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Progressive Rehabilitation and Closure Plan – Jackal Renewables Pty Ltd

Title of the Project: Claypave South

Tenure Number: ML 50070

EA Number: EA0001386

EA Holder Name: Jackal Renewables Pty Ltd

EA Holder Contact Details: c/- Ardent Group Pty Ltd, PO Box 320, Red Hill QLD 4059

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Appendices

- Appendix 1 – PRCP Schedule
- Appendix 2 – EA0001386 – Land Outcome Document
- Appendix 3 – Ecological Studies
- Appendix 4 – Mine Planning Report

Abbreviations

EA	Environmental Authority EA0001386
EP Act	<i>Environmental Protection Act 1994</i>
ESC	Erosion and Sediment Control
ERA	Environmentally Relevant Activity
ICC	Ipswich City Council
ML	Mining Lease
NUMA	Non-use Management Area
PMLU	Post-mining Land Use
PoO	Plan of Operations
PRCP	Progressive Rehabilitation and Closure Plan
RE	Regional Ecosystem
ROM	Run-of-Mine
ROW	Right of Way
RRC	Resource Recovery Centre

PART A – REHABILITATION PLANNING PART

1. INTRODUCTION

1.1 Background

Ardent Group Pty Ltd (Ardent Group) has been engaged by Jackal Renewables Pty Ltd (Jackal Renewables) to prepare a transitional Progressive Rehabilitation and Closure Plan (PRCP) for the “Claypave South” Project (the Project) in accordance with the requirements of the *Environmental Protection Act 1994* (EP Act).

This transitional PRCP is applicable to Mining Lease (ML) 50070. The current version of the Environmental Authority EA0001386 (EA) was issued to Jackal Renewables, the owner and operator of the Project, on 27 July 2018.

The EA authorises carrying out Environmentally Relevant Activity (ERA) 20(a) under Schedule 3 of the *Environmental Protection Regulation 2019*: “clay pit mining, dimension stone mining or mining gemstones (including the material from which gemstones are extracted) - at least 5,000t but not more than 100,000t in a year”.

1.2 Purpose of the PRCP

In accordance with the stated purpose outlined under Section 126B of the *Environmental Protection Act 1994* (EP Act), the PRCP:

- (a) specifies a plan for how and where environmentally relevant activities will be carried out on land in a way that maximises the progressive rehabilitation of the land to a stable condition; and
- (b) provides for the condition to which the holder must rehabilitate the land before the authority may be surrendered.

This PRCP has been prepared to address the requirements of Sections 126C and 126D of the EP Act, and has been prepared in accordance with the *Guideline Progressive Rehabilitation and Closure Plans (PRC Plans)* (DES 17 March 2021).

The PRCP comprises two parts:

Part A – Rehabilitation Planning Part, which includes the following:

- Provide a description of:
 - each resource tenure, including the area of each tenure, that applies to the PRCP.
 - the relevant activities to which the application relates.
 - the likely duration of the relevant activities.
- A description of how and where the mining activities will be carried out.
- Details of consultation undertaken in relation to the preparation of the PRCP and ongoing consultation in relation to any required rehabilitation required under the PRCP.
- Details of how the proposed Post-Mining Land Uses (‘PMLUs’) are consistent with community consultation and relevant plans for the land of the local government, the State and Commonwealth.
- Proposed methods and techniques for rehabilitating the land to a stable condition in a way that supports the rehabilitation milestones under the proposed PRCP Schedule.

- Identifies any risks of a stable condition for land not being achieved, and specifies methods to manage or minimise the identified potential risks.

Part A is to justify and support the proposed PRCP Schedule.

Part B – PRCP Schedule, which includes a proposed PRCP schedule that complies with section 126D of the EP Act and includes the following:

- Nomination of either a PMLU or NUMA for all land within the relevant resource tenures, including land uses for undisturbed land.
- Identification of when land becomes available for rehabilitation or improvement.
- Rehabilitation or management milestones to achieve the PMLU or NUMA outcomes.
- Milestone criteria that demonstrate when each milestone has been completed.
- Completion dates for each milestone to be achieved.
- Any conditions considered necessary or desirable.

The PRCP schedule becomes a legally binding and enforceable instrument with which the Project must comply.

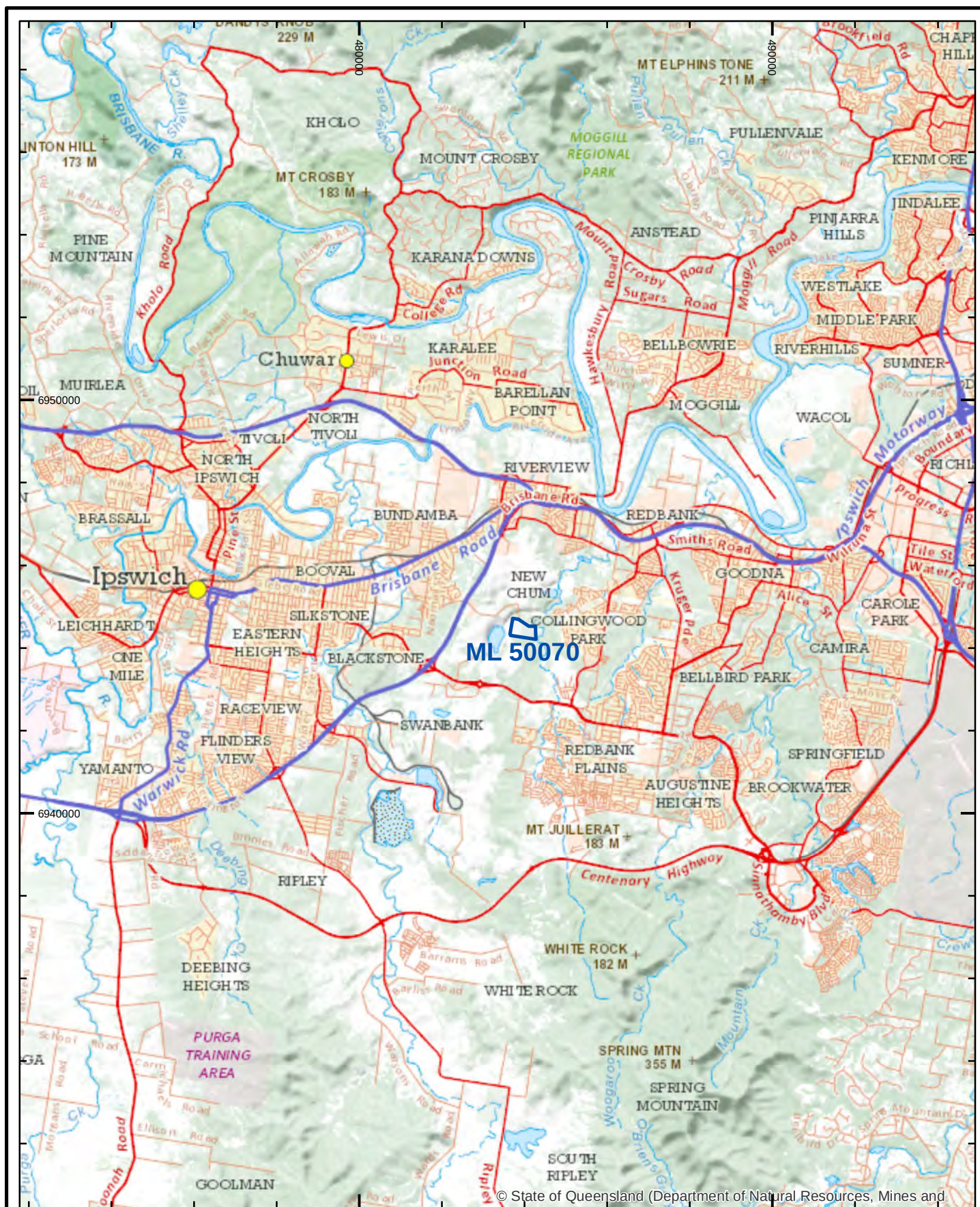
1.3 Land Outcome Document for the PRCP

Environmental Authority EA0001386 dated 27 July 2018 is the Land Outcome Document (LOD) for this PRCP.

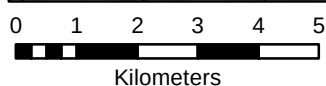
2 Background Information

2.1 Location

The Project is a clay-shale mine on ML 50070 located at New Chum, approximately 7km east of Ipswich, in South East Queensland (Figure 1). ML 50070 is located entirely within a parcel of land held in freehold title, Lot 73 on SP128662 (Figure 2), which covers 25.38 Ha in area.



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JACKAL RENEWABLES PTY LTD

ML 50070



Site Location

Legend

ML boundary

Figure 1

Sheet No.

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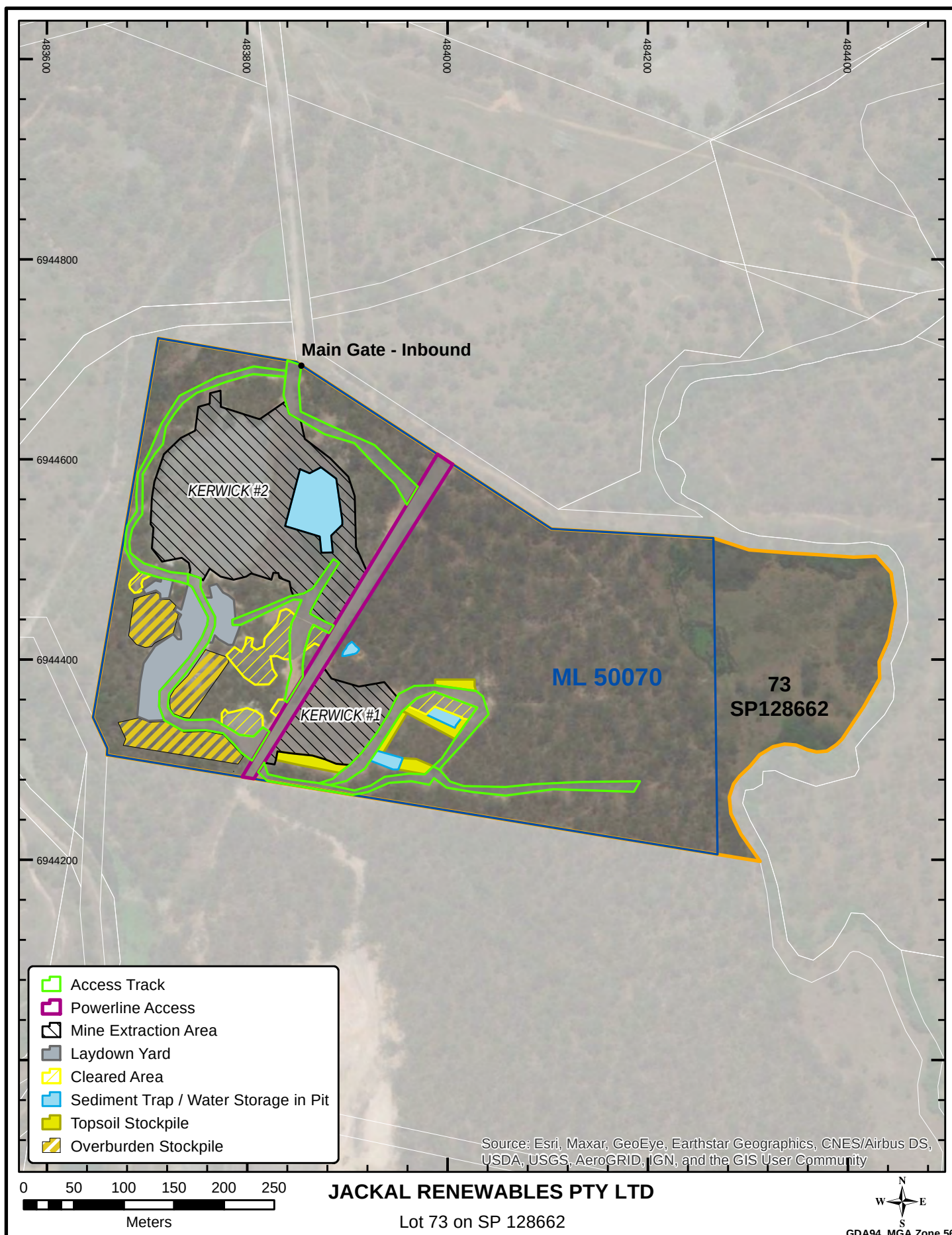
Drawn By: Chris Schleichsch

