-50mm	Light medium clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 20-60mm	7.5YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.15 / 6.5 No dispersion after 10 minutes Partial slaking	
			B22 0.20-0.40 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	7.5YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.30 / 8.0 No dispersion after 10 minutes Partial slaking	
			B23 0.40-0.80 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.60 / 8.0 No dispersion after 10 minutes Complete slaking	
			B24 0.80-1.20 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	2-10% coarse fragments 2-6mm <2% calcium carbonate 2-6mm Manganese nodules	7.5YR4/4 Brown Mottles: Pale Grey Few 2%-10% Few <5 mm	Dry Imperfect drained	Very fine <1mm Few	1.00 / 7.5 No dispersion after 10 minutes Complete slaking	
			C 1.20-1.60 EOTP								

Landscape



Surface



Soil Profile



Site D45	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 689137 7374206 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 18Bl(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 03/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope <1.0 / <1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Bauhinia Moreton Bay Ash No microrelief Extensive clearing Scald erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay Silty	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.40 Gradual 50-100mm	Medium heavy clay Silty	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.30 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.80 Diffuse >100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.60 / 7.5 No dispersion after 10 minutes Partial slaking	
			B23 0.80-1.40 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	1.10 / 7.5 No dispersion after 10 minutes Complete slaking	
			B24 1.50-2.00 EOTP Refusal on cemented soil	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/1 Very dark grey Mottles: Brown Few 2%-10% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	1.75 / 6.0 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site D46	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 690276 7374005 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 4/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Drainage Depression Open depression Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia, sparse No microrelief Limited clearing Sheet erosion	Surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Gradual 50-100mm	Medium clay Sandy	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.50 Clear 20-50mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.35 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.80 Clear 20-50mm	Medium heavy clay Sandy Fine	Strong / Strong Subangular blocky 10-20 mm Slickensides	2-10% coarse fragments 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.65 / 8.0 No dispersion after 10 minutes Partial slaking	
			BC 0.80-1.50 Gradual 50-100mm	Light medium clay Sandy	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 2-6mm	10YR5/4 Yellowish brown Mottles: Brown Common 10%-20% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	1.10 / 8.0 No dispersion after 10 minutes Complete slaking	
			C 1.50-2.00 EOTP	-	-	-	-	-	-	-	

Landscape



Surface



Soil Profile



Site D47	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 689612 7374633 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class II(a) / Test pit	Survey Date / Described by: 4/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Grassland No microrelief Extensive clearing No erosion	Surface flake 2-10% coarse fragments 60-200mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay Silty	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 6-20mm	10YR4/3 Brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.05 / 8.0 No dispersion after 10 minutes Complete slaking	No samples taken
			B21 0.10-0.30 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 5-10 mm No Slickensides	2-10% coarse fragments 20-60mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.20 / 7.0 No dispersion after 10 minutes Partial slaking	
			B22 0.30-0.60 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	2-10% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.45 / 8.0 No dispersion after 10 minutes Partial slaking	
			B23 0.60-1.40 Gradual 50-100mm	Medium heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	1.00 / 8.0 Slight dispersion after 10 minutes Complete slaking	
			B24 1.40-1.80 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR5/2 Greyish brown Mottles: Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.60 / 7.0 No dispersion after 10 minutes Complete slaking	
			BC 1.80-2.10 EOTP	Medium clay	Strong / Firm Angular blocky 5-10 mm No Slickensides	20-50% coarse fragments 6-20mm	2.5Y5/3 Light olive brown Mottles: Orange Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.95 / 7.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D48	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 688951 7374853 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class II(a) / Test pit	Survey Date / Described by: 5/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia, sparse No microrelief Limited clearing Scald erosion	Cracking, with surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.30 Clear 20-50mm	Medium clay Sandy Fine	Strong / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.15 / 8.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.30-0.60 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.45 / 8.0 No dispersion after 10 minutes Complete slaking	
			B22 0.60-1.50 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/3 Brown Mottles: Pale Grey Few 2%-10% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.05 / 7.0 Slight dispersion after 10 minutes Partial slaking	
			BC 1.50-2.10 EOTP	Light medium clay Sandy	Moderate / Firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR5/3 Brown Mottles: Dark Grey Few 2%-10% Few <5 mm	Dry Imperfectly drained	No roots	1.80 / 7.5 No dispersion after 10 minutes Complete slaking	

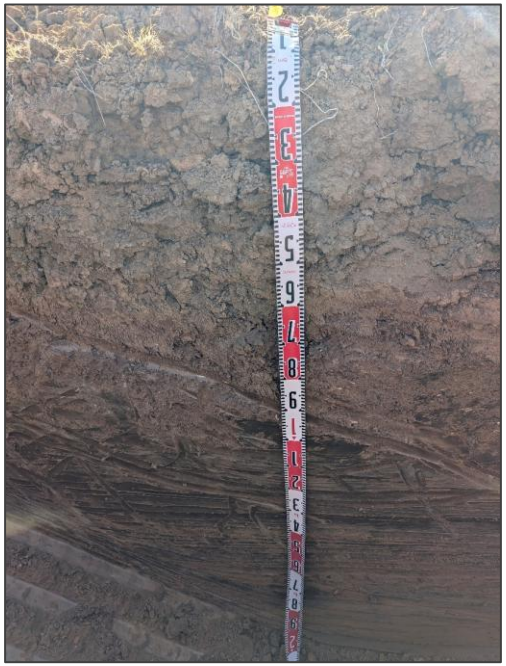
Landscape



Surface



Soil Profile



Site D49	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 688698 7375044 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Auger	**Survey Date / Described by:** 5/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia Ruby Salt Bush Grassland No microrelief Limited clearing Scald erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay Silty	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Very fine <1mm Few	0.05 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.10-0.40 Gradual 50-100mm	Light medium clay Silty	Strong / Very firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.25 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.70 Diffuse >100mm	Light medium clay Silty	Strong / Very firm Subangular blocky 10-20 mm Slickensides	<2% coarse fragments 6-20mm Minor gravel layer	10YR4/4 Dark yellowish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.55 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 0.70-1.20 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.95 / 8.0 No dispersion after 10 minutes Complete slaking	
			B24 1.20-1.80 EOBH	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR5/4 Yellowish brown Mottles: Grey Few 2%-10% Few <5 mm	Dry Moderately well drained	Very fine <1mm Few	1.50 / 8.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D50	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 688483 7374030 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 5Dn(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Auger	**Survey Date / Described by:** 5/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Whitewood Ruby Salt Bush Sparse Emu apple, willow wattle No microrelief Extensive clearing No erosion	Cracking No coarse fragments No rock outcrop self-mulching	A1 0.00-0.15 Clear 20-50mm	Medium heavy clay Silty	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.08 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90
			B21 0.15-0.50 Gradual 50-100mm	Medium heavy clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	<2% calcium carbonate 2-6mm	2.5Y4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.30 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.95 EOBH	Medium heavy clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	<2% calcium carbonate 2-6mm	2.5Y4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.80 / 8.0 Slight Dispersion after 10 minutes Complete slaking	
			Refusal on weathered substrate								

Landscape



Surface



Soil Profile



Site D51	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 688529 7374336 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 5/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / <1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia No microrelief Extensive clearing Scald erosion	Surface flake <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.20 Gradual 50-100mm	Medium clay Silty	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.20-0.40 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.30 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.80 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.60 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 0.80-1.20 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR5/4 Yellowish brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.00 / 6.5 Slight Dispersion after 10 minutes Complete slaking	
			B3 1.20-1.60 Gradual 50-100mm	Medium clay Silty	Strong / Firm Angular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR5/4 Yellowish brown Mottles: Black Few 2%-10% Few <5 mm	Dry Imperfectly drained	No roots	1.40 / 6.0 No dispersion after 10 minutes Complete slaking	
			C 1.60-1.70 EOTP	-	-	-	-	-	-	-	
			BC 1.70+ Refusal on bedrock								

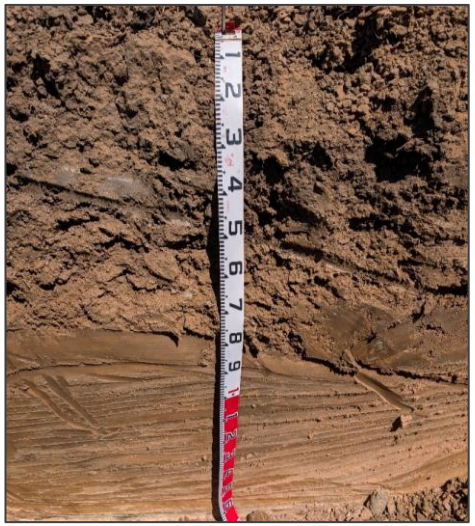
Landscape



Surface



Soil Profile



Site D52	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 688782 7376440 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 5/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Sparse Bauhinia and Brigalow No microrelief Extensive clearing No erosion	Surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Light clay Sandy	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 6-20mm	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 6.5 No dispersion after 10 minutes No slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80 2.00-2.10
			B21 0.20-0.40 Clear 20-50mm	Medium clay Sandy	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0..30 / 7.0 No dispersion after 10 minutes No slaking	
			B22 0.40-1.00 Gradual 50-100mm	Medium clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% calcium carbonate 6-20mm <2% coarse fragments 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.70 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 1.00-1.70 Diffuse >100mm	Medium heavy clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR5/3 Brown Mottles: Dark Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.35 / 7.5 No dispersion after 10 minutes Partial slaking	
			B24 1.70-2.20 EOTP	Medium clay Sandy Coarse	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/3 Brown Mottles: Dark Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	1.95 / 7.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site D53	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 689513 7379001 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 5/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Stream channel Open depression Slope 1.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia Tall height No microrelief No effective disturbance; hoofed animals Sheet erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Silty	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	2.5Y4/2 Weak red No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.70-0.80 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.45 Gradual 50-100mm	Medium heavy clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	2.5Y4/2 Weak red No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.33 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.45-1.00 Diffuse >100mm	Medium heavy clay Silty	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.75 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 1.00-1.80 EOTP	Medium clay Silty	Moderate / Firm Subangular blocky 10-20 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	1.40 / 7.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site D54	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 686680 7385714 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class II(a) / Test pit	Survey Date / Described by: 6/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Whitewood Sparse No microrelief Limited clearing No erosion	Cracking Self-mulching with surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Silty	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80 2.00-2.10
			B21 0.20-0.50 Gradual 50-100mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey Mottles: Pale Brown Common 10%-20% Medium 5-15 mm	Moderately moist Moderately well drained	Very fine <1mm Common	0.35 / 8.0 No dispersion after 10 minutes Complete slaking	
			B22 0.50-1.00 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown Mottles: Pale Grey 2-10%, <5mm Red - Common 10%-20% Few <5 mm	Moderately moist Imperfectly drained	Very fine <1mm Common	0.75 / 6.5 No dispersion after 10 minutes Complete slaking	
			B23 1.00-2.10 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR5/3 Brown Mottles: Pale Grey Red, 10-20%, 5-15mm Common 10%-20% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Common	1.50 / 6.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface





Soil Profile



Site D55	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 686603 7385246 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 2Dn(Te) / Black Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class II(a) / Test pit	**Survey Date / Described by:** 6/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Level plain Plain Flat Slope <1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Complete clearing, not cultivated No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Gradual 50-100mm	Medium clay	Strong / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.70-0.80 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.80 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/1 Very dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.40 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.80-1.00 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	2-10% coarse fragments 2-6mm	10YR4/2 Dark greyish brown Mottles: Black Common 10%-20% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Common	0.90 / 7.5 No dispersion after 10 minutes Complete slaking	
			BC 1.00-1.30 Gradual 50-100mm	Light medium clay Sandy Fine	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20mm	10YR4/4 Dark yellowish brown Mottles: Pale Grey Orange, 2-10%, <5mm Common 10%-20% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	1.15 / 7.0 No dispersion after 10 minutes Partial slaking	
			C 1.30-2.20 EOTP	-	-	-	-	-	-	-	

Landscape



Surface



Soil Profile



Site D56	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 690156 7371197 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class II(a) / Test pit	Survey Date / Described by: 6/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating rises Hillslope Simple slope Slope 2.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia Whitewood No microrelief Extensive clearing No erosion	Surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Silty	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Well drained	Very fine <1mm Common	0.10 / 7.5 No dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.70-0.80 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.80 Diffuse >100mm	Medium clay, faint	Strong / Firm Subangular blocky 20-50 mm Slickensides	10-20% calcium carbonate 6-20mm 10-20% coarse fragments 20-60mm	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.50 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.80-1.40 Diffuse >100mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	7.5YR4/4 Brown Mottles: Dark Grey Common 10%-20% Few <5 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	1.10 / 7.0 No dispersion after 10 minutes Complete slaking	
			B23 1.40-2.20 EOTP	Medium clay Sandy	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	5YR5/6 Yellowish red Mottles: Dark Grey Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	No roots	1.80 / 7.5 No dispersion after 10 minutes Complete slaking	

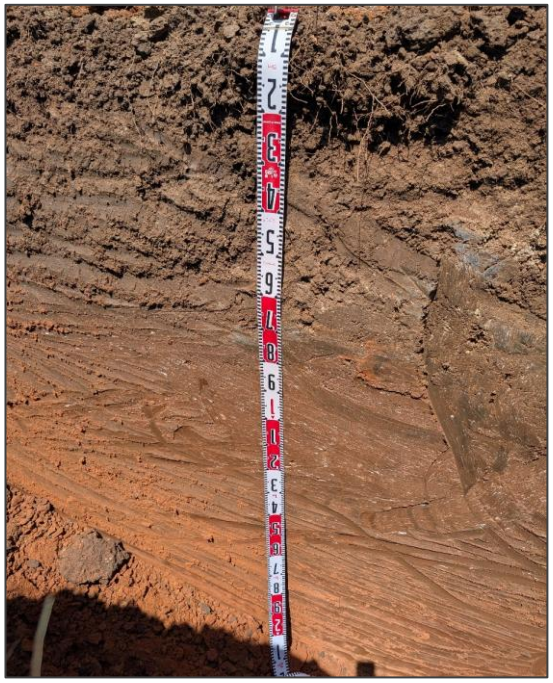
Landscape



Surface



Soil Profile



Site D57	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 690939 7371619 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 6/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Brigalow Ruby Salt Bush No microrelief Extensive clearing Scald erosion	Surface flake 2-10% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay Sandy	Strong / Firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.10 / 7.0 No dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.40 Clear 20-50mm	Medium clay Sandy	Strong / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.30 / 7.0 No dispersion after 10 minutes Complete slaking	
			B22 0.40-0.80 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	2.5Y4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.60 / 8.0 No dispersion after 10 minutes Complete slaking	
			B23 0.80-1.10 Diffuse >100mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.95 / 8.0 No dispersion after 10 minutes Complete slaking	
			B24 1.10-1.60 Diffuse >100mm	Medium clay	Strong / Firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 6-20mm 10-20% coarse fragments 2-6mm	10YR4/3 Brown Mottles: Black Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	No roots	1.35 / 7.5 No dispersion after 10 minutes Complete slaking	
			BC 1.60-1.80 EOTP	Medium clay	Strong / Firm Subangular blocky 10-20 mm No Slickensides	10-20% coarse fragments 6-20mm 10-20% coarse fragments 2-6mm	10YR4/6 Dark yellowish brown Mottles: Pale Grey ,2-10%, <5mm Orange, Common 10%-20%, Medium 5-15 mm	Dry Imperfectly drained	No roots	1.70 / 7.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D58	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 691692 7371103 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 20Bl(Ro) / Grey Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Auger	**Survey Date / Described by:** 6/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Open woodland No microrelief Limited clearing No erosion	Surface flake <2% coarse fragments 2-6mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.70-0.80
			B21 0.20-0.40 Clear 20-50mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.30 / 7.5 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.40-0.80 EOBH	Medium heavy clay Sandy Fine	Strong / Very firm Subangular blocky 10-20 mm Slickensides	<2% calcium carbonate 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.60 / 8.0 No dispersion after 10 minutes Complete slaking	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site D59	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 691156 7377835 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 21Bl(Ta) / Grey Sodosol	**Geology (Dominant):** Alluvium	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class III / Test pit	**Survey Date / Described by:** 6/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow, sparse No microrelief Extensive clearing No erosion	Hard setting No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Sandy loam	Weak / Weak Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR3/2 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Many	0.10 / 6.0 No dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			A2 0.20-0.45 Abrupt 5-20mm	Sandy loam	Moderate / Very firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR4/2 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	0.33 / 6.5 No dispersion after 10 minutes Complete slaking	
			B21 0.45-0.90 Gradual 50-100mm	Medium heavy clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	7.5YR4/1 Dark grey Mottles: Brown Many 20%-50% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	0.65 / 8.5 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.90-1.80 EOTP	Medium heavy clay Sandy	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	10-20% calcium carbonate 20-60mm 10-20% calcium carbonate 6-20mm Coarse fragments <2%, 2-6mm	10YR5/4 Yellowish brown Mottles: Dark Grey Common 10%-20% Few <5 mm	Dry Imperfectly drained	No roots	1.35 / 8.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D60	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 691284 7380721 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 10Ct(Ro) / Grey Vertosol	Geology (Dominant): Alluvium	Soil Survey Type / Observation Class / Method: Free / Detailed Class I / Test pit	Survey Date / Described by: 7/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Stream channel Open depression Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Bauhinia Ruby Salt Bush Sparse No microrelief Limited clearing Sheet erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Medium 2-5mm Many	0.10 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.70-0.80 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.40 Clear 20-50mm	Medium clay	Strong / Strong Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey Mottles: Brown Few 2%-10% Few <5 mm	Dry Moderately well drained	Coarse >5mm Many	0.30 / 7.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.60 Gradual 50-100mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey Mottles: Brown Many 20%-50% Few <5 mm	Dry Imperfectly drained	Fine 1-2mm Few	0.50 / 8.0 No dispersion after 10 minutes Partial slaking	
			B23 0.60-2.00 EOTP	Medium clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	<2% coarse fragments 2-6mm	10YR5/3 Brown Mottles: Brown Common 10%-20% Few <5 mm	Moderately moist Imperfectly drained	Fine 1-2mm Few	1.30 / 8.0 Slight dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D61	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 687657 7379698 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 7/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Risecrest Crest Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Brigalow Ruby Salt Bush Sparse No microrelief Extensive clearing Scald erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Light medium clay Sandy Fine	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.08 / 7.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20
			B21 0.15-0.70 Clear 20-50mm	Light medium clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	<2% calcium carbonate 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Medium 2-5mm Common	0.45 / 8.0 No dispersion after 10 minutes Complete slaking	
			BC 0.70-1.10 Clear 20-50mm	Medium clay	Strong / Very firm Angular blocky 10-20 mm No Slickensides	20-50% coarse fragments 6-20mm	10YR5/4 Yellowish brown Mottles: Pale Grey 10-20%, 5-15mm Orange, Common 10%-20%, Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	0.90 / 7.0 No dispersion after 10 minutes Complete slaking	
			C 1.10-1.50 EOTP	-	-	-	-	-	-	-	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site D62	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 687596 7385994 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 7/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Extensive clearing Scald erosion	Cracking, with surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium clay	Strong / Strong Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 6-20mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.10 / 7.5 No dispersion after 10 minutes Partial slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90 1.10-1.20 1.40-1.50 1.70-1.80
			B21 0.20-0.65 Clear 20-50mm	Medium clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR4/3 Brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.40 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.65-1.10 Diffuse >100mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm <2% coarse fragments 6-20mm	10YR5/4 Yellowish brown Mottles: Orange Common 10%-20% Few <5 mm	Dry Moderately well drained	Very fine <1mm Common	0.90 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 1.10-1.80 EOTP	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm No Slickensides	2-10% coarse fragments 2-6mm 2-10% coarse fragments 6-20mm	10YR4/4 Dark yellowish brown Mottles: Pale Grey 2-10%, <5mm Orange, Common 10%-20%, Medium 5-15 mm	Dry Moderately well drained	Very fine <1mm Common	1.45 / 6.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D63	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 689260 7385313 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 7/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Extensive clearing No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.08 / 8.0 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.15-0.40 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.28 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-1.00 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.70 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 1.00-1.40 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% calcium carbonate 2-6mm	7.5YR4/4 Brown Mottles: Pale Brown Few 2%-10% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Common	1.20 / 7.0 No dispersion after 10 minutes Complete slaking	
			B3 1.40-1.50 Clear 20-50mm	Clay loam	Strong / Firm Subangular blocky 10-20 mm No Slickenside	<2% coarse fragments 2-6mm	10YR5/6 Yellowish brown No mottles or bleaching	Dry Moderately well drained	No roots	1.45 / 6.0 No dispersion after 10 minutes Complete slaking	
			BC 1.50-1.80 EOTP	-	-	-	-	-	-	-	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site D64	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 688292 7383905 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 7/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating rises Hillslope Simple slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow, sparse No microrelief Extensive clearing No erosion	Cracking with surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.08 / 7.5 No dispersion after 10 minutes Partial slaking	No samples taken
			B21 0.15-0.40 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% coarse fragments 20-60mm	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.28 / 8.0 No dispersion after 10 minutes Complete slaking	
			B22 0.40-1.00 Diffuse >100mm	Medium heavy clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	<2% calcium carbonate 2-6mm	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.65 / 6.0 No dispersion after 10 minutes Partial slaking	
			B23 1.00-1.80 EOTP	Medium heavy clay	Strong / Very firm Angular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR5/4 Yellowish brown Mottles: Red 2-10%, <5mm Pale grey, few 2%-10% Few <5 mm	Dry Moderately well drained	No roots	1.40 / 5.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site D65	Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy: 691894 7371606 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 22Bl(Wy) / Brown Kandosol	Geology (Dominant): Arenite-Mudrock	Soil Survey Type / Observation Class / Method: Free / Detailed Class III / Auger	Survey Date / Described by: 7/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Brigalow Sparse No microrelief Extensive clearing No erosion	Firm <2% coarse fragments 2-6mm No rock outcrop	A11 0.00-0.05 Clear 20-50mm	Sandy loam	Weak / Weak Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Rapidly drained	Very fine <1mm Many	0.03 / 6.5 No dispersion after 10 minutes Partial slaking	0.00-0.05 0.10-0.20 0.20-0.30 0.50-0.60 0.80-0.90
			A12 0.05-0.20 Clear 20-50mm	Sandy loam	Weak / Weak Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Rapidly drained	Very fine <1mm Common	0.14 / 6.0 No dispersion after 10 minutes No slaking	
			A2 0.20-0,45 Gradual 50-100mm	Sandy loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Very fine <1mm Few	0.32 / 6.0 Slight Dispersion after 10 minutes Partial slaking	
			B21 0.45-0.80 Gradual 50-100mm	Clay loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments 2-6mm	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.62 / 7.5 Moderate dispersion after 10 minutes Partial slaking	
			B21 0.80-1.00 EOBH No recovery	Silty loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments 2-6mm	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.90 / 7.5 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site D66	**Location (mE/mS GDA2020 ZONE 5) / Method, Accuracy:** 688931 7381952 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Geology (Dominant):** Arenite-Mudrock	**Soil Survey Type / Observation Class / Method:** Free / Detailed Class I / Test pit	**Survey Date / Described by:** 7/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Crest Slope 1.0 / 2.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Scrub No microrelief Complete clearing, not cultivated	Surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Medium heavy clay Silty	Moderate Firm No slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Many	0.10 / 8.5	No samples taken
			B21 0.20-0.60 Clear 20-50mm	Medium heavy clay	Moderate Firm Slickensides	<2% calcium carbonate 2-6mm	10YR4/3 Brown Mottles: Orange Common 10%-20% Few <5 mm	Dry	Fine 1-2mm Few	0.40 / 8.0	
			BC 0.60-1.00 EOTP	Medium heavy clay	Moderate Firm Slickensides	20-50% coarse fragments 60-200mm	10YR4/4 Dark yellowish brown Mottles: Orange Common 10%-20% Medium 5-15 mm	Dry	No roots	0.80 / 8.0	
			Refusal on bedrock								

Landscape



Surface



Soil Profile





Appendix B Class IV Site Descriptions

Site C1	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 685881 7379056 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 5Dn(Ro) / Grey Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Exposed profile cutting	Survey Date / Described by: 07/07/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Natural Woodland Gently undulating plain Plain Slope 1% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Brigalow Sparse No microrelief Extensive clearing No erosion	Self-mulching No coarse fragments 6-20mm No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Silty clay loam Silty	Moderate Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.10 / 7.5	-
			B21 0.20-0.70 Clear 20-50mm	Light clay	Moderate Very firm Subangular blocky 20-50 mm Faint Slickensides	<2% coarse fragments	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.40 / 8.0	
			B22 0.70-0.80 End of profile	Medium clay	Moderate Very firm Subangular blocky No Slickensides	<2% coarse fragments	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.75 / 8.0	

Landscape



Surface



Soil Profile



Site C2	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 685995 7380182 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 19Bl(Ro) / Brown Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 07/07/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Undulating plain Plain Mid-slope Slope 3% / 8% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Sparse No microrelief Limited clearing No erosion	Surface flake No coarse fragments	A1 0.00-0.10 Clear 20-50mm	Light clay	Strong / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 9.0	-
			B21 0.10-0.40 Clear 20-50mm	Light medium clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.25 / 9.0	
			B22 0.40-0.85 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.62 / 7.0	
			B3 0.85-0.95 End of bore hole (EOBH)	Light medium clay	Weak / Firm Subangular blocky 5-10 mm No Slickensides	2-10% coarse fragments 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Imperfectly drained	No roots	0.90 / 7.5	

Landscape



Surface



Soil Profile



Site C3	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686113 7381038 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 6Bl(Pg) / Brown Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 07/07/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Gently undulating plain Plain Mid-slope Slope 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow scrub Medium height Melon hole gilgai 20% coverage No effective disturbance; natural No erosion	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.15 Abrupt 5-20mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	-	-
			B21 0.15-1.00 EOBH	Heavy clay	Strong / Strong Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	-	

Landscape



Surface



Soil Profile



Site C4	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686283 7381960 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 13Bl(Ta) / Brown Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 07/07/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Gently undulating plain Plain Open depression Slope 2.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Sparse No microrelief Limited clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Light clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments	10YR4/3 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	-	-
			B21 0.20-0.50	Light medium clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments	10YR4/3 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	-	
			B22 0.50-1.00 EOBH	Light medium clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	-	

Landscape



Surface



Soil Profile



Site C5	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686275 7382443 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 6Bl(Pg) / Brown Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 07/07/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat 1.0 / 1.0 **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Sparse Normal gilgai Limited clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Light clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	-	-
			B21 0.15-0.40 Diffuse >100mm	Light medium clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	-	
			B22 0.40-0.90 EOBH	Medium heavy clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	7.5YR4/4 Brown No mottles or bleaching	Dry Well drained	No roots	-	

Landscape



Surface



Soil Profile



Site C6	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686387 7383392 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 11Bl(Ta) / Brown Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 07/07/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Gently undulating plain Plain Mid-slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Extensive clearing No erosion	Firm No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Clay loam	Weak / Weak Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	-	-
			B21 0.20-0.80 EOBH	Light clay	Moderate / Strong Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	-	

Landscape



Surface



Soil Profile



Site C7	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686568 7384949 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 2Dn(Te) / Black Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 08/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Level plain Plain Flat Slope 1% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bull Mitchell Grass No microrelief Complete clearing, not cultivated No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.15 Abrupt 5-20mm	Light clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.08 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.15-0.65 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.45 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.65-0.90 Clear 20-50mm	Medium clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/3 Dark brown Mottles: Black Very few <2% Few <5 mm	Dry Well drained	Fine 1-2mm Few	0.77 / 8.5 No dispersion after 10 minutes Partial slaking	
			B23 0.90-1.00 EOBH	Medium clay	Strong / Very firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Well drained	No roots	0.95 / 8.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C8	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686528 7384676 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 4Bl(Te) / Grey Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 08/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Simple slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bull Mitchell Grass Grassland No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 2-6mm No rock outcrop	A1 0.00-0.15 Abrupt 5-20mm	Light clay	Moderate / Weak Subangular blocky 10-20 mm No slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Many	0.08 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.15-0.45 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky 50-100 mm No slickensides	<2% coarse fragments 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Common	0.28 / 9.0 No dispersion after 10 minutes Partial slaking	
			B22 0.45-0.60 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky 20-50 mm No slickensides	2-10% calcium carbonate 6-20mm	2.5Y4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.52 / 9.0 No dispersion after 10 minutes Partial slaking	
			B23 0.60-1.00 EOBH	Medium clay	Strong / Firm Subangular blocky 10-20 mm No Slickensides	2-10% coarse fragments 6-20mm	2.5Y4/2 Dark greyish brown No mottles or bleaching	Dry Well drained	No roots	0.80 / 9.0 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C9	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686568 7384339 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 08/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2% / 5% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bull Mitchell Grass Grassland No microrelief Complete clearing, not cultivated No erosion	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.05 Abrupt 5-20mm	Medium clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.03 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.05-0.35 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.20 / 7.5 No dispersion after 10 minutes Partial slaking	
			B21 0.35-0.70 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.50 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.70-1.00 EOBH	Medium clay	Strong / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm No roots	0.85 / 7.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C10	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686479 7383878 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 15Bl(Ro) / Brown Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 08/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bull Mitchell Grass Grassland No microrelief Complete clearing, not cultivated No erosion	Cracking <2% coarse fragments 2-6mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 7.5 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.40 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 50-100 mm Slickensides	No inclusions or segregations	7.5YR4/3 Brown Mottles: Pale brown Few 2%-10% Medium 5-15 mm	Moderately moist Imperfectly drained	Fine 1-2mm Common	0.25 / 8.0 No dispersion after 10 minutes Complete slaking	
			B22 0.40-0.60 Clear 20-50mm	Medium heavy clay	Strong / Weak Subangular blocky 50-100 mm Slickensides	No inclusions or segregations	7.5YR5/3 Brown Mottles: Orange Few 2%-10% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	0.50 / 9.0 No dispersion after 10 minutes Complete slaking	
			B23 0.60-1.00 EOBH	Medium clay	Strong / Firm Angular blocky 5-10 mm No Slickensides	No inclusions or segregations	7.5YR5/4 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.80 / 8.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C11	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686606 7383191 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Lower slope Slope 2% / 3% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland ironbark No microrelief Complete clearing, not cultivated	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Light clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.08 / 7.5 No dispersion after 10 minutes Partial slaking	-
			B21 0.15-0.85 Clear 20-50mm	Light medium clay Heavy	Strong / Firm Subangular blocky 5-10 mm Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.50 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.85-1.20 EOBH	Medium clay	Strong / Firm Subangular blocky 5-10 mm No slickensides	No inclusions or segregations	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	1.00 / 7.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C12	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686568 7382663 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 19Bl(Ro) / Brown Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow scrub No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 2-6mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.05 / 8.5 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.40 Gradual 50-100mm	Light medium clay	Moderate / Very firm Angular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.35 / 8.5 No dispersion after 10 minutes No slaking	
			B22 0.40-0.70 Gradual 50-100mm	Medium clay	Strong / Strong Angular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	10YR4/4 Dark yellowish brown Mottles: Pale brown Few 2%-10% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	0.55 / 8.5 No dispersion after 10 minutes Partial slaking	
			B23 0.70-1.20 EOBH	Medium heavy clay	Strong / Strong Angular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate <2mm	10YR4/4 Dark yellowish brown Mottles: Orange Few 2%-10% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	0.95 / 8.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C13	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686422 7381673 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 15Bl(Ro) / Brown Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Lower slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Extensive clearing	Cracking No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 8.0 No dispersion after 10 minutes No slaking	-
			B21 0.10-0.45	Medium heavy clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.30 / 8.0 No dispersion after 10 minutes No slaking	
			B22 0.45-1.00 EOBH	Medium heavy clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	No roots	0.75 / 8.0 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C14	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686320 7380926 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 13Bl(Ta) / Brown Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow scrub No microrelief Extensive clearing No erosion	Surface flake <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Abrupt 5-20mm	Clay loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	7.5YR4/2 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Many	0.05 / 7.0 Slight Dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.35 Clear 20-50mm	Light medium clay	Strong / Strong Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	7.5YR3/3 Dark brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.20 / 8.0 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.35-1.00 EOBH	Light medium clay	Strong / Very firm Angular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm, faint	7.5YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.65 / 8.5 Slight Dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C15	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686603 7380371 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 13Bl(Ta) / Brown Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH**	**Sample (m) / Observations**
Grazing Undulating plain Mid-slope Slope 4% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Abrupt 5-20mm	Light medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/4 Dark yellowish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 7.0 No dispersion after 10 minutes	-
			B21 0.10-0.60 Clear 20-50mm	Medium clay	Strong / Firm Angular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.35 / 8.0 No dispersion after 10 minutes Partial slaking	
			B21 0.60-1.00 EOBH	Medium clay	Strong / Firm Angular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/4 Dark yellowish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.80 / 9.0 Slight Dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C16	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686536 7379890 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 11Bl(Ta) / Brown Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Undulating plain Plain Simple slope Slope 3% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow scrub No microrelief Extensive clearing Gully erosion	Cracking 2-10% coarse fragments 20-60mm No rock outcrop	A1 0-0.05 Abrupt 5-20mm	Light clay	Weak / Weak Angular blocky 5-10 mm No Slickensides	2-10% coarse fragments 6-20mm	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.03 / 9.0	0.00-0.05 0.20-0.30 0.50-0.60 0.70-0.80
			B21 0.05-0.85 EOBH	Light medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	20-50% coarse fragments 20-60mm No inclusions or segregations	10YR5/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.45 / 6.5	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site C17	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686614 7379467 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 11Bl(Ta) / Brown Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Crest Slope 1% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Complete clearing, not cultivated	Surface flake No coarse fragments No rock outcrop	A1 0,00-0.10 Clear 20-50mm	Light medium clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 8.0 Slight Dispersion after 10 minutes Partial slaking	0.00-0.10 0.10-0.20 0.30-0.40
			B21 0.10-0.25 Abrupt 5-20mm	Medium clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry	Fine 1-2mm Few	0.18 / 9.0 Slight Dispersion after 10 minutes Partial slaking	
			B22 0.25-0.45 EOBH	Medium clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry	Fine 1-2mm Few	0.35 / 8.0 Slight Dispersion after 10 minutes Partial slaking	
			Refusal on cemented pan								

Landscape



Surface



Soil Profile



Site C18	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 685894 7378520 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 8Dn(Te) / Grey Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 09/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Undulating plain Plain Upper slope Slope 1% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Extensive clearing No erosion	Firm 2-10% coarse fragments 20-60mm No rock outcrop	A1 0-0.15 Clear 20-50mm	Light medium clay	Moderate / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR5/2 Greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.08 / 7.0 Slight Dispersion after 10 minutes No slaking	-
			B21 0.15-0.50 EOBH	Medium clay	Strong / Strong Angular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.32 / 7.5 Slight Dispersion after 10 minutes Partial slaking	
			Refusal on cemented pan								

Landscape



Surface



Soil Profile



Site C19	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 685729 7377775 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 5Dn(Ro) / Grey Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Mid-slope Slope 4% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Grassland Acacia No microrelief Extensive clearing	Surface Flake No coarse fragments No rock outcrop	A1 0.00-0.13 Clear 20-50mm	Light medium clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Moderately moist Well drained	Fine 1-2mm Few	0.07 / 6.5 No dispersion after 10 minutes Complete slaking	0.00-0.10 0.20-0.30 0.50-0.60 0.80-0.90
			B21 0.13-0.60 Clear 20-50m	Medium clay Silty	Strong / Firm Subangular blocky 5-10 mm Slickensides	<2% calcium carbonate 6-20mm	10YR4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Few	0.40 / 7.0 No dispersion after 10 minutes Complete slaking	
			B22 0.60-0.95 EOBH	Medium clay Silty	Strong / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.75 / 7.0 No dispersion after 10 minutes Complete slaking	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site C20	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 685717 7376110 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 17Bl(Ro) / Grey Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Undulating plain Plain Mid-slope Slope 4% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Light medium clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.08 / 7.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.15-1.00 EOBH	Medium clay Silty	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.60 / 7.5 No dispersion after 10 minutes No slaking	

Landscape



Surface



Soil Profile



Site C21	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686105 7376609 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 9Dn(Ro) / Black Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 1% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.15 Gradual 50-100mm	Medium clay	Moderate / Weak Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown Mottles	Dry Moderately well drained	Fine 1-2mm Common	0.08 / 7.0 No dispersion after 10 minutes No slaking	-
			B21 0.15-0.65 Gradual 50-100mm	Medium heavy clay	Strong / Firm Angular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/1 Very dark grey Mottles: Pale brown Very few <2% Few <5 mm	Moderately moist Imperfectly drained	Very fine <1mm Common	0.45 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.65-1.0 EOBH	Medium heavy clay	Moderate / Weak Angular blocky 20-50 mm Slickensides	<2% calcium carbonate 6-20mm	10YR4/2 Dark greyish brown Mottles: Brown Few 2%-10% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	0.85 / 7.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site C22	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686660 7374423 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 11Bl(Ta) / Brown Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Upper slope Slope 2% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Complete clearing, not cultivated	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Loam	Weak / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	7.5YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.10 / 6.5 No dispersion after 10 minutes No slaking	-
			B21 0.20-0.60 EOBH No Recovery of soil	Medium clay	Strong / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.40 / 9.0 Slight dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C23	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 687142 7373573 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 11Bl(Ta) / Brown Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Upper slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow scrub No microrelief Extensive clearing No erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Loam	Moderate / Strong Angular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Many	-	-
			B21 0.10-0.45 Gradual 50-100mm	Medium heavy clay	Strong / Weak Angular blocky 50-100 mm Slickensides	<2% coarse fragments 6-20mm <2% coarse fragments <2mm manganiferous nodules <2mm	10YR3/3 Dark brown Mottles: Brown Few 2%-10% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	-	
			BC 0.45-0.80 EOBH	Medium clay	Weak / Very weak Subangular blocky 10-20 mm No Slickensides	2-10% calcium carbonate 6-20mm	2.5Y5/3 Light olive brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	-	

Landscape



Surface



Soil Profile



Site C24	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686263 7377184 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 16Bl(Ta) / Grey Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Mid-slope Slope 2% / 3% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Open woodland No microrelief Extensive clearing No erosion	Hard setting No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Clay loam	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 8.5 No dispersion after 10 minutes Partial slaking	--
			B21 0.10-0.25 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.18 / 9.0 No dispersion after 10 minutes Partial slaking	
			BC 0.25-0.35 EOBH	Medium clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.30 / 9.0 No dispersion after 10 minutes Partial slaking	
			Refusal on bedrock								

Landscape



Surface



Soil Profile



Site C25	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686594 7377606 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 5Dn(Ro) / Grey Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Gently undulating plain Plain Lower slope Slope 2% / 3% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Complete clearing, not cultivated	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	-	-
			B21 0.10-0.50 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	-	
			BC 0.50-0.60 EOBH	Medium clay	Weak / Very weak Subangular blocky 10-20 mm No Slickensides	2-10% calcium carbonate 6-20mm	2.5Y5/3 Light olive brown Mottles: Brown Common 10%-20% Medium 5-15 mm	Dry Imperfectly drained	Very fine <1mm Few	-	

Landscape



Surface



Soil Profile



Site C26	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 686409 7378079 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 5Dn(Ro) / Grey Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 10/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Lower slope Slope 1% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Open woodland No microrelief Extensive clearing No erosion	Surface flake <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Strong / Firm Angular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 7.5 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.55 Gradual 50-100mm	Medium clay	Moderate / Very firm Angular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown Mottles: Pale brown Few 2%-10% Few <5 mm	Dry Moderately well drained	Fine 1-2mm Few	0.35 / 8.5 No dispersion after 10 minutes Partial slaking	
			BC 0.55-0.80 EOBH	Light clay	Massive / Loose No Slickensides	20-50% coarse fragments 6-20mm 20-50% coarse fragments 2-6mm	10YR6/2 Light brownish grey No mottles or bleaching	Dry Moderately well drained	No roots	0.70 / 8.0 Moderate dispersion after 10 minutes No slaking	

Landscape



Surface



Soil Profile



Site C27	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 690230 7370634 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 16Bl(Ta) / Grey Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 11/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Simple slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Limited clearing No erosion	Cracking No coarse fragments No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 7.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.50 EOBH No recovery of soil	Medium clay	Strong / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.30 / 8.0 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C28	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 691001 7371456 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 16Bl(Ta) / Grey Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 11/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Simple slope Slope 2% / 3% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Moderate / Very firm Angular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.35 Clear 20-50mm	Medium clay	Moderate / Very firm Angular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.25 / 8.5 No dispersion after 10 minutes Partial slaking	
			BC 0.35-0.60 EOBH	Light medium clay	Massive / Loose	20-50% coarse fragments 2-6mm 20-50% coarse fragments 20-60mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.50 / 8.0 No dispersion after 10 minutes Partial slaking	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site C29	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 691447 7371443 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro)) / Grey Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 11/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Brigalow Medium height No microrelief Extensive clearing No erosion	Self-mulching No coarse fragments No rock outcrop	A1 0.00-0.10 Gradual 50-100mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Well drained	Fine 1-2mm Common	0.05 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.60 Diffuse >100mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.35 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.60-1.00 EOBH	Medium clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.80 / 9.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site C30	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 691543 7370618 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 12Da(Te)) / Grey Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 11/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Limited clearing No erosion	Firm <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Moderate / Firm Subangular blocky 10-20 mm Faint Slickensides	No inclusions or segregations	10YR4/1 Dark grey No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.40 Diffuse >100mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm Faint Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.25 / 8.5 No dispersion after 10 minutes Partial slaking	
			B22 0.40-1.00 EOBH	Medium clay	Strong / Firm Subangular blocky 20-50 mm No Slickensides	<2% coarse fragments and manganese nodules 6-20mm	10YR4/3 Brown Mottles: Pale brown Few 2%-10% Medium 5-15 mm	Dry Moderately well drained	Fine 1-2mm Few	0.70 / 7.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C31	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 689683 7372597 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 13Bl(Ta) / Brown Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 11/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Upper slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Grassland No microrelief Extensive clearing No erosion	Firm 2-10% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay	Weak / Weak Subangular blocky 5-10 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.05 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.25 Clear 20-50mm	Light medium clay	Moderate / Weak Angular blocky 20-50 mm No Slickensides	<2% calcium carbonate 6-20mm <2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.18 / 8.5 No dispersion after 10 minutes Complete slaking	
			B22 0.25-0.45 Clear 20-50mm	Light clay	Weak / Weak Subangular blocky 20-50 mm No Slickensides	2-10% calcium carbonate 6-20mm <2% coarse fragments 6-20mm	10YR4/3 Brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.35 / 8.5 No dispersion after 10 minutes Partial slaking	
			B23 0.45-0.70 Abrupt 5-20mm	Medium clay	Moderate / Very firm Angular blocky 20-50 mm No Slickensides	2-10% coarse fragments 6-20mm <2% calcium carbonate 2-6mm	7.5YR4/4 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.55 / 8.5 No dispersion after 10 minutes Partial slaking	
			B24 0.70-1.00 EOBH	Light medium clay	Moderate / Firm Angular blocky 20-50 mm No Slickensides	<2% coarse fragments 6-20mm <2% coarse fragments 2-6mm	7.5YR4/4 Brown Mottles: Grey Very few <2% Few <5 mm	Dry Imperfectly drained	Very fine <1mm Few	0.85 / 8.0 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C32	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 689279 7373071 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 13Bl(Ta)) / Brown Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 11/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**							
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Mid-slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Open woodland No microrelief Extensive clearing No erosion	Firm 2-10% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Strong / Strong Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.40 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	2-10% calcium carbonate 6-20mm	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.25 / 8.0 No dispersion after 10 minutes No slaking	
			B22 0.40-0.60 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% calcium carbonate 6-20mm	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.50 / 8.5 No dispersion after 10 minutes Partial slaking	
			B23 0.60-1.00 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm No Slickensides	<2% calcium carbonate 6-20mm	7.5YR4/4 Brown Mottles: Pale brown Few 2%-10% Few <5 mm	Dry Moderately well drained	Fine 1-2mm Few	0.80 / 8.5 No dispersion after 10 minutes No slaking	

Landscape



Surface



Soil Profile



Site C33	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 689513 7373651 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 17Bl(Ro) / Gery Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 11/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Open depression Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Brigalow scrub No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 2-6mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light medium clay	Moderate / Very firm Angular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.05 / 8.0	-
			B21 0.10-0.50 Gradual 50-100mm	Medium heavy clay	Strong / Very firm Angular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm <2% calcium carbonate 2-6mm	2.5Y4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Common	0.35 / 9.0	
			B22 0.50-0.80 Clear 20-50mm	Medium clay	Moderate / Firm Angular blocky 20-50 mm Slickensides	<2% calcium carbonate 2-6mm No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.65 / 8.5	
			B23 0.80-1.00 EOBH	Medium heavy clay	Moderate / Weak Angular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	7.5YR4/4 Brown Mottles: Brown Few 2%-10% Medium 5-15 mm	Moderately moist Imperfectly drained	Very fine <1mm Few	0.90 / 8.5	

Landscape



Surface



Soil Profile



Site C34	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 691878 7375159 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 11Bl(Ta) / Brown Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 12/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Open woodland No microrelief Extensive clearing	Firm No coarse fragments No rock outcrop	A1 0.00-0.18 Clear 20-50mm	Silty loam	Massive / Loose Granular No Slickensides	<2% coarse fragments 2-6mm	7.5YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.10 / 7.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.18-0.47 Clear 20-50mm	Light clay	Weak / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	7.5YR3/3 Dark brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.32 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.47-0.68 EOBH	Light clay	Weak / Firm Angular blocky 10-20 mm No Slickensides	<2% calcium carbonate 2-6mm	7.5YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.58 / 8.5 Slight dispersion after 10 minutes Partial slaking	
			Refusal on cemented pan								

Landscape



Surface



Soil Profile



Site C35	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 688588 7377380 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 8Dn(Te) / Grey Dermosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 12/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Gently undulating plain Plain Flat Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow scrub No microrelief Extensive clearing Rill erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.20 Clear 20-50mm	Clay loam	Weak / Weak Angular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Many	0.10 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.20-0.35 Clear 20-50mm	Light clay	Weak / Weak Angular blocky 20-50 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.28 / 8.5 No dispersion after 10 minutes No slaking	
			BC 0.35-0.50 EOBH	Light clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.42 / 8.5 No dispersion after 10 minutes No slaking	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site C36	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 688804 7377298 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 19Bl(Ro) / Brown Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Exposed profile cutting	Survey Date / Described by: 12/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH / Dispersion / Slaking	Sample (m) / Observations
Grazing Level plain Plain Open depression Slope 3% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Open woodland No microrelief Extensive clearing Gully erosion	Surface flake No coarse fragments No rock outcrop	A1 0.00-0.18 Clear 20-50mm	Light clay	Weak / Weak Angular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Many	0.10 / 8.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.18-0.35 Clear 20-50mm	Light clay	Weak / Weak Angular blocky 20-50 mm Slickensides	<2% coarse fragments 2-6mm	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Common	0.28 / 8.5 No dispersion after 10 minutes No slaking	
			B22 0.35-1.00+ End of profile	Light clay	Moderate / Firm Subangular blocky 10-20 mm No Slickensides	<2% coarse fragments 2-6mm	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Very fine <1mm Few	0.60 / 8.5 No dispersion after 10 minutes No slaking	

