



Land and Soil Capability Assessment

Proposed Molong BESS

*1 Deight Street & 19 Back Saleyards Road, Molong
NSW 2866*

FOR: StorEnergy 3 Pty Limited

SLR PROJECT No: 620.041615.00001

Revision: 1.0

21 October 2025



Revision Record

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1.0	21 October 2025	Michelle Papenfus	Matt Hemingway	Kate Wheeler
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Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with StorEnergy 3 Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.



Executive Summary

SLR Consulting Australia Pty Ltd (SLR) has been engaged by StorEnergy 3 Pty Ltd (Stor) to prepare a Land and Soil Capability Assessment (LSC) for a Battery Energy Storage System (BESS) facility in Molong, New South Wales.

This LSC assessment for the Molong BESS addresses SEARs (SSD-80471210, 26 March 2025) by characterising soils and evaluating salinity, acid sulfate soil and erosion risks across a ~9.5 ha Development Footprint, of which 5.1 ha forms the LSC Study Area spanning Lot 99 DP 1020247 (1 Deight St) and Lot 1 DP 542283 (19 Back Saleyards Rd). A very-high-intensity field survey in July 2025 (four detailed profiles, exceeding 1:10,000 density) and NATA-accredited laboratory analyses classified two dominant ASC units: Haplic Eutrophic Brown/Grey Dermosol and Haplic Eutrophic Brown/Red Chromosol

The verified LSC is largely Class 3 (3.6 ha) and Class 4 (1.5 ha), with slope-driven water erosion the principal constraint; soils are non-sodic and laboratory salinity is non-saline despite mapped salinity hazard, and the likelihood of acid sulfate soils is very low given elevation and distance from the coast. The site contains a few minor water bodies (dams) and intermittent creeks; Back Creek (~800 m north) and Molong Creek (~1.2 km south) are the nearest waterways.

Overall erosion/dispersion potential is low to moderate. The Project will implement an Erosion and Sediment Control Plan that preserves landform and vegetation during construction, operational and closure. Soil stripping will be localised, with materials stored or directly respread near their point of origin to reinstate profiles, supporting the return of land to an equivalent LSC class.



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Acronyms and Abbreviations

Term	Meaning
AC	Alternating Current
ADG	Australian Dangerous Goods (colloquial), as in the ADG Code: Commonwealth Government, National Transport Commission, Australian Code for the Transport of Dangerous Goods by Road and Rail, Edition 7.9, 2024
ASC	Australian Soil Classification
ASS	Acid Sulfate Soils
AHD	Australian Height Datum
BESS	Battery Energy Storage System
BOM	Bureau of Meteorology
BSAL	Biophysical Strategic Agricultural Land
COD	Commercial Operation Date
DC	Direct Current
DP	Deposited Plan
DPHI	Department of Planning, Housing and Infrastructure
EAL	Environmental Analysis Laboratories (Southern Cross University)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EP&A Regulation	Environmental Planning and Assessment Regulation 2021 (NSW)
ESP	Exchangeable Sodium Percentage
ha	Hectares
kg	Kilogram
kV	Kilovolt
LGA	Local Government Area
LSSEG	Large-Scale Solar Energy Guideline
LSC	Land and Soil Capability
MAP	Mean Annual Precipitation
MW	Megawatt
MWh	Megawatt Hours
NATA	National Association of Testing Authorities
NCST	National Committee on Soil and Terrain
NSW	New South Wales
OEH	Office of Environment and Heritage
SEARs	Secretary's Environmental Assessment Requirements
SMU	Soil Map Unit
SSD	State Significant Development
TL	Transmission Line
ZTV	Zone of Theoretical Visibility



1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by StorEnergy 3 Pty Ltd (Stor) to prepare a Land and Soil Capability Assessment (LSC) for a Battery Energy Storage System (BESS) facility in Molong, New South Wales.

The proposal involves the installation of a BESS facility located across two (2) Lots, 1 Deight Street, legally described as Lot 99 DP 1020247, and 19 Back Saleyards Road, legally described as Lot 1 DP 542283. Both properties are within Molong NSW, 2866. For the purpose of this report, the combined lots that contain the Development Footprint will be referred to as 'Project Lots'.

The Project will involve the development, construction, operation, and eventual decommissioning of a BESS, with a capacity of 150 Megawatts (MW), 730 Megawatt Hours (MWh), connecting to the electricity grid at the existing Transgrid Molong 132/66 Kilovolt (kV) transmission substation via a new overhead transmission line (approximately 900m) ('the Project').

The BESS will comprise battery units, inverters, transformers, a substation and ancillary infrastructure all within the indicative BESS area. The battery units will be within individual containers (or enclosures), with each container measuring approximately 6 metres (m) or 20 feet (ft) in length with an approximate weight of 43,000 kilograms (kg).

1.1 Purpose of this document

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) form the statutory framework for the environmental impact assessment and planning approval of development in NSW. Both the EP&A Act and the EP&A Regulation are administered by the DPHI.

1.2 Report Structure

The structure of this LSC report is shown in Table 1-1.

Table 1-1 LSC Report Structure

Section	Title	Description
1	Introduction	Identifies the context of the project.
2	Policy Context	Summarises the relevant legislation and policy requirements that apply to the assessment.
3	Project Description	Describes the project, including location, site design, and access arrangements.
4	Site Description	Details the existing conditions of the site and surrounds.
5	Assessment	Outlines the methodology and assessment to classify the site's soil against the Australian Land Classifications.
6	Mitigation Measures	Outlines the recommended actions for the applicant following the lodgement of the SSD application.
7	Conclusion	Summarises the findings of the assessment and recommends approval conditions.



2.0 Policy Context

2.1 Secretary's Environmental Assessment Requirements (SEARS)

The proposal is a State Significant Development, and the Department of Planning, Housing and Infrastructure (DPHI) has issued Secretary's Environmental Assessment Requirements (SEARs). SEARs relevant to this study and where they are addressed are listed below.

a soil survey to determine the soil characteristics and consider the potential for salinity, acid sulfate soils, and erosion to occur.

2.2 Assessment Guidelines

- The land and soil resource assessment was completed with consideration of the following guidelines: *Guidelines for Surveying Soil and Land Resources* (NCST, 2009)
- Soil profiles will be assessed and described in accordance with the Australian Soil and Land Survey Field Handbook, Fourth Edition (NCST, 2024).
- Determination of Australian Soil Classification (ASC) (Isbell, 2021) soil types.
- Detailed assessment of the site and soil characteristics as per the requirements of *The Land and Soil Capability Assessment Scheme; Second Approximation* (OEH, 2012), referred to as the LSC Scheme in this report.

3.0 Project Description

3.1 Overview

The Proposal includes the construction of a BESS facility with a capacity of 150 Megawatts (MW) near the Molong 132/66kV substation operated by TransGrid.

The Project Lots are located on land in the northeast periphery of the township of Molong, within the Cabonne Shire Council Local Government Area (LGA). The Project Lots are zoned RU1 Primary Production pursuant to the Cabonne Local Environment Plan 2012 (Cabonne LEP).

Access to the Project is to be provided via Back Saleyards Road, which runs along the western extend of the Project Lots, with an existing substation located to the north on Lot 1. The Project Lots location in the regional context is presented on Figure 3-1, and in the local context on Figure 3-2.

3.2 Project Summary

The Project will involve the development, construction, operation, and eventual decommissioning of a BESS with a capacity of 150 MW/ 730 MWh connecting via overhead TL directly to the existing Molong 132/66kV substation operated by Transgrid.

The BESS will comprise of battery units, inverters, transformers, a substation and ancillary infrastructure all within the Indicative BESS area. The battery units will be within individual containers (or enclosures), with each container measuring approximately 6 metres (m) or 20 feet (ft) in length with an approximate weight of 43,000 kilograms (kg).



The inverters will convert the electricity stored in the battery units from Direct Current (DC) to Alternating Current (AC), and vice versa, that will be directed through the proposed 132kV overhead lines (approximately 900m in length) to the existing Transgrid Molong Substation.

The proposal is considered State Significant under the Planning Systems SEPP, as the proposed Electricity generating works are estimated to cost in excess of \$30 million.

A summary of the project is detailed in Table 3-1.

Table 3-1 Project Summary

Project Element	Description
Proposed Development – Construction and Operation Summary	The Project would generally involve the following stages/components: • Transport of construction personnel, equipment and materials to and from the Site during construction (dependent on construction schedule), including all associated heavy and light vehicle traffic movements. • Site establishment works including limited vegetation clearing within the Development Footprint, bulk earthworks and a temporary construction compound. • Road works to formalise a new driveway crossing from Back Saleyards Road and internal site access road for construction purposes and ongoing access. • Construction of hardstand/laydown areas, fencing, internal roads, control room, auxiliary transformer, battery enclosures, and inverter/transformer/switchgear stations (referred to as Power Conversion Stations (PCS)). • Construction of approximately 900m of overhead 132 kV transmission line to facilitate connection to the existing Transgrid's Molong Substation and associated high voltage concrete or steel poles and wiring. • Construction of ancillary works including a parking area, water tank, Operations and Maintenance (O&M) building (including storage structures), stormwater management infrastructure, security lighting and fencing. • The installation of 264 BESS units (maximum) within individual, modular containers, on hardstand footings with a total capacity of 150 MW/730MWh. • The installation of 50 inverters on hardstand footings. • Installation of subsurface cabling infrastructure throughout the BESS Footprint • Commissioning and testing of all installed equipment on the Development Footprint. The BESS may be subject to capacity replenishment and/or capacity augmentation events as necessary to extend storage durations.
Site Access	Access to the Lot 99 is proposed via a new vehicle crossover and driveway from Back Saleyards Road. An internal access road will be established to accommodate construction vehicles and vehicles associated with ongoing maintenance.
Grid Connection	A new overhead transmission line (132 kV) and associated high voltage steel poles will be constructed to connect the BESS to the existing Transgrid Molong 132/66 kV substation north of the BESS Footprint. The transmission line poles will be up to 18 metres (m) in height with a minimum ground clearance of 7.5 m and located within the proposed 45m transmission line easement.
Construction Duration	Construction is anticipated to take approximately 22 months from commencement of construction to end of reliability testing.



Project Element	Description
Operation Life Expectancy	The operational life will be determined by the evolving nature of the technology, however, is anticipated that the lifespan will be approximately 30 years from the Commercial Operation Date (COD).
Decommissioning	The BESS will be decommissioned, and the infrastructure removed, returning the Development Footprint to its original use following the approximate 30 year life expectancy.

4.0 Site Description

4.1 Locality

The Project Lots are located within the Cabonne Shire LGA and is located approximately 2km east of the Molong Township (the local Post Office - Molong LPO has been used as central reference point). The Project Lots have frontage to both Deight Street and Back Saleyards Road on its western boundary. Lot 1 also has frontage to Euchareena Road in its northwestern corner but is principally accessed by Back Saleyards Road.

The Project Lots are bound to the south by Molong Creek, and is generally cleared land, with scattered trees throughout the property.

4.2 Surrounding Areas

The surrounding area is characterised by a mixture of different land uses including predominantly rural land lots to the east, north and south with recreational and rural residential properties to the west.

Recreational activities comprising the Molong Showground and Golf Course are located west of Lot 1. Moving south along the western boundary of the Project Lots, this area is zoned R5 Large Lot residential under the Local Environment Plan (LEP) and will therefore likely contain large residential lots generally 4,000m² in size in the future. Currently, this land is predominantly rural in nature with a mixture of grazing activities and rural residential dwellings.

The southern boundary of the Project Lots is bound by Molong Creek. Beyond Molong Creek is rural grazing land and the Mitchell Highway. West and north of the Project Lots is predominantly rural land with grazing and other agricultural activities as well as rural dwellings. The Molong Solar Farm also sits approximately 450m northeast of Lot 1.

The Project Lots sit approximately 2km east of the Molong Township (the local Post Office - Molong LPO has been used as central reference point). The township of Molong has an approximate population of around 2,600 people (Australian Bureau of Statistics, 2021). The town features one main 'strip' of retail and commercial activities that also extend into adjoining streets. Existing facilities and services in Molong include:

- IGA Supermarket
- Cafes and take-away restaurants
- Service station and Mechanic
- Hardware store
- Post office
- Church
- Schools and Daycare
- Medical Centre and pharmacy
- Police station and fire station
- Rural Fire Service (RFS) and NSW State Emergency Services (SES)
- Other small-scale retail
- Visitor accommodation
- Recreational activities such as public pools and parks.



It is anticipated that Molong would be the key service centre of the BESS construction work force, as well as Orange, Manildra and other smaller surrounding towns.

4.3 Roads and Access

The Project Lots are located east of the Molong Township and has frontage to both Back Saleyards Road and Deight Street. Back Saleyards Road connects to Euchareena Road in the northwestern corner of the Lot 1 which directs traffic to the Molong Township to the west and the township of Euchareena to the northeast. Deight Street is a no through road, bound by Molong Creek to the South

Both Back Saleyards Road and Deight Street connect to Marsden Street, which connects off Mitchell Highway to the west.

The visual quality of the landscape surrounding these access corridors are defined by a gently sloping, undulating terrain. The road verges are generally vegetated with glimpses toward the surrounding landscape.

5.0 Assessment

5.1 Objective

The objective of the LSC assessment is to address the soil and land related Secretary's Environmental Assessment Requirements (SEAR's) (SSD-80471210 issued on 26 March 2025) item that is included for the Project:

a soil survey to determine the soil characteristics and consider the potential for salinity, acid sulfate soils, and erosion to occur.

5.2 Assessment Approach

5.2.1 Scope of work

The land and soil resource assessment includes:

- Field soil survey to obtain required level of field samples in accordance with relevant guidelines.
- Determination of Australian Soil Classification (ASC) (Isbell, 2021) soil types.
- Detailed assessment of the site and soil characteristics as per the requirements of LSC Scheme.
- Documentation of the results of the detailed assessment comprising of a written report and associated mapping to address specific items in LSC Scheme.
- Determination of salinity, acid sulfate soils risk and erosive potential for soil types within the Development Footprint.

5.2.2 Land and Soil Capability Study Area

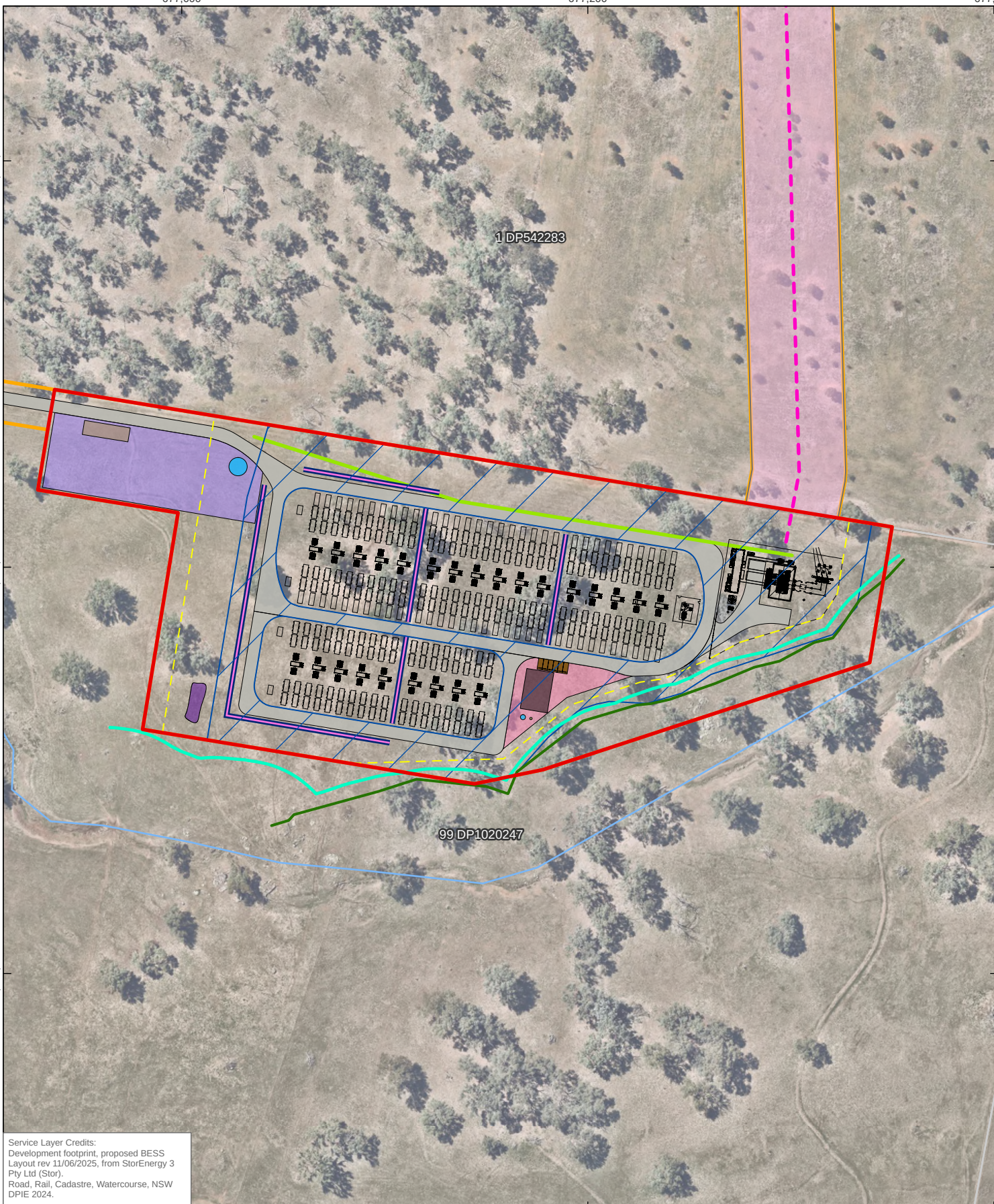
The Development Footprint, encompassing an approximate area of 9.6 hectares. Table 5-1 shows the areas requiring soil survey for the LSC assessment. This area is termed the LSC Study Area (Figure 5-1).



