

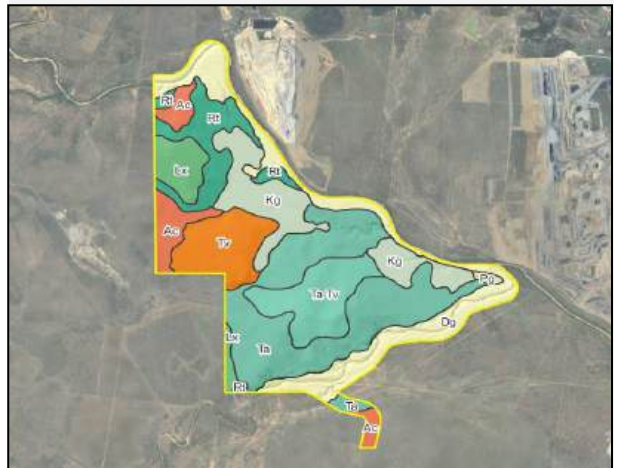


APPENDIX E - SOILS ASSESSMENT



ISAAC DOWNS EXTENSION: BASELINE SOILS ASSESSMENT

Prepared for Stanmore
December 2025



© Landloch Pty Ltd 2025

The information contained in this document produced by Landloch Pty Ltd is solely for the use of the Client identified on the cover sheet for the purpose for which it has been prepared and Landloch Pty Ltd undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

All rights reserved. No section or element of this document may be removed from this document, reproduced, electronically stored or transmitted in any form without the written permission of Landloch Pty Ltd.

Disclaimer: All care and diligence has been exercised in testing, interpreting data and the development of recommendations presented in this report. The monitoring and testing have been undertaken in a skilled, professional manner, according to accepted practices. Specific circumstances and research findings after the date of publication may influence the accuracy of the data and recommendations within this report.

The landscape is not uniform. Because of this non-uniformity, no monitoring, testing or sampling technique can produce completely precise results for any site. Any conclusions based on the monitoring and/or testing presented in this report can therefore only serve as a 'best' indication of the environmental condition of the site at the time of preparing this document. It should be noted that site conditions can change with time.

The information that comprises this report should only be used within the limitations stipulated in this report. Landloch does not accept any risks and responsibilities for losses, damages, costs and other consequences resulting from using any information, material and recommendations in this report.

TOOWOOMBA

PO Box 57
HARLAXTON QLD 4350
Phone (07) 4613 1825

PERTH

PO Box 5175
SOUTH LAKE WA 6164
Phone (08) 9494 2835

NEWCASTLE

PO Box 7017
REDHEAD NSW 2290
Phone (02) 4965 7717

Landloch Pty Ltd
A.C.N. 011 032 803
A.B.N. 29011032803

Web site: www.landloch.com.au
Email: admin@landloch.com.au

Project Number: 1401.24d

Report Title: Isaac Downs Extension: Baseline Soils Assessment

Client: Stanmore Resources Ltd

Review History

Version Number	Prepared by:	Reviewed by:	Date
Rev 0	L. Thompson	M. Crawford	12/03/2025
Rev 1	L. Thompson	M. Crawford	26/03/2025
Rev 2	L. Thompson	M. Crawford	16/10/2025
Rev 3	L. Thompson	M. Crawford	15/12/2025

EXECUTIVE SUMMARY

Landloch was engaged by Stanmore Resources Ltd (Stanmore) to undertake an assessment of soil resources for the Isaac Downs Extension Project, comprising of a study area within and surrounding the mining lease (ML) application areas. This report characterises the soils for use in rehabilitation and provides details on the management and handling of soil materials.

This study describes soils across the 3,863 ha study area and included a program of soil sampling, analysis and soil characterisation. A total of 102 soil profile observations and 177 check sites were made by Landloch during the field survey. An additional 91 existing soil observations across the study area were used to inform the soil types and boundaries. The site density met the requirements of a 1:25,000 scale survey. Observation sites were chosen to target specific soil types and spatial distribution. Due to landscape limitations, some areas were not accessible for sampling during the fieldwork.

The topography of the study area is comprised of two dominant rises overlying residual Tertiary deposits. Quaternary alluvial deposits form a flat plain along the eastern boundary. Minor areas of Tertiary basalt form a rise to the northwest. The Isaac River forms the eastern boundary with Cherwell Creek marking the majority of the southern boundary. South of Cherwell Creek the study area consists of a flat plain and a gentle rise of basalt colluvium.

Nine Soil Mapping Units (SMUs) have been developed for the study area based on similarities with geomorphological and chemical properties. The SMUs developed in this study are:

- Taurus: sodic texture contrast soils with moderately thick sandy surfaces. Neutral to alkaline trend with sodic and saline subsoil. Occurs on gently undulating rises within the southern half of the study area.
- Davey: deep alluvial sands occurring on the levees along the Isaac River and Cherwell creek. Neutral to acidic trend, non-sodic and non-saline.
- Krongie: cracking clay soils with normal gilgai microrelief. Alkaline trend with sodic and saline subsoil. Occurs on alluvial floodplains along the Isaac River.
- Taurus-Teviot Complex: complex soil unit consisting of sodic texture contrast soils with cracking clay soils sporadically occurring in gilgai depressions. Occurs on a gently undulating rise within the southern half of the study area.
- Retro: sodic texture contrast soils with moderately thick loamy surfaces. Neutral to strong alkalinity with sodic and saline subsoil. Occurs on gently undulating rises on the northern half of the study area.
- Teviot: cracking clay soils with normal gilgai microrelief. Alkaline trend with sodic and saline subsoils. Occurs on gently undulating rises, within the central study area.
- Arcturus: cracking clay soils derived from basalt with crabhole gilgai microrelief. Alkaline with sodic and slightly saline subsoil. Occurs on gently undulating rises and colluvial depositions on the western and southern most boundary.
- Luxor: texture contrast soils with thick sandy surfaces and clay subsoils. Neutral to alkaline trend and sodic subsoil. Occurs on a prominent rise on the northern half of the study area.

- Pegunny: cracking clay soils in low lying flood plains, subject to prolonged waterlogging. Acidic trend with sodic subsoils. Minor occurrence on the southeastern tip of the study area.

A Land Suitability Assessment was undertaken on four cropping systems and grazing for the pre-mining land use. The cropping system assessed were irrigated cotton, dryland safflower, dryland sorghum, and dryland wheat. From the assessment, approximately 94% of the land is considered unsuitable, with a Land Suitability Class of 4 or 5. Approximately 94% of the land is considered unsuitable for grazing improved pastures, with a Land Suitability Class of 4 and 5. The study area is therefore, more suitable for low intensity grazing on a mix of native and improved pastures.

Using the data generated in the Land Suitability Assessment, Agricultural Land Classification for each SMU was determined. The study area is predominantly classed as Class C2 Agricultural Land (~72% of the total land area). This is considered suitable for grazing on native pastures or mixed pastures. Class C1 agricultural land accounts for ~22% of the area. The intensity of land use for Class C1 areas is restricted by gilgia micro-relief making it unsuitable for machinery access to sow pastures. The agricultural land classification of Class C1 is designated on account of the higher fertility than the Class C2 soils. Class B agricultural land accounts for approximately ~6% of the area and is associated with the soils of the Arcturus SMU. This is the only SMU considered suitable for cropping land uses within the study area. The remaining 1% of the study area is assessed as Class C3 agricultural land and is suitable for light grazing on native pastures only.

Recommendations for stripping of soil for the use as growth media in rehabilitation have been calculated for the entire study area. *Good quality topsoil* is estimated at 18,779,500 m³ (+/- 20%), 9,379,500 m³ (+/- 20%) of *marginal topsoil*, and 7,812,000 m³ (+/- 20%) of *subsoil*. Amelioration rates are calculated for each layer of stripped soil to improve their quality for rehabilitation. The recommendations include additions of lime and/ or gypsum at rates between 1 and 10 t/ha per 0.10 m of soil.

Key management recommendations for topsoil stripping and management include:

- Stockpiling should aim for a short as possible timeframe to reduce decline in topsoil quality,
- Stockpiles should not exceed the height of 2 m,
- Revegetation of stockpiles should be high priority to protect from erosion, discourage weeds, and maintain soil microbes,
- Stockpiles should be located where they will not be disturbed by future mining, or in areas that may be subject to overland flow or ponding of water,
- Topsoil and subsoil material should be stockpiled separately, and topsoil should not be placed on the top of subsoil.
- Soil material should not be stripped when saturated to avoid structural decline,
- Geographical Information Systems should be used to record stockpile locations and volumes, as well as origin of source material (soil type),
- Amelioration should be incorporated into the soil prior to stripping and stockpiling. This allows mixing of ameliorants into soil material, and importantly, maximises the time available for ameliorants to adjust soil chemistry.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	II
1 INTRODUCTION	1
1.1 Project Description	1
1.2 Scope of Works	1
2 METHODOLOGY	3
2.1 References and guidelines	3
2.2 Desktop assessment	3
2.2.1 Information sources	3
2.2.2 Preliminary mapping	4
2.3 Field work	4
2.3.1 Ground observation sites	4
2.3.2 Ground observation types and proportions	5
2.3.3 Surface descriptions	5
2.3.4 Full morphological descriptions	5
2.3.5 Sampling protocol	6
2.4 Laboratory analysis	6
2.5 Land evaluation	7
2.5.1 Land suitability for cropping	7
2.5.2 Land suitability for grazing	8
2.5.3 Agricultural land classification	9
2.5.4 Good-quality agricultural land	9
2.5.5 Versatile cropping land	9
3 DESCRIPTION OF STUDY AREA	10
3.1 Climate	10
3.2 Topography	10
3.3 Vegetation	11
3.4 Surface geology	11
3.5 Radiometrics	11
3.6 Existing land resource information	12
3.6.1 Soil profile classes	12
3.6.2 Existing soils data	13

3.7	Acid Sulfate Soils	13
3.8	Existing land use	14
3.9	Areas of regional interest	14
3.9.1	Soil conservation plans	15
4	SOIL MAPPING UNITS	15
4.1	Taurus	19
4.1.1	Taurus SPC	19
4.2	Davey	22
4.2.1	Davey SPC	22
4.3	Krongie	25
4.3.1	Krongie SPC	25
4.4	Taurus-Teviot Complex	30
4.5	Retro	32
4.5.1	Retro SPC	32
4.6	Teviot	35
4.6.1	Teviot SPC	35
4.7	Arcturus	38
4.7.1	Arcturus SPC	38
4.8	Luxor	41
4.8.1	Luxor SPC	41
4.9	Pegunny	44
4.9.1	Pegunny SPC	44
5	DISCUSSION OF SOIL CHEMICAL AND PHYSICAL LIMITATIONS	48
5.1	Soil pH	48
5.1.1	Acidic soils	48
5.1.2	Alkaline soils	49
5.2	Salinity	49
5.3	ESP and dispersivity	50
5.4	Cation exchange capacity	50
5.5	Calcium magnesium ratio	51
6	LAND EVALUATION RESULTS	51
6.1	Land suitability for cropping	51
6.2	Land suitability for grazing	52
6.3	Agricultural land classification	53

7	SOIL RESOURCES	53
7.1	Recoverable growth media	53
7.1.1	Good quality topsoil	54
7.1.2	Marginal topsoil	54
7.1.3	Subsoil	55
7.2	Recovery of growth media	58
7.3	Amelioration of growth media	58
7.4	Management of growth media	60
7.5	Monitoring of rehabilitation	61
8	CONCLUDING REMARKS	62
	REFERENCES	63
	GLOSSARY	66
	APPENDIX A: MAPS AND FIGURES	70
	APPENDIX B: TABLES	78
	APPENDIX C: LAND SUITABILITY ASSESSMENT	85
	APPENDIX D: SOIL PROFILE DESCRIPTIONS	99
	APPENDIX E: LABORATORY DATA	209

1 INTRODUCTION

Stanmore Resources Ltd (Stanmore) has engaged Landloch Pty Ltd (Landloch) to provide a baseline soil characterisation for the Isaac Downs Extension (IDE) Project (ID Extension or the Project). The soils information collected in this study will be used to inform environmental assessments for the Project, including an environmental impact statement (EIS) and Progressive Rehabilitation and Closure (PRC) Plan. The report has been prepared to address the criteria set out in the *Terms of Reference* document prepared by DETSI for the Project. The assessment of the materials for use in rehabilitation is detailed in Landloch (2025) – *Assessment of long-term erosion potential for rehabilitated landform batters at Isaac Downs Extension*.

1.1 Project Description

The ID Extension Project is a proposed open cut coal mine and is situated approximately 12 km from the township of Moranbah, QLD. The ID Extension Project includes proposed disturbance areas (open cut pit and associated infrastructure) and areas of non-disturbance. The total study area is ~3,863 ha and includes the mining lease (ML) application areas and the proposed disturbance areas. The soil survey was conducted by Landloch staff in two field programs at scale of 1:25,000 across ~3,863 ha. The general layout of the study area is presented in Figure 1.

1.2 Scope of Works

The scope of works for this study included the following:

- i. Desktop assessment: gathering existing soils information to inform field sampling.
- ii. Fieldwork: soil survey and sampling at a scale of 1:25,000.
- iii. Laboratory analysis of 46 soil profiles.
- iv. Assessment and reporting: characterising and mapping soils, land suitability assessment, and developing recommendations for soil use and management for rehabilitation.

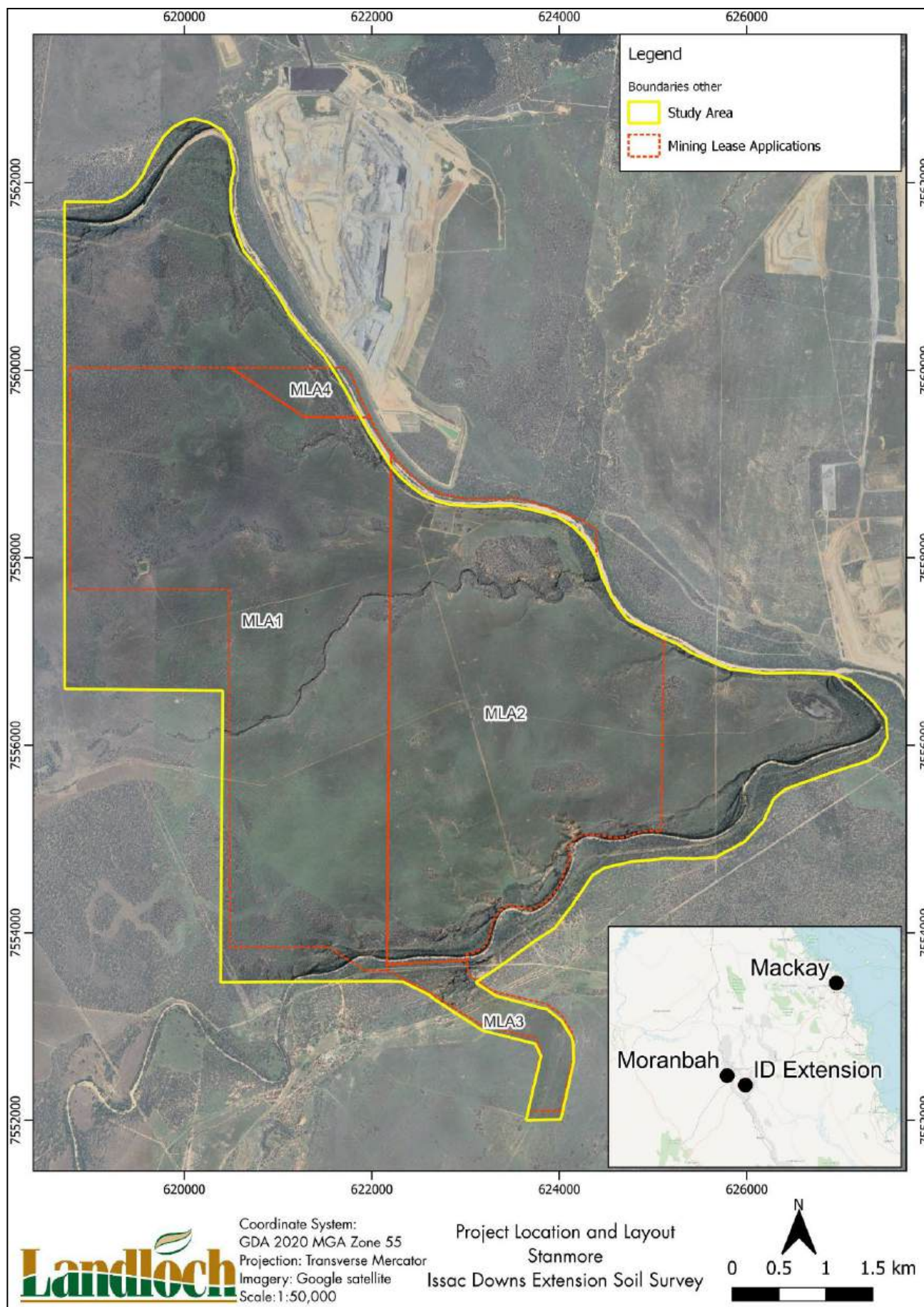


Figure 1. Study area boundary.

2 METHODOLOGY

The study methodology adopted is detailed in this section.

2.1 References and guidelines

The soil assessment was undertaken in reference to the guidelines and references below:

- Australian Soil and Land Survey: Guidelines for Surveying Soil and Land Resources (McKenzie et al., 2008),
- Australian Soil Survey and Land Survey Field Handbook (The National Committee on Soil and Terrain [NCST], 2024),
- Australian Soil Classification (Isbell & NCST, 2021),
- Land – EIS information guideline (ESR/2020/5303), (Department of Environment, Science and Information [DESI] 2024, Queensland Government),
- Application for activities with impacts to land (ESR/2015/1839), (Department of Environment, Science and Information [DESI] 2024, Queensland Government),
- Regional Planning Interest Act, Statutory Guideline (RPI Act 2014), and
- Environmental Impact Assessment Companion Guideline (Department of Agriculture and Fisheries, 2024).
- Soil Conservation Act 1986.
- Terms of reference for an environmental impact statement for the Isaac Downs Extension Project (DETSI, 2025).

2.2 Desktop assessment

A desktop assessment was undertaken prior to commencing field work to construct a baseline conceptual model of the soil and landscape characteristics of the study area. The desktop assessment identified preliminary mapping units that would be assessed through ground observations during the field work. This assessment included:

- Reviewing the available topographic, geological, vegetation, and radiometric data, soil mapping and associated reports for the study area and surrounding region,
- Reviewing aerial imagery of the study area, and
- Drafting preliminary mapping units for validation during the fieldwork.

2.2.1 Information sources

The information sources below are referred to in the desktop component of this study:

- Project boundaries supplied by the client
- Aerial imagery from Google Earth (2024)
- Digital elevation model (DEM) supplied by the client
- Radiometric data from Geoscience Australia (Geoscience Australia, 2019)
- Vegetation mapping from the State of Queensland (Neldner et al., 2023)
- Surficial geology from Geoscience Australia (Geoscience Australia, 2015)
- Land Suitability Assessment of the Collinsville–Nebo–Moranbah region (Story et al., 1967)

- Climate data from the Bureau of Meteorology (Bureau of Meteorology [BoM], 2024)

2.2.2 Preliminary mapping

Analysis of existing soil, geology, and topographical data using existing geographical information systems software assisted the development of Preliminary Mapping Units (PMUs) within the study area. The review of existing data identified tracts of land that were expected to share similar 'soil landscape' features (e.g., soil type, geology, vegetation, and landform) that can be separated from neighbouring tracts of land with a different pattern of similar attribute values. These areas were used to guide sampling locations during the field program.

2.3 Field work

The required scale of mapping and the size of the proposed study area dictated the number of soil inspection sites required.

The inspection site density is defined in the Guidelines for Surveying Soil and Land Resources (McKenzie et al., 2008). The objective of the survey was to:

- Map the soils of the study area,
- Conduct a Land Suitability Assessment, and
- Determine the Agricultural Land Classification.

To meet these objectives, the study area was assessed at a moderately high intensity, sufficient to determine strategic planning for intensive land uses. The intensity of the survey required an inspection site every 5 – 25 ha, with a scale of mapping that delineates areas of approximately 2.5 ha.

2.3.1 Ground observation sites

The entire study area (3,863 ha) was assessed at a density of 1 site per 14 ha (279 sites). Details of the ground observations for this study are provided in Table 1.

Table 1. Survey scale and requisite number of inspection sites.

Intensity/Area	Size (ha)	Inspection density	Landloch Sites	Existing Sites	Publication scale	Map unit type	Objective
Moderately high intensity Disturbance areas	~3,863	~1 site per 14 ha	279	91	1:25,000 (1 site per 5-25ha)	Mainly simple, some compound, moderately detailed	Moderately intensive uses at 'field' level, detailed project planning

2.3.2 Ground observation types and proportions

Details of the recommended proportions of ground observation types (McKenzie et al., 2008) are shown in Table 2.

Table 2. Ground observation types and proportions.

Site Types	Details	Recommended Proportions	Adopted proportions
Representative profiles	Detailed morphological and site descriptions to characterise the main soils and landscapes in a survey area. Full laboratory analysis to a depth of 1.5 m.	5–10%	5%
Detailed profiles	Detailed morphological and site descriptions to characterise the main soils and landscapes in a survey area. Select laboratory analysis (diagnosis) to classify soils.	25–50%	19%
Semi-detailed profiles and check sites	Brief mapping observations to confirm mapping boundaries, soil type distributions or other characteristics being mapping in the survey. These are brief with only the minimal amount of information recorded to correlate the site with a soil where a 'detailed' ground observation has occurred.	40–70%	76%

2.3.3 Surface descriptions

Data was collected from all ground observation sites in reference to the *Australian Soil and Land Survey Field Handbook* (NCST, 2024). Surface descriptions were recorded from all sites described in Table 2, sites with only surface descriptions relate to check sites. At all sites, these data included, but are not limited to:

- Geospatial location,
- Soil surface condition,
- Land use management, and
- Landscape attributes (landform, vegetation, erosion, micro-relief, rock outcrops).

2.3.4 Full morphological descriptions

Full morphological descriptions (detailed and representative profiles) included the collection and recording of the following details:

- Field texture,
- Pedality and structure,

- Colour (Munsell chart) and mottles,
- Coarse fragments and segregations,
- Horizon depths and designations, and
- Horizon boundary type and distinctness.

Soil profile descriptions were made from undisturbed push-tube cores. Where available, existing exposures such as road cuttings, or gullies were observed. Detailed soil profile descriptions were made to depths of up to 1.5 m or until refusal of equipment, whichever is shallower. All soil inspection sites were located by in-field GPS.

2.3.5 Sampling protocol

Soil samples were collected in accordance with national and state protocols: DESI, (2024), Department of Department of Resources (DoR) (2021), and Department of Science, Information Technology and Innovation (DSITI) and the Department of Natural Resources and Mines (DNRM) (2015). Generalised sampling depths are 0–0.1 m, 0.2–0.3 m, 0.4–0.6 m, 0.7–0.9 m, 1.0–1.2 m, and 1.4–1.5 m with no sample interval exceeding 0.3 m in thickness. Allowances were made for horizon boundaries, with samples collected from within major soil horizons (i.e., sampling will not cross A and B horizons).

Surface soil samples were bulked by combining at least 10 sub-samples collected randomly within a 10 m radius of the soil profile and on the same landform element. All samples were identified using the project name, unique profile number and depth range from where the sample was taken. Samples for chemical analysis were placed into bags, with a sample weight of approximately 250 to 500 g, as required to adequately analyse the soils.

2.4 Laboratory analysis

Laboratory analysis was undertaken by a laboratory with National Association of Testing Authorities (NATA) and Australian Soil and Plant Analysis Council (ASPAC) accreditation. Different analytical suites will be adopted, based on the site description. The typical analytical suite for reference soils is itemised below. Sites that have partial analysis have one or more of these analytes measured, mainly for classification purposes.

The suite of laboratory analyses was split into a topsoil characterisation suite and subsoil characterisation suite (Table 3) in line with DESI (2024).

Table 3. Detailed soil laboratory analysis (~20 % of all samples).

Laboratory Suite	Target samples	Analysis
Topsoil Suite	A horizon (topsoil fertility) generally between 0 – 100 mm depth. Analyses include soil fertility as this is the 'growth media' depth	• pH_{1:5} (water) • EC_{1:5} • Total Cl • Exchangeable cations (K⁺, Ca²⁺, Mg²⁺, Na⁺ & Al³⁺)

Laboratory Suite	Target samples	Analysis
	of the soil profile and is a major factor in determining a soil's nutrient status. This will also include one sample from the subsoil for baseline comparison.	• Effective cation exchange capacity (ECEC) • Exchangeable sodium percentage (ESP) • Water repellence • Particle size distribution of the fine fraction (coarse sand, fine sand, silt, clay) • Organic C • Total N & Total P • Available P and K (Colwell) • PBI • Available S (KCl) • Trace elements (Cu, Zn, Mn & Fe)
Subsoil Suite	All other horizons below the topsoil (>100mm). Analyses focus on chemical and physical properties of the soil.	• pH_{1:5} (water) • EC_{1:5} • Total Cl • Exchangeable cations (K⁺, Ca²⁺, Mg²⁺, Na⁺ & Al³⁺) • Effective cation exchange capacity (ECEC) • Exchangeable sodium percentage (ESP) • Particle size distribution of the fine fraction (coarse sand, fine sand, silt, clay)

2.5 Land evaluation

Land evaluation involves determining the potential of land for alternative (and possibly competing) land uses and identifying management requirements for sustainable use. Modern land evaluation techniques generally refer to either or both land capability and land suitability.

Land capability classification evaluates the potential of land for broadly defined land uses (e.g. cropping, pastoral, non-agricultural) whereas land suitability classification assesses the potential of land for a specific land use (e.g. furrow irrigated cotton).

The EIS guidelines dictate the types of classification systems that are to be adopted when preparing the land section of an EIS. These systems are as follows:

- Land suitability;
- Agricultural land classification;
- Good-quality agricultural land; and
- Versatile cropping land.

Assessment of these classification systems are outlined in the sections below.

2.5.1 Land suitability for cropping

Land suitability classification assesses the potential of land for a specific land use. The study area is assessed here on the potential for cropping as a pre-mining land use.

The assessment of land suitability has been carried out in accordance with the methodologies described in:

- Department of Science, Information Technology and Innovation (DSITI) & Department of Natural Resources and Mines (DNRM) (2015). *Guidelines for Agricultural land evaluation in Queensland* (2nd edition). Queensland Government, Brisbane Queensland; and
- DSITI & DNRM (2013). Regional Land Suitability Frameworks for Queensland, Chapter 10 – Suitability Framework for the Inland Isaac and Southern Burdekin area. Queensland Government Brisbane, Queensland.

There are 5 Land Suitability Classes for cropping land uses. They are described as:

- Class 1 (suitable): Highly productive land requiring only simple management practices to maintain economic production.
- Class 2 (suitable): Land with limitations that either constrain production or require more than the simple management practices of class 1 land to maintain economic production.
- Class 3 (suitable): Land with limitations that either further constrain production, or require more than those management practices of class 2 land to maintain economic production.
- Class 4 (unsuitable): Currently unsuitable land. The limitations are so severe that the sustainable use of the land in the proposed manner is precluded. In some circumstances, the limitations may be surmountable with changes to knowledge, economics or technology.
- Class 5: Land with extreme limitations that preclude any possibility of successful sustained use of the land in the proposed manner.

Each Unique Mapping Area (UMA) within an SMU is assessed on the hazard criteria defined for the particular land use. The land suitability class reflects the score of the most limiting attribute for a given UMA.

2.5.2 Land suitability for grazing

The pre-mining land suitability is assessed here in terms of the potential to establish and graze improved pastures. The land suitability uses hazard assessment criteria referenced in Department of Minerals and Energy (DME) (1995) and Short and Highlands Environmental (2023).

Land Suitability Class 1–3 is considered suitable for grazing sown pastures and can attain maximal production levels. The grazing potential (productivity) decreases from Class 1 to Class 5:

- Class 1 (Highly Suitable) can support a wide range of pasture types and livestock production,
- Class 2 (Suitable) can support a range of pasture types and livestock production with some management inputs.
- Class 3 (Marginally Suitable) requires intensive management to support grazing and may be suitable for certain pasture types only.

- Class 4 is considered to have limitations so severe that the establishment and grazing of improved pastures is not currently viable but may be possible with significant inputs and management.
- Class 5 can support low intensity grazing on established mixed native and introduced pasture species. However, long-term productivity is reliant on climate and grazing management.

2.5.3 Agricultural land classification

Agriculture land classification in Queensland follows a simple hierarchical scheme that is applicable across the state. It allows the presentation of interpreted land evaluation data to indicate the location and extent of agricultural land that can be used sustainably for a wide range of land uses with minimal land degradation. Provision is also made to highlight areas that may be suitable for one specific crop considered important in a particular area. Three broad classes of agricultural land and one non-agricultural land class are identified:

- Class A – Crop land:
 - A1 – suitable for a wide range of broadacre and horticultural crops; and
 - A2 – suitable for a wide range of horticultural crops only.
- Class B – Limited crop land.
- Class C – Pasture land:
 - C1 – suitable for sown pastures on high fertility soils;
 - C2 – suitable for native pastures on lower fertility soils;
 - C3 – suitable for light grazing of native pastures in accessible area; more suitable for forestry or catchment protection.
- Class D – Non-agricultural land.

The method for assessment of Agricultural Land Class (ALC) is to use suitability data generated from the land suitability assessment (as outlined in Section 2.5.1). This data is assessed against a range of criteria to determine the land class, and thereby provide an assessment of the type of agriculture that the land is currently suitable for.

2.5.4 Good-quality agricultural land

The good-quality agricultural land was used in the planning framework with the now repealed State Planning Policy 1/92: Development and the Conservation of Agricultural Land. This was replaced by the agricultural land classification system, and as such is no longer required for an EIS and is not included in this report.

2.5.5 Versatile cropping land

Versatile cropping land is a 2-class system in which land is considered either versatile cropping land or not. It is an assessment based on the combination of crop requirements and the physical limitations of the soil. Where the soil properties meet a crop requirement, the crop is deemed suitable. The greater the number of suitable crops, the more versatile the land. If the land is suitable for four or more crops, it is considered to

be versatile cropping land (similar to an Agricultural Land Classification of Class A). As such, any Class A land present within the proposed disturbance area is also considered to be versatile cropping land.

3 DESCRIPTION OF STUDY AREA

The desktop review is used to construct a baseline conceptual model of the soils and landscape characteristics of the study area. Sampling locations were chosen to capture the variety of landscapes and soil characteristics derived from the information collected in the desktop review. The following section details the findings of the desktop review.

3.1 Climate

The study area is situated in Queensland's subtropical climatic zone, and is characterised by high summer temperatures, warm dry winters, and distinct wet and dry seasons.

Moranbah water treatment plant (site number 034038, now decommissioned) is approximately 12 km northwest of the study area (Bureau of Meteorology 2024). It provides historic climate statistics with temperature records of 25 years (1986 – 2012) and rainfall records 40 years (1972 – 2012).

The mean recorded temperature range throughout the year for Moranbah area is ~10 – 34 °C, with December and January being the hottest months, and July being the coldest (Appendix B Table 1).

The mean rainfall for Moranbah has a recorded range of ~9 – 104 mm per month, and a mean total of 613 mm annually. The rainfall is strongly summer dominant with approximately 50% of the annual rainfall received between November and February (Appendix B Table 2).

3.2 Topography

The study area is located within the northeastern part of the Bowen-basin, Queensland and is within the upper catchment of the Isaac basin. The topography of the study area is characterised by a maximum elevation difference of 40 m and slopes up to 2% gradient. Two gently undulating rises exist in the north-western and southern section of the study area and are separated by Conrock gully which drains into the Isaac River along the eastern boundary. A third gentle rise exists on the southernmost point beyond Cherwell Creek. An alluvial plain wraps along the eastern and southern boundary, incorporating the Isaac River and Cherwell Creek junction.

The topography of the study area (elevation, slope, and waterways) is presented in Appendix A Figures 1 – 3.

3.3 Vegetation

The preclearance broad vegetation groups (BVGs) are mapped across the study area at a scale of 1:1 million (Neldner et al., 2023).

The study area is dominated by two vegetation groups consisting of woodlands of *Eucalyptus populnea* (popular box) (BVG code 17a) covering approximately 52% of the study area, and woodlands of *Acacia harpophylla* (brigalow) (BVG code 25a) extending across approximately 29% of the study area.

The remaining vegetation groups consists of *Eucalyptus camaldulensis* (river red gums) (BVG code 16a) and *Eucalyptus coolabah* (coolabah) (BVG code 16c) along flood plains and drainage lines. Minor occurrences of grasslands and palustrine swamps occur sporadically throughout the study area.

The preclearance BVGs of the study are presented in Appendix A Figure 4 and described in Appendix B Table 3.

3.4 Surface geology

Surface geology (1:100,000 scale) from Geoscience Australia (2015) was used to classify the geology immediately underlying the study area.

The majority of the study area is underlain by Tertiary and Quaternary alluvial deposits (TQa) consisting of poorly consolidated sand, silt, and clay with minor gravels. It extends northeast from the southern boundary and makes up approximately 43% of the study area.

Quaternary alluvial (Qa) deposits consisting of clay, sand, and silt extend along the eastern boundary and makes up approximately 32% of the study area.

Quaternary colluvium deposits (Qr and Qr/b) exist within in the northwest and make up approximately 24% of the study area. This geological unit is made up of colluvial and residual deposits of silt and mud derived from basalt.

Minor occurrences of volcanic (Tb) and metamorphic (Rr) geological unit underlies approximately 2% of the study area along Isaac River and Cherwell Creek respectively.

A gentle rise towards the southernmost boundary consists of Tertiary and Quaternary residual colluvium (TQr) of basalt origin, accounting for <1% of the study area.

The underlying surface geology is presented in Appendix A Figure 5 and detailed in Appendix B Table 4.

3.5 Radiometrics

The radiometric, or gamma-ray spectrometric method, measures the natural variations in the gamma-rays detected near Earth's surfaces as a result of the natural radioactive decay of potassium (K), uranium (U), and Thorium (Th). This can be useful in revealing where changes occur in surface geology, soil weathering, and surface soil texture.

Data were sourced from Radiometric Map of Australia Grids (cell size of 100 m) (Geoscience Australia, 2019). The total gamma count was used to assist with defining

soil sampling locations and preliminary mapping units. Sampling locations were targeted for a range of gamma count values.

The radiometric mapping displays a green and blue 'mottling' suggesting a mix of weathered material such alluvial deposits. A small area of a dark purple patch exists on the northwestern boundary and suggests highly weather material likely rich in quartz. Minor incursion of red occurs along the western boundary suggesting igneous parent material or clayey soils are present.

The radiometric mapping is presented in Appendix A Figure 6.

3.6 Existing land resource information

The study area is situated within Blackwater, Monteagle, Conners, Oxford, and Girrah land systems described in the Lands of the Isaac-Comet Area, Queensland (Story et al., 1967). A general description and proportion of each land system within the study area is shown in Table 4 and presented in Appendix A Figure 7.

Table 4. Land System units relevant to the Project area.

Land System	Description	Area (ha)	Proportion (%)
Blackwater (Bl)	Lowlands with box and texture-contrast soils on undissected Tertiary land surface.	1,749	45
Monteagle (Mo)	Brigalow plains and cracking clay soils on weathered Tertiary clay and older rocks.	1,290	34
Conners (Co)	Alluvial plains with box on texture-contrast soils throughout the area.	648	17
Oxford (O)	Downs with cracking clay soils on slightly weathered or unweathered basalt.	128	3
Girrah (Gi)	Lowlands with brigalow and cracking clay soils on unweathered Permian shale and lithic sandstone.	48	1

3.6.1 Soil profile classes

A Soil Profile Class (SPC) is a group of similar soil profiles with a defined central concept and range of values (Powell, 2008). General principles as per McDonald (1983) that should be adhered to when developing or assigning SPCs are:

- Profiles should have relatively similar profile attributes, though the range of variation will be governed by the particular soil landscape,
- Profiles should have the:
 - a) same sequence of major horizons,
 - b) same or similar soil genesis, and
 - c) same or similar land use responses.
- Should not include profiles from notably different orders of the Australian Soil Classification (ASC) where soil properties are likely to affect the land use.

The use of broad scale mapping and information sources provided guidance for the derivation of the study area SMUs and soil types. The soil maps produced in this report have been integrated with the national level classification scheme (ASC) and state based SPCs (QLD).

Linkages between the Land Systems and SPCs are detailed in Appendix B Tables 5 – 8.

3.6.2 Existing soils data

A soil and land suitability study was previously conducted for a discontinued mining project in a similar location to the ID Extension Project (the discontinued Integrated Isaac Plains project) by Tuck and Baker (2007). The soil survey was conducted at a scale of 1:25,000, with a total of 91 soils observation within the proposed ID Extension study area. The soil types derived by Tuck and Baker (2007) are described in Appendix B Table 9 and presented in Appendix A Figure 8. This was relied upon to target soil sample locations, inform the general soil types and landscape patterns, and confirm mapping boundaries.

Isaac Downs Mine (northeast of the study area) was soil surveyed in 2020 by SGM Environmental at a scale of 1:25,000. SGM Environmental made 40 soil observations, from which, 5 soil units were summarised. They include:

- Chromosols – texture contrast soils that are not highly acidic and are not sodic in the upper B horizon.
- Tenosols – weak pedological arrangement, low clay content.
- Dermosols – gradational textured clay soils.
- Vertosols – clay soils with cracking surface and often gilgai microrelief.
- Kandosols – weakly structured gradational loams and clay soils.
- Sodosols – texture contrast soils with a sodic upper B horizon.

Where possible, the SGM Environmental soil units are correlated with Landloch SMUs for continuity of information between Isaac Downs Mine and ID Extension.

3.7 Acid Sulfate Soils

Acid sulfate soils (ASS) occur naturally over extensive areas of low-lying coastal land, predominantly below 5 m Australian Height Datum (AHD). These soils may be found close to the natural ground surface but may also be buried at depth in the soil profile. ASS can also be found in non-coastal areas or at elevations above 5 m AHD where soils are exposed to prolonged or periodic waterlogging. Such waterlogging may occur naturally, or occur from human disturbance or intervention (Dear et al., 2024).

The likelihood of acid sulphate soils occurring within the study area is low. No acid sulfate soils were identified in the desktop assessment.

3.8 Existing land use

Catchment scale land use mapping, sourced through the Australian Collaborative Land Use Management Program (ACLUMP) (ABARES, 2023) provides land use mapping for Australia at 1:250,000 scale with a cell grid size of ~6 ha. This mapping was utilised to assess current land use within the study area. The study area lies within the Great Barrier Reef Catchment area and within two sub-catchment areas; sc00113 and sc012, totalling an approximate area of 855,000 ha combined.

The current land uses, according to ABARES mapping, within the study area includes grazing on native pastures, grazing on modified pastures and other minimal use (Environmental). Grazing on native pastures accounts for ~44% and grazing on modified pastures accounts for ~50% of the mapped land use within the study area. Other minimal land use accounts for ~5% of the study area and the remaining 1% is mapped as water bodies such as rivers, dams and creeks.

Current land uses immediately surrounding the study area includes primarily grazing on native or modified pastures and mining/extractive resources. Surrounding mining activities include Stanmore's Isaac Downs, Eagle Downs, and Poitrel coal mine to the east of the study area. And Cubico Products Coolibah quarry to the west of the study area.

Within the two sub catchment areas, the study area accounts for ~0.4% of the total grazing on native pastures land use and ~0.5% of the total grazing on modified pasture land use areas.

3.9 Areas of regional interest

The RPI Act 2014 aims to manage the impact of resource activities and regulated activities within Queensland. There are 4 areas of regional interest and are identified because of it's economic, social and environmental significance. Areas of regional interest must be assessed if a resource or regulated activity is to be undertaken in Queensland under the RPI Act. The 4 areas of regional interest are:

- I) Priority agricultural areas (PAAs),
- II) Priority living areas (PLAs),
- III) Strategic environmental areas (SEAs), and
- IV) Strategic cropping areas (SCAs).

Areas of regional interest can be viewed through the Queensland government online interactive mapping tool *QGlobe*. The 4 areas of regional interest have been considered for the study area. The desktop assessment did not identify any regional interests within the study area.

3.9.1 Soil conservation plans

The Soil Conservation Act 1986 provides framework for creating and enforcing property and project plans to manage soil erosion and run-off. There are three types of soil conservation plans:

- I) Property plans: approved plans across a single property and may affect surrounding neighbouring properties. Neighbouring properties will need to accept the plans.
- II) Project plans: approved plans extending across multiple properties (often 10 – 20) in a catchment.
- III) Non-statutory plans: soil conservation plans that have not been approved or do not require approval under the *Soil Conservation Act 1986*.

The desktop assessment identified no approved soil conservation plans within the study area and no plans within the region that the study area may be affected by.

4 SOIL MAPPING UNITS

Landloch made a total of 102 soil profile descriptions from (push tube) cores or existing vertical exposures. A total of 177 soil observations (check sites) were made by Landloch in the field. An additional 91 observation sites from Tuck and Baker (2007) were also used as check sites to confirm mapping boundaries. Of the soil profiles sampled, 46 received laboratory analysis. Soil observation sites are presented in Appendix A Figure 9. The soil profile descriptions are provided in Appendix D: *Soil Profile Descriptions*, and laboratory data is presented in Appendix E: *Laboratory Data*.

Each soil profile has been correlated with a known existing QLD government SPC within the region (Story et al., 1967). Soil profiles were classified using the Australian Soil Classification (Isbell & NCST, 2021) before being aggregated into Soil Mapping Units (SMUs). Each SMU contain a dominant soil profile class, and occasionally, minor associated SPCs or Unique Mapping Areas (UMA)s.

This section presents the SMUs as well as the SPCs within them.

From the information gathered during the field and desktop survey, the soils identified within the study area have been grouped into a total of 9 SMUs. A summary of the SMUs is presented in Table 5 in descending order according to the total land area (%). Their distribution is presented in Figure 2.

Table 5. Soil mapping units in order of dominance within the study area.

SMU	Description	Tuck and Baker (2007) Soil Units	Total Land Area (ha)	Total Land Area (%)
Taurus (Ta)	Sodic texture contrast soils with moderately thick sandy surfaces. Occurs on gently undulating rises within the southern half of the study area.	Sodosols	1,122	29
Davey (Da)	Deep alluvial sands occurring on the levees along the Isaac River and Cherwell Creek.	Tenosols	692	18
Krongie (Kg)	Cracking clay soils with normal gilgai microrelief. Occurring on alluvial floodplains along the Isaac River	Vertosols	515	13
Taurus-Teviot Complex (Ta-Tv)	Complex soil unit consisting of sodic texture contrast soils (Taurus) with sporadically occurring cracking clay soils (Teviot) in gilgai depressions. Occurs on a gently undulating rise within the southern half of the study area.	Sodosols	388	10
Retro (Rt)	Sodic texture contrast soils with thin loamy surfaces. Occurs on gently undulating rises on the northern half of the study area.	Sodosols	343	9
Teviot (Tv)	Cracking clay soils in the depressions of normal gilgai microrelief. Texture contrast soils on the mounds. Occurs on gently undulating rises, central within the study area.	Vertosols	340	9
Arcturus (Ac)	Cracking clay soils derived from basalt with crabhole microrelief. Occurs on gently undulating rises and colluvial depositions on the western boundary.	Vertosols	246	6

SMU	Description	Tuck and Baker (2007) Soil Units	Total Land Area (ha)	Total Land Area (%)
Luxor (Lx)	Texture contrast soils with thick sandy surfaces and clay subsoils. Occurring on a prominent rise on the northern half of the study area.	Chromosols	201	5
Pegunny (Pg)	Cracking clay soils in low lying flood plains, subject to prolonged waterlogging. Occurs in a minor area on the southeastern tip of the study area.	Vertosols	16	1

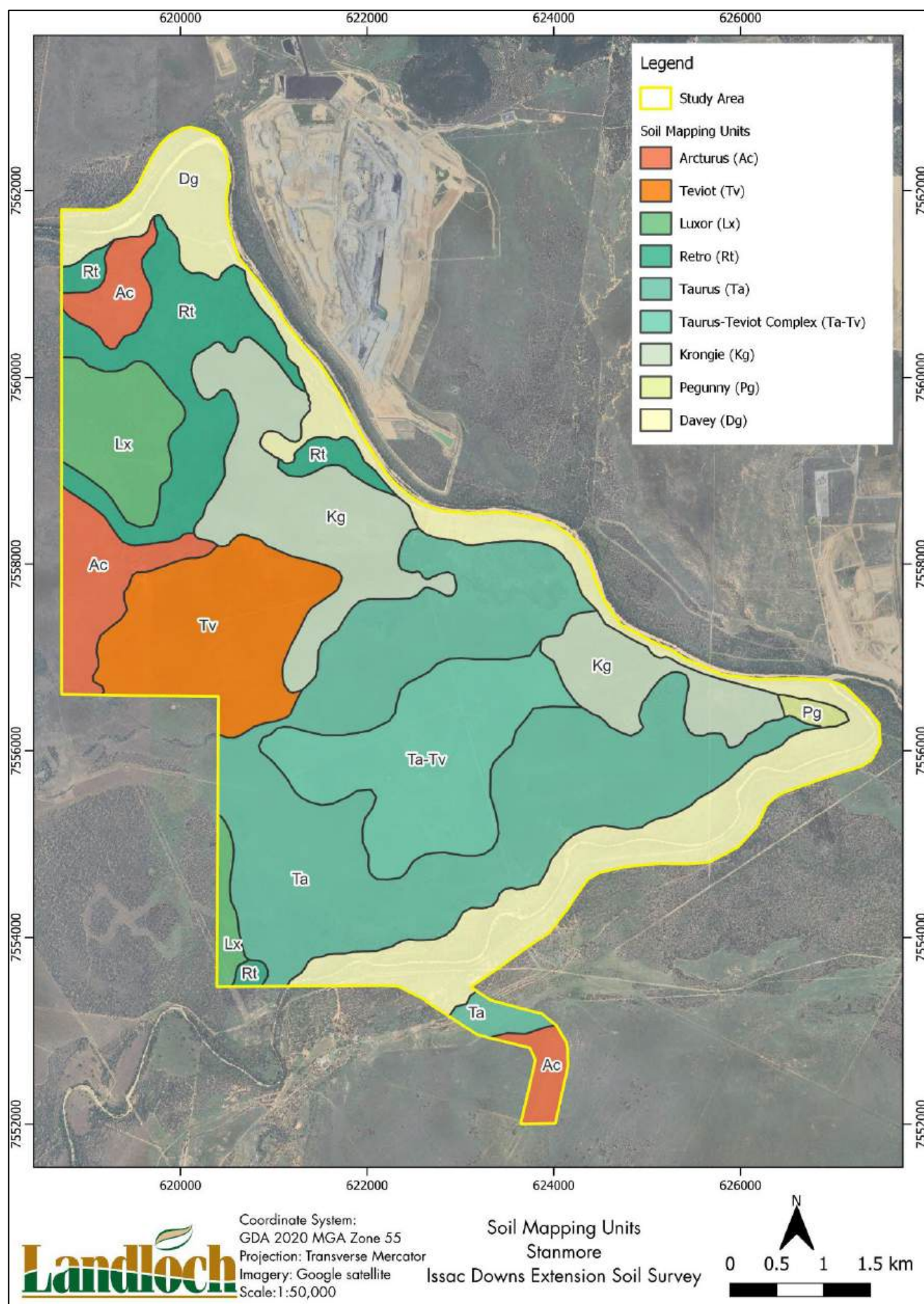


Figure 2. Soil Mapping Units within the study area.