Landscape



Surface



Soil Profile



Site C37	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 688262 7373639 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 11Bl(Ta) / Brown Dermosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 12/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2% / 2% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Sparse No microrelief Extensive clearing	Surface flake 2-10% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.15 Clear 20-50mm	Clay loam	Massive / Loose Angular blocky 5-10 mm No Slickensides	<2% coarse fragments 2-6mm	10YR3/3 Dark brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.08 / 7.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.15-0.50	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/3 Brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.30 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.90 EOBH	Medium clay	Moderate / Very firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.70 / 7.5 No dispersion after 10 minutes Partial slaking	
			No recovery of soil								

Landscape



Surface



Soil Profile



Site C38	**Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy:** 687935 7374475 / GPS <3.00m	**Soil Profile Class / Australian Soil Class:** 2Dn(Te) / Black Vertosol	**Soil Survey Type / Observation Class / Method:** Free / Class IV(a) / Auger	**Survey Date / Described by:** 12/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	**Vegetation / Microrelief / Disturbance / Erosion**	**Surface condition / surface rock / Rock outcrop**	**Soil Profile Description**								
			Horizon / Depth (m) / Boundary	**Field Texture**	**Structure / Strength / Pedality / Slickensides**	**Coarse fragments / Segregations**	**Colour / Mottle / Bleaching**	**Soil water status / Drainage**	**Roots Size / Abundance**	**Depth (m) / Field pH / Dispersion / Slaking**	**Sample (m) / Observations**
Grazing Gently undulating plain Plain Flat Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Brigalow scrub Open woodland No microrelief Extensive clearing No erosion	Cracking <2% coarse fragments 2-6mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Strong / Very firm Angular blocky 20-50 mm No Slickensides	No inclusions or segregations	10YR3/1 Very dark grey No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Common	0.05 / 7.0 No dispersion after 10 minutes Partial slaking	-
			B21 0.10-0.50 Diffuse >100mm	Medium heavy clay	Strong / Firm Angular blocky 20-50 mm Slickensides	<2% coarse fragments <2mm	10YR3/1 Very dark grey No mottles or bleaching	Moderately moist Moderately well drained	Very fine <1mm Few	0.35 / 7.5 No dispersion after 10 minutes Partial slaking	
			B22 0.50-0.80 EOBH	Medium heavy clay	Strong / Very firm Angular blocky 20-50 mm Slickensides	<2% calcium carbonate 2-6mm	10YR4/1 Dark grey No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Few	0.65 / 7.5 No dispersion after 10 minutes Partial slaking	

Landscape



Surface



Soil Profile



Site C39	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 687178 7374537 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 2Dn(Te) / Black Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 12/09/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description								
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Gently undulating plain Plain Mid-slope Slope 2% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Bauhinia Sparse No microrelief Extensive clearing No erosion	Self-mulching <2% coarse fragments 6-20mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Light clay	Moderate / Firm Subangular blocky 5-10 mm No Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Well drained	Fine 1-2mm Few	0.05 / 7.5	-
			B21 0.10-0.60 Gradual 50-100mm	Medium clay	Strong / Very firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Dry Moderately well drained	Fine 1-2mm Few	0.35 / 7.5	
			B22 0.60-1.00 EOBH	Medium clay	Strong / Firm Subangular blocky 10-20 mm No Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Dry Moderately well drained	No roots	0.80 / 7.5	

Landscape



Surface



Soil Profile



Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C40	686376 7375625 GPS <3.00m	12Da(Te) / Class IV(b)	Date: 21/10/2025 Grazing, gently undulating rises, risecrest, crest, minor area <5 ha, aggregated into UMA 57 / 12Da(Te). Open woodland, extensive clearing, no microrelief, no rock outcrop, scald erosion. Surface: 5-10% coarse fragments, 60-200 mm	
Site C41	686511 7375532 GPS <3.00m	12Da(Te) / Class IV(b)	Date: 21/10/2025 Grazing, gently undulating rises, residual rise, lower slope, start of rise, minor area <5 ha, aggregated into UMA 57 / 12Da(Te). Open woodland, extensive clearing, no microrelief, no rock outcrop, scald erosion. Surface: 5-10% coarse fragments, 60-200 mm	
Site C42	690703 7372706 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 23/10/2025 Grazing, gently undulating plains, flat, slope <1% Bauhinia, scrub, extensive clearing, no microrelief, no erosion, no rock outcrop Surface: Self mulching, <2% coarse fragments, 20-60 mm, medium clay, 7.5YR4/3 Brown	-

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C43	685717 7378011 GPS <3.00m	16Bl(Ta) / Class IV(b)	Date: 23/10/2025 Grazing, gently undulating rises, simple slope, slope 2-3% Bauhinia, grassland, extensive clearing, no microrelief, scald and sheet erosion, no rock outcrop Surface: Firm with areas of crusting, <% coarse fragments, 20-60 mm, light medium clay, 7.5YR4/2 Brown	 
Site C44	690653 7370148 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 03/11/2025 Grazing, gently undulating plains, lower slope, slope 1% Bauhinia, Brigalow, extensive clearing, no microrelief, no erosion, no rock outcrop Surface: Firm, no coarse fragments, light sandy clay, 7.5YR3/2	-

Site C45	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy: 686634 7385472 / GPS <3.00m	Soil Profile Class / Australian Soil Class: 2Dn(Te) / Black Vertosol	Soil Survey Type / Observation Class / Method: Free / Class IV(a) / Auger	Survey Date / Described by: 03/11/2025 / MCCR

Land use / Landform Pattern / Element / Slope (% slope, clinometer), Acid Sulfate Soil (ASS)	Vegetation / Microrelief / Disturbance / Erosion	Surface condition / surface rock / Rock outcrop	Soil Profile Description							
			Horizon / Depth (m) / Boundary	Field Texture	Structure / Strength / Pedality / Slickensides	Coarse fragments / Segregations	Colour / Mottle / Bleaching	Soil water status / Drainage	Roots Size / Abundance	Depth (m) / Field pH	Sample (m) / Observations
Grazing Level plain Plain Flat Slope 1% / 1% **ASS Attributes** pH < 5 <4: No Shell / Corroded Shell: No Jarositic horizons: Potential Sulfurous smell: No Dead, dying, stunted vegetation: No Further Assessment: No	Brigalow Grassland No microrelief Complete clearing, not cultivated No erosion	Surface flake <2% coarse fragments 20-60mm No rock outcrop	A1 0.00-0.10 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	No inclusions or segregations	10YR3/2 Very dark greyish brown No mottles or bleaching	Moist Well drained	Fine 1-2mm Few	0.05 / 7.0 No dispersion after 10 minutes Partial slaking	No samples taken Recent rainfall prior to site visit
			B21 0.10-0.40 Clear 20-50mm	Medium clay	Strong / Firm Subangular blocky 20-50 mm Slickensides	2-10% calcium carbonate 6-20mm	10YR3/2 Very dark greyish brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Few	0.25 / 8.0 No dispersion after 10 minutes Partial slaking	
			B22 0.40-0.95 Clear 20-50mm	Medium heavy clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR3/3 Dark brown No mottles or bleaching	Moderately moist Moderately well drained	Fine 1-2mm Few	0.70 / 7.5 No dispersion after 10 minutes Complete slaking	
			B23 0.95-1.00 EOBH	Medium heavy clay	Strong / Firm Subangular blocky 10-20 mm Slickensides	No inclusions or segregations	10YR4/2 Dark greyish brown Mottles: Brown Common 10%-20% Few <5 mm	Moderately moist Moderately well drained	Fine 1-2mm Few	0.97 / 7.0 No dispersion after 10 minutes Complete slaking	

Landscape



Surface



Soil Profile



Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C46	686518 7384762 GPS <3.00m	Boundary – 3Bl(Te) / 4Bl(Te) Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plains, lower slope, slope 1% Grassland, extensive clearing, no microrelief, no erosion, no rock outcrop Surface: Firm, no coarse fragments, medium clay, 10YR4/2 Dark greyish brown	
Site C47	686475 7384419 GPS <3.00m	Boundary – 4Bl(Te) / 15Bl(Ro) Class IV(b)	Date: 04/11/2025 Boundary – Surface colour changes to brown heading towards the south. Grey to the north.	
Site C48	686430 7384037 GPS <3.00m	5Dn(Ro) / Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plains, mid slope, open depression area Grassland, Acacia, extensive clearing, no microrelief, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR3/2 Very dark greyish brown	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C49	686420 7383767 GPS <3.00m	6Bl(Pg) / Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plains, mid slope, open depression area Grassland, Acacia, extensive clearing, gilgai in immediate area extending to the east, no erosion, minor rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/2 Dark greyish brown	
Site C50	686311 7382886 GPS <3.00m	Near boundary – 7Bl(Pg) / 15Bl(Ro) Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plains, mid slope Gilgai boundary site Brigalow, extensive clearing, gilgai in immediate area extending to the south (none to the north), no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/1 Dark grey	
Site C51	686230 7382225 GPS <3.00m	Boundary – 7Bl(Pg) / 13Bl(Ta) Class IV(b)	Date: 04/11/2025 Boundary site, gilgai increases to the north. No gilgai to the south.	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C52	686389 7382028 GPS <3.00m	13Bl(Ta) / Class IV(b)	Date: 04/11/2025 Dam to the south, disturbance area covering approximately 0.5 ha. Area aggregated into UMA 59 / 13Bl(Ta)	
Site C53	686171 7381780 GPS <3.00m	Boundary – 7Bl(Pg) / 13Bl(Ta) Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plain, mid slope Gilgai boundary site Brigalow, extensive clearing, gilgai in immediate area extending to the south (none to the north), no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/1 Dark grey	
Site C54	686058 7380830 GPS <3.00m	Near boundary – 7Bl(Pg) / 10Ct(Ro) Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plain, mid slope Gilgai boundary site Brigalow, extensive clearing, gilgai in immediate area extending to the north (none to the south), no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/1 Dark grey	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C55	685902 7379582 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plain, lower slope, 2% Bauhinia, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Firm, isolated area (0.5-1.0 ha) of rocks on surface – 20-600mm, light medium clay, 10YR3/2 Very dark greyish brown	
Site C56	688450 7376507 GPS <3.00m	7Bl(Pg) / Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plain, mid slope Brigalow, extensive clearing, gilgai observed, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/1 Dark grey	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C57	689204 7374168 GPS <3.00m	11Bl(Ta) / Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plain, drainage line, gully Brigalow, extensive clearing, no gilgai observed, no erosion, no rock outcrop Exposed soil profile, shows 0.80 m soil depth over eroded bedrock. Surface: Cracking, no coarse fragments, clay loam, 10YR3/3 Dark brown	
Site C58	689681 7374242 GPS <3.00m	18Bl(Ro) / Class IV(b)	Date: 04/11/2025 Grazing, gently undulating plain, mid slope, 1% Sparse Bauhina, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/2 Dark greyish brown	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C59	688493 7374238 GPS <3.00m	5Dn(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plain, flat plain, <1% Sparse Bauhina and Brigalow, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/1 Dark grey Aerial imagery suggests boundary between north and south areas.	-
Site C60	688685 7375439 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plain, gully, drainage line Sparse Bauhina, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Flake, <2% coarse fragments 20-60mm, light clay - sandy, 10YR3/2 Very dark greyish brown	
Site C61	688267 7375835 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plain Sparse Bauhina, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Flake, <2% coarse fragments 2-6mm, light clay - sandy, 10YR3/2 Very dark greyish brown Isolated area with scalded surface covering <1 ha	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C62	688799 7376454 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plains Sparse Bauhina and Brigalow, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Firm, no coarse fragments 2-6mm, sandy clay loam, 10YR3/2 Very dark greyish brown	 

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C63	688847 7376568 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plains Sparse Bauhina, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Firm, no coarse fragments, sandy clay loam, 10YR3/3 Dark brown	 
Site C64	688865 7376603 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plain Sparse Bauhina and Brigalow, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Firm, no coarse fragments, sandy clay loam, 10YR3/2 Very dark greyish brown	-
Site C65	688877 7376634 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plain Sparse Bauhina and Brigalow, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Firm, no coarse fragments, sandy clay loam, 10YR3/2 Very dark greyish brown	-
Site C66	688885 7376665 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 05/11/2025 Grazing, gently undulating plain Sparse Bauhina and Brigalow, extensive clearing, no gilgai observed, no erosion, no rock outcrop Surface: Firm, no coarse fragments, sandy clay loam, 10YR3/2 Very dark greyish brown	-

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C67	687232 7382661 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 06/11/2025 Grazing, gently undulating plain Sparse vegetation, extensive clearing, no erosion, no rock outcrop Minor area gilgai observed in immediate area, <10% coverage, not observed in broader area, therefore aggregated into UMA 63 / 15Bl(Ro) Surface: Self mulching, no coarse fragments, medium clay, 10YR4/2 Dark greyish brown	
Site C68	686707 7382940 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 06/11/2025 Grazing, gently undulating plain Sparse vegetation, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Self mulching, no coarse fragments, light clay, 10YR4/2 Dark greyish brown	
Site C69	686642 7385711 GPS <3.00m	10Ct(Ro) / Class IV(b)	Date: 06/11/2025 Grazing, gently undulating plain, flat plain <1% Sparse vegetation, extensive clearing, no erosion, no rock outcrop Minor area gilgai observed in immediate area, <10% coverage, not observed in broader area, not observed at nearby site D54, therefore aggregated into UMA 48 / 10Ct(Ro) Surface: Self mulching, no coarse fragments, medium clay - silty, 10YR4/1 Dark grey	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C70	690192 7371142 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 06/11/2025 Grazing, gently undulating plain, lower slope, depression, drainage line Brigalow and Bauhinia, limited clearing, no gilgai, no erosion, no rock outcrop Surface: Self mulching, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	
Site C71	690898 7371680 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 06/11/2025 Grazing, gently undulating plain, lower slope, depression, drainage line Brigalow, limited clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	 

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C72	690621 7371071 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 06/11/2025 Grazing, gently undulating plain, lower slope, depression, drainage line Grassland, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	 

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C73	691255 7380354 GPS <3.00m	20Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, upper to mid slope, 2% Brigalow and Bauhinia, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Hard setting, no coarse fragments, sandy loam, 7.5YR3/2	 
Site C74	686931 7379314 GPS <3.00m	Boundary 2Dn(Te) / 17Bl(Ro) Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, flat plain, <1% Sparse Bauhinia, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, light clay, 10YR3/2 Very dark greyish brown	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C75	687750 7379472 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, mid slope, <1% Sparse Bauhinia, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	 
Site C76	687331 7379476 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, mid slope, <1% Sparse Bauhinia, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C77	687037 7380446 GPS <3.00m	Near boundary 15Bl(Ro) / 4Bl(Te) Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, gully, soil depth on exposed profile shows 1.2m+ Sparse Bauhinia and Brigalow, extensive clearing, no gilgai, gully erosion, no rock outcrop Surface: Flake, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	
Site C78	687135 7381274 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, mid slope, <1% Brigalow, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C79	687402 7384348 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, simple slope, <1% Grassland, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, medium clay, 10YR4/3 Brown	 
Site C80	687483 7385209 GPS <3.00m	10Ct(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, depression, gully Limited clearing, no gilgai, no erosion, no rock outcrop Surface: Cracking and self mulching in areas, no coarse fragments, light medium clay, 10YR4/1 Dark grey	
Site C81	687959 7385438 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, simple slope, <1% Grassland, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, medium clay, 10YR4/3 Brown	-

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C82	688039 7381267 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, mid slope, <1% Grassland, sparse Brigalow, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	 
Site C83	688340 7381227 GPS <3.00m	15Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plain, mid slope, <1% Grassland, sparse Brigalow, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, light medium clay, 10YR4/2 Dark greyish brown	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C84	686739 7383375 GPS <3.00m	Boundary – 6Bl(Pg) / 15Bl(Ro) Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, mid slope Gilgai boundary site Brigalow, extensive clearing, gilgai in immediate area extending to the east (none to the west), no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/2 Dark greyish brown	
Site C85	686286 7382653 GPS <3.00m	7Bl(Pg) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, mid slope Brigalow, extensive clearing, gilgai observed, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR4/1 Dark grey	-
Site C86	686188 7381933 GPS <3.00m	13Bl(Ta) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, drainage line, gully Brigalow, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, light clay, 10YR4/3 Brown	-
Site C87	685981 7380217 GPS <3.00m	19Bl(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, drainage line, gully Brigalow, extensive clearing, no gilgai, gully erosion, no rock outcrop Surface: Self mulching, no coarse fragments, light clay, 10YR3/2 Very dark greyish brown	-
Site C88	686597 7380487 GPS <3.00m	4Bl(Te) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, drainage line, gully Brigalow, extensive clearing, no gilgai, gully erosion, no rock outcrop Surface: Flake, no coarse fragments, light medium clay, 10YR3/2 Very dark greyish brown	

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C89	686064 7379484 GPS <3.00m	9Dn(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, minor drainage line Brigalow, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Cracking, no coarse fragments, medium clay, 10YR3/1 Very dark grey	
Site C90	686565 7378346 GPS <3.00m	10Ct(Ro) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, drainage line, exposed soil profile observed to 1.0m depth Bauhinia, extensive clearing, no gilgai, no erosion, no rock outcrop Surface: Flake, no coarse fragments, medium clay, 10YR4/2 Dark greyish brown	
Site C91	689908 7378062 GPS <3.00m	7Bl(Pg) / Class IV(b)	Date: 07/11/2025 Desktop site. Review of SLR (2023) site C18 landscape and surface photos, combined with aerial imagery shows gilgai. This site is within UMA 24, aerial and landscape photos show similarity with nearby UMA 28 (Grey Vertosol).	-

Site No.	Location (mE/mS GDA2020 ZONE 55) / Method, Accuracy	Soil Profile Class / Observation Class	Description	Plates
Site C92	692160 7373851 GPS <3.00m	6Bl(Pg) / Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, flat, slope <1% Brigalow, extensive clearing, no erosion, no rock outcrop, Normal gilgai Surface: Flake, <2% coarse fragments, 20-60 mm, light clay, 10YR4/3 Brown	
Site C93	691275 7379297 GPS <3.00m	Boundary – 6Bl(Pg) / 21Bl(Ta) Class IV(b)	Date: 07/11/2025 Grazing, gently undulating plains, flat, slope <1% Gilgai boundary site Brigalow, extensive clearing, no erosion, no rock outcrop, Normal gilgai in immediate area extending to the east (none to the west) - 30% coverage - 0.5 to 1.0m deep mound position Surface: Flake, <2% coarse fragments, 20-60 mm, light clay, 10YR4/3 Brown	

Appendix C Analysed Site Laboratory Summary

Table AppC-1: Soil Chemistry for 1Dn(Te), Analysed Site D1

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
pH 1:5 water (pH units)	8.55	8.94	9.2
pH CaCl2 (following 4A1) pH units	7.84	8.17	8.35
Organic Carbon (W&B) % (40°C)	1.66	0.7	-
Nitrate - N (2M KCl) (mg/kg)	2.7	<1.0	-
Ammonium - N (2M KCl) (mg/kg)	1.4	<1.0	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-
PBI + Col P	100	92	-
Colwell Potassium (mg/kg)	500	150	-
KCl Sulfur (S) (mg/kg)	5.8	6.8	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	4650	3860	2520
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	458	563	536
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	415	126	92
Sodium (NH4Cl/BaCl2) (mg/kg)	200	1320	1410
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	23.2	19.3	12.6
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	3.77	4.63	4.41
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	1.06	0.322	0.234
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.87	5.73	6.15
Ca:Mg ratio	6.2	4.2	2.9
K:Mg ratio	0.28	0.07	0.05
GTRI	-	-	-
ECR (%)	6.7	20	27
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	4490	4090	2720
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	471	563	561
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	455	136	100
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	28.8	274	659
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	22.4	20.4	13.6
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	3.87	4.63	4.61
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	1.16	0.347	0.256

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.125	1.19	2.87
Ca:Mg ratio	5.8	4.4	2.9
K:Mg ratio	0.3	0.08	0.06
ECR (%)	4.7	5.8	15
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02
ECEC (cmol/kg)	27.6	26.6	21.3
Calcium (%)	81.3	76.8	63.7
Magnesium (%)	14	17.4	21.7
Potassium (%)	4.2	1.3	1.2
Sodium (%)	0.5	4.5	13
Aluminium (%)	0	0	0
Hydrogen (%)	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-
Chloride (mg/kg)	62	700	830
Salinity EC 1:5 (dS/m)	0.17	0.67	0.71
Boron (mg/kg)	1.4	-	-
Iron (Fe) (mg/kg)	6.2	-	-
Manganese (Mn) (mg/kg)	3.5	-	-
Copper (Cu) (mg/kg)	0.6	-	-
Zinc (Zn) (mg/kg)	0.27	-	-
Oxalate ext. Molybdenum (mg/kg)	0.81	-	-
Dumas Total Nitrogen (% dry wt)	0.21	0.12	-
TDS (mg(/L)	110	430	450
% Air-dry Moisture Content (% of dry wt)	2.9	3.2	2.6
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0288	0.0316	0.0263
Moisture (dry basis) (%)	3.01	3.17	2.09
Moisture 105Â°C (dry basis) (%)	10.1	12.5	8.1
Texture (ISSS Classification)	Clay	Clay	Silty Clay Loam
Gravel fraction (% of whole sample)	1.5	0.8	57.4

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
Sand fraction (%(< 2 mm fraction)	40.8	30.2	43.3
Silt fraction (% < 2 mm fraction)	14.8	17.9	28.5
Clay fraction (% < 2 mm fraction)	44.4	51.9	28.2
Moisture 40Â°C (dry basis) (%)	-	-	-
R1 Dispersion Ratio	0.4	0.66	0.35
EAT	4	3	2
15 Bar (%)	20.3	22.7	15.1

'-' indicates no laboratory assessment was undertaken

Table AppC-2: Soil Chemistry for 2Dn(Te), Analysed Site D3 (SLR Site B25 (2023)

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	D3-0.00-0.10 (B25, SLR 2023)	D3-0.20-0.30 (B25, SLR 2023)	D3-0.50-0.60 (B25, SLR 2023)	D3-0.70-0.80	D3-0.90-1.00 (B25, SLR 2023)
pH 1:5 water	7.26	6.8	8.06	-	9.13
Organic Carbon (W&B)	3.85	1.5	-	-	-
Nitrate - N (2M KCl)	3.8	47	-	-	-
Ammonium - N (2M KCl)	4.1	<1.0	-	-	-
Colwell Phosphorus	18	5.5	-	-	-
PBI + Col P	67	94	-	-	-
Colwell Potassium	1800	1100	-	-	-
KCl Sulfur (S)	11	37	-	-	-
Exchangeable Calcium	19	23	28	-	20
Exchangeable Magnesium	6.7	7.9	8.3	-	5.7
Exchangeable Potassium	0.56	0.37	0.36	-	0.18
Exchangeable Sodium	0.42	0.62	0.91	-	1.2
Exchangeable acidity	<0.02	<0.02	-	-	-
Exchangeable aluminium	<0.02	<0.02	-	-	-
This Exchangeable hydrogen	<0.02	<0.02	-	-	-
Calcium/Magnesium Ratio	2.9	2.9	3.4		3.6
ECEC	27	32	38	-	27
Calcium (%)	72	72	75	-	74
Magnesium (%)	25	25	22	-	21
Potassium (%)	2.1	1.2	0.95	-	0.64
Sodium - ESP (%)	1.6	2	2.4	-	4.3
Aluminium (%)	0.04	0.05	0.04	-	0.04
Hydrogen (%)	0	0	0	-	0
CaCl2 extr. Aluminium	<0.1	-	-	-	-
Chloride	41	380	1100	1200	740
EC	0.117	0.087	0.189	-	740
Boron	2.7	-	-	-	-
Iron (Fe)	8.1	-	-	-	-
Manganese (Mn)	11	-	-	-	-
Copper (Cu)	0.9	-	-	-	-
Zinc (Zn)	1.1	-	-	-	-
Oxalate ext. Molybdenum	0.59	-	-	-	-
Dumas Total Nitrogen	0.38	0.14	-	-	-
% Air-dry Moisture Content	2.9	3.5	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	D3-0.00-0.10 (B25, SLR 2023)	D3-0.20-0.30 (B25, SLR 2023)	D3-0.50-0.60 (B25, SLR 2023)	D3-0.70-0.80	D3-0.90-1.00 (B25, SLR 2023)
S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	0.0286	0.0351	-	-	-
Moisture (dry basis)	5.75	5.67	8.57	8.4	4.62
Moisture 105Â°C (dry basis)	---	---	---	---	---
Texture (ISSS Classification)	Clay Loam	Clay	Clay	Clay	Clay Loam
Gravel fraction	2.4	1	53.7	45.7	87.1
Sand fraction	51.6	47.9	24.9	31	58.7
Silt fraction	21.4	15.2	18.1	10.7	12.4
Clay fraction	27	36.9	57	58.3	29
Moisture 40Â°C (dry basis)	2.9	5.1	7	6.3	3.3
R1 Dispersion Ratio	0.31	0.31	0.27	0.37	0.57
EAT	3	4	4	---	4
15 Bar (%)	19.5	18.1	23.4	22.4	12.4

Legend
GTE Laboratory Data
SLR Site Data

'-' indicates no laboratory assessment was undertaken

Table AppC-3: Soil Chemistry for 3Bl(Te), Analysed Site D5

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	7.63	8.63	8.96	8.13	8.63	5.21	8.08
pH CaCl2 (following 4A1) pH units	6.42	7.67	8.12	7.52	8.01	4.6	7.4
Organic Carbon (W&B) % (40°C)	1.34	1.12	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	<1.0	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	1.7	1.3	-	-	-	-	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-	-	-	-	-
PBI + Col P	116	112	-	-	-	-	-
Colwell Potassium (mg/kg)	97	80	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	7.5	6.3	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3900	4330	4400	2980	3450	2290	2940
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	1080	1310	1360	1460	1490	1490	1420
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	115	109	88	110	121	100	116
Sodium (NH4Cl/BaCl2) (mg/kg)	566	1010	1120	2440	2110	2210	1890
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	19.5	21.6	22	14.8	17.2	11.4	14.7
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	8.89	10.8	11.2	12	12.3	12.3	11.7
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.294	0.278	0.226	0.281	0.309	0.255	0.297
Sodium (NH4Cl/BaCl2) (cmol/kg)	2.46	4.38	4.87	10.6	9.19	9.6	8.23

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Ca:Mg ratio	2.2	2	2	1.2	1.4	0.9	1.3
K:Mg ratio	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GTRI	-	-	-	-	-	-	-
ECR (%)	8.9	13	13	29	24	29	24
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	4060	4470	4330	3140	3570	2490	3260
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1060	1430	1530	1590	1640	1520	1660
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	144	133	105	118	120	98.8	118
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	314	532	446	1150	1020	1200	1050
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	20.3	22.3	21.6	15.7	17.8	12.4	16.3
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	8.72	11.7	12.6	13.1	13.5	12.5	13.7
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.368	0.34	0.269	0.301	0.306	0.253	0.302
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	1.36	2.31	1.94	4.99	4.43	5.24	4.55
Ca:Mg ratio	2.3	1.9	1.7	1.2	1.3	1	1.2
K:Mg ratio	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
ECR (%)	5.6	7.2	6.1	16	13	18	14
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	1.3	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	1.2	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	<0.02

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
ECEC (cmol/kg)	30.7	36.7	36.4	34	36.1	31.7	34.8
Calcium (%)	66	60.8	59.3	46.1	49.4	39.2	46.7
Magnesium (%)	28.4	32	34.7	38.4	37.5	39.4	39.3
Potassium (%)	1.2	0.9	0.7	0.9	0.9	0.8	0.9
Sodium (%)	4.4	6.3	5.3	15	12	17	13
Aluminium (%)	0	0	0	0	0	3.8	0
Hydrogen (%)	0	0	0	0	0	0.3	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-
Chloride (mg/kg)	130	290	350	1400	1100	1500	1200
Salinity EC 1:5 (dS/m)	0.13	0.35	0.46	1	0.97	1	0.88
Boron (mg/kg)	1.4	-	-	-	-	-	-
Iron (Fe) (mg/kg)	27	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	28	-	-	-	-	-	-
Copper (Cu) (mg/kg)	2.2	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.18	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.3	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.11	0.092	-	-	-	-	-
TDS (mg(/L)	83	230	290	650	620	660	570
% Air-dry Moisture Content (% of dry wt)	3.5	4	5.3	4.4	3.5	4	4.3
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0349	0.0395	0.0531	0.0437	0.0347	0.0404	0.0425
Moisture (dry basis) (%)	3.4	4.13	3.33	3.15	3.1	3.31	3.18
Moisture 105Â°C (dry basis) (%)	11.7	15.1	13.3	12.4	14	13.1	13.7

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Clay	Silty Clay	Clay
Gravel fraction (% of whole sample)	< 0.1	< 0.1	4.3	< 0.1	3.4	< 0.1	< 0.1
Sand fraction (%(< 2 mm fraction)	38.5	30.8	31.7	31.2	29.4	17.1	29.8
Silt fraction (% < 2 mm fraction)	10.2	13.5	11.9	13	13.5	28.2	14.8
Clay fraction (% < 2 mm fraction)	51.3	55.8	56.4	55.9	57.1	54.7	55.4
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.44	0.51	0.44	0.66	0.57	0.74	0.66
EAT	2	2	2	2	2	2	2
15 Bar (%)	25.8	28.2	27.3	26.8	27.1	28.2	29.9

'-' indicates no laboratory assessment was undertaken

Table AppC-4: Soil Chemistry for 4Bl(Te), Analysed Site D6

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.00-1.10
pH 1:5 water (pH units)	7.17	8.98	9.07	9.1	8.95
pH CaCl2 (following 4A1) pH units	6.06	8.09	8.26	8.37	8.14
Organic Carbon (W&B) % (40°C)	1.77	0.91	-	-	-
Nitrate - N (2M KCl) (mg/kg)	1.2	<1.0	-	-	-
Ammonium - N (2M KCl) (mg/kg)	2.5	1.2	-	-	-
Colwell Phosphorus (mg/kg)	7.3	<5.0	-	-	-
PBI + Col P	68	122	-	-	-
Colwell Potassium (mg/kg)	330	100	-	-	-
KCl Sulfur (S) (mg/kg)	4.8	8.9	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	2400	3900	3470	2110	2000
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	746	1250	1260	1060	1140
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	252	126	109	67	64
Sodium (NH4Cl/BaCl2) (mg/kg)	205	1030	1380	1680	1890
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	12	19.4	17.3	10.6	10
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	6.13	10.3	10.4	8.69	9.38
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.644	0.321	0.278	0.17	0.163
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.892	4.47	6.02	7.32	8.22
Ca:Mg ratio	2	1.9	1.7	1.2	1.1
K:Mg ratio	0.11	<0.05	<0.05	<0.05	<0.05
GTRI	-	-	-	-	-
ECR (%)	7.8	14	19	28	30

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.00-1.10
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	2470	4020	3940	2250	2050
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	784	1440	1350	1140	1130
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	307	137	108	81.8	52.2
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	66.4	319	465	595	934
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	12.3	20.1	19.6	11.2	10.2
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.45	11.8	11.1	9.34	9.32
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.785	0.35	0.275	0.209	0.134
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.289	1.39	2.02	2.59	4.06
Ca:Mg ratio	1.9	1.7	1.8	1.2	1.1
K:Mg ratio	0.12	<0.05	<0.05	<0.05	<0.05
ECR (%)	5.4	5.2	7	12	18
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
ECEC (cmol/kg)	19.8	33.6	33	23.3	23.8
Calcium (%)	62.1	59.7	59.5	48	43.1
Magnesium (%)	32.5	35.2	33.6	40	39.2
Potassium (%)	4	1	0.8	0.9	0.6
Sodium (%)	1.5	4.1	6.1	11	17
Aluminium (%)	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-
Chloride (mg/kg)	44	260	420	1100	1100
Salinity EC 1:5 (dS/m)	0.074	0.39	0.51	0.91	0.91

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.00-1.10
Boron (mg/kg)	0.77	-	-	-	-
Iron (Fe) (mg/kg)	25	-	-	-	-
Manganese (Mn) (mg/kg)	38	-	-	-	-
Copper (Cu) (mg/kg)	1.4	-	-	-	-
Zinc (Zn) (mg/kg)	0.96	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	0.84	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.16	0.093	-	-	-
TDS (mg(/L)	47	250	330	580	580
% Air-dry Moisture Content (% of dry wt)	2.4	3.4	3.2	3.3	2.9
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0243	0.0336	0.0323	0.0329	0.0289
Moisture (dry basis) (%)	1.54	3.17	2.94	1.44	2.15
Moisture 105Â°C (dry basis) (%)	3.5	15.5	16.2	5.8	7.4
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Clay Loam
Gravel fraction (% of whole sample)	< 0.1	0.3	1.1	47.4	0.3
Sand fraction (%(< 2 mm fraction)	48.8	32.2	36.2	43.8	50.3
Silt fraction (% < 2 mm fraction)	15.2	9	10.7	15.7	18.3
Clay fraction (% < 2 mm fraction)	36	58.8	53.1	40.5	31.4
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-
R1 Dispersion Ratio	0.39	0.54	0.6	0.69	0.5
EAT	3	3	3	2	2
15 Bar (%)	27.2	26.4	24.9	17.4	22.9

'-' indicates no laboratory assessment was undertaken

Table AppC-5: Soil Chemistry for 5Dn(Ro), Analysed Site D7

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
pH 1:5 water (pH units)	8.57	8.96	8.76
pH CaCl2 (following 4A1) pH units	7.82	8.01	7.92
Organic Carbon (W&B) % (40°C)	1.46	0.78	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	<1.0	-
Ammonium - N (2M KCl) (mg/kg)	1.6	<1.0	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-
PBI + Col P	133	115	-
Colwell Potassium (mg/kg)	120	120	-
KCl Sulfur (S) (mg/kg)	5.6	4.6	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	5520	4470	2990
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	796	1010	1150
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	171	132	132
Sodium (NH4Cl/BaCl2) (mg/kg)	227	530	1510
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	27.6	22.3	14.9
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	6.55	8.31	9.43
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.438	0.338	0.339
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.988	2.3	6.56
Ca:Mg ratio	4.2	2.7	1.6
K:Mg ratio	0.07	<0.05	<0.05
GTRI	-	-	-
ECR (%)	4	7.9	22
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	5340	4800	2690
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	813	1100	1090
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	172	137	139
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	48.7	126	725
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	26.7	24	13.4
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.69	9.07	8.93
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.439	0.349	0.355

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.212	0.55	3.15
Ca:Mg ratio	4	2.6	1.5
K:Mg ratio	0.07	<0.05	<0.05
ECR (%)	1.9	2.6	14
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02
ECEC (cmol/kg)	34	33.9	25.9
Calcium (%)	78.4	70.6	51.9
Magnesium (%)	19.7	26.7	34.5
Potassium (%)	1.3	1	1.4
Sodium (%)	0.6	1.6	12
Aluminium (%)	0	0	0
Hydrogen (%)	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-
Chloride (mg/kg)	25	57	640
Salinity EC 1:5 (dS/m)	0.16	0.23	0.58
Boron (mg/kg)	1.2	-	-
Iron (Fe) (mg/kg)	11	-	-
Manganese (Mn) (mg/kg)	4.6	-	-
Copper (Cu) (mg/kg)	1.1	-	-
Zinc (Zn) (mg/kg)	0.19	-	-
Oxalate ext. Molybdenum (mg/kg)	0.92	-	-
Dumas Total Nitrogen (% dry wt)	0.15	0.099	-
TDS (mg(/L)	100	140	370
% Air-dry Moisture Content (% of dry wt)	2.8	3.4	3.6
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0275	0.0338	0.036
Moisture (dry basis) (%)	3.35	2.84	2.69
Moisture 105Â°C (dry basis) (%)	8.6	12.6	13.4
Texture (ISSS Classification)	Clay	Clay	Clay
Gravel fraction (% of whole sample)	2.1	9.4	20

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
Sand fraction (%(< 2 mm fraction)	31.9	30.2	28.2
Silt fraction (% < 2 mm fraction)	16.8	14.6	16.5
Clay fraction (% < 2 mm fraction)	51.3	55.2	55.3
Moisture 40Â°C (dry basis) (%)	-	-	-
R1 Dispersion Ratio	0.26	0.57	0.77
EAT	4	2	2
15 Bar (%)	20.9	21.9	22.8

'-' indicates no laboratory assessment was undertaken

Table AppC-6: Soil Chemistry for 6BI(Pg), Analysed Site 12m

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	7.75	5.67	5.77	5.75	7.65	7.22	7.59
pH CaCl2 (following 4A1) pH units	7.11	5.22	5.36	5.42	7.26	6.76	7.2
Organic Carbon (W&B) % (40°C)	0.75	0.42	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	<1.0	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	1.6	1.7	-	-	-	-	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-	-	-	-	-
PBI + Col P	100	94	-	-	-	-	-
Colwell Potassium (mg/kg)	220	170	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	20	56	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3410	2040	1910	1740	2150	2390	2120
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	1060	1210	1210	1210	1280	1360	1320
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	195	173	201	203	246	257	276
Sodium (NH4Cl/BaCl2) (mg/kg)	436	1470	1940	2320	2480	2570	2570
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	17	10.2	9.54	8.69	10.7	11.9	10.6
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	8.75	9.92	9.96	9.94	10.5	11.2	10.9
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.499	0.441	0.514	0.52	0.629	0.656	0.707
Sodium (NH4Cl/BaCl2) (cmol/kg)	1.9	6.4	8.43	10.1	10.8	11.2	11.2

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Ca:Mg ratio	1.9	1	1	0.9	1	1.1	1
K:Mg ratio	0.06	<0.05	0.05	0.05	0.06	0.06	0.07
GTRI	-	-	-	-	-	-	-
ECR (%)	8.5	25	31	36	35	34	36
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3550	2110	1910	1640	2310	2290	2080
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1110	1110	1120	1040	1380	1330	1300
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	235	201	250	226	311	285	329
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	101	471	618	560	690	690	686
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	17.7	10.5	9.52	8.19	11.5	11.4	10.4
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	9.13	9.16	9.2	8.54	11.3	10.9	10.7
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.602	0.514	0.639	0.578	0.795	0.728	0.842
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.44	2.05	2.69	2.44	3	3	2.99
Ca:Mg ratio	1.9	1.2	1	1	1	1	1
K:Mg ratio	0.07	0.06	0.07	0.07	0.07	0.07	0.08
ECR (%)	3.7	12	15	15	14	14	15
Exchangeable acidity (cmol/kg)	<0.02	0.11	0.06	0.06	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	0.06	<0.02	0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	0.05	0.04	0.03	<0.02	<0.02	<0.02

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
ECEC (cmol/kg)	27.9	22.4	22.1	19.8	26.7	26.1	24.9
Calcium (%)	63.5	47.1	43.1	41.4	43.2	43.8	41.7
Magnesium (%)	32.8	40.9	41.6	43.1	42.6	41.9	42.9
Potassium (%)	2.2	2.3	2.9	2.9	3	2.8	3.4
Sodium (%)	1.6	9.2	12	12	11	12	12
Aluminium (%)	0	0.3	0.1	0.1	0	0	0
Hydrogen (%)	0	0.2	0.2	0.2	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-
Chloride (mg/kg)	300	1500	2200	3000	3000	2700	3300
Salinity EC 1:5 (dS/m)	0.33	1.1	1.5	2	2.1	1.9	2.3
Boron (mg/kg)	2.9	-	-	-	-	-	-
Iron (Fe) (mg/kg)	18	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	7.7	-	-	-	-	-	-
Copper (Cu) (mg/kg)	1.6	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.26	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.1	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.098	0.031	-	-	-	-	-
TDS (mg(/L)	210	700	970	1200	1400	1200	1400
% Air-dry Moisture Content (% of dry wt)	3.3	3.6	5	5.1	3.1	3.2	3.5
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.033	0.0359	0.0498	0.0508	0.0308	0.0321	0.0345
Moisture (dry basis) (%)	2.63	2.69	2.98	2.79	3.6	3.16	3.81
Moisture 105Â°C (dry basis) (%)	7.2	12.2	14.1	12.2	14.1	14.2	14.5

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Gravel fraction (% of whole sample)	0.8	< 0.1	0.2	9	18.1	17.9	2.8
Sand fraction (%(< 2 mm fraction)	31	24	24.1	25.2	25.1	23	25.2
Silt fraction (% < 2 mm fraction)	13	16.6	15.7	15.8	16.7	15.8	13.9
Clay fraction (% < 2 mm fraction)	56	59.4	60.2	59.1	58.2	61.2	60.9
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.42	0.65	0.69	0.69	0.66	0.71	0.78
EAT	4	2	2	2	2	2	2
15 Bar (%)	21.3	23.5	23.2	23.5	23.2	23.4	24.1

'-' indicates no laboratory assessment was undertaken

Table AppC-7: Soil Chemistry for 6BI(Pg), Analysed Site 12d

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	8.21	7.79	8.02	8.23	8.08	7.96	7.19
pH CaCl2 (following 4A1) pH units	7.49	7.2	7.51	7.69	7.57	7.5	6.7
Organic Carbon (W&B) % (40°C)	0.88	0.41	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	1	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	<1.0	<1.0	-	-	-	-	-
Colwell Phosphorus (mg/kg)	5.9	<5.0	-	-	-	-	-
PBI + Col P	90	89	-	-	-	-	-
Colwell Potassium (mg/kg)	230	130	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	4.2	18	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3920	2550	2330	2250	2350	2210	1980
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	847	1090	1150	1090	1200	1270	1160
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	242	147	163	164	197	230	179
Sodium (NH4Cl/BaCl2) (mg/kg)	232	1800	2450	2310	2590	2680	1970
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	19.6	12.7	11.7	11.2	11.7	11	9.86
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	6.97	8.96	9.43	8.98	9.83	10.5	9.58
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.618	0.375	0.417	0.418	0.504	0.587	0.458
Sodium (NH4Cl/BaCl2) (cmol/kg)	1.01	7.83	10.7	10	11.3	11.6	8.57

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Ca:Mg ratio	2.8	1.4	1.2	1.3	1.2	1.1	1
K:Mg ratio	0.09	<0.05	<0.05	<0.05	0.05	0.06	<0.05
GTRI	-	-	-	-	-	-	-
ECR (%)	5.8	27	34	34	35	36	32
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3440	2390	2130	2240	2140	2060	1960
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	800	1060	1070	1100	1110	1120	1160
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	258	166	179	175	223	247	223
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	52.9	580	643	682	681	602	538
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	17.2	11.9	10.6	11.2	10.7	10.3	9.79
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.58	8.71	8.84	9.03	9.13	9.23	9.52
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.659	0.423	0.458	0.447	0.569	0.631	0.569
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.23	2.52	2.8	2.97	2.96	2.62	2.34
Ca:Mg ratio	2.6	1.4	1.2	1.2	1.2	1.1	1
K:Mg ratio	0.1	<0.05	0.05	<0.05	0.06	0.07	0.06
ECR (%)	3.6	13	14	14	15	14	13
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
ECEC (cmol/kg)	24.6	23.6	22.7	23.6	23.3	22.7	22.2
Calcium (%)	69.7	50.6	46.8	47.3	45.8	45.1	44.1
Magnesium (%)	26.7	36.9	38.9	38.2	39.1	40.6	42.9
Potassium (%)	2.7	1.8	2	1.9	2.4	2.8	2.6
Sodium (%)	0.9	11	12	13	13	12	11
Aluminium (%)	0	0	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-
Chloride (mg/kg)	26	1500	2200	2300	2600	3000	2500
Salinity EC 1:5 (dS/m)	0.14	1.1	1.5	1.5	1.7	2	1.6
Boron (mg/kg)	0.86	-	-	-	-	-	-
Iron (Fe) (mg/kg)	15	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	8.2	-	-	-	-	-	-
Copper (Cu) (mg/kg)	1.8	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.25	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.1	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.095	0.055	-	-	-	-	-
TDS (mg(/L)	92	690	980	980	1100	1300	1000
% Air-dry Moisture Content (% of dry wt)	2.7	3	2.6	2.7	3.2	3.1	4.1
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0267	0.0297	0.0262	0.0271	0.0323	0.0305	0.0408
Moisture (dry basis) (%)	2.39	2.57	2.61	2.47	2.37	2.74	2.73
Moisture 105Â°C (dry basis) (%)	4.7	10.6	11.3	11.1	11.9	11.7	10.6

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Clay	Clay	Clay
Gravel fraction (% of whole sample)	7	8.9	5	0.7	0.4	1.6	3.3
Sand fraction (%(< 2 mm fraction)	39.7	35.7	34.4	39.5	36.8	34.1	30.2
Silt fraction (% < 2 mm fraction)	13.1	12.3	13.4	10.3	11.4	13.6	13.7
Clay fraction (% < 2 mm fraction)	47.3	52.1	52.2	50.2	51.8	52.3	56.1
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.43	0.69	0.68	0.71	0.72	0.69	0.68
EAT	2	2	2	2	2	2	2
15 Bar (%)	18.5	21	21.2	24.2	24.5	23.8	25.1

'-' indicates no laboratory assessment was undertaken

Table AppC-8: Soil Chemistry for 7Bl(Pg), Analysed Site D14d

Analysis (Unit)	Sample Depth (mbgl) / Horizon					
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.30-1.40
pH 1:5 water (pH units)	7.51	7.55	7.67	6.61	8.16	7.54
pH CaCl2 (following 4A1) pH units	6.19	6.36	7.16	5.88	7.52	6.9
Organic Carbon (W&B) % (40°C)	0.55	0.64	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	<1.0	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	<1.0	1.1	-	-	-	-
Colwell Phosphorus (mg/kg)	11	12	-	-	-	-
PBI + Col P	84	94	-	-	-	-
Colwell Potassium (mg/kg)	180	230	-	-	-	-
KCl Sulfur (S) (mg/kg)	4.1	4	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3070	3040	3200	2260	2120	1820
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	894	911	1270	1010	1220	1130
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	193	231	179	127	197	148
Sodium (NH4Cl/BaCl2) (mg/kg)	263	394	1810	1320	1780	1720
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	15.3	15.2	16	11.3	10.6	9.1
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	7.35	7.49	10.4	8.31	10.1	9.34
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.495	0.592	0.458	0.325	0.503	0.379
Sodium (NH4Cl/BaCl2) (cmol/kg)	1.14	1.71	7.88	5.75	7.73	7.48
Ca:Mg ratio	2.1	2	1.5	1.4	1.1	1
K:Mg ratio	0.07	0.08	<0.05	<0.05	<0.05	<0.05
GTRI	-	-	-	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon					
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.30-1.40
ECR (%)	6.7	9.2	24	24	29	30
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	2730	3290	3210	2080	2290	1680
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	774	955	1190	907	1360	1050
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	211	297	202	142	247	151
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	96.7	162	497	438	716	494
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	13.6	16.4	16	10.4	11.4	8.36
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.37	7.86	9.77	7.46	11.2	8.66
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.54	0.76	0.515	0.364	0.631	0.386
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.421	0.704	2.16	1.91	3.11	2.15
Ca:Mg ratio	2.1	2.1	1.6	1.4	1	1
K:Mg ratio	0.09	0.1	0.05	<0.05	0.06	<0.05
ECR (%)	4.6	5.7	9.4	11	14	13
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
ECEC (cmol/kg)	21	25.7	28.5	20.1	26.4	19.6
Calcium (%)	65	63.8	56.3	51.5	43.3	42.8
Magnesium (%)	30.4	30.5	34.3	37.2	42.5	44.3
Potassium (%)	2.6	3	1.8	1.8	2.4	2