Table 5-1 Study Area

Assessment Component	Hectares
Development Footprint	9.6
LSC Study Area	5.1





Service Layer Credits:
Development footprint, proposed BESS
Layout rev 11/06/2025, from StorEnergy 3
Pty Ltd (Stor).
Road, Rail, Cadastre, Watercourse, NSW
DPIE 2024.



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:2,500 at A4

Project Number: 620.041615

Date Drawn: 12-Sep-2025

Drawn by: AS



LEGEND

- | | | |
|--|------------------------|-----------------------|
| Watercourse | Heritage Buffer (50m) | O&M Building |
| Proposed Electricity Transmission Line | Top of Bank 40m Buffer | Sewerage Holding Tank |
| Noisewall | Fence line | Washdown Bay |
| Swale (Indicative) | Car Parking Spaces | Water Tank |
| BESS Infrastructure | Construction Compound | Proposed Easement |
| LSC Study Area | Detention Basin | APZ (Indicative) |
| Development Footprint (9.56 ha) | Internal Road | |
| | Laydown Area | |

MOLONG BESS

LSC STUDY AREA

FIGURE 5-1

5.2.3 Legislation and Standards

The *Large-Scale Solar Energy Guideline* (LSSEG) for SSD was issued August 2022 by the NSW Government (DPIE, 2022). The guideline provides the community, industry, applicants and regulators with general guidance on the planning framework for the assessment and determination of State Significant large-scale energy projects under the Environmental Planning and Assessment Act 1979.

Agricultural impact assessments on Large Scale Solar Projects are governed by Section 5.2 of the DPIE (2022) LSSEG. Following completion of a soil survey, the applicant must verify the agricultural LSC Class (LSC) for the land in accordance LSC Scheme (NSW OEH, 2012). Applicants are required to undertake a level of agricultural impact assessment that is proportionate to the agricultural capability of the land which may be affected by the project. The agricultural impact assessment is addressed in a separate report.

5.3 Methodology

5.3.1 Soil Survey Methodology

5.3.1.1 Field Soil Survey

Survey observations were conducted at a very high intensity (1:10,000 scale) in accordance with the *Guidelines for Surveying Soil and Land Resources* (NCST, 2009) to satisfy soil mapping requirements. To satisfy the mapping requirement, one observation per 1 to 4 hectares is required, therefore at least 2 observations are required for the LSC Study Area.

The field survey for the LSC assessment was undertaken during July 2025. The field soil survey program comprised 4 detailed soil profile observations which exceeds the requirement for a 1:10,000 survey density. The locations of the observation sites are shown on Figure 5-2.

5.3.1.2 Soil Survey Observation Types

Detailed soil profile observations were assessed in accordance with the *Australian Soil and Land Survey Field Handbook* (NCST, 2009). Each soil-profile exposure was sampled with a hydraulic soil corer, to either a depth of approximately 1.0 metres, to equipment refusal, or to bedrock. Detailed soil profile morphological descriptions were prepared at all sites to record the information specified in the LSC Scheme (OEH, 2012). Information was recorded for the major parameters specified in Table 5-2.

Global Positioning System (GPS) readings was taken for all sites where soil descriptions are recorded. Vegetation type, landform and aspect were also noted. Soil exposures from pits were photographed during field operations.

Table 5-2 Field Assessment Parameters

Description	Application
Horizon depth	Weathering characteristics, soil development
Field colour	Permeability, susceptibility to dispersion/erosion
Field texture grade	Erodibility, hydraulic conductivity, moisture retention, root penetration
Boundary distinctness and shape	Erosional/dispositional status, textural grade



Description	Application
Consistence force	Structural stability, dispersion, ped formation
Structure pedality grade	Soil structure, root penetration, permeability, aeration
Structure ped and size	Soil structure, root penetration, permeability, aeration
Stones – amount and size	Water holding capacity, weathering status, erosional/depositional character
Roots – amount and size	Effective rooting depth, vegetative sustainability
Ants, termites, worms etc.	Biological mixing depth

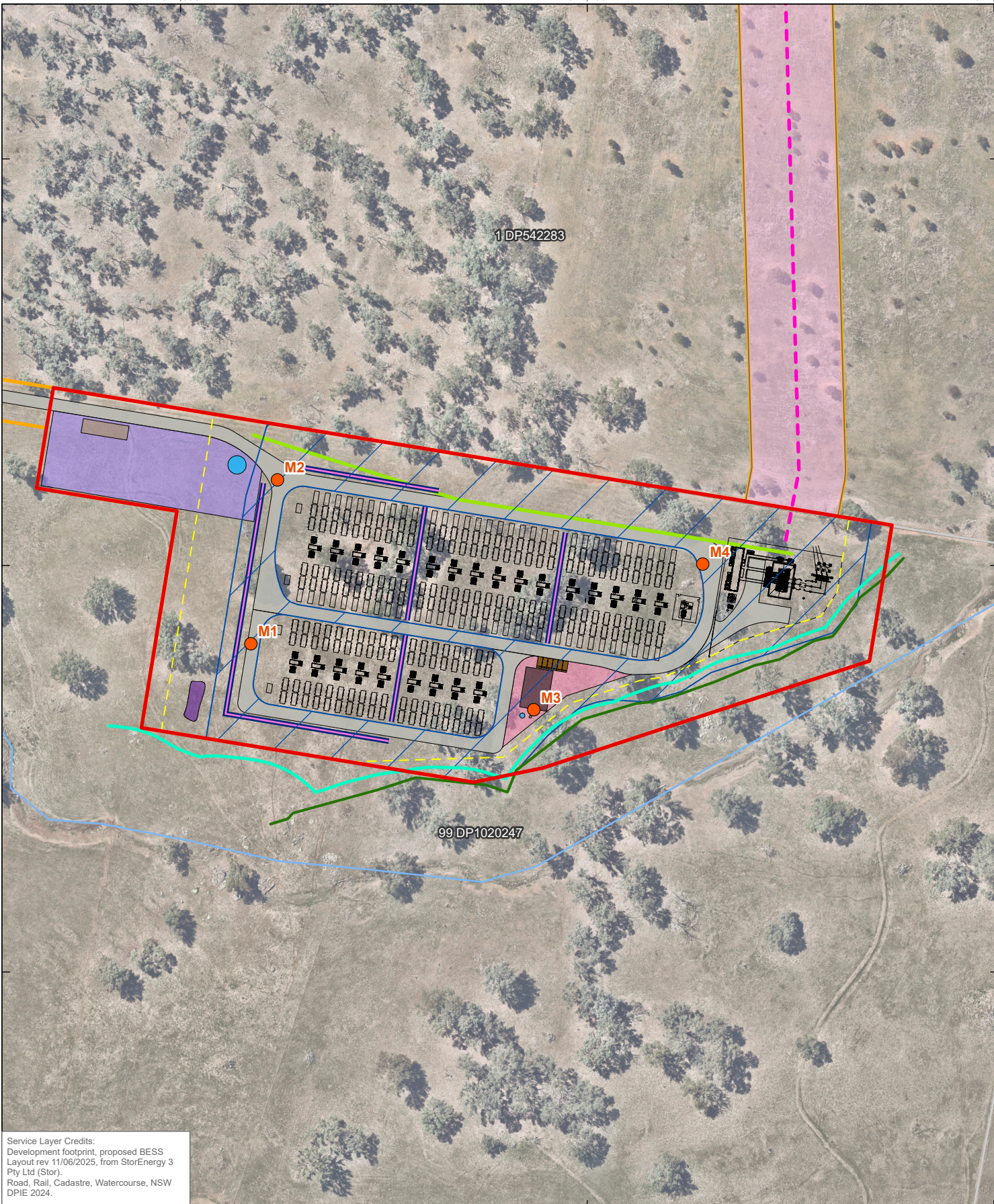
Soil samples from 4 detailed sites were utilised in the LSC assessment laboratory testing program. Samples were analysed to classify the soil based on the ASC (Isbell, 2021) and enable LSC classification.

Soil collected from each major soil horizon (soil layer) was sent to a National Association of Testing Authorities Australia (NATA) accredited laboratory (EAL Laboratories at the Southern Cross University in Lismore) for analysis. The selected physical and chemical laboratory analysis properties and their relevant application are listed in Table 5-3. Certificates of analysis are provided in Appendix A.

Table 5-3 Laboratory Analysis Parameters

Property	Application
Coarse Fragments (>2mm)	Soil workability; root development
Particle-Size Distribution (<2mm)	Determine fraction of clay, silt, fine sand and coarse sand; nutrient retention; exchange properties; erodibility; workability; permeability; sealing; drainage; interpretation of most other physical and chemical properties and soil qualities.
Soil Reaction (pH)	Nutrient availability; nutrient fixation; toxicities (especially aluminium and manganese); liming; Sodicity; correlation with other soil properties.
Electrical Conductivity (EC)	Appraisal of salinity hazard in soil substrates or groundwater; total soluble salts. Soil salinity was determined through measurement of the electrical conductivity (EC) of soil:water (1:5) suspensions. These values were converted to the EC of a saturated extract (ECe) based on soil texture.
Cation Exchange Capacity (CEC) & Exchangeable Cations	Nutrient status; calculation of exchangeable cations including sodium, calcium, magnesium, potassium and exchangeable sodium percentage (ESP); assessment of other physical and chemical properties, especially dispersivity, shrink – swell, water movement, aeration.
Munsell Colour Chart (Munsell)	Drainage, oxidation, fertility, correlation with other physical, chemical and biological properties.





Service Layer Credits:
 Development footprint, proposed BESS
 Layout rev 11/06/2025, from StorEnergy 3
 Pty Ltd (Stor).
 Road, Rail, Cadastre, Watercourse, NSW
 DPIE 2024.



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:2,500 at A4

Project Number: 620.041615

Date Drawn: 18-Sep-2025

Drawn by: AS



LEGEND

- | | | |
|--|-------------------------|-------------------------|
| ● Observation Site | Heritage Buffer (50m) | ■ O&M Building |
| — Watercourse | Top of Bank 40m Buffer | ■ Sewerage Holding Tank |
| — Proposed Electricity Transmission Line | — Fence line | ■ Washdown Bay |
| — Noisewall | ■ Car Parking Spaces | ■ Water Tank |
| — Swale (Indicative) | ■ Construction Compound | ■ Proposed Easement |
| — BESS Infrastructure | ■ Detention Basin | ■ APZ (Indicative) |
| ■ LSC Study Area | ■ Internal Road | |
| ■ Development Footprint (9.56 ha) | ■ Laydown Area | |

MOLONG BESS

OBSERVATION SITES

FIGURE 5-2

5.3.2 Land and Soil Capability Assessment

The LSC classification applied to the Project Lots was in accordance with the OEH guideline *The Land and Soil Capability Assessment Scheme; Second Approximation* (OEH, 2012) (referenced as LSC Scheme in this report). This scheme uses the biophysical features of the land and soil to derive detailed rating tables for a range of land and soil hazards. The LSC Scheme consists of eight classes, which classify the land based on the severity of long-term limitations. The LSC classes are described in Table 5-4 and their definition has been based on two considerations:

- The biophysical features of the land to derive the LSC classes associated with various hazards.
- The management of the hazards including the level of inputs, expertise and investment required to manage the land sustainably.

Table 5-4 Land and Soil Capability Assessment Classification

Class	Land and Soil Capability
Land capable of a wide variety of land uses (cropping, grazing, horticulture, forestry, conservation)	
1	Extremely high capability land: Land has no limitations. No special land management practices required. Land capable of all rural land uses and land management practices.
2	Very high capability land: Land has slight limitations. These can be managed by readily available, easily implemented management practices. Land is capable of most land uses and land management practices, including intensive cropping with cultivation.
3	High capability land: Land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation.
Land capable of a variety of land uses (cropping with restricted cultivation, pasture cropping, grazing, some horticulture, forestry, nature conservation)	
4	Moderate capability land: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology.
5	Moderate–low capability land: Land has high limitations for high-impact land uses. Will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation. The limitations need to be carefully managed to prevent long-term degradation.
Land capable for a limited set of land uses (grazing, forestry and nature conservation, some horticulture)	
6	Low capability land: Land has very high limitations for high-impact land uses. Land use restricted to low-impact land uses such as grazing, forestry and nature conservation. Careful management of limitations is required to prevent severe land and environmental degradation.
Land generally incapable of agricultural land use (selective forestry and nature conservation)	
7	Very low capability land: Land has severe limitations that restrict most land uses and generally cannot be overcome. On-site and off-site impacts of land management practices



Class	Land and Soil Capability
	can be extremely severe if limitations not managed. There should be minimal disturbance of native vegetation.
8	Extremely low capability land: Limitations are so severe that the land is incapable of sustaining any land use apart from nature conservation. There should be no disturbance of native vegetation.

The biophysical features of the land that are associated with various hazards are broadly soil, climate and landform and more specifically: slope, landform position, acidity, salinity, drainage, rockiness and climate.

The eight hazards associated with these biophysical features that are assessed by the LSC Scheme are:

- 1 Water erosion
- 2 Wind erosion
- 3 Soil structure decline
- 4 Soil acidification
- 5 Salinity
- 6 Water logging
- 7 Shallow soils and rockiness
- 8 Mass movement

Each hazard is assessed against set criteria tables, as described in the LSC Scheme; each hazard for the land is ranked from 1 through to 8 with the overall ranking of the land determined by its most significant limitation.

5.4 Existing Environment

5.4.1 Climate

The nearest Bureau of Meteorology (BOM) weather station to the Project Lots is located at Molong Post Office approximately 3 km from the Transgrid Molong Substation. This BOM weather station provides rainfall data from 2002 to 2025. The Molong (Hill St) BOM weather station, located approximately 4 km from the Transgrid Molong Substation, provides mean temperature between 1907 and 1975 while rainfall data is available from 1884 to 2022.

As shown in Table 5-5, the area experiences a wide range of temperatures across the seasons with average maximum temperatures ranging from 29°C to 31°C during summer (December to February), and average minimum temperatures from 1°C to 0.6°C during winter (July to August). Average rainfall ranges from 66 millimetres (mm) in January to 30 mm in May. Average evaporation rates range from 36 mm in June to 216 mm in December, with the annual average at 1,436 mm.

The closest station with pan evaporation data is the Orange Agricultural Institute station (number 63254) approximately 30 km southeast of the Project Lots. Evaporation data were sourced from the SILO point data service provided by the Queensland Government's Department of Environment, Tourism, Science and Innovation (DETSI). This service delivers high-resolution daily climate data for Australia, including rainfall, temperature, and evaporation, based on interpolated observational records. The median pan evaporation from the nearest point data is reported in Table 5-5 and is 1,436 mm based on data from 2010 to 2025.



Table 5-5 Meteorological Data Summary Statistics for All Years

045840438	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (°C)¹												
31*	30.1	27.5	22.5	17.4	14.0	12.9*	14.7	18.6	22.6	26.4	29.5	22.3
Mean minimum temperature (°C)¹												
13.3	13.2	10.3	6.0	2.8	0.9	-0.1	0.6	2.4	5.4	8.4	11.4	6.2
Mean annual rainfall (mm)²												
66	46.5	65	36.6	30	37.7	46	42.5	49	41.7	71.0	70.3	623.5
Mean annual evaporation (mm)³												
224	178	146	92.4	56.2	36.0	43.4	62.0	96.1	144	175	216	1,436
¹ Molong Hill St. Station number 65023. Opened 1884 to current												
² Molong Post Office. Station number 65041. Opened 1995 to current												
³ SILO point data obtained from -33.10 148.90												

5.4.2 Surface Geology

The surface geology (Figure 5-3) of the area is characterised by sediments of volcanic origin (specifically Fairbridge Volcanics; "Owkf" rock unit). The Fairbridge Volcanics consists of basaltic to andesitic and latitic volcanics, along with volcanoclastic sandstones, tuff, conglomerate, breccia and siltstone. Minor limestones may be present, though allochthonous (i.e. originating elsewhere).

5.4.3 Topography

The Project Lots are located at a local elevation ranging from 555 – 610 m Australian Height Datum (AHD), with a gradual gentle gradient to the south (Figure 5-4). The Project Lots appeared to be located near a regionally moderate elevation. With undulating low hills with elevation ranges of 540 to 690 m. At the scale of the locality, the area tended to have relief to the south, towards Molong Creek.