Requested by: Richard Davis

Date: 6/07/2018

Data sources:

Old Department of Natural Resources, Mines & Energy, Geoscience Australia



	Current Disturbance	Legend 73 SP128662 - ML boundary - Property boundary
Figure 2 Sheet No. RTPL_ARD_JKRGEN_MAP_2013_A	Drawn By: Chris Schlebusch	
	Requested by: Jacob Arnold Date: 18/12/2020	

Data sources:
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2.2 Tenure to which PRCP relates

Details of the ML, which is the subject of this PRCP, are outlined in Table 1. This PRCP applies to the entire area of this tenure.

Table 1: Mining Tenement Details ML 50070

Specifications	Details
ML Number	50070
Tenement name	Claypave South
Grant Date	24 February 1994
Expiry Date	29 February 2044
Area	21.5800 Ha (Public enquiry Report) 21.52 Ha (Qld State Shapefile Area)
Environmental Authority	EA0001386
Minerals	Clay- Brick Clay Clay – Fire Clay Clay – Pottery / White Ware Shale

2.3 Property Description

The Project is located entirely within a parcel of land held in freehold title. The real property description and current ownership is provided in Table 2.

Table 2 Real Property Description Underlying ML 50070

Specifications	Details
Background Tenure	Lot 73 on SP128662 (Lot 73)
Tenure type	Freehold
Owner	Jackal Renewables Pty Ltd
Local government area	Ipswich City Council
Underlying land parcels	Lot 273 on SP128662

Note that Lot 273 is a volumetric title and lies under Lot 73 but commences approximately 25m below the current ground surface. Lot 273 is unallocated State Land.

2.4 ML Layout

The ML is unequally divided by a power line right of way (ROW) which also provides north-south access across the Lot.

To the east of the power line ROW is the clay mining operation (Kerwick Pit#1). These activities are subject to EA0001386, as specified in Table 1.

To the west of the power line ROW is Kerwick clay Pit#2. Mining in this pit has almost completed and this structure will then be used primarily for water management during mining operations.

In this western sector is also a Resource Recovery Centre (RRC). This was approved via a negotiated decision notice from Ipswich City Council (ICC) on 4 February 2020 for Development Approval No. 2491/2018/MCU for a Material Change of Use application for Special Industry (Waste recycling and reprocessing – waste transfer station, crushing, milling or grinding), Caretakers Residence and Environmentally Relevant Activities (ERA33, ERA54(1) and ERA62(1)(a)) over Lot 73 on SP128662. These operations are subject to EA0001872 and include the following ERAs:

- ERA 33 - Crushing, milling, grinding or screening, Crushing, grinding, milling or screening more than 5000t of material in a year;
- ERA 54 - Mechanical waste reprocessing, 1: Operating a facility for receiving and mechanically reprocessing, in a year, more than 5,000t of inert, non-putrescible waste or green waste only; and
- ERA 62 - Resource recovery and transfer facility operation, 1: Operating a facility for receiving and sorting, dismantling, baling or temporarily storing-, (a) scrap metal, non-putrescible waste or green waste only.

Figure 3 shows the overall layout of the site.

The plan for the Resource Recovery Centre is that it will be developed slowly in stages, as market opportunities arise. The processing operation at this stage includes processing of fibre cement products and blending to meet customer requirements.

Figure 4 shows the layout of the Resource Recovery Centre. The Resource Recovery - Environmental Authority EA0001872 dated 7 September 2022 does not contain any requirements relating to rehabilitation, however there are specific requirements (Condition WT2) relating to the use of Kerwick #2 Pit for stormwater runoff from disturbed areas and therefore Kerwick #2 Pit must be maintained throughout mining operations.

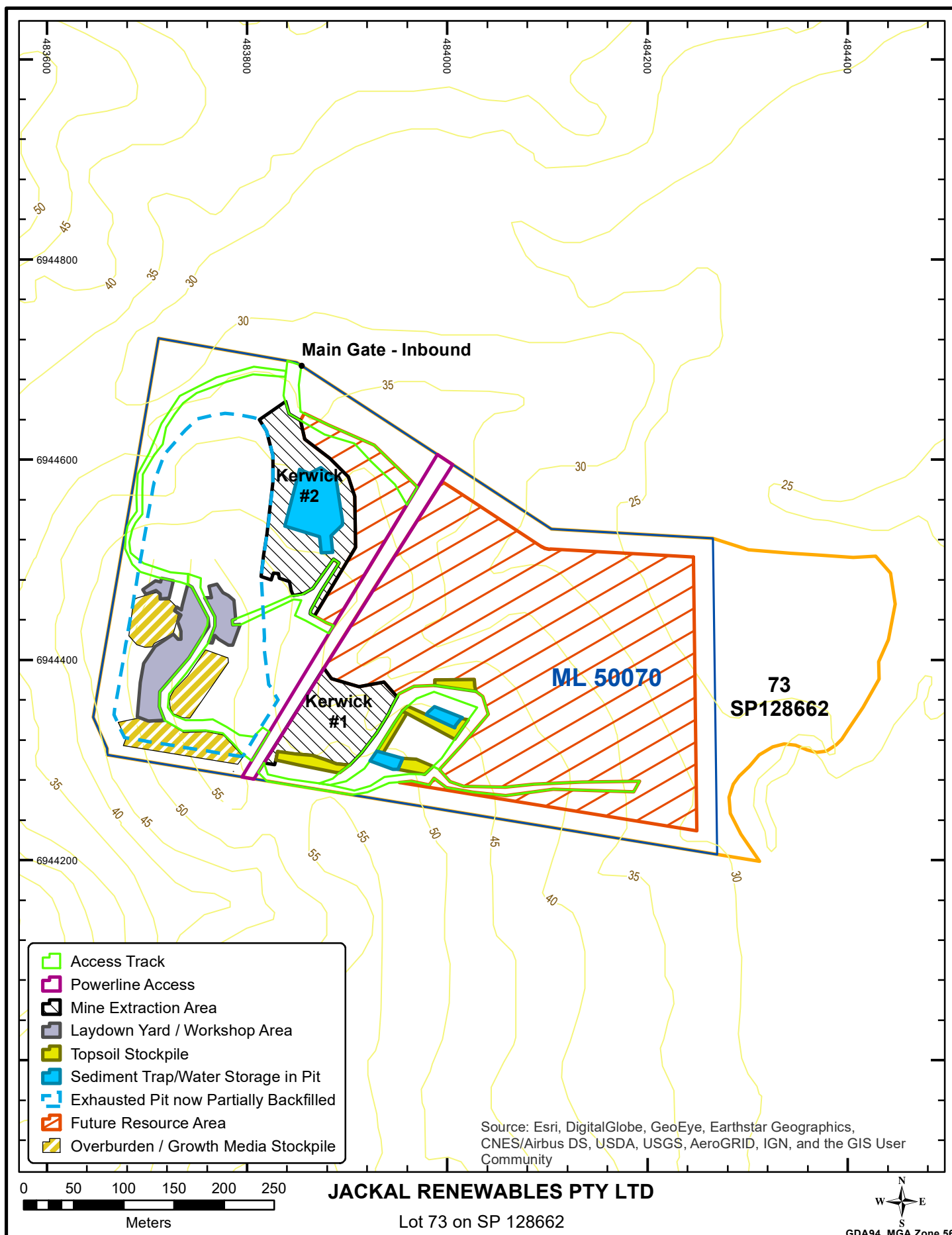


	Figure 2 - Use of Site for ML Purposes	Legend 73 SP128662 ML boundary Property boundary 5m Regional Contour
Figure 1 Sheet No. RTPL_ARD_JKRGEN_MAP_2012_B	Drawn By: Chris Schlebusch Requested by: Richard Davis Date: 29/10/2020	Data sources: ©Qld Department of Natural Resources, Mines & Energy, ©Geoscience Australia

2.5 Primary Mine Features/Infrastructure on Site

Road access to the site is from the Cunningham Highway, via Chum Street / Rhondda Road.

There is no built infrastructure (buildings or processing plant) on the Project site relating to mining activities. However, on the western portion of the ML the industrial activities described in section 2.4 approved under a DA and subject to EA0001872 include an enclosed processing area, workshop, resource recovery station and office building and in the immediate vicinity is a processing pad and product stockpile.

The primary mine features associated with the mining activities are:

- Clay pit Kerwick Pit #1 – operational pit to be progressively mined from west to east on a campaign basis.
- Clay pit Kerwick Pit #2 – pit primarily for stormwater runoff from disturbed mining areas, and water management over life of mine.
- Overburden rock from the mining process is predominantly siltstone, mudstone and sandstone which is used for environmental control works or as backfill in mined areas. Note that there is limited requirement for the stockpiling of overburden during the project.
- Three historical overburden stockpiles onsite, which have naturally revegetated and are currently safe, stable and non-polluting. These stockpiles will be disturbed in the future to facilitate rehabilitation of the site.