Analysis (Unit)	Sample Depth (mbgl) / Horizon					
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.30-1.40
Sodium (%)	2	2.7	7.6	9.5	12	11
Aluminium (%)	0	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-
Chloride (mg/kg)	42	150	1700	1000	1500	1500
Salinity EC 1:5 (dS/m)	0.06	0.14	1.2	0.72	1	1
Boron (mg/kg)	0.53	-	-	-	-	-
Iron (Fe) (mg/kg)	28	-	-	-	-	-
Manganese (Mn) (mg/kg)	24	-	-	-	-	-
Copper (Cu) (mg/kg)	2.2	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.46	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.1	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.044	0.057	-	-	-	-
TDS (mg(/L)	38	87	770	460	650	640
% Air-dry Moisture Content (% of dry wt)	2.9	3.8	4.5	3.3	2.8	2.2
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.029	0.0378	0.0448	0.0328	0.0284	0.0218
Moisture (dry basis) (%)	2.54	2.66	3.21	2.3	2.39	2.25
Moisture 105Â°C (dry basis) (%)	5.7	6.9	12.9	8.7	8.9	10
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Clay	Clay
Gravel fraction (% of whole sample)	0.3	7.6	11.8	6.9	8.7	9.5
Sand fraction (%(< 2 mm fraction)	41.5	36.1	23.9	44.2	43.2	39.8
Silt fraction (% < 2 mm fraction)	13.8	11.7	16.2	11.4	11.6	19.5

Analysis (Unit)	Sample Depth (mbgl) / Horizon					
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.30-1.40
Clay fraction (% < 2 mm fraction)	44.7	52.3	60	44.4	45.2	40.7
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-
R1 Dispersion Ratio	0.48	0.6	0.53	0.67	0.73	0.61
EAT	3	2	2	2	2	2
15 Bar (%)	21.2	22.8	25.3	20.6	21	17.4

'-' indicates no laboratory assessment was undertaken

Table AppC-9: Soil Chemistry for 7Bl(Pg), Analysed Site D14m

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
pH 1:5 water (pH units)	7.18	8.36	8.19	8.03	7.47	7.41	7.41	7.21
pH CaCl2 (following 4A1) pH units	6.34	7.7	7.36	7.57	7.02	7.01	6.96	6.73
Organic Carbon (W&B) % (40°C)	1.77	1.16	-	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	1.2	<1.0	-	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	2.2	1.3	-	-	-	-	-	-
Colwell Phosphorus (mg/kg)	10	<5.0	-	-	-	-	-	-
PBI + Col P	82	118	-	-	-	-	-	-
Colwell Potassium (mg/kg)	410	140	-	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	5.6	7.4	-	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3660	4240	2560	2380	2190	2250	2310	-
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	948	923	968	1390	1420	1460	1560	-
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	423	164	145	287	299	308	331	-
Sodium (NH4Cl/BaCl2) (mg/kg)	215	974	1070	2750	2890	3000	3110	-
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	18.3	21.2	12.8	11.9	10.9	11.3	11.5	-
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	7.8	7.59	7.96	11.4	11.7	12	12.8	-
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	1.08	0.42	0.371	0.735	0.764	0.786	0.847	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.937	4.24	4.64	12	12.6	13	13.5	-
Ca:Mg ratio	2.3	2.8	1.6	1	0.9	0.9	0.9	-
K:Mg ratio	0.14	0.06	<0.05	0.07	0.07	0.07	0.07	-
GTRI	-	-	-	-	-	-	-	-
ECR (%)	7.2	14	19	35	37	37	37	-
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3100	3780	2510	2240	1690	1650	1730	-
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	831	818	944	1280	1080	1080	1190	-
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	471	186	170	313	271	278	312	-
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	48.2	163	393	740	612	648	749	-
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	15.5	18.9	12.5	11.2	8.42	8.26	8.66	-
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.84	6.73	7.77	10.6	8.92	8.84	9.82	-
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	1.2	0.476	0.434	0.801	0.693	0.711	0.797	-
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.21	0.707	1.71	3.22	2.66	2.82	3.26	-
Ca:Mg ratio	2.3	2.8	1.6	1.1	0.9	0.9	0.9	-
K:Mg ratio	0.18	0.07	0.06	0.08	0.08	0.08	0.08	-
ECR (%)	6	4.4	9.6	16	16	17	18	-
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
ECEC (cmol/kg)	23.7	26.8	22.4	25.7	20.7	20.6	22.5	-
Calcium (%)	65.2	70.5	55.8	43.4	40.7	40	38.4	-
Magnesium (%)	28.8	25.1	34.7	41	43.1	42.9	43.6	-
Potassium (%)	5.1	1.8	1.9	3.1	3.4	3.4	3.5	-
Sodium (%)	0.9	2.6	7.6	13	13	14	14	-
Aluminium (%)	0	0	0	0	0	0	0	-
Hydrogen (%)	0	0	0	0	0	0	0	-
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-	-
Chloride (mg/kg)	120	780	670	2900	3000	3000	3200	2400
Salinity EC 1:5 (dS/m)	0.13	0.62	0.49	1.9	1.9	1.9	2.1	1.6
Boron (mg/kg)	0.87	-	-	-	-	-	-	-
Iron (Fe) (mg/kg)	27	-	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	26	-	-	-	-	-	-	-
Copper (Cu) (mg/kg)	1.9	-	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.72	-	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.2	-	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.17	0.12	-	-	-	-	-	-
TDS (mg(/L)	82	390	310	1200	1200	1200	1300	1000
% Air-dry Moisture Content (% of dry wt)	2.8	3	2.6	3.9	4.7	4.7	4.2	-
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.028	0.0296	0.0255	0.0394	0.0469	0.0466	0.0418	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
Moisture (dry basis) (%)	2.48	2.33	1.88	3.14	3.25	2.97	3.23	-
Moisture 105Â°C (dry basis) (%)	4.8	8.2	8.1	13.7	14.7	13.1	15	-
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Clay	Clay	Clay	-
Gravel fraction (% of whole sample)	0.3	0.9	7.2	0.2	10.2	9	19.4	-
Sand fraction (%(< 2 mm fraction)	33.6	32.3	47.7	25.4	23.7	49.2	23	-
Silt fraction (% < 2 mm fraction)	19.9	17.5	11.4	16.2	15.7	11.5	15.3	-
Clay fraction (% < 2 mm fraction)	46.6	50.2	41	58.4	60.6	39.3	61.7	-
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.38	0.35	0.61	0.7	0.76	0.99	0.79	-
EAT	3	3	2	2	2	2	2	-
15 Bar (%)	20.9	14.1	18.3	27.8	24.1	24	24.9	-

'-' indicates no laboratory assessment was undertaken

Table AppC-10: Soil Chemistry for 8Dn(Te), Analysed Site D19

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.00-1.10
pH 1:5 water (pH units)	8.19	8.82	8.95	7.96	8.88
pH CaCl2 (following 4A1) pH units	7.38	7.87	8.03	7.14	7.99
Organic Carbon (W&B) % (40°C)	1.64	1.1	-	-	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	<1.0	-	-	-
Ammonium - N (2M KCl) (mg/kg)	4.8	<1.0	-	-	-
Colwell Phosphorus (mg/kg)	9.3	<5.0	-	-	-
PBI + Col P	67	100	-	-	-
Colwell Potassium (mg/kg)	470	170	-	-	-
KCl Sulfur (S) (mg/kg)	4.2	5.7	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	4640	5050	3170	1750	3150
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	779	743	501	670	653
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	405	181	88	59	114
Sodium (NH4Cl/BaCl2) (mg/kg)	145	426	513	1750	1100
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	23.1	25.2	15.8	8.73	15.7
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	6.41	6.11	4.13	5.51	5.37
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	1.03	0.464	0.225	0.151	0.292
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.632	1.85	2.23	7.61	4.8
Ca:Mg ratio	3.6	4.1	3.8	1.6	2.9
K:Mg ratio	0.16	0.08	0.05	<0.05	0.05
GTRI	-	-	-	-	-
ECR (%)	5.3	6.9	11	35	19

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.00-1.10
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3890	4620	2770	1850	2910
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	684	680	440	667	602
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	453	178	77.3	70.2	112
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	36.1	105	162	917	440
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	19.4	23	13.8	9.25	14.5
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	5.62	5.59	3.62	5.49	4.95
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	1.16	0.456	0.198	0.18	0.285
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.157	0.458	0.705	3.99	1.91
Ca:Mg ratio	3.5	4.1	3.8	1.7	2.9
K:Mg ratio	0.21	0.08	0.06	<0.05	0.06
ECR (%)	5	3.1	4.9	22	10
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
ECEC (cmol/kg)	26.4	29.6	18.4	18.9	21.7
Calcium (%)	73.7	78	75.4	48.9	67
Magnesium (%)	21.3	18.9	19.7	29	22.9
Potassium (%)	4.4	1.5	1.1	1	1.3
Sodium (%)	0.6	1.5	3.8	21	8.8
Aluminium (%)	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-
Chloride (mg/kg)	21	16	120	1000	370
Salinity EC 1:5 (dS/m)	0.099	0.15	0.21	0.76	0.38

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.00-1.10
Boron (mg/kg)	0.9	-	-	-	-
Iron (Fe) (mg/kg)	7.7	-	-	-	-
Manganese (Mn) (mg/kg)	6.2	-	-	-	-
Copper (Cu) (mg/kg)	0.94	-	-	-	-
Zinc (Zn) (mg/kg)	0.36	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.1	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.16	0.1	-	-	-
TDS (mg(/L)	64	99	130	490	240
% Air-dry Moisture Content (% of dry wt)	2.8	3	1.7	3.1	2.2
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0278	0.0301	0.0169	0.0309	0.0218
Moisture (dry basis) (%)	2.3	2.49	1.82	2.04	1.68
Moisture 105Â°C (dry basis) (%)	5.9	7.7	6.4	8.3	6.6
Texture (ISSS Classification)	Clay	Clay	Clay Loam	Clay Loam	Clay Loam
Gravel fraction (% of whole sample)	0.5	9.5	0.3	6.6	56.7
Sand fraction (%(< 2 mm fraction)	33.6	39.2	45.8	44.3	40.9
Silt fraction (% < 2 mm fraction)	18.8	19.1	22.4	23	21.9
Clay fraction (% < 2 mm fraction)	47.7	41.7	31.8	32.8	37.2
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-
R1 Dispersion Ratio	0.43	0.44	0.44	0.52	0.51
EAT	3	3	2	2	2
15 Bar (%)	19.3	17.4	13.3	16.1	14

'-' indicates no laboratory assessment was undertaken

Table AppC-11: Soil Chemistry for 9Dn(Ro), Analysed Site 21

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	8.06	8.79	8.72	8.59	8.67	7.42	7.99
pH CaCl2 (following 4A1) pH units	7.38	8.07	8.1	7.94	8.11	6.75	7.28
Organic Carbon (W&B) % (40°C)	2.37	1.1	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	2.7	<1.0	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	2.4	1.4	-	-	-	-	-
Colwell Phosphorus (mg/kg)	9.3	<5.0	-	-	-	-	-
PBI + Col P	99	118	-	-	-	-	-
Colwell Potassium (mg/kg)	640	140	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	7.2	8.5	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	5200	4570	3990	4210	3960	3180	2710
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	643	863	864	942	937	988	817
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	544	174	174	167	190	165	143
Sodium (NH4Cl/BaCl2) (mg/kg)	32.4	1530	2050	2600	2660	2580	2080
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	25.9	22.8	19.9	21	19.8	15.9	13.5
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	5.29	7.1	7.11	7.75	7.71	8.13	6.72
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	1.39	0.445	0.445	0.427	0.486	0.421	0.366
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.141	6.67	8.9	11.3	11.6	11.2	9.03

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Ca:Mg ratio	4.9	3.2	2.8	2.7	2.6	2	2
K:Mg ratio	0.26	0.06	0.06	0.06	0.06	0.05	0.05
GTRI	-	-	-	-	-	-	-
ECR (%)	4.7	19	26	29	31	33	32
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	4790	4620	4150	3520	3690	2360	2230
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	637	1020	975	903	828	745	648
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	690	233	233	190	191	124	122
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	10.6	528	864	983	663	851	793
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	23.9	23.1	20.7	17.6	18.4	11.8	11.1
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	5.24	8.41	8.02	7.42	6.81	6.13	5.33
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	1.76	0.596	0.597	0.486	0.487	0.318	0.313
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.046	2.3	3.76	4.28	2.88	3.7	3.45
Ca:Mg ratio	4.6	2.7	2.6	2.4	2.7	1.9	2.1
K:Mg ratio	0.34	0.07	0.07	0.07	0.07	0.05	0.06
ECR (%)	5.8	8.4	13	16	12	18	19
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
ECEC (cmol/kg)	31	34.4	33.1	29.7	28.6	21.9	20.2
Calcium (%)	77.2	67.1	62.6	59	64.4	53.7	55
Magnesium (%)	16.9	24.5	24.2	25	23.8	27.9	26.4
Potassium (%)	5.7	1.7	1.8	1.6	1.7	1.4	1.5
Sodium (%)	<0.2	6.7	11	14	10	17	17
Aluminium (%)	0	0	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-
Chloride (mg/kg)	<5	870	1500	1500	1700	1600	1100
Salinity EC 1:5 (dS/m)	0.11	0.8	1.2	1.1	1.3	1.1	0.83
Boron (mg/kg)	1.1	-	-	-	-	-	-
Iron (Fe) (mg/kg)	12	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	13	-	-	-	-	-	-
Copper (Cu) (mg/kg)	1.4	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.67	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.23	0.11	-	-	-	-	-
TDS (mg(/L)	72	510	740	720	820	710	530
% Air-dry Moisture Content (% of dry wt)	3.1	3.3	3.2	4.7	3.1	4.1	3
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0309	0.033	0.0321	0.0465	0.0305	0.0413	0.0297
Moisture (dry basis) (%)	2.69	2.74	2.66	2.86	2.73	2.52	2.61
Moisture 105Â°C (dry basis) (%)	3.7	11.3	10.7	12.6	12.6	11.8	11.1

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Clay	Silty Clay	Clay
Gravel fraction (% of whole sample)	0.9	6.4	6.7	18.8	18	3.2	43.1
Sand fraction (%(< 2 mm fraction)	36.8	22.7	22.1	25.1	20.6	13.3	34.3
Silt fraction (% < 2 mm fraction)	22.5	18.3	17	16.3	20.2	27.1	17.9
Clay fraction (% < 2 mm fraction)	40.8	59	60.9	58.6	59.3	59.6	47.8
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.37	0.63	0.7	0.75	0.68	0.72	0.65
EAT	4	3	2	2	2	2	2
15 Bar (%)	20.9	22.9	22.9	23.7	22.6	22.2	16.9

'-' indicates no laboratory assessment was undertaken

Table AppC-12: Soil Chemistry for 10Ct(Ro) Analysed Site D22 (SLR Site B10 (2023)

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	D22-0.00-0.10 (B25, SLR 2023)	D22-0.20-0.30 (B25, SLR 2023)	D22-0.50-0.60 (B25, SLR 2023)	D3-0.70-0.80	D22-0.90-1.00 (B25, SLR 2023)
pH 1:5 water	8.53	8.57	8.68	-	6.15
Organic Carbon (W&B)	1.33	1.25	-	-	-
Nitrate - N (2M KCl)	<1.0	<1.0	-	-	-
Ammonium - N (2M KCl)	1.2	1.1	-	-	-
Colwell Phosphorus	7.9	<5.0	-	-	-
PBI + Col P	101	118	-	-	-
Colwell Potassium	310	150	-	-	-
KCl Sulfur (S)	8.4	5.6	-	-	-
Exchangeable Calcium	23	23	19	-	11
Exchangeable Magnesium	9.3	10	11	-	10
Exchangeable Potassium	0.6	0.56	0.42	-	0.33
Exchangeable Sodium	1.4	2.7	8	-	10
Exchangeable acidity	<0.02	<0.02	-	-	-
Exchangeable aluminium	<0.02	<0.02	-	-	-
This Exchangeable hydrogen	<0.02	<0.02	-	-	-
Calcium/Magnesium Ratio	2.5	2.3	1.7	-	1.1
ECEC	34	36	39	-	32
Calcium (%)	67	63	50	-	35
Magnesium (%)	27	28	29	-	32
Potassium (%)	1.8	1.5	1.1	-	1
Sodium - ESP (%)	4	7.4	21	-	32
Aluminium (%)	0.03	0.04	0.03	-	0.5
Hydrogen (%)	0	0	0	-	0.1
CaCl2 extr. Aluminium	<0.1	-	-	-	-
Chloride	100	29	1500	1600	
EC	0.155	0.258	0.797	-	1.058
Boron	1.3	-	-	-	-
Iron (Fe)	14	-	-	-	-
Manganese (Mn)	12	-	-	-	-
Copper (Cu)	1.5	-	-	-	-
Zinc (Zn)	0.4	-	-	-	-
Oxalate ext. Molybdenum	1.2	-	-	-	-
Dumas Total Nitrogen	0.13	0.12	-	-	-
% Air-dry Moisture Content	3.5	3.6	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	D22-0.00-0.10 (B25, SLR 2023)	D22-0.20-0.30 (B25, SLR 2023)	D22-0.50-0.60 (B25, SLR 2023)	D3-0.70-0.80	D22-0.90-1.00 (B25, SLR 2023)
S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	0.0345	0.0361	-	-	-
Moisture (dry basis)	5.95	7.12	7.25	-	6.23
Moisture 105Â°C (dry basis)	---	---	---	-	---
Texture (ISSS Classification)	Clay	Clay	Clay	-	Clay
Gravel fraction	2	18.2	84.1	-	27.3
Sand fraction	34.4	25.6	27.9	-	36.3
Silt fraction	16.9	16.4	15	-	19.8
Clay fraction	48.8	58	57.1	-	43.9
Moisture 40Â°C (dry basis)	0.3	3.4	7.6	-	6.6
R1 Dispersion Ratio	0.35	0.37	0.61	-	0.59
EAT	3	4	4	-	4
15 Bar (%)	20.4	20.9	21.5	18.9	-

Legend
GTE Laboratory Data
SLR Site Data

'-' indicates no laboratory assessment was undertaken

Table AppC-13: Soil Chemistry for 10Ct(Ro), Analysed Site D22

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.00-1.10	1.30-1.40	1.60-1.70
pH 1:5 water (pH units)	6.01	6.08	5.71
pH CaCl2 (following 4A1) pH units	5.26	5.27	5
Organic Carbon (W&B) % (40°C)	-	-	-
Nitrate - N (2M KCl) (mg/kg)	-	-	-
Ammonium - N (2M KCl) (mg/kg)	-	-	-
Colwell Phosphorus (mg/kg)	-	-	-
PBI + Col P	-	-	-
Colwell Potassium (mg/kg)	-	-	-
KCl Sulfur (S) (mg/kg)	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	2010	1970	1840
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	1140	1150	1120
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	103	100	109
Sodium (NH4Cl/BaCl2) (mg/kg)	2040	1860	2120
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	10	9.82	9.2
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	9.39	9.44	9.23
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.263	0.254	0.278
Sodium (NH4Cl/BaCl2) (cmol/kg)	8.89	8.1	9.21
Ca:Mg ratio	1.1	1	1
K:Mg ratio	<0.05	<0.05	<0.05
GTRI	-	-	-
ECR (%)	32	30	34
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	2020	2040	1940
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1010	1050	1080
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	101	109	108
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	940	956	981
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	10.1	10.2	9.66
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	8.28	8.65	8.86
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.258	0.277	0.276

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.00-1.10	1.30-1.40	1.60-1.70
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	4.09	4.16	4.27
Ca:Mg ratio	1.2	1.2	1.1
K:Mg ratio	<0.05	<0.05	<0.05
ECR (%)	19	19	20
Exchangeable acidity (cmol/kg)	<0.02	<0.02	0.62
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	0.55
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	0.07
ECEC (cmol/kg)	22.7	23.2	23.7
Calcium (%)	44.4	43.7	40.8
Magnesium (%)	36.5	37.2	37.4
Potassium (%)	1.1	1.2	1.2
Sodium (%)	18	18	18
Aluminium (%)	0	0	2.3
Hydrogen (%)	0	0	0.3
CaCl2 extr. Aluminium (mg/kg)	-	-	-
Chloride (mg/kg)	1400	1500	1400
Salinity EC 1:5 (dS/m)	0.92	0.95	0.92
Boron (mg/kg)	-	-	-
Iron (Fe) (mg/kg)	-	-	-
Manganese (Mn) (mg/kg)	-	-	-
Copper (Cu) (mg/kg)	-	-	-
Zinc (Zn) (mg/kg)	-	-	-
Oxalate ext. Molybdenum (mg/kg)	-	-	-
Dumas Total Nitrogen (% dry wt)	-	-	-
TDS (mg(/L)	590	610	590
% Air-dry Moisture Content (% of dry wt)	2.7	3.3	3.1
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0265	0.0334	0.0312
Moisture (dry basis) (%)	2.56	2.23	2.11
Moisture 105Â°C (dry basis) (%)	9.4	9.7	8.7
Texture (ISSS Classification)	Clay	Clay	Silty Clay Loam
Gravel fraction (% of whole sample)	< 0.1	49.7	0.4

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.00-1.10	1.30-1.40	1.60-1.70
Sand fraction (%(< 2 mm fraction)	36.5	39.7	32.8
Silt fraction (% < 2 mm fraction)	22.6	18.4	28
Clay fraction (% < 2 mm fraction)	41	42	39.2
Moisture 40Â°C (dry basis) (%)	-	-	-
R1 Dispersion Ratio	0.51	0.59	0.42
EAT	2	2	2
15 Bar (%)	18.3	18.5	17.8

'-' indicates no laboratory assessment was undertaken

Table AppC-14: Soil Chemistry for 11Bl(Ta), Analysed Site D24

Analysis (Unit)	Sample Depth (mbgl) / Horizon			
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90
pH 1:5 water (pH units)	7.69	7.64	8.38	9.07
pH CaCl2 (following 4A1) pH units	6.38	6.72	7.5	8.11
Organic Carbon (W&B) % (40°C)	0.8	0.57	-	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	20	-	-
Ammonium - N (2M KCl) (mg/kg)	1.4	2.2	-	-
Colwell Phosphorus (mg/kg)	6	<5.0	-	-
PBI + Col P	51	118	-	-
Colwell Potassium (mg/kg)	300	89	-	-
KCl Sulfur (S) (mg/kg)	4.4	8.7	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	1490	1660	1920	1640
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	596	1180	1240	1090
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	201	85	100	86
Sodium (NH4Cl/BaCl2) (mg/kg)	151	1530	1570	1560
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	7.44	8.26	9.56	8.19
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	4.9	9.75	10.2	8.98
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.515	0.218	0.257	0.22
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.656	6.64	6.84	6.8
Ca:Mg ratio	1.5	0.9	0.9	0.9
K:Mg ratio	0.11	<0.05	<0.05	<0.05
GTRI	-	-	-	-
ECR (%)	8.7	28	26	29
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1450	1590	1890	1500
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	593	1150	1310	1020
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	236	106	117	91.2

Analysis (Unit)	Sample Depth (mbgl) / Horizon			
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	44.7	740	860	751
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	7.24	7.91	9.41	7.47
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	4.88	9.48	10.8	8.41
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.603	0.27	0.3	0.233
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.194	3.22	3.74	3.27
Ca:Mg ratio	1.5	0.8	0.9	0.9
K:Mg ratio	0.12	<0.05	<0.05	<0.05
ECR (%)	6.2	17	17	18
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02
ECEC (cmol/kg)	12.9	20.9	24.3	19.4
Calcium (%)	56.1	37.9	38.8	38.6
Magnesium (%)	37.8	45.4	44.6	43.4
Potassium (%)	4.7	1.3	1.2	1.2
Sodium (%)	1.5	15	15	17
Aluminium (%)	0	0	0	0
Hydrogen (%)	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-
Chloride (mg/kg)	40	900	890	630
Salinity EC 1:5 (dS/m)	0.057	0.68	0.68	0.54
Boron (mg/kg)	0.49	-	-	-
Iron (Fe) (mg/kg)	15	-	-	-
Manganese (Mn) (mg/kg)	26	-	-	-
Copper (Cu) (mg/kg)	0.9	-	-	-
Zinc (Zn) (mg/kg)	0.46	-	-	-
Oxalate ext. Molybdenum (mg/kg)	0.64	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon			
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90
Dumas Total Nitrogen (% dry wt)	0.09	0.084	-	-
TDS (mg(/L)	37	440	430	350
% Air-dry Moisture Content (% of dry wt)	1.6	3.7	3.2	3.3
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0163	0.037	0.0319	0.0325
Moisture (dry basis) (%)	1.1	2.37	2.14	1.9
Moisture 105Â°C (dry basis) (%)	2.8	12.8	10.7	9.4
Texture (ISSS Classification)	Clay Loam	Clay	Clay	Clay Loam
Gravel fraction (% of whole sample)	1.1	1.1	1.1	21
Sand fraction (%(< 2 mm fraction)	68.3	36.1	39.8	46.8
Silt fraction (% < 2 mm fraction)	10	13.3	16.3	17.3
Clay fraction (% < 2 mm fraction)	21.7	50.6	43.9	35.9
Moisture 40Â°C (dry basis) (%)	-	-	-	-
R1 Dispersion Ratio	0.47	0.43	0.65	0.56
EAT	3	2	2	2
15 Bar (%)	12.8	17.5	19.7	18.5

'-' indicates no laboratory assessment was undertaken

Table AppC-15: Soil Chemistry for 12Da(Te), Analysed Site D32 (SLR Site b12 (2023))

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	D32-0.00-0.10 (B12, SLR 2023)	D32-0.20-0.30 (B12, SLR 2023)	D32-0.50-0.60 (B12, SLR 2023)	D32-0.80-0.90	(B12 0.90-1.00, SLR 2023)
pH 1:5 water	6.87	7.04	8.28	-	8.89
Organic Carbon (W&B)	1.38	0.55	-	-	-
Nitrate - N (2M KCl)	<1.0	<1.0	-	-	-
Ammonium - N (2M KCl)	5.4	<1.0	-	-	-
Colwell Phosphorus	8.2	6.2	-	-	-
PBI + Col P	38	53	-	-	-
Colwell Potassium	170	220	-	-	-
KCl Sulfur (S)	5.4	13	-	-	-
Exchangeable Calcium	8.7	8.6	11	-	14
Exchangeable Magnesium	4.4	4.4	6.6	-	8.3
Exchangeable Potassium	0.45	0.4	0.53	-	0.63
Exchangeable Sodium	0.64	0.57	0.91	-	2.7
Exchangeable acidity	<0.02	<0.02	-	-	-
Exchangeable aluminium	<0.02	<0.02	-	-	-
This Exchangeable hydrogen	<0.02	<0.02	-	-	-
Calcium/Magnesium Ratio	2	1.9	1.7	-	1.6
ECEC	14	14	19	-	25
Calcium (%)	61	61	59	-	54
Magnesium (%)	31	32	34	-	33
Potassium (%)	3.1	2.9	2.7	-	2.5
Sodium - ESP (%)	4.5	4.1	4.7	-	11
Aluminium (%)	0.09	0.08	0.06	-	0.04
Hydrogen (%)	0	0	0	-	0
CaCl2 extr. Aluminium	<0.1	-	-	-	-
Chloride	6	67	300	760	
EC	0.046	0.042	0.13	-	0.498
Boron	0.57	-	-	-	-
Iron (Fe)	12	-	-	-	-
Manganese (Mn)	19	-	-	-	-
Copper (Cu)	0.79	-	-	-	-
Zinc (Zn)	0.56	-	-	-	-
Oxalate ext. Molybdenum	0.47	-	-	-	-
Dumas Total Nitrogen	0.11	0.05	-	-	-
% Air-dry Moisture Content	1.2	1.9	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	D32-0.00-0.10 (B12, SLR 2023)	D32-0.20-0.30 (B12, SLR 2023)	D32-0.50-0.60 (B12, SLR 2023)	D32-0.80-0.90	(B12 0.90-1.00, SLR 2023)
S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	0.0117	0.0192		-	-
Moisture (dry basis)	5.95	7.12	7.25	-	6.23
Moisture 105Â°C (dry basis)	---	---	---	-	---
Texture (ISSS Classification)	Clay	Clay	Clay	-	Clay
Gravel fraction	2	18.2	84.1	-	27.3
Sand fraction	34.4	25.6	27.9	-	36.3
Silt fraction	16.9	16.4	15	-	19.8
Clay fraction	48.8	58	57.1	-	43.9
Moisture 40Â°C (dry basis)	0.3	3.4	7.6	-	6.6
R1 Dispersion Ratio	0.35	0.37	0.61	-	0.59
EAT	3	4	4	-	4
15 Bar (%)	8.5	14.5	12.9	13.3	-

Legend
GTE Laboratory Data
SLR Site Data

'-' indicates no laboratory assessment was undertaken

Table AppC-16: Soil Chemistry for SPC 12, Analysed Site D32

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	8.67	8.66	8.46
pH CaCl2 (following 4A1) pH units	8.09	8.15	8.04
Organic Carbon (W&B) % (40°C)	-	-	-
Nitrate - N (2M KCl) (mg/kg)	-	-	-
Ammonium - N (2M KCl) (mg/kg)	-	-	-
Colwell Phosphorus (mg/kg)	-	-	-
PBI + Col P	-	-	-
Colwell Potassium (mg/kg)	-	-	-
KCl Sulfur (S) (mg/kg)	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	2160	2190	2090
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	1010	1190	1210
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	247	262	286

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
Sodium (NH4Cl/BaCl2) (mg/kg)	797	1100	1140
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	10.8	10.9	10.4
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	8.28	9.78	10
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.632	0.671	0.73
Sodium (NH4Cl/BaCl2) (cmol/kg)	3.47	4.78	4.95
Ca:Mg ratio	1.3	1.1	1
K:Mg ratio	0.08	0.07	0.07
GTRI			
ECR (%)	18	21	22
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1990	2020	1910
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1130	1260	1280
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	283	298	331
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	91.7	169	137
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	9.95	10.1	9.53
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	9.32	10.4	10.5
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.724	0.762	0.846
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.399	0.735	0.598
Ca:Mg ratio	1.1	1	0.9
K:Mg ratio	0.08	0.07	0.08
ECR (%)	5.5	6.8	6.7
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02
ECEC (cmol/kg)	20.4	22	21.5
Calcium (%)	48.8	45.8	44.3
Magnesium (%)	45.7	47.4	49
Potassium (%)	3.6	3.5	3.9
Sodium (%)	2	3.3	2.8
Aluminium (%)	0	0	0

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
Hydrogen (%)	0	0	0
CaCl2 extr. Aluminium (mg/kg)	-	-	-
Chloride (mg/kg)	740	1000	1300
Salinity EC 1:5 (dS/m)	0.71	0.89	1.1
Boron (mg/kg)	-	-	-
Iron (Fe) (mg/kg)	-	-	-
Manganese (Mn) (mg/kg)	-	-	-
Copper (Cu) (mg/kg)	-	-	-
Zinc (Zn) (mg/kg)	-	-	-
Oxalate ext. Molybdenum (mg/kg)	-	-	-
Dumas Total Nitrogen (% dry wt)	-	-	-
TDS (mg(/L)	450	570	700
% Air-dry Moisture Content (% of dry wt)	1.9	2.3	2.2
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0185	0.0232	0.0217
Moisture (dry basis) (%)	1.57	1.86	1.8
Moisture 105Â°C (dry basis) (%)	9.3	10.2	9.4
Texture (ISSS Classification)	Clay	Clay	Clay
Gravel fraction (% of whole sample)	13.2	50.9	7.8
Sand fraction (%(< 2 mm fraction)	49.1	43.6	43.5
Silt fraction (% < 2 mm fraction)	13.2	14.5	16.4
Clay fraction (% < 2 mm fraction)	37.7	41.9	40.1
Moisture 40Â°C (dry basis) (%)	-	-	-
R1 Dispersion Ratio	0.59	0.57	0.5
EAT	4	2	2
15 Bar (%)	15.5	17.9	15.5

'-' indicates no laboratory assessment was undertaken

Table AppC-17: Soil Chemistry for 13Bl(Ta), Analysed Site 36

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	8	8.52	9.01	9.06	9.03	8.7	8.39
pH CaCl2 (following 4A1) pH units	6.94	7.74	8.12	8.31	8.27	7.91	7.36
Organic Carbon (W&B) % (40°C)	1.23	0.69	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	<1.0	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	2.1	1.3	-	-	-	-	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-	-	-	-	-
PBI + Col P	86	157	-	-	-	-	-
Colwell Potassium (mg/kg)	110	72	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	6.2	5.2	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3210	3620	2720	2240	2190	1400	1010
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	794	1050	1170	1180	1090	924	605
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	115	92	82	86	89	70	53
Sodium (NH4Cl/BaCl2) (mg/kg)	79.9	324	778	839	879	777	620
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	16	18.1	13.6	11.2	10.9	6.99	5.03
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	6.53	8.61	9.65	9.73	8.97	7.6	4.98
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.295	0.236	0.21	0.219	0.227	0.18	0.135
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.348	1.41	3.39	3.65	3.83	3.38	2.7

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Ca:Mg ratio	2.4	2.1	1.4	1.1	1.2	0.9	1
K:Mg ratio	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GTRI	-	-	-	-	-	-	-
ECR (%)	2.8	5.8	13	16	17	20	22
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3380	3900	2830	2330	5740	1560	998
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	821	1130	1320	1320	932	1030	589
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	141	90.6	84	76.5	163	64.8	42
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	12.7	58.5	116	110	157	278	211
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	16.9	19.4	14.1	11.6	28.6	7.77	4.98
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.75	9.31	10.8	10.9	7.67	8.51	4.85
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.359	0.232	0.215	0.196	0.417	0.166	0.107
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.055	0.254	0.506	0.479	0.681	1.21	0.92
Ca:Mg ratio	2.5	2.1	1.3	1.1	3.7	0.9	1
K:Mg ratio	0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05
ECR (%)	1.7	1.7	2.8	2.9	2.9	7.8	9.5
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
ECEC (cmol/kg)	24	29.2	25.7	23.2	37.4	17.7	10.9
Calcium (%)	70.2	66.5	55	50.1	76.6	44	45.9
Magnesium (%)	28.1	31.8	42.2	47	20.5	48.2	44.7
Potassium (%)	1.5	0.8	0.8	0.8	1.1	0.9	1
Sodium (%)	0.2	0.9	2	2.1	1.8	6.9	8.5
Aluminium (%)	0	0	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-
Chloride (mg/kg)	11	26	290	550	490	570	360
Salinity EC 1:5 (dS/m)	0.067	0.2	0.41	0.56	0.53	0.49	0.29
Boron (mg/kg)	1.1	-	-	-	-	-	-
Iron (Fe) (mg/kg)	11	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	11	-	-	-	-	-	-
Copper (Cu) (mg/kg)	0.92	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.22	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	0.98	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.1	0.084	-	-	-	-	-
TDS (mg(/L)	43	130	260	360	340	310	190
% Air-dry Moisture Content (% of dry wt)	2.9	2.6	2.6	2.4	1.9	2.3	1
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0287	0.0256	0.0262	0.0241	0.0194	0.0227	0.0103
Moisture (dry basis) (%)	1.83	2.46	2.07	1.72	1.73	1.4	1.08
Moisture 105Â°C (dry basis) (%)	5.8	9.7	8.6	7.4	7.9	6.1	5

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Sandy Clay	Sandy Clay Loam	Sandy Loam
Gravel fraction (% of whole sample)	7.2	5.5	6.1	10.2	48.8	5.5	13
Sand fraction (%(< 2 mm fraction)	55.5	49.4	49.4	52.7	62.7	63.5	78.4
Silt fraction (% < 2 mm fraction)	3.3	4.4	7.3	8.6	4	5.8	4.1
Clay fraction (% < 2 mm fraction)	41.2	46.3	43.4	38.7	33.3	30.7	17.5
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.24	0.26	0.35	0.37	0.59	0.57	0.38
EAT	3	4	4	4	4	2	2
15 Bar (%)	18.7	19.9	12.9	17.8	14.3	15.2	9.1

'-' indicates no laboratory assessment was undertaken

Table AppC-18: Soil Chemistry for 14Bl(Ro), Analysed Site D32 (SLR Site B05 (2023))

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10 (B05, SLR 2023)	0.20-0.30 (B05, SLR 2023)	0.50-0.60 (B05, SLR 2023)	0.80-0.90	0.90-1.00, (B05, SLR 2023)
pH 1:5 water	8.2	8.91	9.03	-	8.97
Organic Carbon (W&B)	1.31	1.22	-	-	-
Nitrate - N (2M KCl)	<1.0	<1.0	-	-	-
Ammonium - N (2M KCl)	2.1	1.3	-	-	-
Colwell Phosphorus	<5.0	<5.0	-	-	-
PBI + Col P	119	112	-	-	-
Colwell Potassium	120	110	-	-	-
KCl Sulfur (S)	4	6.8	-	-	-
Exchangeable Calcium	29	39	36	-	28
Exchangeable Magnesium	6.8	9.3	13	-	12
Exchangeable Potassium	1	0.47	0.48	-	0.34
Exchangeable Sodium	0.37	1.7	4.2	-	0.34
Exchangeable acidity	<0.02	<0.02	-	-	-
Exchangeable aluminium	<0.02	<0.02	-	-	-
This Exchangeable hydrogen	<0.02	<0.02	-	-	-
Calcium/Magnesium Ratio	4.3	4.2	2.8	-	2.4
ECEC	37	51	53	-	45
Calcium (%)	78	77	67	-	61
Magnesium (%)	18	18	24	-	26
Potassium (%)	2.8	0.94	0.91	-	0.76
Sodium - ESP (%)	0.98	3.3	7.9	-	13
Aluminium (%)	0.03	0.02	0.01	-	0.01
Hydrogen (%)	0	0	0	-	0
CaCl2 extr. Aluminium	<0.1	-	-	-	-
Chloride	14	340	580	1500	-
EC	0.128	0.159	0.298	-	0.688
Boron	0.9	-	-	-	-
Iron (Fe)	15	-	-	-	-
Manganese (Mn)	6.8	-	-	-	-
Copper (Cu)	1.2	-	-	-	-
Zinc (Zn)	0.12	-	-	-	-
Oxalate ext. Molybdenum	1.3	-	-	-	-
Dumas Total Nitrogen	0.15	0.1	-	-	-
% Air-dry Moisture Content	3.3	3.7	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10 (B05, SLR 2023)	0.20-0.30 (B05, SLR 2023)	0.50-0.60 (B05, SLR 2023)	0.80-0.90	0.90-1.00, (B05, SLR 2023)
S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	0.0332	0.0365	-	-	-
Moisture (dry basis)	7.97	8.2	7.92	7.77	-
Moisture 105Â°C (dry basis)	-	-	-	-	-
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	-
Gravel fraction	17.7	32.3	< 0.1	2.7	-
Sand fraction	30.1	27.7	29.4	29.9	-
Silt fraction	16.3	14.1	14.3	10.4	-
Clay fraction	53.6	58.2	56.3	59.8	-
Moisture 40Â°C (dry basis)	-	-	-	-	-
R1 Dispersion Ratio	0.29	0.49	0.49	0.44	-
EAT	4	4	4	-	4
15 Bar (%)	8.5	14.5	12.9	13.3	-

Legend
GTE Laboratory Data
SLR Site Data

'-' indicates no laboratory assessment was undertaken

Table AppC-19: Soil Chemistry for SPC 14, Analysed Site D37

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	8.5	8.99	8.99
pH CaCl2 (following 4A1) pH units	7.91	8.18	8.26
Organic Carbon (W&B) % (40°C)	-	-	-
Nitrate - N (2M KCl) (mg/kg)	-	-	-
Ammonium - N (2M KCl) (mg/kg)	-	-	-
Colwell Phosphorus (mg/kg)	-	-	-
PBI + Col P	-	-	-
Colwell Potassium (mg/kg)	-	-	-
KCl Sulfur (S) (mg/kg)	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3360	3000	2880
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	1060	992	1030
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	132	91	82

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
Sodium (NH4Cl/BaCl2) (mg/kg)	1630	1590	1660
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	16.8	15	14.4
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	8.7	8.16	8.47
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.337	0.233	0.21
Sodium (NH4Cl/BaCl2) (cmol/kg)	7.11	6.91	7.24
Ca:Mg ratio	1.9	1.8	1.7
K:Mg ratio	<0.05	<0.05	<0.05
GTRI			
ECR (%)	23	24	25
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3620	3170	3050
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1170	1110	1220
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	135	91.4	89.6
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	563	601	787
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	18	15.8	15.2
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	9.62	9.09	10.1
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.346	0.234	0.229
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	2.45	2.61	3.42
Ca:Mg ratio	1.9	1.7	1.5
K:Mg ratio	<0.05	<0.05	<0.05
ECR (%)	9.2	10	13
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02
ECEC (cmol/kg)	30.5	27.8	28.9
Calcium (%)	59.2	57	52.6
Magnesium (%)	31.6	32.7	34.8
Potassium (%)	1.1	0.8	0.8
Sodium (%)	8	9.4	12
Aluminium (%)	0	0	0

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
Hydrogen (%)	0	0	0
CaCl2 extr. Aluminium (mg/kg)	-	-	-
Chloride (mg/kg)	1400	960	990
Salinity EC 1:5 (dS/m)	1	0.81	0.81
Boron (mg/kg)	-	-	-
Iron (Fe) (mg/kg)	-	-	-
Manganese (Mn) (mg/kg)	-	-	-
Copper (Cu) (mg/kg)	-	-	-
Zinc (Zn) (mg/kg)	-	-	-
Oxalate ext. Molybdenum (mg/kg)	-	-	-
Dumas Total Nitrogen (% dry wt)	-	-	-
TDS (mg(/L)	640	520	520
% Air-dry Moisture Content (% of dry wt)	2.9	3.2	3.3
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0285	0.0317	0.0328
Moisture (dry basis) (%)	3.6	2.73	2.53
Moisture 105Â°C (dry basis) (%)	12	8.2	9.5
Texture (ISSS Classification)	Clay	Clay	Clay
Gravel fraction (% of whole sample)	5.6	8.6	66.4
Sand fraction (%(< 2 mm fraction)	36.6	49.5	46.1
Silt fraction (% < 2 mm fraction)	13.3	13.7	14.4
Clay fraction (% < 2 mm fraction)	50.2	36.8	39.5
Moisture 40Â°C (dry basis) (%)	-	-	-
R1 Dispersion Ratio	0.52	0.52	0.47
EAT	3	2	2
15 Bar (%)	15.5	17.9	15.5

'-' indicates no laboratory assessment was undertaken

Table AppC-20: Soil Chemistry for 15Bl(Ro), Analysed Site D39

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20
pH 1:5 water (pH units)	7.78	8.54	8.78	9.3	9.28
pH CaCl2 (following 4A1) pH units	6.85	7.8	7.97	8.4	8.48
Organic Carbon (W&B) % (40°C)	1.5	1.61	-	-	-
Nitrate - N (2M KCl) (mg/kg)	1	8.9	-	-	-
Ammonium - N (2M KCl) (mg/kg)	1.5	<1.0	-	-	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-	-	-
PBI + Col P	107	141	-	-	-
Colwell Potassium (mg/kg)	160	130	-	-	-
KCl Sulfur (S) (mg/kg)	4.3	11	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	4270	5190	3930	2880	2830
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	505	615	610	935	793
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	171	146	85	71	79
Sodium (NH4Cl/BaCl2) (mg/kg)	158	313	684	2660	2230
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	21.3	25.9	19.6	14.4	14.1
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	4.15	5.06	5.02	7.69	6.52
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.437	0.373	0.216	0.182	0.202
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.686	1.36	2.97	11.6	9.72
Ca:Mg ratio	5.1	5.1	3.9	1.9	2.2
K:Mg ratio	0.11	0.07	<0.05	<0.05	<0.05
GTRI					
ECR (%)	4.2	5.3	11	35	32

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3960	4840	3510	3080	3140
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	450	616	540	907	803
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	201	161	73.7	57.2	69
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	44.4	57.2	84.5	836	892
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	19.8	24.1	17.5	15.4	15.7
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	3.7	5.07	4.45	7.46	6.61
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.515	0.412	0.188	0.146	0.176
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.193	0.249	0.368	3.64	3.88
Ca:Mg ratio	5.3	4.8	3.9	2.1	2.4
K:Mg ratio	0.14	0.08	<0.05	<0.05	<0.05
ECR (%)	2.9	2.2	2.5	14	15
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
ECEC (cmol/kg)	24.2	29.9	22.5	26.6	26.3
Calcium (%)	81.8	80.8	77.8	57.7	59.5
Magnesium (%)	15.3	17	19.7	28	25.1
Potassium (%)	2.1	1.4	0.8	0.6	0.7
Sodium (%)	0.8	0.8	1.6	14	15
Aluminium (%)	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-
Chloride (mg/kg)	17	45	250	860	720
Salinity EC 1:5 (dS/m)	0.065	0.2	0.36	0.86	0.78

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20
Boron (mg/kg)	1.1	-	-	-	-
Iron (Fe) (mg/kg)	11	-	-	-	-
Manganese (Mn) (mg/kg)	16	-	-	-	-
Copper (Cu) (mg/kg)	1.4	-	-	-	-
Zinc (Zn) (mg/kg)	0.2	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.3	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.19	0.13	-	-	-
TDS (mg(/L)	42	130	230	550	500
% Air-dry Moisture Content (% of dry wt)	2.7	2.3	2.5	3.1	2.8
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0274	0.0233	0.0254	0.0307	0.0283
Moisture (dry basis) (%)	2.22	2.26	1.73	2.23	2.18
Moisture 105Â°C (dry basis) (%)	6.4	8.3	8.1	9.4	9.6
Texture (ISSS Classification)	Clay	Clay	Clay	Clay	Silty Clay Loam
Gravel fraction (% of whole sample)	3.7	0.5	20.4	43.1	55.5
Sand fraction (%(< 2 mm fraction)	43.3	40.9	56.2	34.6	31.6
Silt fraction (% < 2 mm fraction)	10.1	12	9.9	22.7	28.7
Clay fraction (% < 2 mm fraction)	46.6	47.2	33.9	42.8	39.7
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-
R1 Dispersion Ratio	0.26	0.22	0.54	0.67	0.64
EAT	3	4	4	2	2
15 Bar (%)	19.5	19.2	15.3	21.7	22.8

'-' indicates no laboratory assessment was undertaken

Table AppC-21: Soil Chemistry for 16Bl(Ta), Analysed Site D43

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
pH 1:5 water (pH units)	7.4	8.15	8.72
pH CaCl2 (following 4A1) pH units	6.16	6.99	7.76
Organic Carbon (W&B) % (40°C)	0.68	0.83	-
Nitrate - N (2M KCl) (mg/kg)	<1.0	<1.0	-
Ammonium - N (2M KCl) (mg/kg)	1.3	1.1	-
Colwell Phosphorus (mg/kg)	6.5	<5.0	-
PBI + Col P	56	89	-
Colwell Potassium (mg/kg)	240	140	-
KCl Sulfur (S) (mg/kg)	4.8	7	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	1750	2530	2860
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	625	1110	1230
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	148	125	143
Sodium (NH4Cl/BaCl2) (mg/kg)	297	700	896
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	8.71	12.6	14.3
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	5.14	9.11	10.1
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.377	0.32	0.366
Sodium (NH4Cl/BaCl2) (cmol/kg)	1.29	3.04	3.9
Ca:Mg ratio	1.7	1.4	1.4
K:Mg ratio	0.07	<0.05	<0.05
GTRI	-	-	-
ECR (%)	11	13	15
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1640	2570	2670
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	589	1130	1140
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	178	158	141
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	130	378	357
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	8.16	12.8	13.3
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	4.85	9.3	9.39
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.454	0.405	0.362