4.1 Taurus

The Taurus SMU comprises of brown texture contrast soils occurring on gently undulating rises throughout the southern half of the study area. The soils have a loamy surface with saline and sodic subsoils. Surface stone are common throughout this SMU and range in size between 20 – 200 mm. The landscape is mostly cleared of vegetation for cattle grazing. However, minor occurrences of remnant vegetation exist with *Eucalyptus Populnea* (poplar box) being the dominant species.

4.1.1 Taurus SPC

The soils of the Taurus SPC have developed from late Tertiary alluvial deposits that now form gently undulating rises. These soils have neutral, loamy surfaces with alkaline, sodic and saline, clay subsoils (Sodosols). The surface soils are low in fertility and currently support low intensity grazing on improved pastures.

A summary of the key attributes for the Taurus SPC is provided in Table 6.

Table 6. Summary of the key attributed for the Taurus SPC.

	
Representative Landscape Site 133	
ASC Name	Sodosol
Dominant Land Use	Grazing
Geology	Late Tertiary/Quaternary alluvial deposits (TQa-QLD)

Dominant Vegetation	Pasture, remnant <i>Eucalyptus Populnea</i>
Dominant Topography	Gently undulating rises
Slope	<1 – 3%
Soil Depth	1 – 1.5 m
Surface Condition	Hard-setting
Micro-relief	Nil
Drainage	Imperfectly drained
Permeability	Slowly permeable
Chemical Properties	Neutral to strongly alkaline, saline, and sodic
Soil Profile Observations	25, 41, 47, 48, 50, 56, 57, 60, 69, 71, 79, 81, 96, 91, 93, 97, 98, 101, 106, 107, 110, 112, 114, 119, 123, 125, 126, 127, 129, 131, 113, 133, MLA3_5, MLA3_6, MLA3_7

4.1.1.1 Soil profile description

The representative soil profile for the Taurus SPC is Site 133. It is classified as a Mesotrophic Effervescent Brown Sodosol; slightly gravelly, loamy, clayey, deep. Its description is detailed in Table 7.

Table 7. The soil profile of site 133 is representative of the Taurus SPC.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A11 0 – 0.10	Dark brown (7.5YR3/2), sandy loam. Massive structure. Weak (dry) consistence. Nil mottles. No coarse fragments. No segregations. Many (25 – 200/0.01 m ²) fine (1 – 2 mm) roots present. Clear (20 – 50 mm) boundary change to:
	A12 0.10 – 0.30	Dark brown (7.5YR3/3), sandy loam. Massive structure. Weak (dry) consistence. Nil mottles. No coarse fragments. No segregations. Many fine roots present. Abrupt change to:
	B21 0.30 – 0.60	Dark Brown (7.5YR3/3), medium clay, sandy. Moderate subangular blocky structure (5 – 10 mm). Strong (dry) consistence. Nil mottles. Few (2 – 10%) soft carbonate segregations (2 – 6 mm). No coarse fragments. Few fine roots present. Gradual change to:
	B22 0.60 – 0.90	Brown (7.5YR4/4), medium clay, sandy. Strong angular blocky structure (5 – 10 mm). Strong (dry) consistence. Few (2 – 10%) faint brown mottles (5 – 15 mm). Few soft carbonate segregations (2 – 6 mm). No coarse fragments. Few fine roots present. Diffuse change to:
	B23 0.90 – 1.40	Brown (7.5YR4/4), medium clay, sandy. Strong angular blocky structure (5 – 10 mm). Strong (dry) consistence. Few faint brown mottles (5 – 15 mm). Few soft carbonate segregations (2 – 6 mm). No coarse fragments. Very few fine roots present.

4.1.1.2 Physio-chemical attributes

The physio-chemical properties representative of the Taurus SPC is summarised in Table 8.

Table 8. Summary of the physio-chemical parameters for the Taurus SPC (site 133).

Sample Depth (m)	pHw (1:5)		EC _{se}		ESP		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0–0.10	6.6	Neutral	1.7	Non-saline	2.6	Non-sodic	3.8	Low Ca
0.15–0.25	6.7	Neutral	0.4	Non-saline	2.7	Non-sodic	2.8	Low Ca
0.40–0.50	7.6	Mildly alkaline	1.6	Non-saline	11.2	Sodic	1.1	Low Ca
0.70–0.80	8.5	Strongly alkaline	6.8	Moderately saline	12.5	Sodic	0.9	Low Ca
1.10–1.20	7.7	Mildly alkaline	27.8	Extremely saline	16.3	Highly sodic	0.9	Low Ca
1.30–1.40	8.0	Moderately alkaline	17.0	Extremely saline	18.7	Highly Sodic	0.8	Low Ca

4.2 Davey

The soils of Davey are very deep alluvial sands situated on the levees of the Isaac River and Cherwell Creek following the eastern and southern boundaries of the study area. They support open woodlands of *Eucalyptus* and *Corymbia* species, and in some areas, are extensively cleared for cattle grazing on mixed pastures.

4.2.1 Davey SPC

The Davey SPC is the only SPC within the Davey SMU and is therefore the dominant SPC. The soils are uniformly textured sandy soils (Arenosols). They are situated on the banks and levees along the Isaac River and Cherwell Creek. They have a slightly acidic to neutral trend. The soils are non-saline with low fertility supporting open woodlands of *Eucalyptus populnea* (poplar box) and *Corymbia tessularis* (Moreton Bay ash).

A summary of the key attributes for the Davey SPC is provided in Table 9.

Table 9. Summary of the key attributes of the Davey SPC.

	
Representative Landscape Site 29	
ASC Name	Arenosol
Dominant Land Use	Grazing
Geology	Quaternary Alluvium (Qa–QLD)
Dominant Vegetation	<i>Eucalyptus populnea</i> and <i>Corymbia tessalaris</i>
Dominant Topography	Levee
Slope	< 1%
Soil Depth	>1.5 m
Surface Condition	Soft
Micro-relief	Nil
Drainage	Rapidly drained
Permeability	Rapid permeability
Chemical Properties	Neutral to slightly acidic, non-saline, non-sodic
Soil Profile Observations	29, 32, 99, 109, 124, 135, MLA3_8

4.2.1.1 Soil profile description

The representative soil profile for the Davey SPC is site 29. It is classified as a Basic Tenic Brown Arenosol; non-gravelly, sandy, sandy, deep. Its description is detailed in Table 10.

Table 10. The soil profile of site 29 is representative of the Davey SPC.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A11 0 – 0.15	Dark brown (10YR3/3) loamy sand. Massive (apedal) structure. Nil mottles. Nil segregations. Nil coarse fragments. Many fine roots present. Clear change to:
	A12 0.15 – 0.30	Dark brown (10YR3/3) loamy sand. Massive (apedal) structure. Nil Mottles. Nil segregations. Nil coarse fragments. Fine root development common (10–25/0.01 m ²). Gradual change to:
	B21w 0.30 – 0.80	Brown (10YR4/3) loamy sand. Massive (apedal) structure. Nil Mottles. Nil segregations. Nil coarse fragments. Few fine roots present. Diffuse change to:
	B22w 0.80 – 1.20	Brown (10YR4/4) loamy sand. Massive (apedal) structure. Nil Mottles. Nil segregations. Nil coarse fragments. Few fine roots present.

Note: w = development of colour/structure in the B horizon.

4.2.1.2 Physio-chemical attributes

The physio-chemical properties of the Davey SPC are summarised in Table 11.

Table 11. Summary of the physio-chemical properties of the Davey SPC (site 29).

Sample Depth (m)	pHw (1:5)		EC _{se}		ESP*		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0–0.1	7.6	Mildly alkaline	1.2	Non-saline	–	n/a	2.4	Low Ca
0.15–0.25	7.4	Mildly alkaline	0.7	Non-saline	–	n/a	2.6	Low Ca
0.30–0.40	7.3	Neutral	0.5	Non-saline	–	n/a	2.9	Low Ca
0.50 – 0.60	6.7	Neutral	0.5	Non-saline	–	n/a	2.5	Low Ca
0.80–0.90	7.0	Neutral	0.5	Non-saline	–	n/a	2.4	Low Ca
1.10–1.20	6.4	Slightly acidic	0.5	Non-saline	–	n/a	2.1	Low Ca

* Sodicity is a measurement on the clay fraction of soil. Sodicity values for sandy textured soils are misleading and have been omitted from reporting (Menzies, 2015).

4.3 Krongie

The soils of Krongie are deep, cracking clay soils with strongly developed normal gilgai micro-relief, forming on alluvial back plains. They are highly sodic and saline at depth and have a neutral to strongly alkaline trend. Surface stone are common throughout this SMU and range in size between 20 – 200 mm. The landscapes have been heavily cleared and is now dominated by thick *Acacia harpophylla* (brigalow) regrowth.

4.3.1 Krongie SPC

The Krongie SPC has developed strong normal gilgai microrelief. They have weakly self-mulching surfaces and form deep vertical cracks when dry (Vertosols). The soils have neutral to slightly alkaline surfaces and become saline and sodic from 0.3 m below the surface. The mounds and depressions have similar physical attributes but differ slightly in chemical composition. The depressions may remain waterlogged for a period of weeks after saturation.

A summary of the key attributes for the Krongie SPC is provided in Table 12.

Table 12. Summary of key attributes of the Krongie SPC.

	
Representative Landscape Site 33d	
ASC Name	Vertosol
Dominant Land Use	Grazing
Geology	Quaternary alluvium (Qa-QLD)
Dominant Vegetation	<i>Acacia harpophylla</i> regrowth
Dominant Topography	Level plain
Slope	<1%
Soil Depth	>1.5 m
Surface Condition	Weakly self-mulching, cracking
Micro-relief	Normal gilgai (VI 0.5 m, HI 5 m)
Drainage	Imperfectly drained
Permeability	Slowly permeable
Chemical Properties	Neutral to strongly alkaline, saline, sodic.
Soil Profile Observations	33d, 33m, 37d, 37m, 38, 46d, 46m, 52, 65, 74, 76d, 76m, 111, 121d, 121m

4.3.1.1 Soil profile description

The Krongie SPC has two representative profiles. Site 33d is representative of the depressions and is classified as a Epihypersodic-Endocalcareous Epipedal Black Vertisol; gravelly, medium fine, medium fine, deep. Its description is detailed in Table 13.

Site 33m is representative of the mounds and is classified as a Endocalcareous-Endohypersodic Epipedal Black Vertisol; gravelly, medium fine, medium fine, deep. Its description is detailed in Table 14.

Table 13. Soil profile of site 33d is representative of the Krongie SPC depressions.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A11 0 – 0.15	Black (10YR2/1) medium clay, sandy. Moderate subangular blocky structure (5 – 10 mm). Very firm (dry) consistence. Nil mottles. Nil segregations. Few (2 – 10%) subangular ironstone coarse fragments (2 – 6 mm). Many fine roots. Clear boundary change to:
	A12 0.15 – 0.30	Black (10YR2/1) medium clay, sandy. Moderate subangular blocky structure (5 – 10 mm). Very firm (dry) consistence. Nil mottles. Nil segregations. Few (2 – 10%) subangular ironstone coarse fragments (2 – 6 mm). Fine root development common. Gradual boundary change to:
	B21 0.30 – 0.65	Very dark greyish brown (10YR3/2) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm). Very firm (dry) consistence. Very few (< 2%) distinct brown mottles (5 – 15 mm). Few soft carbonate nodule segregations (6 – 20 mm). Few subangular ironstone coarse fragments (2 – 6 mm). Few fine roots. Gradual boundary change to:
	B22 0.65 – 1.00	Dark yellowish brown (10YR4/4) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm). Very firm (dry consistence). Few distinct brown mottles (15 – 30 mm). Soft carbonate nodule segregations (2 – 6 mm) common. Few subangular ironstone coarse fragments (2 – 6 mm). Few fine roots. Gradual boundary change to:

	B23 1.00 – 1.40	Dark yellowish brown (10YR4/4) medium clay, sandy. Massive structure. Very firm (dry consistence). Few distinct dark brown mottles (5 – 15 mm). Few soft carbonate nodule segregations (2 – 6 mm). Few subangular ironstone coarse fragments (2 – 6 mm). Few fine roots.

Table 14. Soil profile of site 33m is representative of the Krongie SPC mounds.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A11 0 – 0.15	Black (10YR2/1) medium clay, sandy. Moderate subangular blocky structure (5 – 10 mm). Very firm (dry) consistence. Nil mottles. Nil segregations. Few subangular ironstone coarse fragments (2 – 6 mm). Many fine roots. Clear boundary change to:
	A12 0.15 – 0.30	Black (10YR2/1) medium clay, sandy. Moderate subangular blocky structure (5 – 10 mm). Very firm (dry) consistence. Nil mottles. Nil segregations. Few subangular ironstone coarse fragments (2 – 6 mm). Fine roots common. Gradual boundary change to:
	B21 0.30 – 0.65	Black (10YR2/1) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm). Very firm (dry) consistence. Nil mottles. Few soft carbonate segregations (2 – 6 mm). Few subangular ironstone coarse fragments (2 – 6 mm). Few fine roots. Gradual boundary change to:
	B22 0.65 – 1.00	Very dark greyish brown (10YR3/2) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm). Very firm (dry) consistence. Very few faint brown mottles (5 – 15 mm). Few soft carbonate segregations (2 – 6 mm). Few subangular ironstone coarse fragments (2 – 6 mm). Few fine roots. Gradual boundary change to:
	B23 1.00 – 1.40	Yellowish brown (10YR5/6) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm). Very firm (dry) consistence. Few distinct dark brown mottles (5 – 15 mm). Very few soft carbonate segregations (2 – 6 mm). Few

		subangular ironstone coarse fragments (2 – 6 mm). Few fine roots.

4.3.1.2 Physio-chemical attributes

The physio-chemical properties for the Krongie SPC depressions are summarised in Table 15.

Table 15. Summary of the physio-chemical properties for the Krongie SPC depressions (site 33d).

Sample Depth (m)	pHw (1:5)		ECse		ESP		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0–0.10	7.5	Mildly alkaline	0.8	Non-saline	1.1	Non-sodic	4.0	Low Ca
0.15–0.25	8.2	Moderately alkaline	1.4	Non-saline	4.2	Non-sodic	3.7	Low Ca
0.30–0.40	8.8	Strongly alkaline	2.3	Slightly saline	7.3	Sodic	2.9	Low Ca
0.65–0.75	8.5	Strongly alkaline	7.6	Moderately saline	16.6	Highly sodic	1.7	Low Ca
1.00–1.10	8.7	Strongly alkaline	10.0	Highly saline	18.6	Highly sodic	1.4	Low Ca
1.30–1.40	8.2	Moderately alkaline	11.2	Highly saline	19.7	Highly sodic	1.2	Low Ca

The physio-chemical properties for the Krongie SPC mounds are summarised in Table 16.

Table 16. Summary of the physio-chemical properties for the Krongie SPC mounds (site 33m).

Sample Depth (m)	pHw (1:5)		ECse		ESP		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0–0.10	7.2	Neutral	0.7	Non-saline	1.8	Non-sodic	2.3	Low Ca
0.15–0.25	7.2	Neutral	1.3	Non-saline	4.9	Non-sodic	2.3	Low Ca

0.30–0.40	8.4	Moderately Alkaline	3.6	Slightly saline	8.7	Sodic	1.6	Low Ca
0.50–0.60	8.5	Strongly Alkaline	8.6	Highly saline	12.6	Sodic	1.3	Low Ca
0.80–0.90	8.3	Moderately Alkaline	10.1	Highly saline	14.8	Sodic	1.2	Low Ca
1.10–1.20	8.5	Moderately Alkaline	10.3	Highly saline	14.4	Sodic	1.1	Low Ca

4.4 Taurus-Teviot Complex

The Teviot-Taurus Complex SMU is comprised of two distinct SPCs; Taurus, a texture contrast soil (Sodosol); and Teviot, a cracking clay (Vertosol). These two soils occur together in the landscape with no distinguishable pattern in their distribution (sporadic) and are therefore, mapped as one soil unit. The sporadic nature of this soil complex is identified throughout the area in other land resource studies such as Story et al., (1967).

This SMU occurs within the southern half of the study area on a gently undulating rise formed from late Tertiary and Quaternary alluvial deposits. The dominant soil within this SMU is the sodic texture contrast soils of Taurus. The secondary soils occurring within this SMU are the Teviot soils which occur sporadically as normal gilgai depressions (no mounds). These depressions can be singular or several as a group, and range in width (horizontal interval ~3 – 10 m) and depth (vertical interval ~0.3 – 0.7 m).

This SMU has been extensively cleared to support low intensity cattle grazing. *Eucalyptus populnea* (poplar box) regrowth dominates the area and is associated with the occurrence of the Taurus soils. *Acacia harpophylla* (brigalow) regrowth is common with gilgai depressions and the occurrence of the Teviot soils.

Representative soil profiles and physio-chemical parameters for the Taurus and Teviot SPCs are detailed in section 5.1 *Taurus* and 5.6 *Teviot*.

A summary of the key attributes for the Taurus-Teviot Complex SMU is provided in Table 17.

Table 17. Summary of key attributes of the Taurus-Teviot Complex SMU.

	
Representative Landscape Site 95	
ASC Name	Sodosol (Taurus) / Vertosol (Teviot)
Dominant Land Use	Grazing
Geology	Late Tertiary/Quaternary alluvium (TQa-QLD)
Dominant Vegetation	<i>Eucalyptus populnea</i> and <i>Acacia harpophylla</i> regrowth
Dominant Topography	Gently undulating rise
Slope	1 – 3 %
Soil Depth	>1.5 m
Surface Condition	Hard setting (Taurus), weakly self-mulching (Teviot)
Micro-relief	Flat, occasional normal gilgai depressions
Drainage	Imperfectly drained
Permeability	Moderate to slowly permeable
Chemical Properties	Taurus: neutral to strongly alkaline, saline, and sodic Teviot: slightly acidic to strongly alkaline, saline, sodic
Soil Profile Observations	70, 78, 88, 89, 95, 97, 100, 101, 104, 111

4.5 Retro

The soils of the Retro SMU are deep, sodic, and saline texture contrast soils forming on residual quaternary deposits. Surface stone are common throughout this SMU and range in size between 20 – 200 mm. These soils occur on the northern half of the study area on a gently undulating rise. They support open woodlands and are occasionally cleared for cattle grazing.

4.5.1 Retro SPC

Retro is the only SPC within the Retro SMU and is therefore the dominant SPC. The soils have moderately thick loamy surfaces and strongly alkaline, sodic and saline subsoils (Sodosols). They support open woodlands of *Eucalyptus populnea* (poplar box) and *Acacia harpophylla* (brigalow). The landscapes have evidence of minor to extensive clearing for cattle grazing.

A summary of the key attributes for the Retro SPC is provided in Table 18.

Table 18. Summary of key attributes of the Retro SPC.

	
Representative Landscape Site 17	
ASC Name	Sodosol
Dominant Land Use	Grazing
Geology	Residual Quaternary deposits (Qr-QLD)

Dominant Vegetation	<i>Eucalyptus populnea</i> and <i>Acacia harpophylla</i>
Dominant Topography	Gently undulating rise
Slope	1 – 2%
Soil Depth	1 – 1.5 m
Surface Condition	Hardsetting
Micro-relief	Nil
Drainage	Imperfectly drained
Permeability	Moderately permeable
Chemical Properties	Slightly acidic to highly alkaline, saline, sodic.
Soil Profile Observations	6, 11, 12, 16m, 17, 22, 25, 31, 68

4.5.1.1 Representative profile

The soil profile of site 17 is representative of the Retro SPC. It is classified as a Hypercalcic, Subnatric, Brown Sodosol: moderately thick, moderately gravelly, clay loam, clayey, deep. Its description is detailed in Table 19.

Table 19. Soil profile description of site 17 is representative of the Retro SPC.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A1 0 – 0.10	Very dark greyish brown (10YR3/2) sandy clay loam. Massive structure. Firm (dry) consistence. Nil mottles. Nil segregations. Few subangular ironstone coarse fragments (20 – 60 mm). Many fine roots. Clear boundary change to:
	A2j 0.10 – 0.15	Dark brown (10YR3/3) sandy clay loam. Massive structure. Weak (dry) consistence. Nil mottles. Nil segregations. Few subangular ironstone coarse fragments (20 – 60 mm). Fine root development common. Abrupt boundary change to:
	B21 0.15 – 0.25	Dark yellowish brown (10YR4/4) medium heavy clay, sandy. Moderate angular blocky structure (5 – 10 mm). Strong (dry) consistence. Nil mottles. Nil Segregations. Few subangular ironstone coarse fragments (20 – 60 mm). Few fine roots. Gradual boundary change to:
	B22 0.25 – 0.50	Strong brown (7.5YR4/6) medium heavy clay, sandy. Moderate angular blocky structure (5 – 10 mm). Strong (dry) consistence. Nil mottles. Few soft carbonate segregations (2 – 6 mm). Few subangular ironstone coarse fragments (6 - 20 mm). Few fine roots. Gradual boundary change to:
	B23 0.50 – 1.00	Yellowish brown (10YR5/6) medium heavy clay, sandy. Moderate angular blocky structure (5 – 10 mm). Strong (dry) consistence. Few faint brown mottles (5 – 15 mm). Few soft carbonate segregations (2 – 6 mm). Few subangular ironstone coarse fragments (6 – 20 mm). No root development. Gradual boundary change to:
	BC 1.00 – 1.30+	Yellowish brown (10YR5/6) medium heavy clay, sandy. Massive structure. Strong (dry) consistence. Nil mottles. Few soft carbonate segregations (2 – 6 mm). Weathered sandstone present (40%). No root development.

4.5.1.2 Physio-chemical attributes

The physio-chemical properties of the Retro SPC are summarised in Table 20.

Table 20. Summary of the physio-chemical properties of the Retro SPC (site 17).

Sample Depth (m)	pHw (1:5)		EC _{se}		ESP		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0 – 0.10	6.4	Slightly acidic	0.6	Non-saline	2.7	Non-sodic	2.6	Low Ca
0.10 – 0.15	6.6	Neutral	0.6	Non-saline	2.1	Non-sodic	2.6	Low Ca
0.15 – 0.25	7.3	Neutral	2.7	Slightly saline	11.9	Sodic	1.1	Low Ca
0.30 – 0.40	8.7	Strongly alkaline	6.7	Moderately saline	15.1	Highly sodic	0.8	Low Ca
0.60 – 0.70	8.4	Moderately alkaline	7.2	Moderately saline	18	Highly sodic	0.7	Low Ca
1.00 – 1.10	8.9	Strongly alkaline	7.1	Moderately saline	21.5	Highly sodic	0.6	Low Ca
1.20 – 1.30	8.9	Strongly alkaline	7.7	Moderately saline	21.6	Highly sodic	0.6	Low Ca

4.6 Teviot

The Teviot SMU is comprised of two distinct SPCs; Taurus, a deep brown uniform clay (Vertosol); and Retro, a texture contrast soil (Sodosol). The two soils occur together in the gilgai micro-relief with Teviot soils occurring in the depressions and the Retro soils occurring on the mounds. This SMU has been extensively cleared for cattle grazing, however, there is thick *Acacia harpophylla* (brigalow) regrowth.

4.6.1 Teviot SPC

The Teviot soils are uniformly textured Brown Vertosols occurring in the depressions of normal gilgai micro-relief. They are situated on gently undulating rises and occur in the middle and southern sections of the study area. They have a slightly acidic to strongly alkaline trend with saline and sodic subsoils. Mature vegetation has been mostly cleared, however there is thick *Acacia harpophylla* (brigalow) regrowth present.

A summary of the key attributes for the Teviot SPC is provided in Table 21.

Table 21. Summary of the key attributes for the Teviot SPC.

	
Representative Landscape Site 16d	
ASC Name	Vertosol
Dominant Land Use	Grazing
Geology	Residual Quaternary deposits (Qr-QLD), Late Tertiary/Quaternary deposits (TQa-QLD)
Dominant Vegetation	<i>Acacia harpophylla</i> regrowth
Dominant Topography	Gently undulating rises
Slope	1 – 2%
Soil Depth	>1.5 m
Surface Condition	Weakly self-mulching
Micro-relief	Normal gilgai (VI 0.5 m, HI 5 m)
Drainage	Imperfectly draining
Permeability	Moderate permeability
Chemical Properties	Slightly acidic to strongly alkaline, saline, sodic
Soil Profile Observations	16d, 30, 35, 45, 47, 56, 57, 67

4.6.1.1 Representative profile

The soil profile representative of the Teviot SPC is site 16d. It is classified as a Endocalcareous-Endohypersodic Epipedal Brown Vertisol; slightly gravelly, medium fine, medium fine, deep. Its description is detailed in Table 22.

Table 22. Soil profile of site 16d is representative of the Teviot SPC depression.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A11 0 – 0.10	Dark brown (7.5YR3/2) light medium clay, fine sandy. Moderate subangular blocky structure (2 – 5 mm). Very strong (dry) consistence. Nil mottles. Nil segregations. Few subangular ironstone coarse fragments (2 – 6 mm). Fine root development common. Clear boundary change to:
	A12 0.10 – 0.20	Dark brown (7.5YR3/2) medium clay fine sandy. Moderate subangular blocky structure (2 – 5 mm). Very strong (dry) consistence. Nil mottles. Nil segregations. Few subangular ironstone coarse fragments (2 – 6 mm). Fine root development common. Clear boundary change to:
	B21 0.20 – 0.45	Brown (7.5YR4/3) medium clay, fine sandy. Moderate angular blocky structure (5 – 10 mm). Very strong (dry) consistence. Very few faint brown mottles (5 – 15 mm). Nil segregations. Very few ironstone coarse fragments (2 – 6 mm). Few fine roots. Gradual boundary change to:
	B22 0.45 – 1.00	Brown (7.5YR4/3) medium clay, fine sandy. Moderate angular blocky structure (5 – 10 mm). Very strong (dry) consistence. Few distinct dark brown mottles (5 – 15 mm). Few soft carbonate segregations (2 – 6 mm). Very few subangular ironstone coarse fragments (2 – 6 mm). Few fine roots. Gradual change to:
	B23 1.00 – 1.40	Strong brown (7.5YR5/6) medium clay, fine sandy. Moderate angular blocky structure (5 – 10 mm). Very strong (dry) consistence. Few distinct dark brown mottles (5 – 15 mm). Nil segregations. Very few subangular ironstone coarse fragments. Few fine roots.

4.6.1.2 Physio-chemical attributes

The physio-chemical properties for the depressions of the Teviot SPC are summarised in Table 23.

Table 23. Summary of the physio-chemical properties of the Teviot SPC depression (site 16d).

Sample Depth (m)	pHw (1:5)		ECse		ESP		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0–0.10	6.5	Slightly acidic	0.4	Non saline	1.1	Non sodic	3.6	Low Ca
0.10–0.20	6.2	Slightly acidic	0.3	Non saline	1.8	Non sodic	4.8	Balanced
0.20–0.30	6.3	Slightly acidic	0.4	Non saline	3.6	Sodic	4.1	Balanced
0.50–0.60	7.6	Mildly alkaline	2.8	Slightly saline	8.6	Sodic	2.9	Low Ca
0.90–1.00	8.4	Moderately alkaline	5.8	Moderately saline	14.9	Sodic	1.9	Low Ca
1.30–1.40	7.8	Mildly alkaline	7.2	Moderately saline	18.8	Highly sodic	1.5	Low Ca

4.7 Arcturus

The Arcturus SMU comprises of black clays formed from Quaternary basalt situated on the western boundary of the study area. The soils have a neutral to strongly alkaline trend and are slightly sodic and saline. They have a strongly self-mulching surface with crabhole gilgai and deep cracks. The vegetation is dominated by thinly wooded grasslands.

4.7.1 Arcturus SPC

The soils of the Arcturus SPC are moderately deep to deep Black Vertosols. They have strongly self-mulching surface with deep cracks and crabhole micro-relief. The soils are alkaline and become saline and sodic at depth. They support open woodlands of *Eucalyptus orgadophila* (mountain coolabah) on grasslands.

A summary of the key attributes for the Arcturus SPC is provided in Table 24.

Table 24. Summary and key attributes of the Arcturus SPC.



Representative Landscape Site 1

ASC Name	Vertosol
Dominant Land Use	Grazing
Geology	Quaternary basalt (Qr/b-QLD)
Dominant Vegetation	<i>Eucalyptus orgadophila</i> and grasses
Dominant Topography	Gently undulating rises
Slope	1 – 2%
Soil Depth	0.9 – 1.5 m
Surface Condition	Strong self-mulching
Micro-relief	Crabhole gilgai
Drainage	Moderately drained
Permeability	Slowly permeable
Chemical Properties	Mild to moderately alkaline, saline, sodic

Soil Profile Observations	1, 4, 8, 9, 10, 15, 21, MLA3_1, MLA3_2, MLA3_3, MLA3_4

4.7.1.1 Soil profile description

The representative soil profile for the Arcturus SPC is Site 1. It is classified as a Haplic, Self-mulching Black Vertosol: slightly gravelly, moderately fine, very fine, moderately deep. Its description is detailed in Table 25.

Table 25. The soil profile description of site 1 is representative of the Arcturus SPC.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A11 0 – 0.10	Black (7.5YR2/1) medium clay, fine sandy. Moderate polyhedral structure (2 – 5 mm). Very firm (dry) consistence. Nil mottles. Nil segregations. Very few, subangular (basalt) coarse fragments (5 - 10 mm). Many fine roots present. Clear boundary change to:
	A12 0.10 – 0.30	Black (7.5YR2/1) medium clay, fine sandy. Moderate angular blocky structure (5 – 10 mm). Very firm (dry) consistence. Nil mottles. Few carbonate segregations (2 – 6 mm). Very few, subangular (basalt) coarse fragments (5 - 10 mm). Fine roots common. Gradual boundary change to:
	B2 0.30 – 0.70	Black (7.5YR2/1) medium clay, fine sandy. Strong lenticular structure (10 – 20 mm). Very firm (dry) consistence. Nil mottles. Few carbonate segregations (2 – 6 mm). Very few, subangular (basalt) coarse fragments (5 - 10 mm). Few fine roots. Gradual change to:
	BC 0.70 – 0.90	Black (7.5YR2/1) medium clay, fine sandy. Massive structure. Very strong (dry) consistence. Few carbonate segregations (2 – 6 mm). Many subangular (basalt) coarse fragments (5 - 10 mm). Few fine roots. Gradual change to:
	C 0.90+	Weathered basalt. Massive. Weak.

4.7.1.2 Physio-chemical properties

The physio-chemical properties of the Arcturus SPC are summarised in Table 26.

Table 26. Summary of the physio-chemical properties of the Arcturus SPC (site 1).

Sample Depth (m)	pHw (1:5)		ECse		ESP		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0–0.10	8.0	Moderately alkaline	0.8	Non-saline	2.6	Non-sodic	6.4	Balanced
0.10–0.20	7.8	Mildly alkaline	2.0	Slightly saline	5.3	Non-sodic	6.1	Balanced
0.30–0.40	8.1	Moderately alkaline	4.1	Moderately saline	7.1	Sodic	5.9	Balanced
0.70–0.80	8.2	Moderately alkaline	5.5	Moderately saline	8.2	Sodic	6.1	Balanced

4.8 Luxor

The Luxor SMU comprises of thick sandy surfaced texture contrast soils with clayey subsoils. They have a neutral to mildly alkaline trend and are sodic and non-saline. These soils occur in the northern half of the study area on a gently undulating rise with minimal clearing. Open woodlands of *Eucalyptus populnea* (poplar box) dominate the landscape.

4.8.1 Luxor SPC

The soils within the Luxor SPC are Brown Chromosol soils forming on residual quaternary deposits. They have thick sandy surfaces above clay subsoils that are non-saline and become sodic at depth. The sandy surfaces have low fertility and support open woodlands with native and improved pastures.

A summary of the key attributes for the Luxor SPC is provided in Table 27.

Table 27. Summary and key attributes of the Luxor SPC.

	
Representative Landscape Site 5	
ASC Name	Chromosol
Dominant Land Use	Grazing
Geology	Quaternary residual deposits (Qr-QLD)
Dominant Vegetation	<i>Eucalyptus populnea</i>
Dominant Topography	Gently undulating rise
Slope	1 – 3%
Soil Depth	> 0.8 m
Surface Condition	Soft
Micro-relief	Nil
Drainage	Imperfectly draining
Permeability	Slow permeability
Chemical Properties	Neutral to mildly alkaline, sodic, non-saline
Soil Profile Observations	5, 7, 13, 18, 19

4.8.1.1 Soil profile description

The representative site for the Luxor SPC is site 5. It is classified as a Mottled-Sodic Mesotrophic Brown Chromosol; thick, non-gravelly, sandy, clayey, moderately deep. Its description is detailed in Table 28.

Table 28. Soil profile description for site 5 is representative of the Luxor SPC.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A11 0 – 0.15	Dark brown (7.5YR3/4) clayey sand. Massive structure. Very weak (dry) consistence. Nil mottles. Nil segregations. Nil coarse fragments. Many fine roots. Clear boundary change to:
	A12 0.15 – 0.30	Brown (7.5YR4/4) clayey sand. Massive structure. Very weak (dry) consistence. Nil mottles. Nil segregations. Few rounded ironstone coarse fragments (2 – 6 mm). Many fine roots. Clear boundary to:
	A2j 0.30 – 0.40	Brown (7.5YR5/4), with a sporadic bleach. Clayey sand. Massive structure. Very weak (dry) consistence. Nil mottles. Nil segregations. Rounded ironstone coarse fragments (2 – 6 mm) common. Fine roots common. Abrupt boundary change to:
	B2 0.40 – 0.80+	Strong brown (10YR5/6) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm) Strong (dry) consistence. Few distinct grey mottles (5 – 15 mm). Nil segregations. Few rounded ironstone (2 – 6 mm) coarse fragments. Few fine roots present.

4.8.1.2 Physio-chemical parameters

The physio-chemical properties for the Luxor SPC are summarised in Table 29.

Table 29. Summary of the physio-chemical properties of the Luxor SPC (site 5).

Sample Depth (m)	pHw (1:5)		EC _{se}		ESP*		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0 – 0.10	7.2	Neutral	1.2	Non-saline	–	n/a	3.8	Low Ca
0.15 – 0.25	6.7	Neutral	0.5	Non-saline	–	n/a	2.7	Low Ca
0.30 – 0.40	7.3	Neutral	0.5	Non-saline	–	n/a	2.4	Low Ca
0.40 – 0.50	6.9	Neutral	0.4	Non-saline	3.6	Non-sodic	1.7	Low Ca
0.70 – 0.80	7.8	Mildly alkaline	0.5	Non-saline	6.8	Sodic	1.6	Low Ca

* Sodicity is a measurement on the clay fraction of soil. Sodicity values for sandy textured soils are misleading and have been omitted from reporting (Menzies, 2015).

4.9 Pegunny

The soils of Pegunny are deep, brown clays forming in depressions on alluvial deposits. They are subject to prolonged periods of waterlogging after rainfall. This waterlogging restricts vegetation growth, however, woodlands of *Eucalyptus camaldulensis* (red river gum) generally border these low-lying areas. The Pegunny SMU occupies a small area of the eastern boundary of the study area.

4.9.1 Pegunny SPC

Pegunny is the only SPC within the Pegunny SMU and is therefore the dominant SPC. The soils are gradationally textured Brown Vertosols. They are situated in localised depressions on alluvial plains. They are often waterlogged, and as a result, have a neutral to highly acidic trend.

A summary of the key attributes of the Pegunny SPC is provided in Table 30.

Table 30. Summary of the key attribute of the Pegunny SPC.



Representative Landscape Site 134

ASC Name	Vertosol
Dominant Land Use	Grazing
Geology	Quaternary alluvial (Qa-QLD)
Dominant Vegetation	<i>Eucalyptus camaldulensis</i>
Dominant Topography	Alluvial plain
Slope	<1%
Soil Depth	> 1.5 m
Surface Condition	Hard setting
Micro-relief	Gilgai depression (VI 1 – 2 m, HI 20 – 50 m)
Drainage	Poorly draining
Permeability	Slow permeability
Chemical Properties	Neutral to highly acidic, non-saline, sodic.
Soil Profile Observations	134

4.9.1.1 Soil profile description

The representative soil profile for the Pegunny SPC is site 134. It is classified as a Epiacidic-Mottled Crusty Brown Vertosol; non-gravelly, fine, medium fine, deep. Its description is detailed in Table 31.

Table 31. Soil profile description of site 134 is representative of the Pegunny SPC.

Soil Profile Photograph	Horizon/ Depth (m)	Description
	A1 0 – 0.05	Dark brown (10YR3/2) light clay, sandy. Weak sub-angular blocky structure (2 – 5 mm). Weak (dry) consistence. Nil mottles. Nil segregations. Nil coarse fragments. Many fine roots. Abrupt boundary change to:
	B21 0.05 – 0.30	Very dark grey (7.5YR3/1) medium clay, sandy. Moderate subangular blocky structure (5 – 10 mm). Very firm (dry) consistence. Few faint brown mottles (5 – 15 mm). Nil segregations. Nil coarse fragments. Many fine roots. Clear boundary change to:
	B22 0.30 – 0.50	Dark brown (7.5YR3/2) medium clay, sandy. Moderate subangular blocky structure (5 – 10 mm). Strong (dry) consistence. Few faint brown mottles (5 – 15 mm). Nil segregations. Nil coarse fragments. Fine roots common. Clear boundary change to:
	B23 0.50 – 0.80	Dark brown (10YR3/3) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm) with slickenside present. Strong (dry) consistence. Few faint brown mottles (5 – 15 mm). Nil segregations. Nil coarse fragments. Fine roots common. Gradual boundary change to:
	B24 0.80 – 1.20	Dark brown (10YR3/3) medium clay, sandy. Moderate angular blocky structure (5 – 10 mm). Strong (dry) consistence. Few faint brown mottles (5 – 15 mm). Few manganese segregations present as mottles. Nil coarse fragments. Few fine roots.

4.9.1.2 Physio-chemical properties

The physio-chemical properties for the Pegunny SPC are summarised in Table 32.

Table 32. Summary of the physio-chemical properties of the Pegunny SPC (site 134).

Sample Depth (m)	pHw (1:5)		ECse		ESP		Ca:Mg	
	Unit	Rating	dS/m	Rating	%	Rating	Ratio	Rating
0 – 0.05	5.9	Moderately acidic	1.2	Non-saline	2.2	Non-sodic	2.4	Low Ca
0.10 – 0.20	6.0	Moderately acidic	0.4	Non-saline	2.5	Non-sodic	2.4	Low Ca
0.35 – 0.45	6.7	Neutral	0.4	Non-saline	3.9	Non-sodic	1.9	Low Ca
0.60 – 0.70	5.7	Moderately acidic	1.1	Non-saline	7.8	Sodic	1.4	Low Ca
0.80 – 0.90	5.5	Strongly acidic	1.2	Non-saline	10.0	Sodic	1.4	Low Ca
1.10 – 1.20	6.4	Slightly acidic	1.2	Non-saline	10.9	Sodic	1.4	Low Ca

5 DISCUSSION OF SOIL CHEMICAL AND PHYSICAL LIMITATIONS

Forty-two soil profiles within the study area were sampled for laboratory analysis. The suitability of soil for rehabilitation, and its limitations, delineated by SMUs, is discussed in this section through contextualising the results of the laboratory analysis.

5.1 Soil pH

The laboratory soil pH discussed here is that from a 1:5 soil to de-ionised water solution. Soil pH measures the activity of the hydrogen ions (H⁺) and hydroxyl ions (OH⁻) and is used to predict the chemical composition occurring in the soils and indicate potential deficiencies for toxicities (Slattery, et al., 1999). The soil pH ratings are detailed in Table 33.

Table 33. Interpretation of pHw. Adapted from Hazelton and Murphy (2025).

pH	Ratings
>9.0	Very strongly alkaline
9.0 – 8.5	Strongly alkaline
8.4 – 7.9	Moderately alkaline
7.8 – 7.4	Mildly alkaline
7.3 – 6.6	Neutral
6.5 – 6.1	Slightly acid
6.0 – 5.6	Moderately acid
5.5 – 5.1	Strongly acid
<5.1	Very strongly acid

The pH of soil is dependent on the parent material from which the soils were formed, and the weathering that acted on it. Weathering lowers the pH over time (QLD Government, 2022a). The pH value is a measurement of hydrogen ion concentration, where acid soils have higher concentrations of hydrogen ions. Generally, areas of higher rainfall have a higher rate of soil acidification (QLD Government, 2022b).

Alkaline soils are influenced by the parent material and the base ions within the soil mineralogy (QLD Government, 2022b). Alkaline soils are common in low rainfall areas of Australia, such as Central Queensland, where ions cannot be easily leached from the soil profile, and often form as precipitates (e.g., calcium carbonate at pH > 8.3 (Hazelton & Murphy, 2025).

5.1.1 Acidic soils

The uniformly textured soils of the Davey SMU have neutral surfaces and become slightly acidic at depth. This reflects the well-draining nature of these sandy soils. These soils do not have pH limitations to plant growth.

The texture contrast soils of Taurus, Retro, and Luxor all have acidic to neutral surfaces. The low clay content and exposure to weathering have leached cations from these layers, resulting the acidic pH trend.

The clay soils of Teviot and Pegunny have neutral surface soils on the mounds and acidic surface soils in the depressions. This trend reflects the extended waterlogging occurring in the depressions, and hence, the leaching of cations over time, lowering the soil pH. In comparison, the mounds are not exposed to prolonged waterlogging.

Applications of lime prior to stripping may be beneficial for plant growth where soils are strongly acidic to increase the pH of the soil.

Extremely acidic soils or acid sulfate soils (potential or actual) were not identified during the field program or through laboratory analysis.

5.1.2 Alkaline soils

The texture contrast soils of Taurus, Retro, and Luxor have neutral to alkaline subsoils. This reflects the depth of weathering acting on these imperfectly draining profiles, and hence, the leaching acting on these layers. The high alkalinity of the Taurus and Retro subsoils is also an indication of sodium bicarbonate in the soil solution (high exchangeable sodium), see section 5.3: *ESP and Dispersivity*.

The clay soils of Arcturus SMU are alkaline throughout the profile. This reflects the basalt parent material in which the soils are derived from. The high clay content and buffering capacity of the soils maintains the alkalinity of the soil. The high alkalinity of this soil also indicates the presence of sodium bicarbonate in the soil solution (high ESP).

The clay soils of the Krongie and Teviot become highly alkaline with depth. This trend reflects the poor drainage profile and low rainfall climate limiting the weathering acting on this soil at depth. The high clay content and high buffering capacity, maintains the alkalinity of the soil. The high alkalinity of this soil also indicates the presence of sodium bicarbonate in the soil solution (high ESP).

In addition, the alkaline soils (Arcturus, Krongie, Teviot, Retro, Taurus) have calcium carbonate present within the soil (identified by soft white nodules and their reaction to 1M HCl) which buffers the soil pH to 8.3 (Department of Environment and Resource Management, 2011). Calcium carbonate is generally non-toxic to plants; however, it may affect plant nutrient uptake (Moore and Scholz, 2001).

Gypsum can be used to slightly lower the pH of soils that are highly alkaline, sodic, and low in calcium (Tavakkoli, et al., 2022). Application rates of gypsum will be dependent on individual soil characteristics.

5.2 Salinity

The effect of salinity is dependent on the texture of the soil. Clay soils, having greater water storage capacity, are able to dilute salts to a greater extent than sandy textured soils. Therefore, the level of salinity has a greater effect on plant growth in sandy soils than clays soils. To account for this, an industry standard adjustment factor based on soil texture is used to estimate the Saturated Extract Electrical Conductivity (EC_{se}) from the Electrical Conductivity measured as a 1:5 soil to de-ionised water solution. The effect of salinity is generally low at EC_{se} of < 2 dS/m.

$$EC_{se} \left(\frac{dS}{m} \right) = EC_{1:5} \left(\frac{dS}{m} \right) * \text{adjustment factor } (f)$$

(Hazelton and Murphy, 2025) [Eqn 5.4]

The soils of Davey, Luxor and Pegunny have no salinity limitations to plant growth.

The texture contrast soils of Taurus and Retro have saline subsoils. This reflects the imperfectly draining nature of the soil, allowing salts to accumulate within the profile over time. Saline soil layers may inhibit plant growth and should be avoided for use in rehabilitation as a primary growth media.

The clay soils of Arcturus, Krongie and Teviot have moderate to high salinity in the subsoils. This is a reflection of the poor profile drainage and low rainfall climate, allowing salts to accumulate at depth. The mounds of the gilgai have become saline at a shallower depth compared to the depressions. This reflects the drainage and movement (shrink swell cycles) of melonhole gilgai formations. These saline soil layers should be avoided for use in rehabilitation as a primary growth media.

5.3 ESP and dispersivity

Exchangeable sodium percentage (ESP) is an indicator of a soil's susceptibility to erosion, surface crusting, hard/dense subsoils, and poor infiltration. Generally, a soil is considered sodic when ESP is $> 6\%$ and highly sodic when ESP is $> 14\%$

The Davey soil is the only SMU within the study area that are non-sodic. This is expected for well-drained coarse textured soils.

The subsoils of the texture contrast SMUs (Taurus, Retro, and Luxor) are all sodic. These soils are a high risk for erosion if the subsoils are exposed. Field observations identified areas of erosion where overland flow have created extensive gullying in these SMUs. Luxor SMU was the exception; the landscape position and low disturbance have resulted in little erosion of this SMU.

The clayey soils of Krongie, Teviot and Arcturus all have sodic subsoils. Field observations of erosion within these were uncommon. However, the high fine fraction (clay) percentage of these soils make them vulnerable to erosion if disturbed or subject to concentrations of overland flow. They should not be used in rehabilitation where there are steep gradients. The sodic subsoils should be avoided as a surface layer in rehabilitation.