5.4.4 Hydrology

The Project Lots contains one man-made waterbody, located in the southwest corner (Figure 5-4). The site contains a few minor water bodies (dams) and intermittent creeks. The nearest natural watercourse is Back Creek, a freshwater environment situated approximately 800 m to the north. Molong Creek is also located approximately 1.2 km to the south. Back Creek flows for approximately 4.6 km downstream before reaching its confluence with Molong Creek. Both creeks are natural freshwater systems that flow through predominantly rural landscapes. Molong Creek originates in the elevated terrain near Amaroo and flows generally northward through the township of Molong, eventually discharging into the Bell River.

5.4.5 Land Use

The Project Lots have been substantially modified by both current and historical land use, primarily for agriculture purposes including grazing of modified pastures. A portion of the Project Lots is also occupied by the Transgrid Molong Substation. A review of the Cabonne Local Environmental Plan (LEP) 2012 indicates that the study area is zoned as RU1 Primary Production. The NSW Soil and Land Information eSPADE (DPHI 2025) mapped the land use



in 2007 as primarily dryland cropping. In 2017 the land use has shifted to a combination of dryland cropping and urban and intensive uses in the northern portion of the Project Lots.

5.4.6 Existing Soils Information

5.4.6.1 Soil Landscape Units

Soil Landscapes Units (SLU's) within the Project Lots have been mapped by the former NSW Department of Land and Water Conservation, incorporating the NSW Soil Conservation Service (now part of NSW Department of Primary Industries (DPI)), on the *Soil Landscapes of the Bathurst 1:250,000 Sheet* (Kovac, Murphy and Lawrie, 2010). One SLU occurs within the Project Lots. The Molong SLU is predominantly associated with Euchrozems while non-calcic Brown Soils and Yellow Podzolic Soils are found on lower slopes. Terra Rossa soils are associated with scattered limestone outcrops.

5.4.6.2 Australian Soil Classification

The NSW Soil and Land Information eSPADE (DPHI 2025) mapped soils in the Project Lots as Ferrosols (Figure 5-6). Ferrosols are characterised by their high content of free iron oxides, which gives them a distinctive red or red-brown colour. These soils typically have well-structured B2 horizons and are often found in regions with mafic or ultramafic igneous rocks.

5.4.6.3 Inherent Soil Fertility

NSW regional mapping provides an estimation of the inherent fertility of soils in NSW. It uses the best available soils and natural resource mapping developed for LSC dataset. The mapping describes soil fertility in NSW according to a five-class system: low (1), moderately low (2), moderate (3), moderately high (4), high (5).

Soils with 'low' fertility, due to their poor physical and/or chemical status, only support limited plant growth. Soils with 'moderately low' fertility can generally only support plants suited to grazing; large inputs of fertiliser are required to make the soil suitable for arable purposes. Soils with 'moderate' fertility usually require fertilisers and/or have some physical restrictions for arable use. Soils with 'moderately high' fertility have a high level of fertility in their virgin state which is significantly reduced after a few years of cultivation (Murphy, et al., 2007).

The Project Lots is dominated by soils with moderately high fertility (4).

5.4.6.4 Land and Soil Capability

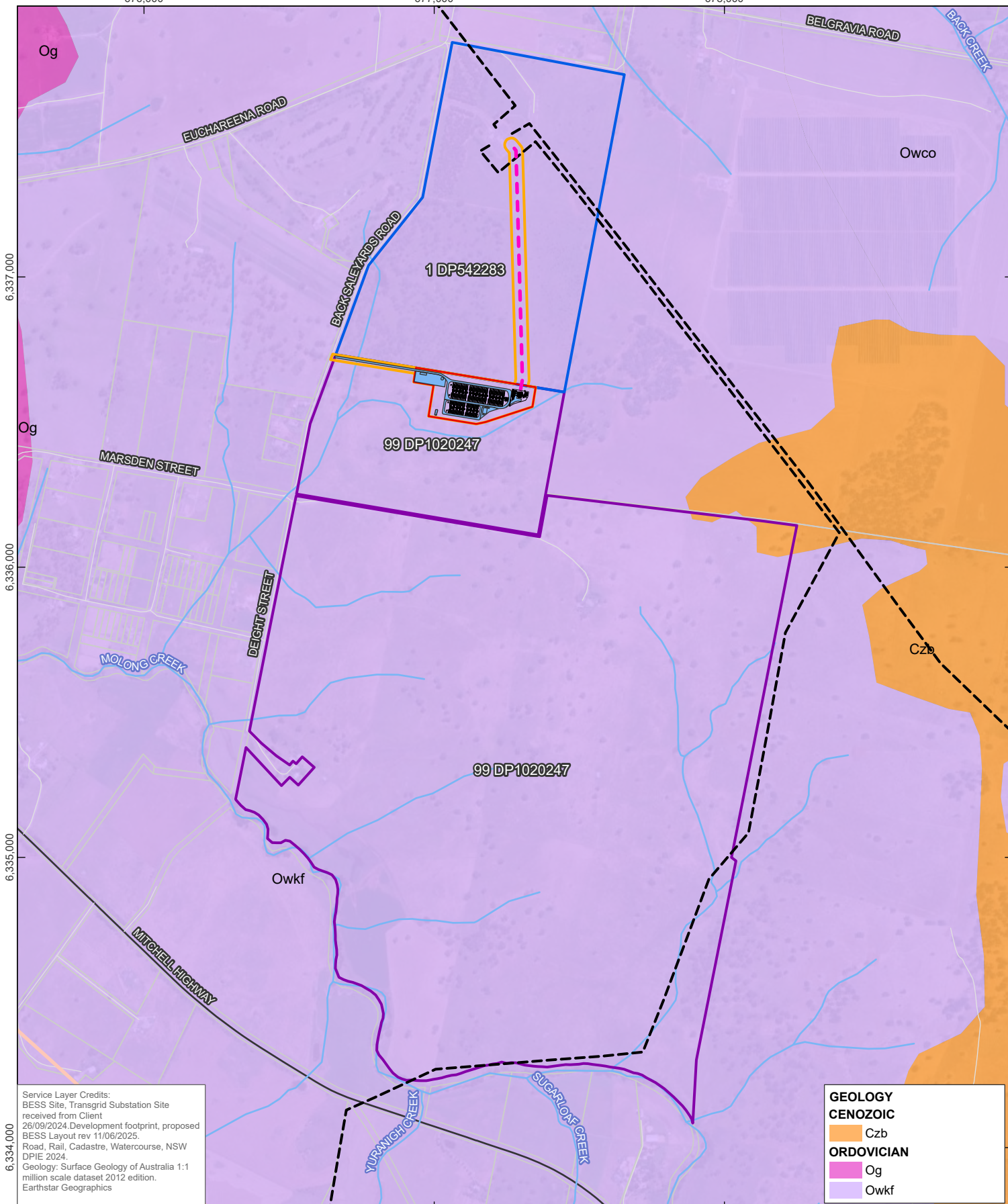
The NSW Soil and Land Information eSPADE site (DPHI 2025) mapped soils in the Project Lots as LSC Class 3 (Figure 5-7). The NSW LSC Class 3 indicates that the land and soil capability of the study area contains "moderate limitations".



676,000

677,000

678,000



Service Layer Credits:
 BESS Site, Transgrid Substation Site
 received from Client
 26/09/2024. Development footprint, proposed
 BESS Layout rev 11/06/2025.
 Road, Rail, Cadastre, Watercourse, NSW
 DPIE 2024.
 Geology: Surface Geology of Australia 1:1
 million scale dataset 2012 edition.
 Earthstar Geographics

GEOLOGY
CENOZOIC
 Czb
ORDOVICIAN
 Og
 Owkf



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:17,500 at A4

Project Number: 620.041615

Date Drawn: 18-Sep-2025

Drawn by: AS

LEGEND

— Watercourse
 — Primary Road
 — Road

Transgrid Line

--- 132kV
 --- 66kV
 — Cadastre

--- Proposed Electricity
 Transmission Line
 [Red Outline] BESS Footprint
 [Orange Outline] Development Footprint
 [Blue Outline] BESS Layout
 [Purple Outline] BESS Site
 [Blue Outline] Transgrid Substation
 Site

MOLONG BESS

SURFACE GEOLOGY



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FIGURE 5-3

676,500

677,000

677,500

6,337,500

6,337,000

6,336,500

EUCHAREENAROAD

BACKSLEYARDSROAD

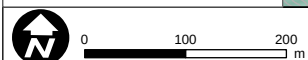
MARSDEN STREET

1 DP542283

99 DP1020247

99 DP1020247

Service Layer Credits:
 BESS Site, Transgrid Substation Site
 received from Client
 26/09/2024. Development footprint, proposed
 BESS Layout rev 11/06/2025.
 Road, Rail, Cadastre, Watercourse, NSW
 DPIE 2024. Topography: Molong201108



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:7,500 at A4

Project Number: 620.041615

Date Drawn: 17-Sep-2025

Drawn by: AS

LEGEND

Watercourse
 Road
 Topographic Contour (1m)
 Topographic Contour (5m)
 Transgrid Line

--- 132kV

Proposed Electricity
 Transmission Line
 BESS Footprint
 Development Footprint
 BESS Site
 Transgrid Substation
 Site

MOLONG BESS

TOPOGRAPHY AND HYDROLOGY



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FIGURE 5-4

676,500

677,000

677,500

6,337,500

6,337,500

6,336,500

EUCHAREENAROAD

BACKSLEYARDSROAD

MARSDEN STREET

Service Layer Credits:
 Development footprint, proposed BESS
 Layout rev 11/06/2025, from StorEnergy 3
 Pty Ltd (Stor)
 Road, Rail, Cadastre, Watercourse, NSW
 DPIE 2024. Image: Nearmap 2025



0 100 200 m

Coordinate System: GDA2020 MGA Zone 55

Scale: 1:7,500 at A4

Project Number: 620.041615

Date Drawn: 18-Sep-2025

Drawn by: AS

LEGEND

— Watercourse
 — Road

Transgrid Line

- - - 132kV

Soil Landscape

Molong

— Proposed Electricity
 Transmission Line

BESS Footprint

Development Footprint

BESS Layout

MOLONG BESS

SOIL LANDSCAPE UNITS



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FIGURE 5-5

676,500

677,000

677,500

6,337,500

6,337,000

6,336,500

EUCHAREENAROAD

BACKSALEYARDSROAD

FE

MARSDEN STREET

Service Layer Credits:
 Development footprint, proposed BESS
 Layout rev 11/06/2025, from StorEnergy 3
 Pty Ltd (Stor).
 Road, Rail, Cadastre, Watercourse, NSW
 DPIE 2024.
 ASC Soil Classification, CSIRO Aug, 2024
 Maxar



0 100 200 m

Coordinate System: GDA2020 MGA Zone 55

Scale: 1:7,500 at A4

Project Number: 620.041615

Date Drawn: 17-Sep-2025

Drawn by: AS

LEGEND

— Watercourse
 — Road

Transgrid Line

- - - 132kV

Australian Soil Classification

■ Ferrosols

— Proposed Electricity
 Transmission Line

■ BESS Footprint

■ Development Footprint

■ BESS Layout

MOLONG BESS

REGIONAL AUSTRALIAN
 SOIL CLASSIFICATION



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FIGURE 5-6

676,500

677,000

677,500

6,337,500

6,337,500

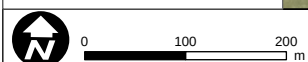
6,336,500

EUCHAREENAROAD

BACKSLEYARDSROAD

MARSDEN STREET

Service Layer Credits:
 Development footprint, proposed BESS
 Layout rev 11/06/2025, from StorEnergy 3
 Pty Ltd (Stor).
 Road, Rail, Cadastre, Watercourse, NSW
 DPIE 2024, Image: Nearmap 2025
 ASC Soil Classification, CSIRO Aug, 2024



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:7,500 at A4

Project Number: 620.041615

Date Drawn: 17-Sep-2025

Drawn by: AS

LEGEND

— Watercourse
 — Road

Transgrid Line

- - - 132kV

— Cadastre

Land and Soil Capability

3 - Moderate limitations

- - - Proposed Electricity
Transmission Line

BESS Footprint

Development Footprint

BESS Layout

MOLONG BESS**REGIONAL LAND
AND SOIL CAPABILITY**

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FIGURE 5-7

5.4.6.5 Strategic Regional Land Use Policy Mapping

The 'NSW Government's Strategic Regional Land Use Policy' (the Policy) defines and identifies strategic agricultural land (SAL) across NSW. SAL includes land with unique natural resource characteristics, known as biophysical strategic agricultural land (BSAL), and clusters of significant agricultural industries known as critical industry clusters (CICs).

For exploration activities located on or within 2 kilometres of mapped SAL, specific information is required outlining any possible impacts the proposed exploration activity will have on SAL as well as the mitigation measures to be employed to minimise or prevent impacts on SAL. The Policy has been developed to achieve balanced land use outcomes, specifically between mining, coal seam gas and agriculture.

The Project Lots and surrounding area is mapped as BSAL.

5.4.6.6 Acid Sulfate Soils

The potential for acid generation from regolith material (topsoil and subsoil) within the Project Lots and surrounding land is low. Potential acid sulphate soils (PASS), which are the main cause of acid generation within the soil mantle, are commonly found less than five metres above sea level, particularly in low-lying coastal areas such as mangroves, salt marshes, floodplains, swamps, wetlands, estuaries, and brackish or tidal lakes. The Project Lots is located approximately 230 kilometres from the coast at >570 metres AHD.

The likelihood of acid sulphate soils occurring within the Project Lots is very low due to its position away from the coast and potential acid sulfate landform type.

5.4.6.7 Hydrogeological Landscapes

The NSW Soil and Land Information eSPADE (DPHI 2025) indicates that the Project Lots contains a high salinity hazard in the northern portion (transmission corridor) and a very high salinity hazard in the southern portion (Lot 99). Land salinity is classified as moderate in the northern section and high in the southern section. Salt export risk is generally moderate across the Project Lots. Instream electrical conductivity (EC) levels vary from low in the northern portion too high in the southern portion.

5.5 Site Characteristics and Land Use

5.5.1 Australian Soil Classification

The eSPADE (DPHI 2025) mapped soils in the site area as Ferrosols.

Based on this investigation two soil map unit were identified within the LSC Study Area. The LSC Study Area is mapped according to the dominant ASC soil type, Haplic Eutrophic Brown/Grey Dermosol and Haplic Eutrophic Brown/Red Chromosol (Figure 5-8) using a combination of the soil survey and laboratory analysis results. The soil unit and the associated observation sites are shown below in Table 5-6.

Haplic Eutrophic Brown/Grey Dermosols and Haplic Eutrophic Brown/Red Chromosols exhibit similarities in their physical and chemical properties, which are relevant to land management and infrastructure development. Both soil types are classified as Eutrophic, indicating elevated base cation concentrations and inherently high fertility, which supports vegetation establishment and post-disturbance rehabilitation. Structurally, each possesses a well-developed B horizon with moderate to strong pedality, contributing to stable profiles and moderate permeability. Although Chromosols are distinguished by a clear texture contrast between the A and B horizons - typically a loamy surface overlying a clayey subsoil - this



distinction does not significantly alter their overall drainage capacity or erosion resistance under undisturbed conditions.

A description of a representative profile of the Haplic Eutrophic Brown/Grey Dermosol and Haplic Eutrophic Brown/Red Chromosol identified follows Table 5-6. Detailed site descriptions are provided in Appendix B.