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.565	1.64	1.55
Ca:Mg ratio	1.7	1.4	1.4
K:Mg ratio	0.09	<0.05	<0.05
ECR (%)	7.3	8.5	7.8
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02
ECEC (cmol/kg)	14	24.2	24.6
Calcium (%)	58.2	53	54.1
Magnesium (%)	34.6	38.5	38.1
Potassium (%)	3.2	1.7	1.5
Sodium (%)	4	6.8	6.3
Aluminium (%)	0	0	0
Hydrogen (%)	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-
Chloride (mg/kg)	87	240	270
Salinity EC 1:5 (dS/m)	0.094	0.22	0.32
Boron (mg/kg)	0.56	-	-
Iron (Fe) (mg/kg)	14	-	-
Manganese (Mn) (mg/kg)	22	-	-
Copper (Cu) (mg/kg)	1.1	-	-
Zinc (Zn) (mg/kg)	0.56	-	-
Oxalate ext. Molybdenum (mg/kg)	0.79	-	-
Dumas Total Nitrogen (% dry wt)	0.096	0.11	-
TDS (mg(/L)	60	140	210
% Air-dry Moisture Content (% of dry wt)	1.5	4	3.3
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0149	0.0396	0.0328
Moisture (dry basis) (%)	1.62	2.75	2.8
Moisture 105Â°C (dry basis) (%)	5.9	10.9	11
Texture (ISSS Classification)	Clay Loam	Clay	Clay
Gravel fraction (% of whole sample)	1.9	6.8	1.3

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	0.00-0.10	0.20-0.30	0.50-0.60
Sand fraction (%(< 2 mm fraction)	57.7	34.8	36.9
Silt fraction (% < 2 mm fraction)	14.8	13.9	11.6
Clay fraction (% < 2 mm fraction)	27.5	51.3	51.5
Moisture 40Â°C (dry basis) (%)	-	-	-
R1 Dispersion Ratio	0.59	0.63	0.65
EAT	2	2	2
15 Bar (%)	15.5	22.7	21.6

'-' indicates no laboratory assessment was undertaken

Table AppC-22: Soil Chemistry for SPC 14Bl(Ro), Analysed Site D44 (SLR Site B01 (2023))

Analysis (Unit)	Sample Depth (mbgl) / Horizon					
	0.00-0.10 (B01, SLR 2023)	0.10-0.20	0.20-0.30 (B01, SLR 2023)	0.50-0.60 (B01, SLR 2023)	0.80-0.90	(B01 0.9-1.0, SLR 2023)
pH 1:5 water	6.79		7.68	9.03	-	9.19
Organic Carbon (W&B)	1.89	1.35	-	-	-	-
Nitrate - N (2M KCl)	3.7	<1.0	-	-	-	-
Ammonium - N (2M KCl)	1.6	1.2	-	-	-	-
Colwell Phosphorus	<5.0	<5.0	-	-	-	-
PBI + Col P	60	74	-	-	-	-
Colwell Potassium	310	86	-	-	-	-
KCl Sulfur (S)	5.4	3.7	-	-	-	-
Exchangeable Calcium	11		11	22	-	13
Exchangeable Magnesium	2.1		2.7	9.3	-	1.8
Exchangeable Potassium	0.55		0.21	0.27	-	<0.12
Exchangeable Sodium	0.4		1.1	4.5	-	1.3
Exchangeable acidity	<0.02	<0.02	-	-	-	-
Exchangeable aluminium	<0.02	<0.02	-	-	-	-
This Exchangeable hydrogen	<0.02	<0.02	-	-	-	-
Calcium/Magnesium Ratio	5		4.2	2.4	-	7.4
ECEC	14		15	36	-	17
Calcium (%)	77		74	61	-	81
Magnesium (%)	16		18	26	-	11
Potassium (%)	4		1.4	0.74	-	0.3
Sodium - ESP (%)	2.9		7.3	12	-	7.6
Aluminium (%)	0.08		0.04	0.04	-	0.09
Hydrogen (%)	0		0	0	-	0
CaCl2 extr. Aluminium	<0.1	-	-	-	-	-
Chloride	21	15	120	630	830	
EC	0.151		0.125	0.402	-	0.609
Boron	0.56	-	-	-	-	-
Iron (Fe)	18	-	-	-	-	-
Manganese (Mn)	34	-	-	-	-	-
Copper (Cu)	1.2	-	-	-	-	-
Zinc (Zn)	0.78	-	-	-	-	-
Oxalate ext. Molybdenum	0.62	-	-	-	-	-
Dumas Total Nitrogen	0.16	0.11	-	-	-	-
% Air-dry Moisture Content	1.8	2.2	-	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon					
	0.00-0.10 (B01, SLR 2023)	0.10-0.20	0.20-0.30 (B01, SLR 2023)	0.50-0.60 (B01, SLR 2023)	0.80-0.90	(B01 0.9-1.0, SLR 2023)
S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	0.0183	0.0215	-	-	-	-
Moisture (dry basis)	3.77	4.78	7.9	7.5	6.24	2.79
Moisture 105Â°C (dry basis)	---	---	---	---	---	10.8
Texture (ISSS Classification)	Clay Loam	Clay	Clay	Clay	Clay	Clay
Gravel fraction	2.5	11	20.9	4.7	13.4	11.7
Sand fraction	55.7	50.9	30.7	33.1	37.2	39.6
Silt fraction	16.9	13.8	9.3	9.3	9.2	10.5
Clay fraction	27.5	35.4	60	57.6	53.7	50
Moisture 40Â°C (dry basis)	1.9	3.9	9.5	8.5	9.3	-
R1 Dispersion Ratio	0.37	0.3	0.46	0.6	0.67	0.74
EAT	3	-	3	2	-	-
15 Bar (%)	11.3	12.7	22.8	20.1	17.9	-

Legend
GTE Laboratory Data
SLR Site Data

'-' indicates no laboratory assessment was undertaken

Table AppC-23: Soil Chemistry for 17Bl(Ro), Analysed Site D44

Analysis (Unit)	Sample Depth (mbgl) / Horizon
	1.10-1.20
pH 1:5 water (pH units)	8.54
pH CaCl2 (following 4A1) pH units	7.72
Organic Carbon (W&B) % (40°C)	-
Nitrate - N (2M KCl) (mg/kg)	-
Ammonium - N (2M KCl) (mg/kg)	-
Colwell Phosphorus (mg/kg)	-
PBI + Col P	-
Colwell Potassium (mg/kg)	-
KCl Sulfur (S) (mg/kg)	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	2610
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	1110
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	103
Sodium (NH4Cl/BaCl2) (mg/kg)	1730
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	13
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	9.12
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.264
Sodium (NH4Cl/BaCl2) (cmol/kg)	7.52
Ca:Mg ratio	1.4
K:Mg ratio	<0.05
GTRI	
ECR (%)	26
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	2700
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1170
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	98.8
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	834

Analysis (Unit)	Sample Depth (mbgl) / Horizon
	1.10-1.20
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	13.5
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	9.66
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.253
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	3.63
Ca:Mg ratio	1.4
K:Mg ratio	<0.05
ECR (%)	14
Exchangeable acidity (cmol/kg)	<0.02
Exchangeable aluminium (cmol/kg)	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02
ECEC (cmol/kg)	27
Calcium (%)	49.9
Magnesium (%)	35.7
Potassium (%)	0.9
Sodium (%)	13
Aluminium (%)	0
Hydrogen (%)	0
CaCl2 extr. Aluminium (mg/kg)	-
Chloride (mg/kg)	860
Salinity EC 1:5 (dS/m)	0.68
Boron (mg/kg)	-
Iron (Fe) (mg/kg)	-
Manganese (Mn) (mg/kg)	-
Copper (Cu) (mg/kg)	-
Zinc (Zn) (mg/kg)	-
Oxalate ext. Molybdenum (mg/kg)	-
Dumas Total Nitrogen (% dry wt)	-
TDS (mg(/L)	430
% Air-dry Moisture Content (% of dry wt)	2.9

Analysis (Unit)	Sample Depth (mbgl) / Horizon
	1.10-1.20
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0287
Moisture (dry basis) (%)	2.79
Moisture 105Â°C (dry basis) (%)	10.8
Texture (ISSS Classification)	Clay
Gravel fraction (% of whole sample)	11.7
Sand fraction (%(< 2 mm fraction)	39.6
Silt fraction (% < 2 mm fraction)	10.5
Clay fraction (% < 2 mm fraction)	50
Moisture 40Â°C (dry basis) (%)	---
R1 Dispersion Ratio	0.74
EAT	2
15 Bar (%)	18.2

'-' indicates no laboratory assessment was undertaken

Table AppC-24: Soil Chemistry for 18Bl(Ro), Analysed Site D45

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	7.54	8.25	8.16	7.71	7.28	6.51	6.95
pH CaCl2 (following 4A1) pH units	6.88	7.52	7.52	7.29	6.75	5.92	6.33
Organic Carbon (W&B) % (40°C)	1.35	1.34	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	1.5	<1.0	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	<1.0	1.5	-	-	-	-	-
Colwell Phosphorus (mg/kg)	7.2	<5.0	-	-	-	-	-
PBI + Col P	49	96	-	-	-	-	-
Colwell Potassium (mg/kg)	540	210	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	5.9	5.5	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3570	4360	5010	4990	4920	4550	3960
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	496	636	868	1020	987	905	806
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	477	203	195	210	243	251	214
Sodium (NH4Cl/BaCl2) (mg/kg)	16.3	69.6	480	681	724	714	626
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	17.8	21.7	25	24.9	24.6	22.7	19.8
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	4.08	5.23	7.14	8.37	8.12	7.45	6.63
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	1.22	0.519	0.499	0.537	0.62	0.642	0.546
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.071	0.303	2.09	2.96	3.15	3.11	2.72

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Ca:Mg ratio	4.4	4.2	3.5	3	3	3	3
K:Mg ratio	0.3	0.1	0.07	0.06	0.08	0.09	0.08
GTRI							
ECR (%)	5.6	3	7.4	9.5	10	11	11
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	2820	4220	4460	4570	4240	3650	3420
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	408	611	847	915	879	746	732
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	421	226	204	214	252	257	226
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	<6.0	17.3	103	121	143	155	143
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	14.1	21.1	22.3	22.8	21.1	18.2	17.1
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	3.36	5.03	6.97	7.53	7.23	6.14	6.03
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	1.08	0.579	0.523	0.546	0.643	0.657	0.577
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.024	0.075	0.446	0.524	0.62	0.674	0.621
Ca:Mg ratio	4.2	4.2	3.2	3	2.9	3	2.8
K:Mg ratio	0.32	0.12	0.08	0.07	0.09	0.11	0.1
ECR (%)	5.9	2.4	3.2	3.4	4.3	5.2	4.9
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
ECEC (cmol/kg)	18.5	26.8	30.2	31.4	29.6	25.7	24.3
Calcium (%)	75.9	78.8	73.7	72.6	71.3	70.9	70.3
Magnesium (%)	18.1	18.8	23.1	24	24.4	23.9	24.8
Potassium (%)	5.8	2.2	1.7	1.7	2.2	2.6	2.4
Sodium (%)	<0.2	0.3	1.5	1.7	2.1	2.6	2.6
Aluminium (%)	0	0	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-
Chloride (mg/kg)	40	13	280	760	760	750	630
Salinity EC 1:5 (dS/m)	0.092	0.081	0.31	0.58	0.57	0.54	0.47
Boron (mg/kg)	0.79	-	-	-	-	-	-
Iron (Fe) (mg/kg)	11	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	7.6	-	-	-	-	-	-
Copper (Cu) (mg/kg)	0.93	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.47	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	0.66	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.12	0.13	-	-	-	-	-
TDS (mg(/L)	59	52	200	370	370	350	300
% Air-dry Moisture Content (% of dry wt)	2.1	2.4	4	3.9	3.9	3.8	3.9
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0214	0.0241	0.0403	0.0386	0.0387	0.0383	0.0388
Moisture (dry basis) (%)	1.57	2.21	2.66	2.7	2.69	2.77	2.29
Moisture 105Â°C (dry basis) (%)	6.4	10.4	11.5	12.1	13.6	13.6	12.3

Analysis (Unit)	Sample Depth (mbgl) / Horizon						
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80
Texture (ISSS Classification)	Clay Loam	Clay	Clay	Clay	Clay	Clay	Clay
Gravel fraction (% of whole sample)	0.8	0.2	43.6	10.1	< 0.1	4.8	1.9
Sand fraction (%(< 2 mm fraction)	52.6	35.1	29.9	23.5	26.7	26.3	32
Silt fraction (% < 2 mm fraction)	16.4	20.3	18.2	20.3	19.4	22.4	19.4
Clay fraction (% < 2 mm fraction)	31	44.6	51.9	56.3	53.9	51.3	48.6
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.49	0.33	0.31	0.35	0.53	0.56	0.61
EAT	3	4	4	4	2	2	2
15 Bar (%)	16.9	20.2	22.8	23.6	26	25.3	22.6

'-' indicates no laboratory assessment was undertaken

Table AppC-25: Soil Chemistry for 19Bl(Ro), Analysed Site D52

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
pH 1:5 water (pH units)	7.48	8.03	9.23	9.14	8.99	9.02	9.09	7.91
pH CaCl2 (following 4A1) pH units	6.38	7.11	8.21	8.4	8.33	8.29	8.32	7.1
Organic Carbon (W&B) % (40°C)	1.14	0.47	-	-	-	-	-	-
Nitrate - N (2M KCl) (mg/kg)	2.6	<1.0	-	-	-	-	-	-
Ammonium - N (2M KCl) (mg/kg)	2.3	1.2	-	-	-	-	-	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-	-	-	-	-	-
PBI + Col P	60	78	-	-	-	-	-	-
Colwell Potassium (mg/kg)	260	110	-	-	-	-	-	-
KCl Sulfur (S) (mg/kg)	4.4	3.5	-	-	-	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	2300	2330	1890	1480	1710	1210	1360	-
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	366	467	1040	1040	1270	990	994	-
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	226	121	99	97	101	80	88	-
Sodium (NH4Cl/BaCl2) (mg/kg)	24.3	80.9	829	1080	1310	1200	1210	-
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	11.5	11.6	9.43	7.41	8.52	6.06	6.78	-
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	3.01	3.84	8.55	8.55	10.5	8.14	8.18	-
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.579	0.309	0.253	0.247	0.257	0.205	0.224	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.106	0.352	3.6	4.72	5.71	5.21	5.25	-
Ca:Mg ratio	3.8	3	1.1	0.9	0.8	0.7	0.8	-
K:Mg ratio	0.19	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	-
GTRI								-
ECR (%)	4.5	4.1	18	24	24	28	27	-
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	2130	2280	1720	1470	1530	1140	1220	-
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	340	435	1030	1120	1280	1020	986	-
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	263	122	88.7	98.2	85.7	77.9	78.5	-
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	<6.0	14.6	78.1	186	256	213	329	-
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	10.6	11.4	8.59	7.32	7.62	5.67	6.08	-
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	2.8	3.58	8.44	9.22	10.5	8.38	8.11	-
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.673	0.311	0.227	0.251	0.219	0.199	0.201	-
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	<0.020	0.064	0.34	0.81	1.11	0.925	1.43	-
Ca:Mg ratio	3.8	3.2	1	0.8	0.7	0.7	0.8	-
K:Mg ratio	0.24	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	-
ECR (%)	4.8	2.4	3.2	6	6.8	7.4	10	-
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
ECEC (cmol/kg)	14.1	15.3	17.6	17.6	19.5	15.2	15.8	-
Calcium (%)	75.3	74.2	48.8	41.6	39.1	37.4	38.4	-
Magnesium (%)	19.8	23.3	48	52.4	54.1	55.2	51.3	-
Potassium (%)	4.8	2	1.3	1.4	1.1	1.3	1.3	-
Sodium (%)	<0.2	0.4	1.9	4.6	5.7	6.1	9	-
Aluminium (%)	0	0	0	0	0	0	0	-
Hydrogen (%)	0	0	0	0	0	0	0	-
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-	-	-	-
Chloride (mg/kg)	10	49	310	670	760	840	710	810
Salinity EC 1:5 (dS/m)	0.038	0.054	0.45	0.69	0.85	0.8	0.74	0.7
Boron (mg/kg)	0.74	-	-	-	-	-	-	-
Iron (Fe) (mg/kg)	14	-	-	-	-	-	-	-
Manganese (Mn) (mg/kg)	21	-	-	-	-	-	-	-
Copper (Cu) (mg/kg)	1.2	-	-	-	-	-	-	-
Zinc (Zn) (mg/kg)	0.28	-	-	-	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	0.68	-	-	-	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.097	0.077	-	-	-	-	-	-
TDS (mg(/L)	24	35	290	440	540	510	470	450
% Air-dry Moisture Content (% of dry wt)	1.8	1.5	1.6	1.5	2.3	1.4	1.7	-
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0178	0.0146	0.0164	0.015	0.0231	0.0144	0.0165	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon							
	0.00-0.10	0.20-0.30	0.50-0.60	0.80-0.90	1.10-1.20	1.40-1.50	1.70-1.80	2.00-2.10
Moisture (dry basis) (%)	1.34	1.49	1.31	1.68	1.92	2.07	1.58	-
Moisture 105Â°C (dry basis) (%)	6.5	6.4	6.4	6	7.4	7.2	6.6	-
Texture (ISSS Classification)	Clay	Sandy Clay	Clay	Clay	Clay	Clay	Clay	-
Gravel fraction (% of whole sample)	2.7	1.9	4.2	16.5	18.1	19.3	3.9	-
Sand fraction (%(< 2 mm fraction)	61.3	62.4	54.6	54	46.6	51.7	54.7	-
Silt fraction (% < 2 mm fraction)	7.1	5.6	11.5	10.9	13.5	11.5	10.3	-
Clay fraction (% < 2 mm fraction)	31.7	32	34	35.2	39.9	36.8	35.1	-
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-	-	-	-
R1 Dispersion Ratio	0.32	0.39	0.62	0.66	0.72	0.72	0.63	-
EAT	3	4	4	2	2	2	2	-
15 Bar (%)	12.7	13.6	15	15.2	15.4	14.3	13.7	-

'-' indicates no laboratory assessment was undertaken

Table AppC-26: Soil Chemistry for SPC 20BI(Ro), Analysed Site D58

Analysis (Unit)	Sample Depth (mbgl) / Horizon			
	0.00-0.10	0.20-0.30	0.50-0.60	0.70-0.80
pH 1:5 water (pH units)	8.49	8.61	9.01	8.93
pH CaCl2 (following 4A1) pH units	7.5	7.58	8.16	8.2
Organic Carbon (W&B) % (40°C)	1.07	1.15	-	-
Nitrate - N (2M KCl) (mg/kg)	2.5	1.5	-	-
Ammonium - N (2M KCl) (mg/kg)	1.3	1.1	-	-
Colwell Phosphorus (mg/kg)	<5.0	<5.0	-	-
PBI + Col P	92	78	-	-
Colwell Potassium (mg/kg)	190	130	-	-
KCl Sulfur (S) (mg/kg)	5	10	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	3910	3870	2980	2790
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	723	751	847	878
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	181	152	111	104
Sodium (NH4Cl/BaCl2) (mg/kg)	228	657	1070	1140
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	19.5	19.3	14.9	13.9
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	5.95	6.18	6.97	7.23
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.463	0.388	0.284	0.267
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.991	2.86	4.67	4.94
Ca:Mg ratio	3.3	3.1	2.1	1.9
K:Mg ratio	0.08	0.06	<0.05	<0.05
GTRI	-	-	-	-
ECR (%)	5.4	11	18	20
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	3930	3730	3150	2470
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	750	769	915	853
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	218	183	124	121

Analysis (Unit)	Sample Depth (mbgl) / Horizon			
	0.00-0.10	0.20-0.30	0.50-0.60	0.70-0.80
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	62.4	291	193	211
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	19.6	18.6	15.7	12.3
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.17	6.33	7.52	7.02
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.557	0.469	0.318	0.31
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.271	1.27	0.837	0.918
Ca:Mg ratio	3.2	2.9	2.1	1.8
K:Mg ratio	0.09	0.07	<0.05	<0.05
ECR (%)	3.1	6.5	4.7	6
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02
ECEC (cmol/kg)	26.6	26.7	24.4	20.6
Calcium (%)	73.7	69.7	64.4	60
Magnesium (%)	23.2	23.7	30.9	34.1
Potassium (%)	2.1	1.8	1.3	1.5
Sodium (%)	1	4.7	3.4	4.5
Aluminium (%)	0	0	0	0
Hydrogen (%)	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-
Chloride (mg/kg)	29	140	500	540
Salinity EC 1:5 (dS/m)	0.1	0.22	0.56	0.58
Boron (mg/kg)	0.81	-	-	-
Iron (Fe) (mg/kg)	11	-	-	-
Manganese (Mn) (mg/kg)	6.8	-	-	-
Copper (Cu) (mg/kg)	1.3	-	-	-
Zinc (Zn) (mg/kg)	0.31	-	-	-
Oxalate ext. Molybdenum (mg/kg)	1.1	-	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon			
	0.00-0.10	0.20-0.30	0.50-0.60	0.70-0.80
Dumas Total Nitrogen (% dry wt)	0.13	0.1		
TDS (mg(/L)	66	140	360	370
% Air-dry Moisture Content (% of dry wt)	3.5	3.6	2.8	2.6
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0352	0.036	0.0276	0.0255
Moisture (dry basis) (%)	2.35	3.08	1.78	1.68
Moisture 105Â°C (dry basis) (%)	10.4	10.3	8.9	8.5
Texture (ISSS Classification)	Clay	Clay	Clay	Clay
Gravel fraction (% of whole sample)	1	0.5	0.7	3
Sand fraction (%(< 2 mm fraction)	42.2	42.1	48.3	56.1
Silt fraction (% < 2 mm fraction)	14.7	14.7	10	7.3
Clay fraction (% < 2 mm fraction)	43.1	43.2	41.7	36.7
Moisture 40Â°C (dry basis) (%)	-	-	-	-
R1 Dispersion Ratio	0.35	0.55	0.51	0.62
EAT	3	2	3	2
15 Bar (%)	20.9	22.7	18.4	18.1

'-' indicates no laboratory assessment was undertaken

Table AppC-27: Soil Chemistry for 21Bl(Ta), Analysed Site D59 (SLR Site B21 (2023))

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10 (B21, SLR 2023)	0.20-0.30 (B21, SLR 2023)	0.50-0.60 (B21, SLR 2023)	D59-0.80-0.90	(B21 0.9-1.0, SLR 2023)
pH 1:5 water	7.83	8.81	9.25	-	9.25
Organic Carbon (W&B)	0.35	-	0.22	-	-
Nitrate - N (2M KCl)	<1.0	-	<1.0	-	-
Ammonium - N (2M KCl)	<1.0	-	<1.0	-	-
Colwell Phosphorus	<5.0	-	<5.0	-	-
PBI + Col P	21	-	73	-	-
Colwell Potassium	130	-	180	-	-
KCl Sulfur (S)	<2.5	-	4.8	-	-
Exchangeable Calcium	5.4	7.6	6.8	-	20
Exchangeable Magnesium	0.91	6.3	7.7	-	9
Exchangeable Potassium	0.38	0.33	0.37	-	0.35
Exchangeable Sodium	<0.065	0.98	2.1	-	5.8
Exchangeable acidity	<0.02	-	<0.02	-	-
Exchangeable aluminium	<0.02	-	<0.02	-	-
This Exchangeable hydrogen	<0.02	-	<0.02	-	-
Calcium/Magnesium Ratio	6	1.2	0.88	-	2.2
ECEC	6.8	15	17	-	35
Calcium (%)	80	50	40	-	57
Magnesium (%)	13	41	45	-	26
Potassium (%)	5.6	2.2	2.2	-	1
Sodium - ESP (%)	0.52	6.4	12	-	17
Aluminium (%)	0.17	0.1	0.07	-	0.02
Hydrogen (%)	0	0	0	-	0
CaCl2 extr. Aluminium	<0.1	-	-	-	-
Chloride	<5	5	51	170	-
EC	0.067	0.05	0.131		0.731
Boron	0.26	-	-	-	-
Iron (Fe)	4.3	-	-	-	-
Manganese (Mn)	4.7	-	-	-	-
Copper (Cu)	0.47	-	-	-	-
Zinc (Zn)	<0.08	-	-	-	-
Oxalate ext. Molybdenum	<0.25	-	-	-	-
Dumas Total Nitrogen	0.035	-	0.05	-	-
% Air-dry Moisture Content	0.3	-	1.7	-	-

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.10 (B21, SLR 2023)	0.20-0.30 (B21, SLR 2023)	0.50-0.60 (B21, SLR 2023)	D59-0.80-0.90	(B21 0.9-1.0, SLR 2023)
S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	0.0032	-	0.0169	-	-
Moisture (dry basis)	1.18	1.11	4.54	4.41	-
Moisture 105Â°C (dry basis)	-	-	-	-	-
Texture (ISSS Classification)	Sandy Loam	Sandy Loam	Sandy Clay	Clay	-
Gravel fraction	4.7	5.7	2	6.4	-
Sand fraction	87.5	83.5	57.5	57.5	-
Silt fraction	2	5.1	3.4	4.8	-
Clay fraction	10.4	11.4	39.1	37.8	-
Moisture 40Â°C (dry basis)	2.4	1.5	6.1	6.4	-
R1 Dispersion Ratio	0.44	0.42	0.69	0.68	-
EAT	3	2	2	-	2
15 Bar (%)	2.7	3.4	13.5	12.4	-

Legend
GTE Laboratory Data
SLR Site Data

'-' indicates no laboratory assessment was undertaken

Table AppC-28: Soil Chemistry for SPC 21Bl(Ta), Analysed Site D59

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
pH 1:5 water (pH units)	9.32	9.3	9.3
pH CaCl2 (following 4A1) pH units	8.36	8.31	8.39
Organic Carbon (W&B) % (40°C)	-	-	-
Nitrate - N (2M KCl) (mg/kg)	-	-	-
Ammonium - N (2M KCl) (mg/kg)	-	-	-
Colwell Phosphorus (mg/kg)	-	-	-
PBI + Col P	-	-	-
Colwell Potassium (mg/kg)	-	-	-
KCl Sulfur (S) (mg/kg)	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	1430	1610	1490
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	747	850	791
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	145	122	142

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
Sodium (NH4Cl/BaCl2) (mg/kg)	814	1140	957
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	7.13	8.04	7.46
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	6.15	6.99	6.51
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.37	0.313	0.363
Sodium (NH4Cl/BaCl2) (cmol/kg)	3.54	4.98	4.16
Ca:Mg ratio	1.2	1.2	1.1
K:Mg ratio	0.06	<0.05	0.06
GTRI	-	-	-
ECR (%)	23	26	24
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	1430	1680	1500
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	820	976	826
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	165	130	154
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	95.4	123	95.4
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	7.14	8.36	7.49
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	6.74	8.03	6.79
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.423	0.333	0.395
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.415	0.536	0.415
Ca:Mg ratio	1.1	1	1.1
K:Mg ratio	0.06	<0.05	0.06
ECR (%)	5.7	5	5.4
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02
ECEC (cmol/kg)	14.7	17.3	15.1
Calcium (%)	48.5	48.4	49.6
Magnesium (%)	45.8	46.5	45
Potassium (%)	2.9	1.9	2.6
Sodium (%)	2.8	3.1	2.7
Aluminium (%)	0	0	0

Analysis (Unit)	Sample Depth (mbgl) / Horizon		
	1.10-1.20	1.40-1.50	1.70-1.80
Hydrogen (%)	0	0	0
CaCl2 extr. Aluminium (mg/kg)	-	-	-
Chloride (mg/kg)	370	670	460
Salinity EC 1:5 (dS/m)	0.48	0.69	0.55
Boron (mg/kg)	-	-	-
Iron (Fe) (mg/kg)	-	-	-
Manganese (Mn) (mg/kg)	-	-	-
Copper (Cu) (mg/kg)	-	-	-
Zinc (Zn) (mg/kg)	-	-	-
Oxalate ext. Molybdenum (mg/kg)	-	-	-
Dumas Total Nitrogen (% dry wt)	-	-	-
TDS (mg(/L)	300	440	350
% Air-dry Moisture Content (% of dry wt)	1.5	1.7	1.5
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0153	0.0167	0.0145
Moisture (dry basis) (%)	1.11	1.37	1.17
Moisture 105Â°C (dry basis) (%)	7.4	7.4	7.6
Texture (ISSS Classification)	Sandy Clay	Clay	Clay
Gravel fraction (% of whole sample)	23.3	29.3	19.5
Sand fraction (%(< 2 mm fraction)	64.9	57	58.1
Silt fraction (% < 2 mm fraction)	2.8	8	4.9
Clay fraction (% < 2 mm fraction)	32.3	35	37
Moisture 40Â°C (dry basis) (%)	-	-	-
R1 Dispersion Ratio	0.69	0.73	0.68
EAT	2	2	2
15 Bar (%)	11	12.7	12.1

'-' indicates no laboratory assessment was undertaken

Table AppC-29: Soil Chemistry for SPC 22BI(Wy), Analysed Site D65

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.05	0.10-0.20	0.20-0.30	0.50-0.60	0.80-0.90
pH 1:5 water (pH units)	7.48	7.85	7.68	8.03	9.14
pH CaCl2 (following 4A1) pH units	6.74	6.99	6.6	7.03	8.24
Organic Carbon (W&B) % (40°C)	0.64	0.49	-	-	-
Nitrate - N (2M KCl) (mg/kg)	3.1	1.1	-	-	-
Ammonium - N (2M KCl) (mg/kg)	<1.0	<1.0	-	-	-
Colwell Phosphorus (mg/kg)	5.9	<5.0	-	-	-
PBI + Col P	20	19	-	-	-
Colwell Potassium (mg/kg)	330	360	-	-	-
KCl Sulfur (S) (mg/kg)	2.5	<2.5	-	-	-
Calcium (Ca) - NH4Cl/BaCl2 (mg/kg)	616	814	862	1490	1890
Magnesium (Mg) - NH4Cl/BaCl2 (mg/kg)	114	99	201	544	613
Potassium (K) - NH4Cl/BaCl2 (mg/kg)	259	299	215	167	162
Sodium (NH4Cl/BaCl2) (mg/kg)	11.1	13	65.9	257	456
Calcium (Ca) - NH4Cl/BaCl2 (cmol/kg)	3.07	4.06	4.3	7.45	9.44
Magnesium (Mg) - NH4Cl/BaCl2 (cmol/kg)	0.94	0.813	1.65	4.47	5.04
Potassium (K) - NH4Cl/BaCl2 (cmol/kg)	0.662	0.765	0.55	0.428	0.414
Sodium (NH4Cl/BaCl2) (cmol/kg)	0.048	0.057	0.287	1.12	1.98
Ca:Mg ratio	3.3	5	2.6	1.7	1.9
K:Mg ratio	0.7	0.94	0.33	0.1	0.08
GTRI	-	-	-	-	-
ECR (%)	15	14	12	11	14

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.05	0.10-0.20	0.20-0.30	0.50-0.60	0.80-0.90
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (mg/kg)	496	542	847	1560	1740
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (mg/kg)	118	84.1	210	600	640
Potassium (K) - prewash alc. pH 8.5 NH4Cl (mg/kg)	183	185	203	182	161
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	<6.0	<6.0	7	62.9	32.7
Calcium (Ca) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	2.47	2.7	4.23	7.76	8.69
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.97	0.692	1.73	4.93	5.27
Potassium (K) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	0.468	0.472	0.518	0.465	0.411
Sodium (Na) - prewash alc. pH 8.5 NH4Cl (cmol/kg)	<0.020	<0.020	0.03	0.274	0.142
Ca:Mg ratio	2.6	3.9	2.4	1.6	1.7
K:Mg ratio	0.48	0.68	0.3	0.09	0.08
ECR (%)	12	12	8.4	5.5	3.8
Exchangeable acidity (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable aluminium (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
Exchangeable hydrogen (cmol/kg)	<0.02	<0.02	<0.02	<0.02	<0.02
ECEC (cmol/kg)	3.92	3.87	6.5	13.4	14.5
Calcium (%)	63.2	69.7	65	57.8	59.9
Magnesium (%)	24.8	17.9	26.5	36.7	36.3
Potassium (%)	12	12	8	3.5	2.8
Sodium (%)	<0.2	0.2	0.5	2	1
Aluminium (%)	0	0	0	0	0
Hydrogen (%)	0	0	0	0	0
CaCl2 extr. Aluminium (mg/kg)	<0.1	-	-	-	-
Chloride (mg/kg)	15	<5	17	92	270
Salinity EC 1:5 (dS/m)	0.058	0.059	0.052	0.13	0.32

Analysis (Unit)	Sample Depth (mbgl) / Horizon				
	0.00-0.05	0.10-0.20	0.20-0.30	0.50-0.60	0.80-0.90
Boron (mg/kg)	0.18	-	-	-	-
Iron (Fe) (mg/kg)	13	-	-	-	-
Manganese (Mn) (mg/kg)	8.1	-	-	-	-
Copper (Cu) (mg/kg)	0.45	-	-	-	-
Zinc (Zn) (mg/kg)	0.41	-	-	-	-
Oxalate ext. Molybdenum (mg/kg)	<0.25	-	-	-	-
Dumas Total Nitrogen (% dry wt)	0.075	0.039	-	-	-
TDS (mg(/L)	37	38	33	84	200
% Air-dry Moisture Content (% of dry wt)	0.3	0.3	0.5	1.6	1.3
S7 Gravimetric water content of air dried fine fraction (GWCad-ff) (g/g)	0.0027	0.0026	0.0046	0.016	0.0131
Moisture (dry basis) (%)	0.298	0.288	0.472	1.19	1.27
Moisture 105Â°C (dry basis) (%)	4.4	2.3	3.4	7.1	7.1
Texture (ISSS Classification)	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Clay	Sandy Clay Loam
Gravel fraction (% of whole sample)	3	2.2	10.4	2	4
Sand fraction (%(< 2 mm fraction)	85.7	86.1	78.7	64.3	68.2
Silt fraction (% < 2 mm fraction)	3.9	3.6	3.9	4.4	6.8
Clay fraction (% < 2 mm fraction)	10.4	10.3	17.4	31.3	25
Moisture 40Â°C (dry basis) (%)	-	-	-	-	-
R1 Dispersion Ratio	0.32	0.43	0.49	0.61	0.59
EAT	3	3	3	2	4
15 Bar (%)	4.7	4.2	7.7	14	11.4

'-' indicates no laboratory assessment was undertaken

Appendix D Interpretation of Key Field and Laboratory Soils Data

Soil pH (1:5 soil/water)

Table AppD-1 presents the pH ratings used to interpret pH data (Adapted from Slattery et al. [1999] and McKenzie et al. [2004]).

Table AppD-1: **pH (1:5 soil/water)**

$pH_{1:5}$	Rating
<3.0 / 3.0-4.0	Very strongly acid
4.0-5.5	Strongly acid
5.5-6.0	Moderately acid
6.0-7.0	Slightly acid to neutral
7.0-8.0	Neutral to slightly alkaline
8.0-9.0	Moderately alkaline
9.0-10.0	Strongly alkaline
10.0-11.0	Very strongly alkaline

Electrical Conductivity

Table AppD-2 presents the EC 1:5 salinity ratings used to assess the significance of laboratory measured EC 1:5 data where clay content was known (Shaw, R.J. 1988).

Table AppD-2: Electrical Conductivity Ratings

Rating	EC 1:5 deciSiemens per metre (dS/m)			
	10-20 per cent (%) clay	20-40 % clay	40-60 % clay	60-80 % clay
Very low	<0.05	<0.08	<0.12	<0.18
Low	0.05-0.10	0.08-0.17	0.12-0.25	0.18-0.37
Moderate	0.10-0.25	0.17-0.40	0.25-0.58	0.37-0.85
High	0.25-0.45	0.40-0.67	0.58-1.00	0.85-1.5
Very high	0.45-0.70	0.67-1.05	1.00-1.58	1.5-2.4
Extreme	>0.70	>1.05	>1.58	>2.4

Cation Exchange Capacity

Table AppD-3 presents the ratings used to assess CEC levels in the topsoil as a guide to overall fertility status (Landon 1991).

Table AppD-3: Cation Exchange Capacity Ratings

Rating	CEC/Equivalent CEC (milliequivalent [meq]/100 grams [g] of soil)
Very low	<5
Low	5-15
Moderate	15-25
High	25-40
Very high	>40

Cation Dominance – Exchangeable Sodium Percentage

Table AppD-4 presents the ratings used to interpret sodicity levels (Baker and Eldershaw 1993).

Table AppD-4: Exchangeable Sodium Percentage Ratings

Rating	ESP (%)
Non-sodic (low)	<6
Sodic (moderate)	6-15
Strongly sodic (high)	15-20
Extremely sodic (very high)	>20

Calcium / Magnesium Ratio (Ca:Mg)

Table AppD-5 presents the ratings used to interpret Ca/Mg ratios (Baker and Eldershaw, 1993). Soils that disperse readily but have low ESP levels; often have high levels of Mg relative to the other cations. The ratio of Ca to Mg provides a guide to the relative abundance of the two major cations and is useful when used in conjunction with ESP and R1 ratio for predicting soil physical behaviour.

Table AppD-5: Ca:Mg Ratio Ratings

Rating	Ca/Mg Ratio	Comments
Very low	<0.10	Mg is >10 times more dominant than Ca
Low	0.10–0.50	Mg is 5–10 times more dominant than Ca
Moderate	0.51–1.0	Ca and Mg becoming co-dominant
High	1.1–2	Ca more dominant than Mg
Very high	>2	Ca >2 times more dominant than Mg

Phosphorus

Table AppD-6 presents Bicarbonate Extractable Phosphorus categories shown by Ahern et al. (1994). The ratings were used to assess available Bicarb. extr. P levels.

Table AppD-6: Available Phosphorus

Rating	Bicarbonate Extractable Phosphorus
Very low	<5
Low	6-9
Moderate	10-15
High	16-40
Very high	>40

Dispersion Ratio R1

Table AppD-7 presents the ratings used to interpret the R1 ratios (Baker and Eldershaw, 1993). The R1 ratio is a measure of the amount of silt and clay that disperses during testing compared with the total amount of silt and clay present. As such, it is a direct laboratory measure of soil dispersion and is useful when used in conjunction with ESP, EAT and the Ca/Mg ratio for predicting soil physical behaviour.

Table AppD-7: Dispersion Ratio Ratings

Rating	R1 Ratio
Low	<0.6
Moderate	0.6–0.8
High	0.8–0.95
Very high	>0.95

Emerson Aggregate Test

This test assesses the behaviour and cohesion of the soil aggregate in a brief period (two hours). The soil behaviours assessed were slaking and dispersion. Plate AppD-1 outlines the EAT assessment and class number and Table AppA-8 outlines the Emerson classes as per Australian Standard AS1289.3.8.1-2006 (Standards Australia, 2016).

Plate AppD-1: Determining the Emerson Class Number of Aggregates

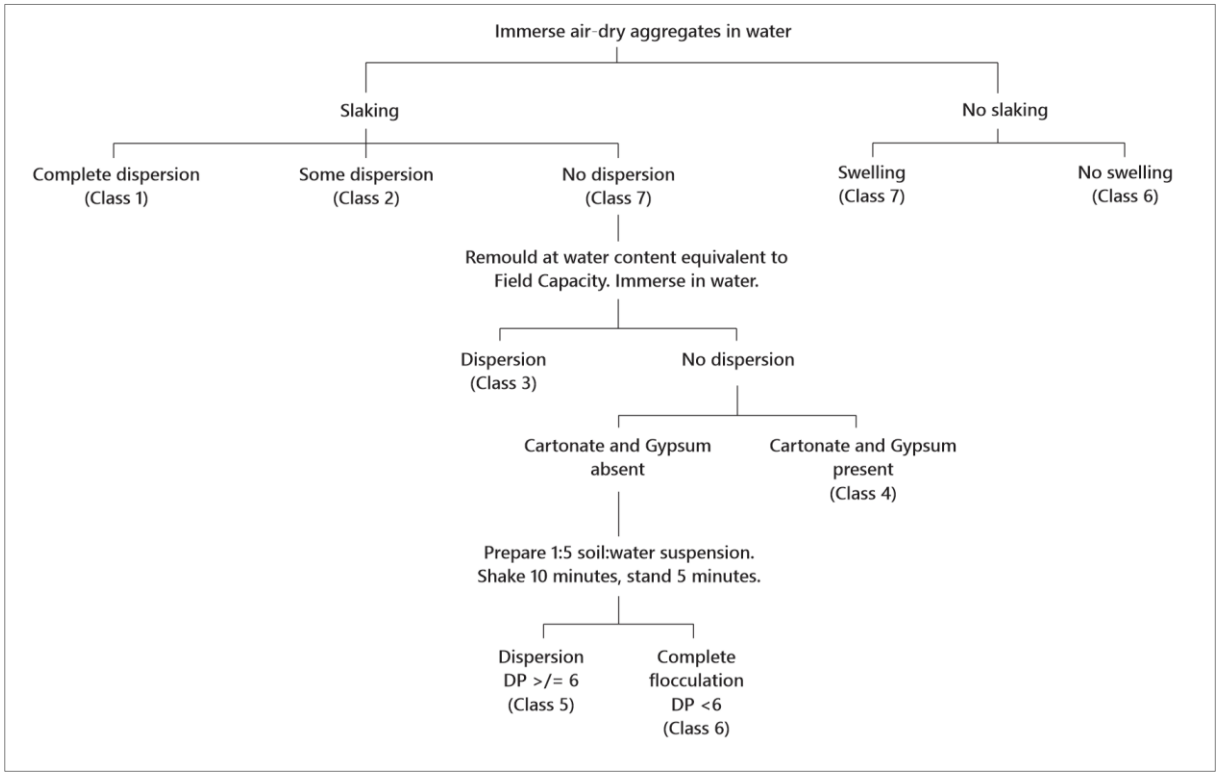


Table AppA-8: Emerson Class Descriptions

Emerson Class	Description
Class 1	Air-dried crumbs of soil show a strong dispersing reaction, i.e. a colloidal cloud covers nearly the whole of the bottom of the beaker, usually in a very thin layer. The reaction should be evident within 10 min. In extreme cases, all the water in the beaker becomes cloudy, leaving only a coarse residue in a cloud of clay.
Class 2	Air-dried crumbs of soil show a moderate to slight reaction. A moderate reaction consists of an easily recognizable cloud of colloids in suspension, usually spreading in thin streaks on the bottom of the beaker. A slight reaction consists of the bare hint of cloud in water at the surface of the crumbs.
Class 3	The soil remoulded at the plastic limit disperses in water.
Class 4	The remoulded soil does not disperse in water. Calcium carbonate (calcite) or calcium sulfate (gypsum) is present.
Class 5	The remoulded soil does not disperse in water and the 1:5 soil / water suspension remains dispersed after five minutes.
Class 6	The remoulded soil does not disperse in water and the 1:5 soil / water suspension begins to flocculate within five minutes.
Class 7	The air-dried crumbs of soil remain coherent (do not disperse) in water and swell.
Class 8	The air-dried crumbs of soil remain coherent (do not disperse) in water and do not swell.

Soil Erodibility

The Universal Soil Loss Equation (USLE) soil erodibility factor (K factor) of topsoil was estimated from suggested K factor values from Rosewell (1993). Table AppD-9 outlines the K factors from soil texture.

Table AppD-9: Estimating USLE K factors from Soil Texture

Soil texture	Suggested K factor
Sand	0.015
Clayey sand	0.025
Loamy sand	0.020
Sandy loam	0.030
Fine sandy loam	0.035
Sandy clay loam	0.025
Loam	0.040
Loam, fine sandy	0.050
Silt loam	0.055
Clay loam	0.030
Silty clay loam	0.040
Fine sandy clay loam	0.025
Sandy clay	0.017
Silty clay	0.025
Light clay	0.025
Light medium clay	0.018
Medium clay	0.015
Heavy clay	0.012

These K factor values are assessed against the soil erodibility classes from Rosewell and Loch (2002) outlined in Table AppD-10.

Table AppD-10: Estimating USLE K factors from Soil Texture

Rating	K of the USLE (t/ha/yr per unit of rainfall erosivity)
Very low	0.00-0.01
Low	0.01-0.02
Moderate	0.02-0.04
High	0.04-0.06
Very high	>0.06

Particle Size Analysis and Soil Texture

Particle size analysis (PSA) measures the composition percentage of sand, silt, and clay sized particles, this allows soil texture to be determined.

The triangular texture diagram based on international fractions (Marshall, 1947), as shown in NCST (2024) has been used to derive soil texture based on PSA laboratory results.

Plant Available Water Capacity

Plant available water capacity (PAWC) is the amount of water that may be stored within a soil profile of up to 1.20 m in depth (DSITI & DNRM, 2015) and is the difference between a drained upper limit and crop lower limit. The amount of water a soil profile may hold impacts on its ability to provide for and be used by vegetation.

The soil texture lookup table from RPI 08/14 Guideline (DSDMIP, 2019) was initially used to estimate PAWC. Using available Class III observation site laboratory data, pedotransfer modelling as per the Salinity Management Handbook (using SALFPredict) (DERM, 2011) was used to assess PAWC.

This overall PAWC total was affected by the soil texture, physical and chemical barriers, as discussed further in Section 4.4 with results outlined in SPC summaries in Section 5 and Appendix F.