Shared infrastructure between the ML activities subject to EA0001386 and the activities approved under the Development Approval subject to EA0001872 includes:

- Access roads.
- Stormwater infrastructure.
- Laydown area and carparking.

Due to the nature of the mining operations, there are no existing or proposed tailings dams or heap leach pads; nor are there any mine water management dams. There is no water, power or sewage connection to the site.

A high voltage transmission power line runs NW to SE, approximately 290m to the north of the site.

A combined 33kV - 11kV power line traverses the subject site, from SW to NE, but does not supply power to the site. This power line is not currently subject to an easement agreement registered on the land title. There is no formal agreement between the ML holder, or landholder, regarding the location of this power line with the power line owner (Energex). Despite this, there is an understanding between the ML holder and land owner, and Energex that this power line alignment must remain clear to enable access for maintenance in accordance with requirements specified under the *Electricity Act 1994*.

2.6 Type of Mining Operation

Mining on ML 50070 has been granted for the following minerals:

- Clay - Brick Clay;

- Clay – Fire Clay;
- Clay – Pottery / White Ware; and
- Shale.

The mining method generally employed on ML 50070 comprises of the following steps:

- Vegetation clearing (limited as necessary);
- Topsoil and overburden stripping (as necessary);
- Clay/shale extraction (in situ) or reclamation (old spoil dumps) (dozer, excavator, front end loader or similar);
- Clay/shale stockpiling; and
- Clay/shale haulage.

Common with other clay pit operations in the area, ML 50070 is worked according to market demand. The type of clay required is based primarily on its firing characteristics and colour. Material is transported off the lease to customers, on demand. Extraction from ML 50070 has been generally 20,000 tonnes per annum; however it is anticipated that this may be up to approximately 100,000 tonnes per annum based on likely market requirements.

The area to the west of Kerwick #2 pit has almost been exhausted of the clay resource. This area also contains overburden/growth media stockpiles that have been stored for rehabilitation. It is intended that these stockpiles will be used as appropriate during the progressive rehabilitation to achieve the rehabilitation outcomes specified in the Environmental Authority for the mining lease.

This area has been partially backfilled and is now utilised for equipment parking, laydown, workshop and amenities, for mining and also as relevant to the activities relating to the Resource Recovery Centre, shown in Figure 4.

Overburden rock from the mining process is predominantly sandstone which is used for environmental control works or as backfill in mined areas.

Mining will continue within Kerwick Pit #1 and extend from west to east over time to fulfill client orders. Resource drilling is planned in this area to confirm the resource ahead of mining.

2.7 Proposed Duration of Mining Operation

The current mining lease extends until 29 February 2044.

Based on current resource utilisation rates, Jackal Renewables has determined the estimated life of mine is approximately 20 years. This is based on clay and shale mineral resource estimates to the end of 2040, considering current and forecast future mining rates (refer Table 3).

The detailed mine plan is included as Appendix 4, for specific details.

Table 3 Proposed Mining Sequence and Duration

Mining Area	Resource (m ³)	Commence Mining	Complete Mining	Landform Completed	Rehabilitation Completed
Kerwick Stage 1 #1	124,573	2023	2028	2030	2034
Kerwick Stage 2 #1	142,520	2028	2032	2033	2037
Kerwick Stage 3 #1	158,590	2032	2036	2038	2042
Kerwick Stage 4 #1	108,536	2036	2039	2040	2044

The mine plan has estimated the following volumes of resource, waste rock and topsoil during the planned staged mining of the resource.

Table 4 Mining Stages and Estimated Volumes

Mining Area	Pit Surface Area (m ²)	Pit Design Total Volume (m ³)	Resource Volume (m ³)	Waste Volume (m ³)	Topsoil Volume (m ³)
Kerwick Stage 1 #1	22,619	215,512	124,573	90,939	3,393
Kerwick Stage 2 #1	21,255	246,560	142,520	104,040	3,188
Kerwick Stage 3 #1	23,109	274,361	158,590	115,771	3,466
Kerwick Stage 4 #1	23,399	187,767	108,536	79,231	3,510
Total		924,199	534,218	389,980	13,557

There is currently approximately 4,500 m³ of topsoil in existing stockpiles on site.

3 Rehabilitation Planning

3.1 Baseline Information

3.1.1 Climate

3.1.1.1 Current Climate

The climate of the Project is sub-tropical with warm to hot wet summers and cool dry winters. Climate data was derived from the Ipswich weather station (Station 040101) as this is the closest weather station to the site that has both rainfall and temperature data available (BOM, 2022).

Mean annual rainfall for Ipswich is 878.5mm (1870 – 1994). Rainfall occurs predominantly in the summer months, as shown in Table 5.

In south-east Queensland the annual average potential evaporation is almost 50% greater than the annual average rainfall, which contributes to the depletion of soil moisture (DES, 2019).

Table 5 Climate data for Ipswich

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean maximum temperature (°C)	32.0	31.1	29.9	27.5	24.1	21.5	21.1	22.8	25.9	28.5	30.8	31.9
Mean minimum temperature (°C)	20.0	19.7	18.3	14.7	11.0	8.2	7.0	7.6	10.7	14.2	16.9	18.8
Mean Rainfall(mm)	124.9	119.7	100.6	63.1	50.5	51.1	43.5	33.6	41.4	65.7	78.1	105.6

(BOM, 2022)

3.1.1.2 Long-term Climate Projections

The long-term climate projections are important to understand when planning for rehabilitation. These predictions are documented in the Long Paddock Queensland Future Climate Dashboard Queensland Government (2022). The mean annual temperature for the Ipswich CC is predicted to rise by approximately 1.0°C by 2030 and by approximately 4.1 °C by 2090, as shown in Figure 5.

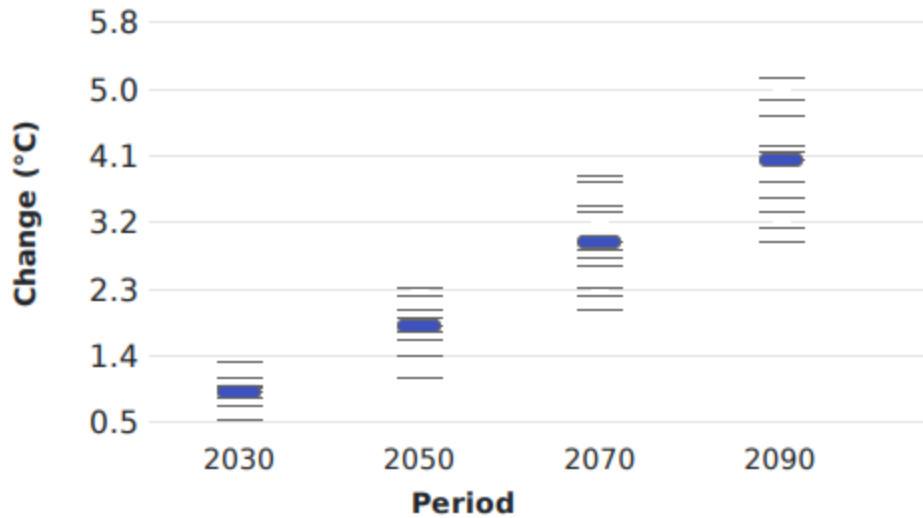


Figure 5 Mean temperature for annual season (based on 1986 to 2005 reference period)

(Queensland Government, 2022)

The maximum 1-day precipitation is predicted to remain similar as shown in Figure 6.

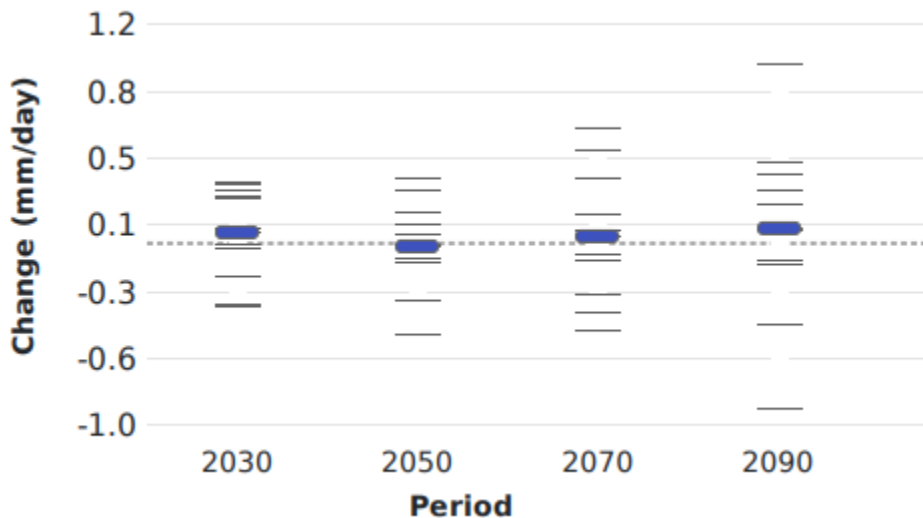
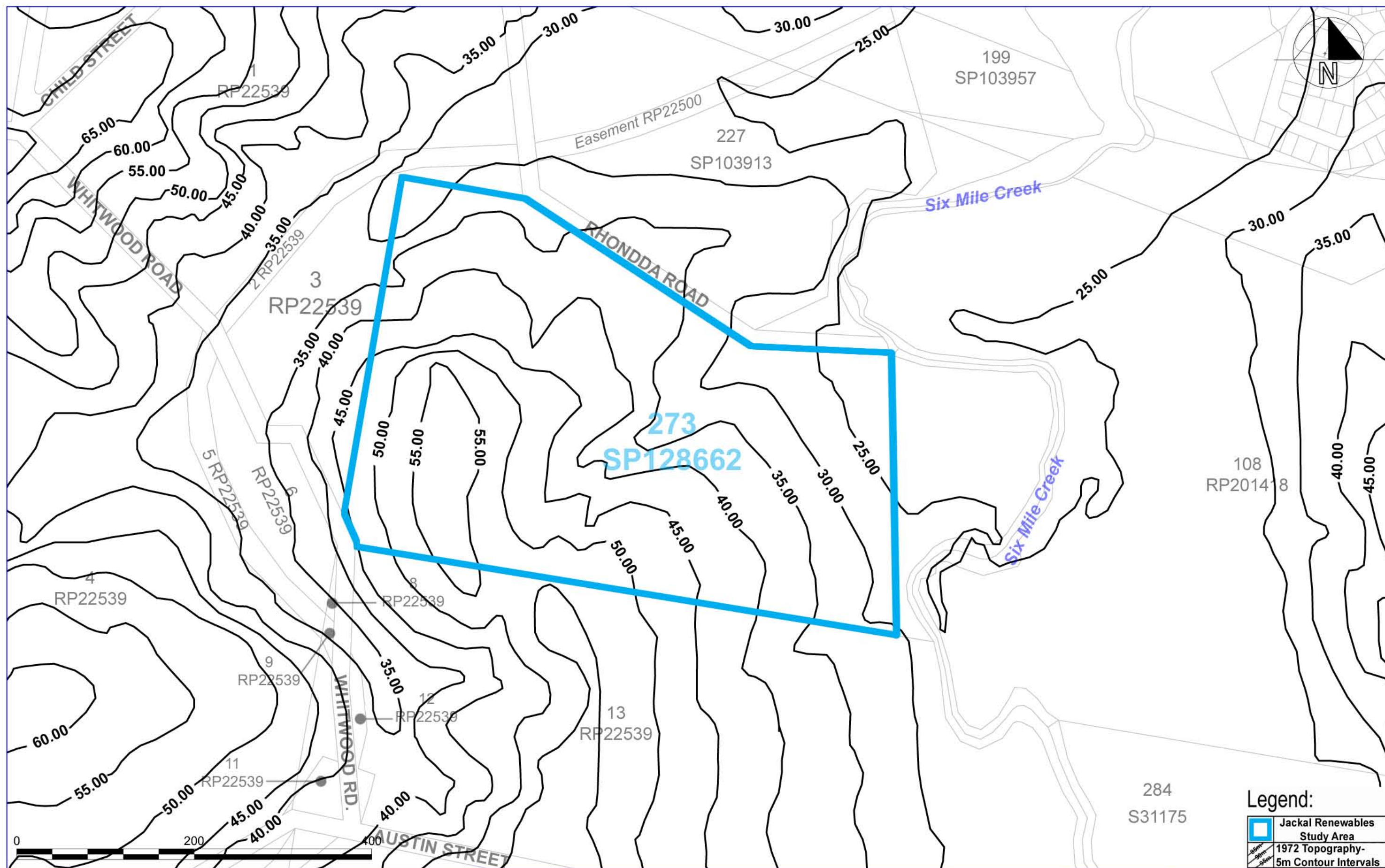