Table 5-6 Soil Unit within LSC Study Area

SMU	ASC Soil Type	Observation Site	Hectares	Percentage
1	Haplic Eutrophic Brown/Grey Dermosol	M1, M2	2.72	53%
2	Haplic Eutrophic Brown/Red Chromosol	M3, M4	2.33	47%
Total			5.1	100%

Soil Map Unit 1: Haplic Eutrophic Brown / Grey Dermosol

Table 5-7 Summary Haplic Eutrophic Brown Dermosol (Site M1)

Overview	
Landscape Site	
Overview	Soil Surface
	
Site Description	
ASC Name	Haplic Eutrophic Brown Dermosol [BENO-]
Representative Site	M1
Survey Type	Analysed detailed
Landform Pattern	Hillslope
Landform Element	Upper slope
Surface Condition	Soft
Dominant Land Use	Grazing
Drainage	Moderately well
Permeability	Moderate
Aspect	North
Average Slope (%)	5% clinometer
Coordinates (GDA2020 Zone 55)	677015, 6336565



Table 5-8 Profile Haplic Eutrophic Brown Dermosol (Site M1)

Profile	Horizon / Depth (m)	Description
	A 0 - 0.15 Clear	Dark reddish brown, silty clay loam, moderately moist, moderate 10-15 mm polyhedral structure with a rough fabric. Nil mottling, 5%, <2 mm coarse fragments, nil segregations. Sampled 0-10 cm
	B 0.15 - 0.50 Gradual	Strong brown, silty clay, moderately moist, moderate 20-50 mm polyhedral structure with a rough fabric. Nil mottling, nil coarse fragments, nil segregations. Sampled 20-30 cm
	BC 0.50+	Dark yellowish brown, silty clay, weak pedality with an earthy fabric. Nil mottling, 10%, <2 mm coarse fragments, nil segregations. Sampled 50-60 cm and 80-90 cm

Table 5-9 Chemical Parameters Haplic Eutrophic Brown Dermosol (Site M1)

Layer	pH (1:5 water)		ESP		ECe		Ca:Mg	
	Unit	Rating	%	Rating	dS/m	Rating	Ratio	Rating
A	5.9	Moderately Acidic	0.30	Non sodic	0.53	Non-saline	2.3	Ca low
B	7.1	Neutral	0.30	Non sodic	0.31	Non-saline	2.0	Ca low
BC	7.3	Mildly Alkaline	0.40	Non sodic	0.26	Non-saline	2.1	Ca low
BC	7.4	Mildly Alkaline	0.40	Non sodic	0.28	Non-saline	1.9	Ca low



Soil Map Unit 2: Haplic Eutrophic Brown / Red Chromosol

Table 5-10 Summary Haplic Eutrophic Brown Chromosol (Site M3)

Overview	
Landscape Site	
Overview	Soil Surface
	
Site Description	
ASC Name	Haplic Eutrophic Brown Chromosol [BFMO]
Representative Site	M3
Survey Type	Analysed detailed
Landform Pattern	Hillslope
Landform Element	Mid slope
Surface Condition	Soft
Dominant Land Use	Grazing
Drainage	Moderately well
Permeability	Moderate
Aspect	East
Average Slope (%)	3% clinometer
Coordinates (GDA2020 Zone 55)	677174, 6336529



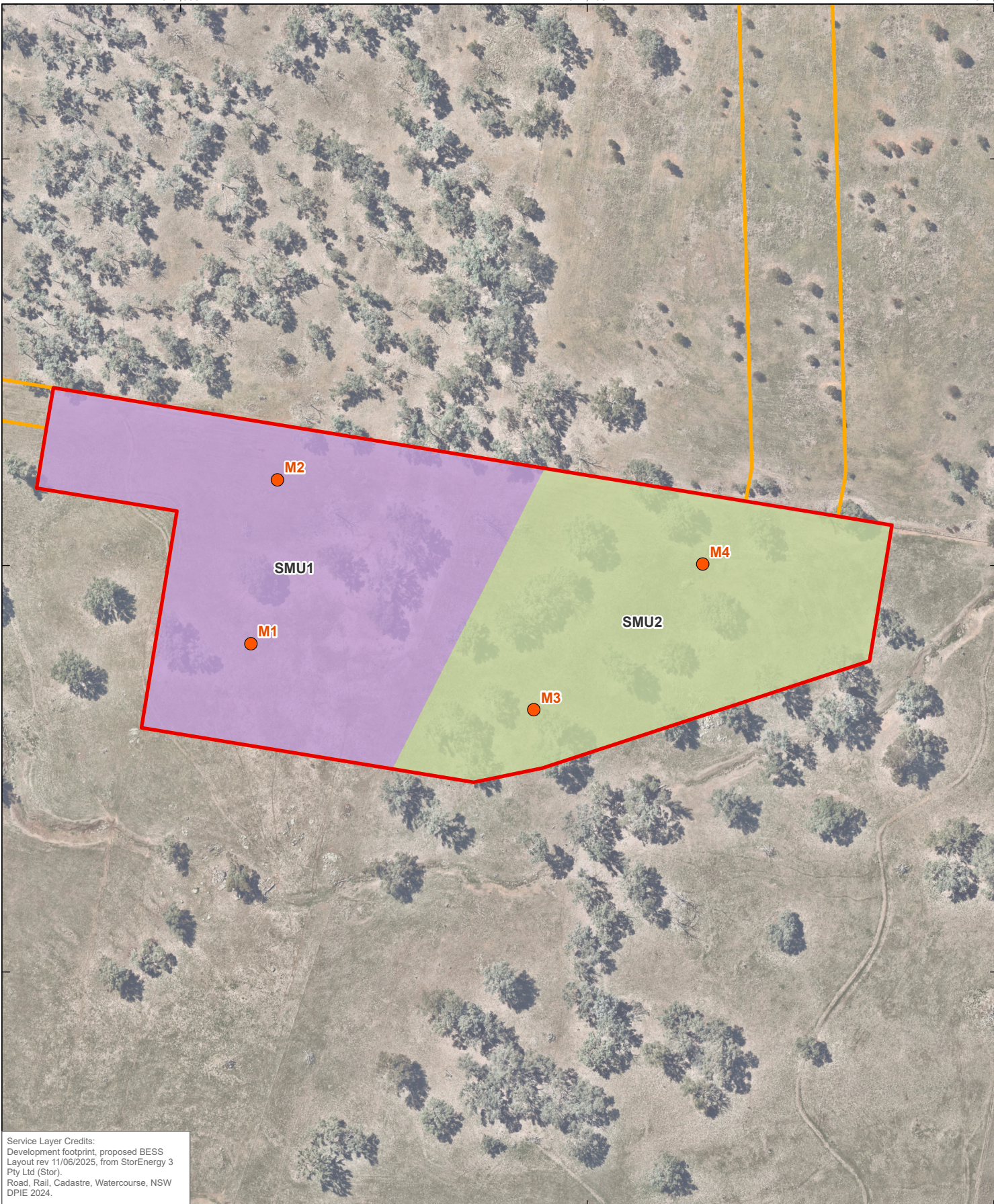
Table 5-11 Profile Haplic Eutrophic Brown Chromosol (Site M3)

Profile	Horizon / Depth (m)	Description
	A1 0 - 0.20 gradual	Dark reddish brown, silty loam, moderately moist, moderate 5-10 mm subangular blocky structure. Nil mottling, 10%, 20-80 mm rock fragments, nil segregations. Sampled 0-10 cm
	B21 0.20 - 0.40 Gradual	Dark greyish brown (10YR 4/2) silty clay, moderately moist, moderate 10-20 mm polyhedral structure. Nil mottling, 10%, 10 – 20mm coarse fragments, nil segregations. Sampled 30-40 cm
	B22 0.40 - 0.70 Gradual	Brown, heavy clay, moderately moist, moderate 10-20 mm polyhedral structure. Nil mottling, 10%, 10 – 20mm coarse fragments, nil segregations. Sampled 60-70 cm
	B23 0.70+ 	Brown, silty clay, moderately moist, apedal. Nil mottling, 10%, 2-5 mm coarse fragments, nil segregations. Sampled 90-100 cm

Table 5-12 Chemical Parameters Haplic Eutrophic Brown Chromosol (Site M3)

Layer	pH (1:5 water)		ESP		ECe		Ca:Mg	
	Unit	Rating	%	Rating	dS/m	Rating	Ratio	Rating
A1	5.9	Moderately Acidic	0.3	Non sodic	0.52	Non-saline	2.4	Ca low
B21	7.0	Neutral	0.5	Non sodic	0.26	Non-saline	1.9	Ca low
B22	7.1	Neutral	0.6	Non sodic	0.20	Non-saline	1.9	Ca low
B23	7.1	Neutral	0.6	Non sodic	0.23	Non-saline	2.1	Ca low





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DPIE 2024.



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:2,500 at A4

Project Number: 620.041615

Date Drawn: 18-Sep-2025

Drawn by: AS

LEGEND

- Sample Location
- LSC Study Area
- Development Footprint (9.56 ha)

Soil Mapping Units

- SMU1: Haplic Eutrophic Brown/Grey Dermosol
- SMU2: Haplic Eutrophic Brown/Red Chromosol

MOLONG BESS

SOIL MAPPING UNIT



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Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041615.00001 Stor Energy NSW\06 SLR Data\01 GIS\GIS\NSW_Stor.aprx\620041615_LSC_F05-08_Soil Mapping Unit

FIGURE 5-8

5.5.2 LSC Assessment

5.5.2.1 LSC Hazard Evaluation

Hazard 1: Water Erosion

The Project Lots lies within the Eastern NSW Division, and the appropriate criteria for this division were used in the assessment. Assessment of water erosion hazard is almost solely dependent on the slope percentage of the land, based on each Soil Landscape Unit. The only exception is land which falls within the slope range of 10 to 20%, which may be designated LSC Class 4 or LSC Class 5 depending on the presence of gully erosion and/or sodic/dispersible soils. A slope analysis for the Project Lots is shown on Figure 5-9 while the slope analysis methodology is shown in Appendix C.

Hazard 2: Wind Erosion

There are four factors used to assess wind erosion hazard for each soil type. Three criteria were assessed to be consistent for each soil type:

- Average rainfall determines the capacity of the land to maintain vegetative cover and keep soil wet. The mean average precipitation (MAP) measured is 620 mm (Section 5.4.1), and therefore the Project Lots lies within the “greater than 500 mm rainfall” category for the purpose of assessing wind erosion hazard.
- Wind erosive power for the Project Lots has been mapped as “High” based on Figure 6 Wind erosive power in NSW provided in the LSC Scheme (NSW OEH, 2012); and
- Exposure of the land to wind was determined to be “Low” throughout the Project Lots.

The determining factor with regard to wind erosion hazard was therefore the erodibility of each soil type as determined by soil texture according the LSC Scheme.

Hazard 3: Soil Structure Decline

Soil structure decline is assessed on soil characteristics, including surface soil texture, sodicity (laboratory tested) and degree of self-mulching (field tested). These parameters assess the soil structure, stability and resilience of the soil. Laboratory tests for sodicity all indicated low levels of exchangeable sodium percentage, resulting in a non-sodic rating (Hazelton and Murphy, 2025).

Hazard 4: Soil Acidification

The soil acidification hazard is assessed using three criteria, being soil buffering capacity, pH and mean annual rainfall. In this assessment, soil buffering capacity was based on soil Great Soil Group; surface soil pH and a regional mean annual rainfall range of 550-700 millimetres.

Hazard 5: Salinity

The salinity hazard is determined through a range of data and criteria which includes the recharge potential, discharge potential and salt stores. The recharge potential for the site was determined based on an average annual rainfall of 620 mm, with annual mean pan evaporation of 1,436 mm (Section 5.4.1). This would suggest a low recharge potential.

Based on the annual rainfall data and the average annual estimated evapotranspiration, a low discharge potential exists for the site due to a likely balanced rate of water flow.



According to the LSC Scheme Figure 7 Salt Store Map of NSW (NSW OEH, 2012) the Project Lots is located in an area of “Low” salt store. However, due to the current available scale of this mapping, laboratory tested electrical conductivity (EC) values were used to determine salt store. Soil salinity in the laboratory analysed samples was determined through the measurement of the EC of 1:5 soil: water suspensions. These values were converted to the EC of a saturated extract (EC_e) based on soil texture (Hazelton & Murphy, 2025). Salinity in the topsoils and subsoils were classed as non-saline.

Hazard 6: Water Logging

Water logging was determined by the soils drainage characteristics, specifically field sample evidence of mottling, soil texture attributes as well as slope and climate. Soil drainage at all soil observation sites were rated as well drained.

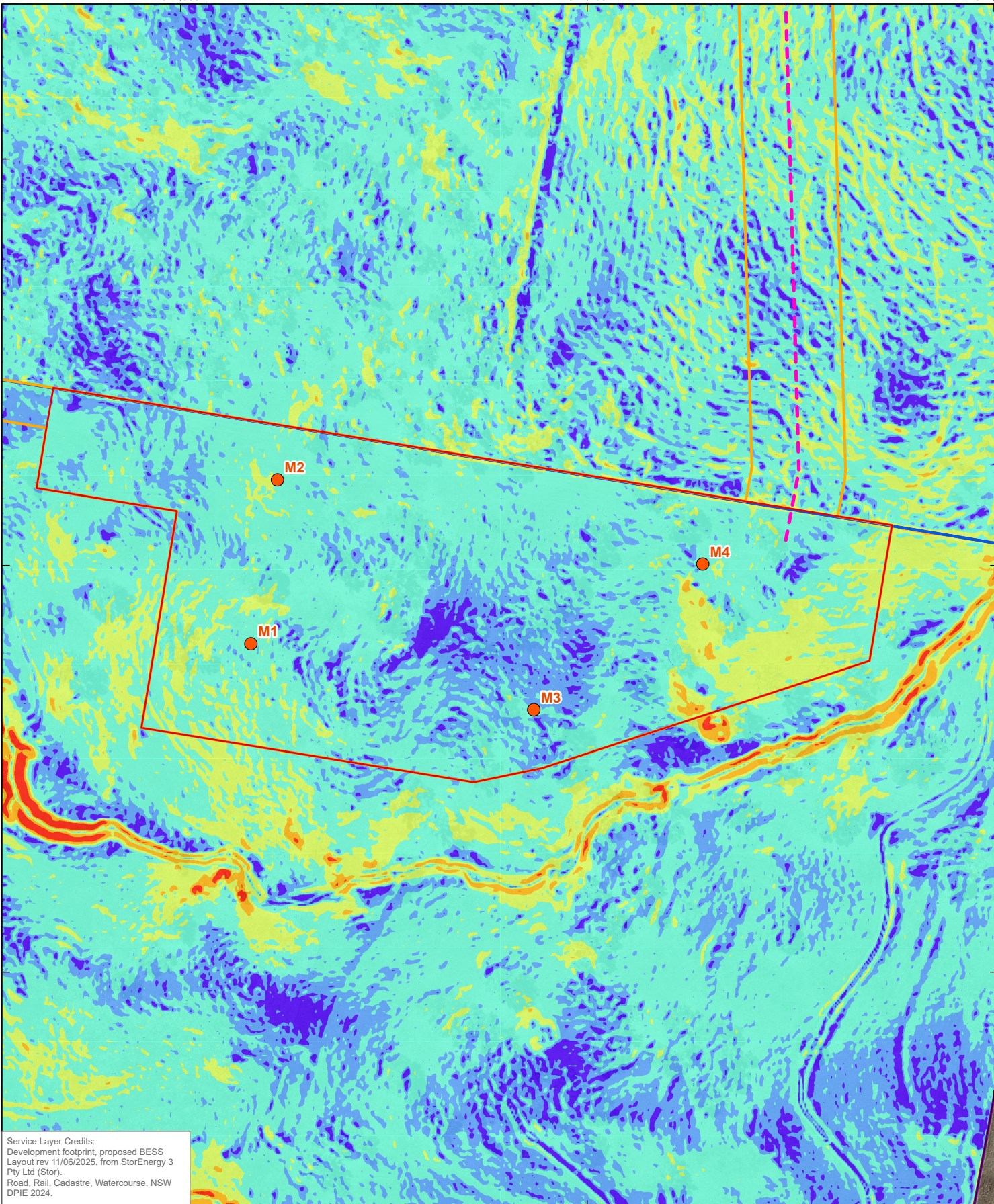
Hazard 7: Shallow Soils and Rockiness

The shallow soils and rockiness hazard is determined by an estimated exposure of rocky outcrops and average soil depth. Rock outcrop limitation is based on observation on site and the Soil Landscape Reports for the area. Soil Landscape Reports are not available for the Project Lots. An outcrop was observed south of observation site M4.

Hazard 8: Mass Movement

The mass movement hazard is assessed through a combination of three criteria; mean annual rainfall, presence of mass movement and slope class.





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Pty Ltd (Stor).
Road, Rail, Cadastre, Watercourse, NSW
DPIE 2024.



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:2,500 at A4

Project Number: 620.041615

Date Drawn: 18-Sep-2025

Drawn by: AS

LEGEND

- Observation Site
- Proposed Electricity Transmission Line
- BESS Footprint
- Development Footprint

Slope %

- < 3
- 3 - 5
- 5 - 10
- 10 - 20
- 20 - 33
- >33

MOLONG BESS

SLOPE ASSESSMENT



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FIGURE 5-9

5.5.2.2 LSC Class

The eSPADE site (DPHI 2025) mapped soils in the Project Lots LSC Class 3.

Based on this investigation, as listed in Table 5-13, the pre-disturbance LSC Study Area has been classified into LSC Class 3 and LSC Class 4. Two LSC classes were dominated by 3.5 ha of LSC Class 3 and 1.6 ha of LSC Class 4, as summarised in Table 5-14 and shown on Figure 5-10. The key criteria resulting in the LSC Class 3 and LSC Class 4 differentiation is slope. Further assessment points are listed below.