Appendix E SLR (2023) Detailed Sites Review

Table AppE-1: Summary of SLR (2023) Detailed Sites Review

Site	SLR Classifciation	SMU	GTE Classficiation	Samples Analysed	Issue	Notes	Site able to be used	Report / Mapping GTE Decision 22Dec25 RM
B01	Eutrophic Red Dermosol	2B	n/a	Yes	No profile to review		Need to check for soil profile - NOT AVAILABLE	No Profile to review, site conducted by GTE. D44 conducted on site, Grey Vertosol
B02	Self-Mulching Black Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol		Colour is incorrect based on dominant colour class in the upper 0.5 m of the B2 horizon. No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Linear Gilgai noted. No gilgai mound / depression site conducted	Yes - But amendment of soiil profile assessment needed	Incorrect colour grading on SLR site. Based on SLR horizons, it would grade as a Brown soil (SPC 15). Amend change in report, UMA upidated to include this in UMA
B03	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted. Shallow site to 0.40 m	Yes - But additional informaiton provided may pull it out as a separate SPC	Additional UMA added for this site. GTE SPC 2 is too deep, remember to assess as a shallow UMA (AG land Asserssment)
B04	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Linear Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site
B05	Self-Mulching Black Vertosol	1	n/a	Yes	No profile to review		Need to check for soil profile - NOT AVAILABLE	No Profile to review, site conducted by GTE. D37 conducted on site, Black Vertosol
B06	Self-Mulching Red Vertosol	1	Red Dermosol, or Self mulching Red Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton provided may pull it out as a separate SPC / confirm ASC	Correct colour for Red Vertosol. Site D36 is within 75m. We could move this closer to amend this, but in any case, the area is too small and unmappable. A subdominant vertosol as D36 is a Brown Dermosoil. Highlight in report, no change to mapping
B07	Self-Mulching Black Vertosol	1	n/a	Yes	No profile to review		Need to check for soil profile - NOT AVAILABLE	No Profile to review, site conducted by GTE. D22 conducted on site, Grey Vertosol
B08	Self-Mulching Grey Vertosol	1	Grey Dermosol, or Self mulching Grey Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Normal Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton provided may pull it out as a separate SPC / confirm ASC	UMA amended for this site
B09	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Linear Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site
B10	Self-Mulching Red Vertosol	1	Red Dermosol, or Self mulching Red Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Linear Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton provided may pull it out as a separate SPC / confirm ASC	GTE Site D22 conducted on B10 site. Red Vertosol was not observed. Area remains as Grey Vertosol
B11	Self-Mulching Black Vertosol	1	Self-Mulching Black Vertosol			Incipient Linear Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton provided may the depth may pull it out as separate SPC	Additional UMA added for this site
B12	Eutrophic Red Chromosol	3	n/a	Yes	No profile to review		Need to check for soil profile - NOT AVAILABLE	Sub-dominant soil tyupe in SLR report. Site D32 / D4 (Grey Dermosol) was conducted within 5 metres. No Profile to review, therefore no changes made Area remains as Grey Dermosol
B13	Self-Mulching Black Vertosol	1	Self-Mulching Black Vertosol			Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton provided may the depth may pull it out as separate SPC	Additional UMA added for this site

B14	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site
B15	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site. SPC 2 (due to SLR refusal at 0.90 m).
B16	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site
B17	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site
B18	Self-Mulching Black Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Cant assess horizon depths due to photo placemnt. Agree it is a brown vertosol Amend change in report, amend in mapping, UMA added
B19	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	UMA amended for this site
B20	Eutrophic Red Chromosol	3	Red Chromosol	Yes			Yes - But additional informaiton provided may the depth may pull it out as separate SPC	Sub-dominant soil tyupe in SLR report. Site D52 (Grey Dermosol) was conducted within 35 metres. Surface around B20 may indicate anotehr soil type, but area is too small to be mapped. Sites to the north east indicate mixed ssurface soils. Area remains as Grey Dermosol
B21	Subnatric Brown Sodosol	1	Brown Sodosol, or Brown Chromosol	Yes	No profile to review		Yes - Check for lab to confirm ASC	Site D59 conducted, Grey Sodosol
B22	Self-Mulching Black Vertosol	1	Red Dermosol, or Self mulching Red Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But amendment of soiil profile assessment needed	Incorrect colour grading on SLR site. Based on SLR horizons, it would grade as a Brown Vertosol (SPC 15). Amend change in report, amend in mapping, UMA amended
B23	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	UMA amended for this site
B24	Self-Mulching Black Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But amendment of soiil profile assessment needed	Incorrect colour grading on SLR site. Based on SLR horizons, it would grade as a Brown Vertosol (SPC 19). Amend change in report, amend in mapping, new UMA asdded
B25	Self-Mulching Brown Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	D3 completed within 5 m of B25. D3 is a black vertosol, and B25 wouldn't be mappabale at this scale, therefore no ASC change.
B26	Self-Mulching Brown Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But amendment of soiil profile assessment needed	Incorrect colour grading on SLR site. Based on SLR horizons, it would grade as a Black Vertosol (SPC 19). Amend change in report, amend in mapping, UMA amended
B27	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site. SPC 2 due to weathered material at 1.0m

B28	Eutrophic Red Dermosol	2A	n/a	Yes	No profile to review		Need to check for soil profile NOT AVAILABLE	Site D60 completed nearby. Agree, no ASC change.
B29	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Melonhole noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site
B30	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Additional UMA added for this site
B31	Self-Mulching Brown Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Loacted within Brown Vertosol SPC Agree, no ASC change.
B32	Self-Mulching Red Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But amendment of soiil profile assessment needed	Incorrect colour grading on SLR site. GTE re-assesses as a Brown Vertosol. Amend change in report, no change to mapping
B33	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Site D10 completed nearby. Additional UMA added for the site
B34	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Crabhole Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Site D64 completed nearby. Agree, no ASC change.
B35	Self-Mulching Brown Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Site D64 completed nearby. UMA Amended
B36	Self-Mulching Brown Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Draft mapping lines moved. Agree, no ASC change
B37	Self-Mulching Black Vertosol	1	Black Dermosol, or Self-Mulching Black Vertosol		No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Site C45 completed nearby. Agree, no ASC change.
B38	Self-Mulching Brown Vertosol	1	Brown Dermosol, or Self-mulching Brown Vertosol	Yes	No Slickensides and/or lenticular peds noted (discsussed in Section 4.1.1, Vertosol Description)	Incipient Gilgai noted. No gilgai mound / depression site conducted	Yes - But additional informaiton will be needed to confirm ASC	Site D62 completed to the south. Agree, no ASC change.

Appendix F SLR (2023) Check Sites Review

Table AppF-1: Summary of SLR (2023) Check Sites Review

Site	SLR Classifciation	SMU	GTE Classficiation	Issue	Notes	Site able to be used	Report / Mapping GTE Decision
C01	Self-Mulching Black Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C02	Self-Mulching Brown Vertosol	1	Self -mulching present Not enough information to confirm ASC	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C03	Self-Mulching Brown Vertosol	1	Self -mulching present Not enough information to confirm ASC	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C04	Self-Mulching Black Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Outside of project area, different soil type
C05	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C06	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C07	Self-Mulching Black Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Offsite
C08	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Offsite
C09	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Offsite
C10	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Offsite
C11	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Offsite
C12	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Surface appears similar, likley a vertic dermosol. Acknowledge in report
C13	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Surface appears similar, likley a vertic dermosol. Acknowledge in report
C14	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.

C15	Self-Mulching Brown Vertosol	1	Surface flake present B21 horizon shown but with no measurements	Surface site / profile witgh no measurement tape. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But additional informaiton will be needed to confirm ASC	SPC UMA Reviewed Agree, no ASC change.
C16	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C17	Brown Dermosol	1 (sub-dominant)	Surface looks soft, profile has not been scrapped back to see structure.	Surface site / profile witgh no measurement tape. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But additional informaiton will be needed to confirm ASC	Site is located to close / on disturbance (track). Is not considered realiable . No UMA changes
C18	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	GTE review of C18 photo indicates gilgai, as per UMA. Site C91 completed within the area
C19	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Surface is same colour as GTE SPC UMA. Acknowledge in report
C20	Brown Dermosol	1 (sub-dominant)	Surface looks soft, profile has not been scrapped back to see structure.	Surface site / profile witgh no measurement tape. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But additional informaiton will be needed to confirm ASC	UMA added for this and an adjcent GTE Site C57
C21	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Surface colour is brown, however no profile photos avbilablae so best ot leave as SPC Grey Vertosol
C22	Brown Dermosol	3	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Area too small to map out, between the sat imagery of the gilgai. Area is deemed to be the major gilgai SPC
C23	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Surface is same colour as GTE SPC UMA (Site D47). Acknowledge in report
C24	Self-Mulching Brown Vertosol	1	Minimal surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Surface is same colour as GTE SPC UMA (Site D47). Acknowledge in report
C25	Brown Dermosol	1 (sub-dominant)	Surface looks soft, profile has not been scrapped back to see structure.	Surface site / profile witgh no measurement tape. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But additional informaiton will be needed to confirm ASC	Site has been decided to fit within the SPC 21 (Grey sodosol) as a sub-dominant soil.
C26	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Site C92 conducted and UMA is observed as gilgai, surrounding by brown soils. Therefore Brown vertosol gilgai UMA included
C27	Self-Mulching Brown Vertosol	1	Surface looks soft, profile has not been scrapped back to see structure.	Surface site / profile with no measurement tape. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But additional informaiton will be needed to confirm ASC	Surface doesn't look flaing, likley the Brown dermosol
C28	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.

C29	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C30	Red Dermosol	2B	Cracks not wide enough. Not enough information to confirm ASC.`	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Area looks distrubed and colour isnt red. GTE assumes Site D57 <15 m away is more accurate as a grey vertosol
C31	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C32	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.
C33	Epipdeal Brown Vertosol	1	Surface does not present vertic properties Not enough information to	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Surface resembles a firm surfgace, not epipedal. Stays as Dermosol
C34	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Only surface is shown as brown. Not enough to change the GTE SPC Grey Vertosol
C35	Brown Dermosol	3	Surface likley hard, minor flake Not enough information to	Surface site / profile with no measurement tape. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	Only surface is shown as brown. Not enough to change the GTE SPC Grey Dermosol
C36	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	UMA Amended
C37	Self-Mulching Brown Vertosol	1	Surface flake present Not enough information to confirm ASC.	Surface site / No profile. SLR assessment is based on minimimal infomration	Assess as adjacent Detailed site / UMA, unless it is obvious . Site only good for Surface check	Yes - But amendment of soiil profile assessment may be needed	SPC UMA Reviewed Agree, no ASC change.

Appendix G Project Central West Region Soil Sites

Project description

Project name:	Central West Region Salinity Investigations
Project status:	Data is from an active project and may be subject to change through additions/updates or further quality assessment processes
Location:	

Site characteristics

Date described:	24/06/2004	Observation type:	Relatively undisturbed soil core
Site Type:	Free survey site	Observation class:	Class IIIa (limited chemistry)
Slope (%):	1	Morphological type:	Crest
Slope type	Abney level or clinometer and tape	Landform element:	Crest
Geology:	Not recorded	Landform pattern:	Plain
Soil Name:	Not recorded	Substrate lithology:	Sandstone
Runoff:	Slow	Depth to free water:	Not recorded
Permeability:	Slowly permeable (5-50 mm/day)	Erosion:	Not recorded
Drainage:	Moderately well drained	Microrelief type:	Zero or none
Disturbance:	Limited clearing	Proportion gilgai:	N/A
Rock outcrop:	No bedrock exposed	Vertical interval (m):	N/A
Surface condition:	Periodic cracking; Self-mulching	Horizontal interval (m):	N/A
Surface coarse fragments:	Few (2-10%), detrital sedimentary rock (unidentified), medium pebbles (6-20 mm)	Microrelief component sampled:	N/A

Site location

Datum	Latitude (dd)	Longitude (dd)	Zone	Easting (m)	Northing (m)	Location accuracy (m)	Location measurement method
GDA 94	-23.67881	148.85534	55	689197	7380102	Not recorded	Averaging GNSS
GDA 2020	-23.67880	148.85535	55	689198	7380103		

Soil classification

Australian Soil Classification (ASC)	Confidence	ASC Technical Reference	Buried	GSG	PPF
Endocalcareous, Self-mulching, Black Vertosol; non-gravelly, fine, medium fine, moderate.	No analytical data are available but confidence is fair.	Isbell (1996) The Australian Soil Classification (First Edition)	N/A	Brown clay	Ug5.13

Vegetation

Community name	Mid-high open woodland, Acacia harpophylla	
Stratum	Species	Common name
Tallest 6.01-12 m	*Acacia harpophylla*	brigalow
	Brachychiton rupestris	narrow-leaved bottle tree, bottle tree, Queensland bottle tree

Profile morphology

No	Name	Upper depth (m)	Lower depth (m)	Colour	Mottles	Textures	Structures	Coarse fragments	Segregations	Strengths	Bounds
1	A11	0	0.05	Very dark greyish brown (10YR 3/2) moist	no mottles or other colour patterns mottle;	Light medium clay	Strong 5-10 mm Subangular blocky structure; Strong 2-5 mm Granular structure;	no coarse fragments;	No segregations;		clear
2	B21	0.05	0.3	Very dark greyish brown (10YR 3/2) moist	no mottles or other colour patterns mottle;	Medium clay	Strong 10-20 mm Angular blocky structure;	no coarse fragments;	No segregations;		gradual
3	B22	0.3	0.6	Dark brown (7.5YR 3/2) moist	no mottles or other colour patterns mottle;	Medium clay	Strong 10-20 mm Angular blocky structure; Strong 5-10 mm Subangular blocky structure;	no coarse fragments;	No segregations;		diffuse
4	B23	0.6	0.85	Dark brown (7.5YR 3/3) moist	no mottles or other colour patterns mottle;	Medium clay	Moderate 5-10 mm Lenticular structure;	no coarse fragments;	Very few (<2%) Fine (<2mm) Calcareous Nodules;		gradual

5	BC	0.85	1.05	Brown (7.5YR 4/4) moist	no mottles or other colour patterns mottle;		Moderate 2-5 mm Polyhedral structure;	abundant (50-90%) angular sandstone small pebbles (2-6 mm); common (10-20%) angular sandstone medium pebbles (6-20 mm);				gradual
6	C	1.05	1.2					very abundant (>90%) sandstone (size not recorded);				

Field test	
Field EC 1:5 soil/water dS/m	
Depth (m)	Value
0.01	.19
0.3	1.17
0.6	1.65
0.9	1.26

Field test	
pH by Raupach and Tucker method	
Depth (m)	Value
0.01	7.5
0.3	8.5
0.6	8.5
0.9	8.0

Notes			
Note level	Horizon name	Horizon no	Note
Observation			Disturbance data derived (in 2023) from remote sensing (aerial photography, satellite imagery). Accuracy of the disturbance value is influenced by accuracy of the site location and availability of imagery close to the date of site description.

Laboratory test results					
				Sample	1
				Upper depth (m)	0.5
				Lower depth (m)	0.6
Group	Method	Code	Units	Bulked Sample	N
Profile General	pH - 1:5 water	4A1			8.4
	EC - 1:5 water	3A1	dS/m		1.27
	Cl - 1:5 water - automated	5A2	mg/kg		1450
	Water sol NO3 - automated	7B1	mg/kg		4.40
Alcoholic Cations	Exch Ca - alcoh. NH4Cl, pH8.5, prewash	15C1_Ca	cmol_c/kg		16.60
	Exch Mg - alcoh. NH4Cl, pH8.5, prewash	15C1_Mg	cmol_c/kg		12.10
	Exch Na- alcoh. NH4Cl, pH8.5, prewash	15C1_Na	cmol_c/kg		7.40
	Exch K - alcoh. NH4Cl, pH8.5, prewash	15C1_K	cmol_c/kg		0.50
	CEC - alcoh. NH4Cl, pH8.5, prewash	15C1_CEC	cmol_c/kg		36.0
Other Cations	ESP (Exch. Na %)	15N1	%		21.0

Photo No: 140
Date: 4/04/2005
Title: S 293 Soil
Desc:



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Project SALTC Site 294 Observation 1

SALI4320

Project description

Project name:	Central West Region Salinity Investigations
Project status:	Data is from an active project and may be subject to change through additions/updates or further quality assessment processes
Location:	

Site characteristics

Date described:	24/06/2004	Observation type:	Relatively undisturbed soil core
Site Type:	Free survey site	Observation class:	Class IIIa (limited chemistry)
Slope (%):	1	Morphological type:	Simple slope
Slope type	Abney level or clinometer and tape	Landform element:	Plain
Geology:	Not recorded	Landform pattern:	Plain
Soil Name:	Not recorded	Substrate lithology:	Clay
Runoff:	Slow	Depth to free water:	Not recorded
Permeability:	Slowly permeable (5-50 mm/day)	Erosion:	Not recorded
Drainage:	Imperfectly drained	Microrelief type:	Normal gilgai
Disturbance:	Complete clearing - pasture - but never cultivated	Proportion gilgai:	Not recorded
Rock outcrop:	No bedrock exposed	Vertical interval (m):	0.15
Surface condition:	Periodic cracking; Self-mulching	Horizontal interval (m):	6
Surface coarse fragments:	Very few (<2%), silcrete, medium pebbles (6-20 mm)	Microrelief component sampled:	Not recorded

Site location

Datum	Latitude (dd)	Longitude (dd)	Zone	Easting (m)	Northing (m)	Location accuracy (m)	Location measurement method
GDA 94	-23.68673	148.85734	55	689390	7379222	Not recorded	Averaging GNSS
GDA 2020	-23.68672	148.85736	55	689391	7379223		

Soil classification

Australian Soil Classification (ASC)	Confidence	ASC Technical Reference	Buried	GSG	PPF
Endocalcareous-Endohypersodic, Self-mulching, Black Vertosol; non-gravelly, fine, medium fine, very deep.	No analytical data are available but confidence is fair.	Isbell (1996) The Australian Soil Classification (First Edition)	N/A	Brown clay	Ug5.15

Vegetation

Community name	Tall sparse shrubland, Acacia harpophylla	
Stratum	Species	Common name
Tallest 1.01-3.0 m	*Acacia harpophylla*	brigalow
Lowest	*Cenchrus ciliaris*	buffel grass

Profile morphology

No	Name	Upper depth (m)	Lower depth (m)	Colour	Mottles	Textures	Structures	Coarse fragments	Segregations	Strengths	Bounds
1	A11	0	0.05	Very dark greyish brown (2.5Y 3/2) moist	no mottles or other colour patterns mottle;	Light clay	Strong 5-10 mm Subangular blocky structure; Strong 2-5 mm Granular structure;	no coarse fragments;	No segregations;		gradual
2	B21	0.05	0.3	Very dark greyish brown (2.5Y 3/2) moist	no mottles or other colour patterns mottle;	Light medium clay	Strong 10-20 mm Angular blocky structure;	no coarse fragments;	No segregations;		diffuse
3	B22k	0.3	1	Very dark greyish brown (2.5Y 3/2) moist	no mottles or other colour patterns mottle;	Medium clay	Moderate 20-50 mm Subangular blocky structure; Moderate 5-10 mm Lenticular structure;	no coarse fragments;	Common (10-20%) Fine (<2mm) Calcareous Nodules; Few (2-10%) Medium (2-6 mm) Calcareous Nodules;		diffuse

4	B3	1	1.65	Dark brown (10YR 3/3) moist	common (10-20%) medium (5-15 mm) distinct brown mottle;	Medium clay	Moderate 5-10 mm Lenticular structure;	no coarse fragments;	Few (2-10%) Fine (<2mm) Calcareous Nodules; Few (2-10%) Medium (2-6 mm) Calcareous Soft segregations; Few (2-10%) Fine (<2mm) Manganiferous Veins;		

Field test

Field dispersion test as per LRO guideline (2012)

Depth (m)	Value
0.01	0
0.3	0
0.6	0
0.9	1
1.2	1
1.5	1

Field test

Field EC 1:5 soil/water dS/m

Depth (m)	Value
0.01	.27
0.3	2.33
0.6	2.18
0.9	2.5
1.2	2.55
1.5	2.39

Field test

pH by Raupach and Tucker method

Depth (m)	Value
0.01	7.0
0.3	8.5
0.6	8.5
0.9	8.5
1.2	8.5
1.5	8.0

Notes

Note level	Horizon name	Horizon no	Note
Observation			Disturbance data derived (in 2023) from remote sensing (aerial photography, satellite imagery). Accuracy of the disturbance value is influenced by accuracy of the site location and availability of imagery close to the date of site description.
Horizon	A11	1	B3 SODIC MEDIUM CLAY
Horizon	B3	4	B3 sodic medium clay

Laboratory test results

				Sample	1	2
				Upper depth (m)	0.2	0.8
				Lower depth (m)	0.3	0.9
Group	Method	Code	Units	Bulked Sample	N	N
Profile General	pH - 1:5 water	4A1			8.3	8.3
	EC - 1:5 water	3A1	dS/m		1.31	1.78
	Cl - 1:5 water - automated	5A2	mg/kg		1880	2330
	Water sol NO3 - automated	7B1	mg/kg		<1	<1
Alcoholic Cations	Exch Ca - alcoh. NH4Cl, pH8.5, prewash	15C1_Ca	cmol_c/kg		21.60	15.90
	Exch Mg - alcoh. NH4Cl, pH8.5, prewash	15C1_Mg	cmol_c/kg		7.85	9.18
	Exch Na- alcoh. NH4Cl, pH8.5, prewash	15C1_Na	cmol_c/kg		4.85	7.31
	Exch K - alcoh. NH4Cl, pH8.5, prewash	15C1_K	cmol_c/kg		0.46	0.38
	CEC - alcoh. NH4Cl, pH8.5, prewash	15C1_CEC	cmol_c/kg		38.0	36.0
Other Cations	ESP (Exch. Na %)	15N1	%		13.0	20.0

Photo No: 141
Date: 24/06/2004
Title: S 294 Soil
Desc: Black vertosol over clay sediments



Photo No: 142
Date: 24/06/2004
Title: S 294 Landscape
Desc: Cleared brigalow



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Appendix H Regional Frameworks SPC Assessments

Table AppJ-1: Summary of Land Suitability classes for 1Dn(Te), Representative Site D1

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	5	5	5	4	5	5	5	5	5	5	5	5	5	5
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	4	2	2	2	2	2	2	2	2	2	2	2	2	2
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	4M	1	1	2	1	1	1	1	1	1	1	1	1	1
Overall Suitability Class		5	5	4	5	5	5	5	5	5	5	5	5	5

Table AppJ-2: Summary of Land Suitability classes for 2Dn(Te), Representative Site D3

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	11	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Surface Condition (Ps)	4	2	2	2	2	2	2	2	2	2	2	2	2	2
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	4M	1	1	2	1	1	1	1	1	1	1	1	1	1
Overall Suitability Class		5	5	3	4	5	4	5	4	4	4	4	5	5

Table AppJ-3: Summary of Land Suitability classes for 3Bl(Te), Representative Site D5

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

Table AppJ-4: Summary of Land Suitability classes for 4Bl(Te)Representative Site D6

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	5	5	5	4	5	5	5	5	5	5	5	5	5	5
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		5	5	4	5	5	5	5	5	5	5	5	5	5

Table AppJ-5: Summary of Land Suitability classes for 5Dn(Ro), Representative Site D7

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	4S	2	2	2	2	2	2	2	2	2	2	2	2	2
Overall Suitability Class		5	5	3	4	5	4	5	4	4	4	4	5	5

Table AppJ-6: Summary of Land Suitability classes for 6Bl(Pg), Representative Site D12m

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	22	2	2	2	2	2	2	2	2	2	2	2	2	2
Soil Water Availability (M)[1]	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	4	2	2	2	2	2	2	2	2	2	2	2	2	2
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

1 – Soil water availability is based on the lowest PAWC of both the mound and depression, which is depression at 115.2 mm/100cms

Table AppJ-7: Summary of Land Suitability classes for 7Bl(Pg), Representative Site D14m

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	22	2	2	2	2	2	2	2	2	2	2	2	2	2
Soil Water Availability (M) [1]	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	4	2	2	2	2	2	2	2	2	2	2	2	2	2
Wetness (W)[2]	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

1 – Soil water availability is based on the lowest PAWC of both the mound and depression, which is depression at 106.8 mm/100cms
2 – Wetness assessed on depression site location, D14d

Table AppJ-8: Summary of Land Suitability classes for 8Dn(Te), Representative Site D19

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	41	3	3	3	3	3	3	3	3	3	3	3	3	3
Erosion Hazard (Es)	42	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3M	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Suitability Class		5	5	3	4	5	4	5	4	4	4	4	5	5

Table AppJ-9: Summary of Land Suitability classes for 9Dn(Ro), Representative Site D21

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	22	2	2	2	2	2	2	2	2	2	2	2	2	2
Soil Water Availability (M)	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

Table AppJ-10: Summary of Land Suitability classes for 10Ct(Ro), Representative Site D22

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	33	4	4	4	4	4	4	4	4	4	4	4	4	4
Soil Water Availability (M)	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

Table AppJ-11: Summary of Land Suitability classes for 11Bl(Ta), Representative Site D24

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	33	4	4	4	4	4	4	4	4	4	4	4	4	4
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	8	4	4	4	4	4	4	4	4	4	4	4	4	4
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	4S	2	2	2	2	2	2	2	2	2	2	2	2	2
Overall Suitability Class		5	5	4	4	5	4	5	4	4	4	4	5	5

Table AppJ-12: Summary of Land Suitability classes for 12Da(Te), Representative Site D32

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		5	5	4	4	5	4	5	4	4	4	4	5	5

Table AppJ-13: Summary of Land Suitability classes for 13Bl(Ta), Representative Site D36

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	31	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		5	5	4	4	5	4	5	4	4	4	4	5	5

Table AppJ-14: Summary of Land Suitability classes for 14Bl(Ro), Representative Site D37

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

Table AppJ-15: Summary of Land Suitability classes for 15Bl(Ro), Representative Site D39

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	~
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

Table AppJ-16: Summary of Land Suitability classes for 16Bl(Ta), Representative Site D43

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	5	5	5	4	5	5	5	5	5	5	5	5	5	5
Narrow Moisture Range (Pm)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	8	4	4	4	4	4	4	4	4	4	4	4	4	4
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	~
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		5	5	4	5	5	5	5	5	5	5	5	5	5

Table AppJ-17: Summary of Land Suitability classes for 17Bl(Ro), Representative Site D44

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	22	2	2	2	2	2	2	2	2	2	2	2	2	2
Soil Water Availability (M)	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		4	4	4	4	4	4	4	4	4	4	4	4	4

Table AppJ-18: Summary of Land Suitability classes for 18Bl(Ro), Representative Site D45

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Water Availability (M)	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3M	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Suitability Class		4	4	3	3	4	3	4	3	3	3	3	4	4

Table AppJ-19: Summary of Land Suitability classes for 19Bl(Ro), Representative Site D52

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		5	5	4	4	5	4	5	4	4	4	4	5	5

Table AppJ-20: Summary of Land Suitability classes for 20Bl(Ro), Representative Site D58

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Erosion Hazard (Es)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Water Availability (M)	4	5	5	3	4	5	4	5	4	4	4	4	5	5
Narrow Moisture Range (Pm)	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Surface Condition (Ps)	5	3	3	3	3	3	3	3	3	3	3	3	3	3
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	4M	1	1	2	1	1	1	1	1	1	1	1	1	1
Overall Suitability Class		5	5	3	4	5	4	5	4	4	4	4	5	5

Table AppJ-21: Summary of Land Suitability classes for 21Bl(Ta), Representative Site D59

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Soil Water Availability (M)	6	5	5	5	5	5	5	5	5	5	5	5	5	5
Narrow Moisture Range (Pm)	6	3	3	3	3	3	3	3	3	3	3	3	3	3
Surface Condition (Ps)	8	4	4	4	4	4	4	4	4	4	4	4	4	4
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	3S	4	4	4	4	4	4	4	4	4	4	4	4	4
Overall Suitability Class		5	5	5	5	5	5	5	5	5	5	5	5	5

Table AppJ-22: Summary of Land Suitability classes for 22Bl(Wy), Representative Site D65

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	22	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	21	1	1	1	1	1	1	1	1	1	1	1	1	1
Soil Water Availability (M)	5	5	5	4	5	5	5	5	5	5	5	5	5	5
Narrow Moisture Range (Pm)	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Surface Condition (Ps)	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Rockiness (R)	G2	1	1	1	1	1	1	1	1	1	1	1	1	1
Microrelief (Tm)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wetness (W)	4M	1	1	2	1	1	1	1	1	1	1	1	1	1
Overall Suitability Class		5	5	4	5	5	5	5	5	5	5	5	5	5

Appendix I Beef Cattle Grazing Suitability Assessment

Table AppK-1: Summary of Beef Cattle Grazing Land Suitability Classes for SPCs

SPC / Class III Site	Water Availability	Nutrient Def	Physical Factors	Salinity	Rockiness	Gilgai	pH	ESP	Wetness	Topography	Water erosion	Flooding	Beef Cattle Grazing Class
1Dn(Te) / D1	4	4	2	3	1	-	3	1	1	-	1	1	**4**
2Dn(Te) / D3	3	1	2	4	1	-	2	1	1	-	1	1	**4**
3Bl(Te) / D5	1	4	1	3	1	-	2	1	1	-	1	1	**4**
4Bl(Te) / D6	4	3	3	3	1	-	2	1	1	-	1	1	**4**
5Dn(Ro) / D7	3	4	3	3	1	-	3	1	1	-	1	1	**4**
6Bl(Pg) / D12m/d	2	3	3	5	1	1	3	1	1	-	1	1	**5**
7Bl(Pg) / d14m/d	2	1	3	5	1	1	2	1	1	-	1	1	**5**
8Dn(Te) / D19	3	3	3	4	1	-	3	1	1	-	1	1	**4**
9Dn(Ro) / D21	2	3	3	4	1	-	3	1	1	-	1	1	**4**
10Ct(Ro) / D22	2	3	3	4	1	-	3	1	1	4	1	2	**4**
11Bl(Ta) / D24	3	3	2	3	1	-	2	1	1	-	2	1	**3**
12Da(Te) / D32	3	3	1	2	1	-	2	1	2	-	1	1	**3**
13Bl(Ta) / D36	3	4	1	3	1	-	3	1	1	-	1	1	**4**
14Bl(Ro) / D37	2	4	3	2	1	-	3	1	1	-	1	1	**4**
15Bl(Ro) / D39	2	4	3	3	1	-	2	1	1	-	1	1	**4**
16Bl(Ta) / D43	4	3	2	3	1	-	2	1	1	-	2	1	**4**
17Bl(Ro) / D44	2	4	3	3	1	-	2	1	1	-	1	1	**4**
18Bl(Ro) / D45	2	3	3	3	1	-	2	1	1	-	1	1	**3**
19Bl(Ro) / D52	3	4	3	3	1	-	2	1	1	-	1	1	**4**
20Bl(Ro) / D58	3	4	3	3	1	-	3	1	1	-	1	1	**4**
21Bl(Ta) / D59	5	4	2	1	1	-	2	1	2	-	2	1	**5**
22Bl(Wy) / D65	4	3	1	1	1	-	2	1	1	-	1	1	**3**

Appendix J Regional Frameworks UMA Assessments

Table AppL-1: Land Suitability Classes, Limitation and Crop Land Assessment UMAs distinct from SPCs

UMA	SPC	Key Site/s Reviewed	UMA Confidence Code	Cropping Land Use Limitations and Assessment	Beef Cattle Grazing Land Use Limitations and Assessment	Agricultural Land Use Classification Land Use Limitations and Assessment
1	1Dn(Te)	D1 (Analysed Site)[1]	1	-		
2	2Dn(Te)	D55	1	No limitation amendments to SPC UMA		
3	2Dn(Te)	D3 (Analysed Site)	1	-		
4	2Dn(Te)	B15 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
5	2Dn(Te)	B11 (SLR, 2023), C38, C39	2	Incipient gilgai reported, none present in photo or satellite imagery review. Soil profile indicates weathered substrate at 0.85 mbgl. PAWC would likely be impacted, which would reduce it slightly. The amount cannot be accurately assessed, however it is based on site D3 PAWC at 0.90 mbgl (SALFPredict, 2025), the PAWC would be below 75 mm/100cm C38 indicated soil profile depth of 0.80 mbgl C39 indicated soil profile depth of 0.80 mbgl Limitation Amendments to SPC UMA		
				Soil water availability updated in Table AppL-2	No limitation amendments to UMA	ALC updated in Table AppL-3
6	2Dn(Te)	B04 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
7	2Dn(Te)	B03 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. Soil profile indicates weathered substrate at 0.40 mbgl. PAWC would likely be impacted, which would reduce it slightly. The amount cannot be accurately assessed, however it is based on site D3 PAWC at 0.40 mbgl (SALFPredict, 2025), the PAWC would be 46 mm/100cm		
				Soil water availability updated in Table AppL-4	Water availability limitation updated in Table AppL-5	ALC updated in Table AppL-6
8	2Dn(Te)	SLR Site B27	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
9	3Bl(Te)	D5 (Analysed site)	1	-		
10	4Bl(Te)	D20	1	No limitation amendments to SPC UMA		
11	4Bl(Te)	D6 (Analysed site)	1	-		
12	8Dn(Te)	C18	1	Soil profile indicates weathered substrate at 0.85 mbgl. PAWC would likely be impacted, which would reduce it slightly. The amount cannot be accurately assessed, however it is based on site D19 PAWC at 0.50 mbgl (SALFPredict, 2025), the PAWC would be below 66.7 mm/100cm		
				Soil water availability updated as Table AppL-7	Limitation assessed in Table AppL-8, no change	ALC updated in Table AppL-9
13	5Dn(Ro)	D42	1	Soil profile indicates weathered substrate at 0.85 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed, however it is based on site D7 PAWC at 0.85 mbgl (SALFPredict, 2025), the PAWC		

UMA	SPC	Key Site/s Reviewed	UMA Confidence Code	Cropping Land Use Limitations and Assessment	Beef Cattle Grazing Land Use Limitations and Assessment	Agricultural Land Use Classification Land Use Limitations and Assessment
				would be above 97 mm/100cm, calculated at 0.70 mbgl. It is assumed that the PAWC would be above 100 mm100cm and has been assessed as this.		
				Soil water availability assessed in Table AppL-10, no change	Water availability limitation assessed in Table AppL-11, no change	No updates for cropping or beef cattle grazing, therefore no update to ALC
14	5Dn(Ro)	D7 (Analysed Site)	1	-		
15	17Bl(Ro)	D26	1	Slope is reported as 2.0 / 2.0 %. This impacts the water erosion and erosion hazard for cropping.		
				Soil water availability assessed in Table AppL-12, no change	-	No updates for cropping therefore no update to ALC
16	5Dn(Ro)	D50	1	Soil profile indicates weathered substrate at 0.95 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed, however it is based on site D7 PAWC at 0.85 mbgl (SALFPredict, 2025), the PAWC would be above 97 mm/100cm, calculated at 0.70 mbgl. It is assumed that the PAWC would be above 100 mm100cm and has been assessed as this.		
				Soil water availability assessed in Table App-10, no change	Water availability limitation assessed in Table AppL-11, no change	No updates for cropping or beef cattle grazing, therefore no update to ALC
17	5Dn(Ro)	D33	1	Soil profile indicates weathered substrate at 0.90 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed, however it is based on site D7 PAWC at 0.85 mbgl (SALFPredict, 2025), the PAWC would be above 97 mm/100cm, calculated at 0.70 mbgl. It is assumed that the PAWC would be above 100 mm100cm and has been assessed as this.		
				Soil water availability assessed in Table App-10, no change	Water availability limitation assessed in Table AppL-11, no change	No updates for cropping or beef cattle grazing, therefore no update to ALC
18	6Bl(Pg)	D12m/d (Analysed Site)	1	-		
19	6Bl(Pg)	D9m/d	1	Slope is reported as 2.0 / 2.0 %. This impacts the water erosion and erosion hazard for cropping.		
				Soil water availability assessed in Table AppL-10, no change	-	No updates for cropping therefore no update to ALC
20	6Bl(Pg)	C28	1	Boundary of UMA, no assessment undertaken		
21	6Bl(Pg)	C26	1	No limitation amendments to SPC UMA		
22	6Bl(Pg)	C3	1	No limitation amendments to SPC UMA		
23	6Bl(Pg)	C5	1	No limitation amendments to SPC UMA		
24	7Bl(Pg)	C18	2	Boundary of UMA, no assessment undertaken		

UMA	SPC	Key Site/s Reviewed	UMA Confidence Code	Cropping Land Use Limitations and Assessment	Beef Cattle Grazing Land Use Limitations and Assessment	Agricultural Land Use Classification Land Use Limitations and Assessment
25	7Bl(Pg)	D14m/d (Analysed site)	1	-		
26	7Bl(Pg)	D15	1	No limitation amendments to SPC UMA		
27	7Bl(Pg)	-	5	No limitation amendments to SPC UMA		
28	7Bl(Pg)	C22	1	Slope is reported as 2.0 / 2.0 %. This impacts the water erosion and erosion hazard for cropping.		
				Soil water availability assessed in Table AppL-14, no change	-	No updates for cropping therefore no update to ALC
29	8Dn(Te)	C35	1	Site has no recovery of soil at 0.50 m not refusal. Based on the assessment of the field site, this isn't an indicator of refusal therefore no amendment to soil profile or PAWC will be undertaken. No limitation amendments to SPC UMA		
30	8Dn(Te)	D19 (Analysed site)	1	-		
31	8Dn(Te)	D34	1	No limitation amendments to SPC UMA		
32	16Bl(Ta)	C24	1	No limitation amendments to SPC UMA		
33	9Dn(Ro)	D21 (Analysed site)	1	-		
34	9Dn(Ro)	D28	1	No limitation amendments to SPC UMA		
35	14Bl(Ro)	D37 (Analysed site)	1	-		
36	9Dn(Ro)	B33, B34 (SLR, 2023)	2	Incipient / crabhole gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
37	9Dn(Ro)	B19, B23 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
38	9Dn(Ro)	B16 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
39	9Dn(Ro)	B14 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
40	9Dn(Ro)	B13 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
41	9Dn(Ro)	B13 (SLR, 2023)	2	Incipient linear gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
42	9Dn(Ro)	B29, B30 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review.		

UMA	SPC	Key Site/s Reviewed	UMA Confidence Code	Cropping Land Use Limitations and Assessment	Beef Cattle Grazing Land Use Limitations and Assessment	Agricultural Land Use Classification Land Use Limitations and Assessment
				Slope at Site B30 indicates 3%, but on review this is likely a simple, short slope within the drainage line. GTE has assessed this as not representative of the UMA as a whole, and therefore will not be assessed. No limitation amendments to SPC UMA		
43	10Ct(Ro)	D27	1	No limitation amendments to SPC UMA		
44	10Ct(Ro)	D21 (Analysed site), D22, D23, D30, D47, D48, D53, D60	1	No limitation amendments to SPC UMA		
45	10Ct(Ro)	D25, D31	1	No limitation amendments to SPC UMA		
46	10Ct(Ro)	D16	1	No limitation amendments to SPC UMA		
47	10Ct(Ro)	D17	1	No limitation amendments to SPC UMA		
48	10Ct(Ro)	D54, C69	1	Site c69 indicates one single gilgai in the area. As no other gilgai were observed, this was considered sub-dominant of the UMA and unmappable. No limitation amendments to SPC UMA		
49	11Bl(Ta)	C22	1	Site has no recovery of soil at 0.60 m not refusal. Based on the assessment of the field site, this isn't an indicator of refusal therefore no amendment to soil profile or PAWC will be undertaken. No limitation amendments to SPC UMA.		
50	11Bl(Ta)	C34	1	Soil profile indicates weathered substrate at 0.68 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed, however it is based on site D24 PAWC at 0.80 mbgl (SALFPredict, 2025), the PAWC would be 72.6 mm/100cm, calculated at 0.70 mbgl.		
				Soil water availability assessed in Table App-15	Water availability limitation assessed in Table AppL-16	ALC updated in Table AppL-17
51	11Bl(Ta)	C34	1	Soil profile indicates weathered substrate at 0.45 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed, however it is based on site D24 PAWC at 0.80 mbgl (SALFPredict, 2025), the PAWC would be 55.26 mm/100cm, calculated at 0.50 mbgl.		
				Soil water availability assessed in Table App-15	Water availability limitation assessed in Table AppL-16	ALC updated in Table AppL-17
52	11Bl(Ta)	D24 (Analysed site)	1	-		
53	11Bl(Ta)	C23	1	Soil profile indicates weathered substrate at 0.80 mbgl. PAWC would not be impacted. The PAWC falls within existing cropping and beef cattle grazing PAWC. No limitation amendments to SPC UMA		
54	11Bl(Ta)	C37	1	Soil profile indicates weathered substrate at 0.80 mbgl. PAWC would not be impacted. The PAWC falls within existing cropping and beef cattle grazing PAWC. No limitation amendments to SPC UMA		

UMA	SPC	Key Site/s Reviewed	UMA Confidence Code	Cropping Land Use Limitations and Assessment	Beef Cattle Grazing Land Use Limitations and Assessment	Agricultural Land Use Classification Land Use Limitations and Assessment
55	11Bl(Ta)	C57	2	Profile of the soil exposure presents weathered substrate. A ruler measurement is within the photo, however notes indicate approximately 0.80 of soil from surface to the weathered substrate. Soil profile indicates weathered substrate at 0.80 mbgl. PAWC would not be impacted. The PAWC falls within existing cropping and beef cattle grazing PAWC. No limitation amendments to SPC UMA		
56	11Bl(Ta)	C6	1	Soil profile indicates weathered substrate at 0.80 mbgl. PAWC would not be impacted. The PAWC falls within existing cropping and beef cattle grazing PAWC. No limitation amendments to SPC UMA		
57	12Da(Te)	D32 (Analysed site)	1	-		
58	12Da(Te)	C30	1	No limitation amendments to SPC UMA		
59	13Bl(Ta)	C4	1	No limitation amendments to SPC UMA		
60	13Bl(Ta)	C14	1	No limitation amendments to SPC UMA		
61	13Bl(Ta)	D36 (Analysed site)	1	-		
62	15Bl(Ro)	C9	1	No limitation amendments to SPC UMA		
63	15Bl(Ro)	D10, D11, D61, D66, C10, C13	1	Soil profile for site D11 indicates weathered substrate at 0.90 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed, however it is based on site D36 PAWC at 1.00 mbgl (SALFPredict, 2025), the PAWC would be 94.10 mm/100cm, calculated at 0.90 mbgl. Based on the review of the entire UMA and overall depths of the key sites, both Class I and IV(a), it is assessed that this depth is an anomaly. It is assessed the overall UMA falls within existing cropping and beef cattle grazing PAWC, No limitation amendments to SPC UMA		
64	15Bl(Ro)	D8, D13	1	No limitation amendments to SPC UMA		
65	15Bl(Ro)	D39	1	No limitation amendments to SPC UMA		
66	15Bl(Ro)	D2	1	No limitation amendments to SPC UMA		
67	16Bl(Ta)	D43 (Analysed site)	1	-		
68	16Bl(Ta)	C28	1	Soil profile indicates weathered substrate at 0.60 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed, however it is based on site D43 PAWC at 0.40 mbgl (SALFPredict, 2025), the PAWC would be above 60.3 mm/100cm, calculated at 0.40 mbgl. It is assumed that the PAWC would be above 60 and below 75 mm/100cm and has been assessed as this. The assumed PAWC falls within existing cropping and beef cattle grazing PAWC. No limitation amendments to SPC UMA		
69	16Bl(Ta)-	C27	1	Soil profile indicates weathered substrate at 0.50 mbgl. PAWC would likely be impacted, which would increase. The amount cannot be accurately assessed,		

UMA	SPC	Key Site/s Reviewed	UMA Confidence Code	Cropping Land Use Limitations and Assessment	Beef Cattle Grazing Land Use Limitations and Assessment	Agricultural Land Use Classification Land Use Limitations and Assessment
				however it is based on site D43 PAWC at 0.40 mbgl (SALFPredict, 2025), the PAWC would be above 60.3 mm/100cm, calculated at 0.40 mbgl. It is assumed that the PAWC would be above 60 and below 75 mm/100cm and has been assessed as this. The assumed PAWC falls within existing cropping and beef cattle grazing PAWC. No limitation amendments to SPC UMA		
70	17Bl(Ro)	D41	1	No limitation amendments to SPC UMA		
71	17Bl(Ro)	D29	1	Slope is reported as 2.0 / 2.0 %. This impacts the water erosion and erosion hazard for cropping.		
				Soil water availability assessed in Table AppL-18, no change	-	No updates for cropping, therefore no update to ALC
72	17Bl(Ro)	C33, D38, D46 B07 (SLR, 2023)	1	Incipient gilgai reported, none present in photo or satellite imagery review. Slope is reported as 2.0 / 2.0 %. This impacts the water erosion and erosion hazard for cropping.		
				Soil water availability assessed in Table AppL-18, no change	-	No updates for cropping, therefore no update to ALC
73	17Bl(Ro)	D44 (Analysed site), B01 (SLR, 2023)	1	-		
74	18Bl(Ro)	D45 (Analysed site)	1	-		
75	19Bl(Ro)	D49, D52 (Analysed site)	1	-		
76	19Bl(Ro)	B22 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. Slope is reported as 2.0 %. This impacts the water erosion and erosion hazard for cropping.		
				Soil water availability assessed in Table AppL-19, no change	-	No updates for cropping, therefore no update to ALC
77	19Bl(Ro)	D18	1	Slope is reported as 2.0 / 2.0 %. This impacts the water erosion and erosion hazard for cropping.		
				Soil water availability assessed in Table AppL-19, no change	-	No updates for cropping, therefore no update to ALC
78	19Bl(Ro)	D62, D63, D64, B35 (SLR, 2023)	1	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		
79	19Bl(Ro)	C11, C12	1	No limitation amendments to SPC UMA		
80	19Bl(Ro)	B18 (SLR, 2023)	2	Incipient gilgai reported, none present in photo or satellite imagery review. No limitation amendments to SPC UMA		

UMA	SPC	Key Site/s Reviewed	UMA Confidence Code	Cropping Land Use Limitations and Assessment	Beef Cattle Grazing Land Use Limitations and Assessment	Agricultural Land Use Classification Land Use Limitations and Assessment
81	20Bl(Ro)	D58 (Analysed site)	1	-		
82	21Bl(Ta)	D59 (Analysed site) B21 (SLR, 2023)	1	-		
83	22Bl(Wy)	D65 (Analysed site)	1	-		

1- Analysed sites are already assessed, as per Appendix X and X, therefore no further assessment is required for the UMA it occupies.