Figure 6 Maximum 1-day precipitation for annual season (based on 1986 to 2005 reference period)

(Queensland Government, 2022)

3.1.2 Topography

Generally, the landform is elevated in the western portion, up to a height of approximately 54m (Australian height datum, AHD). The landform of the western portion of the site is impacted by past and current mining activities, including a sizable excavation subject to clay and shale extraction. The approximate pre-surface mining landform slopes to the east, to a flood plain (at height of approximately 22m AHD), adjacent to Six Mile Creek, as shown in Figure 7. Regional topography is shown in Figure 8 (Moreton Geotechnical Services, 2018).



Moreton Geotechnical Services Pty Ltd PO Box 915 Ipswich QLD 4305 Tele/Fax: (07) 3294 6988 Email: mgs@gil.com.au		Jackal Renewables Rhondda Road, New Chum, Queensland Plan 3 - Contour Plan 1972 Map View Contours		Date: March, 2018	Scale: 1:4000	Sheet No: Three (3 of 16)	File: S12.21_ Folder: 2018.02.09_03
MGS Ref: 2018/11 ACN 055 833 120 ABN 24 055 833 120		Taylor Mining Services Pty Ltd Redbank Plains Road Blackstone QLD 4305		Ph: (07) 3816 2311 Fax: (07) 3816 2377 www.taylorminingservices.com.au			

FIGURE 7 Pre Surface Mining Site Topography

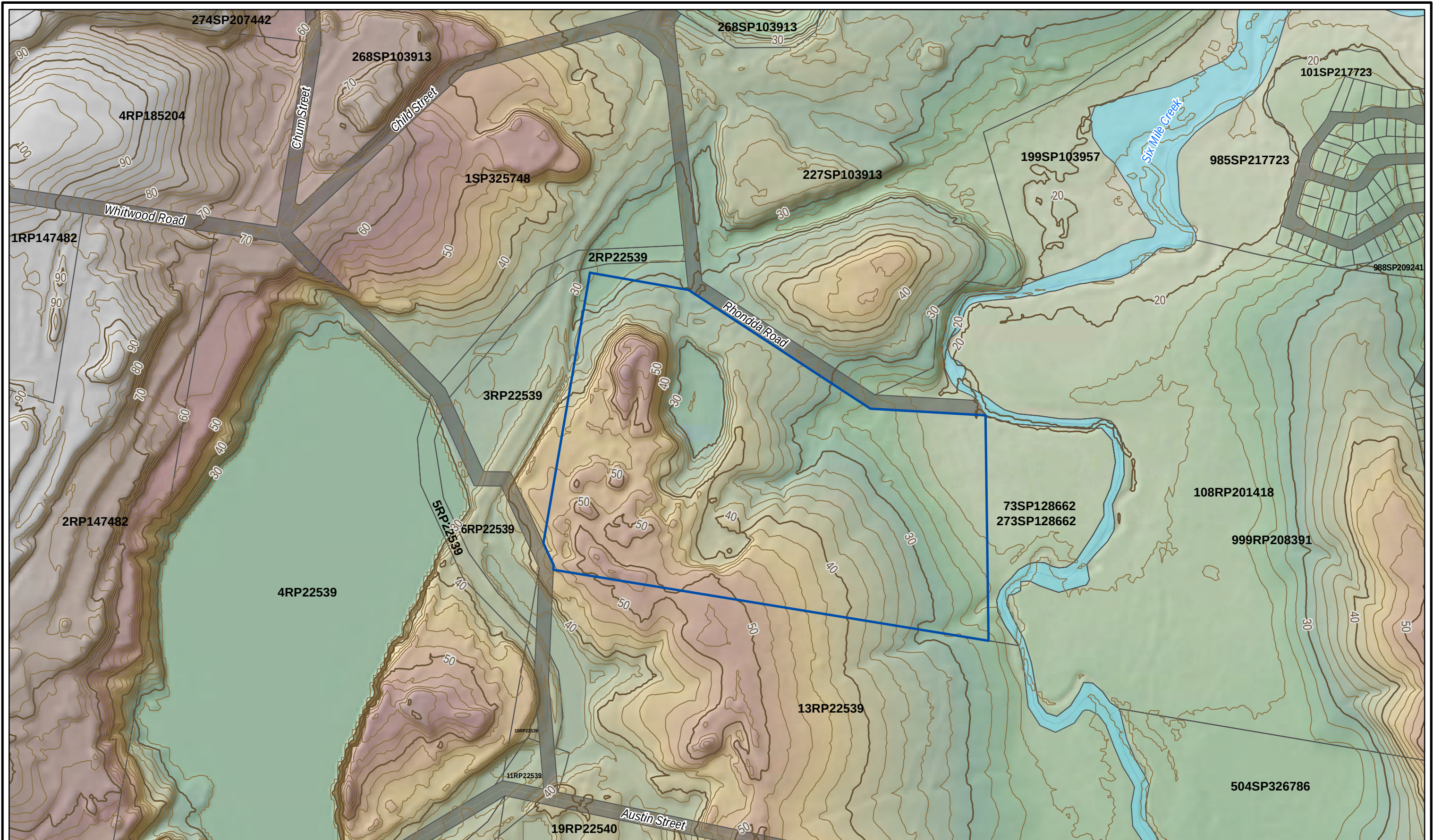


	Figure 8 - ML50070		Legend	
	Regional Topography		ML50070 Boundary	Contour (2m)
	Drawn By: Chris Schlebusch		Property Boundary	Contour (10m)
Sheet No. RTPL_ARD_STW001_MAP_1018_A	Requested by: Richard Davis		Road Parcel	Watercourse Parcel
	Date: 24/01/2023			

3.1.3 Geological setting

3.1.3.1 Regional Geology

Regionally, the ML50070 is located in the Triassic to Middle Jurassic age Clarence Moreton Basin. This basin extends over approximately 10,000 km² of south eastern Queensland and northern New South Wales. In Queensland, the western boundary of the basin continues into the Surat Basin, while the other directions are bounded by older metamorphic and volcanic terrains. The Clarence Moreton Basin is mainly a fluvial - environment basin, with lesser coal swamp and lacustrine facies developed in some areas.

The Clarence Moreton Basin overlies the Ipswich Basin, a Middle Triassic age alluvial, fluvial and lacustrine environment basin, which includes the Ipswich Coal Measures. The Ipswich Coal Measures were the dominant coal resource targeted by historical to recent coal mining in the Ipswich coal field.

3.1.3.2 Site Geology

The local geology (Figure 9) indicates that rocks to the west of ML 50070 which comprise part of the Late Triassic Blackstone Formation (the upper part of the Ipswich Coal Measures – Ipswich Basin), include shale, siltstone, coal (including the Bluff Seam) and sandstone (Cranfield et al, 1989).

Overlying rocks were part of the Bundamba Group of the Clarence – Moreton Basin (or Woogaroo Subgroup as they are now known (Cranfield and Schwarzbock, 1972)). The constituent formations in this area are the Aberdare Conglomerate and Raceview Formation. The Aberdare Conglomerate, which disconformably overlies the Blackstone Formation does not crop out within the lease, but is likely exposed in the high wall of the Kerwick #2 pit. The Raceview Formation consists of fine to medium grained, sub-labile to quartzose sandstone, shale, mudstone, thin coal seams and siltstone. The siltstone is fissile, with plant fragments and mica flakes on the bedding planes. The thickest coal seam in the unit is the Little West Moreton Seam. Forming the top of the sequence in the area is the Tertiary Redbank Plains Formation composed of poorly consolidated lacustrine interbedded multi-coloured claystone, shale, and labile sandstone. This unit lies unconformably on the Raceview Formation (Staines, 1961).

The lithological summary for the two formations are as detailed in Table 6 below, as well as showing a smaller formation which covers the north-west and south-east corners of the ML.