Table 5-13 Land & Soil Capability Assessment

Soil Type		Hazard Criteria								LSC
SMU	ASC Great Group	Water erosion	Wind erosion	Soil structure decline	Soil acidification	Salinity	Water logging	Shallow soils and rockiness	Mass Movement	
1	Haplic Eutrophic Brown Dermosol	3	2	1	2	1	2	1	1	3
1	Haplic Eutrophic Grey Dermosol	3	2	1	2	2	2	1	1	4
2	Haplic Eutrophic Brown Chromosol	3	2	1	2	1	2	1	1	3
2	Haplic Eutrophic Red Chromosol	3	2	1	2	1	2	2	1	4

Table 5-14 LSC Class within LSC Study Area

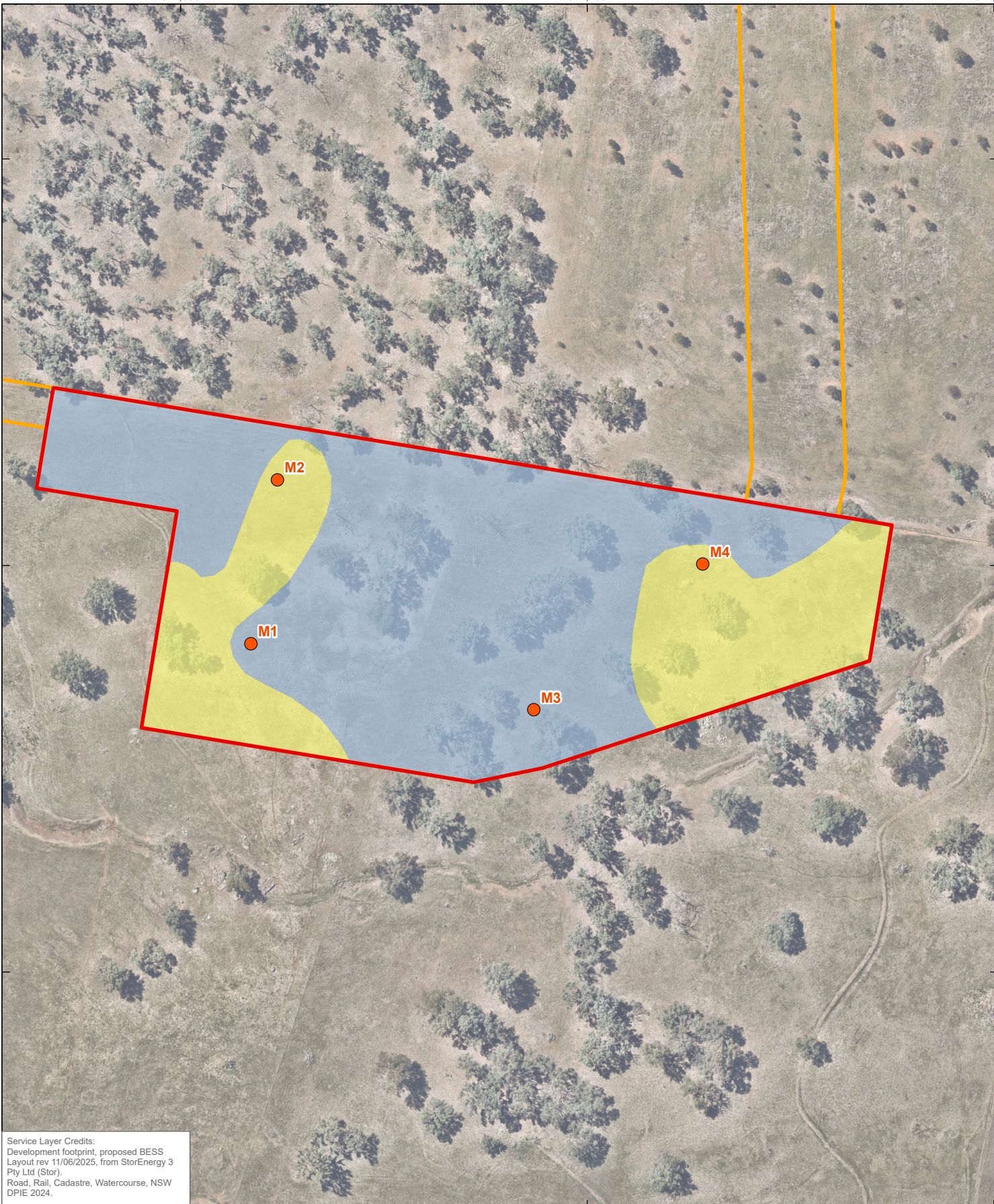
LSC	Analysed Site	ASC	Limitation	Agricultural Capability Rating	LSC Study Area	
					Hectare	Percentage
3	M1, M3	Haplic Eutrophic Brown Dermosol / Chromosol	Water erosion	High	3.5	69%
4	M2, M4	Haplic Eutrophic Grey Dermosol / Red Chromosol	Water erosion	Moderate	1.6	31%
Total					5.1	100%

LSC Class 3 is rated as having high capability land. Land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation. The limitation associated with the rating is Hazard 1: Water Erosion (slope 3 to <10%).



LSC Class 4 is rated as having moderate capability land. Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology. The limitation associated with the rating is Hazard 1: Water Erosion (10 to <20%).





Service Layer Credits:
Development footprint, proposed BESS
Layout rev 11/06/2025, from StorEnergy 3
Pty Ltd (Stor).
Road, Rail, Cadastre, Watercourse, NSW
DPIE 2024.



Coordinate System: GDA2020 MGA Zone 55

Scale: 1:2,500 at A4

Project Number: 620.041615

Date Drawn: 18-Sep-2025

Drawn by: AS

LEGEND

● Sample Location

▭ LSC Study Area

▭ Development Footprint (9.56 ha)

Land and Soil Capability

▭ Class 3

▭ Class 4

MOLONG BESS

**VERIFIED LAND AND
SOIL CAPABILITY CLASSIFICATION**



DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

FIGURE 5-10

5.5.3 Soil Erosion Potential

The soils with the highest erodibility are those with weak particle cohesion between soil particles and an abundance of soil particles that are easily detached and transported by raindrop impact and / or surface runoff. These soils are particularly prone to erosion when their physical weaknesses are combined with low infiltration rates, leading to increased overland flow and concentrated water movement (Hazelton & Murphy, 2016).

Soil erodibility is a function of inherent soil properties, not land management. However, disturbance and removal of protective vegetation or groundcover can expose highly erodible soils and rapidly accelerate erosion. Common indicators of high erodibility include:

- Low organic matter (OM) content,
- High exchangeable sodium percentage (ESP),
- Dispersive behaviour,
- Poor soil structure, and
- Fine or unstable surface textures (e.g. loamy sand, silty clay loam).

In the LSC Study Area, soil dispersion class and erosive potential were assessed based on both site observations and laboratory analysis (Table 5-15).

Laboratory data from the detailed survey sites identified non-sodic topsoil and subsoil horizons. Non-sodic soils tend to have aggregated structure, making them less susceptible to dispersion, crusting, and tunnel erosions. No dispersion or slaking was observed in topsoils. Slaking was observed in the subsoils of M1, M3 and M4 showing some slaking.

Based on the integrated assessment of field and laboratory data, indicative soil erodibility classes were assigned to both the topsoil and subsoil at each survey location. These preliminary classifications, summarised in Table 5-15, are informed by the criteria outlined in Hazelton & Murphy (2025).

Table 5-15 Soil Erodibility Class

SMU	ASC Soil Type	Analysed Site	Soil Erodibility Class and Soil Morphology Associated with Class	
			Topsoil	Subsoil
1	Haplic Eutrophic Brown Dermosol	M1	Low No dispersion or slaking observed during laboratory testing Moderate structure Organic matter >2%	Moderate Slaking observed during laboratory testing ESP <1%
1	Haplic Eutrophic Grey Dermosol	M2	Low No dispersion or slaking observed during laboratory testing Moderate structure Organic matter >2%	Low No dispersion or slaking observed during laboratory testing ESP <1%
2	Haplic Eutrophic Brown Chromosol	M3	Low No dispersion or slaking observed during laboratory testing	Moderate Slaking observed during laboratory testing ESP <1%



SMU	ASC Soil Type	Analysed Site	Soil Erodibility Class and Soil Morphology Associated with Class	
			Topsoil	Subsoil
			Moderate structure Organic matter >2%	
2	Haplic Eutrophic Red Chromosol	M4	Low No dispersion or slaking observed during laboratory testing Moderate structure Organic matter >2%	Moderate Slaking observed during laboratory testing ESP <1%

Soils identified with higher erodibility should be prioritised for appropriate erosion control strategies, such as establishing groundcover, applying surface roughening techniques, or incorporating soil ameliorants (e.g. gypsum for sodic conditions).

Caution should be exercised in using this assessment of soil erodibility, as soil erodibility is only one component of erosion hazard. Other contributing factors include rainfall erosivity, slope length and gradient, surface cover and land management practice. In addition to the soil erodibility class, the presence of erosive surface flows over the Project Lots will increase soil erosion risk. Effective control can be achieved through the implementation of structural measures, topsoiling and vegetative techniques and by phasing development. Appropriate erosion and sediment control measures are recommended for the entire Project Lots.

5.5.4 Acid Sulfate Soils

Assessing land elevation and distance from the coast, in conjunction with existing ASS mapping for NSW, the potential for ASS is considered a very low risk. Further, there was no evidence of ASS indicators such as soil gleying, odour, marine sediments and organic materials recorded as part of the soils survey.

5.6 Impact Assessment on Land Resource

5.6.1 Soils

In areas where disturbance is required for construction of the BESS and complete ancillary works, soils will be subject to greater levels of disturbance.

Soil that is proposed to be disturbed during the Project will be stripped and re-used during construction and/or rehabilitation to mitigate long term impacts on soil resources during operation. As limited surface disturbance is anticipated, soil stripping and re-use will be confined to small areas; in other words, soil may be stripped and stored adjacent to disturbance and respread from where it was stripped. This localised approach will promote reinstatement of the soil profile to its original condition. Soils may be stripped only in areas where soil disturbance occurs.

Overall, the impacts to the soils of the LSC Study Area, where disturbance is proposed, are expected to be minimal and temporary. There will be no direct or indirect impacts to the soil resources of the Project locality outside the LSC Study Area.

5.6.2 Land and Soil Capability

Due to the nature of the Project which will require only localised and sporadic landform modification including minor soil stripping (for excavation works and leveling), impacts on LSC are expected to be minor.



The operational life of the Project will be determined by the evolving nature of the technology, however is anticipated that the lifespan will be approximately 30 years from the commercial operations date (COD).

Following the end of life for the Project, disturbance footprints will be re-graded (where required) and any minor stockpiles of topsoil and subsoil be respread over disturbed areas and rehabilitated to return the site as close as possible to its original state and use. This strategy, along with good soil management practices as outlined in Section 6.0 will facilitate the rehabilitation in returning the land to an equivalent LSC Class.

It is anticipated there will be no permanent impacts on LSC classes within the LSC Study Area as a result of the Project where mitigation measures are suitably implemented.

5.6.3 Erosion and Sedimentation

There is low to moderate potential risk for dispersion where soils are disturbed by Project construction efforts within the LSC Study Area. Higher impact activities such as where earthworks are necessary for construction of site facilities are very likely to result in increased dispersion when soil is remoulded, compacted or pulverised. Wind erosion must also be considered and soils exposed as a result of construction should be sown with pasture species with starter fertiliser to provide stabilising ground cover.

However, due to the nature of the soil and mostly flat nature of the landform, the risk of erosion and sedimentation impacts on agriculture as a result of the Project is low.

With the implementation of mitigation measures detailed in Section 6.0, it is expected that direct and indirect erosion and sedimentation risks would be limited and manageable.

6.0 Recommended Mitigation Measure

The Project will include several measures to prevent, minimise and manage potential adverse impacts on soil resources. This incorporates procedural mitigation measures along with a land management process that ensures the Project has negligible impact on agricultural resources and enterprise.

In addition to the specific measures described in this assessment, all activities associated with the Project will be conducted in consideration of approval obligations and environmental management measures in development consent stipulated environmental management plans.

6.1 Soil Erosion Management

The soil erosion potential of the tested soils indicate there is a low to moderate potential risk for dispersion of the soils within the LSC Study Area which would result in long term agricultural impacts. The Project will prepare an erosion and sediment control plan (ESCP) that will address specific soil dispersion risks based on disturbance activity and phase of the Project, and may include the following:

Construction Phase:

- Apply erosion and sediment controls at earthworks sites in accordance with Landcom (2004).
- Areas disturbed during construction that are not in active use for over 3 months, should be sown with pasture species with starter fertiliser to provide stabilising ground cover and a healthy topsoil to provide long term protection against erosion.



Operation Phase:

- Soil disturbance during operation of the Project should be minimal and limited to maintenance activities, involving very small, localised disturbance areas on an infrequent basis.
- Standard erosion and sediment control measures should be implemented to minimise the potential for sediment export within areas to be disturbed during operations. These measures would be developed on a case-by-case basis referring to this soil assessment and are likely to include measures such as sediment fencing, localised sediment traps, and progressive stabilisation with vegetation.
- Measures to manage any bare areas and erosion that develop over time should be included in the ESCP.

Decommissioning and Rehabilitation Phase:

A detailed Decommissioning and Rehabilitation Plan should be prepared within 1 year of the planned closure of the Project. This plan will detail all aspects of decommissioning and removal of all infrastructure unwanted for post Project land use (some infrastructure may remain for post Project land use purposes i.e., constructed internal roads may be kept as part of the agricultural infrastructure), which may require temporary erosion and sediment control measures.

6.2 Soil Stripping for Rehabilitation

Soil that is proposed to be disturbed during the Project will be stripped and either directly re-applied over disturbed areas or stored for re-use in rehabilitation to mitigate long term effects on the land and soil capability. Some stockpiled soils may be utilised as noise or visual bunds or for erosion and sedimentation control structures.

6.2.1 Soil Stripping Strategy

Laboratory results and field assessments were used to evaluate the suitability of soil materials for recovery and re-use during rehabilitation. Key limiting factors include soil structure, texture, stoniness, dispersion, sodicity, and acidity. However, due to the limited extent of surface disturbance, soil stripping and re-use are expected to be localised, with soils reinstated close to their point of origin to maintain the original profile structure.

Soil will only be stripped where disturbance occurs, and to the necessary depth—either to the base of the excavation or to where parent material is reached. When respread, clay subsoils must be placed as subsoil layers and covered with the topsoil, replicating the existing natural profile to minimise erosion and maintain soil function.

6.2.2 Higher Impact Areas

For long-term stockpiling in areas where higher impact activities will displace larger volumes of soil, it is recommended that topsoil be stripped first. If subsoil excavation is required, the subsoil should then be placed directly onto the exposed subsoil surface of the stockpile area, forming a low-profile landform. A thin layer of topsoil from the stripped area should be placed over the subsoil stockpile as a cap to encourage vegetation growth.

Topsoil and subsoil should be stockpiled separately where possible.

Depths of topsoil and subsoil in these areas should be recorded in GIS. Stockpiles should be rehabilitated with target species to establish vegetation cover and enhance the seedbank over the storage period.



6.2.3 Stripped Soil Management

The following soil handling techniques are recommended to prevent soil degradation:

- Strip soil only to required excavation depths and in slightly moist conditions.
- Use low-impact methods like windrowing with graders to minimise compaction.
- Stockpile topsoil and subsoil separately; keep surfaces coarse to reduce erosion and avoid anaerobic conditions.
- Locate stockpiles in free-draining areas and divert upslope water using drains or banks.
- Install erosion controls (e.g., silt fences, mulch) around stockpiles as per the ESCP requirements.
- Limit stockpile height to 3 m; store clay soils in lower, short-term piles.
- Seed and fertilise stockpiles early with annual cover species to suppress weeds and support soil health.
- Establish final target species on stockpiles to build seedbank for rehabilitation.
- Keep a soil inventory for future rehabilitation needs.
- Inspect stockpiles for weeds before re-spreading; treat or scalp if necessary.

6.2.4 Soil Re-spreading and Seedbed Preparation

The following re-spreading and seedbank preparation techniques are recommended to prevent soil degradation:

- Re-spread topsoil to match original soil horizon depths.
- Apply fertiliser and seed immediately after spreading to minimise erosion.
- Lightly contour rip topsoiled areas to bond layers and aid root penetration.
- Scarify soil surface before or during seeding to improve water infiltration and reduce run-off.

7.0 Conclusions

SLR Consulting Australia Pty Ltd (SLR) has been engaged by StorEnergy 3 Pty Ltd (Stor) to prepare a Land Resource Assessment, including a LSC Assessment for a Battery Energy Storage System (BESS) facility in Molong, New South Wales, comprising a 9.6 ha Development Footprint. The LSC Study Area covers the BESS footprint and comprises 5.1 ha.

The investigation of the LSC Study Area has confirmed the presence of two dominant soil types classified under the Australian Soil Classification system: Haplic Eutrophic Brown/Grey Dermosol and Haplic Eutrophic Brown/Red Chromosol.

The land capability assessment determined that the Study Area comprises predominantly LSC Class 3 (3.5 ha) and LSC Class 4 (1.6 ha), with slope-driven water erosion hazards being the key differentiating factor. While LSC Class 3 land demonstrates high capability and can support intensive agricultural uses with careful management, LSC Class 4 presents greater constraints, requiring specialised management practices and higher resource inputs.

Soils analysed in the LSC Study Area were non-saline. There is low to moderate potential risk for dispersion where soils are disturbed by Project construction efforts within the LSC



Study Area. An ESCP will guide controls across all project phases: preserving landform and vegetation during construction, applying targeted sediment controls during operation, and implementing a detailed rehabilitation plan at decommissioning.