Table AppL-2: UMA 5 Re-assessment for 2Dn(Te)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Soil Water Availability (M)	5	5	5	4	5	5	5	5	5	5	5	5	5	5
Overall Suitability Class		5	5	4	5	5	5	5	5	5	5	5	5	5

Table AppL-3: UMA 5 Re-assessment for 2Dn(Te)

ALC	UMA
C2	UMA 5

Table AppL-4: UMA 7 Re-assessment for 2Dn(Te)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Soil Water Availability (M)	6	5	5	5	5	5	5	5	5	5	5	5	5	5
Overall Suitability Class		5	5	5	5	5	5	5	5	5	5	5	5	5

Table AppL-5: UMA 7 Re-assessment for 2Dn(Te)

Water Availability[1]	Nutrient Def	Physical Factors	Salinity[2]	Rockiness	Gilgai	pH	ESP	Wetness	Topography	Water erosion	Flooding	Beef Cattle Grazing Class
5	-	-	-	-	-	-	-	-	-	-	-	**5**

Table AppL-6: UMA 7 Re-assessment for SPC 2

ALC	SPC
C3	SPC 2

Table AppL-7: UMA 12 Re-assessment for 8Dn(Te)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Soil Water Availability (M)	5	5	5	4	5	5	5	5	5	5	5	5	5	5
Overall Suitability Class		5	5	4	5	5	5	5	5	5	5	5	5	5

Table AppL-8: UMA 12 Re-assessment for 8Dn(Te)

Water Availability	Nutrient Def	Physical Factors	Salinity[2]	Rockiness	Gilgai	pH	ESP	Wetness	Topography	Water erosion	Flooding	Beef Cattle Grazing Class
4	-	-	-	-	-	-	-	-	-	-	-	**4**

Table AppL-9: UMA 12 Re-assessment for 8Dn(Te)

ALC	SPC
C2	SPC 8

Table AppL-10: UMAs 13, 16, 17 Re-assessment for 5Dn(Ro)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Soil Water Availability (M)	3	4	4	3	3	4	3	4	3	3	3	3	4	4
Overall Suitability Class[1]		4	4	4	4	4	4	4	4	4	4	4	4	4

1- Wetness limitation indicates higher overall suitability class

Table AppL-11: UMAs 13, 16, 17 Re-assessment for 5Dn(Ro)

Water Availability[1]	Nutrient Def	Physical Factors	Salinity[2]	Rockiness	Gilgai	pH	ESP	Wetness	Topography	Water erosion	Flooding	Beef Cattle Grazing Class
2	4	4	3	3	1	-	3	1	1	-	1	**4**

Table AppL-12: UMA 15 Re-assessment for 17Bl(Ro)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Suitability Class[1]		4	4	3	3	4	3	4	3	3	3	3	4	4

1- Soil water availability limitation indicates higher overall suitability class

Table AppL-13: UMA 19 Re-assessment for 6Bl(Pg)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Suitability Class[1]		4	4	4	4	4	4	4	4	4	4	4	4	4

1- Wetness limitation indicates higher overall suitability class

Table AppL-14: UMA 28 Re-assessment for 7Bl(Pg)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Suitability Class[1]		4	4	4	4	4	4	4	4	4	4	4	4	4

1- Wetness limitation indicates higher overall suitability class

Table AppL-15: UMA 50, 51 Re-assessment for 11Bl(Ta)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Soil Water Availability (M)	5	5	5	4	5	5	5	5	5	5	5	5	5	5
Overall Suitability Class[1]		5	5	4	5	5	5	5	5	5	5	5	5	5

Table AppL-16: UMA 50, 51 Re-assessment for 11Bl(Ta)

Water Availability[1]	Nutrient Def	Physical Factors	Salinity[2]	Rockiness	Gilgai	pH	ESP	Wetness	Topography	Water erosion	Flooding	Beef Cattle Grazing Class
4	3	2	3	1	-	2	1	1	-	2	1	**4**

Table AppL-17: UMA 50, 51 Re-assessment for 11Bl(Ta)

ALC	UMA
C2	50, 51

Table AppL-18: UMAs 71, 72 Re-assessment for 17Bl(Ro)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Suitability Class[1]		4	4	3	3	4	3	4	3	3	3	3	4	4

1- Soil water availability limitation indicates higher overall suitability class

Table AppL-19: UMAs 76, 77 Re-assessment for 19Bl(Ro)

Limitation Categories	Limitation Value	Suitability subclasses for different land uses												
		Barley	Chickpea	Cotton	Maize	Millet	Mung bean	Oat	Safflower	Sorghum	Soybean	Sunflower	Triticale	Wheat
Water Erosion (E)	31	2	2	2	2	2	2	2	2	2	2	2	2	2
Erosion Hazard (Es)	32	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Suitability Class[1]		5	5	4	4	5	4	5	4	4	4	4	5	5

1- Soil water availability and wetness limitations indicates higher overall suitability class

Appendix K Crop Land Use Yield Assessments

Table AppM-1: Summary of Crop Land Use Assessment against Plant Salt-Tolerance Data (DERM, 2011)

SPC	Sample ID:	Electrical Conductivity (dS/m)	ECse (dS/m) (SALFPREDICT)	Root Depth Observed (m) - Class III Site	Crops	Barley	Cotton	Maize	Oat	Safflower	Sorghum	Soybean	Sunflower	Wheat
					90% Yield (Ecse, dS/m)	10	9.6	2.5	5.5	-	7.4	5.5	5.9	7.4
					75% Yield (Ecse, dS/m)	13	12.5	3.8	6.3	-	8.4	6.3	6.5	9.5
					50% Yield (Ecse, dS/m)	18	17.3	5.9	7.5	-	9.9	7.5	7.5	13
1Dn(Te)	D1-0.00-0.10	0.17	1.0	0.40				90% Yield		-				
	D1-0.20-0.30	0.67	5.5						90% Yield	-		90% Yield		
	D1-0.50-0.60	0.71	6.5			90% Yield	90% Yield	75% Yield		-	90% Yield	75% Yield	90% Yield	90% Yield
2Dn(Te)	D3-0.00-0.10	0.04	0.7	1.00m						-				
	D3-0.20-0.30	0.09	1.4							-				
	D3-0.50-0.60	1.42	3.0					90% Yield		-				
	D3-0.70-0.80	2.71	3.5							-				
	D3-0.90-1.00	3.11	3.4			90% Yield	90% Yield		90% Yield	-	90% Yield	90% Yield	90% Yield	90% Yield
3Bl(Te)	D5-0.00-0.10	0.13	1.1	1.80m						-				
	D5-0.20-0.30	0.35	2.5							-				
	D5-0.50-0.60	0.46	2.8							-				
	D5-0.80-0.90	1.00	2.8							-				
	D5-1.00-1.10	0.97	8.1							-		50% Yield	50% Yield	90% Yield
	D5-1.40-1.50	1.00	7.9							-				
	D5-1.70-1.80	0.88	8.7			90% Yield	90% Yield	90% Yield	90% Yield	-	90% Yield			
4Bl(Te)	D6-0.00-0.10	0.07	0.6	1.00m						-				
	D6-0.20-0.30	0.39	2.7					90% Yield		-				
	D6-0.50-0.60	0.51	3.8					75% Yield		-				
	D6-0.80-0.90	0.91	7.8					50% Yield	50% Yield	-	90% Yield	50% Yield	50% Yield	90% Yield
	D6-1.00-1.10	0.91	8.1			90% Yield	90% Yield			-				
5Dn(Ro)	D7-0.00-0.10	0.16	0.8	0.60										
	D7-0.20-0.30	0.23	1.2											
	D7-0.50-0.60	0.58	4.7			90% Yield	90% Yield	75% Yield	90% Yield	-	90% Yield	75% Yield	90% Yield	90% Yield
6Bl(Pg)	D12m-0.00-0.10	0.33	2.6	1.80				90% Yield	50% Yield	-	90% Yield	90% Yield	90% Yield	90% Yield
	D12m-0.20-0.30	1.10	9.5					50% Yield		-	75% Yield	50% Yield	50% Yield	50% Yield
	D12m-0.50-0.60	1.50	11.5			90% Yield	90% Yield			-	50% Yield			
	D12m-0.80-0.90	2.00	15.2			75% Yield	75% Yield			-				
	D12m-1.10-1.20	2.10	19.0			50% Yield	50% Yield			-				
	D12m-1.40-1.50	1.90	17.1							-				
	D12m-1.70-1.80	2.30	19.9							-				
7Bl(Pg)	D14m-0.00-0.10	0.13	1.1	1.80						-				
	D14m-0.20-0.30	0.62	5.6					75% Yield	90% Yield	-	90% Yield	90% Yield	90% Yield	
	D14m-0.50-0.60	0.49	4.9							-				
	D14m-0.80-0.90	1.90	16.4			75% Yield	75% Yield	50% Yield	50% Yield	-	50% Yield	50% Yield	50% Yield	50% Yield
	D14m-1.10-1.20	1.90	15.4							-				
	D14m-1.40-1.50	1.90	15.4							-				
	D14m-1.70-1.80	2.10	17.5				50% Yield			-				
8Dn(Te)	D19-0.00-0.05	0.10	0.5	0.90						-				
	D19-0.20-0.30	0.15	0.7							-				
	D19-0.40-0.50	0.21	1.7							-				
	D19-0.50-0.60	0.76	6.9					50% Yield	75% Yield	-		75% Yield	75% Yield	
	D19-0.80-0.90	0.38	3.5			90% Yield	90% Yield			-	90% Yield			90% Yield
9Dn(Ro)	D21-0.00-0.10	0.11	-	1.80						-				
	D21-0.20-0.30	0.80	6.5					50% Yield	75% Yield	-		75% Yield	75% Yield	
	D21-0.50-0.60	1.20	10.4			90% Yield	90% Yield			-	50% Yield	50% Yield	50% Yield	75% Yield
	D21-0.80-0.90	1.10	8.5							-				
	D21-1.10-1.20	1.30	11.6							-				
	D21-1.40-1.50	1.10	9.3							-				
	D21-1.70-1.80	0.83	7.6							-				
10Ct(Ro)	D22-0.00-0.10	0.16	1.1	1.80						-				
	D22-0.20-0.30	0.26	1.1							-				
	D22-0.50-0.60	0.80	5.8					75% Yield	90% Yield	-		90% Yield		
	D22-0.80-0.90	1.06	7.6					50% Yield	75% Yield	-	90% Yield	50% Yield	50% Yield	90% Yield
	D22-1.00-1.10	0.92	9.3						50% Yield	-	75% Yield			
	D22-1.30-1.40	0.95	9.1							-				
	D22-1.60-1.70	0.92	8.9							-				

11Bl(Ta)	D24-0.00-0.10	0.06	**0.5**	0.90							-				
	D24-0.20-0.30	0.68	**5.8**					75% Yield	90% Yield		-		90% Yield		
	D24-0.50-0.60	0.68	**6.1**					50% Yield	75% Yield		-			90% Yield	
	D24-0.80-0.90	0.54	**4.6**								-				
12Da(Te)	D32-0.00-0.10	0.05	**0.3**	1.80							-				
	D32-0.20-0.30	0.04	**0.6**								-				
	D32-0.50-0.60	0.13	**1.5**								-				
	D32-0.80-0.90	0.50	**4.0**					75% Yield			-				
	D32-1.10-1.20	0.71	**5.2**								-				
	D32-1.40-1.50	0.89	**6.5**					50% Yield	90% Yield		-		90% Yield	90% Yield	
	D32-1.70-1.80	1.10	**8.1**						50% Yield		-	90% Yield	50% Yield	50% Yield	90% Yield
13Bl(Ta)	D36-0.00-0.10	0.07	**0.3**	1.80							-				
	D36-0.20-0.30	0.20	**1.0**								-				
	D36-0.50-0.60	0.41	**3.1**					90% Yield			-				
	D36-0.80-0.90	0.56	**4.9**					75% Yield			-				
	D36-1.10-1.20	0.53	**4.8**								-				
	D36-1.40-1.50	0.49	**4.7**								-				
	D36-1.70-1.80	0.29	**3.5**								-				
14Bl(Ro)	D37-0.00-0.10	0.13	**0.6**	1.80							-				
	D37-0.20-0.30	0.16	**1.8**								-				
	D37-0.50-0.60	0.30	**2.0**								-				
	D37-0.80-0.90	0.69	**5.1**					75% Yield			-				
	D37-1.10-1.20	1.00	**9.5**						50% Yield		-	75% Yield	50% Yield	50% Yield	75% Yield
	D37-1.40-1.50	0.81	**6.9**								-				
	D37-1.70-1.80	0.81	**7.0**								-				
15Bl(Ro)	D39-0.00-0.10	0.07	**0.4**	1.80							-				
	D39-0.20-0.30	0.20	**1.1**								-				
	D39-0.50-0.60	0.36	**2.8**					90% Yield			-				
	D39-0.80-0.90	0.86	**6.9**					50% Yield	75% Yield		-		75% Yield	75% Yield	
	D39-1.10-1.20	0.78	**6.3**								-				
16Bl(Ta)	D43-0.00-0.10	0.09	**1.0**	1.80							-				
	D43-0.10-0.20	0.22	**1.8**								-				
	D43-0.20-0.30	0.32	**2.4**								-				
17Bl(Ro)	D44-0.00-0.10	0.15	**0.8**	1.80							-				
	D44-0.10-0.20	0.13	-								-				
	D44-0.20-0.30	0.40	**1.0**								-				
	D44-0.50-0.60	0.61	**2.9**					90% Yield			-				
	D44-0.80-0.90		**2.9**								-				
	D44-1.10-1.20	0.68	**5.2**					75% Yield			-				
18Bl(Ro)	D45-0.00-0.10	0.09	**0.7**	1.80							-				
	D45-0.20-0.30	0.08	**0.4**								-				
	D45-0.50-0.60	0.31	**2.3**												
	D45-0.80-0.90	0.58	**4.9**					75% Yield			-				
	D45-1.10-1.20	0.57	**4.8**								-				
	D45-1.40-1.50	0.54	**4.7**								-				
	D45-1.70-1.80	0.47	**4.0**								-				
19Bl(Ro)	D52-0.00-0.10	0.04	**0.2**	1.80							-				
	D52-0.20-0.30	0.05	**0.6**								-				
	D52-0.50-0.60	0.45	**3.8**					75% Yield							
	D52-0.80-0.90	0.69	**6.7**					50% Yield	75% Yield		-		75% Yield	75% Yield	
	D52-1.10-1.20	0.85	**7.2**								-				
	D52-1.40-1.50	0.80	**8.1**						50% Yield		-	90% Yield	50% Yield	50% Yield	90% Yield
	D52-1.70-1.80	0.74	**7.0**								-				
20Bl(Ro)	D58-0.00-0.10	0.10	**0.5**	0.80							-				
	D58-0.20-0.30	0.22	**1.5**								-				
	D58-0.50-0.60	0.56	**4.5**					75% Yield			-				
	D58-0.70-0.80	0.58	**4.9**								-				
21Bl(Ta)	D59-0.00-0.10	0.07	-	1.80							-				
	D59-0.20-0.30	0.05	**0.2**								-				
	D59-0.50-0.60	0.13	**0.9**								-				
	D59-0.80-0.90	0.73	**3.0**					90% Yield			-				
	D59-1.10-1.20	0.48	**4.3**					75% Yield	75% Yield		-		75% Yield	75% Yield	
	D59-1.40-1.50	0.69	**6.5**					50% Yield			-				
	D59-1.70-1.80	0.55	**5.1**								-				
22Bl(Wy)	D65-0.00-0.05	0.06	**0.4**	1.00							-				
	D65-0.10-0.20	0.06	-								-				
	D65-0.20-0.30	0.05	**0.4**								-				
	D65-0.50-0.60	0.13	**1.2**								-				
	D65-0.80-0.90	0.32	**3.1**					90% Yield			-				

Appendix L Laboratory Certificates

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Eurofins APAL Test Method Codes												
Crop	Actual Crop	SubmissionID	SamplingDate	DateReceived	BatchID	Batch Position No.	AgentName	ClientName	SampleName	Barcode	SampleDepth	Postcode
		147219		2025-11-20	46601	36	GT Environmental - Reece McCann	BWN	D3-0.00-0.10	111981004	0-0.1	4120
		147219		2025-11-20	46601	25	GT Environmental - Reece McCann	BWN	D3-0.20-0.30	111981005	0.2-0.3	4120
		147219		2025-11-20	46601	40	GT Environmental - Reece McCann	BWN	D3-0.50-0.60	111981006	0.5-0.6	4120
		147219		2025-11-20	46601	31	GT Environmental - Reece McCann	BWN	D3-0.70-0.80	111981007	0.7-0.8	4120
		147219		2025-11-20	46601	43	GT Environmental - Reece McCann	BWN	D3-0.90-1.00	111981008	0.9-1	4120
		147219		2025-11-20	46601	6	GT Environmental - Reece McCann	BWN	D22-0.00-0.10	111981064	0-0.1	4120
		147219		2025-11-20	46601	11	GT Environmental - Reece McCann	BWN	D22-0.20-0.30	111981065	0.2-0.3	4120
		147219		2025-11-20	46601	20	GT Environmental - Reece McCann	BWN	D22-0.50-0.60	111981066	0.5-0.6	4120
		147219		2025-11-20	46601	19	GT Environmental - Reece McCann	BWN	D22-0.80-0.90	111981067	0.8-0.9	4120
		147219		2025-11-20	46601	12	GT Environmental - Reece McCann	BWN	D32-0.00-0.10	111981075	0-0.1	4120
		147219		2025-11-20	46601	14	GT Environmental - Reece McCann	BWN	D32-0.20-0.30	111981076	0.2-0.3	4120
		147219		2025-11-20	46603	34	GT Environmental - Reece McCann	BWN	D32-0.50-0.60	111981077	0.5-0.6	4120
		147219		2025-11-20	46604	47	GT Environmental - Reece McCann	BWN	D32-0.80-0.90	111981078	0.8-0.9	4120
		147219		2025-11-20	46603	24	GT Environmental - Reece McCann	BWN	D37-0.00-0.10	111981089	0-0.1	4120
		147219		2025-11-20	46603	5	GT Environmental - Reece McCann	BWN	D37-0.20-0.30	111981090	0.2-0.3	4120
		147219		2025-11-20	46603	16	GT Environmental - Reece McCann	BWN	D37-0.50-0.60	111981091	0.5-0.6	4120
		147219		2025-11-20	46603	45	GT Environmental - Reece McCann	BWN	D37-0.80-0.90	111981092	0.8-0.9	4120
		147219		2025-11-20	46604	23	GT Environmental - Reece McCann	BWN	D44-0.00-0.10	111980904	0-0.1	4120
		147219		2025-11-20	46604	13	GT Environmental - Reece McCann	BWN	D44-0.10-0.20	111980905	0.1-0.2	4120
		147219		2025-11-20	46604	20	GT Environmental - Reece McCann	BWN	D44-0.20-0.30	111980906	0.2-0.3	4120
		147219		2025-11-20	46604	4	GT Environmental - Reece McCann	BWN	D44-0.50-0.60	111980907	0.5-0.6	4120
		147219		2025-11-20	46604	1	GT Environmental - Reece McCann	BWN	D44-0.80-0.90	111980908	0.8-0.9	4120
		147219		2025-11-20	46604	50	GT Environmental - Reece McCann	BWN	D59-0.00-0.10	111980929	0-0.1	4120
		147219		2025-11-20	46603	41	GT Environmental - Reece McCann	BWN	D59-0.20-0.30	111980930	0.2-0.3	4120
		147219		2025-11-20	46603	29	GT Environmental - Reece McCann	BWN	D59-0.50-0.60	111980931	0.5-0.6	4120
		147219		2025-11-20	46604	49	GT Environmental - Reece McCann	BWN	D59-0.80-0.90	111980932	0.8-0.9	4120

NOTE 1: Walkley and Black Organic Carbon % (40°C) data presented in this test report have been obtained by a combination of laboratory wet chemistry and the equivalent modelled result from Mid-Infrared Diffuse Reflectance Spectroscopy and Partial Least Squares Regression (PLSR) analysis. An explanatory

		TMs-006A	TMs-007NO3	TMs-007NH4	TMs-009B	TMs-009I2	TMs-018	TMs-010D	TMs-015G	TMs-015G
Transect GPS Start	Transect GPS Finish	Organic Carbon (W&B)	Nitrate - N (2M KCl)	Ammonium - N (2M KCl)	Colwell Phosphorus	PBI + Col P	Colwell Potassium	KCl Sulfur (S)	Exchangeable acidity	Exchangeable aluminium
		% (40°C)	mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	cmol/kg	cmol/kg
N/A	N/A	3.85	3.8	4.1	18	67	1800	11	<0.02	<0.02
N/A	N/A	1.5	47	<1.0	5.5	94	1100	37	<0.02	<0.02
N/A	N/A									
N/A	N/A									
N/A	N/A									
N/A	N/A	1.33	<1.0	1.2	7.9	101	310	8.4	<0.02	<0.02
N/A	N/A	1.25	<1.0	1.1	<5.0	118	150	5.6	<0.02	<0.02
N/A	N/A									
N/A	N/A									
N/A	N/A	1.38	<1.0	5.4	8.2	38	170	5.4	<0.02	<0.02
N/A	N/A	0.55	<1.0	<1.0	6.2	53	220	13	<0.02	<0.02
N/A	N/A									
N/A	N/A									
N/A	N/A	1.31	<1.0	2.1	<5.0	119	120	4	<0.02	<0.02
N/A	N/A	1.22	<1.0	1.3	<5.0	112	110	6.8	<0.02	<0.02
N/A	N/A									
N/A	N/A									
N/A	N/A	1.89	3.7	1.6	<5.0	60	310	5.4	<0.02	<0.02
N/A	N/A	1.35	<1.0	1.2	<5.0	74	86	3.7	<0.02	<0.02
N/A	N/A									
N/A	N/A									
N/A	N/A									
N/A	N/A	0.35	<1.0	<1.0	<5.0	21	130	<2.5	<0.02	<0.02
N/A	N/A									
N/A	N/A	0.22	<1.0	<1.0	<5.0	73	180	4.8	<0.02	<0.02
N/A	N/A									

y technical note is available upon request. The exception is for quoted work that specifically required laboratory wet chemistry.

TMs-015G	TMs-028	TMs-005	TMs-012C	TMs-012A	TMs-012A	TMs-012A	TMs-012A	TMs-031	TMs-007	TMs-002A1	TMs-002A1
Exchangeable hydrogen	CaCl2 extr. Aluminium	Chloride	Boron	Iron (Fe)	Manganese (Mn)	Copper (Cu)	Zinc (Zn)	Oxalate ext. Molybdenum	Dumas Total Nitrogen	% Air-dry Moisture Content	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)
cmol/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% dry wt	% of dry wt	g/g
<0.02	<0.1	41	2.7	8.1	11	0.9	1.1	0.59	0.38	2.9	0.0286
<0.02		380							0.14	3.5	0.0351
		1100									
		1200									
		740									
<0.02	<0.1	100	1.3	14	12	1.5	0.4	1.2	0.13	3.5	0.0345
<0.02		29							0.12	3.6	0.0361
		1500									
		1600									
<0.02	<0.1	6	0.57	12	19	0.79	0.56	0.47	0.11	1.2	0.0117
<0.02		67							0.05	1.9	0.0192
		300									
		760									
<0.02	<0.1	14	0.9	15	6.8	1.2	0.12	1.3	0.15	3.3	0.0332
<0.02		340							0.1	3.7	0.0365
		580									
		1500									
<0.02	<0.1	21	0.56	18	34	1.2	0.78	0.62	0.16	1.8	0.0183
<0.02		15							0.11	2.2	0.0215
		120									
		630									
		830									
<0.02	<0.1	<5	0.26	4.3	4.7	0.47	<0.08	<0.25	0.035	0.3	0.0032
		5									
<0.02		51							0.05	1.7	0.0169
		170									

SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D3-0.00-0.10
Barcode:	111981004	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0-0.1
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		3.85						
	Dumas Total Nitrogen	% dry wt		0.38						
Other tests	% Air-dry Moisture Content	% of dry wt		2.9						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0286						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		3.8						
	Ammonium - N (2M KCl)	mg/kg		4.1						
	Colwell Phosphorus	mg/kg		18						
	PBI + Col P			67						
	Colwell Potassium	mg/kg		1800						
	KCl Sulfur (S)	mg/kg		11						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
	Exchangeable hydrogen	cmol/kg		<0.02						
Trace Elements	Boron	mg/kg		2.7						
	Iron (Fe)	mg/kg		8.1						
	Manganese (Mn)	mg/kg		11						
	Copper (Cu)	mg/kg		0.90						
	Zinc (Zn)	mg/kg		1.1						
	Oxalate ext. Molybdenum	mg/kg		0.59						
Salt	Chloride	mg/kg		41						
Al	CaCl2 extr. Aluminium	mg/kg		<0.1						

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NOTE[2]: Walkley and Black Organic Carbon % (40°C) data presented in this test report have been obtained by a combination of laboratory wet chemistry and the equivalent modelled result from Mid-Infrared Diffuse Reflectance Spectroscopy and Partial Least Squares Regression (PLSR) analysis. An explanatory technical note is available upon request. The exception is for quoted work that specifically required laboratory wet chemistry.

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D3-0.20-0.30
Barcode:	111981005	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.2-0.3
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.50						
	Dumas Total Nitrogen	% dry wt		0.14						
Other tests	% Air-dry Moisture Content	% of dry wt		3.5						
Other tests	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0351						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		47						
Extractable N-P-K-S	Ammonium - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Colwell Phosphorus	mg/kg		5.5						
Extractable N-P-K-S	PBI + Col P			94						
Extractable N-P-K-S	Colwell Potassium	mg/kg		1100						
Extractable N-P-K-S	KCl Sulfur (S)	mg/kg		37						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
Exchangeable cations	Exchangeable hydrogen	cmol/kg		<0.02						
Salt	Chloride	mg/kg		380						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D3-0.50-0.60
Barcode:	111981006	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.5-0.6
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		1100						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D3-0.70-0.80
Barcode:	111981007	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.7-0.8
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		1200						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D3-0.90-1.00
Barcode:	111981008	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.9-1
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		740						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D22-0.00-0.10
Barcode:	111981064	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0-0.1
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.33						
	Dumas Total Nitrogen	% dry wt		0.13						
Other tests	% Air-dry Moisture Content	% of dry wt		3.5						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0345						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
	Ammonium - N (2M KCl)	mg/kg		1.2						
	Colwell Phosphorus	mg/kg		7.9						
	PBI + Col P			101						
	Colwell Potassium	mg/kg		310						
	KCl Sulfur (S)	mg/kg		8.4						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
	Exchangeable hydrogen	cmol/kg		<0.02						
Trace Elements	Boron	mg/kg		1.3						
	Iron (Fe)	mg/kg		14						
	Manganese (Mn)	mg/kg		12						
	Copper (Cu)	mg/kg		1.5						
	Zinc (Zn)	mg/kg		0.40						
	Oxalate ext. Molybdenum	mg/kg		1.2						
Salt	Chloride	mg/kg		100						
Al	CaCl2 extr. Aluminium	mg/kg		<0.1						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D22-0.20-0.30
Barcode:	111981065	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.2-0.3
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.25						
	Dumas Total Nitrogen	% dry wt		0.12						
Other tests	% Air-dry Moisture Content	% of dry wt		3.6						
Other tests	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0361						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Ammonium - N (2M KCl)	mg/kg		1.1						
Extractable N-P-K-S	Colwell Phosphorus	mg/kg		<5.0						
Extractable N-P-K-S	PBI + Col P			118						
Extractable N-P-K-S	Colwell Potassium	mg/kg		150						
Extractable N-P-K-S	KCl Sulfur (S)	mg/kg		5.6						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
Exchangeable cations	Exchangeable hydrogen	cmol/kg		<0.02						
Salt	Chloride	mg/kg		29						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D22-0.50-0.60
Barcode:	111981066	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.5-0.6
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		1500						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D22-0.80-0.90
Barcode:	111981067	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.8-0.9
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		1600						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D32-0.00-0.10
Barcode:	111981075	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0-0.1
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.38						
	Dumas Total Nitrogen	% dry wt		0.11						
Other tests	% Air-dry Moisture Content	% of dry wt		1.2						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0117						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
	Ammonium - N (2M KCl)	mg/kg		5.4						
	Colwell Phosphorus	mg/kg		8.2						
	PBI + Col P			38						
	Colwell Potassium	mg/kg		170						
	KCl Sulfur (S)	mg/kg		5.4						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
	Exchangeable hydrogen	cmol/kg		<0.02						
Trace Elements	Boron	mg/kg		0.57						
	Iron (Fe)	mg/kg		12						
	Manganese (Mn)	mg/kg		19						
	Copper (Cu)	mg/kg		0.79						
	Zinc (Zn)	mg/kg		0.56						
	Oxalate ext. Molybdenum	mg/kg		0.47						
Salt	Chloride	mg/kg		6						
Al	CaCl2 extr. Aluminium	mg/kg		<0.1						

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NOTE[2]: Walkley and Black Organic Carbon % (40°C) data presented in this test report have been obtained by a combination of laboratory wet chemistry and the equivalent modelled result from Mid-Infrared Diffuse Reflectance Spectroscopy and Partial Least Squares Regression (PLSR) analysis. An explanatory technical note is available upon request. The exception is for quoted work that specifically required laboratory wet chemistry.

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D32-0.20-0.30
Barcode:	111981076	**Crop:**	NOT SPECIFIED
Batch Number:	46601	**Sample Depth:**	0.2-0.3
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		0.55						
	Dumas Total Nitrogen	% dry wt		0.050						
Other tests	% Air-dry Moisture Content	% of dry wt		1.9						
Other tests	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0192						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Ammonium - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Colwell Phosphorus	mg/kg		6.2						
Extractable N-P-K-S	PBI + Col P			53						
Extractable N-P-K-S	Colwell Potassium	mg/kg		220						
Extractable N-P-K-S	KCl Sulfur (S)	mg/kg		13						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
Exchangeable cations	Exchangeable hydrogen	cmol/kg		<0.02						
Salt	Chloride	mg/kg		67						

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SOIL ANALYSIS

Agent: GT Environmental
Agent Address: 4 / 162 Juliette Street, GREENSLOPES, QLD, 4120
Client: BWN
Test Set or Quotation:
Barcode: 111981077
Batch Number: 46603
Submission ID: 147219

Report Date: 03/12/2025
Sampling Date: NA
Date Received: 20/11/2025
Sample Name: D32-0.50-0.60
Crop: NOT SPECIFIED
Sample Depth: 0.5-0.6
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		300						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D32-0.80-0.90
Barcode:	111981078	**Crop:**	NOT SPECIFIED
Batch Number:	46604	**Sample Depth:**	0.8-0.9
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		760						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D37-0.00-0.10
Barcode:	111981089	**Crop:**	NOT SPECIFIED
Batch Number:	46603	**Sample Depth:**	0-0.1
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.31						
	Dumas Total Nitrogen	% dry wt		0.15						
Other tests	% Air-dry Moisture Content	% of dry wt		3.3						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0332						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
	Ammonium - N (2M KCl)	mg/kg		2.1						
	Colwell Phosphorus	mg/kg		<5.0						
	PBI + Col P			119						
	Colwell Potassium	mg/kg		120						
	KCl Sulfur (S)	mg/kg		4.0						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
	Exchangeable hydrogen	cmol/kg		<0.02						
Trace Elements	Boron	mg/kg		0.90						
	Iron (Fe)	mg/kg		15						
	Manganese (Mn)	mg/kg		6.8						
	Copper (Cu)	mg/kg		1.2						
	Zinc (Zn)	mg/kg		0.12						
	Oxalate ext. Molybdenum	mg/kg		1.3						
Salt	Chloride	mg/kg		14						
Al	CaCl2 extr. Aluminium	mg/kg		<0.1						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D37-0.20-0.30
Barcode:	111981090	**Crop:**	NOT SPECIFIED
Batch Number:	46603	**Sample Depth:**	0.2-0.3
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.22						
	Dumas Total Nitrogen	% dry wt		0.10						
Other tests	% Air-dry Moisture Content	% of dry wt		3.7						
Other tests	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0365						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Ammonium - N (2M KCl)	mg/kg		1.3						
Extractable N-P-K-S	Colwell Phosphorus	mg/kg		<5.0						
Extractable N-P-K-S	PBI + Col P			112						
Extractable N-P-K-S	Colwell Potassium	mg/kg		110						
Extractable N-P-K-S	KCl Sulfur (S)	mg/kg		6.8						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
Exchangeable cations	Exchangeable hydrogen	cmol/kg		<0.02						
Salt	Chloride	mg/kg		340						

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SOIL ANALYSIS

Agent: GT Environmental
Agent Address: 4 / 162 Juliette Street, GREENSLOPES, QLD, 4120
Client: BWN
Test Set or Quotation:
Barcode: 111981091
Batch Number: 46603
Submission ID: 147219

Report Date: 03/12/2025
Sampling Date: NA
Date Received: 20/11/2025
Sample Name: D37-0.50-0.60
Crop: NOT SPECIFIED
Sample Depth: 0.5-0.6
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		580						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D37-0.80-0.90
Barcode:	111981092	**Crop:**	NOT SPECIFIED
Batch Number:	46603	**Sample Depth:**	0.8-0.9
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		1500						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D44-0.00-0.10
Barcode:	111980904	**Crop:**	NOT SPECIFIED
Batch Number:	46604	**Sample Depth:**	0-0.1
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.89						
	Dumas Total Nitrogen	% dry wt		0.16						
Other tests	% Air-dry Moisture Content	% of dry wt		1.8						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0183						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		3.7						
	Ammonium - N (2M KCl)	mg/kg		1.6						
	Colwell Phosphorus	mg/kg		<5.0						
	PBI + Col P			60						
	Colwell Potassium	mg/kg		310						
	KCl Sulfur (S)	mg/kg		5.4						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
	Exchangeable hydrogen	cmol/kg		<0.02						
Trace Elements	Boron	mg/kg		0.56						
	Iron (Fe)	mg/kg		18						
	Manganese (Mn)	mg/kg		34						
	Copper (Cu)	mg/kg		1.2						
	Zinc (Zn)	mg/kg		0.78						
	Oxalate ext. Molybdenum	mg/kg		0.62						
Salt	Chloride	mg/kg		21						
Al	CaCl2 extr. Aluminium	mg/kg		<0.1						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D44-0.10-0.20
Barcode:	111980905	**Crop:**	NOT SPECIFIED
Batch Number:	46604	**Sample Depth:**	0.1-0.2
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		1.35						
	Dumas Total Nitrogen	% dry wt		0.11						
Other tests	% Air-dry Moisture Content	% of dry wt		2.2						
Other tests	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0215						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Ammonium - N (2M KCl)	mg/kg		1.2						
Extractable N-P-K-S	Colwell Phosphorus	mg/kg		<5.0						
Extractable N-P-K-S	PBI + Col P			74						
Extractable N-P-K-S	Colwell Potassium	mg/kg		86						
Extractable N-P-K-S	KCl Sulfur (S)	mg/kg		3.7						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
Exchangeable cations	Exchangeable hydrogen	cmol/kg		<0.02						
Salt	Chloride	mg/kg		15						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D44-0.20-0.30
Barcode:	111980906	**Crop:**	NOT SPECIFIED
Batch Number:	46604	**Sample Depth:**	0.2-0.3
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		120						

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SOIL ANALYSIS

Agent: GT Environmental
Agent Address: 4 / 162 Juliette Street, GREENSLOPES, QLD, 4120
Client: BWN
Test Set or Quotation:
Barcode: 111980907
Batch Number: 46604
Submission ID: 147219

Report Date: 03/12/2025
Sampling Date: NA
Date Received: 20/11/2025
Sample Name: D44-0.50-0.60
Crop: NOT SPECIFIED
Sample Depth: 0.5-0.6
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		630						

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SOIL ANALYSIS

Agent: GT Environmental
Agent Address: 4 / 162 Juliette Street, GREENSLOPES, QLD, 4120
Client: BWN
Test Set or Quotation:
Barcode: 111980908
Batch Number: 46604
Submission ID: 147219

Report Date: 03/12/2025
Sampling Date: NA
Date Received: 20/11/2025
Sample Name: D44-0.80-0.90
Crop: NOT SPECIFIED
Sample Depth: 0.8-0.9
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		830						

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D59-0.00-0.10
Barcode:	111980929	**Crop:**	NOT SPECIFIED
Batch Number:	46604	**Sample Depth:**	0-0.1
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		0.35						
	Dumas Total Nitrogen	% dry wt		0.035						
Other tests	% Air-dry Moisture Content	% of dry wt		0.3						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0032						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
	Ammonium - N (2M KCl)	mg/kg		<1.0						
	Colwell Phosphorus	mg/kg		<5.0						
	PBI + Col P			21						
	Colwell Potassium	mg/kg		130						
	KCl Sulfur (S)	mg/kg		<2.5						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
	Exchangeable hydrogen	cmol/kg		<0.02						
Trace Elements	Boron	mg/kg		0.26						
	Iron (Fe)	mg/kg		4.3						
	Manganese (Mn)	mg/kg		4.7						
	Copper (Cu)	mg/kg		0.47						
	Zinc (Zn)	mg/kg		<0.08						
	Oxalate ext. Molybdenum	mg/kg		<0.25						
Salt	Chloride	mg/kg		<5						
Al	CaCl2 extr. Aluminium	mg/kg		<0.1						

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SOIL ANALYSIS

Agent: GT Environmental
Agent Address: 4 / 162 Juliette Street, GREENSLOPES, QLD, 4120
Client: BWN
Test Set or Quotation:
Barcode: 111980930
Batch Number: 46603
Submission ID: 147219

Report Date: 03/12/2025
Sampling Date: NA
Date Received: 20/11/2025
Sample Name: D59-0.20-0.30
Crop: NOT SPECIFIED
Sample Depth: 0.2-0.3
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		5						

NOTE[1]: Eurofins APAL will review published literature for crop desired levels, and reserves the right to make changes to this information in test reports as and when these reviews are conducted.

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:	DS1	**Sample Name:**	D59-0.50-0.60
Barcode:	111980931	**Crop:**	NOT SPECIFIED
Batch Number:	46603	**Sample Depth:**	0.5-0.6
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Organic Carbon (W&B) [2]	% (40°C)		0.22						
	Dumas Total Nitrogen	% dry wt		0.050						
Other tests	% Air-dry Moisture Content	% of dry wt		1.7						
Other tests	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0169						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Ammonium - N (2M KCl)	mg/kg		<1.0						
Extractable N-P-K-S	Colwell Phosphorus	mg/kg		<5.0						
Extractable N-P-K-S	PBI + Col P			73						
Extractable N-P-K-S	Colwell Potassium	mg/kg		180						
Extractable N-P-K-S	KCl Sulfur (S)	mg/kg		4.8						
Exchangeable cations	Exchangeable aluminium	cmol/kg		<0.02						
Exchangeable cations	Exchangeable hydrogen	cmol/kg		<0.02						
Salt	Chloride	mg/kg		51						

NOTE[1]: Eurofins APAL will review published literature for crop desired levels, and reserves the right to make changes to this information in test reports as and when these reviews are conducted.

NOTE[2]: Walkley and Black Organic Carbon % (40°C) data presented in this test report have been obtained by a combination of laboratory wet chemistry and the equivalent modelled result from Mid-Infrared Diffuse Reflectance Spectroscopy and Partial Least Squares Regression (PLSR) analysis. An explanatory technical note is available upon request. The exception is for quoted work that specifically required laboratory wet chemistry.

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SOIL ANALYSIS

Agent:	GT Environmental	**Report Date:**	03/12/2025
Agent Address:	4 / 162 Juliette Street, GREENSLOPES, QLD, 4120	**Sampling Date:**	NA
Client:	BWN	**Date Received:**	20/11/2025
Test Set or Quotation:		**Sample Name:**	D59-0.80-0.90
Barcode:	111980932	**Crop:**	NOT SPECIFIED
Batch Number:	46604	**Sample Depth:**	0.8-0.9
Submission ID:	147219	**GPS Start:**	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Salt	Chloride	mg/kg		170						

NOTE[1]: Eurofins APAL will review published literature for crop desired levels, and reserves the right to make changes to this information in test reports as and when these reviews are conducted.

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Eurofins APAL Test Method Codes														
Crop	Actual Crop	SubmissionID	SamplingDate	DateReceived	BatchID	Batch Position No.	AgentName	ClientName	SampleName	Barcode	SampleDepth	Postcode	Transect GPS Start	Transect GPS Finish
		147220		2025-11-20	46603	23	GT Environmental - Reece McCann	BWN	D1-0.00-0.10	111981001	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	12	GT Environmental - Reece McCann	BWN	D1-0.20-0.30	111981002	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46601	24	GT Environmental - Reece McCann	BWN	D1-0.50-0.60	111981003	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46601	42	GT Environmental - Reece McCann	BWN	D5-0.00-0.10	111981009	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46601	44	GT Environmental - Reece McCann	BWN	D5-0.20-0.30	111981010	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46601	28	GT Environmental - Reece McCann	BWN	D5-0.50-0.60	111981011	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46603	22	GT Environmental - Reece McCann	BWN	D5-0.80-0.90	111981012	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46603	10	GT Environmental - Reece McCann	BWN	D5-1.00-1.10	111981013	1-1.1	4120	N/A	N/A
		147220		2025-11-20	46601	33	GT Environmental - Reece McCann	BWN	D5-1.40-1.50	111981014	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46601	35	GT Environmental - Reece McCann	BWN	D5-1.70-1.80	111981015	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46601	34	GT Environmental - Reece McCann	BWN	D6-0.00-0.10	111981016	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46601	38	GT Environmental - Reece McCann	BWN	D6-0.20-0.30	111981017	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46603	13	GT Environmental - Reece McCann	BWN	D6-0.50-0.60	111981018	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46601	27	GT Environmental - Reece McCann	BWN	D6-0.80-0.90	111981019	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46601	29	GT Environmental - Reece McCann	BWN	D6-1.00-1.10	111981020	1-1.1	4120	N/A	N/A
		147220		2025-11-20	46603	20	GT Environmental - Reece McCann	BWN	D7-0.00-0.10	111981021	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	3	GT Environmental - Reece McCann	BWN	D7-0.20-0.30	111981022	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46601	32	GT Environmental - Reece McCann	BWN	D7-0.50-0.60	111981023	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46601	37	GT Environmental - Reece McCann	BWN	D12m-0.00-0.10	111981024	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46601	45	GT Environmental - Reece McCann	BWN	D12m-0.20-0.30	111981025	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46601	26	GT Environmental - Reece McCann	BWN	D12m-0.50-0.60	111981026	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46601	30	GT Environmental - Reece McCann	BWN	D12m-0.80-0.90	111981027	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46601	41	GT Environmental - Reece McCann	BWN	D12m-1.10-1.20	111981028	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46604	16	GT Environmental - Reece McCann	BWN	D12m-1.40-1.50	111981029	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46601	39	GT Environmental - Reece McCann	BWN	D12m-1.70-1.80	111981030	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46604	45	GT Environmental - Reece McCann	BWN	D12d-0.00-0.10	111981031	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46604	46	GT Environmental - Reece McCann	BWN	D12d-0.20-0.30	111981032	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	41	GT Environmental - Reece McCann	BWN	D12d-0.50-0.60	111981033	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46604	7	GT Environmental - Reece McCann	BWN	D12d-0.80-0.90	111981034	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46604	27	GT Environmental - Reece McCann	BWN	D12d-1.10-1.20	111981035	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46604	25	GT Environmental - Reece McCann	BWN	D12d-1.40-1.50	111981036	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46601	9	GT Environmental - Reece McCann	BWN	D12d-1.70-1.80	111981037	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46604	40	GT Environmental - Reece McCann	BWN	D14d-0.00-0.10	111981038	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46601	10	GT Environmental - Reece McCann	BWN	D14d-0.20-0.30	111981039	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	30	GT Environmental - Reece McCann	BWN	D14d-0.50-0.60	111981040	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46604	28	GT Environmental - Reece McCann	BWN	D14d-0.80-0.90	111981041	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46604	42	GT Environmental - Reece McCann	BWN	D14d-1.10-1.20	111981042	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46604	31	GT Environmental - Reece McCann	BWN	D14d-1.30-1.40	111981043	1.3-1.4	4120	N/A	N/A
		147220		2025-11-20	46604	44	GT Environmental - Reece McCann	BWN	D14m-0.00-0.10	111981044	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46604	26	GT Environmental - Reece McCann	BWN	D14m-0.20-0.30	111981045	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	33	GT Environmental - Reece McCann	BWN	D14m-0.50-0.60	111981046	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46604	8	GT Environmental - Reece McCann	BWN	D14m-0.80-0.90	111981047	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46604	5	GT Environmental - Reece McCann	BWN	D14m-1.10-1.20	111871227	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46604	35	GT Environmental - Reece McCann	BWN	D14m-1.40-1.50	111981049	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46604	43	GT Environmental - Reece McCann	BWN	D14m-1.70-1.80	111981050	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46604	32	GT Environmental - Reece McCann	BWN	D14m-2.00-2.10	111981051	2-2.1	4120	N/A	N/A
		147220		2025-11-20	46604	38	GT Environmental - Reece McCann	BWN	D19-0.00-0.05	111981052	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46604	24	GT Environmental - Reece McCann	BWN	D19-0.20-0.30	111981053	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	6	GT Environmental - Reece McCann	BWN	D19-0.40-0.50	111981054	0.4-0.5	4120	N/A	N/A
		147220		2025-11-20	46601	1	GT Environmental - Reece McCann	BWN	D19-0.50-0.60	111981055	0.5-0.6	4120	N/A	N/A

		147220		2025-11-20	46604	37	GT Environmental - Reece McCann	BWN	D19-0.80-0.90	111981056	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46601	16	GT Environmental - Reece McCann	BWN	D21-0.00-0.10	111981057	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46601	17	GT Environmental - Reece McCann	BWN	D21-0.20-0.30	111981059	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46601	18	GT Environmental - Reece McCann	BWN	D21-0.50-0.60	111981060	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46604	29	GT Environmental - Reece McCann	BWN	D21-0.80-0.90	111981061	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46604	36	GT Environmental - Reece McCann	BWN	D21-1.10-1.20	111981062	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46604	34	GT Environmental - Reece McCann	BWN	D21-1.40-1.50	111981063	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46604	39	GT Environmental - Reece McCann	BWN	D21-1.70-1.80	111981058	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46601	8	GT Environmental - Reece McCann	BWN	D24-0.00-0.10	111981071	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46601	2	GT Environmental - Reece McCann	BWN	D24-0.20-0.30	111981072	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46601	7	GT Environmental - Reece McCann	BWN	D24-0.50-0.60	111981073	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46601	5	GT Environmental - Reece McCann	BWN	D24-0.80-0.90	111981074	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46601	15	GT Environmental - Reece McCann	BWN	D36-0.00-0.10	111981082	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	8	GT Environmental - Reece McCann	BWN	D36-0.20-0.30	111981083	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46603	43	GT Environmental - Reece McCann	BWN	D36-0.50-0.60	111981084	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46601	13	GT Environmental - Reece McCann	BWN	D36-0.80-0.90	111981085	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46603	25	GT Environmental - Reece McCann	BWN	D36-1.10-1.20	111981086	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46601	4	GT Environmental - Reece McCann	BWN	D36-1.40-1.50	111981087	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46603	6	GT Environmental - Reece McCann	BWN	D36-1.70-1.80	111981088	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46603	21	GT Environmental - Reece McCann	BWN	D39-0.00-0.10	111981096	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	15	GT Environmental - Reece McCann	BWN	D39-0.20-0.30	111981097	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	14	GT Environmental - Reece McCann	BWN	D39-0.50-0.60	111981098	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46604	21	GT Environmental - Reece McCann	BWN	D39-0.80-0.90	111981099	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46603	11	GT Environmental - Reece McCann	BWN	D39-1.10-1.20	111981100	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46603	1	GT Environmental - Reece McCann	BWN	D43-0.00-0.10	111980901	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46601	21	GT Environmental - Reece McCann	BWN	D43-0.10-0.20	111980902	0.1-0.2	4120	N/A	N/A
		147220		2025-11-20	46604	19	GT Environmental - Reece McCann	BWN	D43-0.20-0.30	111980903	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	15	GT Environmental - Reece McCann	BWN	D45-0.00-0.10	111980910	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	4	GT Environmental - Reece McCann	BWN	D45-0.20-0.30	111980911	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	9	GT Environmental - Reece McCann	BWN	D45-0.50-0.60	111980912	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46604	12	GT Environmental - Reece McCann	BWN	D45-0.80-0.90	111980913	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46604	3	GT Environmental - Reece McCann	BWN	D45-1.10-1.20	111980914	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46604	11	GT Environmental - Reece McCann	BWN	D45-1.40-1.50	111980915	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46604	2	GT Environmental - Reece McCann	BWN	D45-1.70-1.80	111980916	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46601	22	GT Environmental - Reece McCann	BWN	D52-0.00-0.10	111980917	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	14	GT Environmental - Reece McCann	BWN	D52-0.20-0.30	111980918	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46604	17	GT Environmental - Reece McCann	BWN	D52-0.50-0.60	111980919	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46603	19	GT Environmental - Reece McCann	BWN	D52-0.80-0.90	111980920	0.8-0.9	4120	N/A	N/A
		147220		2025-11-20	46604	10	GT Environmental - Reece McCann	BWN	D52-1.10-1.20	111980921	1.1-1.2	4120	N/A	N/A
		147220		2025-11-20	46604	18	GT Environmental - Reece McCann	BWN	D52-1.40-1.50	111980922	1.4-1.5	4120	N/A	N/A
		147220		2025-11-20	46604	22	GT Environmental - Reece McCann	BWN	D52-1.70-1.80	111980923	1.7-1.8	4120	N/A	N/A
		147220		2025-11-20	46601	23	GT Environmental - Reece McCann	BWN	D52-2.00-2.10	111980924	2-2.1	4120	N/A	N/A
		147220		2025-11-20	46603	36	GT Environmental - Reece McCann	BWN	D58-0.00-0.10	111980925	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	40	GT Environmental - Reece McCann	BWN	D58-0.20-0.30	111980926	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46603	37	GT Environmental - Reece McCann	BWN	D58-0.50-0.60	111980927	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46604	48	GT Environmental - Reece McCann	BWN	D58-0.70-0.80	111980928	0.7-0.8	4120	N/A	N/A
		147220		2025-11-20	46603	28	GT Environmental - Reece McCann	BWN	D65-0.00-0.05	111980936	0-0.1	4120	N/A	N/A
		147220		2025-11-20	46603	32	GT Environmental - Reece McCann	BWN	D65-0.10-0.20	111980937	0.1-0.2	4120	N/A	N/A
		147220		2025-11-20	46603	30	GT Environmental - Reece McCann	BWN	D65-0.20-0.30	111980938	0.2-0.3	4120	N/A	N/A
		147220		2025-11-20	46603	38	GT Environmental - Reece McCann	BWN	D65-0.50-0.60	111980939	0.5-0.6	4120	N/A	N/A
		147220		2025-11-20	46603	31	GT Environmental - Reece McCann	BWN	D65-0.80-0.90	111980940	0.8-0.9	4120	N/A	N/A