Table 6 Geological Description

Rock Unit	Age	Dominant Rock	Lithological Summary
Raceview Formation	Late Triassic	Arenite-Mudrock	Sublabile to quartzose sandstone, shale, mudstone, thin coal seams, siltstone
Redbank Plains Formation	Late Triassic	Arenite-Mudrock	Lacustrine interbedded multi-coloured claystone, shale, labile sandstone
Quaternary Alluvial	Quaternary	Alluvium	Clay, silt, sand and gravel; flood-plain alluvium

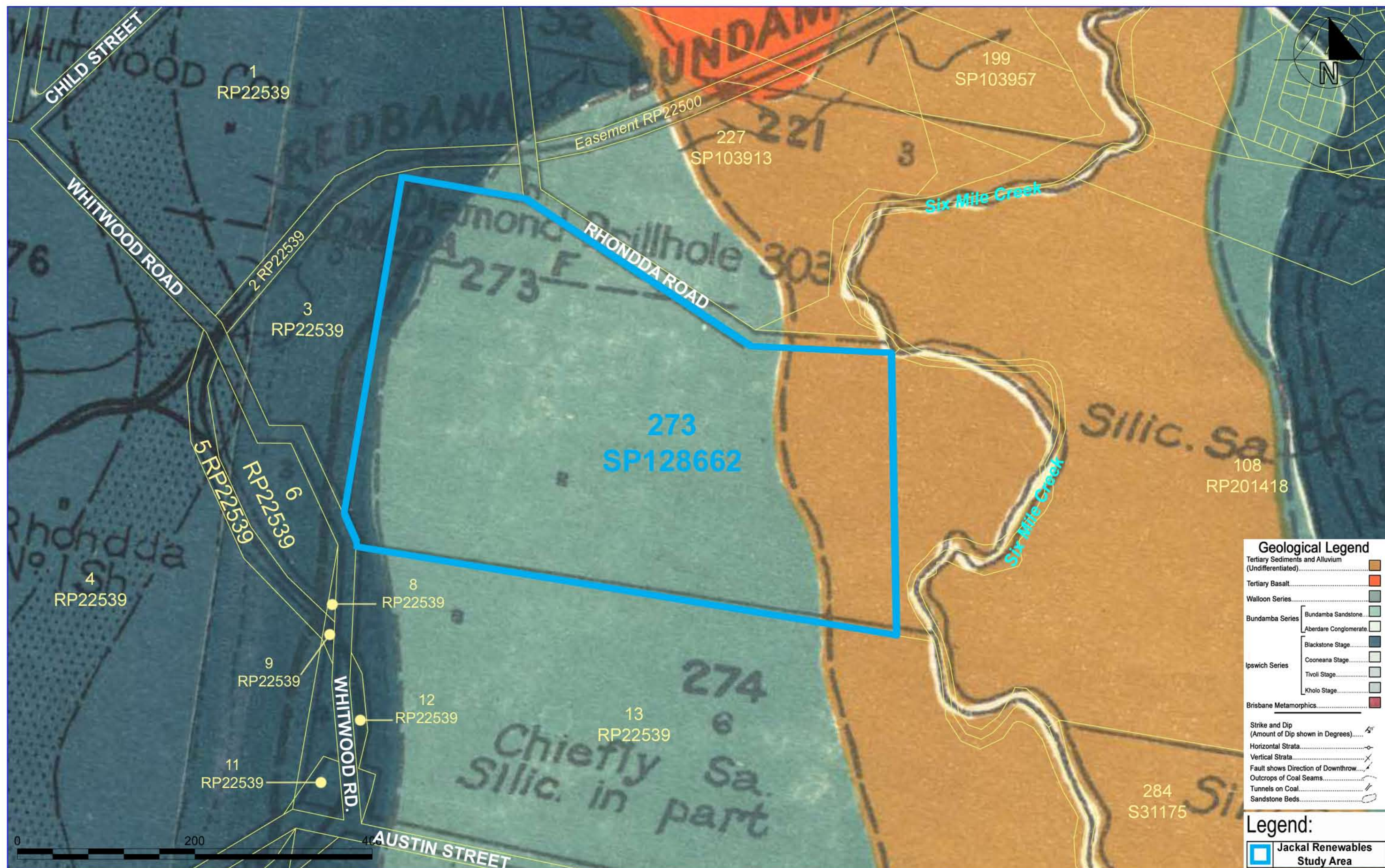


FIGURE 9 - Site Geology Plan

There is extensive open cut overburden material across the western side of the site. An exposed low-wall on the south side of the relict open cut, and part of the exposed highwall on the eastern side of the relict open cut void, also revealed the presence of easterly dipping beds of shale (and some coal) of the Blackstone Stage with a capping of strong sandstone of the Bundamba Sandstone or Aberdare Conglomerate Formations. The strong sandstone is also exposed at ground level around the crestal area in the south west corner of the site. The Bluff Seam was noted to outcrop (come to the surface) to the west of ML50070 in a deep drainage channel that had been previously excavated in the bedrock.

3.1.4 Site Hydrology and Fluvial Networks

The Project area lies within the Brisbane River drainage sub-basin. The environmental values and water quality objectives for the waters located in the Project region are detailed in the 'Sandy, Six Mile, Wolston, Woogaroo and Goodna Creeks environmental values and water quality objectives' as prescribed in Schedule 1 of the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*.

The environmental values for the Lower Six Mile Creek fresh waters are:

- Aquatic ecosystems;
- Stock water;
- Farm supply / use;
- Secondary recreation;
- Visual recreation;
- Industrial use; and
- Cultural and spiritual values.

There is no processing plant on site that generates a waste water, therefore there are no mine water management dams located on ML 50070. All stormwater runoff from disturbed areas from the western portion of the site are generally captured by the flow into the existing Kerwick #2 clay pit, where they are re-used onsite by the landowner, infiltrated or evaporated. Sediment dams and settling ponds are located at low points to the east of the power line to collect the site's surface water runoff that occurs from the Kerwick #1 pit, to the east of the power line, as shown in Figure 10.

The remainder of the stormwater from the undisturbed portions of the site flows through vegetated areas east towards Six Mile Creek to the east.

Six Mile Creek flows to the north, into the Brisbane River.

Due to the ridge lines within the site, the property has very little external catchment entering the site.

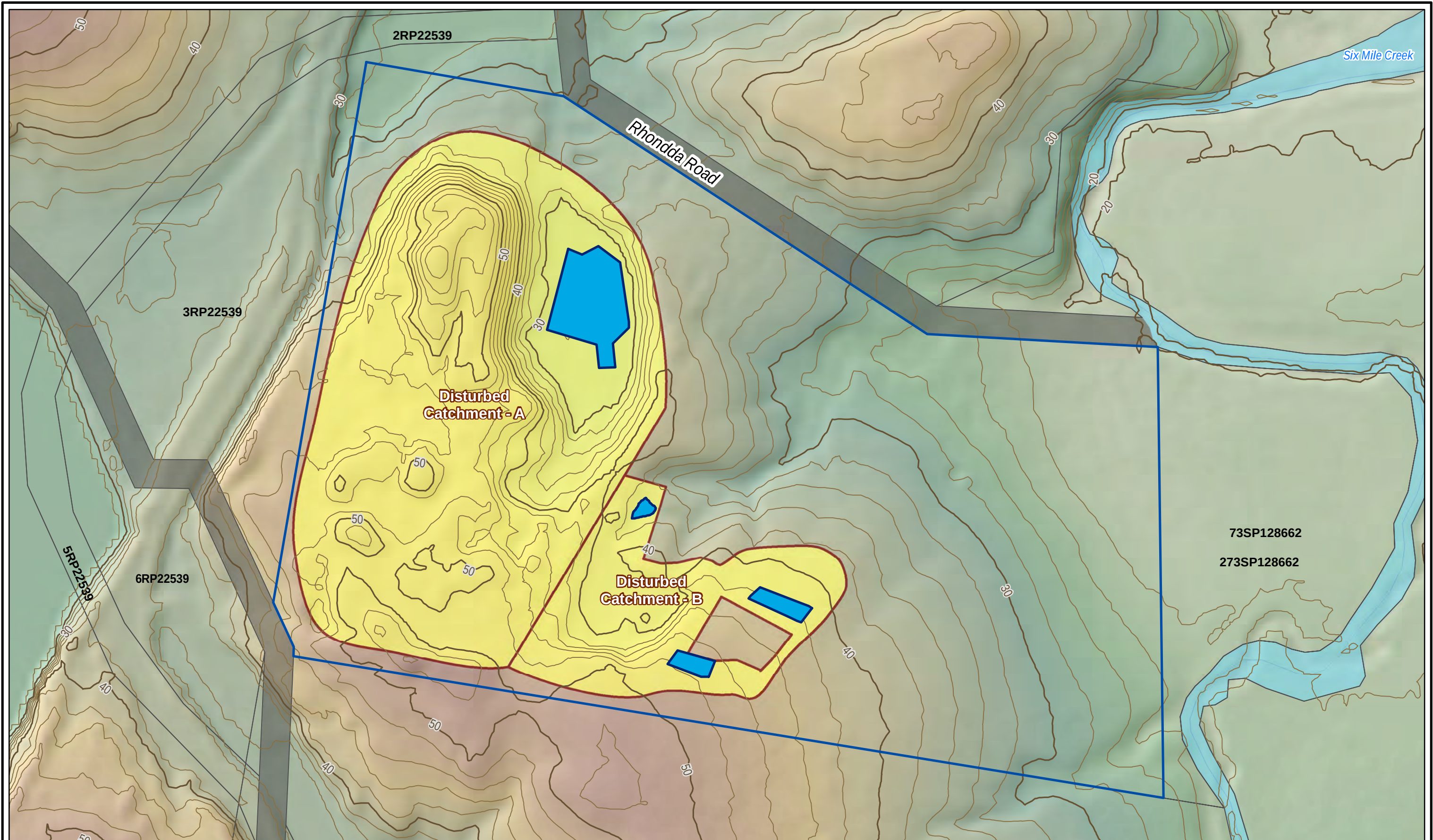


	Figure 10 - ML50070		Legend	
	Stormwater Features on Site		ML50070 Boundary	Water Storage and Sediment Pond
	Drawn By: Chris Schlebusch		Property Boundary	Contour (2m)
Sheet No. RTPL_ARD_STW001_MAP_1019_C	Requested by: Richard Davis		Road Parcel	Contour (10m)
	Date: 6/02/2023		Watercourse Parcel	Disturbed Catchment (catchment boundaries approximate)

The estimated volumes of the water storage / sediment dams are as provided below in Table 7.

Table 7 Water Storage Volumes

Sediment / Water Storage Dam	Approximately Volume (m ³)
Kerwick #2 Pit	2,300
Sediment Dam	1,470
Sediment Dam	915
Kerwick #1 Sediment Dam	700

The water collected in the clay pit and sediment dams is not particularly acidic or saline and does not require treatment for reuse on site. Water monitoring is undertaken on a regular basis and results from the latest round of monitoring undertaken on 19 December 2022 is presented in Table 8.

Table 8 Water Quality Monitoring Results

Parameter	Units	Result
pH (Field Test)	pH unit	8.22
EC (Field Test)	µS/cm	1098
Suspended Solids	mg/L	11
Turbidity	NTU	2.7
Nitrite + Nitrate as N	mg/L	<0.1
Total Kjeldahl Nitrogen as N Calculated	mg/L	0.2
Total Nitrogen as N	mg/L	0.2
Total Phosphorous as P	mg/L	<0.01
Arsenic as As	mg/L	0.001
Cadmium as Cd	mg/L	<0.0001
Chromium as Cr	mg/L	<0.001
Copper as Cu	mg/L	0.003
Lead as Pb	mg/L	<0.001
Nickel as Ni	mg/L	0.003
Zinc as Zn	mg/L	<0.005
Mercury as Hg	mg/L	<0.0001

3.1.5 Flooding

Ipswich City Council records indicate that the property was not subject to recent major flood events, as shown in Figure 11. Therefore, there is no flood plain defined within the mining lease area.