Application of gypsum can be used to reduce sodicity. The short-term effects of gypsum can reduce sodicity immediately, through its positive electrolyte effect. Over long periods, gypsum replaces the sodium ions with calcium on the cation exchange surface, aiding the formation of stable aggregates (Loveday, 1976; McKenzie & Bryce, 2023). Application rates of gypsum will be dependent on individual soil characteristics.

5.4 Cation exchange capacity

The Cation Exchange Capacity (CEC) of a soil is a contributing factor in the stability of the soil structure, nutrient availability for plant growth, soil pH, and the soils' reaction to fertilisers and ameliorants (i.e. buffering capacity) (Hazelton and Murphy, 2025).

The soils of Pegunny have moderate levels of CEC, although they are relatively low for a clay soil. This reflects the acidic pH, reducing the availability of exchange sites on the complex.

The clay textured soils of Arcturus, Teviot, and Krongie have high CEC. This reflects the high clay content of the soils.

The texture contrast soils of Taurus, Retro, and Luxor have low CECs in the surface, and moderate to high CEC in the subsoils reflecting the clay content of the horizons respectively.

5.5 Calcium magnesium ratio

The calcium magnesium ratio is a secondary measurement of the available calcium/magnesium in the soil. Generally, a low calcium to magnesium ratio can result in dispersive soil properties in the soil (reduced stability, reduced infiltration, and increased density).

The Ca:Mg for the Arcturus soils is considered balanced. This reflects the nature of the basalt parent material being high in cations such as calcium.

All other soils (Taurus, Davey, Krongie, Retro, Teviot, Luxor, Pegunny) have low Ca:Mg, although none are at levels which are detrimental for soil stability.

6 LAND EVALUATION RESULTS

The results of the land evaluation assessment is detailed in the following sections. The UMA numbering is presented in Appendix A Figure 10.

6.1 Land suitability for cropping

The land suitability is assessed here on four cropping systems typical of the region:

- Dryland sorghum
- Dryland wheat
- Dryland safflower
- Irrigated cotton

The hazard criteria and detailed breakdown of the assessment of land suitability for cropping is provided in Appendix C.

Overall, the study area is assessed as Class 3 (suitable) and Class 4 and 5 (unsuitable) for the four cropping systems.

The results of the land suitability assessment is provided in Table 34 for each crop and presented in Appendix A Figures 11 – 15.

Table 34. Proportions of the study area suitable for cropping.

Land Use	Land Suitability (area %)				
	Class 1	Class 2	Class 3	Class 4	Class 5
Cotton	0	0	6	94	0
Safflower	0	0	6	76	18
Sorghum	0	0	6	76	18
Wheat	0	0	6	76	18

In summary, 94% of the study area is assessed as unsuitable (Class 4 – 5) for the four cropping systems. The common limitations of the soils were imperfect and slow drainage properties, and susceptibility to erosion. The exception was the sandy soils of the Davey SMU, which is ultimately limited by its poor water holding capacity.

The soils of the Arcturus SMU are assessed as Class 3 across the four cropping systems. These basalt soils are moderately well draining and are suitable for cropping with moderate management inputs.

6.2 Land suitability for grazing on improved pastures

Overall, the study area is assessed as a mix of Class 3 (suitable), Class 4, and 5 (unsuitable) for grazing on improved pastures. Table 35 displays the proportions of Land Suitability Class for the study area. Mapping for grazing land suitability is presented in Appendix A Figure 16.

The hazard criteria and detailed breakdown of the assessment of land suitability for grazing is provided in Appendix C.

Table 35. Proportions of the study area suitable for grazing.

Land Use	Land Suitability (area %)				
	Class 1	Class 2	Class 3	Class 4	Class 5
Grazing	0	0	6	93	1

In summary, grazing on improved pastures is suitable for 6% of the study area. The soil pH limits the potential for grazing of the Arcturus SMU to Class 3. The soils of the Pegunny SMU are assessed as suitable for grazing on improved pastures (Class 3). However, the hazard criteria do not take into account profile drainage. In consideration of the prolonged waterlogging of these soils, it would be appropriate to assign the Pegunny SMU as unsuitable (Class 5) for grazing on improved pastures.

The remaining 94% is assessed as unsuitable for improved pastures, however, low intensity grazing on native and/or introduced pasture species is viable. The Taurus, Retro, and Luxor SMUs are limited by their hard setting surfaces. The strong gilgai formations limit the grazing potential of the Krongie and Teviot SMUs. The low water holding capacity limits the grazing potential of the Davey SMU.

6.3 Agricultural land classification

Overall, the study area is dominated by Class C2 (~72% of the study area) agricultural land. Class C1 accounts for 23% of the study area, Class B accounts for ~6% of the study area and Class C3 accounts for ~1% of the study area.

The Class C2 soils include the Taurus, Retro, Luxor, Taurus-Teviot Complex, and the Davey SMUs. These soils are considered suitable for grazing on native and mixed pastures and have lower fertility than soils of Class C1.

The Class C1 agricultural land includes the clay soils of Krongie and Teviot and considered suitable for grazing on native and mixed pastures. Land use intensity is restricted in these SMUs, as demonstrated in the land suitability assessment (such as gilgai micro-relief), and therefore it is not considered suitable for sown pastures. The agricultural land classification of Class C1 is designated on account of the higher fertility than the Class C2 soils.

The Arcturus SMU is the only soil that is suitable for cropping and is assessed as Class B agricultural land. This SMU is considered suitable for a narrow range of crops or for sown pastures.

The Pegunny SPC is considered as Class C3 agricultural land and is suitable for light grazing practices only on native pastures. Higher intensity land uses are restricted due to the limitation outlined in the land suitability assessment.

Agricultural Land Classification for the study area is presented in Appendix A Figure 17.

7 SOIL RESOURCES

Effective planning for rehabilitation of disturbed areas requires details on the quality, quantity, distribution, and ability of available soil materials to support plant growth. The information in this section will guide material handling processes, such as stripping, recovery, stockpiling, storing, amelioration, and monitoring.

7.1 Recoverable growth media

Recoverable growth media refers to areas where soil material will be removed and stockpiled for later use in the rehabilitation of final landforms. For this report, recoverable growth media is estimated for the entire study area (Table 39), noting that only portions of the study area will be disturbed and hence require recovery of growth medium.

This section classifies soil material against the requirements of Land Suitability Class 3 for grazing (Short & Highlands Environmental, 2023; DME, 1995). The material has been evaluated into three classes; good quality topsoil; marginal topsoil; and subsoil.

The use of each class of growth media is explained in the subsequent sections below.

7.1.1 Good quality topsoil

Should be considered as a primary choice for topsoil materials. Suitability threshold criteria for *good quality topsoil* are detailed in Table 36. These materials have:

- Negligible limitations to plant growth
- Good quality material for intended purpose
- Nil to low levels of ameliorants required.

Table 36. Suitability threshold criteria for good quality topsoil.

Parameter	Range
pH _w	5.6 – 8.4
Available P (mg/kg)	≥ 8
ECe (dS/m)	< 2
ESP (%)	< 6

7.1.2 Marginal topsoil

Should only be considered as a surface layer if there are deficits in *good quality topsoil*. Suitability threshold criteria for *marginal topsoil* are detailed in Table 37. These materials have:

- Minor limitations to plant growth
- Reasonable quality materials for intended purpose
- Low to moderate levels of amelioration will be required.

Table 37. Suitability threshold criteria for marginal topsoil or subsoil.

Parameter	Range
pH _w	≥ 5.1 – ≤ 9
Available P (mg/kg)	≥ 8
ECe (dS/m)	< 10
ESP (%)	< 14

7.1.3 Subsoil

Should only be considered as a subsoil material and should not be used as a surface layer in rehabilitation. Suitability threshold criteria for *subsoil* are detailed in Table 38. These materials have:

- Moderate to severe limitations to plant growth
- Very poor-quality material for plant growth
- Moderate to high levels of amelioration will be required to improve material quality for plant growth.

Table 38. Suitability threshold criteria for subsoil.

Parameter	Range
ECe (dS/m)	< 10
ESP (%)	< 23

Table 39. Recommendations for soil recovery and amelioration rates.

SMU (Area (ha))	Soil Use	Stripping Depth (m)	Volume (m ³) (+/- 20 %)*	Description	Constraints	Amelioration per 0.1 m of soil
Taurus (1,122)	Good quality topsoil	0 – 0.30	3,366,000	Sandy loam	Nil	Nil
	Marginal topsoil	0.30 – 0.60	3,366,000	Medium clay, sandy	Salinity and sodicity	2 t/ha of gypsum
Davey (692)	Good quality topsoil	0 – 1.50	10,380,000	Loamy sand	Nil	Nil
Krongie (515)	Good quality topsoil	0 – 0.30	1,545,000	Medium clay, sandy	Nil	1 t/ha of gypsum
	Marginal topsoil	0.30 – 0.65	1,802,500	Medium clay, sandy	Alkalinity, sodicity, salinity	3 t/ha of gypsum
	Subsoil	0.65 – 1.00	1,802,500	Medium clay, sandy	Alkalinity, sodicity, salinity	10 t/ha of gypsum
Taurus- Teviot Complex (388)	Good quality topsoil	0 – 0.30	1,164,000	Sandy loams and medium clays	Nil	1 t/ha of gypsum
	Marginal topsoil	0.30 – 0.60	1,164,000	Medium clays	Sodicity, salinity	6 t/ha of gypsum
Retro (343)	Good quality topsoil	0 – 0.15	514,500	Sandy clay loam	Nil	Nil
	Marginal topsoil	0.15 – 0.25	343,000	Medium clay, sandy	Sodicity, salinity	4 t/ha of gypsum
	Subsoil	0.25 – 1.30	3,601,500	Medium clay, sandy	Sodicity, salinity, alkalinity	10 t/ha of gypsum
Teviot (340)	Good quality topsoil	0 – 0.20	680,000	Light to medium clay, sandy / sandy clay loam	Nil	1 t/ ha of gypsum
	Marginal topsoil	0.20 – 0.60	1,360,000	Medium clay, sandy	Sodicity, salinity	6 t/ ha of gypsum
	Subsoil	0.60 – 1.00	1,360,000	Medium clay, sandy	Sodicity, salinity	10 t/ ha of gypsum
Arcturus (246)	Good quality topsoil	0 – 0.10	246,000	Medium clay, sandy	Erodibility on steep slopes if ground cover is poor	Nil
	Marginal topsoil	0.10 – 0.30	492,000	Medium clay, sandy	Salinity, sodicity	1 t/ ha of gypsum
	Subsoil	0.30 – 0.70	984,000	Medium clay, sandy	Salinity, sodicity	4 t/ ha of gypsum
Luxor	Good quality topsoil	0 – 0.40	804,000	Clayey sand	Nil	Nil

SMU (Area (ha))	Soil Use	Stripping Depth (m)	Volume (m ³) (+/- 20 %)*	Description	Constraints	Amelioration per 0.1 m of soil
(201)	Marginal topsoil	0.40 – 0.80	804,000	Medium clay, sandy	Sodicity	1 t/ ha of gypsum
Pegunny (16)	Good quality topsoil	0 – 0.50	80,000	Light to medium clay, sandy	Moderate acidity	Nil
	Marginal topsoil	0.50 – 0.80	48,000	Medium clay, sandy	Acidity, sodicity	1 t/ha of lime 1 t/ha of gypsum
	Subsoil	0.80 – 1.20	64,000	Medium clay, sandy	Strong acidity, sodicity	2 t/ha of gypsum 2 t/ha of lime
Total (3,863)	Good quality topsoil	18,779,500 m³ (+/- 20%)				
	Marginal topsoil	9,379,500 m³ (+/- 20%)				
	Subsoil	7,812,000 m³ (+/- 20%)				

* The action of soil stripping is not a uniform process. Actual material collected is likely to vary and is dependent on the final area or depth of stripping. A nominal +/- 20% is used here to demonstrate this variability.

7.2 Recovery of growth media

The depth of topsoil stripping and growth media salvaging should be determined by considering the following: quality of the soils available to be recovered, the volumes of growth media, and the target vegetation of the areas to be rehabilitated. Recommendations for stripping volumes cannot be provided without access to further details on the rehabilitation requirements. In the absence of such rehabilitation information, the following guidance is provided for discussion purposes:

- Soil should be recovered in layers and managed according to the quality and suitability of materials. For example, topsoil, marginal topsoil and subsoil materials should not be mixed.
- If there is a topsoil deficit for the Project, then there is the opportunity to ameliorate 'marginal topsoil' and improve its properties.

Subsoils identified in this Project are unsuitable for surface layers in rehabilitation due to varying levels of alkalinity, sodicity and salinity. However, with the addition of gypsum they can be used as subsurface layers on the proviso they are capped by topsoil.

7.3 Amelioration of growth media

Growth media must be capable of supporting a self-sustaining vegetative cover (Department of Industry, Innovation and Science, 2016) and should;

- Have adequate infiltration
- Have adequate available water capacity
- Have adequate aeration
- Provide adequate rooting depth
- Be capable of supplying adequate plant nutrients
- Be free from excessive salinity, acidity, and alkalinity, and
- Provide microbial associations necessary for plant growth.

Common limitations to the soils within the study area are high alkalinity, salinity, sodicity and erosion potential if ground cover has poor coverage. Table 40 summarises possible ameliorations for the rehabilitation of soil materials consistent within the study area.

Table 40. Summary of amelioration to address the constraints for soil materials identified from the soil survey.

Constraint	Ameliorant	Description	Application
High Acidity	Lime	Lime increases the soil pH of acidic soils.	Incorporation into material prior to stripping.
High alkalinity	Gypsum	Gypsum can help reduce pH of highly alkaline soils through the displacement of exchangeable alkaline salts.	Incorporation into material prior to stripping.
Sodicity	Gypsum	Gypsum can reduce sodicity through the displacement of exchangeable sodium and magnesium by calcium, and provides a mildly saline soil solution that creates a beneficial electrolyte effect.	Incorporation into material prior to stripping.
Salinity	Gypsum	Gypsum improves soil structure, increasing infiltration and drainage aiding in the removal of salts down the soil profile.	Incorporation into material prior to stripping.
Low fertility	Fertiliser	Fertilisers are needed for initial plant growth and should be followed up to meet plant requirements.	Incorporation into material prior to stripping to establish growth during stockpiling. Follow up applications post spreading.
	Organic matter	Organic matter is important for storage and release of nutrients to plants.	
	Nitrogen fixing legumes	Nitrogen fixing legumes can be incorporated into the seed mix so that nitrogen stores within the soil can be replenished over time.	
Erosion	Contour ripping	Ripping can remove compaction from heavy machinery, encourage infiltration and prevent erosion. Ripping may risk brining unwanted waste material to the surface.	Contour ripping should be completed on the final landform prior to seeding.
	Rock mixing	Mixing of rock into the surface can reduce erosion potential and increase infiltration and leaching of salts to depth. The soil:rock mix will be limited by the stability of the fine component.	Rock mixing can be completed prior to or after placement on final landform.
	Rock armouring	Rock or aggregate, underlain by a geotextile can be used on landform surface to increase the stability of soil surface. Rock armouring may not be suitable depending on final land use targets.	Rock or aggregate should be placed on the final landform.
	Vegetative mulch and hydromulch	Coarse organic material spread across the soil surface protect it from splash erosion and sheet flow. Mulching can inhibit weed germination, provide microclimates for seed retention and germination of native species, and facilitate plant growth by inhibiting evaporation of water from the soil.	Vegetative mulch or hydro mulch should be spread on the final landform or stockpile.

7.4 Management of growth media

Successful rehabilitation to achieve post-mining land use objectives requires adequate quantities of suitable growth media to support the desired vegetation community. Soil depths also need to reflect the relevant landform and climate zone in which the site exists. Soil is biologically active and often fragile. When mismanaged, this can lead to the degradation of chemical and physical qualities, which in turn greatly reduces the likelihood of achieving rehabilitation success.

The quality of topsoil growth media requires special mention. The fertility of the topsoil materials has generally been assessed as moderate to high. However, inappropriate handling and stockpiling could easily degrade the fertility of these soils. The topsoils are sandy clay loams to medium clays in texture with moderate organic matter (1 – 2% organic carbon). It is this organic matter and the associated micro-flora and micro-fauna, that are largely responsible for their chemical and physical fertility. Soil management protocols and unsuitable stockpiling practices that lead to the loss of organic matter and soil biota will result in degradation of topsoil quality and negatively impact on the potential for rehabilitation success.

Ideally, topsoil should not be stockpiled but spread across the final landform as required. This avoids double handling, and the loss of seed storage, nutrient quality, and structural degradation of the soil (Department of Industry, Innovation and Science, 2016). Stockpile management best practice guidelines aim to maintain soil fertility, seed bank viability, and minimise erosion. The International Erosion Control Association (IECA) Australasia best practice guidelines (2008) state that where it is desirable to retain seed content, "such as in mining operations", stockpiles should be no higher than 1.5 m (IECA, 2008, p2.37). Department of Industry, Innovation and Science (2016, p33) states that stockpiles should be "as low as possible (<2 m)".

If topsoil is to be stockpiled, then the following list of recommendations should be considered:

- Stockpiling should aim for a short as possible time to reduce decline in topsoil quality
- Stockpiles should not exceed the height of 2 m and should have a large surface area
- Revegetation of stockpiles should be high priority to protect from erosion, discourage weeds and maintain soil microbes
- Stockpiles should be located where they will not be disturbed by future mining, or in areas that may be subject to overland flow or ponding of water
- Topsoil and subsoil material should be stockpiled separately, and topsoil should not be placed over the top of subsoil
- Stripping of soil material should be avoided in wet conditions or when the soil is in a saturated state
- Geographical Information Systems should be used to record stockpile locations and volumes, as well as the origin of the material (soil type) and
- Amelioration should be incorporated into the soil prior to stripping and stockpiling. This allows mixing of ameliorants into soil material, and importantly, allowing ameliorants time to take effect.

7.5 Monitoring of rehabilitation

The objective of the rehabilitation is for areas to be self-sustaining, resilient, stable and require no more management than the surrounding undisturbed land. Common issues for rehabilitated areas are weeds, feral animals, erosion, plant diseases and nutrient cycling. Monitoring of rehabilitated areas is essential in reaching success criteria and addressing issues before the relinquishment of the mining lease.

Monitoring of rehabilitation requires clear objectives and should be assessed on site-specific, realistic rehabilitation targets. Indicators need to be monitored to enable useful long-term monitoring and evaluation and should be progressive throughout the life of the mine.

Good quality monitoring has five main components (Department of Industry, Innovation and Science, 2016):

1. Records and documentation of rehabilitation process including stripping, stockpiling, amelioration and fertiliser applications, species lists and disturbance events such as fire or handling of material.
2. Records and documentation of routine information such as rainfall, temperature, relative humidity, wind speed, runoff, groundwater monitoring, water infiltration, and water courses.
3. Analogue or reference sites to be used for comparison and benchmarking. These sites must be representative of the target land use for the rehabilitation.
4. Initial monitoring undertaken within 2 years after rehabilitation process has concluded. This ensures quality of the rehabilitation process.
5. Long term monitoring to continue 2 years after establishment of final landform.

Landscape Function Analysis (LFA) is a monitoring procedure that uses field indicators to assess the biogeochemical functioning of a landscape. LFA monitoring provides reliable information on the effects of stress and disturbance on any landscape. LFA monitoring can be used for the prediction of the self-sustainability of the landform and is widely used in mining rehabilitation across Queensland and around Australia (Tongway & Hindley, 2004). LFA compares data for rainfall, infiltration, runoff, erosion, plant growth, and nutrient cycling of a rehabilitated landform against an analogue site over time. LFA monitoring should be completed by a suitability qualified person trained in LFA monitoring.

8 CONCLUDING REMARKS

This report provides technical soil details and recommendations to contribute to the management of soil for rehabilitation activities for the Isaac Downs Extension.

The soil survey was completed at a moderately high intensity, 1:25,000 scale. A total of nine soil mapping units are described from the information collected in the desktop review, field program, and laboratory analysis. The soils are a mix of texture contrast soils and gradational clay soils with gilgai micro-relief. A sandy soil unit exists along the Isaac River and Cherwell Creek.

A land suitability assessment was made for four cropping systems; irrigated cotton, dryland safflower, dryland sorghum, dryland wheat; and grazing as pre-mining land uses. From the assessment, approximately 94% of the study area is assessed as unsuitable (Class 4 – 5) for the four cropping systems. The common limitations for cropping are imperfect and slow drainage properties, and susceptibility to erosion.

Approximately 94% of the study area has been assessed as unsuitable for improved pastures, however, low intensity grazing on native or mixed pastures may be viable. Limitations to grazing include the hard setting surfaces of the texture contrast profiles, and the strong gilgai formations associated with the clay soils.

Using the data generated in the Land Suitability Assessment, Agricultural Land Classification for each SMU was determined. The study area is predominantly classed as Class C2 Agricultural Land (~72% of the total land area). Class C1 agricultural land accounts for ~22% of the study area. Class B agricultural land accounts for approximately ~6% of the study area. The remaining 1% of the study area is assessed as Class C3 agricultural land.

Recommendations for the management of stripping and stockpiling of soil material have been discussed. It is calculated that, in the study area, there is 18,779,500 m³ (+/- 20%) of *good quality topsoil*, and 9,379,500 m³ (+/- 20%) of *marginal topsoil*, and 7,812,000 m³ (+/- 20%) of *subsoil*. Recommendations for amelioration have been calculated for each layer of stripped soil material.

Topsoil, marginal topsoil, and subsoil should be stripped and stored/stockpiled separately. Management of these materials (e.g. correct handling and storage) is required to limit any degradation of the soil material.

REFERENCES

- Australian Bureau of Agricultural and Resource Economics and Sciences [ABARES]. (2023). *Australian Collaborative Land Use Management Program: Land use mapping*. Canberra: Department of Agriculture, Fisheries and Forests.
- Bureau of Meteorology. (2024). *Monthly Climate Statistics: Moranbah Water Treatment Plant. Site Number 034038*. Retrieved September 2024
- Dear, S. E., Williams, K. M., McElean, A. E., Ahern, C. R., Dobos, S. K., Moore, N. G., & O'Brien, L. E. (2021). *Queensland Acid Sulfate Soil Technical Manual. Version 5.1*. Queensland: Department of Resources and Department of Environment, Science and Innovation.
- Department of Agriculture and Fisheries [DAF]. (2024). *Environmental Impact Assessment Companion Guideline*. State of Queensland.
- Department of Environment and Resource Management . (2011). *Salinity Management Handbook. Second Edition*. Brisbane, Queensland: State of Queensland.
- Department of Environment, Science and Innovation [DESI]. (2024). *Application requirements for activities with impacts to land [2015/1839]*. State of Queensland.
- Department of Environment, Science and Innovation [DESI]. (2024). *Land—EIS information guideline, ESR/2020/5303*. Brisbane: Queensland Government.
- Department of Industry, Innovation and Science. (2016). *Mine Rehabilitation: Leading Practice Sustainable Development Program for the Mining Industry*. Australian Government.
- Department of Mines and Energy [DME]. (1995). *Land Suitability Assessment Technique*. Queensland Government.
- Department of Resources [DoR]. (2021). *Queensland Soil and Land Resource Survey Information Guideline v2.00*. State of Queensland.
- Department of Science, Information Technology and Innovation (DSITI) and the Department of Natural Resources and Mines (DNRM). (2015). *Guidelines for Agricultural Land Evaluation in Queensland (2nd edition)*. Queensland Government (Department of Science, Information Technology and Innovation and Department of Natural Resources and Mines), Brisbane, Queensland.
- Department of Science, Information Technology and Innovation [DSITI] & Department of Natural Resources and Mines [DNRM]. (2013). *Regional Land Suitability Frameworks for the Inland Fitzroy and Southern Burdekin Area. Chapter 10 - Suitability Framework for the Inland Fitzroy and Southern Burdekin Area*. Brisbane, QLD: Queensland Government.
- Department of the Environment, Tourism Science and Innovation [DETSI]. (2025). *Terms of Reference - Isaac Downs Project*. State of Queensland.
- Geoscience Australia. (2015). 1:100000 scale surficial geology. Geoscience Australia.
- Geoscience Australia. (2019). Radiometric Map of Australia v4, 2019 Ternary colour image. Geophysical Archive Data Delivery System. Retrieved 2024, from <http://pid.geoscience.gov.au/dataset/ga/134857>

- Google Earth. (2024). Map Data: Google, Maxar Technologies.
- Hazelton, P., & Murphy, B. (2025). *Interpreting Soil Test Results - What Do All the Numbers Mean? 4th edn.* Melbourne: CSIRO Publishing.
- IECA. (2008). *Best Practice Erosion and Sediment Control*. Picton, NSW: International Erosion Control Association (Australasia).
- Isbell, R & NCST. (2021). *The Australian Soil Classification. Third Edition*. Melbourne: CSIRO Publishing.
- Landloch. (2025). *Assessment of long-term erosion potential for rehabilitated landform batters at Isaac Downs Extension, Report prepared for Stanmore Resources Limited*.
- Loveday, J. (1976). *Relative significance of electrolyte and cation exchange effects when gypsum is applied to a sodic clay soil*. Soil Research, CSIRO.
- McDonald, R. C. (1983). *Principles of Soil Profile Class Development and Allocation*. Branch Workshop. Gympie, Queensland: Department of Primary Industry.
- McKenzie, D., & Bryce, A. (2023). *Dispersive Soil Manual: Managing Dispersive Soils; practicalities and and economics - Northern Region*. Grains Research and Development Corporation.
- McKenzie, N. J., Grundy, M. J., Webster, R., & Ringrose-Voase, A. J. (2008). *Guidelines for Surveying Soil and Land Resources (2nd Ed)*. Collingwood: CSIRO Publishing.
- Menzies, N. (2015). *Soil Sodidity Chemistry Physics and Ameleoration*. Queensland: Grains Research and Development Corporation. Retrieved from <https://grdc.com.au/resources-and-publications/grdc-update-papers>
- Minty, B., Richardson, M., & Wilford, J. (2008). *New Radiometric Map of Australia*. Issue No. 92. AusGeo.
- Moore, G., & Scholz, G. (2001). *Soil Alkalinity and Soil Sodidity. Soil Guide: A handbook for understanding and managing agricultural soils*. Agriculture Western Australia Bulletin No. 4343, pp. 141 - 142.
- Neldner, V. J., Niehus, R. E., Wilson, B. A., McDonald, W. J., Ford, A. J., & Accad, A. (2021). *The Vegetation of Queensland*. CSIRO, Tropical Forest Research Centre, Department of Environment and Science. Brisbane: Queensland Herbarium and Biodiversity Science, SScience Division.
- Powell, B. (2008). In McKenzie, N. J.; Grundy, M. J.; Webster, R.; Ringrose-Voase, A. J. *Guidlines for Surveying Soil and Land Resources (2nd Ed)*. Collingwood: CSIRO.
- QLD Government. (2022a). *Understanding Soil pH. Science Notes - Land Series L47*. Queensland Government. Retrieved March 25, 2024, from <https://www.publications.qld.gov.au/dataset/science-notes-soils>
- QLD Government. (2022b). *Soil Acidification. Science Notes. Land Series L45*. Queensland Government. Retrieved from <https://www.publications.qld.gov.au/dataset/science-notes-soils>

- Queensland Government. (2014). *Regional Planning Interests Act, Statutory Guideline 08/14*.
- Ryan, P., & Wilson, P. (2008). Field operations. In N. McKenzie, M. Grundy, R. Webster, & A. Ringrose-Voase, *Guidelines for surveying soil and land resources (2nd edn)* (pp. 241–262). Melbourne: CSIRO Publishing.
- SGM Environmental. (2020). *Soil and Land Resources Assessment: Isaac Downs Project*.
- Short, T., & Highlands Environmental. (2023). *Rehabilitated Mined Land Suitability for Beef Cattle Grazing in the Bowen Basin: Technical Paper 1*. Queensland: Department of Environment and Science.
- Slattery, W. J., Conyers, M. K., & Aitken, R. L. (1999). *Soil pH, aluminium, manganese and lime requirement. in 'Soil analysis: an interpretation manual'*. (Eds Peverill, K., Sparrow, L., Reuter, D.) pp.103-128. Collingwood: CSIRO publishing.
- State of Queensland. (1986). Soil Conservation Act.
- State of Queensland. (1992). *State Planning Policy 1/92: Development and the Conservation of Agricultural Land*.
- State of Queensland. (2014). *Regional Planning Interests Act 08/14*.
- State of Queensland. (2019). *RPI Act Statutory Guideline 08/14, How to demonstrate that land in the strategic cropping area does not meet the criteria for strategic cropping land*. Department of State Development, Manufacturing, Infrastructure and Planning.
- Story, R., Galloway, R. W., Gunn, R. H., & Fitzpatrick, E. A. (1967). *Lands of the Isaac-Comet Area, Queensland*. Land Research Series No. 19. Melbourne: CSIRO.
- Tavakkoli, E., Uddin, S., Rengasamy, P., & McDonald, G. (2022). *Field applications of gypsum to reduce pH and improve soil C in highly alkaline soil in southern Australia's dryland cropping region*. Soil Use Management.
- The National Committee on Soil and Terrain (NCST). (2009). *Australian Soil and Land Survey Field Handbook. 3rd edition*. Melbourne: The National Committee on Soil and Terrain. CSIRO Publishing.
- Tongway, D., & Hindley, N. (2004). *Landscape Function Analysis: Procedures for Monitoring and Assessing Landscapes - with Special Reference to Minesties and Rangelands*. Canberra: CSIRO.
- Tuck, G., & Baker, P. (2007). *Integrated Isaac Plains Project: Soils and Land Suitability Study*. Graham Tuck Environmental Services.

GLOSSARY

The glossary of terms has largely been sourced from the Australian Soil Classification (3rd Edition) (R.F. Isbell, CSIRO 2021) and the Australian Soil and land Survey Field Handbook (4th Edition) (The National Committee on Soil and Terrain CSIRO 2024).

A horizon	The surface mineral horizons where some have organic matter accumulation. They are usually darker in colour than the lower horizons.
Acidic	Soils with a pH less than 7.0 in soil/water suspension.
Alkaline	Soils with a pH that exceeds 7.0 in soil/water suspension.
Alluvium	Alluvium is the sediment deposited from transportation by channeled stream flow or over-bank stream flow.
Ameliorant	A substance used to improve the chemical or physical properties of a soil. For example, gypsum to improve aggregate stability and soil structure, lime to increase pH levels.
Angular blocky structure	Soil particles arranged around a point and bounded by six relatively flat, roughly equal faces.
B horizon	Subsoil horizons consisting of one or more mineral layers differing to the A Horizon by: clay, iron, aluminium or organic matter concentrations; structure and/or consistence; and/or colour.
Cation exchange capacity (CEC)	Is the measure of the capacity of a soil to hold the major cations: calcium, magnesium, sodium and potassium (including hydrogen, aluminium and manganese in acid soils). It is a measure of the potential nutrient reserve in the soil and is therefore an indicator of inherent soil fertility. An imbalance in the ratio of cations can result in soil structural problems. High levels of individual cations (e.g. aluminium and manganese) can also be toxic to plants.
Calcium / magnesium ratio	A ratio of exchangeable Calcium vs. exchangeable Magnesium in the soil. This ratio can be used to assess soil stability.
Calcareous	Presence of carbonate segregations or fine earth (soil matrix) effervescence with 1 M HCl.
Dermosols	Soils other than Vertosols, Hydrosols, Calcarosols and Ferrosols that: have B2 horizons that have grade of pedality greater than weak throughout the major part of the horizon; do not have a clear or abrupt textural B horizon.

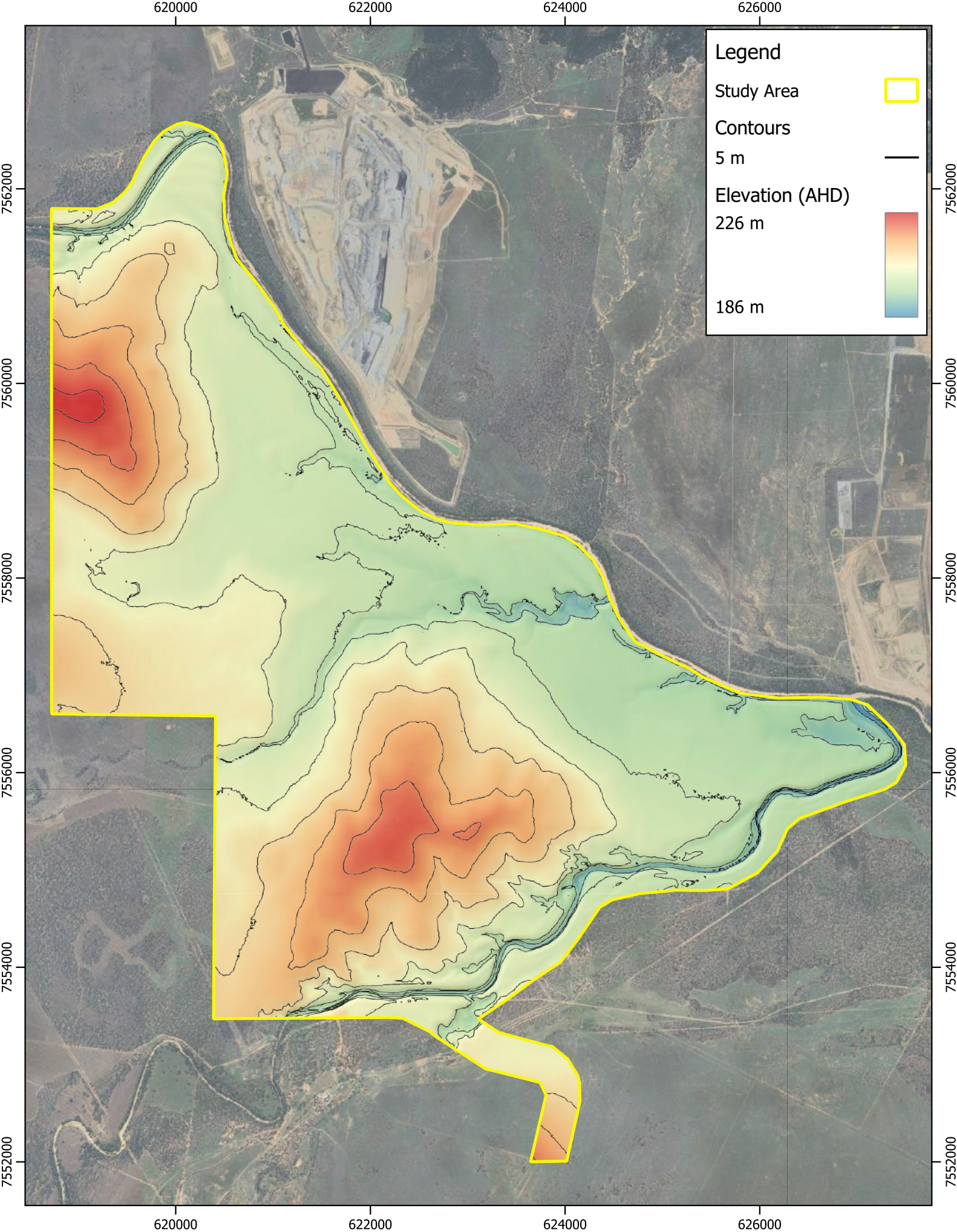
Dispersion	Dispersion is an indicator of sodic soils as it occurs when excessive sodium is present. When water is added, the sodium attaches to the clay and forces the clay particles apart. This results in a cloud of clay forming around the aggregate. The fine clay particles that have dispersed, clog up the small pores in the soil and degrade soil structure as well as restricting root growth and water movement. Dispersive soils usually have a high exchangeable sodium percentage (ESP).
Electrical conductivity (EC)	A measure of the conduction of electricity through water, or a soil water extract. The value can reflect the amount of soluble salts in a soil extract - therefore providing an indication of soil salinity. Soil texture needs to be considered in interpretation.
Exchangeable sodium percentage (ESP)	Is calculated as the proportion of the cation exchange capacity occupied by the sodium ions and is expressed as a percentage. In Australia, sodic soils are categorised as soils with an ESP of 6-14% and strongly sodic soils have an ESP of >14%.
Gypsum	A naturally occurring soft crystalline material which is a hydrated form of calcium sulphate. Gypsum contains approximately 23% calcium and 18% sulphur and is used to improve soil structure.
Haplic	Soils in which the major part of the B2 horizon is whole coloured.
Massive	This term applies to soil horizons greater than 6 mm in thickness, that appear to be coherent or solid and devoid of peds. When displaced, the soil separates into fragments which may be crushed into individual particles.
Mesotrophic	Base status is between 5 and 15 cmol(+) kg ⁻¹ clay inclusive. Soils characterised by moderate inherent fertility, with pH neither too acidic nor too alkaline, inferring suitability for plant growth.
Mottling	The presence of spots, blotches or streaks of subdominant colours different from the matrix colour and also different from the colour of the ped surface. Mottling is often an indication of poor profile drainage but may be caused by the weathering of parent material.
Parent material	The rock from which a soil profile develops.
Particle size analysis	(Particle size distribution) The measurement of the relative amounts of coarse sand, fine sand, silt and clay size particles in a soil sample (as determined in the laboratory).
Pedal	A general soil science term indicating that soil structure is present. A ped is an individual natural soil aggregate consisting of a cluster of primary particles.

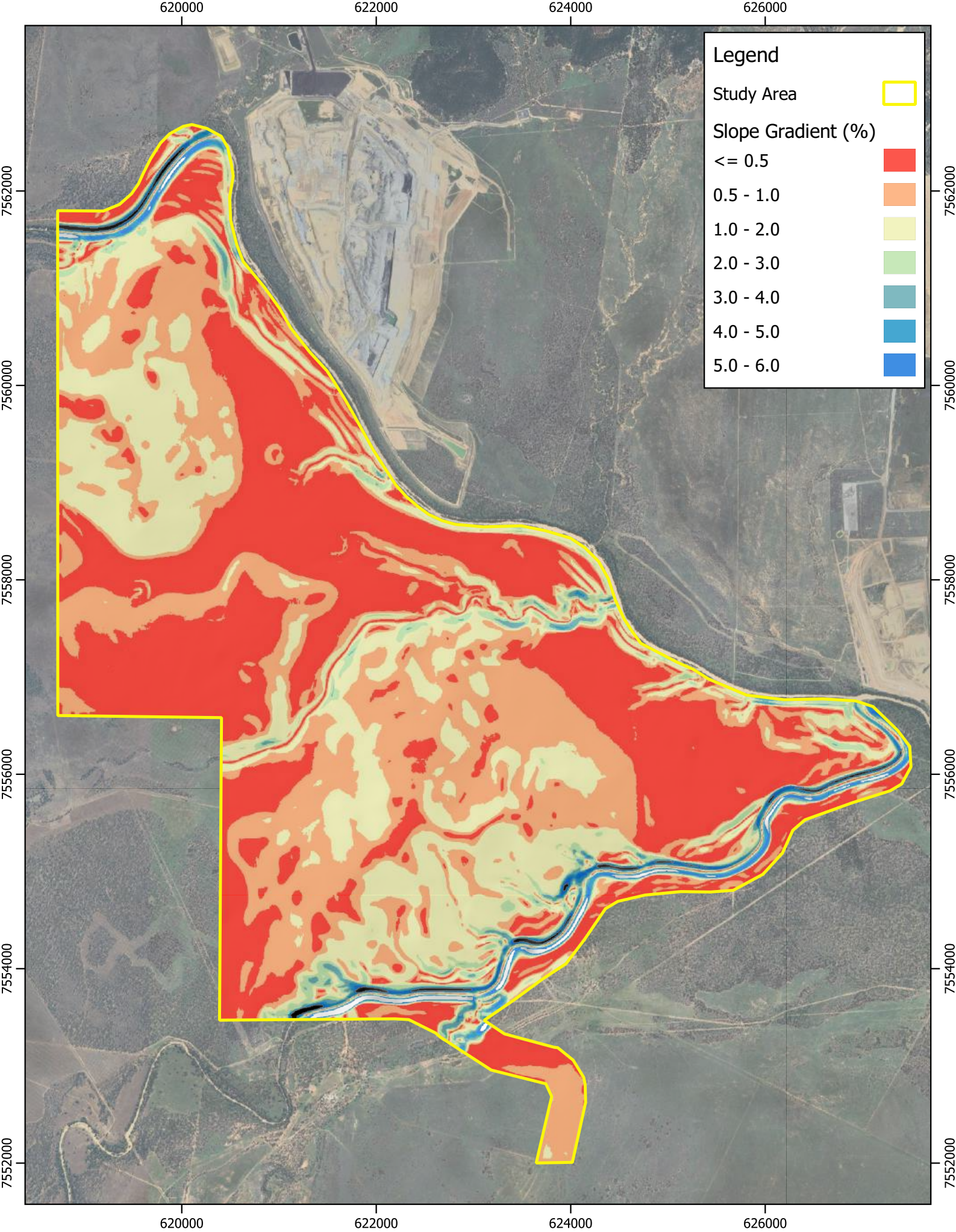
Permeability	The characteristic of a soil controlled by the potential to transmit water (saturated hydraulic conductivity, K_s) of the least permeable layer in the soil, as influenced by and inferred from, attributes of the soil such as mineralogy, structure, texture, porosity, cracks and shrink-swell properties.
pH	Measure of soil acidity and alkalinity on a scale of 0 (extremely acidic) to 14 (extremely alkaline). A pH of 7 is neutral.
Profile	The vertical section of the soil from the soil surface through all its horizons/layers to bedrock, other consolidated substrate material or to a selected depth of unconsolidated material.
Salinity	A measure of the total soluble salts in a soil. A saline soil is one with an accumulation of free salts at the soil surface and/or within the profile affecting plant growth and/or land use. It is generally attributed to changes in land use or natural changes in drainage or climate, which affects the movement of water through the landscape. Salinity levels of soil or water can be tested using electrical conductivity (EC).
Segregations	Accumulations of minerals in the soil due to the concentration of constituents. They occur as a result of chemical or biological action. They can develop <i>in situ</i> by either current or relict pedogenic processes.
Sodicity	Is a measure of exchangeable sodium in relation to other exchangeable cations. It is expressed as the exchangeable sodium percentage (ESP). A sodic soil contains sufficient exchangeable sodium to interfere with the growth of plants, including crops. A soil with an ESP greater than 6 is generally regarded as being a sodic soil.
Soil	Soil is a natural body consisting of layers (soil horizons) of mineral and/or organic constituents of variable thicknesses, which differ from the parent materials in their morphological, physical, chemical, and mineralogical characteristics and their biological characteristics.
Soil profile class (SPC)	A soil profile class is a group of similar profiles defined by any level of generalisation. The variation in some features within the soil profile class is less than the variation between classes.
Structure	Describes the way the soil particles are arranged to form soil peds.

Subangular blocky structure	Similar to angular blocky except peds are bounded by flat and rounded faces with limited accommodation to the faces surrounding the peds.
Subsoil	The subsurface soil below the topsoil. Typically B horizons and sometimes A2 or A3 horizons.
Texture (field)	Determined by measuring the behavior of a small handful of soil grains (<2 mm in size) when moistened and kneaded (1–2 minutes) until it does not stick to the hand. It provides an estimate of the relative amounts of coarse sand, fine sand, silt and clay size particles. Texture is determined by the behavior of the moist bolus and length of the ribbon when sheared between thumb and forefinger.
Topsoil	The surface layer of soil that usually has higher fertility and organic matter and better structure than the underlying layers. Typically it is the A1 horizon and contains the majority of the seed bank.