8.0 References

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Appendix A:

Certificate of Analysis



SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731459
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M1 (0-10)
Crop: Cereal
Sample Depth: 0-10
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Reddish Brown						
	MIR - Aus Soil Texture			Silty clay loam						
	ECEC	cmol/kg	5.00-25.0	31.5						
	Organic Carbon (W&B) ²	% (40°C)	0.90-1.80	2.93						
	Total Carbon (TCod-ff)	% 105°C	0.90-1.80	3.30						
	pH 1:5 water	pH units	6.50-7.50	5.91						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	5.10						
	Dumas Total Nitrogen	% dry wt		0.35						
Other tests	% Air-dry Moisture Content	% of dry wt		4.5						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0445						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	8.4						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	9.6						
	Colwell Phosphorus	mg/kg	29-36	22						
	PBI + Col P		35-70	104						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	600-1500	4300	21.4					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	600-1500	4330	21.6					
	Magnesium (Mg) - AmmAc	mg/kg	60-180	1140	9.37					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	60-180	1110	9.09					
	Potassium (K) - AmmAc	mg/kg	80-150	255	0.652					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	80-150	235	0.602					
	Sodium (Na) - AmmAc	mg/kg	15.0-120	19.2	0.084					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-120	20.9	0.091					
	Exchangeable aluminium	cmol/kg	0.10-0.35	0.04						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	0.08						
Trace Elements	Boron	mg/kg	0.50-2.0	0.72						
	Iron (Fe)	mg/kg	10-70	62						
	Manganese (Mn)	mg/kg	1.0-10	37						
	Copper (Cu)	mg/kg	0.30-1.0	3.9						
	Zinc (Zn)	mg/kg	0.30-1.0	0.99						
	Calcium Chloride Silicon	mg/kg		74						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.062						
	Ece	dS/m	0.10-6.0	0.53						

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731459
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M1 (0-10)
Crop: Cereal
Sample Depth: 0-10
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		35.8						
	MIR - Sand (+20 micron)	% w/w		31.5						
	MIR - Silt (2-20 micron)	% w/w		32.7						
Ratios	Ca:Mg Ratio		2.0-8.0	2.3						
	Ca:Mg ratio		2.0-8.0	2.4						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	0.07						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	68.6						
	Magnesium	%	10.0-20.0	28.9						
	Potassium	%	3.0-8.0	1.9						
	Sodium	%	0.5-6.0	0.3						
	Aluminium	%	0.5-10	0.1						
	Hydrogen	%	0.5-5.0	0.2						

NOTE¹: 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.

NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731460
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M1 (20-30)
Crop: Cereal
Sample Depth: 20-30
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Strong Brown						
	MIR - Aus Soil Texture			Clay						
	ECEC	cmol/kg	5.00-25.0	40.3						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	0.83						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	1.00						
	pH 1:5 water	pH units	6.50-7.50	7.05						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	6.09						
	Dumas Total Nitrogen	% dry wt		0.11						
Other tests	% Air-dry Moisture Content	% of dry wt		5.2						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0520						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	3.2						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	6.0						
	Colwell Phosphorus	mg/kg	38-45	<5.0						
	PBI + Col P		35-70	140						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	5460	27.2					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	5350	26.7					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1660	13.6					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1620	13.3					
	Potassium (K) - AmmAc	mg/kg	120-225	106	0.271					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	89	0.228					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	29.0	0.126					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	30.0	0.130					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.65						
	Iron (Fe)	mg/kg	10-70	19						
	Manganese (Mn)	mg/kg	1.0-10	24						
	Copper (Cu)	mg/kg	0.30-1.0	1.9						
	Zinc (Zn)	mg/kg	0.30-1.0	0.13						
	Calcium Chloride Silicon	mg/kg		66						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.036						
	Ece	dS/m	0.10-6.0	0.21						

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731460
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M1 (20-30)
Crop: Cereal
Sample Depth: 20-30
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		54.0						
	MIR - Sand (+20 micron)	% w/w		20.5						
	MIR - Silt (2-20 micron)	% w/w		25.5						
Ratios	Ca:Mg Ratio		2.0-8.0	2.0						
	Ca:Mg ratio		2.0-8.0	2.0						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	66.1						
	Magnesium	%	10.0-20.0	33.0						
	Potassium	%	3.0-8.0	0.6						
	Sodium	%	0.5-6.0	0.3						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

NOTE¹: 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.

NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731461
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M1 (50-60)
Crop: Cereal
Sample Depth: 50-60
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Brown						
	MIR - Aus Soil Texture			Silty clay						
	ECEC	cmol/kg	5.00-25.0	37.0						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	0.19						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	0.24						
	pH 1:5 water	pH units	6.50-7.50	7.33						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	6.39						
	Dumas Total Nitrogen	% dry wt		<0.030						
Other tests	% Air-dry Moisture Content	% of dry wt		3.3						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0330						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	3.5						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	<1.0						
	Colwell Phosphorus	mg/kg	29-36	<5.0						
	PBI + Col P		35-70	81						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	5210	26.0					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	4940	24.6					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1520	12.5					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1480	12.2					
	Potassium (K) - AmmAc	mg/kg	120-225	45	0.116					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	39	0.100					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	30.2	0.131					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	30.1	0.131					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.15						
	Iron (Fe)	mg/kg	10-70	15						
	Manganese (Mn)	mg/kg	1.0-10	10						
	Copper (Cu)	mg/kg	0.30-1.0	0.68						
	Zinc (Zn)	mg/kg	0.30-1.0	0.11						
	Calcium Chloride Silicon	mg/kg		66						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.030						
	Ece	dS/m	0.10-6.0	0.23						

SOIL ANALYSIS

Agent: SLR Consulting	Report Date: 11/08/2025
Agent Address: 10 Kings Road, NEW LAMBTON, NSW, 2305	Sampling Date: NA
Client: Project 620.041615.00022 Phase 0002	Date Received: 28/07/2025
Test Set or Quotation: SBA1	Sample Name: M1 (50-60)
Barcode: 111731461	Crop: Cereal
Batch Number: 44897	Sample Depth: 50-60
Submission ID: 141702	GPS Start: NA
	GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			Yes						
	MIR - Clay	% w/w		47.3						
	MIR - Sand (+20 micron)	% w/w		21.8						
	MIR - Silt (2-20 micron)	% w/w		30.9						
Ratios	Ca:Mg Ratio		2.0-8.0	2.1						
	Ca:Mg ratio		2.0-8.0	2.0						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	66.5						
	Magnesium	%	10.0-20.0	32.9						
	Potassium	%	3.0-8.0	0.3						
	Sodium	%	0.5-6.0	0.4						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

NOTE¹: 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.

NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731462
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M1 (80-90)
Crop: Cereal
Sample Depth: 80-90
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Yellowish Brown						
	MIR - Aus Soil Texture			Silty clay						
	ECEC	cmol/kg	5.00-25.0	38.5						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	0.12						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	0.17						
	pH 1:5 water	pH units	6.50-7.50	7.40						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	6.51						
	Dumas Total Nitrogen	% dry wt		<0.030						
Other tests	% Air-dry Moisture Content	% of dry wt		3.9						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0386						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	5.3						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	<1.0						
	Colwell Phosphorus	mg/kg	29-36	<5.0						
	PBI + Col P		35-70	77						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	5260	26.2					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	5000	25.0					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1670	13.8					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1620	13.3					
	Potassium (K) - AmmAc	mg/kg	120-225	39	0.101					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	30	0.076					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	34.4	0.150					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	34.3	0.149					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.10						
	Iron (Fe)	mg/kg	10-70	13						
	Manganese (Mn)	mg/kg	1.0-10	13						
	Copper (Cu)	mg/kg	0.30-1.0	0.57						
	Zinc (Zn)	mg/kg	0.30-1.0	0.10						
	Calcium Chloride Silicon	mg/kg		75						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.033						
	Ece	dS/m	0.10-6.0	0.24						

SOIL ANALYSIS

Agent: SLR Consulting	Report Date: 11/08/2025
Agent Address: 10 Kings Road, NEW LAMBTON, NSW, 2305	Sampling Date: NA
Client: Project 620.041615.00022 Phase 0002	Date Received: 28/07/2025
Test Set or Quotation: SBA1	Sample Name: M1 (80-90)
Barcode: 111731462	Crop: Cereal
Batch Number: 44897	Sample Depth: 80-90
Submission ID: 141702	GPS Start: NA
	GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			Yes						
	Slaking 1 hour			Yes						
	MIR - Clay	% w/w		49.1						
	MIR - Sand (+20 micron)	% w/w		18.2						
	MIR - Silt (2-20 micron)	% w/w		32.7						
Ratios	Ca:Mg Ratio		2.0-8.0	1.9						
	Ca:Mg ratio		2.0-8.0	1.9						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	64.8						
	Magnesium	%	10.0-20.0	34.6						
	Potassium	%	3.0-8.0	<0.2						
	Sodium	%	0.5-6.0	0.4						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

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NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731463
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M2 (0-10)
Crop: Cereal
Sample Depth: 0-10
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Brown						
	MIR - Aus Soil Texture			Silty clay loam						
	ECEC	cmol/kg	5.00-25.0	25.3						
	Organic Carbon (W&B) ²	% (40°C)	0.90-1.80	2.56						
	Total Carbon (TCod-ff)	% 105°C	0.90-1.80	2.71						
	pH 1:5 water	pH units	6.50-7.50	5.83						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	5.18						
	Dumas Total Nitrogen	% dry wt		0.31						
Other tests	% Air-dry Moisture Content	% of dry wt		3.2						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0320						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	27						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	24						
	Colwell Phosphorus	mg/kg	29-36	41						
	PBI + Col P		35-70	101						
	KCl Sulfur (S)	mg/kg	4.0-10	7.6						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	600-1500	3550	17.7					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	600-1500	3680	18.4					
	Magnesium (Mg) - AmmAc	mg/kg	60-180	723	5.95					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	60-180	741	6.10					
	Potassium (K) - AmmAc	mg/kg	80-150	276	0.707					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	80-150	261	0.668					
	Sodium (Na) - AmmAc	mg/kg	15.0-120	11.3	0.049					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-120	12.4	0.054					
	Exchangeable aluminium	cmol/kg	0.10-0.35	0.05						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	0.10						
Trace Elements	Boron	mg/kg	0.50-2.0	0.52						
	Iron (Fe)	mg/kg	10-70	73						
	Manganese (Mn)	mg/kg	1.0-10	36						
	Copper (Cu)	mg/kg	0.30-1.0	4.6						
	Zinc (Zn)	mg/kg	0.30-1.0	1.3						
	Calcium Chloride Silicon	mg/kg		61						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.10						
	Ece	dS/m	0.10-6.0	0.87						

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731463
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M2 (0-10)
Crop: Cereal
Sample Depth: 0-10
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		26.2						
	MIR - Sand (+20 micron)	% w/w		36.7						
	MIR - Silt (2-20 micron)	% w/w		37.2						
Ratios	Ca:Mg Ratio		2.0-8.0	3.0						
	Ca:Mg ratio		2.0-8.0	3.0						
	K:Mg Ratio		0.10-0.50	0.12						
	K:Mg ratio		0.10-0.50	0.11						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	72.5						
	Magnesium	%	10.0-20.0	24.1						
	Potassium	%	3.0-8.0	2.6						
	Sodium	%	0.5-6.0	0.2						
	Aluminium	%	0.5-10	0.2						
	Hydrogen	%	0.5-5.0	0.4						

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SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731464
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M2 (20-30)
Crop: Cereal
Sample Depth: 20-30
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Reddish Gray						
	MIR - Aus Soil Texture			Silty clay loam						
	ECEC	cmol/kg	5.00-25.0	34.5						
	Organic Carbon (W&B) ²	% (40°C)	0.90-1.80	0.65						
	Total Carbon (TCod-ff)	% 105°C	0.90-1.80	0.71						
	pH 1:5 water	pH units	6.50-7.50	6.66						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	5.95						
	Dumas Total Nitrogen	% dry wt		0.079						
Other tests	% Air-dry Moisture Content	% of dry wt		3.4						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0336						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	4.3						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	2.1						
	Colwell Phosphorus	mg/kg	29-36	17						
	PBI + Col P		35-70	117						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	600-1500	5140	25.7					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	600-1500	5060	25.2					
	Magnesium (Mg) - AmmAc	mg/kg	60-180	1100	9.03					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	60-180	1090	8.94					
	Potassium (K) - AmmAc	mg/kg	80-150	69	0.177					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	80-150	61	0.156					
	Sodium (Na) - AmmAc	mg/kg	15.0-120	24.1	0.105					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-120	24.2	0.105					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.37						
	Iron (Fe)	mg/kg	10-70	23						
	Manganese (Mn)	mg/kg	1.0-10	21						
	Copper (Cu)	mg/kg	0.30-1.0	3.0						
	Zinc (Zn)	mg/kg	0.30-1.0	0.13						
	Calcium Chloride Silicon	mg/kg		58						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.035						
	Ece	dS/m	0.10-6.0	0.30						

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731464
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M2 (20-30)
Crop: Cereal
Sample Depth: 20-30
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		37.4						
	MIR - Sand (+20 micron)	% w/w		29.9						
	MIR - Silt (2-20 micron)	% w/w		32.6						
Ratios	Ca:Mg Ratio		2.0-8.0	2.8						
	Ca:Mg ratio		2.0-8.0	2.8						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	73.3						
	Magnesium	%	10.0-20.0	26.0						
	Potassium	%	3.0-8.0	0.5						
	Sodium	%	0.5-6.0	0.3						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

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NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731465
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M2 (50-60)
Crop: Cereal
Sample Depth: 50-60
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Reddish Gray						
	MIR - Aus Soil Texture			Silty clay loam						
	ECEC	cmol/kg	5.00-25.0	31.7						
	Organic Carbon (W&B) ²	% (40°C)	0.90-1.80	0.22						
	Total Carbon (TCod-ff)	% 105°C	0.90-1.80	0.21						
	pH 1:5 water	pH units	6.50-7.50	7.11						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	6.31						
	Dumas Total Nitrogen	% dry wt		<0.030						
Other tests	% Air-dry Moisture Content	% of dry wt		3.2						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0320						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	6.1						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	1.1						
	Colwell Phosphorus	mg/kg	29-36	12						
	PBI + Col P		35-70	94						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	600-1500	4990	24.9					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	600-1500	4520	22.6					
	Magnesium (Mg) - AmmAc	mg/kg	60-180	1120	9.23					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	60-180	1080	8.91					
	Potassium (K) - AmmAc	mg/kg	80-150	68	0.173					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	80-150	34	0.086					
	Sodium (Na) - AmmAc	mg/kg	15.0-120	37.6	0.164					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-120	36.8	0.160					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.17						
	Iron (Fe)	mg/kg	10-70	23						
	Manganese (Mn)	mg/kg	1.0-10	12						
	Copper (Cu)	mg/kg	0.30-1.0	0.97						
	Zinc (Zn)	mg/kg	0.30-1.0	0.21						
	Calcium Chloride Silicon	mg/kg		60						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.035						
	Ece	dS/m	0.10-6.0	0.30						

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731465
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M2 (50-60)
Crop: Cereal
Sample Depth: 50-60
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		39.9						
	MIR - Sand (+20 micron)	% w/w		24.5						
	MIR - Silt (2-20 micron)	% w/w		35.6						
Ratios	Ca:Mg Ratio		2.0-8.0	2.7						
	Ca:Mg ratio		2.0-8.0	2.5						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	71.1						
	Magnesium	%	10.0-20.0	28.1						
	Potassium	%	3.0-8.0	0.3						
	Sodium	%	0.5-6.0	0.5						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

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NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731466
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M3 (0-10)
Crop: Cereal
Sample Depth: 0-10
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Reddish Brown						
	MIR - Aus Soil Texture			Silty loam						
	ECEC	cmol/kg	5.00-25.0	25.8						
	Organic Carbon (W&B) ²	% (40°C)	0.90-1.80	2.66						
	Total Carbon (TCod-ff)	% 105°C	0.90-1.80	2.83						
	pH 1:5 water	pH units	6.50-7.50	5.90						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	5.07						
	Dumas Total Nitrogen	% dry wt		0.28						
Other tests	% Air-dry Moisture Content	% of dry wt		3.0						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0299						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	8.1						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	4.9						
	Colwell Phosphorus	mg/kg	29-36	18						
	PBI + Col P		35-70	91						
	KCl Sulfur (S)	mg/kg	4.0-10	4.0						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	600-1500	3410	17.0					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	600-1500	3650	18.2					
	Magnesium (Mg) - AmmAc	mg/kg	60-180	848	6.98					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	60-180	850	7.00					
	Potassium (K) - AmmAc	mg/kg	80-150	153	0.392					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	80-150	146	0.372					
	Sodium (Na) - AmmAc	mg/kg	15.0-120	15.0	0.065					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-120	15.2	0.066					
	Exchangeable aluminium	cmol/kg	0.10-0.35	0.05						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	0.09						
Trace Elements	Boron	mg/kg	0.50-2.0	0.44						
	Iron (Fe)	mg/kg	10-70	84						
	Manganese (Mn)	mg/kg	1.0-10	36						
	Copper (Cu)	mg/kg	0.30-1.0	3.7						
	Zinc (Zn)	mg/kg	0.30-1.0	0.82						
	Calcium Chloride Silicon	mg/kg		77						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.055						
	Ece	dS/m	0.10-6.0	0.52						