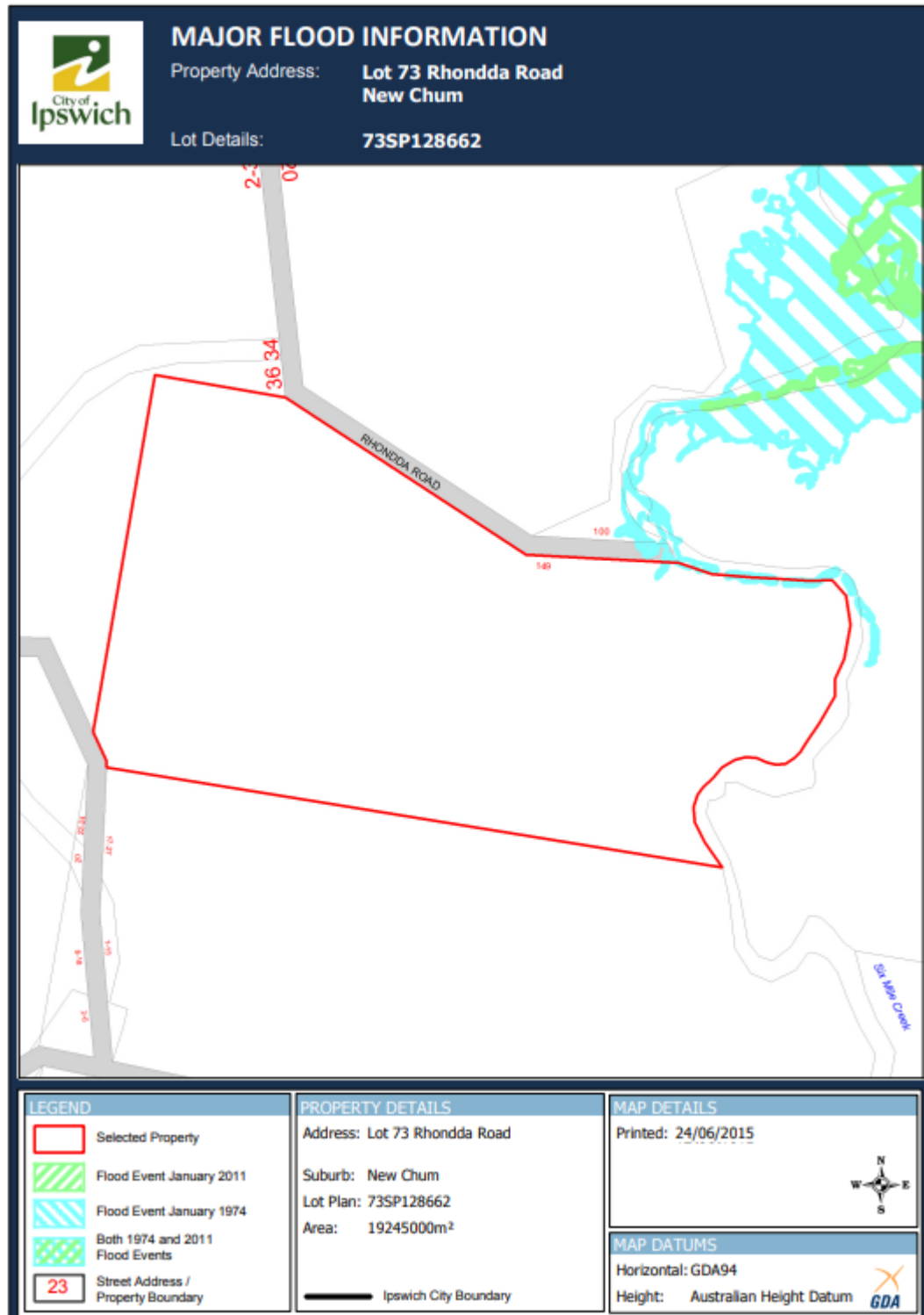


Figure 11 Major Flood Information

3.1.6 Groundwater Levels and Properties

The environmental values for groundwater are also detailed in the ‘Sandy, Six Mile, Wolston, Woogaroo and Goodna Creeks environmental values and water quality objectives.’ The groundwater environmental values for the Sandy, Six Mile, Wolston, Woogaroo and Goodna Creeks catchment waters are:

- Aquatic ecosystems;
- Irrigation;
- Farm supply/use;
- Stock water; and
- Drinking water.

There is limited information regarding groundwater on the site ML50070. Based on the public bore register, Bore MW3 is located approximately 100m to the southwest of the site, and standing water level is 30m AHD, within shales. It is likely that the saturated sediments in this drill hole are influenced by the water level in the adjacent open cut, and the water level does not reflect the regional groundwater levels.

Bores BH8, BH9 are located 600m north of the site records standing water level at approximately 12m AHD. This could be more indicative of regional groundwater levels. Bore CS4 is located in the south east corner of the ML, and is artesian, with the water level at 23m AHD (also ground level). This drill hole is likely to be responding to water under pressure in underground coal workings (i.e. from depths of over 50m below ground level). There are no groundwater quality details available from these bores.

Exploration drilling carried out across the site, did not record groundwater in the drill holes. These holes were drilled to depths below the proposed pit floor.

Six Mile Creek, at the eastern portion of the site may also be influencing shallow groundwater levels, with the bed level in the creek at approximately 20m AHD. The bed level of Six Mile Creek would likely control shallow water table levels in this vicinity (i.e. groundwater level would be at or below 20m AHD). The standing water level in Kerwick #2 Pit was recorded at 23.5m AHD on 27 September 2018 after a long dry period. Six Mile Creek does dry out completely during the dry season and is not supported by groundwater discharge during the dry season.

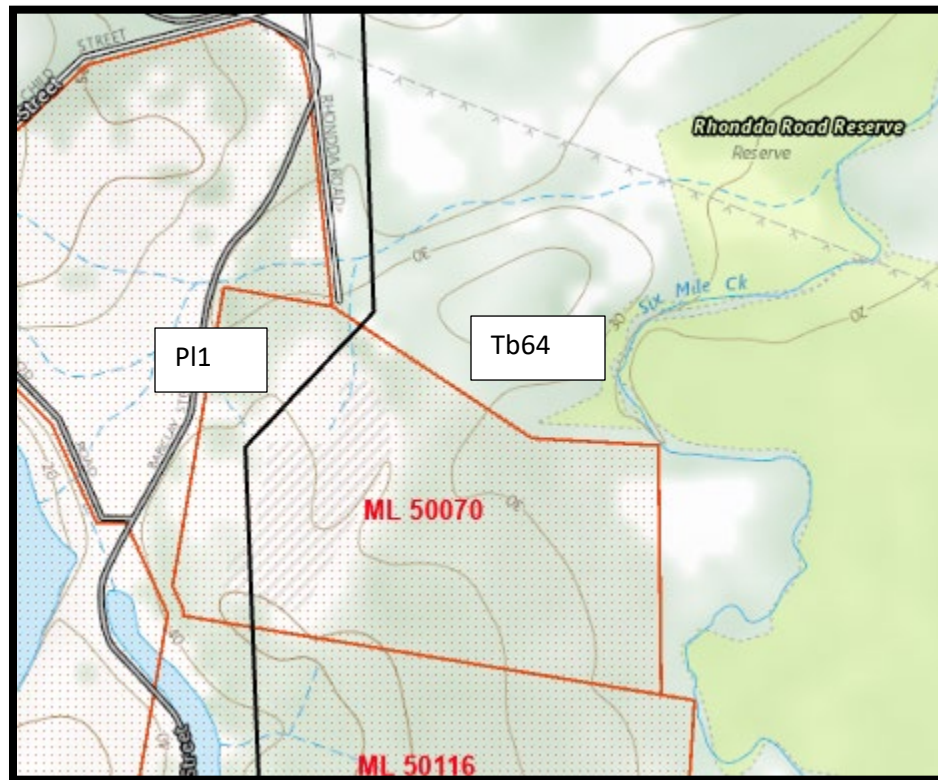
It would be anticipated that groundwater recharge happens from incident rainfall within the surrounding area into the sandstones of the Ipswich and Moreton Basin outcropping areas. In addition, some groundwater recharge may take place from the base of exhausted mine pits in the region. Groundwater discharge areas (soaks) are not locally known, unless artificially created by uncapped artesian bores. It is likely that groundwater provides some base flow to the Brisbane River, north of the site. Groundwater flow direction in shallow sedimentary aquifers is likely to follow general topography towards the north east, from the site.

3.1.7 Soil Types, Properties and Productivity

Soils are relatively thin and sandy over arenite, deeper and more clay rich over mudstone. The soil is characterised as erosive.

In the Atlas of Australian Soils, the main soil type in the area is classified as “Tb64 - Hard pedal mottled-yellow duplex soil”. There is a narrow north south trending sliver of soil “PI1 - Hard pedal mottled-red duplex soils” in the western portion of the mining lease, as shown in Figure 12.

Elevation of the land is approximately 40m AHD and is therefore considered “low risk” under the Queensland Acid Sulfate Soil Technical Manual. The nearest recorded acid sulfate soil site is in grey dermosol soils located 3.5km to the north on the banks of the Brisbane River.



(source – Qld Globe)

Figure 12 Site Soil Type

An estimated 4,500m³ of topsoil is currently available on site for rehabilitation across several stockpiles. These stockpiles are all located within 450m of the areas requiring growth media application for rehabilitation.

Analysis of available growth media material on site has been conducted. These results have been reviewed against relevant criteria from ‘AS 4419-2018: Soils for Landscaping and Garden Use’, as shown in Table 9.

This comparison shows that the available material requires amendment with fertiliser to improve nutrient levels. Low phosphorus content also poses less of an issue for native species, as they are generally not tolerant of high phosphorus levels.

The pH results of the soil samples were 5.0 – 5.6, which is in the correct range for native plant growth. Low calcium levels may be amended by the addition of gypsum, so as not to increase the soil pH. Additionally, low organic matter content may be amended by top dressing with biosolids.