APPENDIX A: MAPS AND FIGURES

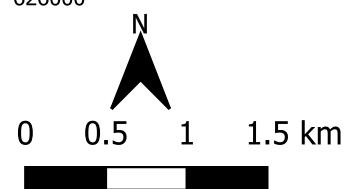
THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

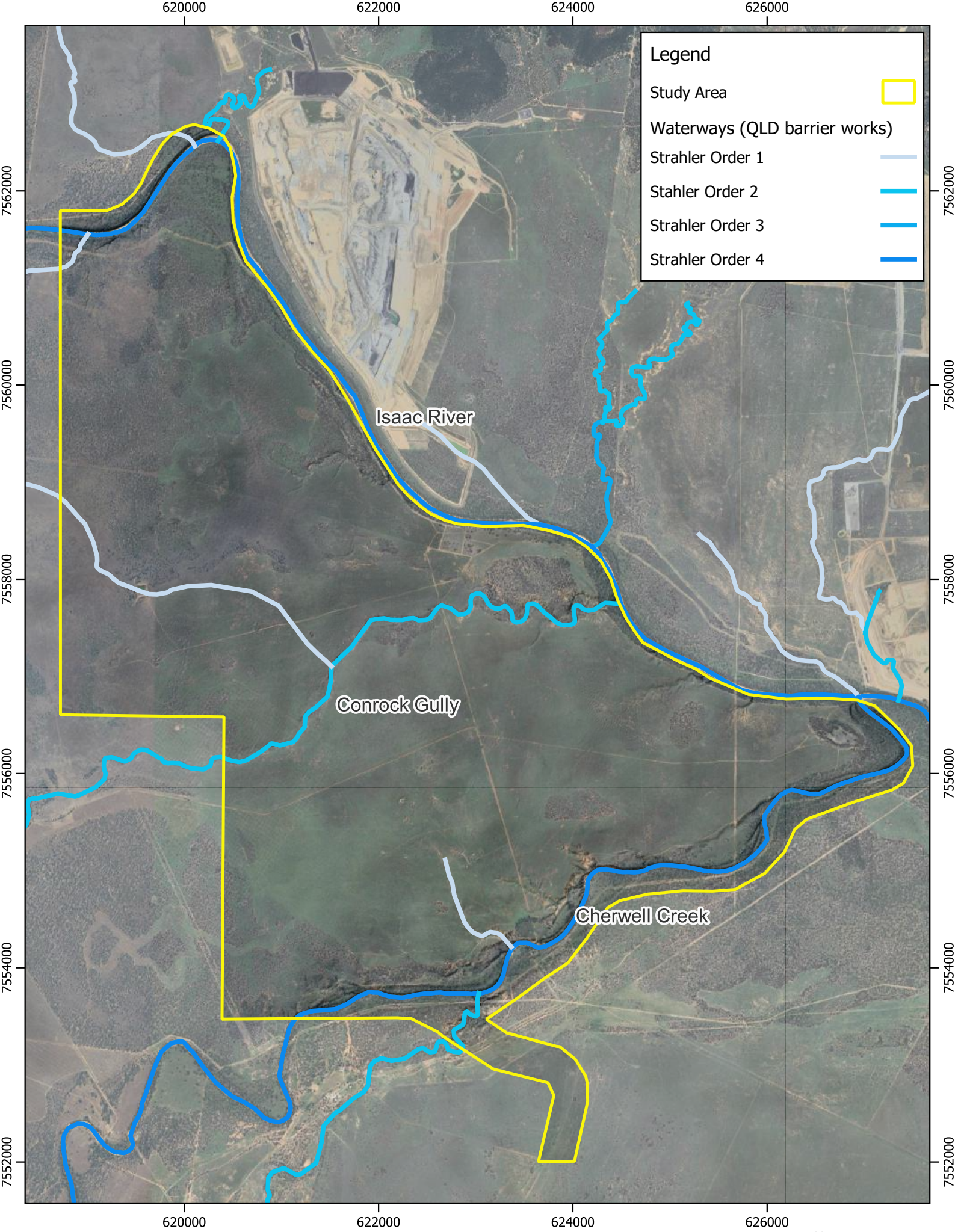




Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A2
Slope Gradient
Stanmore
Issac Downs Extension Soil Survey

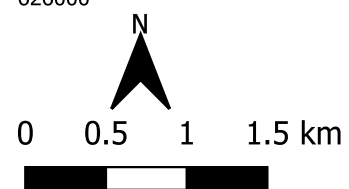


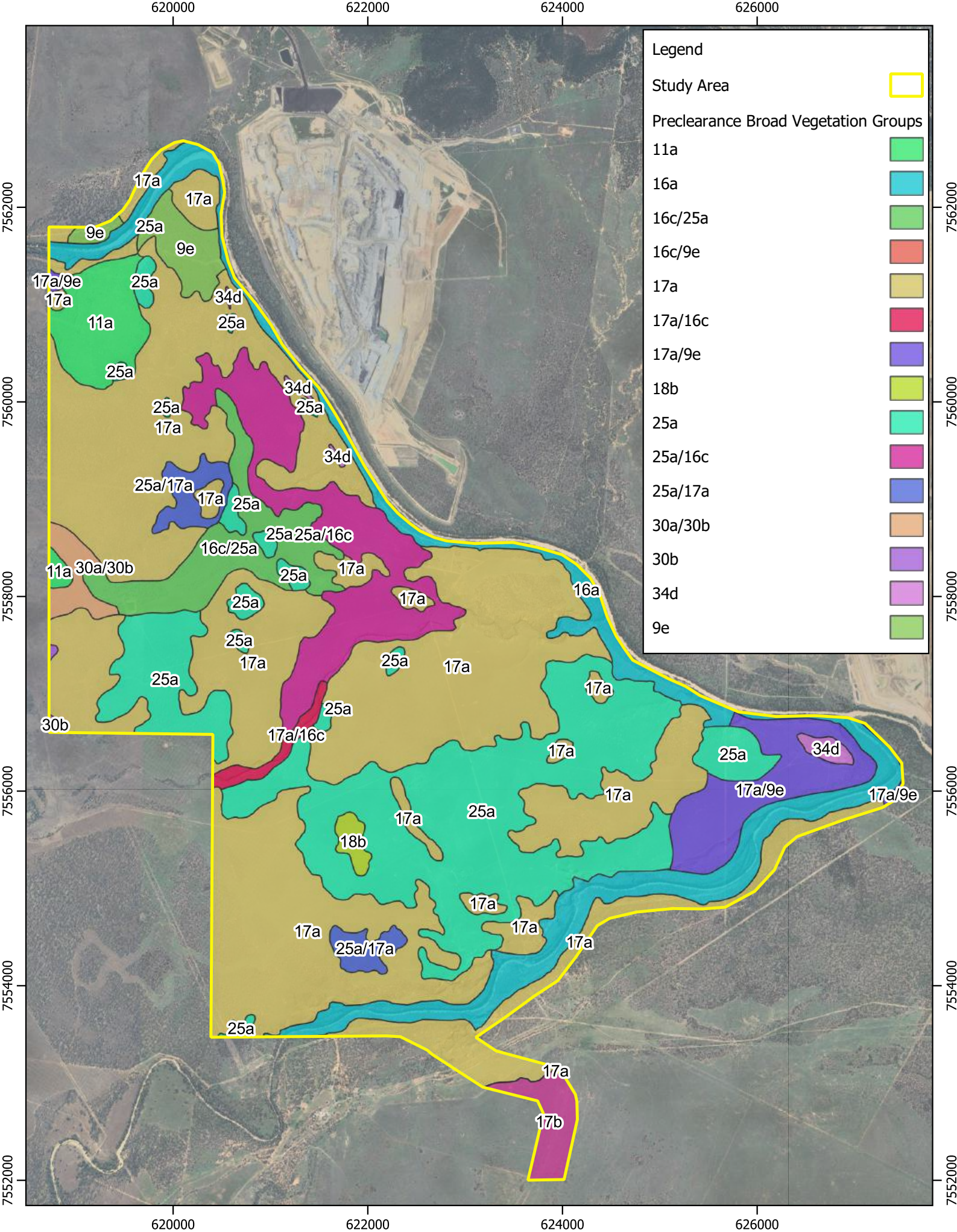


Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A3
Waterways
Stanmore

Issac Downs Extension Soil Survey

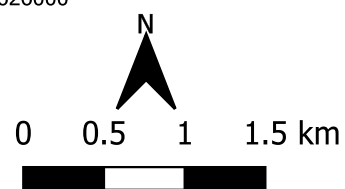


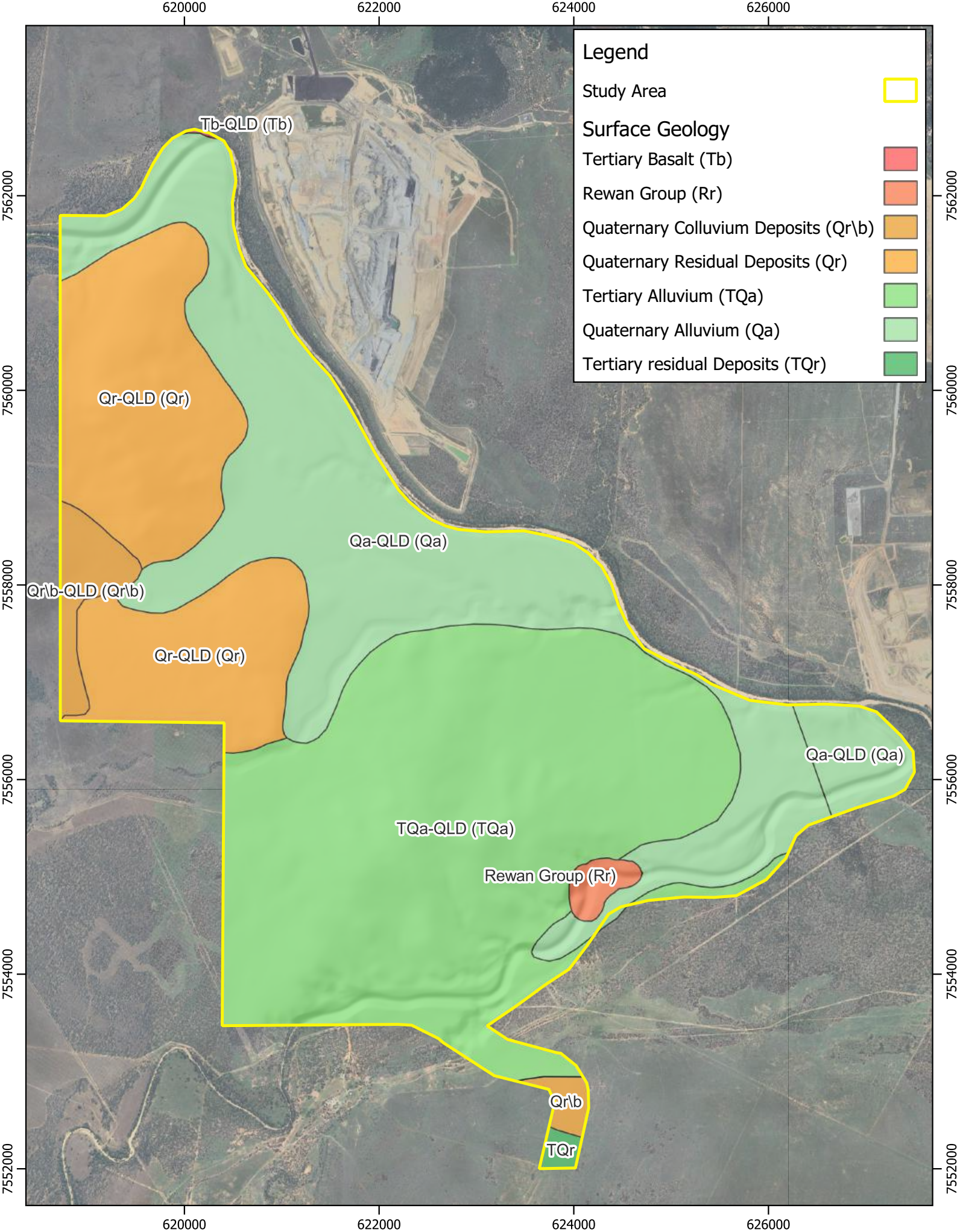


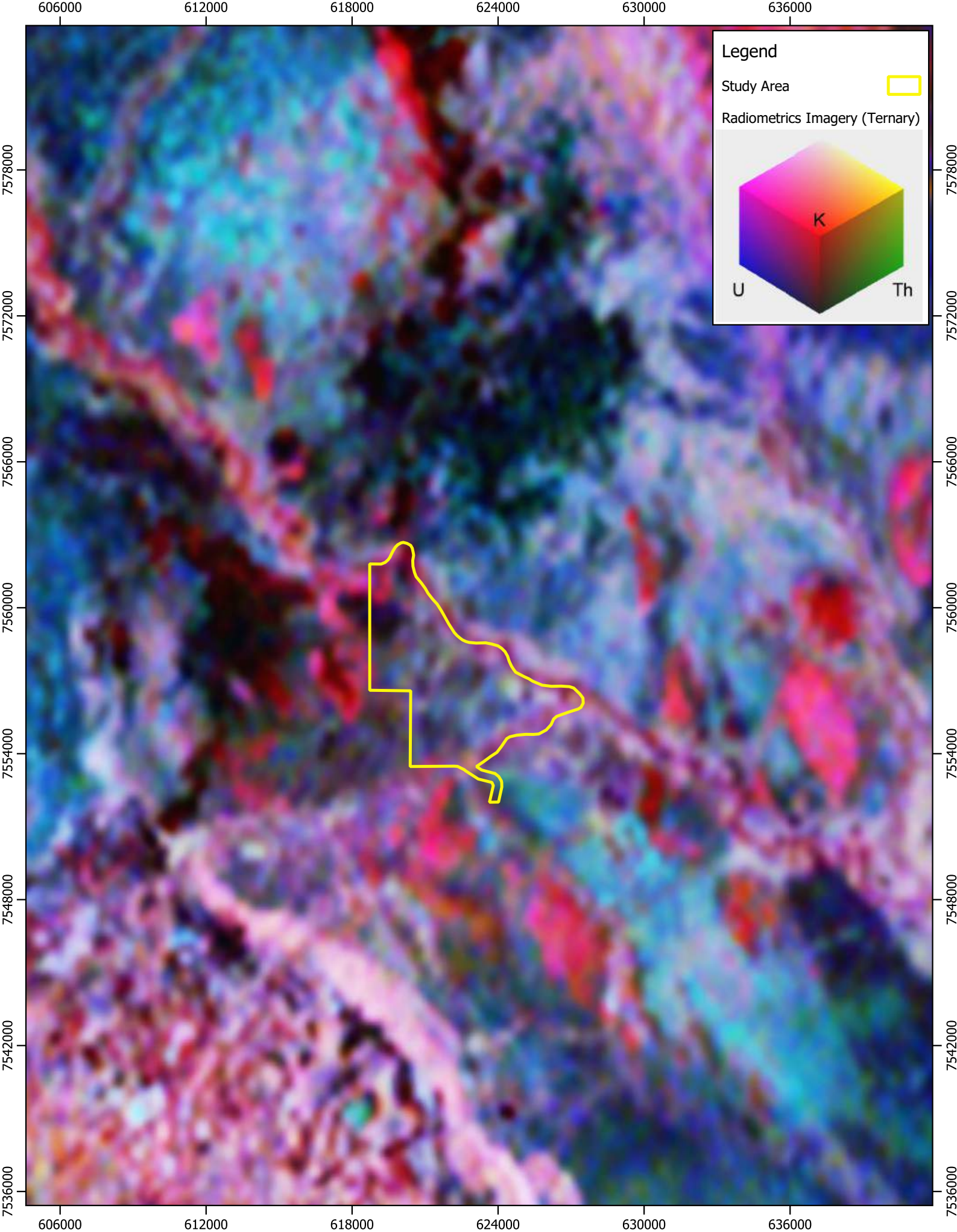
Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

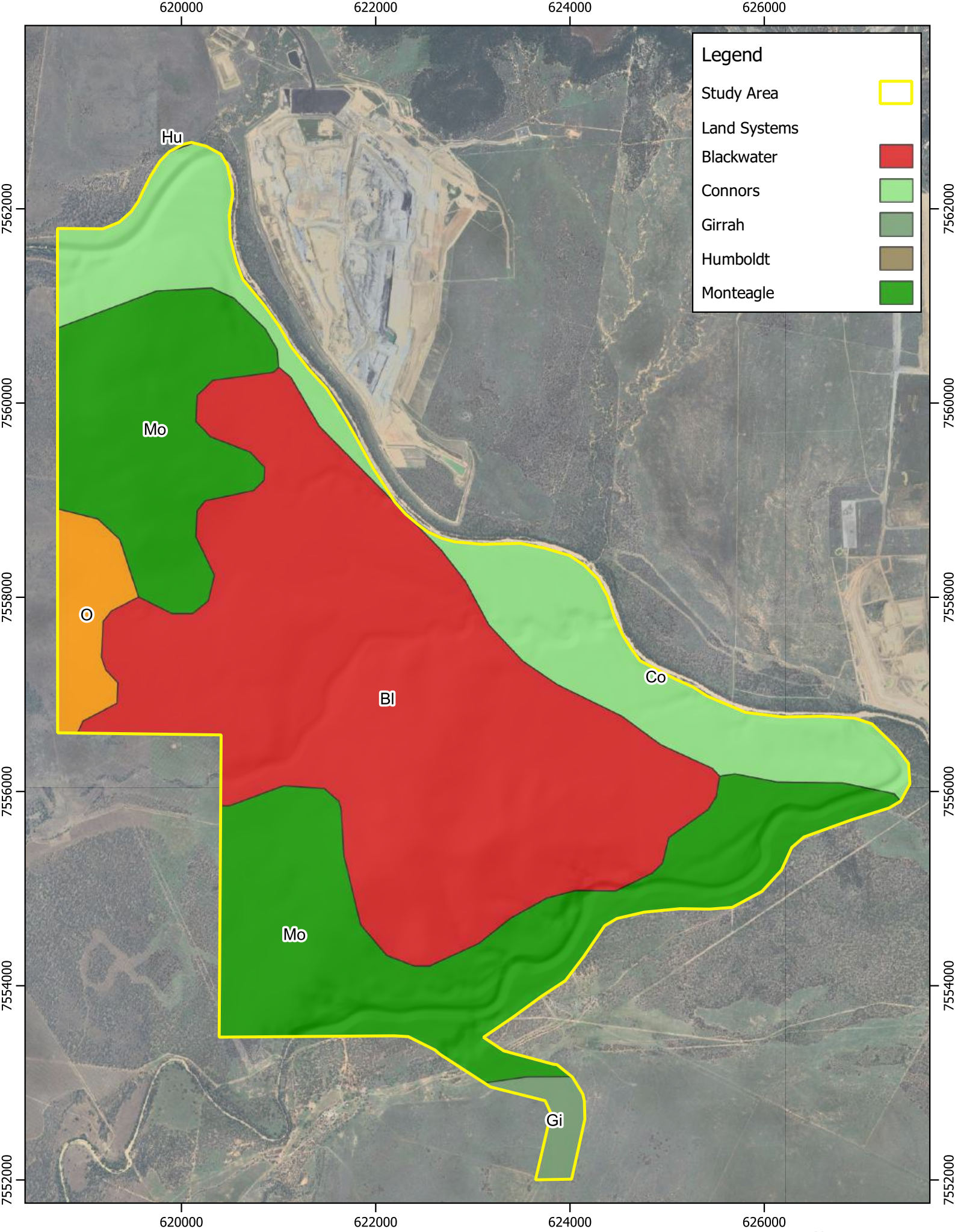
Figure A4
Preclearance BVGs
Stanmore

Issac Downs Extension Soil Survey





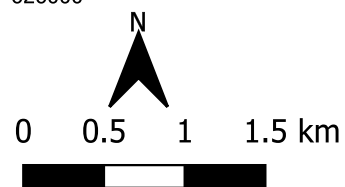


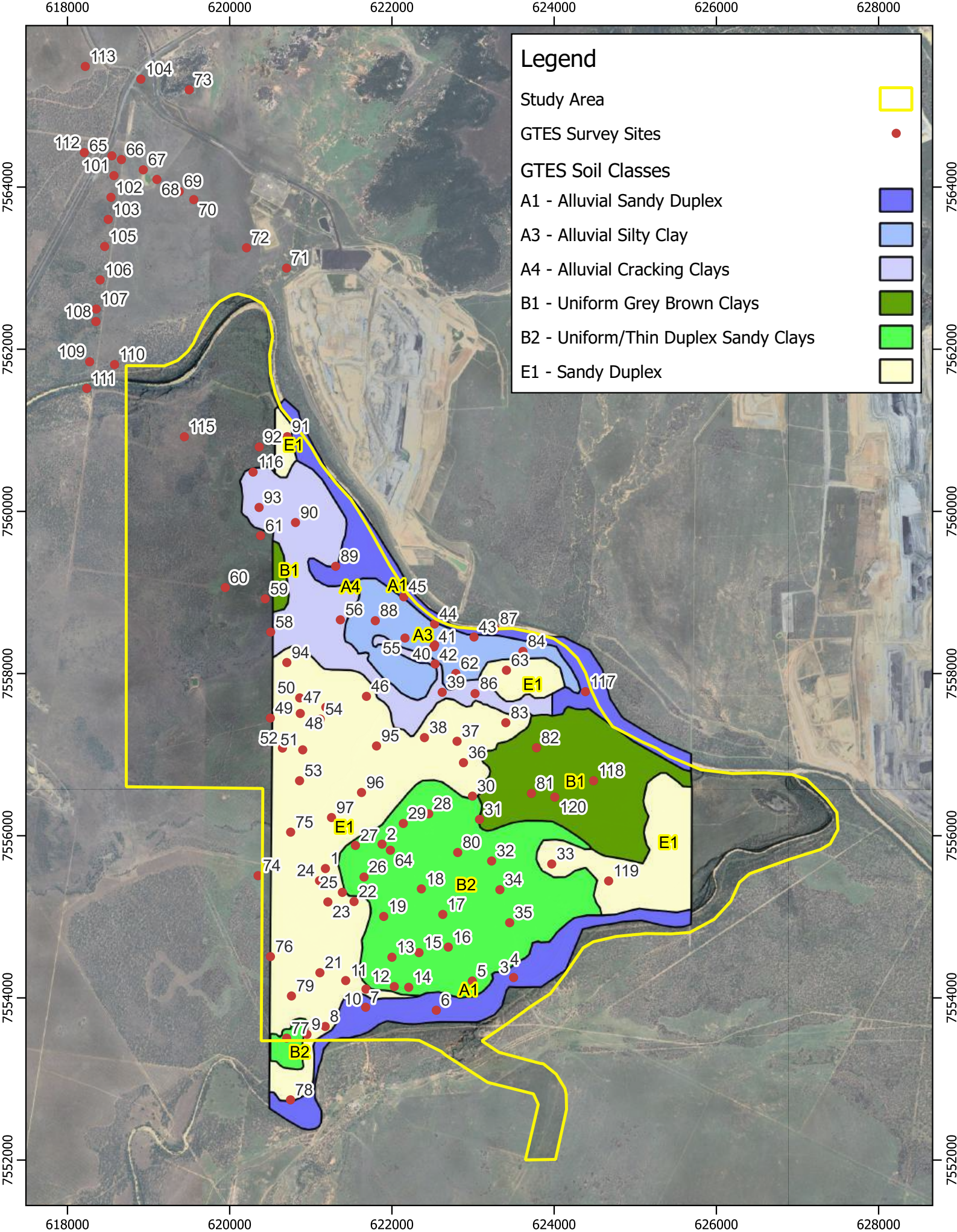


Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A7
Land Systems
Stanmore

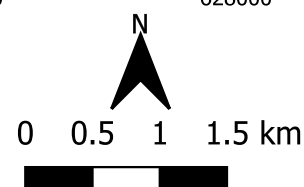
Issac Downs Extension Soil Survey

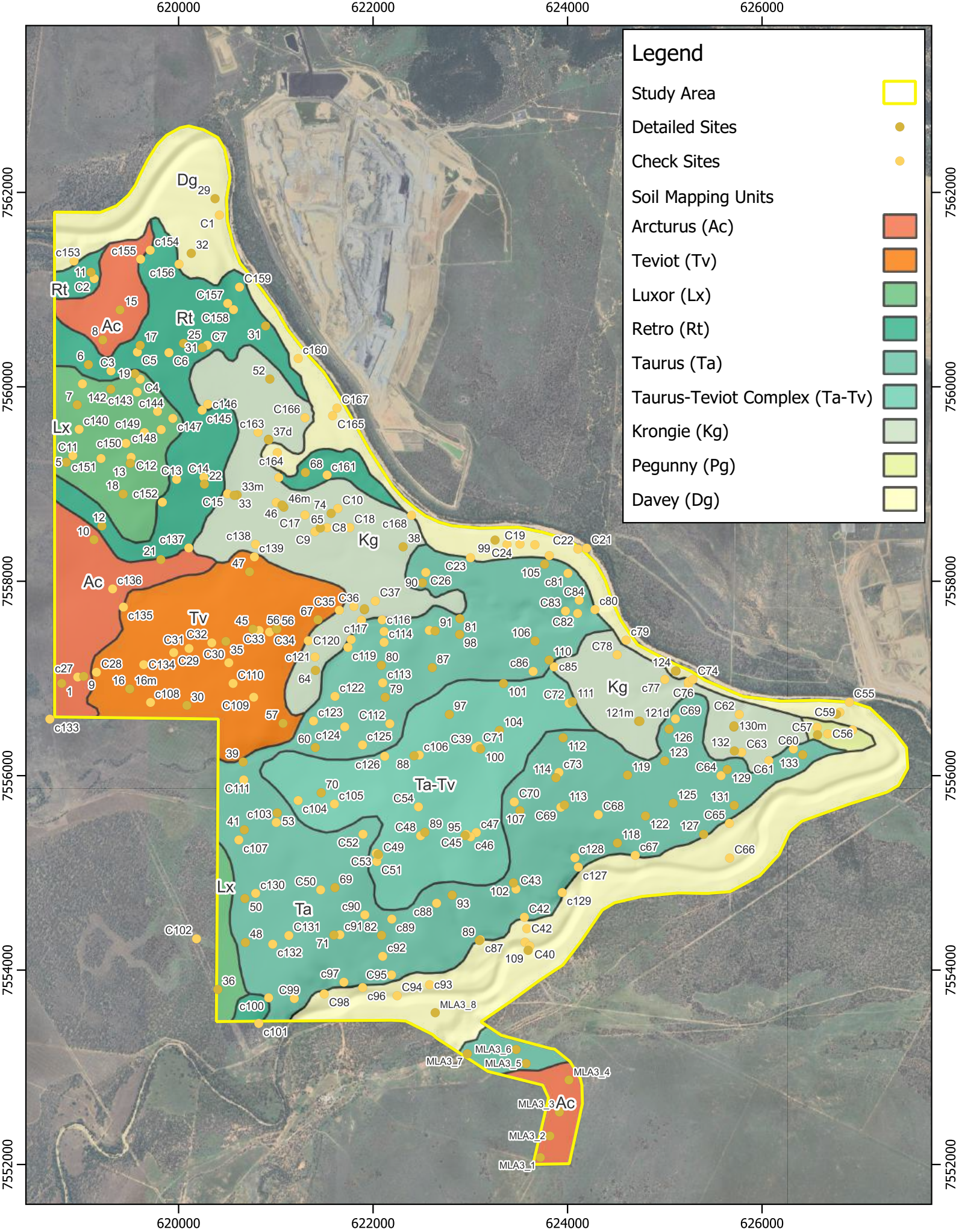


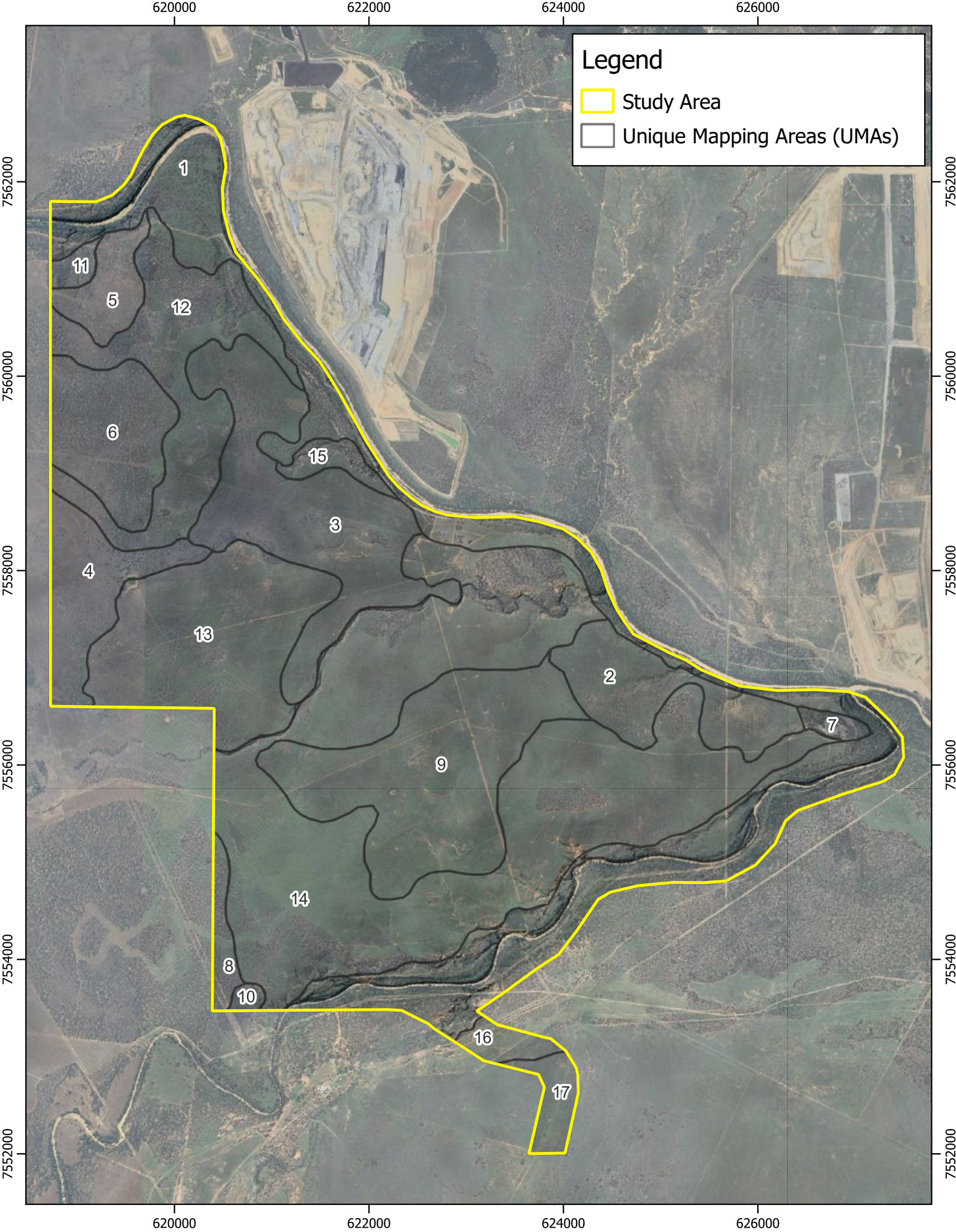


Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:60,000

Figure A8
Existing Soils Information
Stanmore
Issac Downs Extension Soil Survey

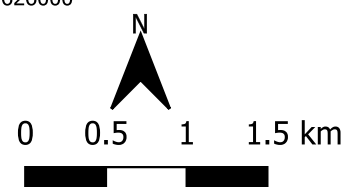


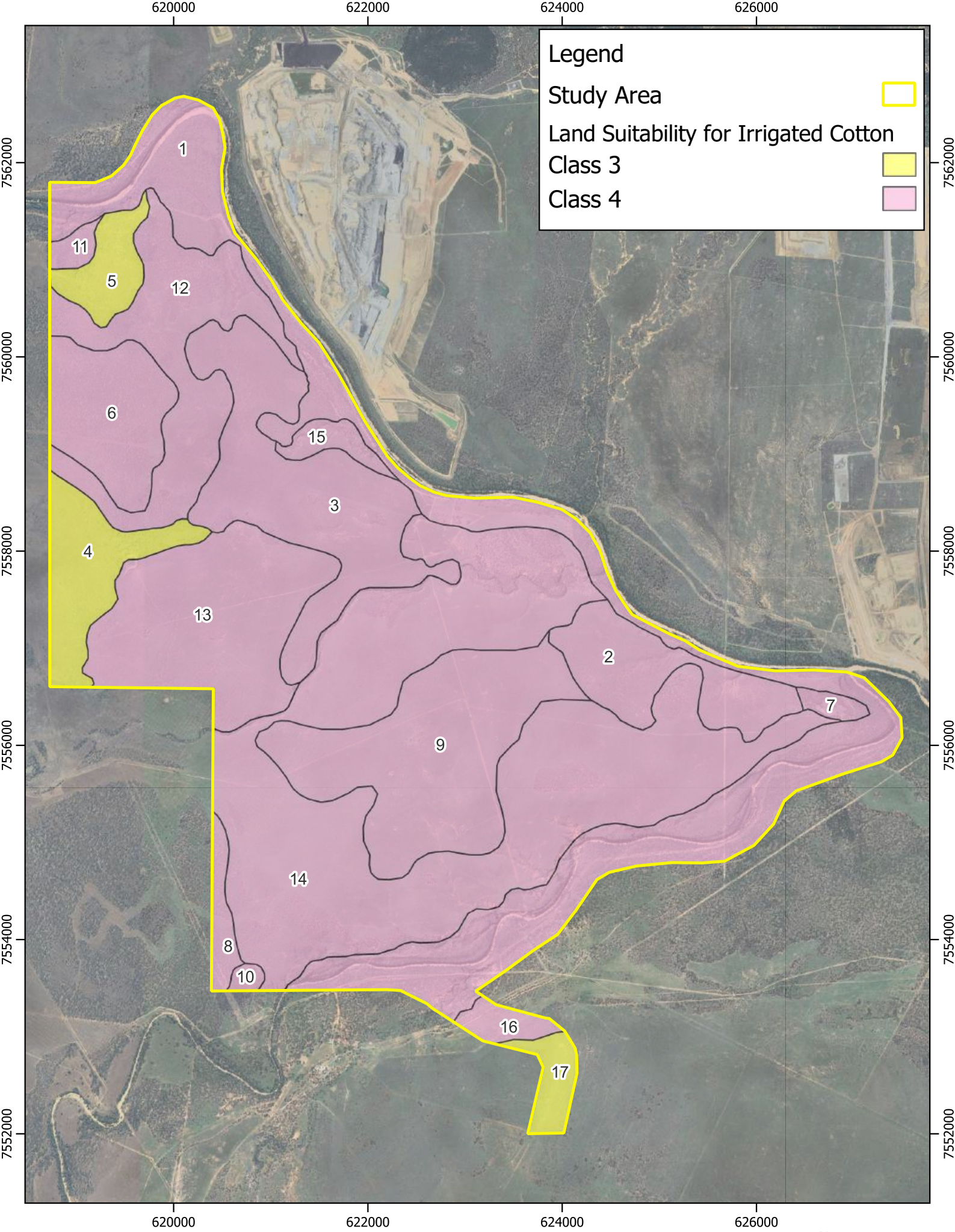




Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A10
Unique Mapping Areas
Stanmore
Issac Downs Extension Soil Survey





Legend

Study Area



Land Suitability for Irrigated Cotton

Class 3



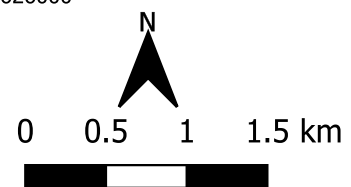
Class 4

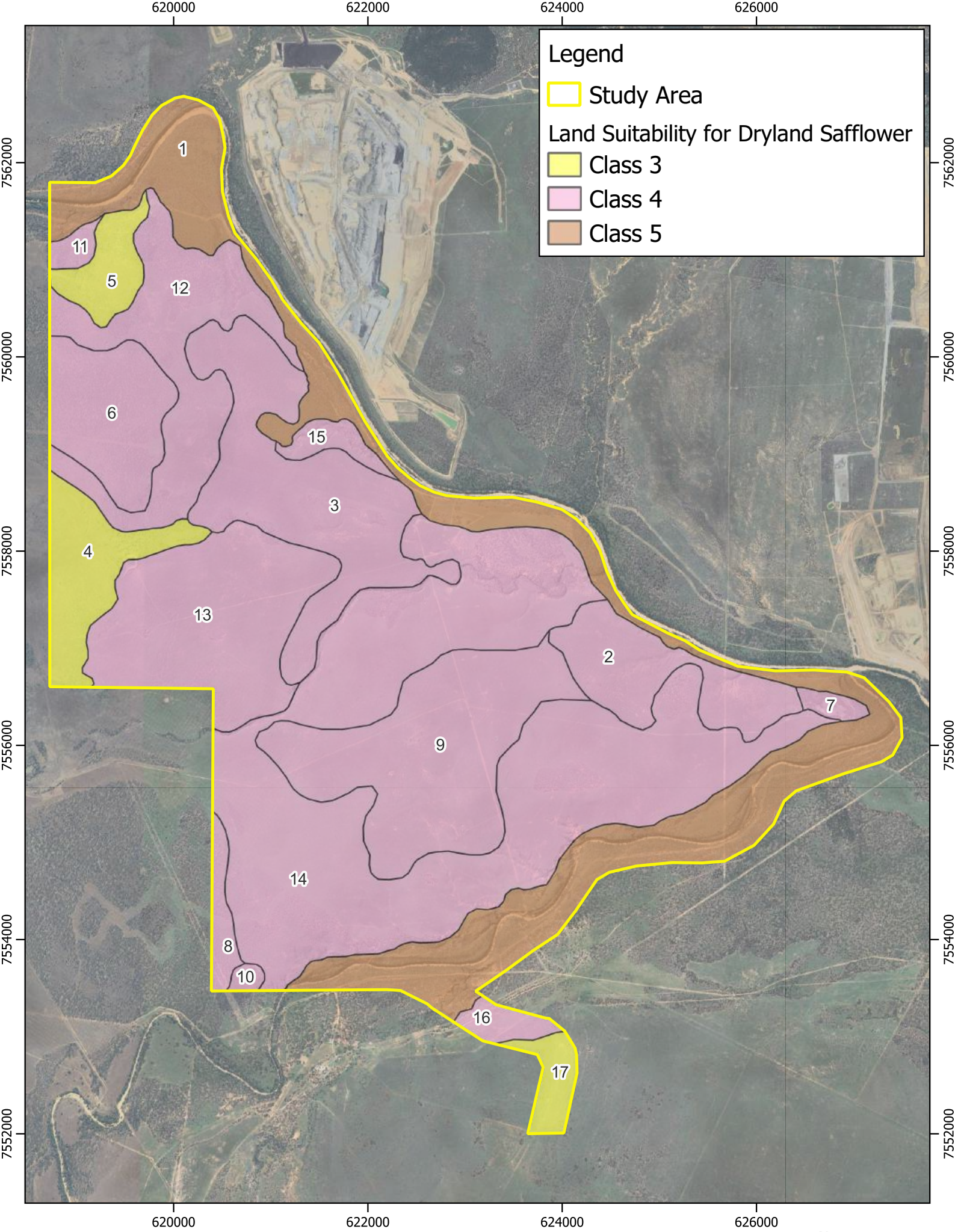


Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A11
LSC Irrigated Cotton
Stanmore

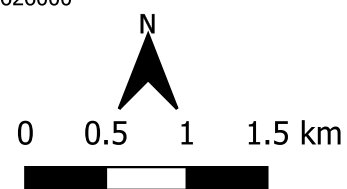
Issac Downs Extension Soil Survey

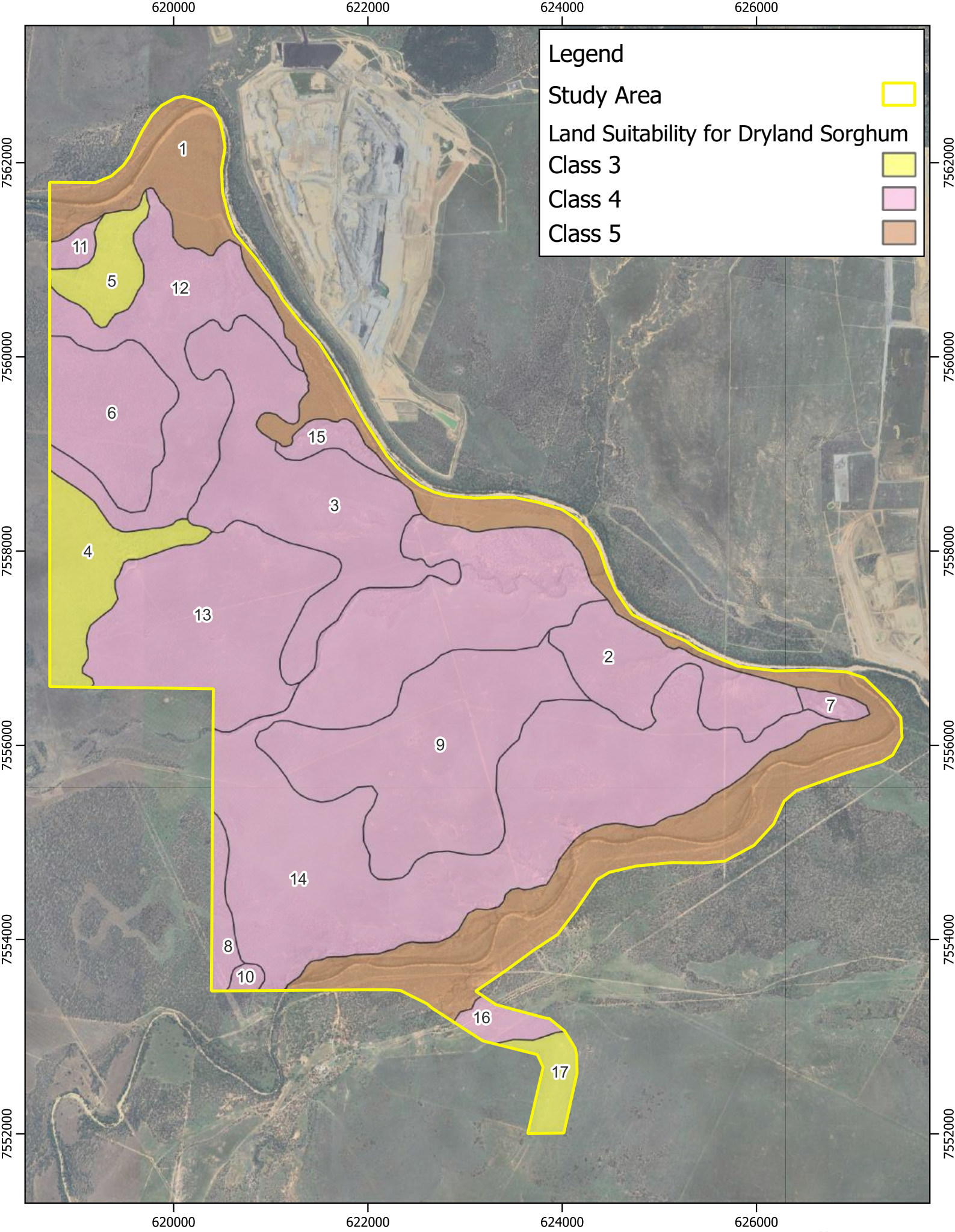




Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A12
LSC Dryland Safflower
Stanmore
Issac Downs Extension Soil Survey

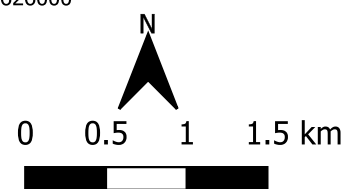


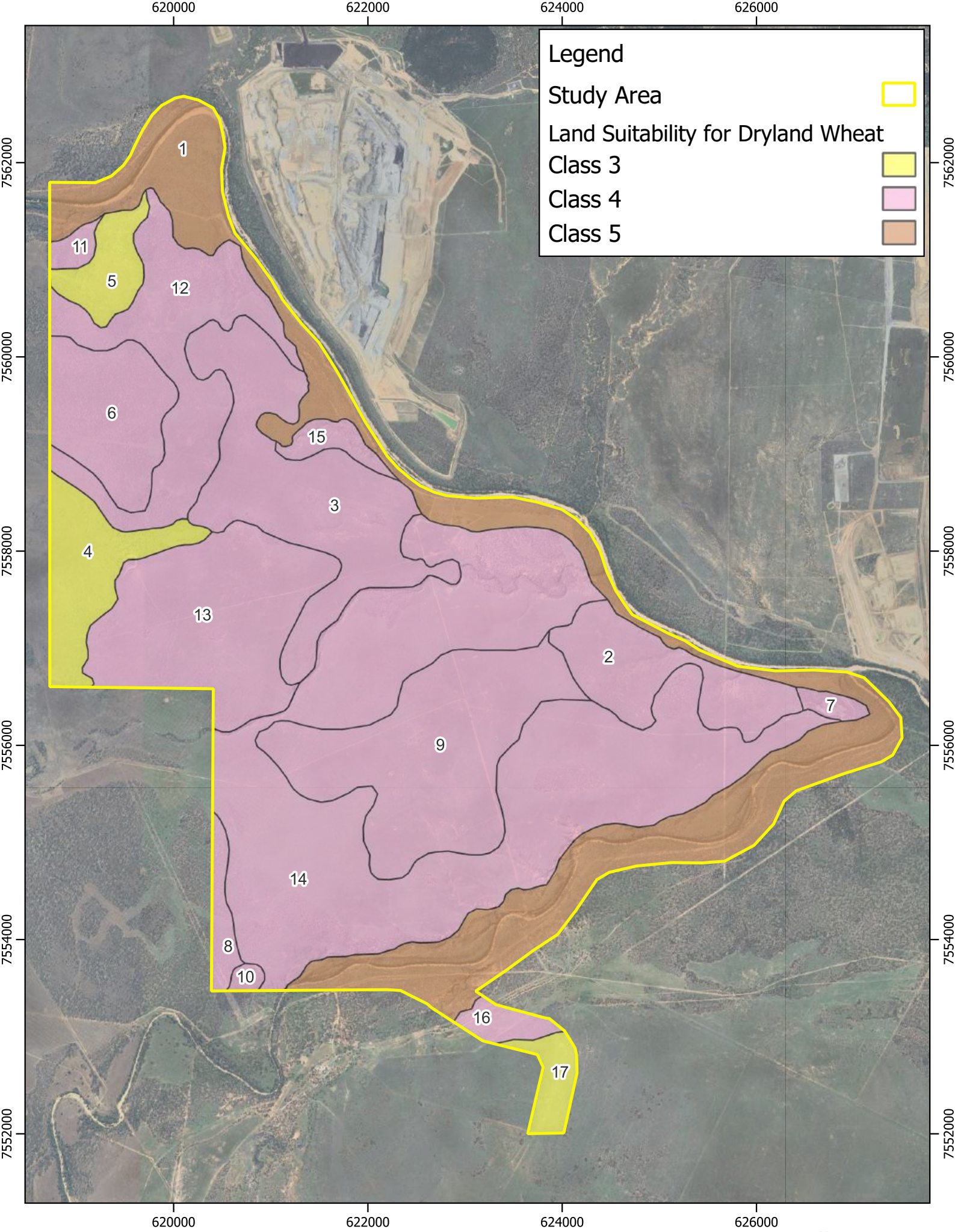


Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A13
LSC Dryland Sorghum
Stanmore

Issac Downs Extension Soil Survey

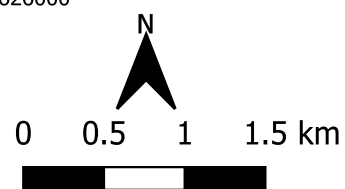


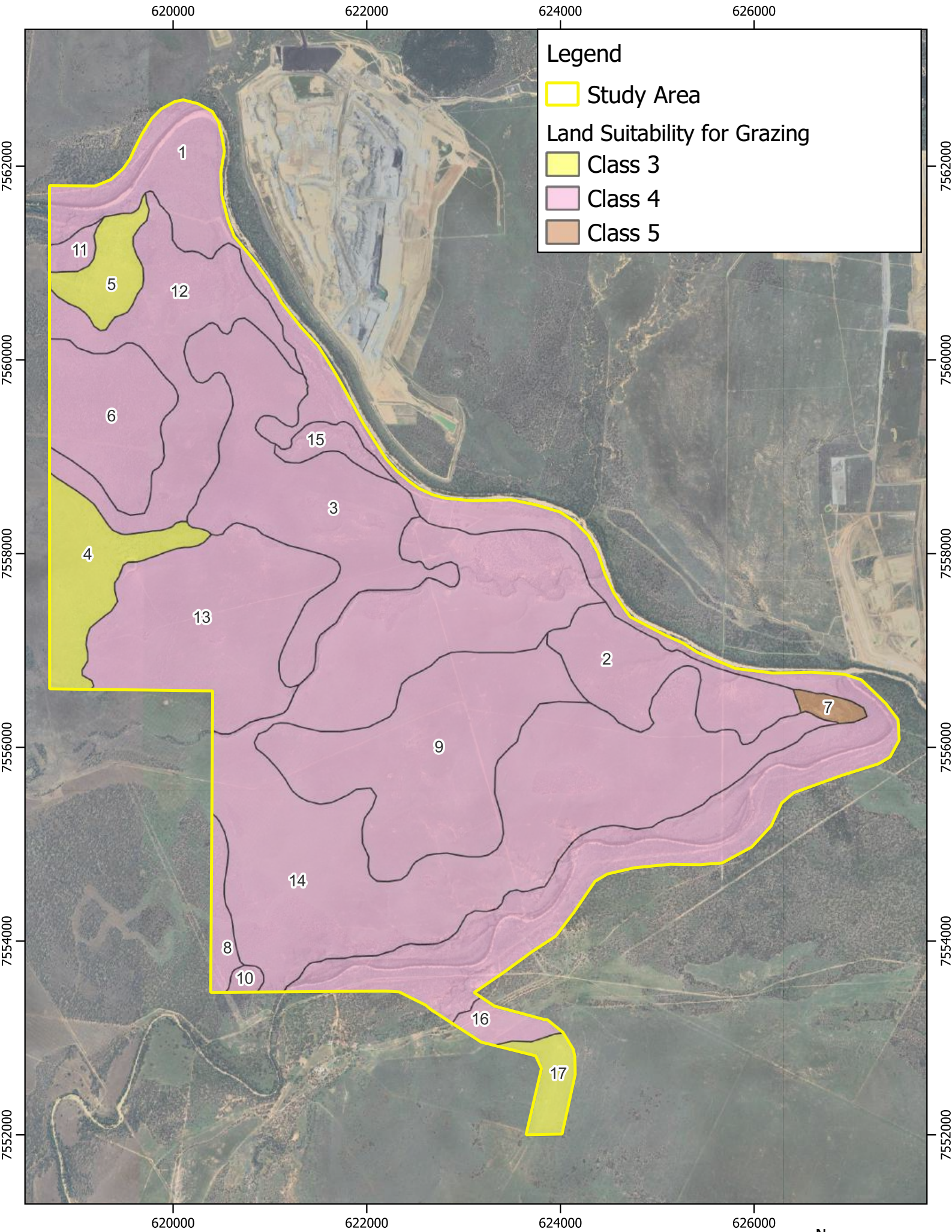


Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A14
LSC Dryland Wheat
Stanmore

Issac Downs Extension Soil Survey

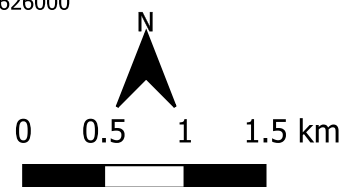


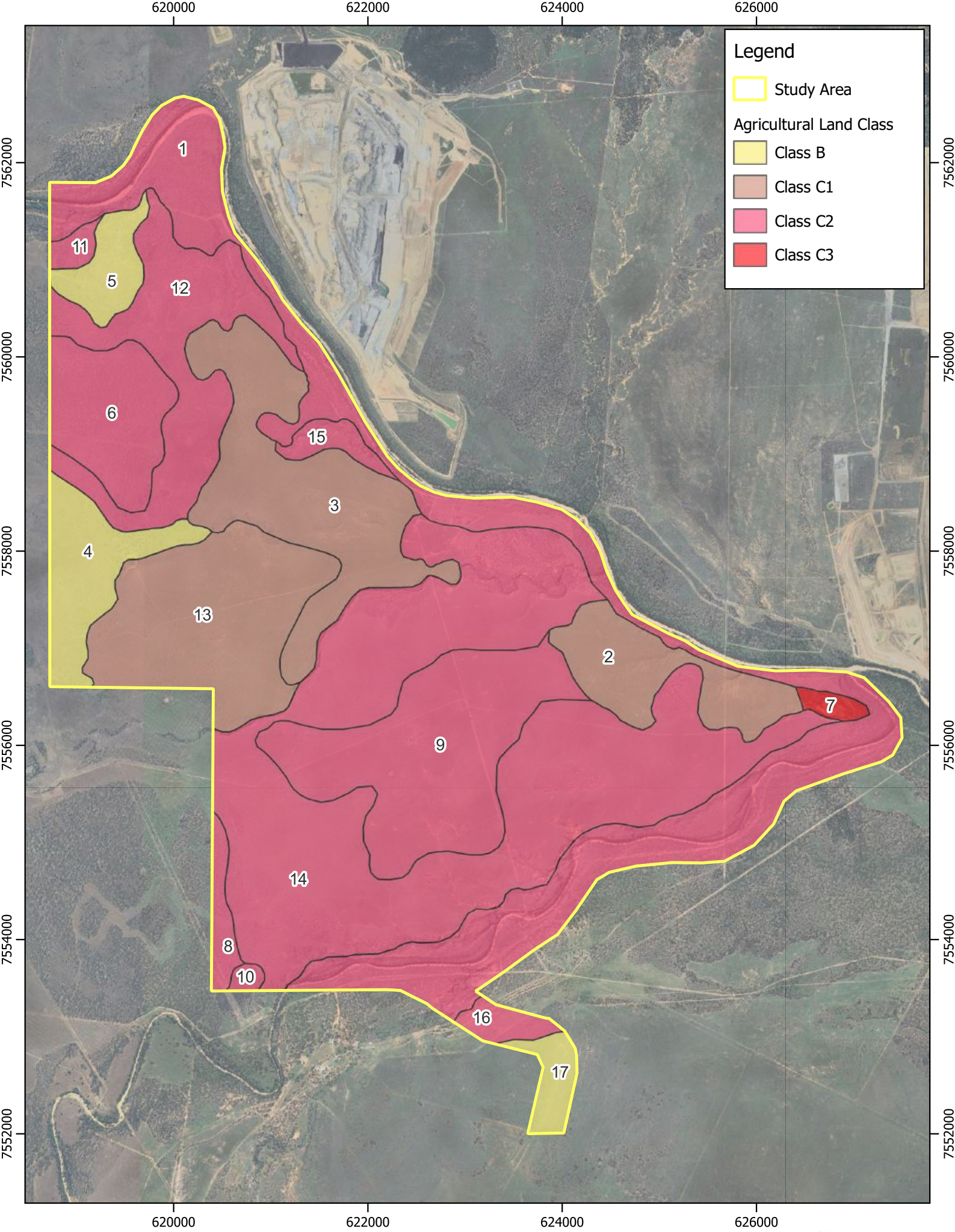


Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A15
LSC Grazing
Stanmore

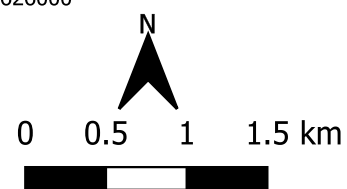
Issac Downs Extension Soil Survey





Coordinate System:
GDA 2020 MGA Zone 55
Projection: Transverse Mercator
Imagery: Google satellite
Scale: 1:50,000

Figure A16
Agricultural Land Classification
Stanmore
Issac Downs Extension Soil Survey



APPENDIX B: TABLES

This section presents the tables referenced in the main report.