SOIL ANALYSIS

Agent: SLR Consulting	Report Date: 11/08/2025
Agent Address: 10 Kings Road, NEW LAMBTON, NSW, 2305	Sampling Date: NA
Client: Project 620.041615.00022 Phase 0002	Date Received: 28/07/2025
Test Set or Quotation: SBA1	Sample Name: M3 (0-10)
Barcode: 111731466	Crop: Cereal
Batch Number: 44897	Sample Depth: 0-10
Submission ID: 141702	GPS Start: NA
	GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		23.3						
	MIR - Sand (+20 micron)	% w/w		42.4						
	MIR - Silt (2-20 micron)	% w/w		34.2						
Ratios	Ca:Mg Ratio		2.0-8.0	2.4						
	Ca:Mg ratio		2.0-8.0	2.6						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	70.6						
	Magnesium	%	10.0-20.0	27.1						
	Potassium	%	3.0-8.0	1.4						
	Sodium	%	0.5-6.0	0.3						
	Aluminium	%	0.5-10	0.2						
	Hydrogen	%	0.5-5.0	0.4						

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NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731467
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M3 (30-40)
Crop: Cereal
Sample Depth: 30-40
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Reddish Brown						
	MIR - Aus Soil Texture			Clay						
	ECEC	cmol/kg	5.00-25.0	39.1						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	0.85						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	0.99						
	pH 1:5 water	pH units	6.50-7.50	6.95						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	5.86						
	Dumas Total Nitrogen	% dry wt		0.093						
Other tests	% Air-dry Moisture Content	% of dry wt		5.6						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0560						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	1.9						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	2.2						
	Colwell Phosphorus	mg/kg	38-45	<5.0						
	PBI + Col P		35-70	147						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	5380	26.8					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	5120	25.5					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1690	13.9					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1600	13.2					
	Potassium (K) - AmmAc	mg/kg	120-225	109	0.278					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	90	0.229					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	43.8	0.191					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	43.6	0.190					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.40						
	Iron (Fe)	mg/kg	10-70	27						
	Manganese (Mn)	mg/kg	1.0-10	27						
	Copper (Cu)	mg/kg	0.30-1.0	2.2						
	Zinc (Zn)	mg/kg	0.30-1.0	0.09						
	Calcium Chloride Silicon	mg/kg		110						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.030						
	Ece	dS/m	0.10-6.0	0.17						

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731467
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M3 (30-40)
Crop: Cereal
Sample Depth: 30-40
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		48.7						
	MIR - Sand (+20 micron)	% w/w		25.5						
	MIR - Silt (2-20 micron)	% w/w		25.8						
Ratios	Ca:Mg Ratio		2.0-8.0	1.9						
	Ca:Mg ratio		2.0-8.0	1.9						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	65.3						
	Magnesium	%	10.0-20.0	33.7						
	Potassium	%	3.0-8.0	0.6						
	Sodium	%	0.5-6.0	0.5						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

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NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731468
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M3 (60-70)
Crop: Cereal
Sample Depth: 60-70
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Brown						
	MIR - Aus Soil Texture			Clay						
	ECEC	cmol/kg	5.00-25.0	40.3						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	0.75						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	0.88						
	pH 1:5 water	pH units	6.50-7.50	7.08						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	6.07						
	Dumas Total Nitrogen	% dry wt		0.078						
Other tests	% Air-dry Moisture Content	% of dry wt		5.7						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0572						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	1.9						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	2.7						
	Colwell Phosphorus	mg/kg	38-45	<5.0						
	PBI + Col P		35-70	155						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	5430	27.1					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	5260	26.3					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1760	14.5					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1660	13.6					
	Potassium (K) - AmmAc	mg/kg	120-225	101	0.259					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	82	0.209					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	57.5	0.250					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	56.8	0.247					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.28						
	Iron (Fe)	mg/kg	10-70	21						
	Manganese (Mn)	mg/kg	1.0-10	24						
	Copper (Cu)	mg/kg	0.30-1.0	1.2						
	Zinc (Zn)	mg/kg	0.30-1.0	0.09						
	Calcium Chloride Silicon	mg/kg		110						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.034						
	Ece	dS/m	0.10-6.0	0.20						

Agent:

SLR Consulting

Agent Address:

10 Kings Road,
NEW LAMBTON, NSW, 2305

Client:

Project 620.041615.00022 Phase 0002

Test Set or Quotation:

SBA1

Barcode:

111731468

Batch Number:

44897

Submission ID:

141702

Report Date:

11/08/2025

Sampling Date:

NA

Date Received:

28/07/2025

Sample Name:

M3 (60-70)

Crop:

Cereal

Sample Depth:

60-70

GPS Start:

NA

GPS End:

NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		52.5						
	MIR - Sand (+20 micron)	% w/w		24.2						
	MIR - Silt (2-20 micron)	% w/w		23.3						
Ratios	Ca:Mg Ratio		2.0-8.0	1.9						
	Ca:Mg ratio		2.0-8.0	1.9						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
		Unit	Desired Level	Level Found						
Exch. cation % of ECEC	Calcium	%	60.0-80.0	65.1						
	Magnesium	%	10.0-20.0	33.8						
	Potassium	%	3.0-8.0	0.5						
	Sodium	%	0.5-6.0	0.6						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

NOTE¹:

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NOTE²:

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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731469
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M3 (90-100)
Crop: Cereal
Sample Depth: 90-100
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Brown						
	MIR - Aus Soil Texture			Silty clay						
	ECEC	cmol/kg	5.00-25.0	33.3						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	0.31						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	0.35						
	pH 1:5 water	pH units	6.50-7.50	7.08						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	6.17						
	Dumas Total Nitrogen	% dry wt		<0.030						
Other tests	% Air-dry Moisture Content	% of dry wt		4.3						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0430						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	1.5						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	2.0						
	Colwell Phosphorus	mg/kg	29-36	7.3						
	PBI + Col P		35-70	98						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	4780	23.8					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	4430	22.1					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1410	11.6					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1320	10.8					
	Potassium (K) - AmmAc	mg/kg	120-225	67	0.172					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	41	0.105					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	49.4	0.215					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	48.6	0.211					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.13						
	Iron (Fe)	mg/kg	10-70	21						
	Manganese (Mn)	mg/kg	1.0-10	13						
	Copper (Cu)	mg/kg	0.30-1.0	0.75						
	Zinc (Zn)	mg/kg	0.30-1.0	0.10						
	Calcium Chloride Silicon	mg/kg		110						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.027						
	Ece	dS/m	0.10-6.0	0.20						

SOIL ANALYSIS

Agent: SLR Consulting	Report Date: 11/08/2025
Agent Address: 10 Kings Road, NEW LAMBTON, NSW, 2305	Sampling Date: NA
Client: Project 620.041615.00022 Phase 0002	Date Received: 28/07/2025
Test Set or Quotation: SBA1	Sample Name: M3 (90-100)
Barcode: 111731469	Crop: Cereal
Batch Number: 44897	Sample Depth: 90-100
Submission ID: 141702	GPS Start: NA
	GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			Yes						
	Slaking 1 hour			Yes						
	MIR - Clay	% w/w		47.7						
	MIR - Sand (+20 micron)	% w/w		23.9						
	MIR - Silt (2-20 micron)	% w/w		28.4						
Ratios	Ca:Mg Ratio		2.0-8.0	2.1						
	Ca:Mg ratio		2.0-8.0	2.0						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	66.5						
	Magnesium	%	10.0-20.0	32.5						
	Potassium	%	3.0-8.0	0.3						
	Sodium	%	0.5-6.0	0.6						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

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NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731470
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M4 (0-10)
Crop: Cereal
Sample Depth: 0-10
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Reddish Brown						
	MIR - Aus Soil Texture			Silty clay loam						
	ECEC	cmol/kg	5.00-25.0	23.6						
	Organic Carbon (W&B) ²	% (40°C)	0.90-1.80	2.36						
	Total Carbon (TCod-ff)	% 105°C	0.90-1.80	2.56						
	pH 1:5 water	pH units	6.50-7.50	5.91						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	5.01						
	Dumas Total Nitrogen	% dry wt		0.26						
Other tests	% Air-dry Moisture Content	% of dry wt		3.4						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0338						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	7.0						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	4.3						
	Colwell Phosphorus	mg/kg	29-36	13						
	PBI + Col P		35-70	103						
	KCl Sulfur (S)	mg/kg	4.0-10	2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	600-1500	3000	15.0					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	600-1500	3300	16.5					
	Magnesium (Mg) - AmmAc	mg/kg	60-180	714	5.87					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	60-180	746	6.14					
	Potassium (K) - AmmAc	mg/kg	80-150	369	0.942					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	80-150	342	0.874					
	Sodium (Na) - AmmAc	mg/kg	15.0-120	8.1	0.035					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-120	8.6	0.037					
	Exchangeable aluminium	cmol/kg	0.10-0.35	0.05						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	0.08						
Trace Elements	Boron	mg/kg	0.50-2.0	0.70						
	Iron (Fe)	mg/kg	10-70	67						
	Manganese (Mn)	mg/kg	1.0-10	57						
	Copper (Cu)	mg/kg	0.30-1.0	4.3						
	Zinc (Zn)	mg/kg	0.30-1.0	1.0						
	Calcium Chloride Silicon	mg/kg		82						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.042						
	Ece	dS/m	0.10-6.0	0.36						

SOIL ANALYSIS

Agent:	SLR Consulting	Report Date:	11/08/2025
Agent Address:	10 Kings Road, NEW LAMBTON, NSW, 2305	Sampling Date:	NA
Client:	Project 620.041615.00022 Phase 0002	Date Received:	28/07/2025
Test Set or Quotation:	SBA1	Sample Name:	M4 (0-10)
Barcode:	111731470	Crop:	Cereal
Batch Number:	44897	Sample Depth:	0-10
Submission ID:	141702	GPS Start:	NA
		GPS End:	NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		28.2						
	MIR - Sand (+20 micron)	% w/w		42.3						
	MIR - Silt (2-20 micron)	% w/w		29.5						
Ratios	Ca:Mg Ratio		2.0-8.0	2.5						
	Ca:Mg ratio		2.0-8.0	2.7						
	K:Mg Ratio		0.10-0.50	0.16						
	K:Mg ratio		0.10-0.50	0.14						
	Unit	Desired Level	Level Found							
Exch. cation % of ECEC	Calcium	%	60.0-80.0	69.6						
	Magnesium	%	10.0-20.0	26.0						
	Potassium	%	3.0-8.0	3.7						
	Sodium	%	0.5-6.0	<0.2						
	Aluminium	%	0.5-10	0.2						
	Hydrogen	%	0.5-5.0	0.3						

NOTE¹: 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.

NOTE²: 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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731471
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M4 (20-30)
Crop: Cereal
Sample Depth: 20-30
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Dark Reddish Brown						
	MIR - Aus Soil Texture			Clay						
	ECEC	cmol/kg	5.00-25.0	34.6						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	1.12						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	1.27						
	pH 1:5 water	pH units	6.50-7.50	6.62						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	5.83						
	Dumas Total Nitrogen	% dry wt		0.13						
Other tests	% Air-dry Moisture Content	% of dry wt		4.8						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0482						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	2.3						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	2.7						
	Colwell Phosphorus	mg/kg	38-45	6.0						
	PBI + Col P		35-70	185						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	4710	23.5					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	4510	22.5					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1440	11.8					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1400	11.5					
	Potassium (K) - AmmAc	mg/kg	120-225	235	0.601					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	199	0.509					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	21.1	0.092					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	21.9	0.095					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	1.1						
	Iron (Fe)	mg/kg	10-70	21						
	Manganese (Mn)	mg/kg	1.0-10	37						
	Copper (Cu)	mg/kg	0.30-1.0	2.9						
	Zinc (Zn)	mg/kg	0.30-1.0	0.15						
	Calcium Chloride Silicon	mg/kg		80						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.032						
	Ece	dS/m	0.10-6.0	0.18						

Agent:

SLR Consulting

Agent Address:

10 Kings Road,
NEW LAMBTON, NSW, 2305

Client:

Project 620.041615.00022 Phase 0002

Test Set or Quotation:

SBA1

Barcode:

111731471

Batch Number:

44897

Submission ID:

141702

Report Date:

11/08/2025

Sampling Date:

NA

Date Received:

28/07/2025

Sample Name:

M4 (20-30)

Crop:

Cereal

Sample Depth:

20-30

GPS Start:

NA

GPS End:

NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			No						
	Slaking 1 hour			No						
	MIR - Clay	% w/w		52.5						
	MIR - Sand (+20 micron)	% w/w		30.2						
	MIR - Silt (2-20 micron)	% w/w		17.2						
Ratios	Ca:Mg Ratio		2.0-8.0	2.0						
	Ca:Mg ratio		2.0-8.0	2.0						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
		Unit	Desired Level	Level Found						
Exch. cation % of ECEC	Calcium	%	60.0-80.0	65.0						
	Magnesium	%	10.0-20.0	33.3						
	Potassium	%	3.0-8.0	1.5						
	Sodium	%	0.5-6.0	0.3						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

NOTE¹:

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.

NOTE²:

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.

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731472
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M4 (50-60)
Crop: Cereal
Sample Depth: 50-60
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
	Colour			Reddish Brown						
	MIR - Aus Soil Texture			Clay						
	ECEC	cmol/kg	5.00-25.0	36.2						
	Organic Carbon (W&B) ²	% (40°C)	1.20-2.00	0.78						
	Total Carbon (TCod-ff)	% 105°C	1.20-2.00	0.90						
	pH 1:5 water	pH units	6.50-7.50	7.03						
	pH CaCl2 (following 4A1)	pH units	5.50-6.50	6.06						
	Dumas Total Nitrogen	% dry wt		0.085						
Other tests	% Air-dry Moisture Content	% of dry wt		5.0						
	S7 Gravimetric water content of air dried fine fraction (GWCad-ff)	g/g		0.0497						
Extractable N-P-K-S	Nitrate - N (2M KCl)	mg/kg	10-50	2.7						
	Ammonium - N (2M KCl)	mg/kg	2.0-10	2.2						
	Colwell Phosphorus	mg/kg	38-45	8.3						
	PBI + Col P		35-70	183						
	KCl Sulfur (S)	mg/kg	4.0-10	<2.5						
Exchangeable cations	Calcium (Ca) - AmmAc	mg/kg	850-2500	4890	24.4					
	Calcium (Ca) - NH4Cl/BaCl2	mg/kg	850-2500	4670	23.3					
	Magnesium (Mg) - AmmAc	mg/kg	80-220	1570	12.9					
	Magnesium (Mg) - NH4Cl/BaCl2	mg/kg	80-220	1500	12.4					
	Potassium (K) - AmmAc	mg/kg	120-225	178	0.455					
	Potassium (K) - NH4Cl/BaCl2	mg/kg	120-225	149	0.381					
	Sodium (Na) - AmmAc	mg/kg	15.0-160	25.8	0.112					
	Sodium (NH4Cl/BaCl2)	mg/kg	15.0-160	25.9	0.113					
	Exchangeable aluminium	cmol/kg	0.10-0.35	<0.02						
	Exchangeable hydrogen	cmol/kg	0.10-0.35	<0.02						
Trace Elements	Boron	mg/kg	0.50-2.0	0.94						
	Iron (Fe)	mg/kg	10-70	19						
	Manganese (Mn)	mg/kg	1.0-10	32						
	Copper (Cu)	mg/kg	0.30-1.0	2.1						
	Zinc (Zn)	mg/kg	0.30-1.0	0.14						
	Calcium Chloride Silicon	mg/kg		67						
Salt	Salinity EC 1:5	dS/m	0.025-0.60	0.029						
	Ece	dS/m	0.10-6.0	0.17						

SOIL ANALYSIS

Agent: SLR Consulting
Agent Address: 10 Kings Road,
 NEW LAMBTON, NSW, 2305
Client: Project 620.041615.00022 Phase 0002
Test Set or Quotation: SBA1
Barcode: 111731472
Batch Number: 44897
Submission ID: 141702

Report Date: 11/08/2025
Sampling Date: NA
Date Received: 28/07/2025
Sample Name: M4 (50-60)
Crop: Cereal
Sample Depth: 50-60
GPS Start: NA
GPS End: NA

	Analyte	Unit	Desired Level	Level Found	c.mol/kg	Very Low	Low	Acceptable	High	Excessive
Physical	Dispersion at 1 hour			0						
	Dispersion at 20 hours			0						
	Dispersion after rework			0						
	Slaking 1 minute			Yes						
	Slaking 1 hour			Yes						
	MIR - Clay	% w/w		52.0						
	MIR - Sand (+20 micron)	% w/w		26.7						
	MIR - Silt (2-20 micron)	% w/w		21.4						
Ratios	Ca:Mg Ratio		2.0-8.0	1.9						
	Ca:Mg ratio		2.0-8.0	1.9						
	K:Mg Ratio		0.10-0.50	<0.10						
	K:Mg ratio		0.10-0.50	<0.05						
		Unit	Desired Level	Level Found						
Exch. cation % of ECEC	Calcium	%	60.0-80.0	64.4						
	Magnesium	%	10.0-20.0	34.2						
	Potassium	%	3.0-8.0	1.1						
	Sodium	%	0.5-6.0	0.3						
	Aluminium	%	0.5-10	0.0						
	Hydrogen	%	0.5-5.0	0.0						

NOTE¹: 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.