Table 9 Soil analysis result comparison

Property		Criteria in AS 4419 (Low Organic, Low Phosphorous Soils)	SS1	SS2	SS3	SS4
EC (dS/m)		<0.75	0.061	0.066	0.082	0.013
Na (% of ECEC)	No pre-treatment for soluble salts	<20	9.1	15.3	20.8	13.6
K (% of ECEC)		3-15	5.26%	5.26%	2.33%	1.79%
Ca (% of ECEC)	Acid and neutral soils	50-80	6.58%	8.77%	<LOR	<LOR
Mg (% of ECEC)		10-30	28.95%	38.6%	41.86%	33.93%
Available P (mg/kg)		<30	<1	<1	<1	<1
OM (%dwb)		3-6	4.3	5	2	0.7
Total available N (NO ₃ + NH ₄) mg/kg		>20	1.3	1.8	1.1	0.3

Note: <LOR denotes that the laboratory result was below the limit of reporting.

3.1.8 Land Stability

A desktop study was conducted in 2018 (Moreton Geotechnical Services, 2018) which summarised the historical mining conditions on the site and is shown in Figure 13.

The site has been subject to underground mining of the Four Foot, Bergins, Striped Bacon, Rob Roy, Cochrane and Matthews Seams; and has been open cut mined along the Bluff Seam prior to substantial backfilling of the void. Subsequent quarrying for shale for paver making has also slightly modified the backfilled open cut landform including extending on the initial open cut coal mine void.

Settlement, and particularly differential settlement, of fill along the line of open cut walls that are buried or proposed to be buried represents the main potential settlement issue; whereas potential subsidence from the multilevel underground flooded mine levels represent a secondary consideration.

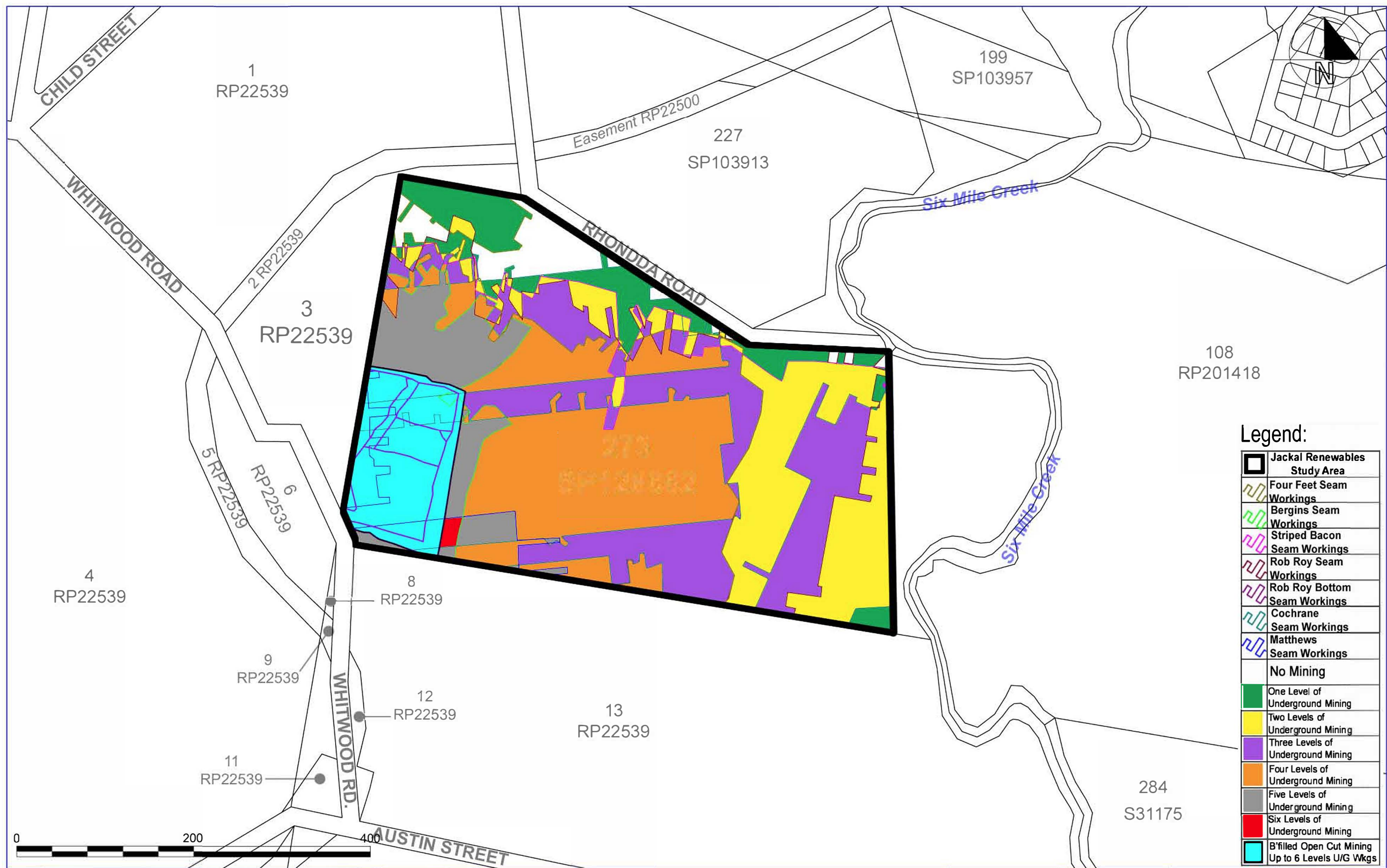


Figure 13 - Historical Mining on Site

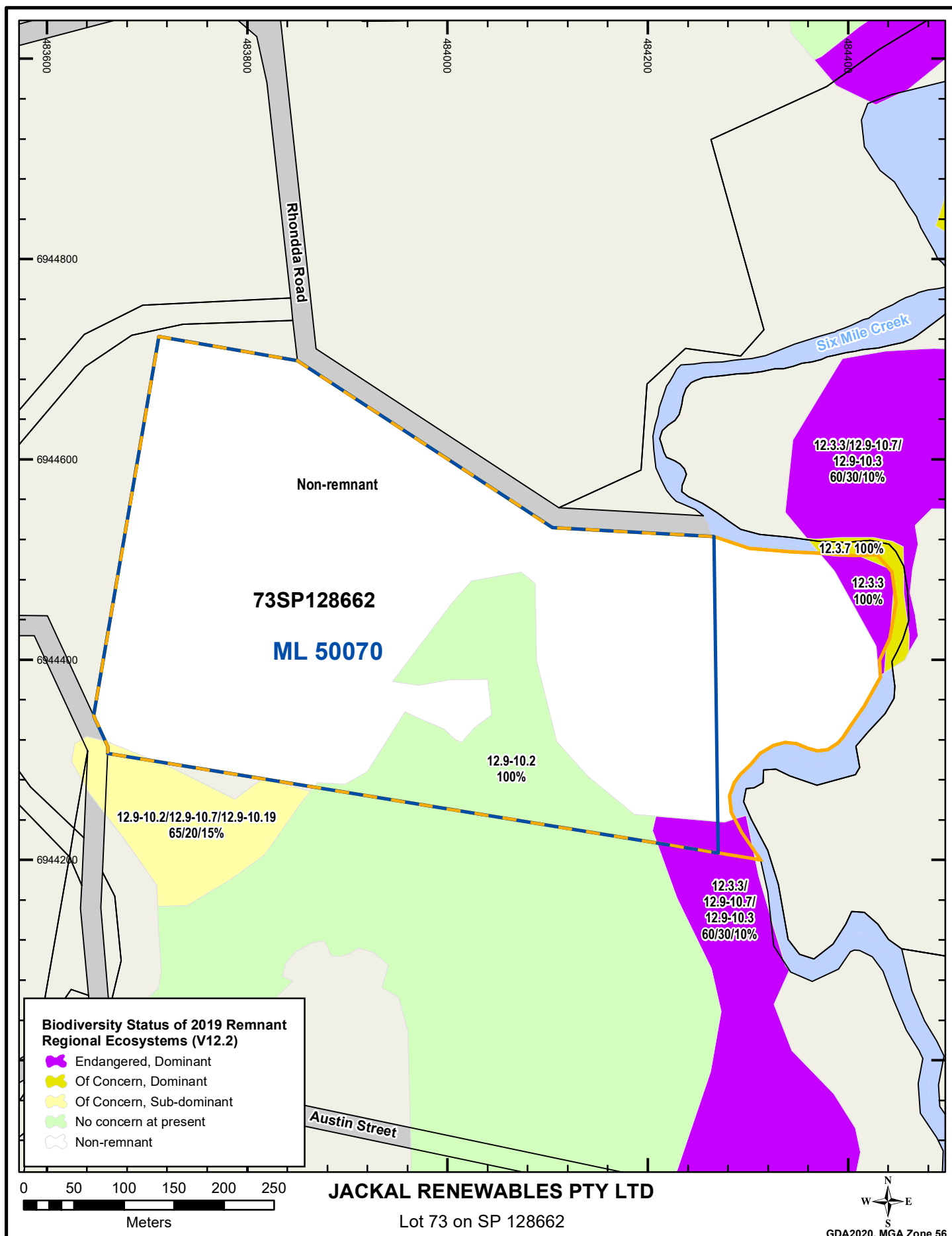
3.1.9 Vegetation Communities and Ecological Data

ML 50070 is located within the south-east Queensland bioregion and the Moreton Region sub-basin.

Table 10 and Figure 14 detail the regional ecosystems within ML 50070 and their biodiversity status.

Table 10 Regional Ecosystems

RE	Short Description	Biodiversity Status
12.3.3	<i>Eucalyptus tereticornis</i> woodland on Quaternary alluvium	Endangered
12.3.7	<i>Eucalyptus tereticornis</i> , <i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i> +/- <i>Melaleuca</i> spp. fringing woodland	Of concern
12.9-10.19	<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i> woodland on sedimentary rocks	No concern at present
12.9-10.2	<i>Corymbia citriodora</i> subsp. <i>variegata</i> +/- <i>Eucalyptus crebra</i> open forest on sedimentary rocks	No concern at present
12.9-10.3	<i>Eucalyptus moluccana</i> open forest on sedimentary rocks	Of concern
12.9-10.7	<i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Angophora</i> spp. and <i>E. melanophloia</i> woodland on sedimentary rocks	Of concern
Non-remnant	None	None



	Regional Ecosystems (Biodiversity Status) Figure 14	Legend ML 50070 73 SP128662 Property boundary Road Parcel Watercourse Parcel
Sheet No. RTPL_ARD_STW001_MAP_1016_B	Drawn By: Chris Schlebusch Requested by: Richard Davis Date: 18/01/2023	Data sources: ©State of Queensland, Department of Resources

There is only a limited area of Category B ESA in the south east and north west corner of ML50070, as shown in Figure 15.

Parts of ML 50070 are mapped within a high-risk area for protected plants. An ecological survey was undertaken in 2018, and again in specific areas during 2021 which concluded that protected plants were not present (Sticks & Stones, 2018; BAAM, 2021). The 2018 survey also confirmed no EVNT plant species were on site (Appendix 3).