Table B1. Mean maximum and minimum temperatures for each month recorded at Moranbah water treatment plant (1986 – 2012). Adapted from Bureau of Meteorology (2024).

Temp.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Noc	Dec	Annual
Mean Max. (°C)	33.9	33.1	32.2	29.6	26.5	23.7	23.6	25.5	29.3	32.3	33.1	33.9	29.7
Mean Min. (°C)	21.9	21.8	20.2	17.6	14.2	11.1	9.8	11.1	14.1	17.6	19.4	21.1	16.7

Table B2. Mean rainfall for each month recorded at Moranbah water treatment plant (1986 – 2012). Adapted from Bureau of Meteorology (2024).

Rainfall	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Noc	Dec	Annual
Mean (mm)	104	101	55	36	35	22	18	25	9	35	69	104	613

Table B3. Preclearance broad vegetation groups descriptions and their occurrence across the study area expressed as a percentage. Adapted from Neldner et al. (2023).

BVG Code	Description	Occurrence (%)
17a	Woodlands dominated by <i>Eucalyptus populnea</i> (poplar box) or <i>E. Brownii</i> (Reid River box) on alluvium, sands plains and footslopes of hills and ranges.	52
25a	Open forests to woodlands dominated by <i>Acacia harpophylla</i> (brigalow) sometimes with <i>Casuarina cristata</i> (belah) on heavy clay soils.	29
16a	Open forest and woodlands dominated by <i>Eucalyptus camaldulensis</i> (river red gum) (or <i>E. tereticornis</i> (blue gum)) and <i>E. coolabah</i> (coolabah) fringing drainage lines.	9
16c	Woodlands and open woodlands dominated by <i>Eucalyptus coolabah</i> (coolabah) or <i>E. microtheca</i> (coolabah) or <i>E. largiflorens</i> (black box) or <i>E. tereticornis</i> (blue gum) or <i>E. chlorophylla</i> on floodplains.	4
11a	Moist to dry open forests to woodlands dominated by <i>Eucalyptus orgadophila</i> (mountain coolibah). Occasionally dominated by <i>E. tereticornis</i> (blue gum), <i>E.</i>	3

	<i>melliodora</i> (yellow box), <i>E. albens</i> (white box), <i>E. crebra</i> (narrow-leaved red ironbark) or <i>E. melanophloia</i> (silver-leaved ironbark)	
9e	Open forests, woodlands and open woodlands dominated by <i>Corymbia clarksoniana</i> (grey bloodwood) or <i>C. novoguineensis</i> or <i>C. intermedia</i> (pink bloodwood) or <i>C. polycarpa</i> (long-fruited bloodwood). Frequently with <i>Erythrophleum chlorostachys</i> (red ironwood) or <i>Eucalyptus platyphylla</i> (poplar gum) predominantly on coastal sandplains and alluvia.	1
30a	Tussock grasslands dominated by <i>Astrebla</i> spp. (mitchell grass) or <i>Dichanthium</i> spp. (bluegrass) often with <i>Eulalia aurea</i> (silky browntop) on alluvia.	1
17b	Woodlands and open woodlands dominated by <i>Eucalyptus melanophloia</i> (silverleaved ironbark) plains and footslopes of hills and ranges.	1
34d	Palustrine wetlands. Freshwater swamps, springs, and billabongs on floodplains ranging from permanent and semi-permanent to ephemeral.	<1
18b	Woodlands dominated <i>Eucalyptus crebra</i> (narrow-leaved red ironbark) frequently with <i>Corymbia</i> spp. or <i>Callitris</i> spp. on flat to undulating plains.	<1
30b	Tussock grasslands dominated by <i>Astrebla</i> spp. (mitchell grass) or <i>Dichanthium</i> spp. (bluegrass) often with <i>Iseilema</i> spp. on undulating downs or clay plains.	<1

Table B4. Surface geology immediately underlying the study area and its occurrence. Adapted from Geoscience Australia (2015).

Geology	Mapping Code	Age	Description	Occurrence (%)
TQa-QLD	TQa	Late Tertiary – Quaternary	Locally red-brown mottled, poorly consolidated sand, silt, clay, minor gravel; high-level alluvial deposits (generally related to present stream valleys but commonly dissected).	43
Qa-QLD	Qa	Quaternary	Clay, silt, sand and gravel; flood-plain alluvium.	32
Qr-QLD	Qr	Quaternary	Clay, silt, sand, gravel and soil; colluvial and residual deposits.	21
Qr/b-QLD	Qr/b	Quaternary	Black soil, silt and mud; residual and colluvial deposits (commonly basalt-	3

			derived or over limestone in Georgina Basin).	
Rewan Group	Rr	Early – Middle Triassic	Lithic sandstone, pebbly lithic sandstone, green to reddish brown mudstone and minor volcanic lithic pebble conglomerate.	1
TQr-QLD	TQr	Tertiary - Quaternary	Clay, silt, sand, gravel and soil; colluvial and residual deposits.	<1
Tb-QLD	Tb	Tertiary	Mostly olivine basalt flows and some plugs; some areas of nephelinite, basanite etc.	<1

Table B5. Linkage between the Blackwater Land System and the associated SPC/ASC soil types.

Land System	SPC	Brief soil profile description	Australian Soil Classification
BL1	Wyseby (Wy)	Wy – Moderately thick clay loamy surface over acid to alkaline, brown clay subsoil; usually higher alluvium with surface coarse billy gravel common.	Chromosols
BL2	Taurus (Ta)	Ta – Moderately thick sandy or loamy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil: deep to very deep soil.	Chromosols
BL3	Rolleston (Ro)	Ro – very deep cracking clay soils, strongly alkaline near the surface and moderately acid beneath	Vertosols
BL4	Rolleston (Ro) Teviot (Tv)	Ro – very deep cracking clay soils, strongly alkaline near the surface and moderately acid beneath Tv – Moderately to strongly self-mulching surface occasionally clay loamy, with mottled, grey or brown subsoils: strongly acid at depth; surface billy gravel common.	Vertosols Chromosols
BL5	Pegunny (Pg)	Pg – Weakly self-mulching to crusting surface with grey, mottled, strongly acidic, salty and sodic subsoil; melonhole; depressions hold water for long periods.	Vertosols
BL6	Taurus (Ta)	Ta – Moderately thick sandy or loamy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil: deep to very deep soil.	Chromosols

Table B6. Linkage between the Monteagle Land System and the associated SPC/ASC soil types.

Land System	SPC	Brief soil profile description	Australian Soil Classification
M01	Annandale (An) and Carlo (Cc)	An – Sandy surface grading to acid to neutral, red, clay loamy to light clay subsoil; very deep soil often with ironstone gravels. Cc – A hard setting or firm pedal, alkaline, black, brown or red non-cracking clay over marl or labile, fine grained calcareous sedimentary rocks.	Red Kandosol Red Dermosol
M02	Luxor (Lx)	Lx - Thick sandy surface over acid to mildly alkaline, grey, brown or red clay subsoil; deep to very deep.	Sodosol
M03	Broadmeadow (Bm) Luxor (Lx)	Bm - Thick sandy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil; deep to very deep soil Lx - Thick sandy surface over acid to mildly alkaline, grey, brown or red clay subsoil.	Sodosol
M04	Taurus (Ta) Springwood (Sp) Broadmeadow (Bm)	Ta - Moderately thick sandy or loamy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil: deep to very deep soil. Sp – Moderately thick sand or loamy surface over acid to mildly alkaline, yellow or grey clay subsoil; deep to very deep soil. Bm - Thick sandy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil; deep to very deep soil.	Sodosol
M05	Pegunny (Pg) Rolleston (Ro)	Pg - Weakly self-mulching to crusting surface with grey, mottled, strongly acidic, salty and sodic subsoil; melonholes; depressions hold water for long periods. Ro - Thin self-mulching or crusting surface, occasionally clay loamy, with mottled, grey or brown subsoils: strongly acid at depth; surface billy gravel common.	Vertosol
M06	Broadmeadow (Bm)	Bm - Thick sandy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil; deep to very deep soil.	Sodosol

Table B7. Linkage between the Connors Land System and the associated SPC/ASC soil types.

Land System	SPC	Brief soil profile description	Australian Soil Classification
Co1	Clematis (Cl)	Cl – Uniform loams to clays, often silty; often flooded, broadleaves and lower flats; mildly to moderately alkaline at depth.	Tenosols Dermosols Kandosols
Co2	Luxor (Lx) Davy (Dg)	Lx - Thick sandy surface over acid to mildly alkaline, grey, brown or red clay subsoil. Dg – Brown uniform sands on levees; acid to neutral pH.	Sodosols/ Kurosols Tenosols Rudosols Arenosols
Co3	Springwood (Sp) Broadmeadow (Bm) Luxor (Lx)	Sp – Moderately thick sand or loamy surface over acid to mildly alkaline, yellow or grey clay subsoil; deep to very deep soil. Bm - Thick sandy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil; deep to very deep soil. Lx - Thick sandy surface over acid to mildly alkaline, grey, brown or red clay subsoil.	Sodosols Kurosols
Co4	Springwood (Sp) Taurus (Ta)	Sp – Moderately thick sand or loamy surface over acid to mildly alkaline, yellow or grey clay subsoil; deep to very deep soil. Ta - Moderately thick sandy or loamy surface over mottled, strongly alkaline, red, brown or grey, columnar clay subsoil: deep to very deep soil.	Sodosols Kurosols
Co5	Warrinilla (Wn) Consuelo (Co) Moolayember (Mo) Wyseby (Wy)	Wn – Brown or black loam to medium clay 0.30-0.90 m deep over massive, sandy buried layers; variable pH; usually flooded country Co – Stratified; brown or black clay loam to heavy clay; acid to neutral pH. Mo – Brown or black sand to loam 0.4-0.6 m deep over buried clay substrata; neutral pH. Wy – Moderately thick clay loamy surface over acid to alkaline, brown clay subsoil; usually higher alluvium with surface coarse billy gravel common.	Tenosols Dermosols Sodosols Kurosols
Co6	Vermont (Vt) Pegunny (Pg)	Vt – Strongly self-mulching surface with alkaline black subsoil; flat often flooded country; includes minor drainage lines within basalt country.	Vertosols

		Pg - Weakly self-mulching to crusting surface with grey, mottled, strongly acidic, salty and sodic subsoil; melonholes; depressions hold water for long periods.	
Co7	Vermont (Vt) Pegunny (Pg)	Vt – Strongly self-mulching surface with alkaline black subsoil; flat often flooded country; includes minor drainage lines within basalt country. Pg - Weakly self-mulching to crusting surface with grey, mottled, strongly acidic, salty and sodic subsoil; melonholes; depressions hold water for long periods.	Vertosols

Table B8. Linkage between the Oxford Land System and the associated SPC/ASC soil types.

Land System	SPC	Brief soil profile description	Australian Soil Classification
Ox1	Bruce (Br), Glenora (Gl), Rugby (Rb)	Br – shallow, neutral to alkaline, black, grey or brown clay; often gravelly or rocky with moderately to strongly self-mulching surface. Gl – Strongly self-mulching surface over neutral to alkaline, brown or red, subsoil; moderately deep to deep soil; surface billy gravel common. Rb – Shallow, neutral, brown, loam to clay; rocky areas usually on upper slopes or hillcrest.	Vertosols, Rudosols, Tenosols, Dermosols
Ox2	Arcturus (Ac), Bruce (Br)	Ac – Strongly self-mulching surface over alkaline, black subsoil; moderately deep soil; linear gilia may occur. Br – shallow, neutral to alkaline, black, grey or brown clay; often gravelly or rocky with moderately to strongly self-mulching surface.	Vertosols
Ox3	May downs (Md), Arcturus (Ac)	Md – Strongly self-mulching surface over alkaline, black subsoil, deep to very deep profile. Ac – Strongly self-mulching surface over alkaline, black subsoil; moderately deep soil; linear gilia may occur.	Vertosols
Ox4	Vermont (Vt)	Vt – Strongly self-mulching surface with alkaline black subsoil; flat often flooded country; includes minor drainage lines within basalt country.	Vertosols

Table B9. Relationship between soil types and existing broad scale government mapping. (adapted from Tuck and Baker, 2007).

Soil Type	Description	Australian Soil Type (Isbell, 1998)	CSIRO (Gunn et al, 1967) land system/soil type
A1	Alluvial sandy duplex of mixed Poplar Box and Brigalow.	Brown Sodosol	Connors/Luxor
A3	Alluvial silty clay with open Poplar box with Brigalow and Flooded Coolibah.	Brown Sodosol	Connors/Springwood
A4	Alluvial plain of dark cracking clay with Brigalow.	Black Vertosol	N/A
E1	Poplar Box sandy duplex on undulating plains	Brown Sodosol	Monteagle/Luxor
E1 variant	Relic ridgelines above E1 with shallower duplex with Silver Leaf and Narrow Leaf Ironbark with Poplar Box.	Brown Sodosol	Monteagle/Luxor
B1	Uniform grey/brown clays with areas of gilgai on flat to gently undulating plains with Brigalow.	Vertosol	Daunia/Teviot
B2	Sandy uniform clay or thin red/brown duplex soils overlying weathered shale / mudstone with Brigalow on undulating plains. Sandy surface which is often gravelly.	Red Chromosol	Daunia/Taurus

APPENDIX C: LAND SUITABILITY ASSESSMENT

C.1 Land Suitability for Cropping

The following section details each hazard criteria for cropping as a land use.

The results of the land suitability assessment are detailed in Section C1.9 Table C9 – C12.

C.1.1 Soil water availability (M)

Water availability refers to the limitation of soil water supply within the root zone and is defined by the moisture present between field capacity and permanent wilting point. This is known as Plant Available Water Capacity (PAWC) and is estimated on soil texture. Water availability is only determined to the effective rooting depth (ERD), which is the depth at which approximately 90% plant roots will extract water, and the depth that is free of physical or biophysical hazards to growth such as rock, pH, and salinity extremes. For soil with no physical or biophysical restriction, an ERD of 0.6 m is assumed.

Table C1 presents the water availability hazard criteria for cropping. Differing groups of crops have different criteria for PAWC classes.

Table C1. Hazard criteria for soil water availability (M).

PAWC (mm/m)	Land Suitability Class		
	Cotton	Safflower, Sorghum	Wheat
>150	1	2	2
125 – 150	2	2	3
100 – 125	3	3	4
75 – 100	3	4	5
50 – 75	4	5	5
<50	5	5	5

C.1.2 Narrow moisture range (Pm)

The narrow moisture range hazard defines the moisture range at which a soil can be cultivated and trafficked without structural degradation. The wider the moisture range the soil can be trafficked or worked, the higher the suitability for cropping.

Table C2 presents the narrow moisture range hazard criteria for cropping.

Table C2. Hazard criteria narrow moisture range (Pm).

Description	Land Suitability Class
Wide moisture range for cultivation – moderately well drained to rapidly drained; not hard setting when dry and not 'spewy' (i.e. boggy) when wet. Deep sands and thick sandy surfaced texture contrast soils.	1
Moderate moisture range for cultivation – moderately well drained to rapidly drained; not hard setting when dry and not 'spewy' when wet. Moderately to strongly self-mulching clays.	1
Moderate moisture range for cultivation – moderately well drained to rapidly drained; predominantly hard setting when dry and not 'spewy' when wet. Well drained earths and moderately well drained hard setting loamy surfaced soils.	2
Moderate moisture range for cultivation (but less than Pm 3) – imperfectly drained to moderately well drained; not hard setting (or only weakly) when dry and 'spewy' when wet. Sandy surfaced (less than 0.4 m), sodic texture contrast soils.	3
Narrow moisture range for cultivation – imperfectly drained to moderately well drained; hard setting, firm or weakly self-mulching when dry and not 'spewy' when wet. Hard setting, firm or weakly self-mulching, pedal clays.	3
Narrow moisture range for cultivation – imperfectly drained to moderately well drained; hard setting when dry and 'spewy' when wet. Loamy surfaced (less than 0.4 m), sodic texture contrast soils or dermosols.	3
Very narrow moisture range for cultivation – imperfectly drained to moderately well drained; very hard setting when dry and 'spewy' when wet. Very hard setting, sodic clays.	4

C.1.3 Microrelief (Tm)

Significant microrelief impacts the suitability of land through potential earthwork requirements to level the land or create the required slope. The type, distribution, and magnitude of microrelief is used to determine the magnitude of the hazard.

Table C3 presents the microrelief hazard criteria for cropping.

Table C3. Hazard criteria for microrelief (Tm).

Description	Class
No microrelief across the majority (greater than 70%) of the land surface	1
Very weakly developed microrelief (VI less than 0.1 m) that occurs across much (30–70%) of the land surface	2
Normal, lattice or linear gilgai (VI 0.1–0.3 m) that occurs across less than 30% of the land surface	2
Normal, lattice or linear gilgai (VI 0.1–0.3 m) that occurs across much (30–70%) of the land surface	2
Normal, lattice or linear gilgai (VI 0.1–0.3 m) across the majority (greater than 70%) of the land surface	2
Shallow, melonhole gilgai (VI 0.3–0.6 m) that occurs across less than 30% of the land surface	2
Shallow, melonhole gilgai (VI 0.3–0.6 m) that occurs across much (30–70%) of the land surface	3
Shallow, melonhole gilgai (VI 0.3–0.6 m) across the majority (greater than 70%) of the land surface	4
Strongly developed, deep, melonhole gilgai (VI 0.6–1.5 m) that occurs across less than 30% of the land surface	4
Strongly developed, deep, melonhole gilgai (VI 0.6–1.5 m) that occurs across much (30–70%) of the land surface	5
Strongly developed, deep, melonhole gilgai (VI 0.6–1.5 m) across the majority (greater than 70%) of the land surface	5

C.1.4 Surface condition (Ps)

Soil surface conditions may affect seedling emergence or establishment through hard-setting, crusting, coarse self-mulching, or hydrophobic conditions. Management techniques may be used to handle these restrictions, such as maintaining moist surface soil in irrigated systems to increase infiltration in hard-setting surfaces.

Table C4 presents the surface condition hazard criteria for cropping.

Table C4. Hazard criteria for surface condition (Ps).

Description	Class
Soils with a soft or loose sandy to sandy loam surface horizons	1
Very fine self-mulching clays (peds less than 2 mm)	1
Soils with soft, firm or only weakly hard setting, sandy to loamy surface horizons	2
Fine self-mulching clays (peds greater than 2–5 mm)	2
Coarse self-mulching clays (peds greater than 5–10 mm); poor seed soil contact due to separation of large peds with drying	3
Clay soils with hard setting, firm pedal or weakly self-mulching surface horizons	3
Very coarse self-mulching clays (peds greater than 10 mm)	4
Loamy, fine sand, silty or clayey surface soils that are extremely hard setting, massive or crusting	4

C.1.5 Rockiness (R)

Rockiness refers to rock outcrops and coarse fragments within the rooting zone that impede cultivation. The impact on cultivation varies with the size, content, and distribution of coarse fragments and rocks. Rockiness of the soil may also affect other soil properties such as infiltration rate, susceptibility to soil compaction, and soil water storage.

Table C5 presents the rockiness hazard criteria for cropping.

Table C5. Hazard criteria for rockiness (R).

Surface	Class 1	Class 2	Class 3	Class 4	Class 5
Gravel, < 20 mm (%)	<10	10 – 50	>50	–	–
Gravel, 20 – 60 mm (%)	–	<10 – 20	20 – 50	>50	–
Cobble, 60 – 200 mm (%)	–	–	<10 – 20	20 – >50	–
Stone, 200 – 600 mm (%)	–	–	<10 – 20	20 – >50	–
Boulders, >600 mm (%)	–	–	<10 – 20	–	20 – >50

C.1.6 Wetness (W)

Wetness hazard considers the adverse effects of excess water on crop and pasture production. Waterlogged soils reduce plant growth and may prevent operation of machinery. Wetness hazard is assessed on estimates of permeability (ability of soil to transmit water internally) and drainage (the ability of soil to drain to moisture levels conducive to plant growth).

Table C6 presents the wetness hazard criteria for cropping. Differing groups of crops have different criteria for wetness hazard classes.

Table C6. Hazard criteria for wetness (W).

Description	Sorghum, Wheat	Safflower	Cotton
Very poorly to poorly drained	5	5	5
Imperfectly drained and highly permeable	2	3	3
Imperfectly drained and moderately permeable	3	3	3
Imperfectly drained and slowly permeable	4	4	4
Moderately well drained and highly permeable	1	1	2
Moderately well drained and moderately permeable	1	1	2
Moderately well drained and slowly permeable	2	2	2
Well drained	1	1	1
Rapidly drained	1	1	1

C.1.7 Water erosion (E)

Cultivation generally increases the potential for soil loss during rainfall. Clearing native vegetation can decrease groundcover, increase surface runoff, increase water velocity, and decrease soil permeability. These effects may result in higher than natural levels of soil loss through erosion. Water erosion hazard is determined on the dispersity and coherence of surface soil for a particular topographical slope.

Table C7 presents the water erosion hazard criteria used for cropping.

Table C7. Criteria used for determining water erosion hazard for cropping (E).

Slope (%)	Surface Soil	Class
<0.5	Non-dispersive moderate to strongly coherent soil in the surface 200 mm	1
	Non-dispersive weakly coherent soil in the surface 200 mm	1
	Dispersive soil in the surface 200 mm	2
0.5–1	Non-dispersive moderate to strongly coherent soil in the surface 200 mm	1
	Non-dispersive weakly coherent soil in the surface 200 mm	2
	Dispersive soil in the surface 200 mm	3
>1–3	Non-dispersive moderate to strongly coherent soil in the surface 200 mm	1
	Non-dispersive weakly coherent soil in the surface 200 mm	3
	Dispersive soil in the surface 200 mm	4
>3–5	Non-dispersive moderate to strongly coherent soil in the surface 200 mm	3
	Non-dispersive weakly coherent soil in the surface 200 mm	3
	Dispersive soil in the surface 200 mm	5
>5–8	Non-dispersive moderate to strongly coherent soil in the surface 200 mm	3
	Non-dispersive weakly coherent soil in the surface 200 mm	4
	Dispersive soil in the surface 200 mm	5
>8	Non-dispersive moderate to strongly coherent soil in the surface 200 mm	5
	Non-dispersive weakly coherent soil in the surface 200 mm	5
	Dispersive soil in the surface 200 mm	5

C.1.8 Water erosion (E)

Erosive subsoil may result in gully or tunnel erosion. Subsoil erosion hazard is determined on indicators of dispersivity, such as exchangeable sodium percentage (ESP), sodium absorption ration (SAR) and salinity of soil water, and the ratio of calcium to magnesium cations. Subsoil erosion risk is assessed on the top layer of the B horizon or at 0.5 m depth, whichever occurs first.

Table C8 presents the subsoil erosion hazard criteria for cropping.

Table C8. Hazard criteria for subsoil erosion (Es).

Slope (%)	Subsoil	Class
<0.5	No subsoil dispersion	1
	Low to moderately dispersive subsoil	1
	Strongly dispersive subsoil	2
0.5–1	No subsoil dispersion	1
	Low to moderately dispersive subsoil	2
	Strongly dispersive subsoil	3
>1–3	No subsoil dispersion	1
	Low to moderately dispersive subsoil	3
	Strongly dispersive subsoil	4
>3–5	No subsoil dispersion	3
	Low to moderately dispersive subsoil	3
	Strongly dispersive subsoil	5
>5–8	No subsoil dispersion	3
	Low to moderately dispersive subsoil	4
	Strongly dispersive subsoil	5
>8	No subsoil dispersion	5
	Low to moderately dispersive subsoil	5
	Strongly dispersive subsoil	5

C.1.9 Results

Each UMA for the SMUs is assessed against the hazard criteria for cropping land suitability. The results of the assessment are detailed in Table C9 – C12.

Table C9. Land suitability assessment results for rainfed cotton.

SMU	UMA	Cotton	LSC
		Limitation	
Taurus (Ta)	14	M3, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
	16	M3, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
Davey (Dg)	1	M4, Pm1, Tm1, Ps1, R1, W1, E2, Es1	4
Krongie (Kr)	2	M1, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
	3	M1, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Taurus-Teviot Complex (Ta-Tv)	9	M2, Pm3, Tm2, Ps4, R2, W3, E4, Es4	4
Retro (Rt)	10	M2, Pm3, Tm1, Ps4, R3, W3, E4, Es4	4
	11	M2, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	12	M2, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	15	M2, Pm3, Tm1, Ps3, R1, W3, E4, Es4	4
Teviot (Tv)	13	M1, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Arcturus (Ac)	4	M1, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	5	M1, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	17	M1, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
Luxor (Lx)	6	M3, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
	8	M3, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
Pegunny (Pg)	7	M1, Pm3, Tm2, Ps3, R1, W4, E4, Es4	4

Table C10. Land suitability assessment results for rainfed safflower.

SMU	UMA	Safflower	LSC
		Limitation	
Taurus (Ta)	14	M3, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
	16	M3, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
Davey (Dg)	1	M5, Pm1, Tm1, Ps1, R1, W1, E2, Es1	5
Krongie (Kr)	2	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
	3	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Taurus-Teviot Complex (Ta-Tv)	9	M4, Pm3, Tm2, Ps4, R2, W3, E4, Es4	4
Retro (Rt)	10	M2, Pm3, Tm1, Ps4, R3, W3, E4, Es4	4
	11	M2, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	12	M2, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	15	M2, Pm3, Tm1, Ps3, R1, W3, E4, Es4	4
Teviot (Tv)	13	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Arcturus (Ac)	4	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	5	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	17	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
Luxor (Lx)	6	M2, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
	8	M2, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
Pegunny (Pg)	7	M4, Pm3, Tm2, Ps3, R1, W4, E4, Es3	4

Table C11. Land suitability assessment results for rainfed sorghum.

SMU	UMA	Sorghum	LSC
		Limitation	
Taurus (Ta)	14	M3, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
	16	M3, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
Davey (Dg)	1	M5, Pm1, Tm1, Ps1, R1, W1, E2, Es1	5
Krongie (Kr)	2	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
	3	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Taurus-Teviot Complex (Ta-Tv)	9	M4, Pm3, Tm2, Ps4, R2, W3, E4, Es4	4
Retro (Rt)	10	M2, Pm3, Tm1, Ps4, R3, W3, E4, Es4	4
	11	M2, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	12	M2, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	15	M2, Pm3, Tm1, Ps3, R1, W3, E4, Es4	4
Teviot (Tv)	13	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Arcturus (Ac)	4	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	5	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	17	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
Luxor (Lx)	6	M2, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
	8	M2, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
Pegunny (Pg)	7	M4, Pm3, Tm2, Ps3, R1, W4, E4, Es3	4

Table C12. Land suitability assessment results for rainfed wheat.

SMU	UMA	Wheat	LSC
		Limitation	
Taurus (Ta)	14	M4, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
	16	M4, Pm3, Tm1, Ps3, R2, W3, E4, Es4	4
Davey (Dg)	1	M5, Pm1, Tm1, Ps1, R1, W1, E2, Es1	5
Krongie (Kr)	2	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
	3	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Taurus-Teviot Complex (Ta-Tv)	9	M4, Pm3, Tm2, Ps4, R2, W3, E4, Es4	4
Retro (Rt)	10	M3, Pm3, Tm1, Ps4, R3, W3, E4, Es4	4
	11	M3, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	12	M3, Pm3, Tm1, Ps4, R2, W3, E4, Es4	4
	15	M3, Pm3, Tm1, Ps3, R1, W3, E4, Es4	4
Teviot (Tv)	13	M2, Pm3, Tm4, Ps3, R2, W4, E4, Es4	4
Arcturus (Ac)	4	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	5	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
	17	M2, Pm1, Tm2, Ps3, R2, W3, E3, Es3	3
Luxor (Lx)	6	M2, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
	8	M2, Pm1, Tm1, Ps1, R1, W3, E4, Es3	4
Pegunny (Pg)	7	M4, Pm3, Tm2, Ps3, R1, W4, E4, Es3	4

C.1 Land Suitability for Grazing

The following section details each hazard criteria for grazing as a land use. The hazard criteria used to assess the land suitability for grazing is adopted from DME (1995) and QMRC (2023).

The results of the land suitability assessment are detailed in Section C.2.11 Table C23.

C.2.1 Soil water availability (M)

Water availability refers to the limitation of soil water supply within the root zone and is defined by the moisture present between field capacity and permanent wilting point. This is known as Plant Available Water Capacity (PAWC) and is estimated on soil texture. For soil with no physical or biophysical restriction, an ERD of 0.6 m is assumed.

The hazard criteria used to determine water availability (PAWC) is provided in Table C13.

Table C13. Hazard criteria for soil water availability (M).

PAWC (mm/m)	Class
> 130	1
100 – 130	2
75 - <100	3
50 – 75	4
<50	5

C.2.2 Nutrient deficiency (Nd)

Pasture productivity is restricted by the availability of nutrients that soil can provide. Plant available phosphorus is used to determine the general soil fertility for assessing nutrient deficiency for pasture growth. Plant available P is assessed in the upper 0.1 m of soil, as this increment is where root activity is the highest and where available P stocks are the greatest.

The criteria used to determine nutrient deficiency limitations is provided in Table C14.

Table C14. Criteria used to determine limitations for nutrient deficiency (Nd).

Available P (mg/kg)	Class
>20	1
20 – 14	2
<14 – 8	3
<8 – 4	4
<4	5

C.2.3 Nutrient availability and toxicity (Nr)

Soil pH affects the availability of some elements, primarily aluminium which becomes soluble, and consequently harmful to plants below pH_w 5.5 (Hazelton & Murphy, 2025).

The criteria used to determine nutrient availability and toxicity hazard is provided in Table C15.

Table C15. Criteria used to determine limitations for nutrient availability and toxicity (Nr).

pH _w	Class
7.3 – 6.6	1
<6.6 – 6 >7.3 – 7.9	2
<6 – 5.6 >7.9 – 8.4	3
<5.6 – 5 >8.4 – 9	4
<5, >9	5

C.2.4 Surface condition (P)

Surface condition affects pasture establishment and spread. Surfaces that are hardsetting or coarse structured decrease seedling emergence and establishment.

The hazard criteria used to determine surface condition limitations for grazing is provided in Table C16.

Table C16. Hazard criteria for surface condition (P).

Surface Condition	Class
Fine (peds <10 mm)	1
Coarse (peds > 10 mm)	2
Surface crust or firm	3
Hard setting	4
Massive	5

C.2.5 Salinity (S)

Salinity refers to the elevated soluble salts within the ERD. Salinity affects the pasture establishment, production, and resilience. Soils with salinity (ECe) of < 2dS/m are considered non-saline.

The hazard criteria to determine salinity limitations is provided in Table C17.

Table C17. Hazard criteria for salinity (S).

ECe (dS/m)	Class
<2	1
2 – 4	2
>4 – 10	3
>10 – 16	4
>16	5

C.2.6 Rockiness (R)

Rockiness refers to rock outcrop and coarse fragments within the ERD that may impede pasture establishment, PAWC, infiltration, and trafficability.

The hazard criteria to determine rockiness limitations for grazing is provided in Table C18.

Table C18. Hazard criteria for rockiness (R).

Surface	Class 1	Class 2	Class 3	Class 4	Class 5
Gravel, 20 – 60 mm (%)	<20	20–50	>50–70	>70–85	>85
Cobble, 60 – 200 mm (%)	<10	10–20	>20–50	>50–75	>75
Stone, 200 – 600 mm (%)	<2	2–10	>10–20	>20–50	>50
Boulders, >600 mm (%)	–	<2	2–10	>10–20	>20

C.2.7 Slope (Ts)

Topographical slope can affect the ability to safely and efficiently move stock. The slope gradient (%) is used to determine the hazard criteria. Slopes less than 15 % are considered suitable (Table C19).

Table C19. Hazard criteria for slope (Ts).

Slope (%)	Class
<5	1
5 – <10	2
10 – <15	3
15 – <20	4
>20	5

C.2.8 Microrelief (Tm)

Significant microrelief impacts the suitability of land for grazing by restricting the trafficability of land by cattle and vehicles. The vertical depth interval is used to determine microrelief hazard for grazing.

The criteria used to determine microrelief hazard for grazing is presented in Table C20.

Table C20. Hazard criteria for microrelief (Tm).

Class	Vertical Interval (m)
1	0
2	<0.2
3	0.2 – 0.4
4	>0.4 – 0.6
5	>0.6

C.2.9 Water erosion (Ea)

Grazing generally increases the potential for soil loss during rainfall. Clearing vegetation and grazing can decrease ground cover, increase surface runoff, increase water velocity, and decrease soil permeability. The water erosion risk is defined by a combination of slope percentage and exchangeable sodium percentage (ESP) (Table C21).

Table C21. Hazard criteria for water erosion (Ea).

Indicator	Class 1	Class 2	Class 3	Class 4	Class 5
Slope (%) when ESP <6% in 0-0.1m soil depth.	<5	5–8	>8-12	>12–18	>18
Slope (%) when ESP 6-14% in 0-0.1m soil depth.	<3	3–6	>6–10	>10–12	>12
Slope (%) when ESP >14% in 0-0.1m soil depth.	<1	1–2	>2–4	>4–6	>6

C.2.10 Subsoil erosion risk (Eb)

Erosive subsoil may result in gully or tunnel erosion. This presents a major hazard to the trafficability of land in which surface erosion and subsequent subsoil erosion has occurred. Subsoil erosion risk is assessed on ESP of the top layer of the B horizon or at 0.5 m depth, whichever occurs first (Table C22).

Table C22. Hazard criteria for subsoil erosion risk (Eb).

Class	ESP (%)
1	<6
2	6–14
3	>14–23
4	>23–34
5	>34

C.2.11 Results

Each UMA for the SMUs is assessed against the hazard criteria for grazing land suitability. The results of the assessment are detailed in Table C23.

Table C23. Assessment of land suitability for grazing on improved pastures for each unique mapping area (UMA) within an SMU.

SMU	UMA	Grazing on Improved Pastures Limitation	LSC
Taurus (Ta)	14	M2, Nd1, Nr1, P4, S3, R2, Ts1, Tm1, Ea1, Eb2	4
	16	M2, Nd1, Nr1, P4, S3, R2, Ts1, Tm1, Ea1, Eb2	4
Davey (Dg)	1	M4, Nd2, Nr2, P5, S3, R1, Ts1, Tm1, Ea1, Eb1	4
Krongie (Kr)	2	M1, Nd1, Nr2, P1, S3, R2, Ts1, Tm4, Ea1, Eb2	4
	3	M1, Nd1, Nr2, P1, S3, R2, Ts1, Tm4, Ea1, Eb2	4
Taurus-Teviot Complex (Ta-Tv)	9	M1, Nd1, Nr1, P4, S1, R2, Ts1, Tm3, Ea1, Eb2	4
Retro (Rt)	10	M2, Nd3, Nr2, P4, S3, R3, Ts1, Tm1, Ea1, Eb3	4
	11	M2, Nd3, Nr2, P4, S3, R3, Ts1, Tm1, Ea1, Eb3	4
	12	M2, Nd3, Nr2, P4, S3, R3, Ts1, Tm1, Ea1, Eb3	4
	15	M2, Nd3, Nr2, P4, S3, R3, Ts1, Tm1, Ea1, Eb3	4
Teviot (Tv)	13	M1, Nd1, Nr2, P1, S3, R2, Ts1, Tm4, Ea1, Eb2	4
Arcturus (Ac)	4	M1, Nd2, Nr3, P1, S3, R2, Ts1, Tm2, Ea1, Eb2	3
	5	M1, Nd2, Nr3, P1, S3, R2, Ts1, Tm2, Ea1, Eb2	3
	17	M1, Nd2, Nr3, P1, S3, R2, Ts1, Tm2, Ea1, Eb2	3
Luxor (Lx)	6	M3, Nd3, Nr1, P4, S1, R1, Ts1, Tm1, Ea1, Eb1	4
	8	M3, Nd3, Nr1, P4, S1, R1, Ts1, Tm1, Ea1, Eb1	4
Pegunny (Pg)	7	M1, Nd1, Nr3, P3, S1, R1, Ts1, Tm3, Ea1, Eb2	5

APPENDIX D: SOIL PROFILE DESCRIPTIONS

Descriptions of the soil profiles and observations made in the field are detailed in this section.

Table D1. Field check site description and notes.