NOTE²: 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.



Appendix B:

Detail Profiles



Appendix B Detailed Site Descriptions

Table 1: Summary M1

Overview	
Landscape Site	
Overview	Soil Surface
	
Site Description	
ASC Name	Haplic Eutrophic Brown Dermosol [BENO-]
Representative Site	M1
Survey Type	Analysed detailed
Landform Pattern	Hillslope
Landform Element	Upper slope
Surface Condition	Soft
Dominant Land Use	Grazing
Drainage	Moderately well
Permeability	Moderate
Aspect	North
Average Slope (%)	7.7%
Coordinates (GDA2020 Zone 55)	677015, 6336565



Table 2: Profile M1

Profile	Horizon / Depth (m)	Description
	A 0 - 0.15 Clear	Dark reddish brown, silty clay loam, moderately moist, moderate 10-15 mm polyhedral structure with a rough fabric. Nil mottling, 5%, <2 mm coarse fragments, nil segregations. Sampled 0-10 cm
	B 0.15 - 0.50 Gradual	Strong brown, silty clay, moderately moist, moderate 20-50 mm polyhedral structure with a rough fabric. Nil mottling, nil coarse fragments, nil segregations. Sampled 20-30 cm
	BC 0.50+	Dark yellowish brown, silty clay, weak pedality with an earthy fabric. Nil mottling, 10%, <2 mm coarse fragments, nil segregations. Sampled 50-60 cm and 80-90 cm

Table 3: Chemical Parameters M1

Layer	pH (1:5 water)		ESP		ECe		Ca:Mg	
	Unit	Rating	%	Rating	dS/m	Rating	Ratio	Rating
A	5.9	Moderately Acidic	0.30	Non sodic	0.53	Non-saline	2.3	Ca low
B	7.1	Neutral	0.30	Non sodic	0.31	Non-saline	2.0	Ca low
BC	7.3	Mildly Alkaline	0.40	Non sodic	0.26	Non-saline	2.1	Ca low
BC	7.4	Mildly Alkaline	0.40	Non sodic	0.28	Non-saline	1.9	Ca low



Table 4: Summary M2

Overview	
Landscape Site	
Overview	Soil Surface
 	
Site Description	
ASC Name	Haplic Eutrophic Grey Dermosol [BFMO-]
Representative Site	M2
Survey Type	Analysed detailed
Landform Pattern	Hillslope
Landform Element	Mid slope
Surface Condition	Soft
Dominant Land Use	Grazing
Drainage	Moderately well
Permeability	Moderate
Aspect	East
Average Slope (%)	10.9%
Coordinates (GDA2020 Zone 55)	677045, 6336642



Table 5: Profile M2

Profile	Horizon / Depth (m)	Description
	A1 0 - 0.15 gradual	Dark brown, silty clay, moderately moist, moderate 2-10 mm polyhedral structure with a rough fabric. Nil mottling, 5% gravel fragments 2 – 5mm, nil segregations. Sampled 0-10 cm
	B2 0.15 - 0.50 Gradual	Dark reddish grey, silty clay loam, moderately moist, moderate 5-20 mm polyhedral structure with a rough fabric. Nil mottling, 20% gravel fragments 2 – 5mm, nil segregations. Sampled 20-30 cm
	BC 0.50+	Dark reddish grey, silty clay loam, moderately moist, weak structure. Nil mottling, 60% rock fragments 2 – 10mm, nil segregations. Sampled 50-60 cm

Table 6: Chemical Parameters M2

Layer	pH (1:5 water)		ESP		ECe		Ca:Mg	
	Unit	Rating	%	Rating	dS/m	Rating	Ratio	Rating
A1	5.8	Moderately Acidic	0.2	Non sodic	0.86	Non-saline	3.0	Ca low
B2	6.7	Neutral	0.3	Non sodic	0.30	Non-saline	2.8	Ca low
BC	7.1	Neutral	0.5	Non sodic	0.30	Non-saline	2.7	Ca low



Table 7: Summary M3

Overview	
Landscape Site	
Overview	Soil Surface
	
Site Description	
ASC Name	Haplic Eutrophic Brown Chromosol [BFMO]
Representative Site	M3
Survey Type	Analysed detailed
Landform Pattern	Hillslope
Landform Element	Mid slope
Surface Condition	Soft
Dominant Land Use	Grazing
Drainage	Moderately well
Permeability	Moderate
Aspect	East
Average Slope (%)	4.6%
Coordinates (GDA2020 Zone 55)	677174, 6336529



Table 8: Profile M3

Profile	Horizon / Depth (m)	Description
	A1 0 - 0.20 gradual	Dark reddish brown, silty loam, moderately moist, moderate 5-10 mm subangular blocky structure. Nil mottling, 10%, 20-80 mm rock fragments, nil segregations. Sampled 0-10 cm
	B21 0.20 - 0.40 Gradual	Dark greyish brown (10YR 4/2) silty clay, moderately moist, moderate 10-20 mm polyhedral structure. Nil mottling, 10%, 10 – 20mm coarse fragments, nil segregations. Sampled 30-40 cm
	B22 0.40 - 0.70 Gradual	Brown, heavy clay, moderately moist, moderate 10-20 mm polyhedral structure. Nil mottling, 10%, 10 – 20mm coarse fragments, nil segregations. Sampled 60-70 cm
	B23 0.70+ 	Brown, silty clay, moderately moist, apedal. Nil mottling, 10%, 2-5 mm coarse fragments, nil segregations. Sampled 90-100 cm

Table 9: Chemical Parameters M3

Layer	pH (1:5 water)		ESP		ECe		Ca:Mg	
	Unit	Rating	%	Rating	dS/m	Rating	Ratio	Rating
A1	5.9	Moderately Acidic	0.3	Non sodic	0.52	Non-saline	2.4	Ca low
B21	7.0	Neutral	0.5	Non sodic	0.26	Non-saline	1.9	Ca low
B22	7.1	Neutral	0.6	Non sodic	0.20	Non-saline	1.9	Ca low
B23	7.1	Neutral	0.6	Non sodic	0.23	Non-saline	2.1	Ca low



Table 10: Summary M4

Overview	
Landscape Site	
Overview	Soil Surface
	
Site Description	
ASC Name	Haplic Eutrophic Red Chromosol [BFMO]
Representative Site	M4
Survey Type	Analysed detailed
Landform Pattern	Hillslope
Landform Element	Mid slope
Surface Condition	Soft
Dominant Land Use	Grazing
Drainage	Moderately well
Permeability	Moderate
Aspect	South
Average Slope (%)	10.5%
Coordinates (GDA2020 Zone 55)	677258, 6336601
Other	Nearby rock outcropping



Table 11: Profile M4

Profile	Horizon / Depth (m)	Description
	A1 0 - 0.20 Clear	Dark reddish brown, silty clay loam, moderately moist, moderate 10 – 20 mm polyhedral structure. Nil mottling, Nil coarse fragments, nil segregations. Sampled 0-10 cm
	B2 0.20 - 0.70 Clear	Dark reddish brown, heavy clay, moderately moist, moderate 20 – 50 mm polyhedral structure with rough fabric. Nil mottling, nil coarse fragments, nil segregations. Sampled 20-30 cm
	BC 0.70+	Reddish brown, heavy clay, moderately moist, weak structure with rough fabric. Nil mottling, nil coarse fragments, nil segregations. Sampled 50-60 cm

Table 12: Chemical Parameters M4

Layer	pH (1:5 water)		ESP		ECe		Ca:Mg	
	Unit	Rating	%	Rating	dS/m	Rating	Ratio	Rating
A1	5.9	Moderately Acidic	0.2	Non sodic	0.36	Non-saline	2.6	Ca low
B2	6.6	Neutral	0.3	Non sodic	0.19	Non-saline	2.0	Ca low
BC	7.0	Neutral	0.3	Non sodic	0.17	Non-saline	1.9	Ca low





Appendix C:

Slope Analysis

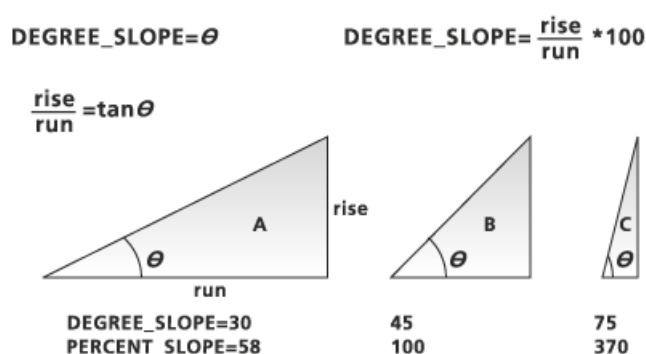


A.1 Methodology

1. Acquire appropriate elevation information.
2. Load Contours into ArcMap 10.3
3. Using 3D Analyst Extension - Create a TIN Surface based on the contours
(http://resources.arcgis.com/en/help/main/10.1/index.html#/Create_TIN/00q90000001v000000/)
4. Using 3D Analyst Extension – Run the Surface Slope Tool
(<http://resources.arcgis.com/en/help/main/10.1/index.html#/00q9000000076000000/>) using a custom Break File (attached).
5. Using a Spatial Join, correlate the Surface Slope at the Soil Survey coordinates.

A.1.1 The Surface Slope Tool

Surface Slope creates an output polygon feature class containing polygons that classify an input TIN or terrain dataset by slope. The slope is the angle of inclination between the surface and a horizontal plane, which may be analysed in degrees or percent. Slope in degrees is given by calculating the arctangent of the ratio of the change in height (dZ) to the change in horizontal distance (dS), or slope = Arctan (dZ/dS). Percent slope is equal to the change in height divided by the change in horizontal distance multiplied by 100, or (dZ/dX) * 100.



The {**slope_field**} is the name of attribute field used to record the polygon aspect codes. Its default value is SlopeCode.

Each triangle is classified into a slope class. Contiguous triangles belonging to the same class are merged during the formation of output polygons. The {units} parameter can be set to use PERCENT or DEGREES. The default is PERCENT. The default percent slope class breaks are 1.00, 2.15, 4.64, 10.00, 21.50, 46.40, 100.00, 1000.00. Optionally, DEGREES may be used to classify slope. The default degree slope class breaks are 0.57, 1.43, 2.66, 5.71, 12.13, 24.89, 45.0, 90.0.

The {class_breaks_table} is used to define custom slope classes. The table can be either a TXT or DBF file for a Windows environment, and a DBF file in a UNIX environment. Each record in the table needs to contain two values that are used to represent the slope range of the class and its corresponding class code.

Table example:

break, code

10.0, 11

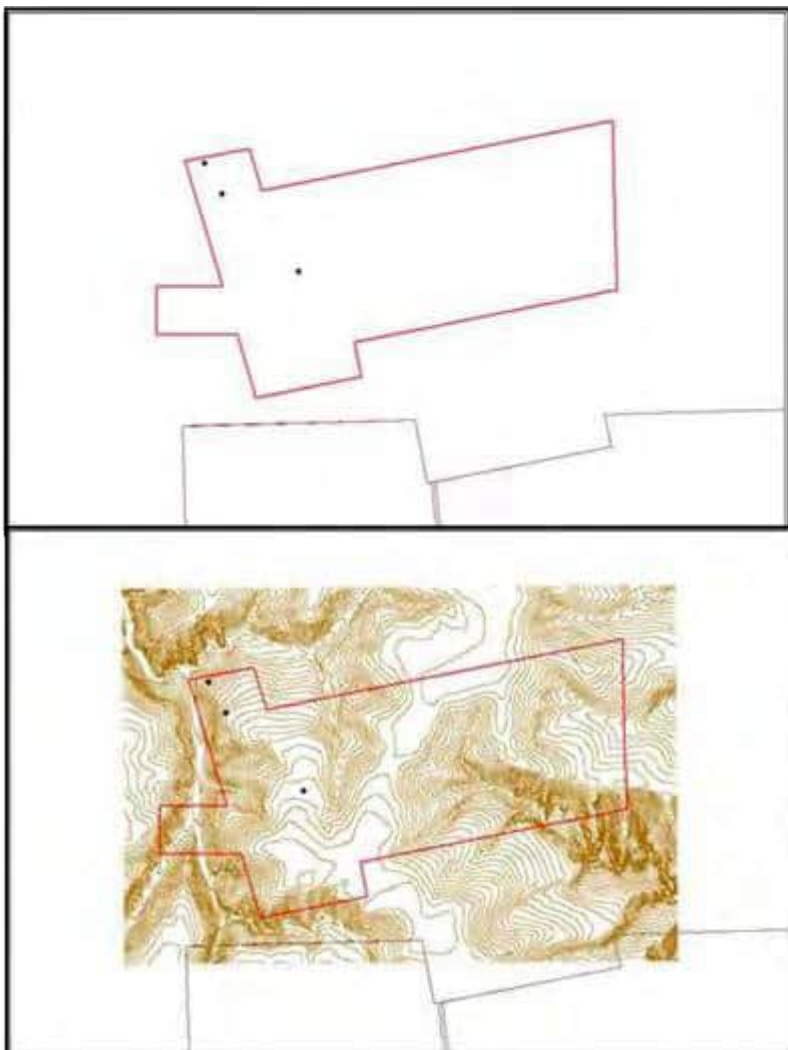
25.0, 22

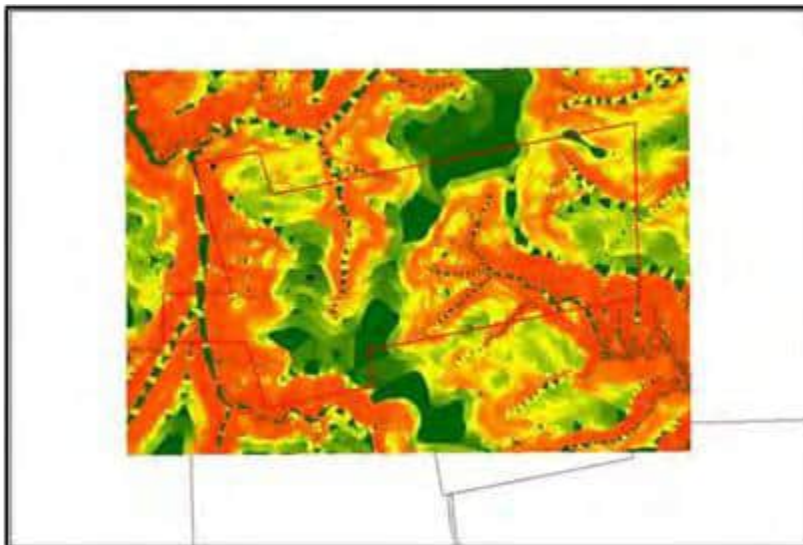
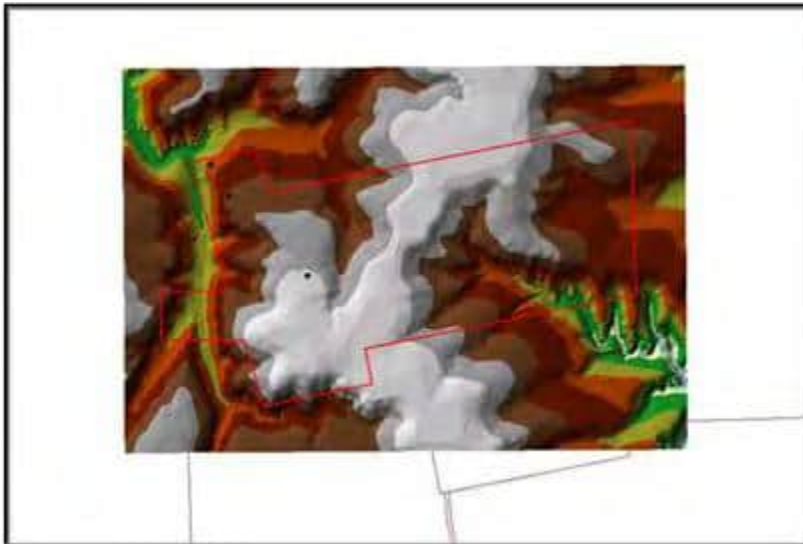
40.0, 33

70.0, 44

Note the comma delineation and use of decimals in the first field. Field names are needed but are ignored. The first field represents the breaks and values need to be decimal, the second field represents codes and values need to be integer. The units of the slope range are defined by the {units}. When this argument is not specified, the default classification is used.

And here is how we do it pictographically (example study shown):







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