NOTE 1: Walkley and Black Organic Carbon % (40°C) data presented in this test report have been obtained by a combination of laboratory wet chemistry and the equivalent modelled result from Mid-Infrared Diffuse Reflectance Spectroscopy and Partial Least Squares Regression (PLSR) analysis. An explanatory technical note is available upon request. The exception is for quoted

TMs-004A	TMs-004B4	TMs-006A	TMs-007NO3	TMs-007NH4	TMs-009B	TMs-009I2	TMs-018	TMs-010D	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E
pH 1:5 water	pH CaCl2 (following 4A1)	Organic Carbon (W&B)	Nitrate - N (2M KCl)	Ammonium - N (2M KCl)	Colwell Phosphorus	PBI + Col P	Colwell Potassium	KCl Sulfur (S)	Calcium (Ca) - NH4Cl/BaCl2	Magnesium (Mg) - NH4Cl/BaCl2	Potassium (K) - NH4Cl/BaCl2	Sodium (NH4Cl/BaCl2)	Calcium (Ca) - NH4Cl/BaCl2	Magnesium (Mg) - NH4Cl/BaCl2
pH units	pH units	% (40°C)	mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	cmol/kg	cmol/kg
8.55	7.84	1.66	2.7	1.4	<5.0	100	500	5.8	4650	458	415	200	23.2	3.77
8.94	8.17	0.7	<1.0	<1.0	<5.0	92	150	6.8	3860	563	126	1320	19.3	4.63
9.2	8.35								2520	536	92	1410	12.6	4.41
7.63	6.42	1.34	<1.0	1.7	<5.0	116	97	7.5	3900	1080	115	566	19.5	8.89
8.63	7.67	1.12	<1.0	1.3	<5.0	112	80	6.3	4330	1310	109	1010	21.6	10.8
8.96	8.12								4400	1360	88	1120	22	11.2
8.13	7.52								2980	1460	110	2440	14.8	12
8.63	8.01								3450	1490	121	2110	17.2	12.3
5.21	4.6								2290	1490	100	2210	11.4	12.3
8.08	7.4								2940	1420	116	1890	14.7	11.7
7.17	6.06	1.77	1.2	2.5	7.3	68	330	4.8	2400	746	252	205	12	6.13
8.98	8.09	0.91	<1.0	1.2	<5.0	122	100	8.9	3900	1250	126	1030	19.4	10.3
9.07	8.26								3470	1260	109	1380	17.3	10.4
9.1	8.37								2110	1060	67	1680	10.6	8.69
8.95	8.14								2000	1140	64	1890	10	9.38
8.57	7.82	1.46	<1.0	1.6	<5.0	133	120	5.6	5520	796	171	227	27.6	6.55
8.96	8.01	0.78	<1.0	<1.0	<5.0	115	120	4.6	4470	1010	132	530	22.3	8.31
8.76	7.92								2990	1150	132	1510	14.9	9.43
7.75	7.11	0.75	<1.0	1.6	<5.0	100	220	20	3410	1060	195	436	17	8.75
5.67	5.22	0.42	<1.0	1.7	<5.0	94	170	56	2040	1210	173	1470	10.2	9.92
5.77	5.36								1910	1210	201	1940	9.54	9.96
5.75	5.42								1740	1210	203	2320	8.69	9.94
7.65	7.26								2150	1280	246	2480	10.7	10.5
7.22	6.76								2390	1360	257	2570	11.9	11.2
7.59	7.2								2120	1320	276	2570	10.6	10.9
8.21	7.49	0.88	<1.0	<1.0	5.9	90	230	4.2	3920	847	242	232	19.6	6.97
7.79	7.2	0.41	1	<1.0	<5.0	89	130	18	2550	1090	147	1800	12.7	8.96
8.02	7.51								2330	1150	163	2450	11.7	9.43
8.23	7.69								2250	1090	164	2310	11.2	8.98
8.08	7.57								2350	1200	197	2590	11.7	9.83
7.96	7.5								2210	1270	230	2680	11	10.5
7.19	6.7								1980	1160	179	1970	9.86	9.58
7.51	6.19	0.55	<1.0	<1.0	11	84	180	4.1	3070	894	193	263	15.3	7.35
7.55	6.36	0.64	<1.0	1.1	12	94	230	4	3040	911	231	394	15.2	7.49
7.67	7.16								3200	1270	179	1810	16	10.4
6.61	5.88								2260	1010	127	1320	11.3	8.31
8.16	7.52								2120	1220	197	1780	10.6	10.1
7.54	6.9								1820	1130	148	1720	9.1	9.34
7.18	6.34	1.77	1.2	2.2	10	82	410	5.6	3660	948	423	215	18.3	7.8
8.36	7.7	1.16	<1.0	1.3	<5.0	118	140	7.4	4240	923	164	974	21.2	7.59
8.19	7.36								2560	968	145	1070	12.8	7.96
8.03	7.57								2380	1390	287	2750	11.9	11.4
7.47	7.02								2190	1420	299	2890	10.9	11.7
7.41	7.01								2250	1460	308	3000	11.3	12
7.41	6.96								2310	1560	331	3110	11.5	12.8
7.21	6.73													
8.19	7.38	1.64	<1.0	4.8	9.3	67	470	4.2	4640	779	405	145	23.1	6.41
8.82	7.87	1.1	<1.0	<1.0	<5.0	100	170	5.7	5050	743	181	426	25.2	6.11
8.95	8.03								3170	501	88	513	15.8	4.13
7.96	7.14								1750	670	59	1750	8.73	5.51

8.88	7.99								3150	653	114	1100	15.7	5.37
8.06	7.38	2.37	2.7	2.4	9.3	99	640	7.2	5200	643	544	32.4	25.9	5.29
8.79	8.07	1.1	<1.0	1.4	<5.0	118	140	8.5	4570	863	174	1530	22.8	7.1
8.72	8.1								3990	864	174	2050	19.9	7.11
8.59	7.94								4210	942	167	2600	21	7.75
8.67	8.11								3960	937	190	2660	19.8	7.71
7.42	6.75								3180	988	165	2580	15.9	8.13
7.99	7.28								2710	817	143	2080	13.5	6.72
7.69	6.38	0.8	<1.0	1.4	6	51	300	4.4	1490	596	201	151	7.44	4.9
7.64	6.72	0.57	20	2.2	<5.0	118	89	8.7	1660	1180	85	1530	8.26	9.75
8.38	7.5								1920	1240	100	1570	9.56	10.2
9.07	8.11								1640	1090	86	1560	8.19	8.98
8	6.94	1.23	<1.0	2.1	<5.0	86	110	6.2	3210	794	115	79.9	16	6.53
8.52	7.74	0.69	<1.0	1.3	<5.0	157	72	5.2	3620	1050	92	324	18.1	8.61
9.01	8.12								2720	1170	82	778	13.6	9.65
9.06	8.31								2240	1180	86	839	11.2	9.73
9.03	8.27								2190	1090	89	879	10.9	8.97
8.7	7.91								1400	924	70	777	6.99	7.6
8.39	7.36								1010	605	53	620	5.03	4.98
7.78	6.85	1.5	1	1.5	<5.0	107	160	4.3	4270	505	171	158	21.3	4.15
8.54	7.8	1.61	8.9	<1.0	<5.0	141	130	11	5190	615	146	313	25.9	5.06
8.78	7.97								3930	610	85	684	19.6	5.02
9.3	8.4								2880	935	71	2660	14.4	7.69
9.28	8.48								2830	793	79	2230	14.1	6.52
7.4	6.16	0.68	<1.0	1.3	6.5	56	240	4.8	1750	625	148	297	8.71	5.14
8.15	6.99	0.83	<1.0	1.1	<5.0	89	140	7	2530	1110	125	700	12.6	9.11
8.72	7.76								2860	1230	143	896	14.3	10.1
7.54	6.88	1.35	1.5	<1.0	7.2	49	540	5.9	3570	496	477	16.3	17.8	4.08
8.25	7.52	1.34	<1.0	1.5	<5.0	96	210	5.5	4360	636	203	69.6	21.7	5.23
8.16	7.52								5010	868	195	480	25	7.14
7.71	7.29								4990	1020	210	681	24.9	8.37
7.28	6.75								4920	987	243	724	24.6	8.12
6.51	5.92								4550	905	251	714	22.7	7.45
6.95	6.33								3960	806	214	626	19.8	6.63
7.48	6.38	1.14	2.6	2.3	<5.0	60	260	4.4	2300	366	226	24.3	11.5	3.01
8.03	7.11	0.47	<1.0	1.2	<5.0	78	110	3.5	2330	467	121	80.9	11.6	3.84
9.23	8.21								1890	1040	99	829	9.43	8.55
9.14	8.4								1480	1040	97	1080	7.41	8.55
8.99	8.33								1710	1270	101	1310	8.52	10.5
9.02	8.29								1210	990	80	1200	6.06	8.14
9.09	8.32								1360	994	88	1210	6.78	8.18
7.91	7.1													
8.49	7.5	1.07	2.5	1.3	<5.0	92	190	5	3910	723	181	228	19.5	5.95
8.61	7.58	1.15	1.5	1.1	<5.0	78	130	10	3870	751	152	657	19.3	6.18
9.01	8.16								2980	847	111	1070	14.9	6.97
8.93	8.2								2790	878	104	1140	13.9	7.23
7.48	6.74	0.64	3.1	<1.0	5.9	20	330	2.5	616	114	259	11.1	3.07	0.94
7.85	6.99	0.49	1.1	<1.0	<5.0	19	360	<2.5	814	99	299	13	4.06	0.813
7.68	6.6								862	201	215	65.9	4.3	1.65
8.03	7.03								1490	544	167	257	7.45	4.47
9.14	8.24								1890	613	162	456	9.44	5.04

work that specifically required laboratory wet chemistry.

TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1
Potassium (K) - NH4Cl/BaCl2	Sodium (NH4Cl/BaCl2)	Ca:Mg ratio	K:Mg ratio	GTRI	ECR	Calcium (Ca) - prewash alc. pH 8.5 NH4Cl	Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl	Potassium (K) - prewash alc. pH 8.5 NH4Cl	Sodium (Na) - prewash alc. pH 8.5 NH4Cl	Calcium (Ca) - prewash alc. pH 8.5 NH4Cl	Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl	Potassium (K) - prewash alc. pH 8.5 NH4Cl	Sodium (Na) - prewash alc. pH 8.5 NH4Cl	Ca:Mg ratio
cmol/kg	cmol/kg				%	mg/kg	mg/kg	mg/kg	mg/kg	cmol/kg	cmol/kg	cmol/kg	cmol/kg	
1.06	0.87	6.2	0.28		6.7	4490	471	455	28.8	22.4	3.87	1.16	0.125	5.8
0.322	5.73	4.2	0.07		20	4090	563	136	274	20.4	4.63	0.347	1.19	4.4
0.234	6.15	2.9	0.05		27	2720	561	100	659	13.6	4.61	0.256	2.87	2.9
0.294	2.46	2.2	<0.05		8.9	4060	1060	144	314	20.3	8.72	0.368	1.36	2.3
0.278	4.38	2	<0.05		13	4470	1430	133	532	22.3	11.7	0.34	2.31	1.9
0.226	4.87	2	<0.05		13	4330	1530	105	446	21.6	12.6	0.269	1.94	1.7
0.281	10.6	1.2	<0.05		29	3140	1590	118	1150	15.7	13.1	0.301	4.99	1.2
0.309	9.19	1.4	<0.05		24	3570	1640	120	1020	17.8	13.5	0.306	4.43	1.3
0.255	9.6	0.9	<0.05		29	2490	1520	98.8	1200	12.4	12.5	0.253	5.24	1
0.297	8.23	1.3	<0.05		24	3260	1660	118	1050	16.3	13.7	0.302	4.55	1.2
0.644	0.892	2	0.11		7.8	2470	784	307	66.4	12.3	6.45	0.785	0.289	1.9
0.321	4.47	1.9	<0.05		14	4020	1440	137	319	20.1	11.8	0.35	1.39	1.7
0.278	6.02	1.7	<0.05		19	3940	1350	108	465	19.6	11.1	0.275	2.02	1.8
0.17	7.32	1.2	<0.05		28	2250	1140	81.8	595	11.2	9.34	0.209	2.59	1.2
0.163	8.22	1.1	<0.05		30	2050	1130	52.2	934	10.2	9.32	0.134	4.06	1.1
0.438	0.988	4.2	0.07		4	5340	813	172	48.7	26.7	6.69	0.439	0.212	4
0.338	2.3	2.7	<0.05		7.9	4800	1100	137	126	24	9.07	0.349	0.55	2.6
0.339	6.56	1.6	<0.05		22	2690	1090	139	725	13.4	8.93	0.355	3.15	1.5
0.499	1.9	1.9	0.06		8.5	3550	1110	235	101	17.7	9.13	0.602	0.44	1.9
0.441	6.4	1	<0.05		25	2110	1110	201	471	10.5	9.16	0.514	2.05	1.2
0.514	8.43	1	0.05		31	1910	1120	250	618	9.52	9.2	0.639	2.69	1
0.52	10.1	0.9	0.05		36	1640	1040	226	560	8.19	8.54	0.578	2.44	1
0.629	10.8	1	0.06		35	2310	1380	311	690	11.5	11.3	0.795	3	1
0.656	11.2	1.1	0.06		34	2290	1330	285	690	11.4	10.9	0.728	3	1
0.707	11.2	1	0.07		36	2080	1300	329	686	10.4	10.7	0.842	2.99	1
0.618	1.01	2.8	0.09		5.8	3440	800	258	52.9	17.2	6.58	0.659	0.23	2.6
0.375	7.83	1.4	<0.05		27	2390	1060	166	580	11.9	8.71	0.423	2.52	1.4
0.417	10.7	1.2	<0.05		34	2130	1070	179	643	10.6	8.84	0.458	2.8	1.2
0.418	10	1.3	<0.05		34	2240	1100	175	682	11.2	9.03	0.447	2.97	1.2
0.504	11.3	1.2	0.05		35	2140	1110	223	681	10.7	9.13	0.569	2.96	1.2
0.587	11.6	1.1	0.06		36	2060	1120	247	602	10.3	9.23	0.631	2.62	1.1
0.458	8.57	1	<0.05		32	1960	1160	223	538	9.79	9.52	0.569	2.34	1
0.495	1.14	2.1	0.07		6.7	2730	774	211	96.7	13.6	6.37	0.54	0.421	2.1
0.592	1.71	2	0.08		9.2	3290	955	297	162	16.4	7.86	0.76	0.704	2.1
0.458	7.88	1.5	<0.05		24	3210	1190	202	497	16	9.77	0.515	2.16	1.6
0.325	5.75	1.4	<0.05		24	2080	907	142	438	10.4	7.46	0.364	1.91	1.4
0.503	7.73	1.1	<0.05		29	2290	1360	247	716	11.4	11.2	0.631	3.11	1
0.379	7.48	1	<0.05		30	1680	1050	151	494	8.36	8.66	0.386	2.15	1
1.08	0.937	2.3	0.14		7.2	3100	831	471	48.2	15.5	6.84	1.2	0.21	2.3
0.42	4.24	2.8	0.06		14	3780	818	186	163	18.9	6.73	0.476	0.707	2.8
0.371	4.64	1.6	<0.05		19	2510	944	170	393	12.5	7.77	0.434	1.71	1.6
0.735	12	1	0.07		35	2240	1280	313	740	11.2	10.6	0.801	3.22	1.1
0.764	12.6	0.9	0.07		37	1690	1080	271	612	8.42	8.92	0.693	2.66	0.9
0.786	13	0.9	0.07		37	1650	1080	278	648	8.26	8.84	0.711	2.82	0.9
0.847	13.5	0.9	0.07		37	1730	1190	312	749	8.66	9.82	0.797	3.26	0.9
1.03	0.632	3.6	0.16		5.3	3890	684	453	36.1	19.4	5.62	1.16	0.157	3.5
0.464	1.85	4.1	0.08		6.9	4620	680	178	105	23	5.59	0.456	0.458	4.1
0.225	2.23	3.8	0.05		11	2770	440	77.3	162	13.8	3.62	0.198	0.705	3.8
0.151	7.61	1.6	<0.05		35	1850	667	70.2	917	9.25	5.49	0.18	3.99	1.7

0.292	4.8	2.9	0.05		19	2910	602	112	440	14.5	4.95	0.285	1.91	2.9
1.39	0.141	4.9	0.26		4.7	4790	637	690	10.6	23.9	5.24	1.76	0.046	4.6
0.445	6.67	3.2	0.06		19	4620	1020	233	528	23.1	8.41	0.596	2.3	2.7
0.445	8.9	2.8	0.06		26	4150	975	233	864	20.7	8.02	0.597	3.76	2.6
0.427	11.3	2.7	0.06		29	3520	903	190	983	17.6	7.42	0.486	4.28	2.4
0.486	11.6	2.6	0.06		31	3690	828	191	663	18.4	6.81	0.487	2.88	2.7
0.421	11.2	2	0.05		33	2360	745	124	851	11.8	6.13	0.318	3.7	1.9
0.366	9.03	2	0.05		32	2230	648	122	793	11.1	5.33	0.313	3.45	2.1
0.515	0.656	1.5	0.11		8.7	1450	593	236	44.7	7.24	4.88	0.603	0.194	1.5
0.218	6.64	0.9	<0.05		28	1590	1150	106	740	7.91	9.48	0.27	3.22	0.8
0.257	6.84	0.9	<0.05		26	1890	1310	117	860	9.41	10.8	0.3	3.74	0.9
0.22	6.8	0.9	<0.05		29	1500	1020	91.2	751	7.47	8.41	0.233	3.27	0.9
0.295	0.348	2.4	<0.05		2.8	3380	821	141	12.7	16.9	6.75	0.359	0.055	2.5
0.236	1.41	2.1	<0.05		5.8	3900	1130	90.6	58.5	19.4	9.31	0.232	0.254	2.1
0.21	3.39	1.4	<0.05		13	2830	1320	84	116	14.1	10.8	0.215	0.506	1.3
0.219	3.65	1.1	<0.05		16	2330	1320	76.5	110	11.6	10.9	0.196	0.479	1.1
0.227	3.83	1.2	<0.05		17	5740	932	163	157	28.6	7.67	0.417	0.681	3.7
0.18	3.38	0.9	<0.05		20	1560	1030	64.8	278	7.77	8.51	0.166	1.21	0.9
0.135	2.7	1	<0.05		22	998	589	42	211	4.98	4.85	0.107	0.92	1
0.437	0.686	5.1	0.11		4.2	3960	450	201	44.4	19.8	3.7	0.515	0.193	5.3
0.373	1.36	5.1	0.07		5.3	4840	616	161	57.2	24.1	5.07	0.412	0.249	4.8
0.216	2.97	3.9	<0.05		11	3510	540	73.7	84.5	17.5	4.45	0.188	0.368	3.9
0.182	11.6	1.9	<0.05		35	3080	907	57.2	836	15.4	7.46	0.146	3.64	2.1
0.202	9.72	2.2	<0.05		32	3140	803	69	892	15.7	6.61	0.176	3.88	2.4
0.377	1.29	1.7	0.07		11	1640	589	178	130	8.16	4.85	0.454	0.565	1.7
0.32	3.04	1.4	<0.05		13	2570	1130	158	378	12.8	9.3	0.405	1.64	1.4
0.366	3.9	1.4	<0.05		15	2670	1140	141	357	13.3	9.39	0.362	1.55	1.4
1.22	0.071	4.4	0.3		5.6	2820	408	421	<6.0	14.1	3.36	1.08	0.024	4.2
0.519	0.303	4.2	0.1		3	4220	611	226	17.3	21.1	5.03	0.579	0.075	4.2
0.499	2.09	3.5	0.07		7.4	4460	847	204	103	22.3	6.97	0.523	0.446	3.2
0.537	2.96	3	0.06		9.5	4570	915	214	121	22.8	7.53	0.546	0.524	3
0.62	3.15	3	0.08		10	4240	879	252	143	21.1	7.23	0.643	0.62	2.9
0.642	3.11	3	0.09		11	3650	746	257	155	18.2	6.14	0.657	0.674	3
0.546	2.72	3	0.08		11	3420	732	226	143	17.1	6.03	0.577	0.621	2.8
0.579	0.106	3.8	0.19		4.5	2130	340	263	<6.0	10.6	2.8	0.673	<0.020	3.8
0.309	0.352	3	0.08		4.1	2280	435	122	14.6	11.4	3.58	0.311	0.064	3.2
0.253	3.6	1.1	<0.05		18	1720	1030	88.7	78.1	8.59	8.44	0.227	0.34	1
0.247	4.72	0.9	<0.05		24	1470	1120	98.2	186	7.32	9.22	0.251	0.81	0.8
0.257	5.71	0.8	<0.05		24	1530	1280	85.7	256	7.62	10.5	0.219	1.11	0.7
0.205	5.21	0.7	<0.05		28	1140	1020	77.9	213	5.67	8.38	0.199	0.925	0.7
0.224	5.25	0.8	<0.05		27	1220	986	78.5	329	6.08	8.11	0.201	1.43	0.8
0.463	0.991	3.3	0.08		5.4	3930	750	218	62.4	19.6	6.17	0.557	0.271	3.2
0.388	2.86	3.1	0.06		11	3730	769	183	291	18.6	6.33	0.469	1.27	2.9
0.284	4.67	2.1	<0.05		18	3150	915	124	193	15.7	7.52	0.318	0.837	2.1
0.267	4.94	1.9	<0.05		20	2470	853	121	211	12.3	7.02	0.31	0.918	1.8
0.662	0.048	3.3	0.7		15	496	118	183	<6.0	2.47	0.97	0.468	<0.020	2.6
0.765	0.057	5	0.94		14	542	84.1	185	<6.0	2.7	0.692	0.472	<0.020	3.9
0.55	0.287	2.6	0.33		12	847	210	203	7	4.23	1.73	0.518	0.03	2.4
0.428	1.12	1.7	0.1		11	1560	600	182	62.9	7.76	4.93	0.465	0.274	1.6
0.414	1.98	1.9	0.08		14	1740	640	161	32.7	8.69	5.27	0.411	0.142	1.7

TMs-015C1	TMs-015C1	TMs-015C1	TMs-015G	TMs-015G	TMs-015G	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-028	TMs-005
K:Mg ratio	GTRI	ECR	Exchangeable acidity	Exchangeable aluminium	Exchangeable hydrogen	ECEC	Calcium	Magnesium	Potassium	Sodium	Aluminium	Hydrogen	CaCl2 extr. Aluminium	Chloride
		%	cmol/kg	cmol/kg	cmol/kg	cmol/kg	%	%	%	%	%	%	mg/kg	mg/kg
0.3		4.7	<0.02	<0.02	<0.02	27.6	81.3	14	4.2	0.5	0	0	<0.1	62
0.08		5.8	<0.02	<0.02	<0.02	26.6	76.8	17.4	1.3	4.5	0	0		700
0.06		15	<0.02	<0.02	<0.02	21.3	63.7	21.7	1.2	13	0	0		830
<0.05		5.6	<0.02	<0.02	<0.02	30.7	66	28.4	1.2	4.4	0	0	<0.1	130
<0.05		7.2	<0.02	<0.02	<0.02	36.7	60.8	32	0.9	6.3	0	0		290
<0.05		6.1	<0.02	<0.02	<0.02	36.4	59.3	34.7	0.7	5.3	0	0		350
<0.05		16	<0.02	<0.02	<0.02	34	46.1	38.4	0.9	15	0	0		1400
<0.05		13	<0.02	<0.02	<0.02	36.1	49.4	37.5	0.9	12	0	0		1100
<0.05		18	1.3	1.2	0.1	31.7	39.2	39.4	0.8	17	3.8	0.3		1500
<0.05		14	<0.02	<0.02	<0.02	34.8	46.7	39.3	0.9	13	0	0		1200
0.12		5.4	<0.02	<0.02	<0.02	19.8	62.1	32.5	4	1.5	0	0	<0.1	44
<0.05		5.2	<0.02	<0.02	<0.02	33.6	59.7	35.2	1	4.1	0	0		260
<0.05		7	<0.02	<0.02	<0.02	33	59.5	33.6	0.8	6.1	0	0		420
<0.05		12	<0.02	<0.02	<0.02	23.3	48	40	0.9	11	0	0		1100
<0.05		18	<0.02	<0.02	<0.02	23.8	43.1	39.2	0.6	17	0	0		1100
0.07		1.9	<0.02	<0.02	<0.02	34	78.4	19.7	1.3	0.6	0	0	<0.1	25
<0.05		2.6	<0.02	<0.02	<0.02	33.9	70.6	26.7	1	1.6	0	0		57
<0.05		14	<0.02	<0.02	<0.02	25.9	51.9	34.5	1.4	12	0	0		640
0.07		3.7	<0.02	<0.02	<0.02	27.9	63.5	32.8	2.2	1.6	0	0	<0.1	300
0.06		12	0.11	0.06	0.05	22.4	47.1	40.9	2.3	9.2	0.3	0.2		1500
0.07		15	0.06	<0.02	0.04	22.1	43.1	41.6	2.9	12	0.1	0.2		2200
0.07		15	0.06	0.02	0.03	19.8	41.4	43.1	2.9	12	0.1	0.2		3000
0.07		14	<0.02	<0.02	<0.02	26.7	43.2	42.6	3	11	0	0		3000
0.07		14	<0.02	<0.02	<0.02	26.1	43.8	41.9	2.8	12	0	0		2700
0.08		15	<0.02	<0.02	<0.02	24.9	41.7	42.9	3.4	12	0	0		3300
0.1		3.6	<0.02	<0.02	<0.02	24.6	69.7	26.7	2.7	0.9	0	0	<0.1	26
<0.05		13	<0.02	<0.02	<0.02	23.6	50.6	36.9	1.8	11	0	0		1500
0.05		14	<0.02	<0.02	<0.02	22.7	46.8	38.9	2	12	0	0		2200
<0.05		14	<0.02	<0.02	<0.02	23.6	47.3	38.2	1.9	13	0	0		2300
0.06		15	<0.02	<0.02	<0.02	23.3	45.8	39.1	2.4	13	0	0		2600
0.07		14	<0.02	<0.02	<0.02	22.7	45.1	40.6	2.8	12	0	0		3000
0.06		13	<0.02	<0.02	<0.02	22.2	44.1	42.9	2.6	11	0	0		2500
0.09		4.6	<0.02	<0.02	<0.02	21	65	30.4	2.6	2	0	0	<0.1	42
0.1		5.7	<0.02	<0.02	<0.02	25.7	63.8	30.5	3	2.7	0	0		150
0.05		9.4	<0.02	<0.02	<0.02	28.5	56.3	34.3	1.8	7.6	0	0		1700
<0.05		11	<0.02	<0.02	<0.02	20.1	51.5	37.2	1.8	9.5	0	0		1000
0.06		14	<0.02	<0.02	<0.02	26.4	43.3	42.5	2.4	12	0	0		1500
<0.05		13	<0.02	<0.02	<0.02	19.6	42.8	44.3	2	11	0	0		1500
0.18		6	<0.02	<0.02	<0.02	23.7	65.2	28.8	5.1	0.9	0	0	<0.1	120
0.07		4.4	<0.02	<0.02	<0.02	26.8	70.5	25.1	1.8	2.6	0	0		780
0.06		9.6	<0.02	<0.02	<0.02	22.4	55.8	34.7	1.9	7.6	0	0		670
0.08		16	<0.02	<0.02	<0.02	25.7	43.4	41	3.1	13	0	0		2900
0.08		16	<0.02	<0.02	<0.02	20.7	40.7	43.1	3.4	13	0	0		3000
0.08		17	<0.02	<0.02	<0.02	20.6	40	42.9	3.4	14	0	0		3000
0.08		18	<0.02	<0.02	<0.02	22.5	38.4	43.6	3.5	14	0	0		3200
														2400
0.21		5	<0.02	<0.02	<0.02	26.4	73.7	21.3	4.4	0.6	0	0	<0.1	21
0.08		3.1	<0.02	<0.02	<0.02	29.6	78	18.9	1.5	1.5	0	0		16
0.06		4.9	<0.02	<0.02	<0.02	18.4	75.4	19.7	1.1	3.8	0	0		120
<0.05		22	<0.02	<0.02	<0.02	18.9	48.9	29	1	21	0	0		1000

0.06		10	<0.02	<0.02	<0.02	21.7	67	22.9	1.3	8.8	0	0		370
0.34		5.8	<0.02	<0.02	<0.02	31	77.2	16.9	5.7	<0.2	0	0	<0.1	<5
0.07		8.4	<0.02	<0.02	<0.02	34.4	67.1	24.5	1.7	6.7	0	0		870
0.07		13	<0.02	<0.02	<0.02	33.1	62.6	24.2	1.8	11	0	0		1500
0.07		16	<0.02	<0.02	<0.02	29.7	59	25	1.6	14	0	0		1500
0.07		12	<0.02	<0.02	<0.02	28.6	64.4	23.8	1.7	10	0	0		1700
0.05		18	<0.02	<0.02	<0.02	21.9	53.7	27.9	1.4	17	0	0		1600
0.06		19	<0.02	<0.02	<0.02	20.2	55	26.4	1.5	17	0	0		1100
0.12		6.2	<0.02	<0.02	<0.02	12.9	56.1	37.8	4.7	1.5	0	0	<0.1	40
<0.05		17	<0.02	<0.02	<0.02	20.9	37.9	45.4	1.3	15	0	0		900
<0.05		17	<0.02	<0.02	<0.02	24.3	38.8	44.6	1.2	15	0	0		890
<0.05		18	<0.02	<0.02	<0.02	19.4	38.6	43.4	1.2	17	0	0		630
0.05		1.7	<0.02	<0.02	<0.02	24	70.2	28.1	1.5	0.2	0	0	<0.1	11
<0.05		1.7	<0.02	<0.02	<0.02	29.2	66.5	31.8	0.8	0.9	0	0		26
<0.05		2.8	<0.02	<0.02	<0.02	25.7	55	42.2	0.8	2	0	0		290
<0.05		2.9	<0.02	<0.02	<0.02	23.2	50.1	47	0.8	2.1	0	0		550
0.05		2.9	<0.02	<0.02	<0.02	37.4	76.6	20.5	1.1	1.8	0	0		490
<0.05		7.8	<0.02	<0.02	<0.02	17.7	44	48.2	0.9	6.9	0	0		570
<0.05		9.5	<0.02	<0.02	<0.02	10.9	45.9	44.7	1	8.5	0	0		360
0.14		2.9	<0.02	<0.02	<0.02	24.2	81.8	15.3	2.1	0.8	0	0	<0.1	17
0.08		2.2	<0.02	<0.02	<0.02	29.9	80.8	17	1.4	0.8	0	0		45
<0.05		2.5	<0.02	<0.02	<0.02	22.5	77.8	19.7	0.8	1.6	0	0		250
<0.05		14	<0.02	<0.02	<0.02	26.6	57.7	28	0.6	14	0	0		860
<0.05		15	<0.02	<0.02	<0.02	26.3	59.5	25.1	0.7	15	0	0		720
0.09		7.3	<0.02	<0.02	<0.02	14	58.2	34.6	3.2	4	0	0	<0.1	87
<0.05		8.5	<0.02	<0.02	<0.02	24.2	53	38.5	1.7	6.8	0	0		240
<0.05		7.8	<0.02	<0.02	<0.02	24.6	54.1	38.1	1.5	6.3	0	0		270
0.32		5.9	<0.02	<0.02	<0.02	18.5	75.9	18.1	5.8	<0.2	0	0	<0.1	40
0.12		2.4	<0.02	<0.02	<0.02	26.8	78.8	18.8	2.2	0.3	0	0		13
0.08		3.2	<0.02	<0.02	<0.02	30.2	73.7	23.1	1.7	1.5	0	0		280
0.07		3.4	<0.02	<0.02	<0.02	31.4	72.6	24	1.7	1.7	0	0		760
0.09		4.3	<0.02	<0.02	<0.02	29.6	71.3	24.4	2.2	2.1	0	0		760
0.11		5.2	<0.02	<0.02	<0.02	25.7	70.9	23.9	2.6	2.6	0	0		750
0.1		4.9	<0.02	<0.02	<0.02	24.3	70.3	24.8	2.4	2.6	0	0		630
0.24		4.8	<0.02	<0.02	<0.02	14.1	75.3	19.8	4.8	<0.2	0	0	<0.1	10
0.09		2.4	<0.02	<0.02	<0.02	15.3	74.2	23.3	2	0.4	0	0		49
<0.05		3.2	<0.02	<0.02	<0.02	17.6	48.8	48	1.3	1.9	0	0		310
<0.05		6	<0.02	<0.02	<0.02	17.6	41.6	52.4	1.4	4.6	0	0		670
<0.05		6.8	<0.02	<0.02	<0.02	19.5	39.1	54.1	1.1	5.7	0	0		760
<0.05		7.4	<0.02	<0.02	<0.02	15.2	37.4	55.2	1.3	6.1	0	0		840
<0.05		10	<0.02	<0.02	<0.02	15.8	38.4	51.3	1.3	9	0	0		710
														810
0.09		3.1	<0.02	<0.02	<0.02	26.6	73.7	23.2	2.1	1	0	0	<0.1	29
0.07		6.5	<0.02	<0.02	<0.02	26.7	69.7	23.7	1.8	4.7	0	0		140
<0.05		4.7	<0.02	<0.02	<0.02	24.4	64.4	30.9	1.3	3.4	0	0		500
<0.05		6	<0.02	<0.02	<0.02	20.6	60	34.1	1.5	4.5	0	0		540
0.48		12	<0.02	<0.02	<0.02	3.92	63.2	24.8	12	<0.2	0	0	<0.1	15
0.68		12	<0.02	<0.02	<0.02	3.87	69.7	17.9	12	0.2	0	0		<5
0.3		8.4	<0.02	<0.02	<0.02	6.5	65	26.5	8	0.5	0	0		17
0.09		5.5	<0.02	<0.02	<0.02	13.4	57.8	36.7	3.5	2	0	0		92
0.08		3.8	<0.02	<0.02	<0.02	14.5	59.9	36.3	2.8	1	0	0		270

TMs-003	TMs-012C	TMs-012A	TMs-012A	TMs-012A	TMs-012A	TMs-031	TMs-007	TMs-003	TMs-002A1	TMs-002A1
Salinity EC 1:5	Boron	Iron (Fe)	Manganese (Mn)	Copper (Cu)	Zinc (Zn)	Oxalate ext. Molybdenum	Dumas Total Nitrogen	TDS	% Air-dry Moisture Content	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)
dS/m	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% dry wt	mg/L	% of dry wt	g/g
0.17	1.4	6.2	3.5	0.6	0.27	0.81	0.21	110	2.9	0.0288
0.67							0.12	430	3.2	0.0316
0.71								450	2.6	0.0263
0.13	1.4	27	28	2.2	0.18	1.3	0.11	83	3.5	0.0349
0.35							0.092	230	4	0.0395
0.46								290	5.3	0.0531
1								650	4.4	0.0437
0.97								620	3.5	0.0347
1								660	4	0.0404
0.88								570	4.3	0.0425
0.074	0.77	25	38	1.4	0.96	0.84	0.16	47	2.4	0.0243
0.39							0.093	250	3.4	0.0336
0.51								330	3.2	0.0323
0.91								580	3.3	0.0329
0.91								580	2.9	0.0289
0.16	1.2	11	4.6	1.1	0.19	0.92	0.15	100	2.8	0.0275
0.23							0.099	140	3.4	0.0338
0.58								370	3.6	0.036
0.33	2.9	18	7.7	1.6	0.26	1.1	0.098	210	3.3	0.033
1.1							0.031	700	3.6	0.0359
1.5								970	5	0.0498
2								1200	5.1	0.0508
2.1								1400	3.1	0.0308
1.9								1200	3.2	0.0321
2.3								1400	3.5	0.0345
0.14	0.86	15	8.2	1.8	0.25	1.1	0.095	92	2.7	0.0267
1.1							0.055	690	3	0.0297
1.5								980	2.6	0.0262
1.5								980	2.7	0.0271
1.7								1100	3.2	0.0323
2								1300	3.1	0.0305
1.6								1000	4.1	0.0408
0.06	0.53	28	24	2.2	0.46	1.1	0.044	38	2.9	0.029
0.14							0.057	87	3.8	0.0378
1.2								770	4.5	0.0448
0.72								460	3.3	0.0328
1								650	2.8	0.0284
1								640	2.2	0.0218
0.13	0.87	27	26	1.9	0.72	1.2	0.17	82	2.8	0.028
0.62							0.12	390	3	0.0296
0.49								310	2.6	0.0255
1.9								1200	3.9	0.0394
1.9								1200	4.7	0.0469
1.9								1200	4.7	0.0466
2.1								1300	4.2	0.0418
1.6								1000		
0.099	0.9	7.7	6.2	0.94	0.36	1.1	0.16	64	2.8	0.0278
0.15							0.1	99	3	0.0301
0.21								130	1.7	0.0169
0.76								490	3.1	0.0309

0.38								240	2.2	0.0218
0.11	1.1	12	13	1.4	0.67	1	0.23	72	3.1	0.0309
0.8							0.11	510	3.3	0.033
1.2								740	3.2	0.0321
1.1								720	4.7	0.0465
1.3								820	3.1	0.0305
1.1								710	4.1	0.0413
0.83								530	3	0.0297
0.057	0.49	15	26	0.9	0.46	0.64	0.09	37	1.6	0.0163
0.68							0.084	440	3.7	0.037
0.68								430	3.2	0.0319
0.54								350	3.3	0.0325
0.067	1.1	11	11	0.92	0.22	0.98	0.1	43	2.9	0.0287
0.2							0.084	130	2.6	0.0256
0.41								260	2.6	0.0262
0.56								360	2.4	0.0241
0.53								340	1.9	0.0194
0.49								310	2.3	0.0227
0.29								190	1	0.0103
0.065	1.1	11	16	1.4	0.2	1.3	0.19	42	2.7	0.0274
0.2							0.13	130	2.3	0.0233
0.36								230	2.5	0.0254
0.86								550	3.1	0.0307
0.78								500	2.8	0.0283
0.094	0.56	14	22	1.1	0.56	0.79	0.096	60	1.5	0.0149
0.22							0.11	140	4	0.0396
0.32								210	3.3	0.0328
0.092	0.79	11	7.6	0.93	0.47	0.66	0.12	59	2.1	0.0214
0.081							0.13	52	2.4	0.0241
0.31								200	4	0.0403
0.58								370	3.9	0.0386
0.57								370	3.9	0.0387
0.54								350	3.8	0.0383
0.47								300	3.9	0.0388
0.038	0.74	14	21	1.2	0.28	0.68	0.097	24	1.8	0.0178
0.054							0.077	35	1.5	0.0146
0.45								290	1.6	0.0164
0.69								440	1.5	0.015
0.85								540	2.3	0.0231
0.8								510	1.4	0.0144
0.74								470	1.7	0.0165
0.7								450		
0.1	0.81	11	6.8	1.3	0.31	1.1	0.13	66	3.5	0.0352
0.22							0.1	140	3.6	0.036
0.56								360	2.8	0.0276
0.58								370	2.6	0.0255
0.058	0.18	13	8.1	0.45	0.41	<0.25	0.075	37	0.3	0.0027
0.059							0.039	38	0.3	0.0026
0.052								33	0.5	0.0046
0.13								84	1.6	0.016
0.32								200	1.3	0.0131

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Eurofins APAL Test Method Codes											
Crop	Actual Crop	SubmissionID	SamplingDate	DateReceived	BatchID	Batch Position No.	AgentName	ClientName	SampleName	Barcode	SampleDepth
		147218		2025-11-20	46603	7	GT Environmental - Reece McCann	BWN	D22-1.00-1.10	111981068	1-1.1
		147218		2025-11-20	46601	3	GT Environmental - Reece McCann	BWN	D22-1.30-1.40	111981069	1.3-1.4
		147218		2025-11-20	46603	42	GT Environmental - Reece McCann	BWN	D22-1.60-1.70	111981070	1.6-1.7
		147218		2025-11-20	46603	44	GT Environmental - Reece McCann	BWN	D32-1.10-1.20	111981079	1.1-1.2
		147218		2025-11-20	46603	26	GT Environmental - Reece McCann	BWN	D32-1.40-1.50	111981080	1.4-1.5
		147218		2025-11-20	46603	18	GT Environmental - Reece McCann	BWN	D32-1.70-1.80	111981081	1.7-1.8
		147218		2025-11-20	46603	9	GT Environmental - Reece McCann	BWN	D37-1.10-1.20	111981093	1.1-1.2
		147218		2025-11-20	46603	35	GT Environmental - Reece McCann	BWN	D37-1.40-1.50	111981094	1.4-1.5
		147218		2025-11-20	46603	17	GT Environmental - Reece McCann	BWN	D37-1.70-1.80	111981095	1.7-1.8
		147218		2025-11-20	46603	2	GT Environmental - Reece McCann	BWN	D44-1.10-1.20	111980909	1.1-1.2
		147218		2025-11-20	46603	39	GT Environmental - Reece McCann	BWN	D59-1.10-1.20	111980933	1.1-1.2
		147218		2025-11-20	46603	33	GT Environmental - Reece McCann	BWN	D59-1.40-1.50	111980934	1.4-1.5
		147218		2025-11-20	46603	27	GT Environmental - Reece McCann	BWN	D59-1.70-1.80	111980935	1.7-1.8

			TMs-004A	TMs-004B4	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E
Postcode	Transect GPS Start	Transect GPS Finish	pH 1:5 water	pH CaCl2 (following 4A1)	Calcium (Ca) - NH4Cl/BaCl2	Magnesium (Mg) - NH4Cl/BaCl2	Potassium (K) - NH4Cl/BaCl2	Sodium (NH4Cl/BaCl2)	Calcium (Ca) - NH4Cl/BaCl2	Magnesium (Mg) - NH4Cl/BaCl2
			pH units	pH units	mg/kg	mg/kg	mg/kg	mg/kg	cmol/kg	cmol/kg
4120	N/A	N/A	6.01	5.26	2010	1140	103	2040	10	9.39
4120	N/A	N/A	6.08	5.27	1970	1150	100	1860	9.82	9.44
4120	N/A	N/A	5.71	5	1840	1120	109	2120	9.2	9.23
4120	N/A	N/A	8.67	8.09	2160	1010	247	797	10.8	8.28
4120	N/A	N/A	8.66	8.15	2190	1190	262	1100	10.9	9.78
4120	N/A	N/A	8.46	8.04	2090	1210	286	1140	10.4	10
4120	N/A	N/A	8.5	7.91	3360	1060	132	1630	16.8	8.7
4120	N/A	N/A	8.99	8.18	3000	992	91	1590	15	8.16
4120	N/A	N/A	8.99	8.26	2880	1030	82	1660	14.4	8.47
4120	N/A	N/A	8.54	7.72	2610	1110	103	1730	13	9.12
4120	N/A	N/A	9.32	8.36	1430	747	145	814	7.13	6.15
4120	N/A	N/A	9.3	8.31	1610	850	122	1140	8.04	6.99
4120	N/A	N/A	9.3	8.39	1490	791	142	957	7.46	6.51

TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015E	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1
Potassium (K) - NH4Cl/BaCl2	Sodium (NH4Cl/BaCl2)	Ca:Mg ratio	K:Mg ratio	GTRI	ECR	Calcium (Ca) - prewash alc. pH 8.5 NH4Cl	Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl	Potassium (K) - prewash alc. pH 8.5 NH4Cl	Sodium (Na) - prewash alc. pH 8.5 NH4Cl	Calcium (Ca) - prewash alc. pH 8.5 NH4Cl
cmol/kg	cmol/kg				%	mg/kg	mg/kg	mg/kg	mg/kg	cmol/kg
0.263	8.89	1.1	<0.05		32	2020	1010	101	940	10.1
0.254	8.1	1	<0.05		30	2040	1050	109	956	10.2
0.278	9.21	1	<0.05		34	1940	1080	108	981	9.66
0.632	3.47	1.3	0.08		18	1990	1130	283	91.7	9.95
0.671	4.78	1.1	0.07		21	2020	1260	298	169	10.1
0.73	4.95	1	0.07		22	1910	1280	331	137	9.53
0.337	7.11	1.9	<0.05		23	3620	1170	135	563	18
0.233	6.91	1.8	<0.05		24	3170	1110	91.4	601	15.8
0.21	7.24	1.7	<0.05		25	3050	1220	89.6	787	15.2
0.264	7.52	1.4	<0.05		26	2700	1170	98.8	834	13.5
0.37	3.54	1.2	0.06		23	1430	820	165	95.4	7.14
0.313	4.98	1.2	<0.05		26	1680	976	130	123	8.36
0.363	4.16	1.1	0.06		24	1500	826	154	95.4	7.49

TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015C1	TMs-015G	TMs-015G	TMs-015G	TMs-Cal02
Magnesium (Mg) - prewash alc. pH 8.5 NH4Cl	Potassium (K) - prewash alc. pH 8.5 NH4Cl	Sodium (Na) - prewash alc. pH 8.5 NH4Cl	Ca:Mg ratio	K:Mg ratio	GTRI	ECR	Exchangeable acidity	Exchangeable aluminium	Exchangeable hydrogen	ECEC
cmol/kg	cmol/kg	cmol/kg				%	cmol/kg	cmol/kg	cmol/kg	cmol/kg
8.28	0.258	4.09	1.2	<0.05		19	<0.02	<0.02	<0.02	22.7
8.65	0.277	4.16	1.2	<0.05		19	<0.02	<0.02	<0.02	23.2
8.86	0.276	4.27	1.1	<0.05		20	0.62	0.55	0.07	23.7
9.32	0.724	0.399	1.1	0.08		5.5	<0.02	<0.02	<0.02	20.4
10.4	0.762	0.735	1	0.07		6.8	<0.02	<0.02	<0.02	22
10.5	0.846	0.598	0.9	0.08		6.7	<0.02	<0.02	<0.02	21.5
9.62	0.346	2.45	1.9	<0.05		9.2	<0.02	<0.02	<0.02	30.5
9.09	0.234	2.61	1.7	<0.05		10	<0.02	<0.02	<0.02	27.8
10.1	0.229	3.42	1.5	<0.05		13	<0.02	<0.02	<0.02	28.9
9.66	0.253	3.63	1.4	<0.05		14	<0.02	<0.02	<0.02	27
6.74	0.423	0.415	1.1	0.06		5.7	<0.02	<0.02	<0.02	14.7
8.03	0.333	0.536	1	<0.05		5	<0.02	<0.02	<0.02	17.3
6.79	0.395	0.415	1.1	0.06		5.4	<0.02	<0.02	<0.02	15.1

TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-Cal02	TMs-005	TMs-003	TMs-003	TMs-002A1	TMs-002A1
Calcium	Magnesium	Potassium	Sodium	Aluminium	Hydrogen	Chloride	Salinity EC 1:5	TDS	% Air-dry Moisture Content	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)
%	%	%	%	%	%	mg/kg	dS/m	mg/L	% of dry wt	g/g
44.4	36.5	1.1	18	0	0	1400	0.92	590	2.7	0.0265
43.7	37.2	1.2	18	0	0	1500	0.95	610	3.3	0.0334
40.8	37.4	1.2	18	2.3	0.3	1400	0.92	590	3.1	0.0312
48.8	45.7	3.6	2	0	0	740	0.71	450	1.9	0.0185
45.8	47.4	3.5	3.3	0	0	1000	0.89	570	2.3	0.0232
44.3	49	3.9	2.8	0	0	1300	1.1	700	2.2	0.0217
59.2	31.6	1.1	8	0	0	1400	1	640	2.9	0.0285
57	32.7	0.8	9.4	0	0	960	0.81	520	3.2	0.0317
52.6	34.8	0.8	12	0	0	990	0.81	520	3.3	0.0328
49.9	35.7	0.9	13	0	0	860	0.68	430	2.9	0.0287
48.5	45.8	2.9	2.8	0	0	370	0.48	300	1.5	0.0153
48.4	46.5	1.9	3.1	0	0	670	0.69	440	1.7	0.0167
49.6	45	2.6	2.7	0	0	460	0.55	350	1.5	0.0145

ESSA /EAL(NATA,ASPAC)

5 Dunphy St Sunnybank Hills
Qld 4109

Phone: 0403245560

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Reference: **25012835 ESSA25 BWNGTE**

Date Received: 19/11/2025
Date Completed: 27/11/2025

FINAL REPORT

Project: BWN

All results in this report relate only to the items tested. Results are expressed on an "as received basis".