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C1	Slight depression	Poplar box	–	Similar to 29, sandy surface	29
C2	Flat	Brigalow	–	Similar to 11, patches of brigalow scattered with depressions	11
C3	Flat	Brigalow	–	Isolated brigalow stand	8,19
C4	Flat	Poplar box	–	Woodland, firm hard setting surface greyish brown sandy loam	19
C5	Simple slope	Brigalow	–	Edge of brigalow, poplar box, large lag rock on surface, minor micro-relief	17
C6	Simple slope	Brigalow/poplar box	–	Lag rock on surface, hard setting surface	17
C7	Lower slope	Cleared brigalow	–	Gilgai depression, edge of boundary	–
C8	Flat	Cleared	–	No gilgai, hard setting surface, brown, ironstone gravel	65
C9	Flat	Mountain coolabah	–	Similar to C8, cracking surface	65
C10	Rise crest	Moreton Bay Ash	–	Hard setting, gravelly, nil micro-relief	74
C11	Simple slope	Poplar box	Luxor	Woodland, sandy surface, termite mounds	5
C12	Crest	Poplar box	Luxor	Sandy surface, light brown, termite mounds	5,13
C13	Simple slope	Cleared brigalow	–	Lag rock, hardsetting, brown	13, 22
C14	Rise slope	Cleared brigalow	–	Ironstone lag rock, HS surface brown	22
C15	Simple slope	Cleared brigalow	–	Cracking surface, gilgai micro-relief, dark brown surface	–
C16	Level plain	Cleared brigalow	–	Edge of dense regrowth no difference in Gilgai formations	46
C17	Level	Cleared brigalow	–	Surface colour changes from pale brown to brown, cracking with self-mulching surface, minor gilgai depressions	46

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C18	Level	Cleared brigalow	–	Gilgai becomes more evident, darker surface colour	46
C19	Level	Poplar box	–	Alluvial plain, sandy surface	99
C20	Level	Poplar box	–	Surface darker, hardsetting, sandy loam surface with ironstone gravels	99
C21	Level	River gum	–	Isaac River, sandy and clayey banks	99
C22	Level	River gum	–	Riverbank, clayey	99
C23	Level	Poplar box	–	Slight dip, sandy surface	99
C24	Level	Poplar box	–	Edge of sandy surface	99
C25	Simple slope	Poplar box cleared	–	Hardsetting surface	105
C26	Slight depression	Cleared brigalow	–	Black, cracking, gilgai	83,90
C27	Rise	Brigalow	–	Hard setting surface, many ironstone gravels on surface	1
C28	Rise	Cleared brigalow	–	Change from cracking to hard setting, boundary	–
C29	Flat	Cleared brigalow	–	Similar to 16, mounds and depressions	16
C30	Flat	Belah	Taurus	Hard setting surface ironstone gravels on the surface	35
C31	Flat	Brigalow	–	Boundary, gilgai well defined, TC soil more dominant to the east	16,45
C32	Flat	Brigalow, poplar box	–	Boundary, some isolated gilgai depressions	45
C33	Flat	Brigalow, poplar box	–	Boundary, some isolated gilgai depressions	56
C34	Flat	Poplar box	–	Gilgai depressions	62
C35	Flat	Brigalow	–	Minor gilgai formations	62
C36	Flat	Brigalow	–	Gilgai formation	62
C37	Flat	Brigalow	–	Change in surface colour – brown	76
C38	Simple slope	Poplar box, brigalow	–	Gully erosion, ironstone and carbonate gravels	–
C39	Flat	Brigalow	–	Gilgai depressions, ironstone lag rock	97
C40	Alluvial bench	River gum, she-oak	Davey	Cherwell creek, sandy with sandstone and ironstone fragments	109,108
C41	Levee	River gum	–	Carbonates and clayey subsoil, side cutting	109
C42	Levee/bench	Poplar box	Davey	Sandy surface	109

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C43	Rise slope	Cleared	–	Boundary, large ironstone fragments on surface.	–
C44	Gully	Cleared	–	Gully between two rises, rocky ironstone lag rock	–
C45	Gilgai depression	Cleared brigalow	–	Gilgai depression, brigalow around edges, crusting surface with weak self-mulching, medium clay sandy surface texture.	95
C46	Gilgai depression	Cleared brigalow	–	Several depressions, as C46	95
C47	Gilgai depression	Cleared brigalow	–	Group of gilgai depression within 20 m radius, as C46	95
C48	Simple slope	Brigalow	–	Melon hole depression, similar to 95, ironstone surface fragments, hardsetting mound.	–
C49	Simple slope	Brigalow	–	Melonhole depression, coarse ironstone surface fragments	–
C50	Simple slope	Poplar box	–	Sandy surface, hard setting	–
C51	Rise crest	Poplar box	–	Large ironstone surface fragments, hard setting	–
C52	Simple slope	Regrowth	–	Hard setting, sandy surface	–
C53	Simple slope	Brigalow regrowth	–	Mound of gilgai, large melonholes, surface texture sandy clay loam, Ironstone gravels, hard setting surface	–
C54	Simple slope	Brigalow regrowth	–	Small depressions, hard setting surface	89
C55	Sandy levee	River gum	–	Cherwell Isaac river junction	–
C56	Swamp	River gum	–	Clay hard setting cracking surface	134
C57	Swamp	River gum	–	Clay cracking surface, large deposits of leaf litter	134
C58	Depression	River gum	–	Clayey soil in depression towards creek	134
C59	Levee	Rivergum	–	Sandy surface close to creek	134
C60	Eroded	–	–	Eroded, bare soil	–
C61	Flat	Brigalow	–	Boundary change, melonhole	–

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C62	Slope	Brigalow, cleared	–	Gilgai, brown, hardsetting, weak self-mulching surface, eroded	130
C63	Plain	Brigalow cleared	–	Gilgai, various depths	132
C64	Flat plain	Brigalow	Taurus	Minor depressions, hard setting surface	129
C65	Flat plain	Cleared poplar box	Taurus	Edge of boundary, Taurus-Davey	131
C66	Levee	Moreton Bay Ash	Davey	Sandy surface	131
C67	Simple slope, dissected	Brigalow	Taurus	Surface darker, more ironstone surface fragments, boundary between Davey soils	127, 118
C67b	Simple slope	Poplar box	Taurus	Hard setting, large ironstone gravels	118
C68	Flat	Poplar box	Taurus	Hard setting, very few surface gravels	126
C69	Simple slope	Narrow leaf ironbark, Dawson gum	Taurus	Hard setting surface, coarse gravel	113
C70	Simple slope	Brigalow	Taurus	Depression, loamy surface, weak self-mulching under hard setting crust, coarse surface gravel	107
C71	Open depression	Brigalow	–	Gilgai depressions	100
C72	Simple slope	Cleared	Taurus	Boundary before alluvial plain	111
C73	Simple slope	Poplar box, brigalow	Taurus	Minor depressions, hard setting, gravelly surface	114
C74	Levee	River gum	Davey	Sandy levee	124
C75	Open depression	Brigalow cleared	–	Open depression west to east	124
C76	Alluvial plain	Brigalow	–	Gilgai, alluvial plain, hard setting weak self-mulching	124
C77	Alluvial plain	Brigalow	–	Gilgai formation	124
C78	Alluvial plain	Cleared	–	Hard setting surface, clayey in areas, some gilgai	124
C79	Levee	Moreton Bay Ash, rivergum	Davey	Sandy levee	124
C80	Alluvial Plain	Cleared	–	Sandy banks with clayey gullies lined with brigalow	124

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C81	Alluvial Plain	Poplar box and Brigalow	Taurus	Mixed vegetation, sandy levee	105
C82	Levee	Dawson gum and Brigalow	–	Clay levee above drainage line	115,105
C83	Channel	Dawson gum, brigalow	–	Sandy drainage channel	–
C84	Channel	Cleared	Taurus	Duplex, gully cutting, carbonates present in subsoil	–
C85	Alluvial Plain	Brigalow	Taurus	Gilgai micro-relief	110
C86	Rise slope	Cleared	Taurus	Hardsetting surface, brown, few ironstone gravels as surface fragments	–
C87	Gully	Cleared	Taurus	Weathered rock, sandstone, approximately 1 m	–
C88	Simple slope	Dawson gum	Taurus	Sandy loam surface, ironstone gravel as surface fragments	93
C89	Open depression	Brigalow re-growth	–	Gilgai depression, in saddle heading downslope	82
C90	Rise crest	Poplar box	Taurus	No micro-relief, hardsetting ironstone gravels on surface	82
C91	Open depression	Poplar box, brigalow cleared	–	Minor depressions, hard setting surface with ironstone gravels	71
C92	Levee	Poplar box, Moreton Bay Ash	Davey	Sandy levee	82, 71
C94	Levee	Moreton bay Ash, River gum	Davey	Sandy levee	71
C95	Levee	Poplar box	Davey	Sandy surface no coarse fragments	–
C96	Rise slope	Brigalow	Taurus	Edge of rise, brigalow starts, ironstone surface fragments	–
C97	Rise crest	Poplar box, Brigalow	Taurus	Lag rock, ironstones, hard setting surface	–
C98	Levee	–	Davey	Sandy levee	–
C99	Rise crest	Ghost gum, brigalow	Taurus	Ironstone lag rock common	–
C100	Flat	Brigalow	–	Ironstone, coarse hard setting surface with minor depressions	–

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C101	Flat	Brigalow	Taurus	Ironstone gravel on surface, texture contrast soil	–
C102	Slight rise	Poplar box	Luxor	Cleared veg but no clear reason	36
C103	Simple slope	Poplar box	–	Clayey sand, brown surface	53
C104	Simple slope	Poplar box	Taurus	Exposed subsoil, clayey, with large ironstone ion surface	53
C105	Simple slope	Poplar box	Taurus	Brigalow regrowth, lag rock surface gravel	70
C106	Crest	Brigalow	–	Gilgai depression, ironstone gravels common	80
C107	Simple slope	Brigalow	–	Gilgai depression, ironstone gravels common	–
C108	Simple slope	Brigalow	–	Cracking clay	–
C109	Rise crest	Brigalow	Taurus	No gilgai, hard setting surface	57
C110	Rise crest	Brigalow	Taurus	Gilgai depressions, hard setting surface	44, 57
C111	Plain	Brigalow, poplar box	Taurus	No gilgai, sandy clay loam, ironstone fragments	39
C112	Simple slope	Brigalow, poplar box	Taurus	Cleared, depressions scattered	79
C113	Simple slope	Poplar box	Taurus	Occurrence of brigalow less, surface gravels common	79
C114	Simple slope	Brigalow	Taurus	Few ironstones gravels on surface	80
C115	Alluvial plain	Brigalow	Taurus	Break of slope, mixed soils	80
C116	Gully	Brigalow, Moreton Bay Ash	–	Drainage cleared	80
C117	Alluvial plain	Brigalow	–	Self-mulching surface, clay soils	80
C118	Gully	Brigalow	–	Sandy creek, TC soils on south bank, clayey soils on north bank, exposed weathered sandstone	64
C119	Gully	Mixed	Taurus	Alkaline pH >8	64
C120	Plain	Brigalow, Moreton Bay Ash	–	Sporadic depressions, boundary near break of slope	64
C121	Plain	Brigalow, Moreton Bay Ash	–	Sporadic depressions, boundary near break of slope	64

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C122	Rise slope	Poplar box, brigalow	Taurus	Lag rock, ironstones, hard setting	64
C123	Rise slope	Brigalow	Taurus	Depressions	60
C124	Simple slope	Brigalow, poplar box	Taurus	Sporadic depressions	60
C125	Simple slope	Brigalow, poplar box	Taurus	Sporadic depressions	60
C126	Simple slope	Brigalow, poplar box	Taurus	Sporadic depressions	60
C127	Eroded	Nil	–	Highly eroded landscape, alkaline pH, coarse ironstone lag rock above older sedimentary rock	–
C128	Eroded	Nil	–	Underlying older sandstone rock. Taurus soils above	–
C129	Eroded	Nil	–	Sandy levee, eroded Taurus	–
C130	Rise slope	Poplar box	–	Ironstone gravels, hard setting surface	–
C131	Rise slope	Poplar box	Taurus	Some coarse ironstones, hard setting, brown	–
C132	Rise slope	Poplar box, narrow leaf ironbark	Taurus	Some coarse ironstones, hard setting, brown	–
C133	Plain	Brigalow Cleared	–	Large ironstone common	–
C134	Plain	Brigalow	Arcturus	Cracking, black clay, coarse fragments on surface	–
C135	Rise	Brigalow, Dawson gum	–	Surface gravels, minor gilgai, similar to 9, boundary	–
C136	Alluvial plain	Coolibah, brigalow	–	Brigalow to the east, basalt clays, gravels, self-mulching strong, cracking with minor crabhole gilgai	–
C137	Plain	Brigalow	–	Self-mulching, cracking clay with normal gilgai depressions, ironstone surface fragments.	–
C138	Plain	Cleared brigalow	–	Self-mulching, normal gilgai, no coarse fragments	–
C139	Rise slope	Poplar box	–	Surface becomes hard setting, boundary	–
C140	Simple slope	Poplar box	–	Sandy surface	–

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C141	Simple slope	Poplar box	–	Vegetation thins out, sandy surface	7
C142	Simple slope	Poplar box	–	Sandy surface, hard setting	–
C143	Simple slope	Poplar box	–	Sandy surface, hard setting	–
C144	Simple slope	Poplar box	–	Hard setting surface	–
C145	Rise slope	Poplar box, brigalow	–	Boundary between TC and vertosol. Sandy loam surface	–
C146	Rise slope	Brigalow	–	Gilgai, lag rock gravel common	–
C147	Simple slope	Poplar box	–	Sandy surface	–
C148	Simple slope	Brigalow	–	Small patch of brigalow	–
C149	Simple slope	Poplar box		Sandy surface, no surface gravel	–
C150	Simple slope	Poplar box	–	Sandy surface	–
C151	Simple slope	Poplar box	–	Sandy surface	–
C152	Rise slope	Brigalow	–	Taurus, hard setting, lag rock on surface, minor gilgai	–
C153	Simple slope	Brigalow	–	Gully, carbonates present	–
C154	Rise slope	Brigalow	Taurus	Minor gilgai depression, hard setting mound with lag rock	–
C155	Rise slope	Brigalow, Dawson	Taurus	Boundary, lag rock, minor gilgai	–
C156	Simple slope	Poplar box	–	Bigalow in distance, hard setting surface, few ironstone gravels	32
C157	Rise	Poplar box, brigalow, Moreton Bay Ash	–	Edge of vegetation, some erosion	–
C158	Depression	Brigalow	–	Brigalow in drainage depression	–
C159	Levee	Poplar box	Davey	Sandy terrace	–
C160	Levee	Poplar box	Davey	Sandy terrace	–
C161	Flat	Cleared	Taurus	Hard setting surface with ironstone gravel	–
C162	Flat	Cleared	–	Gilgai formation	–
C163	Plain	Cleared	–	Gilgai, deep depressions, brigalow regrowth, mounds bare	–
C164	Plain	Moreton Bay Ash, Poplar box	Davey	Reddish, sandy	–
C165	Plain	Brigalow, poplar box	–	Hard setting, surface, no fragments, sandy levee	
C166	Plain	Brigalow	–	Gilgai, hard setting mounds	–

Site ID	Landform	Vegetation	SPC	Description	Nearby Sites
C167	Open depression	Moreton Bay Ash, poplar box	–	Sandy levee	–
C168	Flat	Cleared	–	Sandy surface	–

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Landscape Photograph	Site	131		Geology		Slope					Landform Element	Landform Pattern				Land Use	
	Date	11/11/2024				Percent	Class		Morphological Type			Pattern	Relief	Modal Slope		Grazing	
	Project	1401.24d		Qa		<1		LE		F		PLA	PLA		P	GP	
	Scribe	THOL		Substrate								Outcrop			Vegetation		
	Site Type	Semi-detailed		Observation	Confidence	Depth	Grain Size	Mineral composition	Strength	Lithology	Abundance		Lithology		Species		Cover
	Location EPSG:7855 - GDA2020 / MGA zone 55			-	-	-	-	-	-	-	-	-	Poplar box regrowth				
	Easting	625715															
	Northing	7555695															
				Surface Coarse Fragments				Microrelief									
				Abundance	Size	Shape		Lithology		Type	Proportions	Vertical Interval	Horizontal Interval	Sampled			
	Disturbance	4	1	1	U		Fe		-		-	-	-				
Surface condition	H	Erosion							Type	State	Degree	Gully Depth (m)					
Aggradation	-								-	-	-						
Australian Soil Classification		Confidence	Order	Suborder	Great Group	Subgroup	F1	F2	F3	F4	F5			Surface Cover		80%	
		3	SO	-	-	-	-	-	-	-	Veg / Litter			80/20			
Comments																	
Edge of woodlands																	

Profile Photograph	Layer	Horizon	Lower Depth (m)	Boundary	Texture	Colour			Strucutre			Segregations		Coarse Fragments			Consistent e (soil water status)	Roots (abundanc e, size)	Depth of Sample for Lab (m)
						Moist	Munsell	Mottle	Type	Grade	Size	Abundance / size	Nature / form	Abundance / size	Shape	Lithology / strength			
	1	A11	0.15	C	SL	Moist -	7.5YR3/2	-	-	V	-	0 -	-	1 1	U	Fe -	2 D	3 F	-
	2	A12	0.30	C	SL	Moist -	7.5YR3/3	-	-	V	-	0 -	-	2 2	U	Fe -	2 D	3 F	-
	3	A2j	0.35	A	SL	Moist -	7.5YR3/4	-	-	V	-	0 -	-	2 2	U	Fe -	2 D	2 F	-
	4	B21	0.70	G	MC,S	Moist -	7.5YR4/6	M21FDB -	AB	S	3	0 -	-	1 2	U	Fe -	4 D	1 F	-
	5	B22	0.95	-	MC,S	Moist -	7.5YR4/6	M21FDB -	AB	S	3	2 2	K N	1 1	U	Fe -	4 D	1 F	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Layer	Depth (m)	pH	Slaking		Dispersion		Effervescent		Comments									
			Natural	Remoulded	Natural	Remoulded	HCl	H2O2											
1	0.05	6.5	-	-	-	-	0	-											
2	0.15	6.5	-	-	-	-	0	-											
3	0.3	6.5	-	-	-	-	0	-											
4	0.6	7.5	-	-	-	-	0	-											
5	0.9	8.5	-	-	-	-	3	-											
6	-	-	-	-	-	-	-	-											
7	-	-	-	-	-	-	-	-											
8	-	-	-	-	-	-	-	-											

[illegible]

[illegible]

[illegible]

[illegible]

Landscape Photograph	Site ID	MLA3_1	Geology	Landform Element				Landform Pattern				Land Use					
	Date	29/07/2025		Slope	Class/subclass	Morphological Type	LE Type	Relief	Modal Slope	MTS	Pattern	Grazing					
	Project	1401.24d2	TQr	2%	BG		S	RER	R	VG		GR	RIS				
	Scribe	THOL	Substrate	Observation	Conf	Depth	Mineral comp.	Lithology	Strength	Outcrop			Vegetation				
	Site Type / Observ.	Semi-detailed		-	-	-	-	-	-	-	Abun	Dist	Lith	Species	Statum	Height	
	Datum	GDA94 / MGA56	Surface Coarse Fragments	Abundance	Size	Shape		Alt	Lithology	Strength	-	-	-	Coolibah	-	-	
	Easting	623722		0	-	-		-	-	-	-	-	-	Brigalow	-	-	
	Northing	7552072	Microrelief							Soil Water Regime			-		-	-	
	Surface	F	Type	Proportions	VI (m)		HI (m)		Component Sampled <td rowspan="2">Perm.</td> <td colspan="2" rowspan="2">4</td> <td colspan="2">-</td> <td>-</td> <td>-</td>		Perm.	4		-		-	-
	Aggrad./ Mechan.	-	Z	-	-		-		-					-		-	-
	Disturbance	4	Erosion							Drain.	Nature	Class	-		-	-	
	Method	-	Type	Severity		State	Degree		Depth (m)		-		-	-			
	Depth/ Addition	-	-	-		-	-		-		-	-		-	-		
	ASC	Conf.		Order	Suborder	Great Group	Subgroup	F1	F2	F3	F4	F5	-		Ground Cover	-	
		-		-	-	-	-	-	-	-	-	-	-		Veg/litter	-	
Comments																	
Some cracking evident on surface. Large trees (cooloibah?) dead.																	

Profile Photograph	Layer	Horizon	Lower Depth (m)	Boundary		Texture	Colour			Structure			Cutans		Segregations		Coarse Fragments			SWS/ Str	Voids	Pores	Pan	Roots	Sample depth (m)
				Dist	Sh		Moist	Munsell	Mottle	Grade	Type	Size	Type	Abun /Dist	Abun/ size	Nature /form	Abun/ size	Shape	Lith/ Str						
	1	A1	0.2	C	-	LMC,S	M	7.5YR3/2	-	M	SB	3	-	-	-	-	-	-	-	4 M	-	-	-	3 1	0-0.1
	2	B21w	0.50	G	-	MHC,S	M	7.5YR3/4	-	M	AB	3	-	-	-	-	-	-	-	5 M	-	-	-	2 1	0.2-0.3
	3	B22kv	0.7	-	-	MHC,S	M	7.5YR4/4	M21DBC	M	LE	3	K	-	3 1	K N	-	-	-	4 M	-	-	-	2 1	0.4-0.5
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6-0.7
	Layer	Depth	pH	Effervescent		Slaking		Dispersion		WR	Odour	Comments													
				HCl	H2O2	Na	Re	Na	Re																
	1	0.05	7.5	0	-	1	-	1	-	-	-	-													
	2	0.15	7.5	0	-	1	-	0	-	-	-	Few petrified wood fragments on the road													
	3	0.3	8	0	-	1	-	0	-	-	-	-													
	4	0.6	8.5	3	-	1	-	0	-	-	-	-													
	5	-	-	-	-	-	-	-	-	-	-	-													
	6	-	-	-	-	-	-	-	-	-	-	-													
7	-	-	-	-	-	-	-	-	-	-	-														
8	-	-	-	-	-	-	-	-	-	-	-														

Landscape Photograph	Site ID	MLA3_3	Geology	Landform Element				Landform Pattern				Land Use					
	Date	29/07/2025		Slope	Class/subclass	Morphological Type	LE Type	Relief	Modal Slope	MTS	Pattern	Grazing					
	Project	1401.24d2	Qr/b	2%	VG		S	RER	R	VG	GR	RIS					
	Scribe	THOL	Substrate	Observation	Conf	Depth	Mineral comp.	Lithology	Strength	Outcrop			Vegetation				
	Site Type / Observ.	Semi-detailed		-	-	-	-	-	-	-	Abun	Dist	Lith	Species	Statum	Height	
	Datum	GDA94 / MGA56	Surface Coarse Fragments	Abundance	Size	Shape		Alt	Lithology	Strength	-	-	-	Brigalow	-	-	
	Easting	623917		0	-	-		-	-	-	-	-	-	Coolibah	-	-	
	Northing	7552539	Microrelief							Soil Water Regime			-		-	-	
	Surface	F	Type	Proportions	VI (m)		HI (m)		Component Sampled		Perm.	-		-		-	-
	Aggrad./Mechan.	-	Z	-	-		-		-			-		-		-	-
	Disturbance	4	Erosion							Drain.	Nature	Class	-		-	-	
	Method	-	Type	Severity	State		Degree		Depth (m)		-		-	-	-	-	
	Depth/ Addition	-	-		-		-		-		-	-	-		-	-	
	ASC	Conf.	Order		Suborder	Great Group	Subgroup	F1	F2	F3	F4	F5	-		Ground Cover	80%	
			-		-	-	-	-	-	-	-	-	-		Veg/litter	-	
	Comments																
	-																

Profile Photograph	Layer	Horizon	Lower Depth (m)	Boundary		Texture	Colour			Structure			Cutans		Segregations		Coarse Fragments			SWS/ Str	Voids	Pores	Pan	Roots	Sample depth (m)
				Dist	Sh		Moist	Munsell	Mottle	Grade	Type	Size	Type	Abun /Dist	Abun/ size	Nature /form	Abun/ size	Shape	Lith/ Str		abun/ size	abun/ size		abun/ size	
	1	A1	0.15	G	-	MC,F	M	7.5YR3/2	-	M	SB	3	-	-	-	-	-	-	-	4 M	-	-	-	3 1	0-0.1
	2	B21w	0.40	D	-	MC,F	M	7.5YR3/1	-	M	AB	3	-	-	-	-	-	-	-	4 M	-	-	-	3 1	0.2-0.3
	3	B22v	0.8	-	-	MC,F	M	7.5YR2.5/2	-	M	LE	3	-	-	-	-	-	-	-	4 M	-	-	-	2 1	0.4-0.5
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7-0.8
	Layer	Depth	pH	Effervescent		Slaking		Dispersion		WR	Odour	Comments													
				HCl	H2O2	Na	Re	Na	Re																
	1	0.05	7.5	-	-	1	-	0	-	-	-	-													
	2	0.15	7.5	-	-	0	-	0	-	-	-	-													
	3	0.3	7.5	-	-	1	-	0	-	-	-	-													
	4	0.5	7.5	-	-	1	-	1	-	-	-	-													
	5	0.8	7.5	-	-	0	-	0	-	-	-	-													
	6	-	-	-	-	-	-	-	-	-	-	-													
7	-	-	-	-	-	-	-	-	-	-	-														
8	-	-	-	-	-	-	-	-	-	-	-														

Landscape Photograph	Site ID	MLA3_4		Geology	Landform Element				Landform Pattern				Land Use						
	Date	29/07/2025			Slope	Class/subclass	Morphological Type	LE Type	Relief	Modal Slope	MTS	Pattern	Grazing						
	Project	1401.24d		Qr/b	2%	VG		S	RER	R	VG					GR	RIS		
	Scribe	THOL		Substrate	Observation	Conf	Depth	Mineral comp.	Lithology	Strength	Outcrop			Vegetation					
	Site Type / Observ.	Semi-detailed			-	-	-	-	-	-	-	Abun	Dist	Lith	Species		Statum	Height	
	Datum	GDA94 / MGA56		Surface Coarse Fragments	Abundance	Size	Shape		Alt	Lithology	Strength	-	-	-	Brigalow		-	-	
	Easting	624015			0	-	-		-	-	-	-	-	-	-	Coolibah		-	-
	Northing	7552870		Microrelief							Soil Water Regime			-		-	-		
	Surface	F		Type	Proportions	VI (m)		HI (m)		Component Sampled		Perm.	-		-		-	-	
	Aggrad./ Mechan.	-		Z	-	-		-		-					-		-	-	
	Disturbance	4		Erosion							Drain.	Nature	Class	-		-	-		
	Method	-		Type	Severity		State		Degree			Depth (m)		-	-	-		-	-
	Depth/ Addition	-		-	-		-		-			-	-	-	-	-		-	-
		ASC	Conf.	Order		Suborder	Great Group	Subgroup		F1	F2	F3	F4	F5	-	Ground Cover	-		
			-	-		-	-	-		-	-	-	-	-		Veg/litter	-		
Comments																			

Profile Photograph	Layer	Horizon	Lower Depth (m)	Boundary		Texture	Colour			Structure			Cutans		Segregations		Coarse Fragments			SWS/ Str	Voids	Pores	Pan	Roots	Sample depth (m)
				Dist	Sh		Moist	Munsell	Mottle	Grade	Type	Size	Type	Abun /Dist	Abun/ size	Nature /form	Abun/ size	Shape	Lith/ Str		abun/ size	abun/ size		abun/ size	
	1	A1	0.1	C	-	MC	M	V.D.Brown	-	M	SB	3	-	-	-	-	-	-	-	4 T	-	-	-	3 1	-
	2	B2w	0.30	-	-	MC	M	Black	-	M	AB	3	K	-	-	-	-	-	-	4 T	-	-	-	3 1	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Layer	Depth	pH	Effervescent		Slaking		Dispersion		WR	Odour	Comments													
				HCl	H2O2	Na	Re	Na	Re																
	1	0.05	8	1	-	-	-	0	-	-	-	-													
	2	0.15	8	1	-	-	-	0	-	-	-	Slickensides at 0.3 m													
	3	0.3	8	1	-	-	-	1	-	-	-	-													
	4	-	-	-	-	-	-	-	-	-	-	-													
	5	-	-	-	-	-	-	-	-	-	-	-													
	6	-	-	-	-	-	-	-	-	-	-	-													
	7	-	-	-	-	-	-	-	-	-	-	-													
	8	-	-	-	-	-	-	-	-	-	-	-													

Landscape Photograph	Site ID	MLA3_5		Geology	Landform Element				Landform Pattern				Land Use							
	Date	29/07/2025			Slope	Class/subclass		Morphological Type	LE Type	Relief	Modal Slope		MTS	Pattern	-					
	Project	1401.24d2		-	1%		VG		S		RES		Relief					VG		GR
	Scribe	THOL		Substrate	Observation	Conf	Depth	Mineral comp.		Lithology	Strength		Outcrop			Vegetation				
	Site Type / Observ.	Semi-detailed			-	-	-	-		-	-	-	Abun	Dist	Lith	Species		Statum	Height	
	Datum	GDA94 / MGA56		Surface Coarse	Abundance	Size	Shape		Alt	Lithology	Strength		-	-	-	Brigalow		-	-	
	Easting	623575		Fragments	-	-	-		-	-	-		-	-	-	-		-	-	
	Northing	7553039		Microrelief							Soil Water Regime			-		-	-			
	Surface condition	F		Type	Proportions	VI (m)		HI (m)		Component Sampled			Perm.	4		-		-	-	
	Aggrad./Mechan.	-		-	-	-		-		-						-		-	-	
	Disturbance	4		Erosion								Drain.	Nature	Class	-		-	-		
	Method	-		Type	Severity		State		Degree		Depth (m)		N	4	-		-	-		
	Depth/ Addition	-		-	-		-		-		-				-	-		-	-	-
	ASC	Conf.		Order	Suborder	Great Group	Subgroup		F1	F2	F3	F4	F5	-		Ground Cover	-			
		-		-	-	-	-		-	-	-	-	-			Veg/litter	-			
Comments																				
-																				

Profile Photograph	Layer	Horizon	Lower Depth (m)	Boundary		Texture	Colour			Structure			Cutans		Segregations		Coarse Fragments			SWS/ Str	Voids	Pores	Pan	Roots	Sample depth (m)
				Dist	Sh		Moist	Munsell	Mottle	Grade	Type	Size	Type	Abun /Dist	Abun/ size	Nature /form	Abun/ size	Shape	Lith/ Str		abun/ size	abun/ size		abun/ size	
	1	A1	0.15	C	-	MC,F	M	SB	-	M	SB	3	-	-	-	-	-	-	-	4 D	-	-	-	3 1	-
	2	B21	0.30	G	-	MC,F	M	SB	M21DB	M	AB	3	-	-	-	-	-	-	-	4 T	-	-	-	3 1	-
	3	B22v	0.4	-	-	MC,F	M	AB	-	M	AB	3	K	-	2 1	K n	-	-	-	4 T	-	-	-	2 1	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Layer	Depth	pH	Effervescent		Slaking		Dispersion		WR	Odour	Comments													
				HCl	H2O2	Na	Re	Na	Re			-													
	1	0.05	8.5	0	-	1	-	0	-	-	-	-													
	2	0.15	8.5	0	-	0	-	0	-	-	-	-													
	3	0.3	8.5	3	-	0	-	0	-	-	-	-													
	4	-	-	-	-	-	-	-	-	-	-	-													
	5	-	-	-	-	-	-	-	-	-	-	-													
	6	-	-	-	-	-	-	-	-	-	-	-													
	7	-	-	-	-	-	-	-	-	-	-	-													
	8	-	-	-	-	-	-	-	-	-	-	-													

Landscape Photograph	Site ID	MLA3_6	Geology	Landform Element				Landform Pattern				Land Use							
	Date	29/07/2025		Slope	Class/subclass	Morphological Type	LE Type	Relief	Modal Slope	MTS	Pattern	Grazing							
	Project	1401.24d	-	0.5%	LE/NF		F	PLA	P	LE	LP	PLA							
	Scribe	THOL	Substrate	Observation	Conf	Depth	Mineral comp.	Lithology	Strength	Outcrop		Vegetation							
	Site Type / Observ.	Semi-detailed		-	-	-	-	-	-	-	Abun	Dist	Lith	Species	Statum	Height			
	Datum	GDA94 / MGA56	Surface Coarse	Abundance	Size	Shape		Alt	Lithology	Strength	-	-	-	-	-	-			
	Easting	623473	Fragments	-	-	-		-	-	-	-	-	-	-	-	-			
	Northing	7553184	Microrelief							Soil Water Regime		-		-	-				
	Surface	S	Type	Proportions	VI (m)		HI (m)		Component Sampled		Perm.	3		-		-	-		
	Aggrad./ Mechan.	-	-	-	-		-		-			-		-	-	-			
	Disturbance	4	Erosion							Drain.	Nature	Class	-		-	-			
	Method	-	Type	Severity	State		Degree		Depth (m)		N	3	-		-	-			
	Depth/ Addition	-	-	-	-		-		-				-		-	-	-		
	ASC		Conf.	Order		Suborder	Great Group	Subgroup		F1	F2	F3	F4	F5	-		Ground Cover	80%	
			-	-		-	-	-		-	-	-	-	-			Veg/litter	90/10	
Comments																			

Profile Photograph	Layer	Horizon	Lower Depth (m)	Boundary		Texture	Colour			Structure			Cutans		Segregations		Coarse Fragments			SWS/ Str	Voids	Pores	Pan	Roots	Sample depth (m)
				Dist	Sh		Moist	Munsell	Mottle	Grade	Type	Size	Type	Abun /Dist	Abun/ size	Nature /form	Abun/ size	Shape	Lith/ Str		abun/ size	abun/ size		abun/ size	
	1	A1	0.15	C	-	SCL	M	7.5YR3/2	-	-	V	-	-	-	-	-	0	-	-	2 D	-	-	-	3 1	0-0.1
	2	A12	0.25	C	-	SCL	M	7.5YR4/1	-	-	V	-	-	-	-	-	0	-	-	2 T	-	-	-	3 1	0.15-0.25
	3	B2t	0.55	-	-	MC,F	M	7.5YR4/4	MF22DB	M	AB	3	-	-	2 1	M M	0	-	-	5 T	-	-	-	2 1	0.25-0.035
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.45-0.55
	Layer	Depth	pH	Effervescent		Slaking		Dispersion		WR	Odour	Comments													
				HCl	H2O2	Na	Re	Na	Re																
	1	0.05	7.5	0	0	-	-	2	-	-	-	-													
	2	0.15	7.5	0	0	-	-	2	-	-	-	-													
	3	0.3	8	0	1	-	-	2	-	-	-	-													
	4	0.5	8	0	1	-	-	2	-	-	-	-													
	5	-	-	-	-	-	-	-	-	-	-	-													
	6	-	-	-	-	-	-	-	-	-	-	-													
	7	-	-	-	-	-	-	-	-	-	-	-													
8	-	-	-	-	-	-	-	-	-	-	-														

Landscape Photograph	Site ID	MLA3_7	Geology	Landform Element					Landform Pattern					Land Use		
	Date	29/07/2025		Slope	Class/subclass	Morphological Type	LE Type	Relief	Modal Slope	MTS	Pattern	-				
	Project	1401.24d	-	0.50%	LE		F	PLA	P	F	LP			ALP		
	Scribe	THOL	Substrate	Observation	Conf	Depth	Mineral comp.	Lithology	Strength	Outcrop			Vegetation			
	Site Type / Observ.	Semi-detailed		-	-	-	-	-	-	Abun	Dist	Lith	Species	Statum	Height	
	Datum	GDA94 / MGA56	Surface Coarse Fragments	Abundance	Size	Shape	Alt	Lithology	Strength	-	-	-	Poplar box	-	-	
	Easting	622970		-	-	-	-	-	-	-	-	-	-	-	-	
	Northing	7553140	Microrelief							Soil Water Regime			-	-	-	
	Surface	S	Type	Proportions	VI (m)	HI (m)	Component Sampled			Perm.	3		-	-	-	
	Aggrad./Mechan.	-	-	-	-	-	-				-		-	-	-	
	Disturbance	5	Erosion							Drain.	Nature	Class	-	-	-	
	Method	-	Type	Severity	State	Degree	Depth (m)		N		3	-	-	-		
	Depth/ Addition	-	-	-	-	-	-	-				-	-	-	-	-
	ASC	Conf.	Order	Suborder	Great Group	Subgroup	F1	F2	F3	F4	F5	-		Ground Cover	70%	
		-	-	-	-	-	-	-	-	-	-	-		Veg/litter	80/20	
	Comments															
	-															

Profile Photograph	Layer	Horizon	Lower Depth (m)	Boundary		Texture	Colour			Structure			Cutans		Segregations		Coarse Fragments			SWS/ Str	Voids	Pores	Pan	Roots	Sample depth (m)
				Dist	Sh		Moist	Munsell	Mottle	Grade	Type	Size	Type	Abun /Dist	Abun/ size	Nature /form	Abun/ size	Shape	Lith/ Str		abun/ size	abun/ size		abun/ size	
	1	A1	0.2	G	-	SL	M	7.5YR4/4	-	-	V	-	-	-	-	-	-	-	-	2 D	-	-	-	3 1	0-0.1
	2	A12	0.40	A	-	SL	M	7.5YR5/4	-	-	V	-	-	-	2 2	N N	-	-	-	2 D	-	-	-	2 1	0.2-0.3
	3	B2t	0.7	-	-	MC,S	M	7.5YR4/6	MF22DB	M	SB	3	-	-	-	-	-	-	-	4 D	-	-	-	2 1	0.4-0.5
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Layer	Depth	pH	Effervescent		Slaking		Dispersion		WR	Odour	Comments													
				HCl	H2O2	Na	Re	Na	Re			-													
	1	0.05	6.5	-	-	-	-	0	-	-	-	-													
	2	0.15	6.5	-	-	-	-	0	-	-	-	-													
	3	0.3	7	-	-	-	-	0	-	-	-	-													
	4	0.6	8.5	-	-	-	-	0	-	-	-	-													
	5	-	-	-	-	-	-	-	-	-	-	-													
	6	-	-	-	-	-	-	-	-	-	-	-													
	7	-	-	-	-	-	-	-	-	-	-	-													
8	-	-	-	-	-	-	-	-	-	-	-														

APPENDIX E: LABORATORY DATA

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

ANALYSIS REPORT SOIL

PROJECT NO: EW242020

Customer: LANDLOCH Pty Ltd (QLD)
Address: 196 Peace Street HARLAXTON QLD 4350
Attention: Liam Thompson
Phone: 0411 310 542
Fax: 07 4613 1826
Email: thompson@landloch.com.au

Date of Issue: 19/12/2024

Report No: 1
Date Received: 28/11/2024
Matrix: Soil
Location: 1401.24d Isaac Downs
Sampler ID: Client
Date of Sampling: 4/11/2024
Sample Condition: Acceptable

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.



Signed: **Stephanie Cameron**
Laboratory Operations Manager



GSG Laboratories is certified by the Australasian Soil & Plant Analysis Council to perform various soil and plant tissue analysis. The tests reported herein have been performed in accordance with our terms of accreditation.

This report must not be reproduced except in full and GSG takes no responsibility of the end use of the results within this report.

This analysis relates to the sample submitted and it is the client's responsibility to make certain the sample is representative of the matrix to be tested.

Samples will be discarded one month after the date of this report. Please advise if you wish to have your sample/s returned.

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					1	1	1	1
					0-0.1	0.1-0.2	0.3-0.4	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-1	242020-2	242020-3	242020-4
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.03	7.78	8.09	8.24
Chloride Soluble	DA	DAP-06	mg/kg	5	46.5	213	563	755
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.11	0.27	0.55	0.73
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	813	731	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	183	166	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.08	1.38	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	13.9	8.01	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	453	373	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	4.12	7.23	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	1.06	0.94	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.31	<0.20	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	11.0	6.50	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	8.80	7.60	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	1.01	1.33	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	440	325	413	301
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	6908	6795	6741	6298
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	682	689	707	625
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	278	560	870	985
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	1.13	0.83	1.06	0.77
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	34.5	34.0	33.7	31.5
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	5.68	5.74	5.89	5.21
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	1.21	2.43	3.78	4.28
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	42.6	43.0	44.5	41.8
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	6.08	5.92	5.72	6.05

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					1	1	1	1
					0-0.1	0.1-0.2	0.3-0.4	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-1	242020-2	242020-3	242020-4
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.20	0.15	0.18	0.15
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	2.65	1.94	2.38	1.85
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	81.1	79.0	75.8	75.4
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	13.3	13.4	13.3	12.5
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	2.84	5.66	8.51	10.3
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.05	0.05	0.05	0.05
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	393	306	269	191
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	6680	6671	6618	6004
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	627	658	674	587
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	258	514	693	728
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	1.01	0.78	0.69	0.49
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	33.4	33.4	33.1	30.0
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	5.23	5.48	5.62	4.89
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	1.12	2.23	3.01	3.17
ECEC	Calculation	PMS-15C1	cmol/kg	na	40.8	41.9	42.4	38.6

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					1	1	1	1
					0-0.1	0.1-0.2	0.3-0.4	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-1	242020-2	242020-3	242020-4
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	6.39	6.08	5.89	6.14
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.19	0.14	0.12	0.10
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	2.47	1.87	1.63	1.27
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	81.9	79.6	78.0	77.8
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	12.8	13.1	13.2	12.7
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	2.75	5.34	7.10	8.20
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.05	0.05	0.05	0.06
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					5	5	5	5
					0-0.1	0.15-0.25	0.3-0.4	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-5	242020-6	242020-7	242020-8
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	0.45	NA	NA	11.2
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.15	6.78	7.27	6.86
Chloride Soluble	DA	DAP-06	mg/kg	5	9.70	10.5	12.3	20.4
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.05	0.02	0.02	0.05
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	739	191	158	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	115	64.1	66.7	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.05	0.33	<0.20	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	8.70	8.09	11.6	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	136	124	411	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.57	<3.00	<3.00	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.24	0.36	0.32	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.51	<0.20	<0.20	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	20.0	15.7	10.4	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	22.3	8.00	6.54	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.35	<0.20	0.27	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	128	86.0	92.1	307
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	754	262	303	1040
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	119	57.9	77.0	371
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	39.8	<10.0	<10.0	77.2
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.33	0.22	0.24	0.79
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	3.77	1.31	1.52	5.20
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.99	0.48	0.64	3.09
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.17	0.04	0.04	0.34
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	5.29	2.08	2.46	9.44
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.80	2.72	2.36	1.68

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					5	5	5	5
					0-0.1	0.15-0.25	0.3-0.4	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-5	242020-6	242020-7	242020-8
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.33	0.46	0.37	0.25
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	6.21	10.6	9.61	8.34
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	71.3	63.0	61.6	55.1
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	18.8	23.2	26.1	32.8
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	3.27	2.09	1.77	3.56
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.42	1.07	0.90	0.24
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					5	5	5	5
					0-0.1	0.15-0.25	0.3-0.4	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-5	242020-6	242020-7	242020-8
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.06	0.06	0.06	0.06
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	0.3	NA	NA	4.1
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	57.3	NA	NA	31.9
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	12.4	NA	NA	5.1
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	21.0	NA	NA	10.8
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	4.0	NA	NA	2.1
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	5.1	NA	NA	45.9

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					5	8	8	8
					0.7-0.8	0-0.1	0.1-0.2	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-9	242020-10	242020-11	242020-12
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.84	7.64	8.32	8.03
Chloride Soluble	DA	DAP-06	mg/kg	5	32.8	21.4	17.5	26.4
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.06	0.12	0.13	0.15
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1225	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	167	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	1.40	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	5.97	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	487	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	<3.00	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	1.46	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	<0.20	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	6.86	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	8.28	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.69	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	309	508	290	273
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1102	6221	7648	6610
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	479	459	615	709
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	162	116	154	319
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.79	1.30	0.74	0.70
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	5.51	31.1	38.2	33.1
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	3.99	3.83	5.13	5.91
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.70	0.50	0.67	1.39
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	11.0	36.8	44.8	41.1
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.38	8.13	7.46	5.59

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					5	8	8	8
					0.7-0.8	0-0.1	0.1-0.2	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-9	242020-10	242020-11	242020-12
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.20	0.34	0.15	0.12
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	7.19	3.54	1.66	1.70
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	50.0	84.6	85.4	80.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	36.2	10.4	11.4	14.4
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	6.39	1.37	1.49	3.38
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.20	0.06	0.05	0.05
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	233	399	163	196
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1031	6075	6272	5993
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	390	516	515	646
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	152	105	143	297
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.60	1.02	0.42	0.50
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	5.16	30.4	31.4	30.0
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	3.25	4.30	4.29	5.38
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.66	0.46	0.62	1.29
ECEC	Calculation	PMS-15C1	cmol/kg	na	9.69	36.2	36.7	37.2

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					5	8	8	8
					0.7-0.8	0-0.1	0.1-0.2	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-9	242020-10	242020-11	242020-12
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.59	7.06	7.31	5.57
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.18	0.24	0.10	0.09
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	6.17	2.83	1.14	1.35
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	53.2	84.0	85.4	80.6
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	33.6	11.9	11.7	14.5
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	6.82	1.26	1.69	3.47
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.23	0.06	0.06	0.06
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					8	9	9	9
					0.7-0.8	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-13	242020-14	242020-15	242020-16
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.49	6.70	6.42	7.61
Chloride Soluble	DA	DAP-06	mg/kg	5	49.0	12.9	15.6	44.5
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.17	0.04	0.04	0.08
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1537	847	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	296	145	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	2.09	1.26	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	16.5	6.90	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	500	197	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	3.26	<3.00	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.78	0.60	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.49	<0.20	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	42.1	41.9	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	22.9	11.7	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.57	0.85	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	355	429	182	142
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	6946	1896	2920	3714
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	854	568	701	920
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	481	48.5	181	364
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.91	1.10	0.47	0.36
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	34.7	9.48	14.6	18.6
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	7.12	4.73	5.84	7.67
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	2.09	0.21	0.79	1.58
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	44.9	15.5	21.7	28.2
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	4.88	2.00	2.50	2.42

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					8	9	9	9
					0.7-0.8	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-13	242020-14	242020-15	242020-16
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.13	0.23	0.08	0.05
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	2.03	7.08	2.15	1.29
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	77.4	61.0	67.2	65.8
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	15.9	30.4	26.9	27.2
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	4.66	1.36	3.62	5.61
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.05	0.14	0.10	0.08
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	172	NA	NA	125
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	5344	NA	NA	3686
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	635	NA	NA	716
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	400	NA	NA	348
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.44	NA	NA	0.32
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	26.7	NA	NA	18.4
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	5.29	NA	NA	5.97
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	1.74	NA	NA	1.51
ECEC	Calculation	PMS-15C1	cmol/kg	na	34.2	NA	NA	26.3

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					8	9	9	9
					0.7-0.8	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-13	242020-14	242020-15	242020-16
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	5.05	NA	NA	3.09
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.08	NA	NA	0.05
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	1.29	NA	NA	1.22
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	78.1	NA	NA	70.2
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	15.5	NA	NA	22.7
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	5.08	NA	NA	5.76
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.06	0.06	0.06	0.08
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					9	9	10	10
					0.6-0.7	1.0-1.1	0-0.1	0.2-0.3
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-17	242020-18	242020-19	242020-20
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.13	8.59	6.88	8.14
Chloride Soluble	DA	DAP-06	mg/kg	5	166	173	28.6	29.6
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.32	0.33	0.06	0.08
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	978	614
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	126	64.4
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	1.02	0.64
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	10.5	8.58
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	492	168
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	3.44	<3.00
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	0.86	0.72
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	<0.20	<0.20
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	18.8	10.5
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	15.3	10.8
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	0.69	0.89
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	126	115	519	171
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	5476	6120	4313	5163
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1036	803	1365	1692
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	531	538	170	345
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.32	0.29	1.33	0.44
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	27.4	30.6	21.6	25.8
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	8.63	6.69	11.4	14.1
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	2.31	2.34	0.74	1.50
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	38.7	39.9	35.0	41.9
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.17	4.57	1.90	1.83

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					9	9	10	10
					0.6-0.7	1.0-1.1	0-0.1	0.2-0.3
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-17	242020-18	242020-19	242020-20
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.04	0.04	0.12	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.84	0.74	3.80	1.05
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	70.8	76.6	61.6	61.6
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	22.3	16.8	32.5	33.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	5.97	5.86	2.11	3.58
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.06	0.06	0.06	0.05
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	90.2	91.0	NA	132
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	3488	3422	NA	5103
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	853	674	NA	1627
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	458	469	NA	302
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.23	0.23	NA	0.34
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	17.4	17.1	NA	25.5
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	7.11	5.62	NA	13.6
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	1.99	2.04	NA	1.31
ECEC	Calculation	PMS-15C1	cmol/kg	na	26.8	25.0	NA	40.7

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					9	9	10	10
					0.6-0.7	1.0-1.1	0-0.1	0.2-0.3
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-17	242020-18	242020-19	242020-20
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	2.45	3.05	NA	1.88
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.03	0.04	NA	0.02
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.86	0.93	NA	0.83
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	65.1	68.4	NA	62.6
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	26.5	22.4	NA	33.3
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	7.43	8.15	NA	3.22
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.08	0.09	0.09	0.05
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					10	10	11	11
					0.4-0.5	0.8-0.9	0-0.1	0.15-0.25
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-21	242020-22	242020-23	242020-24
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.70	7.90	6.56	7.41
Chloride Soluble	DA	DAP-06	mg/kg	5	138	597	8.40	12.9
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.19	0.65	0.04	0.06
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	1135	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	186	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	1.63	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	8.89	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	491	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	<3.00	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	0.86	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	0.39	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	22.9	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	16.1	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	0.39	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	149	171	362	154
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	5081	5196	1355	2380
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1744	1967	421	655
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	621	1041	38.8	86.0
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.38	0.44	0.93	0.39
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	25.4	26.0	6.78	11.9
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	14.5	16.4	3.51	5.46
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	2.70	4.53	0.17	0.37
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	43.0	47.4	11.4	18.1
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.75	1.58	1.93	2.18

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					10	10	11	11
					0.4-0.5	0.8-0.9	0-0.1	0.15-0.25
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-21	242020-22	242020-23	242020-24
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.03	0.26	0.07
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.89	0.93	8.14	2.18
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	59.0	54.9	59.4	65.6
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	33.8	34.6	30.8	30.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	6.27	9.56	1.48	2.06
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.05	0.05	0.19	0.12
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	131	136	NA	133
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	4912	5015	NA	2076
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1740	1856	NA	571
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	571	739	NA	78.0
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.34	0.35	NA	0.34
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	24.6	25.1	NA	10.4
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	14.5	15.5	NA	4.76
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	2.48	3.21	NA	0.34
ECEC	Calculation	PMS-15C1	cmol/kg	na	41.9	44.1	NA	15.8

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					10	10	11	11
					0.4-0.5	0.8-0.9	0-0.1	0.15-0.25
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-21	242020-22	242020-23	242020-24
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.69	1.62	NA	2.18
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.02	0.02	NA	0.07
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.80	0.79	NA	2.15
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	58.6	56.8	NA	65.5
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	34.6	35.1	NA	30.0
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	5.92	7.28	NA	2.14
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.05	0.05	0.05	0.14
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					12	12	16d	16d
					0-0.1	0.3-0.4	0-0.1	0.1-0.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-25	242020-26	242020-27	242020-28
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	3.73	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.28	6.28	6.50	6.21
Chloride Soluble	DA	DAP-06	mg/kg	5	8.50	42.0	74.2	13.2
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.06	0.04	0.05	0.04
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	893	NA	1785	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	170	NA	375	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.44	NA	2.01	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	7.84	NA	42.1	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	434	NA	600	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	NA	3.17	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.60	NA	2.52	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	<0.20	NA	1.27	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	21.3	NA	44.0	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	23.4	NA	49.8	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.35	NA	0.85	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	307	223	495	94.0
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	890	1233	3010	2265
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	170	355	496	283
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	<10.0	23.1	54.0	59.7
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.79	0.57	1.27	0.24
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	4.45	6.17	15.1	11.3
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.42	2.96	4.13	2.36
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.04	0.10	0.23	0.26
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	6.72	9.82	20.7	14.2
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.14	2.08	3.64	4.80

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					12	12	16d	16d
					0-0.1	0.3-0.4	0-0.1	0.1-0.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-25	242020-26	242020-27	242020-28
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.56	0.19	0.31	0.10
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	11.7	5.82	6.13	1.70
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	66.2	62.8	72.7	79.7
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	21.1	30.1	20.0	16.6
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.65	1.02	1.13	1.83
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.33	0.23	0.11	0.16
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					12	12	16d	16d
					0-0.1	0.3-0.4	0-0.1	0.1-0.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-25	242020-26	242020-27	242020-28
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.14	0.14	0.14	0.14
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	0.3	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	16.5	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	7.0	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	21.4	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	14.5	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	40.5	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16d	16d	16d	16d
					0.2-0.3	0.5-0.6	0.9-1.0	1.3-1.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-29	242020-30	242020-31	242020-32
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	5.44	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.25	7.60	8.38	7.77
Chloride Soluble	DA	DAP-06	mg/kg	5	16.6	273	632	883
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.05	0.37	0.77	0.96
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	76.3	98.7	102	106
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2220	3333	2943	2363
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	323	673	879	973
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	121	582	1179	1553
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.20	0.25	0.26	0.27
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	11.1	16.7	14.7	11.8
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	2.69	5.61	7.33	8.11
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.53	2.53	5.13	6.75
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	14.5	25.1	27.4	27.0
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	4.12	2.97	2.01	1.46

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16d	16d	16d	16d
					0.2-0.3	0.5-0.6	0.9-1.0	1.3-1.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-29	242020-30	242020-31	242020-32
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.07	0.05	0.04	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	1.35	1.01	0.95	1.01
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	76.4	66.4	53.6	43.8
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	18.5	22.4	26.7	30.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	3.62	10.1	18.7	25.0
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.15	0.09	0.08	0.08
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	49.2	81.2	88.4
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	2868	2614	2175
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	594	806	873
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	419	805	982
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.13	0.21	0.23
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	14.3	13.1	10.9
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	4.95	6.72	7.28
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	1.82	3.50	4.27
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	21.3	23.5	22.7

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16d	16d	16d	16d
					0.2-0.3	0.5-0.6	0.9-1.0	1.3-1.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-29	242020-30	242020-31	242020-32
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	2.90	1.95	1.49
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.03	0.03	0.03
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	0.59	0.89	1.00
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	67.5	55.6	48.0
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	23.3	28.6	32.1
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	8.57	14.9	18.8
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.14	0.10	0.09	0.10
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	0.9	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	26.1	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	7.5	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	26.9	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	10.4	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	28.2	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16m	16m	16m	16m
					0-0.1	0.1-0.2	0.2-0.3	0.5-0.6
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-33	242020-34	242020-35	242020-36
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	2.15	NA	10.2	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.14	7.95	8.67	8.34
Chloride Soluble	DA	DAP-06	mg/kg	5	13.9	15.3	39.9	218
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.08	0.17	0.23	0.48
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	2173	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	256	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.87	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	15.2	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	525	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	4.21	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.84	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.41	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	36.2	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	19.3	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	1.19	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	425	98.0	91.6	135
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2382	6003	5349	5312
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	405	662	1011	1004
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	56.3	251	793	794
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	1.09	0.25	0.23	0.35
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	11.9	30.0	26.7	26.6
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	3.38	5.52	8.43	8.37
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.24	1.09	3.45	3.45
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	16.6	36.9	38.9	38.7
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.53	5.44	3.17	3.17

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16m	16m	16m	16m
					0-0.1	0.1-0.2	0.2-0.3	0.5-0.6
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-33	242020-34	242020-35	242020-36
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.32	0.05	0.03	0.04
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	6.55	0.68	0.60	0.89
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	71.6	81.3	68.8	68.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	20.3	15.0	21.7	21.6
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.47	2.96	8.87	8.91
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.13	0.06	0.06	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	43.5	72.3	87.8
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	3646	2967	2107
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	495	717	986
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	172	316	653
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.11	0.19	0.23
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	18.2	14.8	10.5
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	4.13	5.98	8.22
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.75	1.37	2.84
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	23.2	22.4	21.8

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16m	16m	16m	16m
					0-0.1	0.1-0.2	0.2-0.3	0.5-0.6
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-33	242020-34	242020-35	242020-36
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	4.42	2.48	1.28
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.03	0.03	0.03
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	0.48	0.83	1.03
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	78.5	66.3	48.2
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	17.8	26.7	37.6
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	3.22	6.14	13.0
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.10	0.10	0.10	0.10
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	3.1	NA	2.6	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	24.6	NA	22.6	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	9.2	NA	5.4	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	30.8	NA	22.8	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	7.8	NA	4.3	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	24.5	NA	42.3	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16m	16m	17	17
					0.9-1.0	1.3-1.4	0-0.1	0.1-0.15
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-37	242020-38	242020-39	242020-40
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.03	8.65	6.35	6.65
Chloride Soluble	DA	DAP-06	mg/kg	5	903	1122	11.3	21.8
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	1.18	1.36	0.05	0.05
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	1467	846
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	229	190
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	1.55	0.79
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	13.0	6.54
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	303	276
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	3.40	4.22
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	0.84	1.02
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	0.33	<0.20
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	23.5	35.4
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	22.3	30.5
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	0.77	0.81
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	107	113	254	207
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	4123	2472	1665	1162
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1137	1198	385	271
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1613	2007	78.9	43.3
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.27	0.29	0.65	0.53
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	20.6	12.4	8.33	5.81
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	9.48	9.98	3.21	2.26
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	7.01	8.73	0.34	0.19
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	37.4	31.4	12.5	8.81
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.18	1.24	2.59	2.57

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16m	16m	17	17
					0.9-1.0	1.3-1.4	0-0.1	0.1-0.15
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-37	242020-38	242020-39	242020-40
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.03	0.20	0.24
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.73	0.92	5.19	6.02
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	55.1	39.4	66.3	66.0
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	25.3	31.8	25.6	25.6
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	18.8	27.8	2.73	2.14
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.06	0.07	0.18	0.25
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	82.5	93.5	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2004	2012	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1043	1070	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	1044	1211	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.21	0.24	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	10.0	10.1	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	8.69	8.92	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	4.54	5.27	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	23.5	24.5	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					16m	16m	17	17
					0.9-1.0	1.3-1.4	0-0.1	0.1-0.15
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-37	242020-38	242020-39	242020-40
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.15	1.13	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.02	0.03	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.90	0.98	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	42.7	41.1	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	37.0	36.4	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	19.3	21.5	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.09	0.09	0.09	0.09
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					17	17	17	17
					0.15-0.25	0.3-0.4	0.6-0.7	1.0-1.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-41	242020-42	242020-43	242020-44
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.31	8.65	8.37	8.87
Chloride Soluble	DA	DAP-06	mg/kg	5	270	727	750	751
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.36	0.89	0.96	0.95
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	155	115	89.3	95.6
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2417	4952	4826	4048
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1261	1403	1189	1106
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	780	1165	1216	1274
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.40	0.29	0.23	0.25
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	12.1	24.8	24.1	20.2
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	10.5	11.7	9.91	9.22
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	3.39	5.07	5.29	5.54
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	26.4	41.8	39.6	35.3
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.15	2.12	2.44	2.20

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					17	17	17	17
					0.15-0.25	0.3-0.4	0.6-0.7	1.0-1.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-41	242020-42	242020-43	242020-44
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.04	0.03	0.02	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	1.51	0.70	0.58	0.70
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	45.8	59.2	61.0	57.4
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	39.8	27.9	25.0	26.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	12.8	12.1	13.4	15.7
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.08	0.05	0.06	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	105	90.2	79.4	75.9
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2144	1647	1201	960
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1155	1170	1023	888
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	643	744	745	780
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.27	0.23	0.20	0.19
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	10.7	8.24	6.01	4.80
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	9.63	9.75	8.53	7.40
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	2.80	3.23	3.24	3.39
ECEC	Calculation	PMS-15C1	cmol/kg	na	23.4	21.5	18.0	15.8

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					17	17	17	17
					0.15-0.25	0.3-0.4	0.6-0.7	1.0-1.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-41	242020-42	242020-43	242020-44
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.11	0.84	0.70	0.65
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.03	0.02	0.02	0.03
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	1.15	1.08	1.13	1.23
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	45.7	38.3	33.4	30.4
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	41.1	45.4	47.4	46.8
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	11.9	15.1	18.0	21.5
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.09	0.10	0.12	0.14
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					17	19	19	22
					1.2-1.3	0-0.1	0.4-0.5	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-45	242020-46	242020-47	242020-48
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	4.55
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.88	7.05	6.99	6.91
Chloride Soluble	DA	DAP-06	mg/kg	5	789	24.8	13.9	14.2
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	1.02	0.09	0.06	0.07
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1027	NA	1153
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	172	NA	213
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	1.20	NA	1.10
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	9.96	NA	10.6
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	315	NA	745
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	3.59	NA	3.84
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.40	NA	0.92
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.43	NA	0.22
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	29.3	NA	24.6
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	14.4	NA	14.2
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.63	NA	0.72
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	99.0	229	230	543
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	4098	1077	942	1671
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1110	181	418	205
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1303	46.9	55.9	18.1
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.25	0.59	0.59	1.39
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	20.5	5.39	4.71	8.36
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	9.25	1.51	3.48	1.71
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	5.67	0.20	0.24	0.08
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	35.7	7.71	9.05	11.6
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.22	3.57	1.35	4.89

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					17	19	19	22
					1.2-1.3	0-0.1	0.4-0.5	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-45	242020-46	242020-47	242020-48
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.39	0.17	0.82
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.71	7.62	6.52	12.0
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	57.4	69.9	52.1	72.3
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	25.9	19.6	38.5	14.8
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	15.9	2.65	2.69	0.68
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.06	0.29	0.25	0.19
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	64.2	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	974	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	921	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	808	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.16	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	4.87	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	7.68	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	3.51	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	16.2	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					17	19	19	22
					1.2-1.3	0-0.1	0.4-0.5	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-45	242020-46	242020-47	242020-48
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.63	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.02	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	1.01	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	30.0	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	47.2	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	21.6	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.14	0.14	0.14	0.14
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	1.8
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	40.5
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	6.7
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	23.6
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	6.1
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	21.5

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					22	22	22	22
					0.1-0.2	0.25-0.35	0.5-0.6	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-49	242020-50	242020-51	242020-52
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	2.00	13.8	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.71	7.65	8.89	8.58
Chloride Soluble	DA	DAP-06	mg/kg	5	20.9	17.4	43.3	291
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.07	0.15	0.26	0.56
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	811	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	180	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.53	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	9.15	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	283	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.39	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.80	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	<0.20	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	16.8	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	17.5	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.91	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	250	184	126	98.6
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2287	3116	5163	5055
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	469	904	946	873
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	92.6	271	438	955
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.64	0.47	0.32	0.25
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	11.4	15.6	25.8	25.3
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	3.91	7.53	7.88	7.28
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.40	1.18	1.90	4.15
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	16.4	24.8	35.9	37.0
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.93	2.07	3.27	3.47

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					22	22	22	22
					0.1-0.2	0.25-0.35	0.5-0.6	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-49	242020-50	242020-51	242020-52
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.16	0.06	0.04	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	3.91	1.90	0.90	0.68
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	69.7	62.9	71.8	68.4
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	23.8	30.4	21.9	19.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	2.45	4.75	5.30	11.2
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.14	0.09	0.06	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	146	81.7	74.2
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	2490	2141	1369
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	747	910	733
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	239	395	632
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.37	0.21	0.19
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	12.5	10.7	6.85
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	6.23	7.58	6.11
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	1.04	1.72	2.75
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	20.1	20.2	15.9

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					22	22	22	22
					0.1-0.2	0.25-0.35	0.5-0.6	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-49	242020-50	242020-51	242020-52
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	2.00	1.41	1.12
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.06	0.03	0.03
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	1.86	1.04	1.20
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	61.9	52.9	43.0
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	31.0	37.5	38.4
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	5.17	8.49	17.3
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.14	0.11	0.11	0.14
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	2.0	18.5	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	39.5	24.5	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	6.3	4.5	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	21.0	12.2	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	4.3	7.5	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	27.0	32.8	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					22	29	29	29
					1.2-1.3	0-0.1	0.15-0.25	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-53	242020-54	242020-55	242020-56
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	9.15	7.61	7.42	7.28
Chloride Soluble	DA	DAP-06	mg/kg	5	508	8.40	12.5	9.92
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.75	0.05	0.03	0.02
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	390	265	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	154	138	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	0.95	<0.20	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	15.7	15.9	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	297	286	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	<3.00	<3.00	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.24	0.24	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	2.17	2.83	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	13.8	11.3	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	10.7	8.92	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.21	<0.20	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	105	165	156	87.3
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	5044	451	356	282
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	919	112	83.3	59.0
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1240	13.3	11.4	<10.0
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.27	0.42	0.40	0.22
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	25.2	2.26	1.78	1.41
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	7.66	0.93	0.69	0.49
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	5.39	0.06	0.05	0.04
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	38.6	3.69	2.95	2.19
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.29	2.42	2.56	2.87

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					22	29	29	29
					1.2-1.3	0-0.1	0.15-0.25	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-53	242020-54	242020-55	242020-56
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.04	0.45	0.58	0.46
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.70	11.5	13.6	10.2
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	65.4	61.1	60.4	64.3
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	19.9	25.3	23.6	22.4
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	14.0	1.57	1.68	1.98
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.06	0.60	0.75	1.01
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	67.0	115	109	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1517	252	245	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	810	86.3	61.9	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	830	<10.0	<10.0	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.17	0.29	0.28	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	7.59	1.26	1.23	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	6.75	0.72	0.52	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	3.61	0.04	0.04	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	18.1	2.34	2.09	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					22	29	29	29
					1.2-1.3	0-0.1	0.15-0.25	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-53	242020-54	242020-55	242020-56
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.12	1.75	2.37	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.03	0.41	0.54	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.95	12.6	13.4	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	41.8	53.9	58.7	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	37.2	30.7	24.7	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	19.9	1.86	2.08	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12	0.95	1.07	1.07
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					29	29	29	33d
					0.5-0.6	0.8-0.9	1.1-1.2	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-57	242020-58	242020-59	242020-60
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.68	7.02	6.43	7.49
Chloride Soluble	DA	DAP-06	mg/kg	5	12.2	9.72	9.78	16.8
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.02	0.02	0.02	0.11
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	932
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	208
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	1.39
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	36.8
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	564
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	3.53
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	1.92
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	0.33
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	14.6
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	19.7
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	0.85
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	47.9	44.0	31.3	467
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	280	351	388	4339
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	66.9	88.8	110	659
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	11.9	11.0	15.7	73.0
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.12	0.11	0.08	1.20
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	1.40	1.76	1.94	21.7
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.56	0.74	0.92	5.49
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.05	0.05	0.07	0.32
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	2.15	2.68	3.03	28.7
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.51	2.37	2.12	3.95

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					29	29	29	33d
					0.5-0.6	0.8-0.9	1.1-1.2	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-57	242020-58	242020-59	242020-60
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.22	0.15	0.09	0.22
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	5.70	4.21	2.65	4.17
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	65.0	65.5	64.1	75.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	25.9	27.6	30.3	19.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	2.40	1.79	2.25	1.10
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	1.03	0.83	0.73	0.08
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					29	29	29	33d
					0.5-0.6	0.8-0.9	1.1-1.2	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-57	242020-58	242020-59	242020-60
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	1.07	1.07	1.07	1.07
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33d	33d	33d	33d
					0.15-0.25	0.3-0.4	0.65-0.75	1.0-1.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-61	242020-62	242020-63	242020-64
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.24	8.77	8.51	8.66
Chloride Soluble	DA	DAP-06	mg/kg	5	33.2	129	908	1201
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.19	0.31	1.01	1.34
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	484	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	138	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.48	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	10.4	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	177	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	4.83	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	1.40	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	<0.20	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	8.10	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	16.2	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.93	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	170	136	113	113
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	4647	4289	3993	3020
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	727	784	962	1074
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	300	535	1487	1837
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.44	0.35	0.29	0.29
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	23.2	21.4	20.0	15.1
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	6.06	6.53	8.02	8.95
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	1.30	2.33	6.47	7.99
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	31.1	30.7	34.8	32.3
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.84	3.28	2.49	1.69

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33d	33d	33d	33d
					0.15-0.25	0.3-0.4	0.65-0.75	1.0-1.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-61	242020-62	242020-63	242020-64
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.07	0.05	0.04	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	1.40	1.14	0.83	0.90
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	74.8	69.9	57.4	46.7
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	19.5	21.3	23.1	27.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	4.20	7.58	18.6	24.7
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.07	0.07	0.06	0.07
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	123	89.6	73.7	79.8
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	3973	3381	2652	2090
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	643	708	912	905
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	256	419	966	980
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.32	0.23	0.19	0.20
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	19.9	16.9	13.3	10.5
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	5.36	5.90	7.60	7.54
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	1.11	1.82	4.20	4.26
ECEC	Calculation	PMS-15C1	cmol/kg	na	26.7	24.9	25.3	22.5

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33d	33d	33d	33d
					0.15-0.25	0.3-0.4	0.65-0.75	1.0-1.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-61	242020-62	242020-63	242020-64
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	3.71	2.87	1.74	1.39
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.06	0.04	0.02	0.03
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	1.18	0.92	0.75	0.91
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	74.5	67.9	52.5	46.5
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	20.1	23.7	30.1	33.5
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	4.17	7.32	16.6	19.0
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.08	0.09	0.09	0.10
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33d	33m	33m	33m
					1.3-1.4	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-65	242020-66	242020-67	242020-68
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.20	7.19	7.19	8.42
Chloride Soluble	DA	DAP-06	mg/kg	5	1448	22.5	46.5	317
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	1.49	0.09	0.17	0.48
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1487	576	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	229	101	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	2.18	0.69	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	23.2	7.95	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	642	161	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	4.65	3.98	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	1.50	1.10	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.37	<0.20	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	25.9	9.62	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	27.3	15.2	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.75	0.74	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	114	570	152	113
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2321	3035	3424	5067
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1115	789	891	1198
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1908	97.1	298	702
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.29	1.46	0.39	0.29
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	11.6	15.2	17.1	25.3
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	9.29	6.58	7.43	9.98
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	8.30	0.42	1.30	3.05
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	29.5	23.7	26.3	38.7
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.25	2.31	2.31	2.54

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33d	33m	33m	33m
					1.3-1.4	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-65	242020-66	242020-67	242020-68
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.22	0.05	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.99	6.18	1.48	0.75
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	39.3	64.1	65.2	65.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	31.5	27.8	28.3	25.8
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	28.1	1.78	4.94	7.89
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.08	0.09	0.08	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	87.0	NA	NA	77.8
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2287	NA	NA	2936
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1103	NA	NA	1077
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	1179	NA	NA	521
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.22	NA	NA	0.20
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	11.4	NA	NA	14.7
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	9.19	NA	NA	8.98
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	5.13	NA	NA	2.27
ECEC	Calculation	PMS-15C1	cmol/kg	na	26.0	NA	NA	26.1

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33d	33m	33m	33m
					1.3-1.4	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-65	242020-66	242020-67	242020-68
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.24	NA	NA	1.64
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.02	NA	NA	0.02
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.86	NA	NA	0.76
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	44.0	NA	NA	56.2
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	35.4	NA	NA	34.3
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	19.7	NA	NA	8.67
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.09	0.09	0.09	0.09
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33m	33m	33m	35
					0.6-0.7	1.0-1.1	1.3-1.4	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-69	242020-70	242020-71	242020-72
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.53	8.31	8.54	6.64
Chloride Soluble	DA	DAP-06	mg/kg	5	935	1237	1345	19.2
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	1.15	1.35	1.37	0.07
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	1999
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	223
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	2.09
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	12.7
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	399
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	4.75
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	0.60
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	2.74
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	46.4
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	21.6
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	0.60
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	119	121	136	331
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	4457	3922	5358	1342
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1392	1409	1423	234
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1420	1684	1682	27.9
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.31	0.31	0.35	0.85
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	22.3	19.6	26.8	6.71
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	11.6	11.7	11.9	1.95
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	6.17	7.32	7.31	0.12
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	40.4	39.0	46.3	9.65
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.92	1.67	2.26	3.44

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33m	33m	33m	35
					0.6-0.7	1.0-1.1	1.3-1.4	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-69	242020-70	242020-71	242020-72
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.03	0.03	0.44
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.76	0.80	0.75	8.79
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	55.2	50.3	57.8	69.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	28.7	30.1	25.6	20.2
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	15.3	18.8	15.8	1.26
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.06	0.06	0.05	0.23
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	97.8	97.9	89.8	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2665	2527	2233	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1262	1316	1196	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	800	952	829	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.25	0.25	0.23	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	13.3	12.6	11.2	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	10.5	11.0	9.97	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	3.48	4.14	3.60	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	27.6	28.0	25.0	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					33m	33m	33m	35
					0.6-0.7	1.0-1.1	1.3-1.4	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-69	242020-70	242020-71	242020-72
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.27	1.15	1.12	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.02	0.02	0.02	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.91	0.90	0.92	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	48.3	45.1	44.7	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	38.1	39.1	39.9	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	12.6	14.8	14.4	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.08	0.08	0.09	0.09
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					35	35	35	35
					0.1-0.2	0.3-0.4	0.6-0.7	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-73	242020-74	242020-75	242020-76
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.98	7.82	8.04	7.89
Chloride Soluble	DA	DAP-06	mg/kg	5	11.1	10.9	10.4	18.8
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.04	0.04	0.04	0.08
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	528	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	140	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.43	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	20.7	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	363	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.72	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.62	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	23.7	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	11.0	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.36	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	266	289	390	418
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	909	1391	1405	1142
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	72.9	215	448	536
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	25.5	19.9	58.1	130
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.68	0.74	1.00	1.07
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	4.55	6.96	7.03	5.71
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.61	1.79	3.73	4.47
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.11	0.09	0.25	0.57
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	5.97	9.60	12.0	11.8
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	7.48	3.88	1.88	1.28

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					35	35	35	35
					0.1-0.2	0.3-0.4	0.6-0.7	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-73	242020-74	242020-75	242020-76
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.12	0.41	0.27	0.24
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	11.4	7.72	8.31	9.06
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	76.2	72.5	58.4	48.2
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	10.2	18.7	31.0	37.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.86	0.90	2.10	4.78
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.37	0.23	0.18	0.19
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	170	266	264
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	1101	1262	898
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	118	333	389
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	14.7	45.9	81.6
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.44	0.68	0.68
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	5.51	6.31	4.49
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	0.98	2.78	3.24
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.06	0.20	0.35
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	7.01	9.99	8.79

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					35	35	35	35
					0.1-0.2	0.3-0.4	0.6-0.7	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-73	242020-74	242020-75	242020-76
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	5.60	2.27	1.39
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.44	0.25	0.21
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	6.22	6.83	7.70
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	78.5	63.2	51.1
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	14.0	27.8	36.9
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	0.91	2.00	4.04
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.09	0.32	0.22	0.25
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					36	36	36	36
					0-0.1	0.15-0.25	0.3-0.4	0.5-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-77	242020-78	242020-79	242020-80
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.40	6.94	6.73	7.25
Chloride Soluble	DA	DAP-06	mg/kg	5	7.15	7.78	8.67	17.0
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.04	0.02	0.02	0.04
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	422	102	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	96.0	70.0	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.96	0.21	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	10.5	8.57	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	133	169	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	<3.00	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.20	0.22	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.32	0.44	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	9.40	7.32	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	17.6	8.58	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.24	<0.20	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	103	120	114	198
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	367	287	243	1078
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	68.5	39.6	47.6	411
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	13.5	11.2	15.5	80.1
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.26	0.31	0.29	0.51
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	1.84	1.44	1.22	5.39
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.57	0.33	0.40	3.43
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.06	0.05	0.07	0.35
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	2.75	2.14	1.99	9.69
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.21	4.35	3.06	1.57

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					36	36	36	36
					0-0.1	0.15-0.25	0.3-0.4	0.5-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-77	242020-78	242020-79	242020-80
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.46	0.93	0.74	0.15
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	9.60	14.4	14.7	5.24
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	66.7	66.9	60.9	55.6
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	20.8	15.4	19.9	35.3
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	2.13	2.27	3.38	3.59
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.81	1.04	1.11	0.23
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					36	36	36	36
					0-0.1	0.15-0.25	0.3-0.4	0.5-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-77	242020-78	242020-79	242020-80
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.25	0.25	0.25	0.25
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					36	46d	46d	46m
					0.8-0.9	0-0.1	0.4-0.5	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-81	242020-82	242020-83	242020-84
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.62	7.30	7.99	8.16
Chloride Soluble	DA	DAP-06	mg/kg	5	19.9	11.8	451	18.5
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.06	0.05	0.58	0.11
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	857	NA	772
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	187	NA	173
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	1.06	NA	0.91
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	14.1	NA	11.7
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	349	NA	438
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	5.27	NA	3.09
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	1.23	NA	1.06
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	<0.20	NA	<0.20
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	21.7	NA	10.4
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	17.5	NA	11.3
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.72	NA	0.66
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	201	371	180	422
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1156	4527	4217	5414
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	497	1460	1669	1340
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	106	166	1156	145
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.52	0.95	0.46	1.08
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	5.78	22.6	21.1	27.1
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	4.14	12.2	13.9	11.2
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.46	0.72	5.03	0.63
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	10.9	36.5	40.5	40.0
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.40	1.86	1.52	2.42

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					36	46d	46d	46m
					0.8-0.9	0-0.1	0.4-0.5	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-81	242020-82	242020-83	242020-84
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.12	0.08	0.03	0.10
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	4.72	2.61	1.14	2.71
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	52.9	62.0	52.1	67.7
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	37.9	33.3	34.3	27.9
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	4.22	1.98	12.4	1.58
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.20	0.06	0.05	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	150	275	85.2	279
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1067	4429	3943	4841
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	434	1380	1530	1191
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	93.5	150	815	136
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.38	0.71	0.22	0.72
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	5.34	22.1	19.7	24.2
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	3.62	11.5	12.8	9.93
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.41	0.65	3.54	0.59
ECEC	Calculation	PMS-15C1	cmol/kg	na	9.77	35.0	36.2	35.5

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					36	46d	46d	46m
					0.8-0.9	0-0.1	0.4-0.5	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-81	242020-82	242020-83	242020-84
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.48	1.93	1.55	2.44
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.11	0.06	0.02	0.07
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	3.94	2.01	0.60	2.02
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	54.6	63.2	54.4	68.3
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	37.0	32.8	35.2	28.0
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	4.16	1.86	9.78	1.67
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.23	0.06	0.06	0.06
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					46m	53	53	56
					0.3-0.4	0-0.1	0.8-0.9	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-85	242020-88	242020-89	242020-90
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	0.61
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.76	6.44	6.44	6.23
Chloride Soluble	DA	DAP-06	mg/kg	5	36.1	9.48	53.7	16.1
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.25	0.04	0.11	0.03
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	419	NA	464
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	62.6	NA	168
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	0.81	NA	0.91
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	6.98	NA	12.9
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	161	NA	228
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	<3.00	NA	3.39
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.24	NA	0.50
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.40	NA	0.54
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	14.1	NA	41.3
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	20.9	NA	15.4
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.22	NA	0.44
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	157	116	221	181
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	5073	432	1089	662
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1691	81.0	521	139
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	635	15.0	206	11.6
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.40	0.30	0.57	0.46
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	25.4	2.16	5.45	3.31
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	14.1	0.68	4.34	1.16
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	2.76	0.07	0.90	0.05
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	42.6	3.22	11.3	5.01
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.80	3.20	1.25	2.86

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					46m	53	53	56
					0.3-0.4	0-0.1	0.8-0.9	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-85	242020-88	242020-89	242020-90
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.44	0.13	0.40
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.94	9.24	5.03	9.27
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	59.5	67.1	48.3	66.1
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	33.0	21.0	38.5	23.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	6.47	2.03	7.95	1.01
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.05	0.69	0.20	0.44
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	71.7	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	4049	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1592	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	578	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.18	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	20.2	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	13.3	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	2.51	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	36.2	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					46m	53	53	56
					0.3-0.4	0-0.1	0.8-0.9	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-85	242020-88	242020-89	242020-90
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.53	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.01	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.51	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	55.9	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	36.6	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	6.94	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.06	0.06	0.06	0.06
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	0.3
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	31.2
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	8.7
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	40.8
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	6.0
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	13.0

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					56	56	56	56
					0.1-0.2	0.3-0.4	0.6-0.7	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-91	242020-92	242020-93	242020-94
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	10.0	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.51	7.54	8.53	8.49
Chloride Soluble	DA	DAP-06	mg/kg	5	12.1	20.8	24.4	67.9
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.02	0.11	0.13	0.21
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	316	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	126	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.48	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	11.0	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	225	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.54	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.26	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	39.6	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	15.4	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.44	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	185	337	461	450
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	685	1783	1650	1793
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	124	397	621	710
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	<10.0	27.5	88.9	183
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.47	0.86	1.18	1.15
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	3.43	8.92	8.25	8.97
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.03	3.31	5.18	5.92
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.04	0.12	0.39	0.80
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	5.00	13.2	15.0	16.9
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.31	2.69	1.59	1.52

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					56	56	56	56
					0.1-0.2	0.3-0.4	0.6-0.7	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-91	242020-92	242020-93	242020-94
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.46	0.26	0.23	0.20
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	9.49	6.53	7.87	6.85
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	68.5	67.4	54.9	53.2
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	20.7	25.0	34.5	35.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.87	0.90	2.57	4.72
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.44	0.17	0.15	0.13
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	249	317	288
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	1512	1206	814
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	379	508	574
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	21.1	76.6	109
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.64	0.81	0.74
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	7.56	6.03	4.07
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	3.16	4.23	4.78
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.09	0.33	0.47
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	11.5	11.4	10.1

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					56	56	56	56
					0.1-0.2	0.3-0.4	0.6-0.7	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-91	242020-92	242020-93	242020-94
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	2.39	1.42	0.85
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.20	0.19	0.15
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	5.57	7.11	7.32
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	65.9	52.7	40.3
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	27.5	37.0	47.4
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	0.80	2.91	4.70
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.06	0.19	0.19	0.22
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	0.7	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	18.7	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	7.5	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	24.3	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	8.7	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	40.2	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					57	57	67	67
					0-0.1	0.3-0.4	0-0.1	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-95	242020-96	242020-97	242020-98
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.60	6.32	6.07	8.19
Chloride Soluble	DA	DAP-06	mg/kg	5	114	47.8	10.0	48.0
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.07	0.08	0.07	0.09
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	662	NA	2368	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	173	NA	271	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.69	NA	2.20	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	9.20	NA	9.33	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	228	NA	532	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.59	NA	4.33	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	1.82	NA	0.76	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	9.20	NA	3.04	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	15.4	NA	42.8	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	19.4	NA	44.4	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.46	NA	0.56	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	171	187	457	587
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	551	840	1370	1719
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	102	569	297	785
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	<10.0	215	15.4	161
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.44	0.48	1.17	1.51
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	2.76	4.20	6.85	8.60
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.85	4.74	2.48	6.54
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.04	0.93	0.07	0.70
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	4.11	10.4	10.6	17.4
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.24	0.89	2.77	1.31

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					57	57	67	67
					0-0.1	0.3-0.4	0-0.1	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-95	242020-96	242020-97	242020-98
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.52	0.10	0.47	0.23
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	10.7	4.62	11.1	8.67
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	67.0	40.5	64.7	49.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	20.7	45.7	23.4	37.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.06	9.01	0.63	4.03
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.54	0.21	0.21	0.13
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	367
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	1374
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	621
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	118
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	0.94
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	6.87
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	5.18
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	0.51
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	13.5

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					57	57	67	67
					0-0.1	0.3-0.4	0-0.1	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-95	242020-96	242020-97	242020-98
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	1.33
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	0.18
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	6.96
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	50.8
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	38.3
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	3.79
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.22	0.22	0.22	0.16
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76m	76m	76m	76m
					0-0.1	0.1-0.2	0.4-0.5	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-101	242020-102	242020-103	242020-105
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.19	6.60	8.76	8.11
Chloride Soluble	DA	DAP-06	mg/kg	5	9.16	13.3	476	1595
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.12	0.08	0.65	1.89
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	2561	1177	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	487	419	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	3.19	1.25	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	74.3	51.7	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	982	606	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	4.58	7.59	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.90	2.36	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	1.50	0.84	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	28.3	35.7	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	18.3	38.6	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.94	0.77	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	887	517	150	194
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	3295	2405	4883	5205
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	875	704	1615	1744
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	40.1	96.7	1083	2034
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	2.27	1.33	0.38	0.50
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	16.5	12.0	24.4	26.0
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	7.29	5.87	13.5	14.5
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.17	0.42	4.71	8.84
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	26.2	19.7	43.0	49.9
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.26	2.05	1.81	1.79

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76m	76m	76m	76m
					0-0.1	0.1-0.2	0.4-0.5	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-101	242020-102	242020-103	242020-105
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.31	0.23	0.03	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	8.67	6.74	0.89	1.00
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	62.8	61.2	56.8	52.1
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	27.8	29.8	31.3	29.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.66	2.14	11.0	17.7
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.08	0.11	0.05	0.04
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	132	105
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	2153	1905
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	1454	1382
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	740	857
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	0.34	0.27
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	10.8	9.53
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	12.1	11.5
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	3.22	3.73
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	26.5	25.1

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76m	76m	76m	76m
					0-0.1	0.1-0.2	0.4-0.5	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-101	242020-102	242020-103	242020-105
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	0.89	0.83
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	0.03	0.02
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	1.28	1.07
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	40.7	38.0
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	45.8	46.0
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	12.2	14.9
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.16	0.16	0.08	0.09
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76m	76d	76d	76d
					1.2-1.3	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-106	242020-107	242020-108	242020-109
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.72	6.72	6.29	5.83
Chloride Soluble	DA	DAP-06	mg/kg	5	1655	19.3	123	566
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	4.45	0.09	0.16	0.61
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1452	677	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	468	222	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	1.67	0.98	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	89.6	17.3	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	764	204	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	10.1	11.7	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	1.70	1.52	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.70	<0.20	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	29.4	16.8	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	64.3	41.8	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.60	0.60	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	259	760	198	129
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	9188	2944	3127	2849
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1638	848	1159	1280
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1920	153	414	865
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.66	1.95	0.51	0.33
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	45.9	14.7	15.6	14.2
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	13.7	7.07	9.66	10.7
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	8.35	0.67	1.80	3.76
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	68.6	24.4	27.6	29.0
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.37	2.08	1.62	1.34

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76m	76d	76d	76d
					1.2-1.3	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-106	242020-107	242020-108	242020-109
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.05	0.28	0.05	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.97	7.98	1.84	1.14
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	66.9	60.3	56.6	49.1
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	19.9	28.9	35.0	36.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	12.2	2.72	6.52	13.0
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.03	0.09	0.08	0.08
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	127
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	2685
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	1207
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	519
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	0.33
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	13.4
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	10.1
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	2.26
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	26.1
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	1.33
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	0.03
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	1.25
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	51.5
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	38.6
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	8.65
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	NA	NA	NA	0.09
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	246	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2365	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1512	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	901	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.63	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	11.8	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	12.6	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	3.92	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	29.0	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76m	76d	76d	76d
					1.2-1.3	0-0.1	0.1-0.2	0.3-0.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-106	242020-107	242020-108	242020-109
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.94	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.05	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	2.18	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	40.8	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	43.5	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	13.5	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.08	0.08	0.08	0.08
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76d	76d	78	78
					0.6-0.7	1.0-1.1	0-0.1	0.15-0.25
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-110	242020-111	242020-112	242020-113
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	3.63	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	5.84	7.28	6.92	7.66
Chloride Soluble	DA	DAP-06	mg/kg	5	1445	1465	59.3	80.5
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	3.28	1.68	0.14	0.15
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	897	368
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	359	204
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	0.95	0.30
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	90.2	29.1
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	1298	532
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	9.11	10.5
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	3.80	2.20
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	0.68	0.38
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	36.4	11.8
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	31.2	15.8
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	1.16	0.78
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	144	185	1054	519
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	4400	2803	2164	2413
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1477	1608	594	657
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1456	1570	139	432
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.37	0.47	2.70	1.33
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	22.0	14.0	10.8	12.1
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	12.3	13.4	4.95	5.48
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	6.33	6.83	0.60	1.88
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	41.0	34.7	19.1	20.8
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.79	1.05	2.19	2.20

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76d	76d	78	78
					0.6-0.7	1.0-1.1	0-0.1	0.15-0.25
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-110	242020-111	242020-112	242020-113
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.04	0.55	0.24
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.90	1.37	14.2	6.41
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	53.6	40.3	56.7	58.1
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	30.0	38.6	25.9	26.4
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	15.4	19.7	3.16	9.04
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.05	0.06	0.12	0.11
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	139	165	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	4815	2305	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	1558	1339	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	756	618	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	0.36	0.42	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	24.1	11.5	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	13.0	11.2	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	3.29	2.69	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	40.7	25.8	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	1.85	1.03	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	0.03	0.04	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	0.88	1.64	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	59.1	44.6	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	31.9	43.2	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	8.07	10.4	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.05	0.09	0.09	0.09
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	444
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	2335
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	638
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	424
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	1.14
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	11.7
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	5.32
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	1.84
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	20.0

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					76d	76d	78	78
					0.6-0.7	1.0-1.1	0-0.1	0.15-0.25
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-110	242020-111	242020-112	242020-113
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	2.20
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	0.21
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	5.69
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	58.4
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	26.6
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	9.22
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.08	0.08	0.08	0.11
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	0.2	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	11.0	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	3.1	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	16.3	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	12.4	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	57.0	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					78	78	78	78
					0.35-0.45	0.6-0.7	1.0-1.1	1.3-1.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-114	242020-115	242020-116	242020-117
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	13.7	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.98	6.43	4.96	5.25
Chloride Soluble	DA	DAP-06	mg/kg	5	464	342	727	909
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.26	0.43	0.78	0.86
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	423	256	145	141
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2453	1929	1307	1113
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	828	865	919	911
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	726	949	1323	1416
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	16.5	23.9
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	1.08	0.66	0.37	0.36
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	12.3	9.65	6.54	5.57
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	6.90	7.21	7.66	7.59
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	3.16	4.13	5.75	6.16
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.18	0.27
ECEC	Calculation	PMS-15A1	cmol/kg	na	23.4	21.7	20.5	19.9
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.78	1.34	0.85	0.73

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					78	78	78	78
					0.35-0.45	0.6-0.7	1.0-1.1	1.3-1.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-114	242020-115	242020-116	242020-117
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.16	0.09	0.05	0.05
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	4.63	3.03	1.81	1.81
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	52.4	44.5	31.9	27.9
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	29.5	33.3	37.4	38.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	13.5	19.1	28.1	30.9
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.09	0.10	0.89	1.33
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	218	134	133
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	1631	1200	1059
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	744	827	866
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	591	764	826
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	0.56	0.34	0.34
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	8.16	6.00	5.30
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	6.20	6.89	7.22
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	2.57	3.32	3.59
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	17.5	16.7	16.7
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	1.32	0.87	0.73
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	0.09	0.05	0.05
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	3.19	2.05	2.04
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	46.6	35.8	31.7
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	35.4	41.2	43.2
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	14.7	19.8	21.5
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.09	0.13	1.10	1.59
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	228	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1923	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	601	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	479	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.58	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	9.62	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	5.01	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	2.08	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	17.3	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					78	78	78	78
					0.35-0.45	0.6-0.7	1.0-1.1	1.3-1.4
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-114	242020-115	242020-116	242020-117
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	1.92	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.12	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	3.38	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	55.5	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	28.9	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	12.0	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.13	0.13	1.06	1.53
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	0.4	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	12.4	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	2.4	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	17.2	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	13.7	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	53.9	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					81	81	82	82
					0-0.1	0.4-0.5	0-0.1	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-118	242020-119	242020-120	242020-121
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	5.88	7.43	5.84	8.49
Chloride Soluble	DA	DAP-06	mg/kg	5	7.35	142	13.2	123
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.04	0.17	0.08	0.33
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	596	NA	1944	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	132	NA	249	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.64	NA	2.91	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	11.7	NA	14.6	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	167	NA	401	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.44	NA	4.84	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	2.18	NA	0.74	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.54	NA	2.58	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	11.4	NA	36.2	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	16.6	NA	36.6	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.44	NA	0.68	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	100	289	331	86.6
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	524	1282	1288	4530
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	119	797	376	1356
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	29.2	233	23.1	504
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.26	0.74	0.85	0.22
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	2.62	6.41	6.44	22.7
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.99	6.64	3.13	11.3
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.13	1.01	0.10	2.19
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	4.02	14.8	10.5	36.4
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.64	0.97	2.06	2.00

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					81	81	82	82
					0-0.1	0.4-0.5	0-0.1	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-118	242020-119	242020-120	242020-121
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.26	0.11	0.27	0.02
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	6.38	5.00	8.05	0.61
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	65.2	43.2	61.1	62.2
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	24.7	44.8	29.7	31.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	3.16	6.83	0.95	6.02
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.55	0.15	0.21	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	196	NA	55.2
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	1260	NA	1447
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	689	NA	1199
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	190	NA	414
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.50	NA	0.14
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	6.30	NA	7.24
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	5.74	NA	9.99
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.83	NA	1.80
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	13.4	NA	19.2

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					81	81	82	82
					0-0.1	0.4-0.5	0-0.1	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-118	242020-119	242020-120	242020-121
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	1.10	NA	0.72
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.09	NA	0.01
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	3.75	NA	0.74
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	47.0	NA	37.7
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	42.9	NA	52.1
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	6.17	NA	9.38
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.13	0.17	0.17	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					87	87	87	87
					0-0.1	0.15-0.25	0.3-0.4	0.5-0.6
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-122	242020-123	242020-124	242020-125
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.71	7.24	7.39	6.31
Chloride Soluble	DA	DAP-06	mg/kg	5	7.04	10.8	6.73	56.6
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.06	0.04	0.04	0.10
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	900	229	201	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	168	96.5	91.5	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.24	0.32	0.25	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	9.92	5.96	6.94	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	260	168	134	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	4.07	<3.00	4.95	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.40	0.56	0.46	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.64	1.02	1.50	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	40.4	14.2	6.66	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	19.0	9.06	9.78	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.46	0.40	0.36	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	179	123	101	271
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	730	452	350	642
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	133	63.6	88.2	526
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	11.2	<10.0	<10.0	158
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.46	0.32	0.26	0.69
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	3.65	2.26	1.75	3.21
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.11	0.53	0.74	4.38
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.05	0.04	0.04	0.69
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	5.29	3.17	2.81	9.00
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.29	4.26	2.38	0.73

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					87	87	87	87
					0-0.1	0.15-0.25	0.3-0.4	0.5-0.6
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-122	242020-123	242020-124	242020-125
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.41	0.60	0.35	0.16
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	8.68	9.95	9.22	7.72
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	69.0	71.3	62.3	35.7
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	21.0	16.7	26.2	48.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.92	1.37	1.55	7.64
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.42	0.70	0.79	0.25
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	88.0	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	262	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	93.3	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	<10.0	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	0.23	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	1.31	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	0.78	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	0.04	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	2.38	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					87	87	87	87
DEPTH					0-0.1	0.15-0.25	0.3-0.4	0.5-0.6
Test Parameter	Method Description	Method Reference	Units	LOR	242020-122	242020-123	242020-124	242020-125
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	1.68	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	0.29	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	9.49	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	55.1	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	32.7	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	1.83	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12	0.12	0.93	0.93
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					87	89	89	89
					0.7-0.8	0-0.1	0.15-0.25	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-126	242020-127	242020-128	242020-129
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.39	6.61	8.63	8.40
Chloride Soluble	DA	DAP-06	mg/kg	5	124	21.6	21.2	147
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.16	0.11	0.15	0.35
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1749	424	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	423	124	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	2.25	0.48	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	56.6	7.37	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	842	109	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	6.02	<3.00	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	1.94	1.04	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	2.20	<0.20	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	38.0	4.86	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	44.3	4.86	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.79	0.61	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	346	722	104	84.8
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	729	2089	5500	5254
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	673	437	724	972
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	291	25.4	203	547
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.89	1.85	0.27	0.22
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	3.65	10.4	27.5	26.3
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	5.61	3.64	6.03	8.10
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	1.27	0.11	0.88	2.38
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	11.4	16.1	34.7	37.0
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.65	2.87	4.56	3.24

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					87	89	89	89
					0.7-0.8	0-0.1	0.15-0.25	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-126	242020-127	242020-128	242020-129
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.16	0.51	0.04	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	7.76	11.5	0.77	0.59
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	31.9	65.0	79.2	71.0
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	49.1	22.7	17.4	21.9
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	11.1	0.69	2.54	6.43
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.19	0.14	0.06	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	232	NA	83.8	32.6
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	623	NA	2823	2010
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	508	NA	652	930
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	203	NA	195	454
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.59	NA	0.21	0.08
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	3.12	NA	14.1	10.1
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	4.23	NA	5.43	7.75
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.88	NA	0.85	1.97
ECEC	Calculation	PMS-15C1	cmol/kg	na	8.85	NA	20.6	19.9