Client Name: GTE

Contact: Dennis Baker

Sample Type: Soil

Number of samples: 138 of 140 BWN

ESSA (EAL)Pty Ltd

Soil Analysis Report

Batch Number: 25012835 ESSA237346

Date Received: 19/11/2025

Date Completed: 27/11/2025

Client: GTE BWN (25)

Report ID	E25-01-2835_EALP1_1								
Client Sample ID:			D1-0.00-0.10	D1-0.20-0.30	D1-0.50-0.60	D5-0.00-0.10	D5-0.20-0.30	D5-0.50-0.60	D6-0.00-0.10
EAL Sample ID:			E25-01-2835-0001	E25-01-2835-0002	E25-01-2835-0003	E25-01-2835-0004	E25-01-2835-0005	E25-01-2835-0006	E25-01-2835-0011
Moisture (dry basis)	%	---	3.01	3.17	2.09	3.4	4.13	3.33	1.54
Moisture 105Â°C (dry basis)	%	<0.1	10.1	12.5	8.1	11.7	15.1	13.3	3.5
Texture (ISSS Classification)	---	---	Clay	Clay	Silty Clay Loam	Clay	Clay	Clay	Clay
Gravel > 2 mm fraction	% of whole sample	<0.1	1.5	0.8	57.4	< 0.1	< 0.1	4.3	< 0.1
Sand > 20 µm fraction	% < 2 mm fraction	<0.1	40.8	30.2	43.3	38.5	30.8	31.7	48.8
Silt 2-20 µm fraction	% < 2 mm fraction	<0.1	14.8	17.9	28.5	10.2	13.5	11.9	15.2
Clay < 2 µm fraction	% < 2 mm fraction	<0.1	44.4	51.9	28.2	51.3	55.8	56.4	36
Moisture 40Â°C (dry basis)	%	<0.1	---	---	---	---	---	---	---
R1 Dispersion Ratio	---	---	0.4	0.66	0.35	0.44	0.51	0.44	0.39
Emerson Aggregate Test - Class	---	---	4	3	2	2	2	2	3

D6-0.20-0.30	D6-0.50-0.60	D6-0.80-0.90	D6-1.10-1.20	D7-0.00-0.10	D7-0.20-0.30	D7-0.50-0.60	D12m-0.00-0.10	D12m-0.20-0.30	D12m-0.50-0.60	D12m-0.80-0.90
E25-01-2835-0012	E25-01-2835-0013	E25-01-2835-001	E25-01-2835-0015	E25-01-2835-0016	E25-01-2835-001	E25-01-2835-0018	E25-01-2835-0019	E25-01-2835-0020	E25-01-2835-0021	E25-01-2835-0022
3.17	2.94	1.44	2.15	3.35	2.84	2.69	2.63	2.69	2.98	2.79
15.5	16.2	5.8	7.4	8.6	12.6	13.4	7.2	12.2	14.1	12.2
Clay	Clay	Clay	Clay Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay
0.3	1.1	47.4	0.3	2.1	9.4	20	0.8	< 0.1	0.2	9
32.2	36.2	43.8	50.3	31.9	30.2	28.2	31	24	24.1	25.2
9	10.7	15.7	18.3	16.8	14.6	16.5	13	16.6	15.7	15.8
58.8	53.1	40.5	31.4	51.3	55.2	55.3	56	59.4	60.2	59.1
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0.54	0.6	0.69	0.5	0.26	0.57	0.77	0.42	0.65	0.69	0.69
3	3	2	2	4	2	2	4	2	2	2

D12m-1.10-1.20	D12m-1.40-1.50	D12m-1.70-1.80	D12d-0.00-0.10	D12d-0.20-0.30	D12d-0.50-0.60	D12d-0.80-0.90	D12d-1.10-1.20	D12d-1.40-1.50	D12d-1.70-1.80
E25-01-2835-0023	E25-01-2835-0024	E25-01-2835-0025	E25-01-2835-0026	E25-01-2835-0027	E25-01-2835-0028	E25-01-2835-0029	E25-01-2835-0030	E25-01-2835-0031	E25-01-2835-0032
3.6	3.16	3.81	2.39	2.57	2.61	2.47	2.37	2.74	2.73
14.1	14.2	14.5	4.7	10.6	11.3	11.1	11.9	11.7	10.6
Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
18.1	17.9	2.8	7	8.9	5	0.7	0.4	1.6	3.3
25.1	23	25.2	39.7	35.7	34.4	39.5	36.8	34.1	30.2
16.7	15.8	13.9	13.1	12.3	13.4	10.3	11.4	13.6	13.7
58.2	61.2	60.9	47.3	52.1	52.2	50.2	51.8	52.3	56.1
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0.66	0.71	0.78	0.43	0.69	0.68	0.71	0.72	0.69	0.68
2	2	2	2	2	2	2	2	2	2

D14d-0.00-0.10	D14d-0.20-0.30	D14d-0.50-0.60	D14d-0.80-0.90	D14d-1.10-1.20	D14d-1.30-1.40	D14m-0.00-0.10	D14m-0.20-0.30	D14m-0.50-0.60	D14m-0.80-0.90
E25-01-2835-0033	E25-01-2835-0034	E25-01-2835-0035	E25-01-2835-0036	E25-01-2835-0037	E25-01-2835-0038	E25-01-2835-0039	E25-01-2835-0040	E25-01-2835-0041	E25-01-2835-0042
2.54	2.66	3.21	2.3	2.39	2.25	2.48	2.33	1.88	3.14
5.7	6.9	12.9	8.7	8.9	10	4.8	8.2	8.1	13.7
Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
0.3	7.6	11.8	6.9	8.7	9.5	0.3	0.9	7.2	0.2
41.5	36.1	23.9	44.2	43.2	39.8	33.6	32.3	47.7	25.4
13.8	11.7	16.2	11.4	11.6	19.5	19.9	17.5	11.4	16.2
44.7	52.3	60	44.4	45.2	40.7	46.6	50.2	41	58.4
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0.48	0.6	0.53	0.67	0.73	0.61	0.38	0.35	0.61	0.7
3	2	2	2	2	2	3	3	2	2

D14m-1.10-1.20	D14m-1.40-1.50	D14m-1.70-1.80	D19-0.00-0.05	D19-0.20-0.30	D19-0.40-0.50	D19-0.50-0.60	D19-0.80-0.90	D21-0.00-0.10	D21-0.20-0.30
E25-01-2835-0043	E25-01-2835-0044	E25-01-2835-0045	E25-01-2835-0046	E25-01-2835-0047	E25-01-2835-0048	E25-01-2835-0049	E25-01-2835-0050	E25-01-2835-0051	E25-01-2835-0052
3.25	2.97	3.23	2.3	2.49	1.82	2.04	1.68	2.69	2.74
14.7	13.1	15	5.9	7.7	6.4	8.3	6.6	3.7	11.3
Clay	Clay	Clay	Clay	Clay	Clay Loam	Clay Loam	Clay Loam	Clay	Clay
10.2	9	19.4	0.5	9.5	0.3	6.6	56.7	0.9	6.4
23.7	49.2	23	33.6	39.2	45.8	44.3	40.9	36.8	22.7
15.7	11.5	15.3	18.8	19.1	22.4	23	21.9	22.5	18.3
60.6	39.3	61.7	47.7	41.7	31.8	32.8	37.2	40.8	59
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0.76	0.99	0.79	0.43	0.44	0.44	0.52	0.51	0.37	0.63
2	2	2	3	3	2	2	2	4	3

D21-0.50-0.60	D21-0.80-0.90	D21-1.10-1.20	D21-1.40-1.50	D21-1.70-1.80	D24-0.00-0.10	D24-0.20-0.30	D24-0.50-0.60	D24-0.80-0.90	D36-0.00-0.10
E25-01-2835-0053	E25-01-2835-0054	E25-01-2835-0055	E25-01-2835-0056	E25-01-2835-0057	E25-01-2835-0058	E25-01-2835-0059	E25-01-2835-0060	E25-01-2835-0061	E25-01-2835-0062
2.66	2.86	2.73	2.52	2.61	1.1	2.37	2.14	1.9	1.83
10.7	12.6	12.6	11.8	11.1	2.8	12.8	10.7	9.4	5.8
Clay	Clay	Clay	Silty Clay	Clay	Clay Loam	Clay	Clay	Clay Loam	Clay
6.7	18.8	18	3.2	43.1	1.1	1.1	1.1	21	7.2
22.1	25.1	20.6	13.3	34.3	68.3	36.1	39.8	46.8	55.5
17	16.3	20.2	27.1	17.9	10	13.3	16.3	17.3	3.3
60.9	58.6	59.3	59.6	47.8	21.7	50.6	43.9	35.9	41.2
---	---	---	---	---	---	---	---	---	---
0.7	0.75	0.68	0.72	0.65	0.47	0.43	0.65	0.56	0.24
2	2	2	2	2	3	2	2	2	3

D36-0.20-0.30	D36-0.50-0.60	D36-0.80-0.90	D36-1.10-1.20	D36-1.40-1.50	D36-1.70-1.80	D39-0.00-0.10	D39-0.20-0.30	D39-0.50-0.60	D39-0.80-0.90
E25-01-2835-0063	E25-01-2835-0064	E25-01-2835-0065	E25-01-2835-0066	E25-01-2835-0067	E25-01-2835-0068	E25-01-2835-0069	E25-01-2835-0070	E25-01-2835-0071	E25-01-2835-0072
2.46	2.07	1.72	1.73	1.4	1.08	2.22	2.26	1.73	2.23
9.7	8.6	7.4	7.9	6.1	5	6.4	8.3	8.1	9.4
Clay	Clay	Clay	Sandy Clay	Sandy Clay Loam	Sandy Loam	Clay	Clay	Clay	Clay
5.5	6.1	10.2	48.8	5.5	13	3.7	0.5	20.4	43.1
49.4	49.4	52.7	62.7	63.5	78.4	43.3	40.9	56.2	34.6
4.4	7.3	8.6	4	5.8	4.1	10.1	12	9.9	22.7
46.3	43.4	38.7	33.3	30.7	17.5	46.6	47.2	33.9	42.8
---	---	---	---	---	---	---	---	---	---
0.26	0.35	0.37	0.59	0.57	0.38	0.26	0.22	0.54	0.67
4	4	4	4	2	2	3	4	4	2

D39-1.10-1.20	D43-0.00-0.10	D43-0.10-0.20	D43-0.20-0.30	D45-0.00-0.10	D45-0.20-0.30	D45-0.50-0.60	D45-0.80-0.90	D45-1.10-1.20	D45-1.40-1.50	D45-1.70-1.80
E25-01-2835-0073	E25-01-2835-007	E25-01-2835-0075	E25-01-2835-0076	E25-01-2835-0077	E25-01-2835-0078	E25-01-2835-0079	E25-01-2835-0080	E25-01-2835-0081	E25-01-2835-0082	E25-01-2835-0083
2.18	1.62	2.75	2.8	1.57	2.21	2.66	2.7	2.69	2.77	2.29
9.6	5.9	10.9	11	6.4	10.4	11.5	12.1	13.6	13.6	12.3
Silty Clay Loam	Clay Loam	Clay	Clay	Clay Loam	Clay	Clay	Clay	Clay	Clay	Clay
55.5	1.9	6.8	1.3	0.8	0.2	43.6	10.1	< 0.1	4.8	1.9
31.6	57.7	34.8	36.9	52.6	35.1	29.9	23.5	26.7	26.3	32
28.7	14.8	13.9	11.6	16.4	20.3	18.2	20.3	19.4	22.4	19.4
39.7	27.5	51.3	51.5	31	44.6	51.9	56.3	53.9	51.3	48.6
---	---	---	---	---	---	---	---	---	---	---
0.64	0.59	0.63	0.65	0.49	0.33	0.31	0.35	0.53	0.56	0.61
2	2	2	2	3	4	4	4	2	2	2

D52-0.00-0.10	D52-0.20-0.30	D52-0.50-0.60	D52-0.80-0.90	D52-1.10-1.20	D52-1.40-1.50	D52-1.70-1.80	D58-0.00-0.10	D58-0.20-0.30	D58-0.50-0.60	D58-0.70-0.80
E25-01-2835-0084	E25-01-2835-0085	E25-01-2835-0086	E25-01-2835-0087	E25-01-2835-0088	E25-01-2835-0089	E25-01-2835-0090	E25-01-2835-0091	E25-01-2835-0092	E25-01-2835-0093	E25-01-2835-0094
1.34	1.49	1.31	1.68	1.92	2.07	1.58	2.35	3.08	1.78	1.68
6.5	6.4	6.4	6	7.4	7.2	6.6	10.4	10.3	8.9	8.5
Clay	Sandy Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
2.7	1.9	4.2	16.5	18.1	19.3	3.9	1	0.5	0.7	3
61.3	62.4	54.6	54	46.6	51.7	54.7	42.2	42.1	48.3	56.1
7.1	5.6	11.5	10.9	13.5	11.5	10.3	14.7	14.7	10	7.3
31.7	32	34	35.2	39.9	36.8	35.1	43.1	43.2	41.7	36.7
---	---	---	---	---	---	---	---	---	---	---
0.32	0.39	0.62	0.66	0.72	0.72	0.63	0.35	0.55	0.51	0.62
3	4	4	2	2	2	2	3	2	3	2

D65-0.00-0.05	D65-0.10-0.20	D65-0.20-0.30	D65-0.50-0.60	D65-0.80-0.90	D3-0.00-0.10	D3-0.20-0.30	D3-0.50-0.60	D3-0.70-0.80	D3-0.90-1.00	D22-0.00-0.10
E25-01-2835-0095	E25-01-2835-0096	E25-01-2835-0097	E25-01-2835-009	E25-01-2835-0099	E25-01-2835-0100	E25-01-2835-0101	E25-01-2835-0102	E25-01-2835-0103	E25-01-2835-0104	E25-01-2835-0105
0.298	0.288	0.472	1.19	1.27	5.75	5.67	8.57	8.4	4.62	5.95
4.4	2.3	3.4	7.1	7.1	---	---	---	---	---	---
Sandy Loam	Sandy Loam	Sandy Loam	Sandy Clay	Sandy Clay Loam	Clay Loam	Clay	Clay	Clay	Clay Loam	Clay
3	2.2	10.4	2	4	2.4	1	53.7	45.7	87.1	2
85.7	86.1	78.7	64.3	68.2	51.6	47.9	24.9	31	58.7	34.4
3.9	3.6	3.9	4.4	6.8	21.4	15.2	18.1	10.7	12.4	16.9
10.4	10.3	17.4	31.3	25	27	36.9	57	58.3	29	48.8
---	---	---	---	---	2.9	5.1	7	6.3	3.3	0.3
0.32	0.43	0.49	0.61	0.59	0.31	0.31	0.27	0.37	0.57	0.35
3	3	3	2	4	---	---	---	---	---	---

D22-0.20-0.30	D22-0.50-0.60	D22-0.80-0.90	D22-1.00-1.10	D22-1.30-1.40	D22-1.60-1.70	D32-0.00-0.10	D32-0.20-0.30	D32-0.50-0.60	D32-0.80-0.90	D32-1.10-1.20
E25-01-2835-0106	E25-01-2835-0107	E25-01-2835-0108	E25-01-2835-0109	E25-01-2835-0110	E25-01-2835-0111	E25-01-2835-0112	E25-01-2835-0113	E25-01-2835-0114	E25-01-2835-0115	E25-01-2835-0116
7.12	7.25	6.23	2.56	2.23	2.11	2.65	4.36	3.97	4.18	1.57
---	---	---	9.4	9.7	8.7	---	---	---	---	9.3
Clay	Clay	Clay	Clay	Clay	Silty Clay Loam	Loam	Clay	Clay	Clay	Clay
18.2	84.1	27.3	< 0.1	49.7	0.4	< 0.1	11.2	7.5	23.6	13.2
25.6	27.9	36.3	36.5	39.7	32.8	68.6	56.5	58.5	54.9	49.1
16.4	15	19.8	22.6	18.4	28	11.6	8.4	8.5	9.8	13.2
58	57.1	43.9	41	42	39.2	19.8	35.1	33	35.3	37.7
3.4	7.6	6.6	---	---	---	1.5	5	3.6	5	---
0.37	0.61	0.59	0.51	0.59	0.42	0.38	0.64	0.48	0.57	0.59
---	---	---	2	2	2	---	---	---	---	4

D32-1.40-1.50	D32-1.70-1.80	D37-0.00-0.10	D37-0.20-0.30	D37-0.50-0.60	D37-0.80-0.90	D37-1.10-1.20	D37-1.40-1.50	D37-1.70-1.80	D44-0.00-0.10	D44-0.10-0.20
E25-01-2835-0117	E25-01-2835-0118	E25-01-2835-0119	E25-01-2835-0120	E25-01-2835-0121	E25-01-2835-0122	E25-01-2835-0123	E25-01-2835-0124	E25-01-2835-0125	E25-01-2835-0126	E25-01-2835-0127
1.86	1.8	7.97	8.2	7.92	7.77	3.6	2.73	2.53	3.77	4.78
10.2	9.4	---	---	---	---	12	8.2	9.5	---	---
Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay Loam	Clay
50.9	7.8	17.7	32.3	< 0.1	2.7	5.6	8.6	66.4	2.5	11
43.6	43.5	30.1	27.7	29.4	29.9	36.6	49.5	46.1	55.7	50.9
14.5	16.4	16.3	14.1	14.3	10.4	13.3	13.7	14.4	16.9	13.8
41.9	40.1	53.6	58.2	56.3	59.8	50.2	36.8	39.5	27.5	35.4
---	---	---	---	---	---	---	---	---	1.9	3.9
0.57	0.5	0.29	0.49	0.49	0.44	0.52	0.52	0.47	0.37	0.3
2	2	---	---	---	---	3	2	2	---	---

D44-0.20-0.30	D44-0.50-0.60	D44-0.80-0.90	D44-1.10-1.20	D59-0.00-0.10	D59-0.20-0.30	D59-0.50-0.60	D59-0.80-0.90	D59-1.10-1.20	D59-1.40-1.50	D59-1.70-1.80
E25-01-2835-0128	E25-01-2835-0129	E25-01-2835-0130	E25-01-2835-0131	E25-01-2835-0132	E25-01-2835-0133	E25-01-2835-0134	E25-01-2835-0135	E25-01-2835-0136	E25-01-2835-0137	E25-01-2835-0138
7.9	7.5	6.24	2.79	1.18	1.11	4.54	4.41	1.11	1.37	1.17
---	---	---	10.8	---	---	---	---	7.4	7.4	7.6
Clay	Clay	Clay	Clay	Sandy Loam	Sandy Loam	Sandy Clay	Clay	Sandy Clay	Clay	Clay
20.9	4.7	13.4	11.7	4.7	5.7	2	6.4	23.3	29.3	19.5
30.7	33.1	37.2	39.6	87.5	83.5	57.5	57.5	64.9	57	58.1
9.3	9.3	9.2	10.5	2	5.1	3.4	4.8	2.8	8	4.9
60	57.6	53.7	50	10.4	11.4	39.1	37.8	32.3	35	37
9.5	8.5	9.3	---	2.4	1.5	6.1	6.4	---	---	---
0.46	0.6	0.67	0.74	0.44	0.42	0.69	0.68	0.69	0.73	0.68
---	---	---	2	---	---	---	---	2	2	2

ESSA Pty Ltd/ EAL NATA ASPAC

METHOD DESCRIPTIONS

Soil

Methods used to Analyse Samples

Analyte	ALHS*	Uncertainty %	LOQ	Unit	Name	Method Description
pH	4A1	1.1	0.1	pH	pH	1:5 water extr, pH meter
EC	3A1	5.4	0.01	dS/m	Electrical conductivity	1:5 water extr, EC meter
Cl	5A2	10.0	10.0	mg/kg	Chloride	1:5 water extr, (AA) colorimetric
NO3-N	7C2	6.7	1.0	mg/kg	Nitrate-nitrogen	1:5 water extr, (AA) colorimetric
NH4-N	7C2	7.8	0.6	mg/kg	Ammonium-nitrogen	1M KCl extr, (AA) colorimetric
Bicarb.P	9B2	16.8	1.0	mg/kg	Bicarb.ext.phosphorus	0.5M NaHCO3 @ pH 8.5, (AA) colorimetric
TN	7A2	12.9	0.01	%	Total Kjeldahl Nitrogen	Sulphuric acid digest, (AA) colorimetric
OC	8B1	9.7	0.02	%	Organic Carbon	Walkley & Black, (H2SO4/K2Cr2O7), titr.
Ca (Neut)	15A1	10.3	0.10	meq/100g	Exchangeable calcium	1M NH4Cl @ pH 7.0 shake, AAS
Mg (Neut)	15A1	6.6	0.10	meq/100g	Exchangeable magnesium	1M NH4Cl @ pH 7.0 shake, AAS
Na (Neut)	15A1	7.3	0.03	meq/100g	Exchangeable sodium	1M NH4Cl @ pH 7.0 shake, AAS
K (Neut)	15A1	3.9	0.02	meq/100g	Exchangeable potassium	1M NH4Cl @ pH 7.0 shake, AAS
ECEC	15J1	5.0	1	meq/100g	Effective cation ex.capacity	Sum of exchangeable cations
ESP	15N1	5.0	3	%	Exchangeable Na%	(Exchangeable Na/sum of exch.cations)%
Sand	no ref	22.1	1.0	%	Particle size, sand	Hydrometer, gravimetric
Silt	no ref	16.6	1.0	%	Particle size, silt	Hydrometer, gravimetric
Clay	no ref	12.7	1.0	%	Particle size, clay	Hydrometer, gravimetric
(-) 15Bar					Moisture	Pressure Plate

*** Australian Laboratory Handbook of Soil and Water Chemical Methods (1992 /2011)**

For Manager **D E Baker BSc CPSS**
Analytical Services: _____

Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia*. CSIRO Publishing: Collingwood.
Soluble Salts included in Exchangeable Cations - Except PRE-WASHED (if EC>0.3dS/m).

Lab Accrediation for M4626
ASPAC

Director and Principal Soil Scientist – ESSA Pty Ltd



ity
Adjunct Professional Fellow Southern Cross University
Chief Soil Chemistry Trainer Soil Science Australia (National & Qld)
Hon. Life Member Soil Science Australia (National & Qld)
Certified Professional Practicing Soil Scientist CPSS

Analyte	ALHS*	Uncertainty %	LOQ	Unit	Name	Method Description
Ca (Alc)	15C1	7.2	0.18	meq/100g	Exchangeable calcium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
Mg (Alc)	15C1	4.7	0.31	meq/100g	Exchangeable magnesium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
Na (Alc)	15C1	9.6	0.09	meq/100g	Exchangeable sodium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
K (Alc)	15C1	4.8	0.02	meq/100g	Exchangeable potassium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
CEC	15I3	5.7	1.0	meq/100g	Cation Exchange Capacity	KNO3 + Ca(NO3)2 extr, (AA) colorimetric
DTPA-Cu	12A1	17.1	0.26	mg/kg	DTPA ext. copper	DTPA extraction, AAS
DTPA-Zn	12A1	16.4	0.10	mg/kg	DTPA ext. zinc	DTPA extraction, AAS
DTPA-Mn	12A1	9.0	0.32	mg/kg	DTPA ext. manganese	DTPA extraction, AAS
DTPA-Fe	12A1	13.0	0.23	mg/kg	DTPA ext. iron	DTPA extraction, AAS
ADMC	2A1	11.9	0.4	%	Air Dried Moisture Content	Gravimetric oven dry @ 105C
R1	NA	20.2	NA		Dispersion Ratio	Ratio [Aqueous dispersible (Silt + Clay):Total (Silt + Clay)]
SO4-S	10B3	11.5	0.6	mg/kg	Sulfate sulfur	Ca(H2PO4)2 @ pH 4.0 extractable sulfate-sulfur, ICPOES
Al	15G1	NA	NA	meq/100g	Exchangeable Aluminium	Exch. Hydrogen and Aluminium by 1M KCl
H+	15G1	NA	NA	meq/100g	Exchangeable Acidity	Exch. Hydrogen and Aluminium by 1M KCl
15 Bar		NA	NA		15 Bar Analysis	Pressure Plate/Gravimetric oven dry @ 105C
1/3 Bar		NA	NA		15 Bar Analysis	Pressure Plate/Gravimetric oven dry @ 105C

*** Australian Laboratory Handbook of Soil and Water Chemical Methods (1992)**

For Manager
Analytical Services: _____

QUALITY CONTROL DATA

Reference 25012835

Soil

*** Australian Laboratory Handbook of Soil and Water Chemical Methods (1992)**

Test Method	Units		Actual Value	Acceptance Criteria [Range]
pH	pH	r118		9.7 - 10.1
EC	dS/m	r118		.301 - .334
Cl	mg/kg	r118		28 -40
NO3-N	mg/kg	rv		3 - 8
NH4-N	mg/kg	B		80-96
Olsen P	mg/kg	rv		15 - 20
Total Kjeldahl N	%	32-13		.329 - .485
Total P	%	aspac 111		.040 - .052
Organic Carbon	%	rv		1.82 - 2.3
Ca (Exch. cations)pH7	meq/100g	B		6.96 - 8.04
Mg (Exch. cations)pH7	meq/100g	B		1.88 - 2.22
Na (Exch. cations)pH7	meq/100g	B		.057 - .182
K (Exch. cations)pH7	meq/100g	B		1.21 - 1.41
Exch. Acidity	meq/100g			NA
ECEC	meq/100g	A		NA
CEC	meq/100g	S12		58 - 73
ESP	%	A		NA
Coarse sand	%	RD		29 -33
Fine Sand	%	RD		27 - 32
Silt	%	RD		10 - 16
Clay	%	RD		21 - 29
R1		RD		.38 - .57

Test Method	Units	Test Soil	Actual Value	Acceptance Criteria [Range]
DTPA-Cu	mg/kg	112-09		1.52 - 1.82
DTPA-Zn	mg/kg	112-09		1.25 - 1.45
DTPA-Mn	mg/kg	112-09		148 - 178
DTPA-Fe	mg/kg	112-09		7.9 - 13.2
Suflate-sulfur	mg/kg	B		5 - 12
ADMC	%			NA
15 Bar	%	G	29, 29, 30, 31	23 - 32
0.33 Bar	%	G		36 - 52
Ca (Exch. cations)pH8.5	meq/100g	S12		27.7 - 37.4
Mg (Exch. cations)pH8.5	meq/100g	S12		22.6 - 26.5
Na (Exch. cations)pH8.5	meq/100g	S12		2.0 - 2.28
K (Exch. cations)pH8.5	meq/100g	S12		1.64 - 2.09

ESSA /DETSI(NATA)

5 Dunphy St Sunnybank Hills
Qld 4109

Phone: 0403245560

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Date Received: 19/11/2025
Date Completed: 15/01/2026

FINAL REPORT

Project: BWN (15 Bar)

All results in this report relate only to the items tested. Results are expressed on an "as received basis".

Client Name: GTE

Contact: Dennis Baker

Sample Type: Soil

Number of samples: 138 Selected of 140

ESSA (DETSI)Pty Ltd

Soil Analysis Report

Reference: DESTI 0886 **Ex 2501 2835**

Reported 15/01/2026

Client: GTE

Soil Analysis Report

Job No: 25-0886

Report ID: 25-0886-F-V1

Sample No	Customer's ID	Site ID	Project ID	S_15_BAR 15 Bar %
25-0886-0001	D1-0.00-0.10		BWNSAMPLESVIAEALLISM	20.3
25-0886-0002	D1-0.20-0.30		BWNSAMPLESVIAEALLISM	22.7
25-0886-0003	D1-0.50-0.60		BWNSAMPLESVIAEALLISM	15.1
25-0886-0004	D5-0.00-0.10		BWNSAMPLESVIAEALLISM	25.8
25-0886-0005	D5-0.20-0.30		BWNSAMPLESVIAEALLISM	28.2
25-0886-0006	D5-0.50-0.60		BWNSAMPLESVIAEALLISM	27.3
25-0886-0007	D5-0.80-0.90		BWNSAMPLESVIAEALLISM	26.8
25-0886-0008	D5-1.10-1.20		BWNSAMPLESVIAEALLISM	27.1
25-0886-0009	D5-1.40-1.50		BWNSAMPLESVIAEALLISM	28.2
25-0886-0010	D5-1.70-1.80		BWNSAMPLESVIAEALLISM	29.9
25-0886-0011	D6-0.00-0.10		BWNSAMPLESVIAEALLISM	27.2
25-0886-0012	D6-0.20-0.30		BWNSAMPLESVIAEALLISM	26.4
25-0886-0013	D6-0.50-0.60		BWNSAMPLESVIAEALLISM	24.9
25-0886-0014	D6-0.80-0.90		BWNSAMPLESVIAEALLISM	17.4
25-0886-0015	D6-1.10-1.20		BWNSAMPLESVIAEALLISM	22.9
25-0886-0016	D7-0.00-0.10		BWNSAMPLESVIAEALLISM	20.9
25-0886-0017	D7-0.20-0.30		BWNSAMPLESVIAEALLISM	21.9
25-0886-0018	D7-0.50-0.60		BWNSAMPLESVIAEALLISM	22.8
25-0886-0019	D12m-0.00-0.10		BWNSAMPLESVIAEALLISM	21.3
25-0886-0020	D12m-0.20-0.30		BWNSAMPLESVIAEALLISM	23.5
25-0886-0021	D12m-0.50-0.60		BWNSAMPLESVIAEALLISM	23.2
25-0886-0022	D12m-0.80-0.90		BWNSAMPLESVIAEALLISM	23.5
25-0886-0023	D12m-1.10-1.20		BWNSAMPLESVIAEALLISM	23.2
25-0886-0024	D12m-1.40-1.50		BWNSAMPLESVIAEALLISM	23.4
25-0886-0025	D12m-1.70-1.80		BWNSAMPLESVIAEALLISM	24.1
25-0886-0026	D12d-0.00-0.10		BWNSAMPLESVIAEALLISM	18.5
25-0886-0027	D12d-0.20-0.30		BWNSAMPLESVIAEALLISM	21
25-0886-0028	D12d-0.50-0.60		BWNSAMPLESVIAEALLISM	21.2
25-0886-0029	D12d-0.80-0.90		BWNSAMPLESVIAEALLISM	24.2
25-0886-0030	D12d-1.10-1.20		BWNSAMPLESVIAEALLISM	24.5
25-0886-0031	D12d-1.40-1.50		BWNSAMPLESVIAEALLISM	23.8
25-0886-0032	D12d-1.70-1.80		BWNSAMPLESVIAEALLISM	25.1
25-0886-0033	D14d-0.00-0.10		BWNSAMPLESVIAEALLISM	21.2
25-0886-0034	D14d-0.20-0.30		BWNSAMPLESVIAEALLISM	22.8
25-0886-0035	D14d-0.50-0.60		BWNSAMPLESVIAEALLISM	25.3
25-0886-0036	D14d-0.80-0.90		BWNSAMPLESVIAEALLISM	20.6
25-0886-0037	D14d-1.10-1.20		BWNSAMPLESVIAEALLISM	21
25-0886-0038	D14d-1.30-1.40		BWNSAMPLESVIAEALLISM	17.4
25-0886-0039	D14m-0.00-0.10		BWNSAMPLESVIAEALLISM	20.9
25-0886-0040	D14m-0.20-0.30		BWNSAMPLESVIAEALLISM	14.1
25-0886-0041	D14m-0.50-0.60		BWNSAMPLESVIAEALLISM	18.3
25-0886-0042	D14m-0.80-0.90		BWNSAMPLESVIAEALLISM	27.8
25-0886-0043	D14m-1.10-1.20		BWNSAMPLESVIAEALLISM	24.1
25-0886-0044	D14m-1.40-1.50		BWNSAMPLESVIAEALLISM	24
25-0886-0045	D14m-1.70-1.80		BWNSAMPLESVIAEALLISM	24.9
25-0886-0046	D19-0.00-0.05		BWNSAMPLESVIAEALLISM	19.3
25-0886-0047	D19-0.20-0.30		BWNSAMPLESVIAEALLISM	17.4
25-0886-0048	D19-0.40-0.50		BWNSAMPLESVIAEALLISM	13.3
25-0886-0049	D19-0.50-0.60		BWNSAMPLESVIAEALLISM	16.1

25-0886-0050	**D19-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	14
25-0886-0051	**D21-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	20.9
25-0886-0052	**D21-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	22.9
25-0886-0053	**D21-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	22.9
25-0886-0054	**D21-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	23.7
25-0886-0055	**D21-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	22.6
25-0886-0056	**D21-1.40-1.50**	**BWNSAMPLESVIAEALLISM**	22.2
25-0886-0057	**D21-1.70-1.80**	**BWNSAMPLESVIAEALLISM**	16.9
25-0886-0058	**D24-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	12.8
25-0886-0059	**D24-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	17.5
25-0886-0060	**D24-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	19.7
25-0886-0061	**D24-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	18.5
25-0886-0062	**D36-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	18.7
25-0886-0063	**D36-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	19.9
25-0886-0064	**D36-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	12.9
25-0886-0065	**D36-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	17.8
25-0886-0066	**D36-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	14.3
25-0886-0067	**D36-1.40-1.50**	**BWNSAMPLESVIAEALLISM**	15.2
25-0886-0068	**D36-1.70-1.80**	**BWNSAMPLESVIAEALLISM**	9.1
25-0886-0069	**D39-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	19.5
25-0886-0070	**D39-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	19.2
25-0886-0071	**D39-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	15.3
25-0886-0072	**D39-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	21.7
25-0886-0073	**D39-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	22.8
25-0886-0074	**D43-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	15.5
25-0886-0075	**D43-0.10-0.20**	**BWNSAMPLESVIAEALLISM**	22.7
25-0886-0076	**D43-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	21.6
25-0886-0077	**D45-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	16.9
25-0886-0078	**D45-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	20.2
25-0886-0079	**D45-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	22.8
25-0886-0080	**D45-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	23.6
25-0886-0081	**D45-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	26
25-0886-0082	**D45-1.40-1.50**	**BWNSAMPLESVIAEALLISM**	25.3
25-0886-0083	**D45-1.70-1.80**	**BWNSAMPLESVIAEALLISM**	22.6
25-0886-0084	**D52-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	12.7
25-0886-0085	**D52-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	13.6
25-0886-0086	**D52-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	15
25-0886-0087	**D52-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	15.2
25-0886-0088	**D52-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	15.4
25-0886-0089	**D52-1.40-1.50**	**BWNSAMPLESVIAEALLISM**	14.3
25-0886-0090	**D52-1.70-1.80**	**BWNSAMPLESVIAEALLISM**	13.7
25-0886-0091	**D58-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	20.9
25-0886-0092	**D58-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	22.7
25-0886-0093	**D58-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	18.4
25-0886-0094	**D58-0.70-0.80**	**BWNSAMPLESVIAEALLISM**	18.1
25-0886-0095	**D65-0.00-0.05**	**BWNSAMPLESVIAEALLISM**	4.7
25-0886-0096	**D65-0.10-0.20**	**BWNSAMPLESVIAEALLISM**	4.2
25-0886-0097	**D65-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	7.7
25-0886-0098	**D65-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	14
25-0886-0099	**D65-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	11.4
25-0886-0100	**D3-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	19.5
25-0886-0101	**D3-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	18.1
25-0886-0102	**D3-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	23.4
25-0886-0103	**D3-0.70-0.80**	**BWNSAMPLESVIAEALLISM**	22.4
25-0886-0104	**D3-0.90-1.00**	**BWNSAMPLESVIAEALLISM**	12.4
25-0886-0105	**D22-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	20.4
25-0886-0106	**D22-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	20.9
25-0886-0107	**D22-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	21.5
25-0886-0108	**D22-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	18.9
25-0886-0109	**D22-1.00-1.10**	**BWNSAMPLESVIAEALLISM**	18.3
25-0886-0110	**D22-1.30-1.40**	**BWNSAMPLESVIAEALLISM**	18.5
25-0886-0111	**D22-1.60-1.70**	**BWNSAMPLESVIAEALLISM**	17.8
25-0886-0112	**D32-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	8.5
25-0886-0113	**D32-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	14.5
25-0886-0114	**D32-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	12.9
25-0886-0115	**D32-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	13.3
25-0886-0116	**D32-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	15.5

25-0886-0117	**D32-1.40-1.50**	**BWNSAMPLESVIAEALLISM**	17.9
25-0886-0118	**D32-1.70-1.80**	**BWNSAMPLESVIAEALLISM**	15.5
25-0886-0119	**D37-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	16.2
25-0886-0120	**D37-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	23.4
25-0886-0121	**D37-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	23.5
25-0886-0122	**D37-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	20.8
25-0886-0123	**D37-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	20.1
25-0886-0124	**D37-1.40-1.50**	**BWNSAMPLESVIAEALLISM**	14.2
25-0886-0125	**D37-1.70-1.80**	**BWNSAMPLESVIAEALLISM**	15.9
25-0886-0126	**D44-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	11.3
25-0886-0127	**D44-0.10-0.20**	**BWNSAMPLESVIAEALLISM**	12.7
25-0886-0128	**D44-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	22.8
25-0886-0129	**D44-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	20.1
25-0886-0130	**D44-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	17.9
25-0886-0131	**D44-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	18.2
25-0886-0132	**D59-0.00-0.10**	**BWNSAMPLESVIAEALLISM**	2.7
25-0886-0133	**D59-0.20-0.30**	**BWNSAMPLESVIAEALLISM**	3.4
25-0886-0134	**D59-0.50-0.60**	**BWNSAMPLESVIAEALLISM**	13.5
25-0886-0135	**D59-0.80-0.90**	**BWNSAMPLESVIAEALLISM**	12.4
25-0886-0136	**D59-1.10-1.20**	**BWNSAMPLESVIAEALLISM**	11
25-0886-0137	**D59-1.40-1.50**	**BWNSAMPLESVIAEALLISM**	12.7
25-0886-0138	**D59-1.70-1.80**	**BWNSAMPLESVIAEALLISM**	12.1

This job has been authorized by:

Name: Fred Oudyn

Role: Principal Scientist

NATA

WORLD RECOGNISED ACCREDITATION

ESSA Pty Ltd/ DETSI

METHOD DESCRIPTIONS

Soil

Reference: Reference: DESTI 0886 **Ex 2501 2835**

Methods used to Analyse Samples

Analyte	ALHS*	Uncertainty %	LOQ	Unit	Name	Method Description
pH	4A1	1.1	0.1	pH	pH	1:5 water extr, pH meter
EC	3A1	5.4	0.01	dS/m	Electrical conductivity	1:5 water extr, EC meter
Cl	5A2	10.0	10.0	mg/kg	Chloride	1:5 water extr, (AA) colorimetric
NO3-N	7C2	6.7	1.0	mg/kg	Nitrate-nitrogen	1:5 water extr, (AA) colorimetric
NH4-N	7C2	7.8	0.6	mg/kg	Ammonium-nitrogen	1M KCl extr, (AA) colorimetric
Bicarb.P	9B2	16.8	1.0	mg/kg	Bicarb.ext.phosphorus	0.5M NaHCO3 @ pH 8.5, (AA) colorimetric
TN	7A2	12.9	0.01	%	Total Kjeldahl Nitrogen	Sulphuric acid digest, (AA) colorimetric
OC	8B1	9.7	0.02	%	Organic Carbon	Walkley & Black, (H2SO4/K2Cr2O7), titr.
Ca (Neut)	15A1	10.3	0.10	meq/100g	Exchangeable calcium	1M NH4Cl @ pH 7.0 shake, AAS
Mg (Neut)	15A1	6.6	0.10	meq/100g	Exchangeable magnesium	1M NH4Cl @ pH 7.0 shake, AAS
Na (Neut)	15A1	7.3	0.03	meq/100g	Exchangeable sodium	1M NH4Cl @ pH 7.0 shake, AAS
K (Neut)	15A1	3.9	0.02	meq/100g	Exchangeable potassium	1M NH4Cl @ pH 7.0 shake, AAS
ECEC	15J1	5.0	1	meq/100g	Effective cation ex.capacity	Sum of exchangeable cations
ESP	15N1	5.0	3	%	Exchangeable Na%	(Exchangeable Na/sum of exch.cations)%
Sand	no ref	22.1	1.0	%	Particle size, sand	Hydrometer, gravimetric
Silt	no ref	16.6	1.0	%	Particle size, silt	Hydrometer, gravimetric
Clay	no ref	12.7	1.0	%	Particle size, clay	Hydrometer, gravimetric
15 Bar					Pressure Plate	

*** Australian Laboratory Handbook of Soil and Water Chemical Methods (1992 /2011)**

For Manager
Analytical Services: **D E Baker BSc MASSSI**

Methods from Rayment and Lyons, 2011. *Soil Chemical Methods - Australasia*. CSIRO Publishing: Collingwood.
Soluble Salts included in Exchangeable Cations - Except PRE-WASHED (if EC>0.3dS/m).

Director and Principal Soil Scientist – ESSA Pty Ltd

Adjunct Professional Fellow Southern Cross University
Chief Soil Chemistry Trainer Soil Science Australia (National & Qld)
Hon. Life Member Soil Science Australia (National & Qld)
Certified Professional Practicing Soil Scientist CPSS

Analyte	ALHS*	Uncertainty %	LOQ	Unit	Name	Method Description
Ca (Alc)	15C1	7.2	0.18	meq/100g	Exchangeable calcium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
Mg (Alc)	15C1	4.7	0.31	meq/100g	Exchangeable magnesium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
Na (Alc)	15C1	9.6	0.09	meq/100g	Exchangeable sodium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
K (Alc)	15C1	4.8	0.02	meq/100g	Exchangeable potassium	1M NH4Cl (alcoholic) @ pH 8.5 leach, AAS
CEC	15I3	5.7	1.0	meq/100g	Cation Exchange Capacity	KNO3 + Ca(NO3)2 extr, (AA) colorimetric
DTPA-Cu	12A1	17.1	0.26	mg/kg	DTPA ext. copper	DTPA extraction, AAS
DTPA-Zn	12A1	16.4	0.10	mg/kg	DTPA ext. zinc	DTPA extraction, AAS
DTPA-Mn	12A1	9.0	0.32	mg/kg	DTPA ext. manganese	DTPA extraction, AAS
DTPA-Fe	12A1	13.0	0.23	mg/kg	DTPA ext. iron	DTPA extraction, AAS
ADMC	2A1	11.9	0.4	%	Air Dried Moisture Content	Gravimetric oven dry @ 105C
R1	NA	20.2	NA		Dispersion Ratio	Ratio [Aqueous dispersible (Silt + Clay):Total (Silt + Clay)]
SO4-S	10B3	11.5	0.6	mg/kg	Sulfate sulfur	Ca(H2PO4)2 @ pH 4.0 extractable sulfate-sulfur, ICPOES
Al	15G1	NA	NA	meq/100g	Exchangeable Aluminium	Exch. Hydrogen and Aluminium by 1M KCl
H+	15G1	NA	NA	meq/100g	Exchangeable Acidity	Exch. Hydrogen and Aluminium by 1M KCl
15 Bar		NA	NA		15 Bar Analysis	Pressure Plate/Gravimetric oven dry @ 105C
1/3 Bar		NA	NA		15 Bar Analysis	Pressure Plate/Gravimetric oven dry @ 105C

*** Australian Laboratory Handbook of Soil and Water Chemical Methods (1992)**

For Manager
Analytical Services:

ESSA Pty Ltd/DETSI

QUALITY CONTROL DATA

Reference Reference: DESTI 0886 **Ex 2501 2835**

Soil

*** Australian Laboratory Handbook of Soil and Water Chemical Methods (1992)**

Test Method	Units		Actual Value	Acceptance Criteria [Range]
pH	pH	r118		9.7 - 10.1
EC	dS/m	r118		.301 - .334
Cl	mg/kg	r118		28 -40
NO3-N	mg/kg	rv		3 - 8
NH4-N	mg/kg	B		80-96
Olsen P	mg/kg	rv		15 - 20
Total Kjeldahl N	%	32-13		.329 - .485
Total P	%	aspac 111		.040 - .052
Organic Carbon	%	rv		1.82 - 2.3
Ca (Exch. cations)pH7	meq/100g	B		6.96 - 8.04
Mg (Exch. cations)pH7	meq/100g	B		1.88 - 2.22
Na (Exch. cations)pH7	meq/100g	B		.057 - .182
K (Exch. cations)pH7	meq/100g	B		1.21 - 1.41
Exch. Acidity	meq/100g			NA
ECEC	meq/100g	A		NA
CEC	meq/100g	S12		58 - 73
ESP	%	A		NA
Coarse sand	%	RD		29 -33
Fine Sand	%	RD		27 - 32
Silt	%	RD		10 - 16
Clay	%	RD		21 - 29
R1		RD		.38 - .57

Test Method	Units	Test Soil	Actual Value	Acceptance Criteria [Range]
DTPA-Cu	mg/kg	112-09		1.52 - 1.82
DTPA-Zn	mg/kg	112-09		1.25 - 1.45
DTPA-Mn	mg/kg	112-09		148 - 178
DTPA-Fe	mg/kg	112-09		7.9 - 13.2
Suflate-sulfur	mg/kg	B		5 - 12
ADMC	%			NA
15 Bar	%	G	29, 29, 30, 31	23 - 32
0.33 Bar	%	G		36 - 52
Ca (Exch. cations)pH8.5	meq/100g	S12		27.7 - 37.4
Mg (Exch. cations)pH8.5	meq/100g	S12		22.6 - 26.5
Na (Exch. cations)pH8.5	meq/100g	S12		2.0 - 2.28
K (Exch. cations)pH8.5	meq/100g	S12		1.64 - 2.09

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