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					87	89	89	89
DEPTH					0.7-0.8	0-0.1	0.15-0.25	0.4-0.5
Test Parameter	Method Description	Method Reference	Units	LOR	242020-126	242020-127	242020-128	242020-129
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.74	NA	2.60	1.30
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.14	NA	0.04	0.01
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	6.72	NA	1.04	0.42
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	35.2	NA	68.4	50.6
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	47.8	NA	26.3	39.0
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	9.98	NA	4.11	9.93
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.25	0.25	0.11	0.11
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					89	89	89	90
					0.7-0.8	1.1-1.2	1.3-1.4	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-130	242020-131	242020-132	242020-133
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.87	8.69	9.00	6.24
Chloride Soluble	DA	DAP-06	mg/kg	5	561	722	808	<5.00
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.77	0.93	0.99	0.03
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	433
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	103
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	0.48
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	6.36
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	297
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	<3.00
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	0.52
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	1.00
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	27.7
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	27.7
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	0.21
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	98.6	97.9	93.1	199
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	5016	4665	4605	517
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1208	1163	1158	112
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1223	1478	1561	21.9
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.25	0.25	0.24	0.51
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	25.1	23.3	23.0	2.59
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	10.1	9.69	9.65	0.93
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	5.32	6.43	6.79	0.10
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	40.7	39.7	39.7	4.15
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.49	2.41	2.39	2.77

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					89	89	89	90
					0.7-0.8	1.1-1.2	1.3-1.4	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-130	242020-131	242020-132	242020-133
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.03	0.02	0.55
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.62	0.63	0.60	12.3
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	61.6	58.7	58.0	62.3
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	24.7	24.4	24.3	22.5
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	13.1	16.2	17.1	2.30
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.05	0.06	0.06	0.54
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	58.5	70.4	89.0	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1149	1173	1022	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	788	932	846	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	622	899	796	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.15	0.18	0.23	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	5.75	5.87	5.11	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	6.57	7.77	7.05	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	2.70	3.91	3.46	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	15.2	17.7	15.9	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					89	89	89	90
					0.7-0.8	1.1-1.2	1.3-1.4	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-130	242020-131	242020-132	242020-133
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.87	0.76	0.72	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.02	0.02	0.03	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.99	1.02	1.44	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	37.8	33.1	32.2	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	43.2	43.8	44.4	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	17.8	22.0	21.8	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.15	0.13	0.14	0.14
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					90	95	95	102
					0.5-0.6	0-0.1	0.35-0.45	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-134	242020-135	242020-136	242020-137
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	4.92	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.75	7.90	8.97	6.68
Chloride Soluble	DA	DAP-06	mg/kg	5	8.59	9.14	173	11.2
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.02	0.13	0.33	0.09
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1577	NA	1957
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	251	NA	302
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	1.88	NA	2.39
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	13.6	NA	15.2
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	539	NA	479
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	<3.00	NA	6.00
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.58	NA	1.66
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.38	NA	1.58
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	10.8	NA	45.9
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	10.8	NA	45.9
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.87	NA	0.67
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	107	413	71.0	392
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1720	5890	5416	1852
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	426	317	1167	357
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	66.0	50.8	452	284
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.27	1.06	0.18	1.01
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	8.60	29.5	27.1	9.26
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	3.55	2.64	9.73	2.98
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.29	0.22	1.97	1.23
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	12.7	33.4	39.0	14.5
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.42	11.1	2.78	3.11

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					90	95	95	102
					0.5-0.6	0-0.1	0.35-0.45	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-134	242020-135	242020-136	242020-137
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.08	0.40	0.02	0.34
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	2.15	3.17	0.47	6.93
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	67.5	88.2	69.5	63.9
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	27.9	7.91	25.0	20.5
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	2.25	0.66	5.04	8.52
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.17	0.07	0.06	0.15
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	298	53.9	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	2662	1708	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	216	1021	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	47.0	280	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.76	0.14	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	13.3	8.54	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	1.80	8.51	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.20	1.22	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	16.1	18.4	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					90	95	95	102
					0.5-0.6	0-0.1	0.35-0.45	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-134	242020-135	242020-136	242020-137
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	7.39	1.00	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.42	0.02	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	4.75	0.75	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	82.7	46.3	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	11.2	46.2	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	1.27	6.61	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.14	0.14	0.12	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	<0.1	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	13.3	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	5.5	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	19.3	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	12.6	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	49.3	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					102	102	102	105
					0.1-0.2	0.35-0.45	0.65-0.75	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-138	242020-139	242020-140	242020-141
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	2.89	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.82	8.33	9.06	6.10
Chloride Soluble	DA	DAP-06	mg/kg	5	8.35	36.2	65.2	7.74
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.03	0.18	0.30	0.04
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	847	NA	NA	986
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	237	NA	NA	292
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.75	NA	NA	1.50
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	7.09	NA	NA	18.4
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	65.3	NA	NA	491
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	NA	NA	<3.00
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	1.53	NA	NA	0.80
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	<0.20	NA	NA	0.60
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	23.2	NA	NA	41.1
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	8.38	NA	NA	31.7
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.69	NA	NA	0.39
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	59.4	66.8	66.0	335
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1972	4609	5052	839
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	306	1016	1187	299
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	35.4	232	468	21.8
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.15	0.17	0.17	0.86
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	9.86	23.0	25.3	4.20
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	2.55	8.47	9.89	2.49
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.15	1.01	2.03	0.09
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	12.7	32.7	37.4	7.66
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.87	2.72	2.55	1.68

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					102	102	102	105
					0.1-0.2	0.35-0.45	0.65-0.75	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-138	242020-139	242020-140	242020-141
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.06	0.02	0.02	0.34
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	1.20	0.52	0.45	11.2
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	77.4	70.4	67.6	54.7
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	20.0	25.9	26.5	32.5
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.21	3.08	5.44	1.24
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.17	0.07	0.06	0.29
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	26.9	43.2	23.5	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2089	1754	1344	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	304	831	1027	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	23.6	182	349	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.07	0.11	0.06	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	10.4	8.77	6.72	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	2.53	6.93	8.56	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.10	0.79	1.52	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	13.2	16.6	16.9	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					102	102	102	105
					0.1-0.2	0.35-0.45	0.65-0.75	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-138	242020-139	242020-140	242020-141
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	4.12	1.27	0.79	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.03	0.02	0.01	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	0.52	0.67	0.36	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	79.3	52.8	39.8	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	19.2	41.7	50.7	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	0.78	4.76	8.99	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.17	0.13	0.13	0.13
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	1.0	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	23.1	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	7.6	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	27.0	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	6.1	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	35.4	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					105	105	105	105
					0.2-0.3	0.4-0.5	0.8-0.9	1.1-1.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-142	242020-143	242020-144	242020-145
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.20	8.30	8.32	8.39
Chloride Soluble	DA	DAP-06	mg/kg	5	32.2	18.2	19.8	16.1
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.14	0.13	0.14	0.13
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	623	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	305	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.16	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	13.3	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	161	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.82	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.70	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	18.3	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	9.48	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.46	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	160	155	195	228
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	3639	4739	2632	2071
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	210	630	920	914
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	35.2	44.8	57.8	60.4
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.41	0.40	0.50	0.58
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	18.2	23.7	13.2	10.4
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.75	5.25	7.67	7.62
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.15	0.19	0.25	0.26
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	20.5	29.6	21.6	18.8
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	10.4	4.51	1.72	1.36

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					105	105	105	105
					0.2-0.3	0.4-0.5	0.8-0.9	1.1-1.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-142	242020-143	242020-144	242020-145
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.23	0.08	0.07	0.08
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	2.00	1.34	2.31	3.10
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	88.6	80.2	60.9	55.0
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	8.52	17.8	35.5	40.4
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.75	0.66	1.16	1.39
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.11	0.08	0.10	0.12
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	129	123	169	152
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1764	2380	1865	1340
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	182	541	872	805
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	30.0	41.7	49.3	48.2
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.33	0.32	0.43	0.39
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	8.82	11.9	9.33	6.70
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	1.52	4.51	7.27	6.71
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.13	0.18	0.21	0.21
ECEC	Calculation	PMS-15C1	cmol/kg	na	10.8	16.9	17.3	14.0

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					105	105	105	105
					0.2-0.3	0.4-0.5	0.8-0.9	1.1-1.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-142	242020-143	242020-144	242020-145
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	5.82	2.64	1.28	1.00
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.22	0.07	0.06	0.06
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	3.06	1.86	2.51	2.78
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	81.5	70.3	54.0	47.8
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	14.0	26.6	42.1	47.8
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	1.21	1.07	1.24	1.49
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.21	0.13	0.13	0.16
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					113	113	113	113
					0-0.1	0.15-0.25	0.3-0.4	0.6-0.7
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-146	242020-147	242020-148	242020-149
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	5.98	6.70	6.60	8.19
Chloride Soluble	DA	DAP-06	mg/kg	5	7.45	14.9	45.9	231
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.04	0.03	0.06	0.37
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	746	355	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	231	154	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.07	0.58	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	15.7	7.91	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	304	152	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	<3.00	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.86	1.12	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.88	0.24	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	30.5	35.9	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	24.4	26.5	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.53	0.53	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	220	128	206	217
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	718	584	1005	1059
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	198	186	699	739
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	<10.0	18.3	158	168
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.56	0.33	0.53	0.56
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	3.59	2.92	5.03	5.30
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.65	1.55	5.83	6.16
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.04	0.08	0.69	0.73
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	5.87	4.90	12.1	12.8
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.18	1.88	0.86	0.86

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					113	113	113	113
					0-0.1	0.15-0.25	0.3-0.4	0.6-0.7
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-146	242020-147	242020-148	242020-149
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.34	0.21	0.09	0.09
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	9.61	6.70	4.37	4.36
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	61.2	59.6	41.6	41.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	28.1	31.6	48.2	48.3
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.74	1.62	5.68	5.72
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.38	0.45	0.18	0.17
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	134
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	872
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	725
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	151
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	0.34
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	4.36
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	6.04
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	0.66
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	11.4

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					113	113	113	113
					0-0.1	0.15-0.25	0.3-0.4	0.6-0.7
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-146	242020-147	242020-148	242020-149
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	0.72
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	0.06
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	3.01
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	38.2
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	52.9
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	5.75
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.16	0.16	0.16	0.19
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					113	118	118	121m
					0.9-1.0	0-0.1	0.15-0.25	0-0.05
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-150	242020-151	242020-152	242020-153
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	4.35
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.79	6.36	7.38	7.36
Chloride Soluble	DA	DAP-06	mg/kg	5	478	10.8	20.6	11.6
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.61	0.08	0.08	0.16
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	1777	NA	2065
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	310	NA	391
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	3.29	NA	2.37
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	15.0	NA	16.8
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	625	NA	758
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	<3.00	NA	10.1
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	1.42	NA	1.38
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	2.18	NA	0.66
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	44.6	NA	29.9
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	35.6	NA	14.4
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	0.71	NA	1.09
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	115	440	70.5	612
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	4799	1385	1026	3416
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1181	427	718	680
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	695	44.8	159	50.8
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.29	1.13	0.18	1.57
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	24.0	6.93	5.13	17.1
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	9.84	3.56	5.98	5.67
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	3.02	0.19	0.69	0.22
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	37.2	11.8	12.0	24.6
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.44	1.95	0.86	3.01

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					113	118	118	121m
					0.9-1.0	0-0.1	0.15-0.25	0-0.05
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-150	242020-151	242020-152	242020-153
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.03	0.32	0.03	0.28
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.79	9.54	1.51	6.39
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	64.5	58.5	42.7	69.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	26.5	30.1	49.8	23.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	8.13	1.65	5.76	0.90
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.06	0.19	0.19	0.09
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	90.7	NA	45.3	492
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	748	NA	856	2465
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	955	NA	682	570
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	376	NA	141	41.9
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.23	NA	0.12	1.26
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	3.74	NA	4.28	12.3
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	7.96	NA	5.68	4.75
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	1.63	NA	0.61	0.18
ECEC	Calculation	PMS-15C1	cmol/kg	na	13.6	NA	10.7	18.5

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					113	118	118	121m
					0.9-1.0	0-0.1	0.15-0.25	0-0.05
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-150	242020-151	242020-152	242020-153
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.47	NA	0.75	2.59
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.03	NA	0.02	0.27
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	1.71	NA	1.08	6.80
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	27.5	NA	39.9	66.5
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	58.6	NA	53.0	25.6
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	12.0	NA	5.72	0.98
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.16	0.16	0.21	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	0.5
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	13.5
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	3.3
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	25.7
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	14.5
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	42.5

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121m	121m	121m	121m
					0.1-0.2	0.25-0.35	0.5-0.6	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-154	242020-155	242020-156	242020-157
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	8.12	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.34	8.13	7.84	7.90
Chloride Soluble	DA	DAP-06	mg/kg	5	44.7	126	770	1364
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.20	0.42	4.05	3.70
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	788	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	228	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.94	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	5.01	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	121	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	7.62	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.78	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	<0.20	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	3.88	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	7.24	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	1.03	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	147	110	138	188
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	6121	5957	9440	6062
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	973	1006	1237	1406
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	205	384	1205	1461
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.38	0.28	0.35	0.48
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	30.6	29.8	47.2	30.3
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	8.11	8.38	10.3	11.7
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.89	1.67	5.24	6.35
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	40.0	40.1	63.1	48.9
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.77	3.55	4.58	2.59

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121m	121m	121m	121m
					0.1-0.2	0.25-0.35	0.5-0.6	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-154	242020-155	242020-156	242020-157
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.05	0.03	0.03	0.04
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.94	0.70	0.56	0.99
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	76.5	74.2	74.8	62.0
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	20.3	20.9	16.3	24.0
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	2.23	4.16	8.30	13.0
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.06	0.06	0.04	0.05
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	111	97.5	99.8	141
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	3053	3142	2233	1747
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	901	986	1078	1142
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	154	287	622	796
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.28	0.25	0.26	0.36
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	15.3	15.7	11.2	8.74
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	7.51	8.22	8.98	9.52
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.67	1.25	2.70	3.46
ECEC	Calculation	PMS-15C1	cmol/kg	na	23.7	25.4	23.1	22.1

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121m	121m	121m	121m
					0.1-0.2	0.25-0.35	0.5-0.6	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-154	242020-155	242020-156	242020-157
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	2.03	1.91	1.24	0.92
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.04	0.03	0.03	0.04
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	1.20	0.98	1.11	1.64
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	64.3	61.7	48.3	39.5
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	31.6	32.3	38.8	43.1
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	2.82	4.90	11.7	15.7
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.09	0.09	0.10	0.10
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	0.5	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	8.0	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	2.6	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	18.7	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	4.3	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	65.8	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121m	121d	121d	121d
					1.1-1.2	0-0.1	0.1-0.2	0.25-0.35
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-158	242020-159	242020-160	242020-161
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	3.61	NA	10.3
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.04	8.55	7.70	8.17
Chloride Soluble	DA	DAP-06	mg/kg	5	1570	29.4	21.3	76.5
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	2.05	0.17	0.08	0.28
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	618	545	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	182	232	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	1.26	0.47	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	5.99	14.4	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	183	171	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	<3.00	4.80	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	0.96	1.46	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	<0.20	<0.20	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	4.22	11.8	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	11.7	17.0	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	1.17	0.95	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	229	174	170	174
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2776	5581	3239	3058
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1406	1265	793	903
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1576	270	322	654
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.59	0.45	0.44	0.45
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	13.9	27.9	16.2	15.3
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	11.7	10.5	6.61	7.53
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	6.85	1.17	1.40	2.84
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	33.1	40.1	24.7	26.1
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.18	2.65	2.45	2.03

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121m	121d	121d	121d
					1.1-1.2	0-0.1	0.1-0.2	0.25-0.35
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-158	242020-159	242020-160	242020-161
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.05	0.04	0.07	0.06
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	1.78	1.11	1.77	1.71
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	42.0	69.6	65.7	58.5
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	35.4	26.3	26.8	28.8
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	20.7	2.93	5.68	10.9
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.07	0.06	0.09	0.09
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.13	0.13	0.13	0.13
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	156	143	151	143
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1364	3112	3027	2899
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	1077	1062	695	856
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	854	224	289	558
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.40	0.37	0.39	0.37
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	6.82	15.6	15.1	14.5
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	8.98	8.85	5.79	7.13
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	3.71	0.97	1.26	2.43
ECEC	Calculation	PMS-15C1	cmol/kg	na	19.9	25.8	22.6	24.4

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121m	121d	121d	121d
					1.1-1.2	0-0.1	0.1-0.2	0.25-0.35
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-158	242020-159	242020-160	242020-161
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.76	1.76	2.61	2.03
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.04	0.04	0.07	0.05
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	2.01	1.42	1.71	1.50
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	34.2	60.4	67.0	59.3
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	45.0	34.3	25.6	29.2
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	18.6	3.78	5.56	9.93
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.11	0.09	0.10	0.09
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	0.1	NA	<0.1
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	11.8	NA	7.7
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	2.6	NA	2.4
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	23.3	NA	18.0
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	10.2	NA	13.3
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	52.0	NA	58.7

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121d	121d	121d	126
					0.5-0.6	0.8-0.9	1.1-1.2	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-162	242020-163	242020-164	242020-165
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.29	7.65	7.50	6.70
Chloride Soluble	DA	DAP-06	mg/kg	5	180	324	441	15.4
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	2.13	1.30	1.95	0.09
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	1400
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	208
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	1.16
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	15.9
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	334
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	13.0
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	0.47
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	3.81
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	38.9
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	45.3
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	0.57
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	161	185	203	208
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	4222	2903	3182	878
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	958	977	1014	149
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	912	1033	1181	22.3
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.41	0.47	0.52	0.53
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	21.1	14.5	15.9	4.39
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	7.98	8.14	8.45	1.24
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	3.97	4.49	5.13	0.10
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	33.5	27.6	30.0	6.28
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.64	1.78	1.88	3.54

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121d	121d	121d	126
					0.5-0.6	0.8-0.9	1.1-1.2	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-162	242020-163	242020-164	242020-165
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.05	0.06	0.06	0.43
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	1.23	1.72	1.73	8.49
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	63.0	52.5	53.0	69.9
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	23.8	29.5	28.1	19.8
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	11.8	16.2	17.1	1.54
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.07	0.08	0.07	0.35
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	152	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	4124	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	926	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	601	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	0.39	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	20.6	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	7.72	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	2.61	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	31.4	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	2.67	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	0.05	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	1.24	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	65.7	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	24.6	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	8.33	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.07	0.07	0.07	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	104	158	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	1391	1721	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	582	786	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	411	670	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.27	0.41	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	6.96	8.61	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	4.85	6.55	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	1.79	2.91	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	13.9	18.5	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					121d	121d	121d	126
					0.5-0.6	0.8-0.9	1.1-1.2	0-0.1
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-162	242020-163	242020-164	242020-165
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	1.43	1.31	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.05	0.06	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	1.92	2.19	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	50.1	46.5	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	34.9	35.4	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	12.9	15.8	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.09	0.16	0.12	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					126	126	126	126
					0.2-0.3	0.4-0.5	0.7-0.8	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-166	242020-167	242020-168	242020-169
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	5.96	6.62	7.36	7.24
Chloride Soluble	DA	DAP-06	mg/kg	5	8.63	34.2	43.2	54.2
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.03	0.08	0.09	0.10
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	215	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	172	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	<0.20	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	7.89	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	335	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	5.27	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.70	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.28	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	27.2	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	26.8	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.29	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	224	161	160	161
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	250	1247	1285	1271
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	54.2	517	567	589
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	18.4	73.7	94.9	110
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	2.90	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.57	0.41	0.41	0.41
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	1.25	6.24	6.43	6.36
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.45	4.31	4.73	4.91
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.08	0.32	0.41	0.48
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.03	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	2.39	11.3	12.0	12.2
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.77	1.45	1.36	1.29

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					126	126	126	126
					0.2-0.3	0.4-0.5	0.7-0.8	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-166	242020-167	242020-168	242020-169
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.27	0.10	0.09	0.08
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	24.0	3.65	3.42	3.39
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	52.3	55.2	53.6	52.2
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	18.9	38.1	39.4	40.3
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	3.35	2.84	3.44	3.93
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	1.35	0.20	0.19	0.18
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.10	0.07	0.07	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	131	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	1209	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	468	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	89.4	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	0.34	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	6.05	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	3.90	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	0.39	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	10.7	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					126	126	126	126
					0.2-0.3	0.4-0.5	0.7-0.8	0.9-1.0
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-166	242020-167	242020-168	242020-169
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	1.55	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	0.09	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	3.14	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	56.5	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	36.5	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	3.64	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.17	0.12	0.21	0.21
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					130d	130d	130m	130m
					0-0.1	0.4-0.5	0-0.1	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-170	242020-171	242020-172	242020-173
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.07	8.41	7.02	7.74
Chloride Soluble	DA	DAP-06	mg/kg	5	11.8	356	22.6	1450
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.09	0.54	0.16	4.14
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	1491	NA	2676	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	453	NA	346	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.65	NA	3.32	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	71.2	NA	25.8	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	831	NA	921	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	NA	11.7	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	2.54	NA	1.18	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	1.04	NA	1.54	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	23.2	NA	36.5	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	48.0	NA	16.9	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	1.05	NA	1.47	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	635	182	719	179
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2567	2253	3262	8343
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	627	986	556	1297
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	64.5	868	66.7	1562
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	1.63	0.47	1.84	0.46
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	12.8	11.3	16.3	41.7
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	5.23	8.22	4.63	10.8
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.28	3.77	0.29	6.79
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	20.0	23.7	23.1	59.8
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.46	1.37	3.52	3.86

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					130d	130d	130m	130m
					0-0.1	0.4-0.5	0-0.1	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-170	242020-171	242020-172	242020-173
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.31	0.06	0.40	0.04
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	8.14	1.97	7.98	0.77
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	64.2	47.4	70.6	69.8
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	26.1	34.6	20.1	18.1
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.40	15.9	1.26	11.4
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.11	0.09	0.10	0.04
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.07	0.07	0.07	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	130	NA	131
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	1700	NA	1732
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	782	NA	796
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	512	NA	522
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	0.33	NA	0.34
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	8.50	NA	8.66
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	6.52	NA	6.63
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	2.23	NA	2.27
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	17.6	NA	17.9

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					130d	130d	130m	130m
					0-0.1	0.4-0.5	0-0.1	0.4-0.5
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-170	242020-171	242020-172	242020-173
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	1.30	NA	1.31
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	0.05	NA	0.05
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	1.89	NA	1.87
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	48.3	NA	48.3
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	37.0	NA	37.0
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	12.6	NA	12.7
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.21	0.13	0.13	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					133	133	133	133
					0-0.1	0.15-0.25	0.4-0.5	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-174	242020-175	242020-176	242020-177
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	1.00	NA	6.84	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.58	6.68	7.58	8.53
Chloride Soluble	DA	DAP-06	mg/kg	5	8.50	13.5	149	573
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.12	0.03	0.21	0.90
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	1364	508	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	369	259	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	2.43	0.95	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	39.3	20.8	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	509	236	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.14	<3.00	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.46	0.46	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	2.46	1.24	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	23.9	12.8	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	37.5	34.3	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.59	0.33	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	343	179	96.0	122
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1833	805	1153	4776
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	292	175	764	1134
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	76.4	38.5	448	1141
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.88	0.46	0.25	0.31
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	9.17	4.03	5.77	23.9
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	2.43	1.46	6.37	9.45
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.33	0.17	1.95	4.96
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	12.8	6.13	14.3	38.6
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.77	2.76	0.91	2.53

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					133	133	133	133
					0-0.1	0.15-0.25	0.4-0.5	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-174	242020-175	242020-176	242020-177
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.36	0.31	0.04	0.03
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	6.85	7.49	1.72	0.81
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	71.4	65.6	40.2	61.8
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	19.0	23.8	44.4	24.5
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	2.59	2.73	13.6	12.8
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.17	0.36	0.15	0.06
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.07	0.07	0.07	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	72.0	92.2
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	1035	1389
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	550	948
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	289	495
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	0.18	0.24
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	5.18	6.95
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	4.58	7.90
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	1.26	2.15
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	11.2	17.3

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					133	133	133	133
					0-0.1	0.15-0.25	0.4-0.5	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-174	242020-175	242020-176	242020-177
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	1.13	0.88
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	0.04	0.03
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	1.65	1.37
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	46.1	40.2
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	40.8	45.8
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	11.2	12.5
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12	0.12	0.20	0.13
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	0.4	NA	0.1	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	18.4	NA	4.6	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	11.3	NA	2.8	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	48.8	NA	35.8	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	8.0	NA	8.5	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	13.1	NA	48.1	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					133	133	134	134
					1.1-1.2	1.3-1.4	0-0.05	0.1-0.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-178	242020-179	242020-180	242020-181
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.66	7.99	5.91	6.02
Chloride Soluble	DA	DAP-06	mg/kg	5	700	661	43.4	14.6
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	3.71	2.27	0.14	0.05
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	5910	769
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	915	464
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	7.15	1.09
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	141	78.6
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	1294	713
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	8.41	4.45
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	2.52	2.04
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	6.88	1.46
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	35.7	32.6
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	403	173
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	1.15	0.53
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	134	128	993	540
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	7122	4015	2793	1415
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1117	1046	689	359
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	1332	1270	114	68.0
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.34	0.33	2.55	1.38
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	35.6	20.1	14.0	7.08
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	9.31	8.72	5.74	2.99
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	5.79	5.52	0.50	0.30
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	51.1	34.7	22.8	11.8
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.83	2.30	2.43	2.36

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					133	133	134	134
					1.1-1.2	1.3-1.4	0-0.05	0.1-0.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-178	242020-179	242020-180	242020-181
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.04	0.04	0.44	0.46
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	0.67	0.95	11.2	11.8
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	69.7	57.9	61.3	60.1
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	18.2	25.1	25.2	25.4
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	11.3	15.9	2.18	2.51
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.04	0.06	0.10	0.19
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.07	0.07	0.07	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	104	84.4	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1376	1324	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	956	957	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	680	784	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.27	0.22	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	6.88	6.62	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	7.97	7.98	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	2.96	3.41	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	18.1	18.2	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					133	133	134	134
					1.1-1.2	1.3-1.4	0-0.05	0.1-0.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-178	242020-179	242020-180	242020-181
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.86	0.83	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.03	0.03	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	1.47	1.19	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	38.0	36.3	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	44.0	43.7	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	16.3	18.7	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12	0.12	0.12	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					134	134	134	134
					0.35-0.45	0.6-0.7	0.8-0.9	1.1-1.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-182	242020-183	242020-184	242020-185
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.72	5.65	5.53	6.43
Chloride Soluble	DA	DAP-06	mg/kg	5	27.7	89.0	96.3	89.1
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.05	0.14	0.16	0.16
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	370	193	93.1	90.7
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1271	1588	1627	1658
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	404	672	679	689
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	101	273	358	403
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	2.60	4.80	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.95	0.49	0.24	0.23
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	6.36	7.94	8.14	8.29
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	3.37	5.60	5.66	5.74
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.44	1.19	1.56	1.75
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.03	0.05	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	11.1	15.3	15.6	16.0
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	1.89	1.42	1.44	1.44

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					134	134	134	134
					0.35-0.45	0.6-0.7	0.8-0.9	1.1-1.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-182	242020-183	242020-184	242020-185
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.28	0.09	0.04	0.04
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	8.52	3.24	1.53	1.45
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	57.1	52.1	52.0	51.7
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	30.2	36.7	36.2	35.8
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	3.94	7.78	9.95	10.9
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.20	0.19	0.34	0.14
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.07	0.09	0.17	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					134	134	134	134
					0.35-0.45	0.6-0.7	0.8-0.9	1.1-1.2
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-182	242020-183	242020-184	242020-185
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12	0.16	0.29	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					135	135	135	135
					0-0.1	0.15-0.25	0.4-0.5	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-186	242020-187	242020-188	242020-189
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA	NA	NA	NA
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	6.24	6.45	6.31	6.21
Chloride Soluble	DA	DAP-06	mg/kg	5	18.9	8.45	9.59	8.87
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.07	0.03	0.02	0.02
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	361	<50.0	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	249	258	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.86	0.32	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	38.5	31.1	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	655	355	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	<3.00	<3.00	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.66	0.58	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.80	<0.20	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	28.7	25.6	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	20.2	17.7	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.45	0.31	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	366	223	149	104
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	940	854	927	989
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	231	174	166	181
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	34.4	28.8	27.3	31.6
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.94	0.57	0.38	0.27
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	4.70	4.27	4.64	4.95
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.93	1.45	1.38	1.51
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.15	0.13	0.12	0.14
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	7.74	6.44	6.54	6.88
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.44	2.94	3.35	3.28

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					135	135	135	135
					0-0.1	0.15-0.25	0.4-0.5	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-186	242020-187	242020-188	242020-189
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.49	0.39	0.28	0.18
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	12.1	8.88	5.84	3.88
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	60.8	66.3	70.9	71.9
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	24.9	22.5	21.1	21.9
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.93	1.94	1.81	2.00
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.29	0.35	0.34	0.32
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.07	0.07	0.07	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA	NA	NA	NA
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA	NA	NA	NA
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA	NA	NA	NA
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					135	135	135	135
					0-0.1	0.15-0.25	0.4-0.5	0.8-0.9
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	242020-186	242020-187	242020-188	242020-189
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA	NA	NA	NA
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA	NA	NA	NA
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12	0.12	0.12	0.12
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA	NA	NA	NA
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA	NA	NA	NA

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					135			
DEPTH					1.1-1.2			
Test Parameter	Method Description	Method Reference	Units	LOR	242020-190			
Oven Dry Moisture Content	Oven Dry	PMS-17	%	0.1	NA			
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.08			
Chloride Soluble	DA	DAP-06	mg/kg	5	8.77			
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.02			
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	NA			
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	NA			
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	NA			
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	NA			
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	NA			
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	NA			
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA			
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	NA			
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	NA			
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	NA			
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	NA			
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	94.9			
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1074			
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	221			
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	34.2			
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00			
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.24			
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	5.37			
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.84			
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.15			
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02			
ECEC	Calculation	PMS-15A1	cmol/kg	na	7.63			
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	2.92			

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					135			
DEPTH					1.1-1.2			
Test Parameter	Method Description	Method Reference	Units	LOR	242020-190			
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.13			
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	3.19			
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	70.4			
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	24.2			
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.95			
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.29			
Exchangeable Potassium	ICP-OES	R&L 15A2	mg/kg	10	NA			
Exchangeable Calcium	ICP-OES	R&L 15A2	mg/kg	20	NA			
Exchangeable Magnesium	ICP-OES	R&L 15A2	mg/kg	10	NA			
Exchangeable Sodium	ICP-OES	R&L 15A2	mg/kg	10	NA			
Exchangeable Potassium	R&L 15A2	R&L 15A2	cmol/kg	na	NA			
Exchangeable Calcium	R&L 15A2	R&L 15A2	cmol/kg	na	NA			
Exchangeable Magnesium	PMS-15A2	PMS-15A2	cmol/kg	na	NA			
Exchangeable Sodium	R&L 15A2	R&L 15A2	cmol/kg	na	NA			
ECEC	Calculation	PMS-15A2	cmol/kg	na	NA			
Ca/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA			
K/Mg Ratio	Calculation	PMS-15A2	cmol/kg	na	NA			
Exchangeable Potassium %	Calculation	PMS-15A2	%	na	NA			
Exchangeable Calcium %	Calculation	PMS-15A2	%	na	NA			
Exchangeable Magnesium %	Calculation	PMS-15A2	%	na	NA			
Exchangeable Sodium %	Calculation	PMS-15A2	%	na	NA			
Exchangeable Aluminium %	Calculation	PMS-15A2	%	na	0.07			
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	NA			
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	NA			
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	NA			
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	NA			
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	NA			
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	NA			
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	NA			
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	NA			
ECEC	Calculation	PMS-15C1	cmol/kg	na	NA			

ANALYSIS REPORT

PROJECT NO: EW242020

Location: 1401.24d Isaac Downs

CLIENT SAMPLE ID					135			
DEPTH					1.1-1.2			
Test Parameter	Method Description	Method Reference	Units	LOR	242020-190			
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA			
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	NA			
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	NA			
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	NA			
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	NA			
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	NA			
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12			
Gravel >2.0mm #	Sieve	ASTMD422-63	%	na	NA			
Coarse Sand 0.2-2.0mm #	Sieve	ASTMD422-63	%	na	NA			
Fine Sand 0.1-0.2 mm	Sieve	ASTMD422-63	%	na	NA			
Very Fine Sand 0.02-0.1 mm	Sieve	ASTMD422-63	%	na	NA			
Silt 0.002-0.02mm #	Hydrometer	ASTMD422-63	%	na	NA			
Clay <0.002mm #	Hydrometer	ASTMD422-63	%	na	NA			

This Analysis Report shall not be reproduced except in full without the written approval of the laboratory.

Soils are air dried at 40°C and ground <2mm.

NB: LOR is the Lowest Obtainable Reading.

DOCUMENT END

ANALYSIS REPORT SOIL

PROJECT NO: EW251550

Customer: LANDLOCH Pty Ltd (QLD)
Address: 196 Peace Street HARLAXTON QLD 4350
Attention: Liam Thompson
Phone: 0411 310 542
Fax: 07 4613 1826
Email: thompson@landloch.com.au

Date of Issue: 15/08/2025

Report No: 1
Date Received: 6/08/2025
Matrix: Soil
Location: 1401.24d2 - IDE
Sampler ID: Client
Date of Sampling: 29/07/2025
Sample Condition: Acceptable

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.



Signed: Anne Michie



GSG Laboratories is certified by the Australasian Soil & Plant Analysis Council to perform various soil and plant tissue analysis. The tests reported herein have been performed in accordance with our terms of accreditation.

This report must not be reproduced except in full and GSG takes no responsibility of the end use of the results within this report.

This analysis relates to the sample submitted and it is the client's responsibility to make certain the sample is representative of the matrix to be tested.

Samples will be discarded one month after the date of this report. Please advise if you wish to have your sample/s returned.

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 1	Site 1	Site 1	Site 1
					0-0.1	0.2-0.3	0.4-0.5	0.6-0.7
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	251550-1	251550-2	251550-3	251550-4
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.43	7.57	8.04	8.62
Chloride Soluble	DA	DAP-06	mg/kg	5	18.1	11.1	11.0	8.86
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.08	0.03	0.04	0.14
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	2726	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	291	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	2.55	NA	NA	NA
Phosphorus Buffer Index	UV-Vis	PMS-12	mg/kg	10	54.5	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	18.1	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	572	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	4.35	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.56	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	1.06	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	17.1	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	17.9	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.79	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	525	119	97.5	117
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	2624	2902	3113	5505
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	436	493	558	642
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	23.0	84.6	120	179
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	1.35	0.31	0.25	0.30
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	13.1	14.5	15.6	27.5
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	3.63	4.11	4.65	5.35
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.10	0.37	0.52	0.78
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	18.2	19.3	21.0	34.0
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.61	3.53	3.35	5.14

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 1	Site 1	Site 1	Site 1
					0-0.1	0.2-0.3	0.4-0.5	0.6-0.7
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	251550-1	251550-2	251550-3	251550-4
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.37	0.07	0.05	0.06
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	7.39	1.58	1.19	0.88
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	72.0	75.1	74.1	81.0
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	19.9	21.3	22.1	15.7
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.55	1.90	2.48	2.29
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.12	0.12	0.11	0.07
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	426	99.0	70.4	65.0
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2206	2879	2770	3154
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	347	464	474	551
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	<10.0	43.8	72.4	124
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	1.09	0.25	0.18	0.17
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	11.0	14.4	13.9	15.8
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	2.89	3.87	3.95	4.59
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.04	0.19	0.31	0.54
ECEC	Calculation	PMS-15C1	cmol/kg	na	15.1	18.7	18.3	21.1
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	3.81	3.72	3.51	3.43
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.38	0.07	0.05	0.04
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	7.24	1.36	0.99	0.79
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	73.1	76.9	75.6	74.8
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	19.2	20.6	21.6	21.8
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	0.29	1.02	1.72	2.56
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.15	0.12	0.12	0.11

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 3	Site 3	Site 3	Site 3
					0-0.1	0.2-0.3	0.4-0.5	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	251550-5	251550-6	251550-7	251550-8
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.71	7.70	7.14	7.45
Chloride Soluble	DA	DAP-06	mg/kg	5	10.9	10.1	58.5	360
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.09	0.04	0.10	0.37
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	1653	NA	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	239	NA	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	2.67	NA	NA	NA
Phosphorus Buffer Index	UV-Vis	PMS-12	mg/kg	10	45.5	NA	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	7.38	NA	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	472	NA	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.40	NA	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.48	NA	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.48	NA	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	8.64	NA	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	11.0	NA	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.78	NA	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	412	134	171	239
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	3212	4902	5308	6037
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	547	799	981	1202
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	27.6	145	390	710
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	1.06	0.34	0.44	0.61
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	16.1	24.5	26.5	30.2
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	4.56	6.66	8.18	10.0
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.12	0.63	1.70	3.09
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	21.8	32.2	36.9	43.9
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	3.52	3.68	3.25	3.01

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 3	Site 3	Site 3	Site 3
					0-0.1	0.2-0.3	0.4-0.5	0.7-0.8
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	251550-5	251550-6	251550-7	251550-8
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.23	0.05	0.05	0.06
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	4.84	1.07	1.19	1.40
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	73.6	76.2	72.0	68.7
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	20.9	20.7	22.2	22.8
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.55	1.96	4.60	7.03
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.10	0.07	0.06	0.05
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	307	98.4	NA	149
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	2859	3805	NA	5010
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	451	655	NA	1037
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	<10.0	85.0	NA	504
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.79	0.25	NA	0.38
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	14.3	19.0	NA	25.1
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	3.76	5.46	NA	8.64
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.04	0.37	NA	2.19
ECEC	Calculation	PMS-15C1	cmol/kg	na	18.9	25.1	NA	36.3
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	3.80	3.49	NA	2.90
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.21	0.05	NA	0.04
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	4.16	1.00	NA	1.05
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	75.6	75.7	NA	69.0
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	19.9	21.7	NA	23.8
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	0.23	1.47	NA	6.04
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.12	0.09	0.09	0.06

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 6	Site 6	Site 6	Site 6
					0-0.1	0.15-0.25	0.25-0.35	0.45-0.55
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	251550-9	251550-10	251550-11	251550-12
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	8.15	7.71	7.66	7.77
Chloride Soluble	DA	DAP-06	mg/kg	5	13.8	10.6	13.0	14.7
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.10	0.04	0.04	0.05
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	1364	739	NA	NA
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	296	251	NA	NA
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	1.58	0.91	NA	NA
Phosphorus Buffer Index	UV-Vis	PMS-12	mg/kg	10	25.4	24.9	NA	NA
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	28.9	16.5	NA	NA
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	274	230	NA	NA
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.33	<3.00	NA	NA
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.32	0.60	NA	NA
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.94	0.44	NA	NA
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	12.0	13.7	NA	NA
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	16.2	20.7	NA	NA
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.57	0.46	NA	NA
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	239	214	408	409
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	1804	1170	1506	1494
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	120	132	492	586
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	14.1	23.3	59.2	104
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	<2.00
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.61	0.55	1.05	1.05
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	9.02	5.85	7.53	7.47
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	1.00	1.10	4.10	4.88
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.06	0.10	0.26	0.45
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	0.02
ECEC	Calculation	PMS-15A1	cmol/kg	na	10.7	7.62	13.0	13.9
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	9.02	5.32	1.84	1.53

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 6	Site 6	Site 6	Site 6
					0-0.1	0.15-0.25	0.25-0.35	0.45-0.55
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	251550-9	251550-10	251550-11	251550-12
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.61	0.50	0.26	0.21
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	5.72	7.20	8.07	7.56
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	84.2	76.7	58.1	53.8
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	9.33	14.4	31.6	35.2
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	0.57	1.33	1.99	3.26
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.21	0.29	0.17	0.16
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	185	151	343	352
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	1430	961	1194	1242
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	103	83.3	383	490
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	<10.0	<10.0	23.1	70.5
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.47	0.39	0.88	0.90
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	7.15	4.81	5.97	6.21
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	0.86	0.69	3.19	4.08
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.04	0.04	0.10	0.31
ECEC	Calculation	PMS-15C1	cmol/kg	na	8.55	5.95	10.2	11.5
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	8.33	6.92	1.87	1.52
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.55	0.56	0.28	0.22
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	5.55	6.50	8.65	7.83
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	83.6	80.7	58.7	53.9
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	10.0	11.7	31.4	35.4
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	0.51	0.73	0.99	2.66
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.26	0.37	0.22	0.19

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 7	Site 7	Site 7	
DEPTH					0-0.1	0.2-0.3	0.4-0.5	
Test Parameter	Method Description	Method Reference	Units	LOR	251550-13	251550-14	251550-15	
pH (1:5 in H2O)	Electrode	R&L 4A1	pH units	na	7.44	7.47	8.60	
Chloride Soluble	DA	DAP-06	mg/kg	5	50.4	7.05	23.1	
Electrical Conductivity	Electrode	R&L 3A1	dS/m	0.01	0.03	0.03	0.15	
Total N (LECO)	LECO	R&L 7A5	mg/kg	50	713	451	NA	
Phosphorus (Total)	HNO3/HClO4 ICP	ICP-03	mg/kg	40	117	101	NA	
Organic Carbon (LECO)	LECO	R&L 6B3	%	0.2	0.59	0.54	NA	
Phosphorus Buffer Index	UV-Vis	PMS-12	mg/kg	10	<10.0	10.7	NA	
Phosphorus (Colwell)	Bicarb/UV-Vis	R&L 9B1	mg/kg	5	<5.00	5.50	NA	
Potassium (Available)	Bicarb/ICP	R&L 18A1	mg/kg	10	238	244	NA	
Sulphate-Sulphur	KCl40/ICP	R&L 10D1	mg/kg	3	3.49	3.51	NA	
Extractable Copper	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.40	0.38	NA	
Extractable Zinc	DTPA/ICP	R&L 12A1	mg/kg	0.2	0.32	0.32	NA	
Extractable Manganese	DTPA/ICP	R&L 12A1	mg/kg	1	9.62	8.80	NA	
Extractable Iron	DTPA/ICP	R&L 12A1	mg/kg	1	7.66	6.34	NA	
Extractable Boron	Hot CaCl2/ICP	R&L 12C2	mg/kg	0.2	0.33	<0.20	NA	
Exchangeable Potassium	NH4Cl/ICP	R&L 15A1	mg/kg	10	193	177	570	
Exchangeable Calcium	NH4Cl/ICP	R&L 15A1	mg/kg	20	592	499	2793	
Exchangeable Magnesium	NH4Cl/ICP	R&L 15A1	mg/kg	10	88.0	83.3	446	
Exchangeable Sodium	NH4Cl/ICP	R&L 15A1	mg/kg	10	11.4	<10.0	62.9	
Exchangeable Aluminium	KCl/ICP	R&L 15G1	mg/kg	2	<2.00	<2.00	<2.00	
Exchangeable Potassium	R&L 15A1	R&L 15A1	cmol/kg	na	0.49	0.45	1.46	
Exchangeable Calcium	R&L 15A1	R&L 15A1	cmol/kg	na	2.96	2.50	14.0	
Exchangeable Magnesium	R&L 15A1	R&L 15A1	cmol/kg	na	0.73	0.69	3.72	
Exchangeable Sodium	R&L 15A1	R&L 15A1	cmol/kg	na	0.05	0.04	0.27	
Exchangeable Aluminium	Calculation	R&L 15J1	cmol/kg	na	0.02	0.02	0.02	
ECEC	Calculation	PMS-15A1	cmol/kg	na	4.26	3.71	19.4	
Ca/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	4.04	3.59	3.76	

ANALYSIS REPORT

PROJECT NO: EW251550

Location: 1401.24d2 - IDE

CLIENT SAMPLE ID					Site 7	Site 7	Site 7	
					0-0.1	0.2-0.3	0.4-0.5	
DEPTH								
Test Parameter	Method Description	Method Reference	Units	LOR	251550-13	251550-14	251550-15	
K/Mg Ratio	Calculation	PMS-15A1	cmol/kg	na	0.67	0.65	0.39	
Exchangeable Potassium %	Calculation	PMS-15A1	%	na	11.6	12.2	7.52	
Exchangeable Calcium %	Calculation	PMS-15A1	%	na	69.5	67.3	71.8	
Exchangeable Magnesium %	Calculation	PMS-15A1	%	na	17.2	18.7	19.1	
Exchangeable Sodium %	Calculation	PMS-15A1	%	na	1.16	1.17	1.41	
Exchangeable Aluminium %	Calculation	PMS-15A1	%	na	0.52	0.60	0.11	
Exchangeable Potassium	ICP-OES	R&L 15C1	mg/kg	10	151	136	483	
Exchangeable Calcium	ICP-OES	R&L 15C1	mg/kg	20	417	349	1857	
Exchangeable Magnesium	ICP-OES	R&L 15C1	mg/kg	10	51.0	42.3	368	
Exchangeable Sodium	ICP-OES	R&L 15C1	mg/kg	10	<10.0	<10.0	24.7	
Exchangeable Potassium	R&L 15C1	R&L 15C1	cmol/kg	na	0.39	0.35	1.24	
Exchangeable Calcium	R&L 15C1	R&L 15C1	cmol/kg	na	2.09	1.75	9.29	
Exchangeable Magnesium	PMS-15C1	PMS-15C1	cmol/kg	na	0.43	0.35	3.07	
Exchangeable Sodium	R&L 15C1	R&L 15C1	cmol/kg	na	0.04	0.04	0.11	
ECEC	Calculation	PMS-15C1	cmol/kg	na	2.96	2.51	13.7	
Ca/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	4.91	4.95	3.03	
K/Mg Ratio	Calculation	PMS-15C1	cmol/kg	na	0.91	0.99	0.40	
Exchangeable Potassium %	Calculation	PMS-15C1	%	na	13.1	13.9	9.03	
Exchangeable Calcium %	Calculation	PMS-15C1	%	na	70.4	69.5	67.7	
Exchangeable Magnesium %	Calculation	PMS-15C1	%	na	14.3	14.0	22.4	
Exchangeable Sodium %	Calculation	PMS-15C1	%	na	1.47	1.73	0.78	
Exchangeable Aluminium %	Calculation	PMS-15C1	%	na	0.75	0.88	0.16	

This Analysis Report shall not be reproduced except in full without the written approval of the laboratory.

Soils are air dried at 40°C and ground <2mm.

NB: LOR is the Lowest Obtainable Reading.

DOCUMENT END