Vegetation is currently authorised to be cleared within ML 50070 (excluding the 20m vegetation buffer) for mining activities.

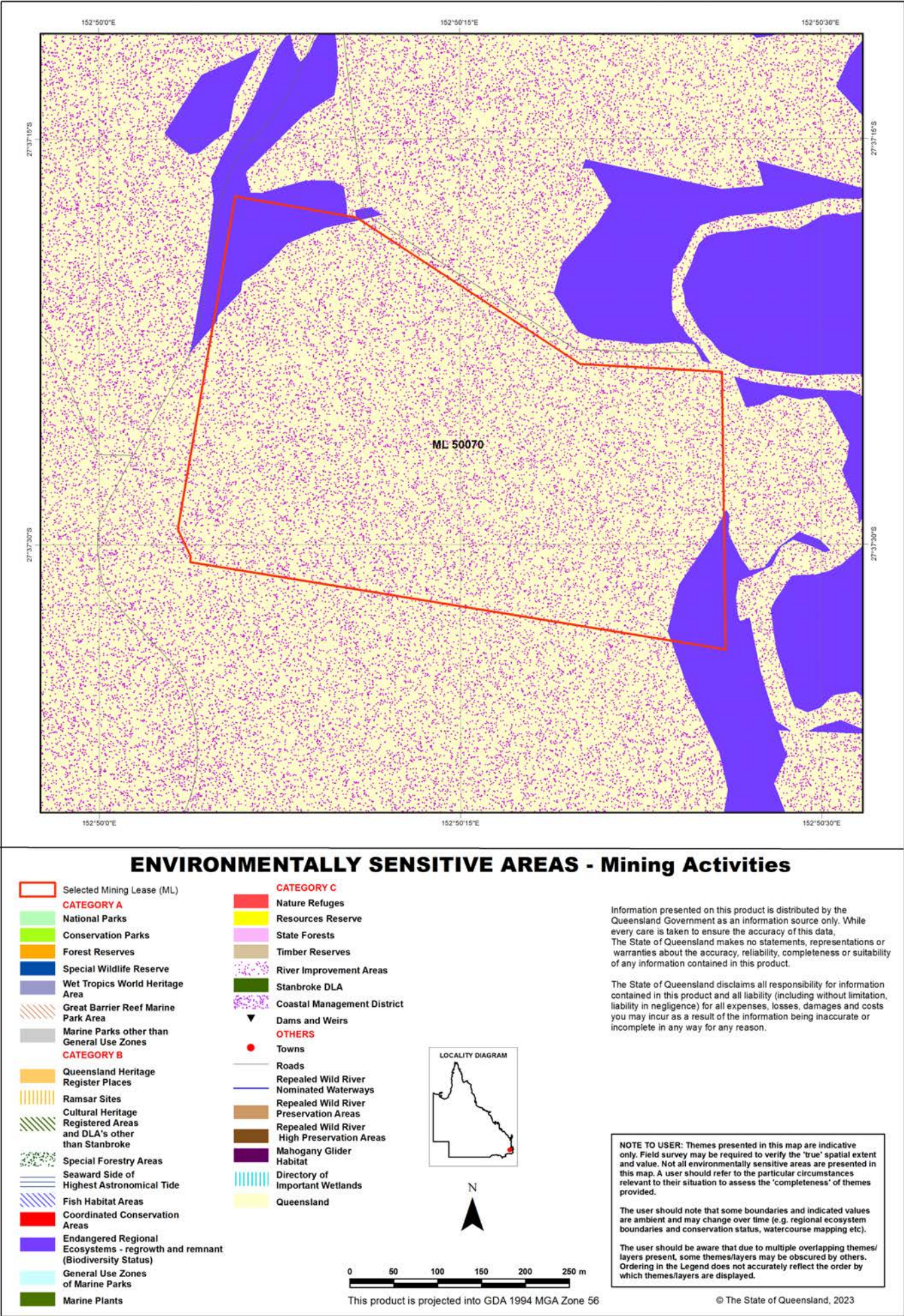


FIGURE 15 ESA Map

3.1.10 Fauna Presence and Populations

An ecological survey was conducted in October 2018 which reports no animals listed as Conservation Significant were observed during the survey, and there was no evidence of the presence of Conservation Significant animals on the site.

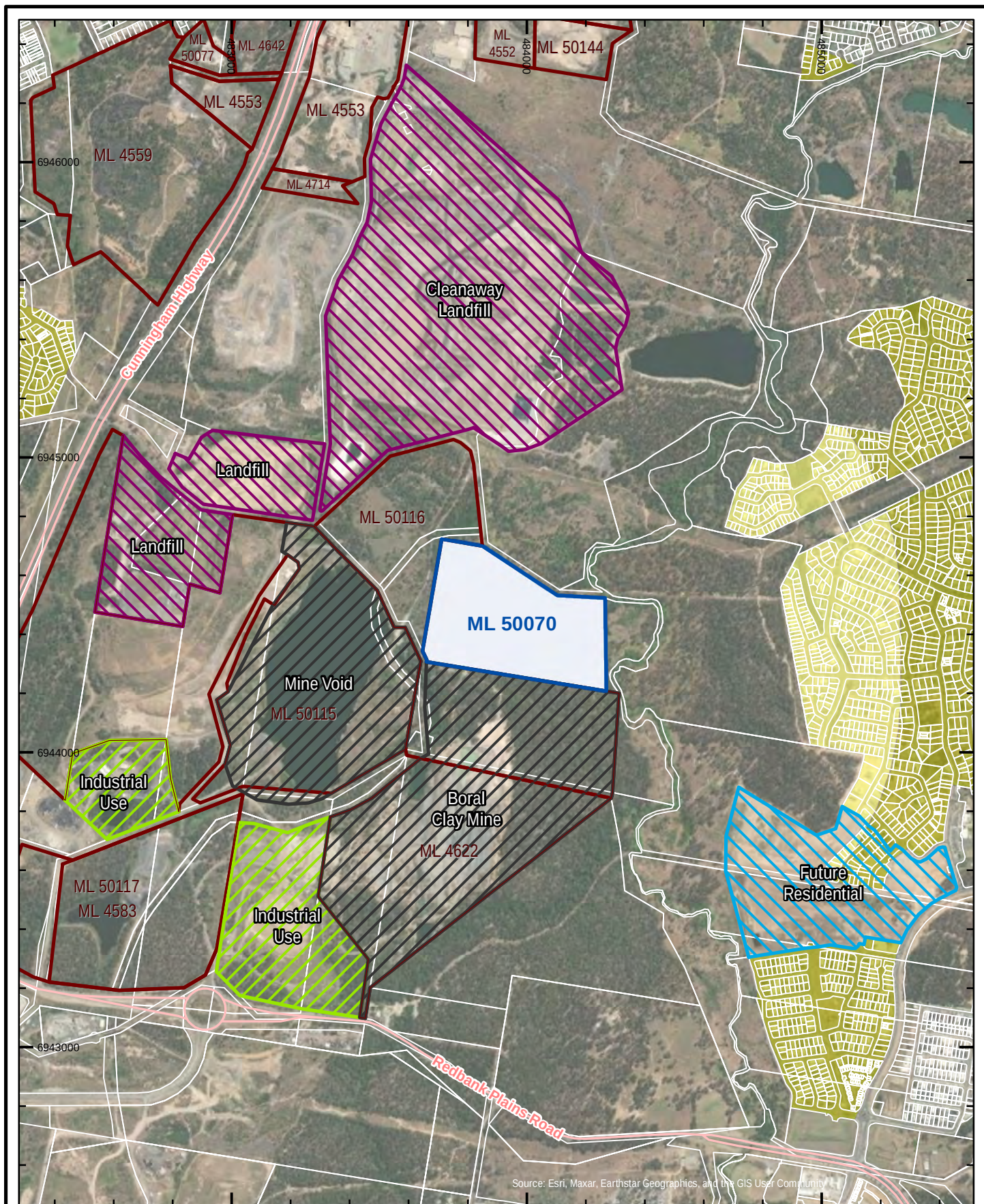
The preferred habitat for protected fauna potentially present on site was reviewed in the 2018 ecological survey (Sticks and Stones, 2018). An analysis of the animals' preferred habitat and the degree of disturbance that the site has been subjected to, suggested that: it is unlikely that any of the pelagic or coastal birds would be present on site; it would be possible although not probable for most of the other indicated birds to be occasionally on site, for example, when travelling through or over the site; it would be unlikely for many of the protected terrestrial animal species to be present on site. A SAT survey was conducted for Koala in and adjacent to the proposed development site. No signs or indications of Koala presence or use were recorded during the survey. No protected animals or their signs were observed or recorded during the survey. Appendix 3 contains the Ecological Survey Report.

3.1.11 Pre-mining Land Use

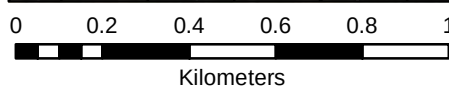
ML 50070 is located within a setting which has been extensively modified by coal mining activities since the 1800s. Open-cut coal mining followed the original underground operations and created large voids and spoil heaps which have disturbed and modified the original landscape and drainage system.

The site has experienced extensive underground and open cut mining from the commencement of Rhondda Collieries Pty Ltd operations in 1900 to the last mining in 1996. Substantial back filling of the void has occurred (Moreton Geotechnical Services Pty Ltd, 2018). Mining for clay shale commenced in 1994.

The ML is surrounded by mine sites, some of which are still active, some of which are being used for other industrial purposes such as landfill or broadscale industrial activities, as shown in Figure 16.



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



JACKAL RENEWABLES PTY LTD

Lot 73 on SP 128662



GDA2020, MGA Zone 56



**Figure 16 - ML50070
Surrounding Land Use**

Drawn By: Chris Schleichbusch

Requested by: Richard Davis

Date: 6/02/2023

Sheet No.

RTPL_ARD_STW001_MAP_1017_B

Legend

- ML 50070
- Property boundary
- Industrial
- Landfill
- Mine
- Residential

- Residential lots within 1km
- Residential lots within 2km

Data sources:
©State of Queensland, Department of Resources

3.1.12 Landholders

As noted in Section 2.3, ML is entirely within Lot 73 on SP128662, freehold land owned by Jackal Renewables Pty Ltd. This lot is depth restricted, to approximately 30m below existing ground level.

Below this lot is Lot 273 SP128662, unallocated State Land leasehold land, owned by The State of Queensland.

3.1.13 Sensitive Receptors

Sensitive receptors are located at varying distances to the north, east, south and west of the ML50070. Figure 16 illustrates these locations.

3.2 Design for Closure

As this is a Transitional PRCP, there is no requirement to demonstrate how aspects of the mine site have been designed for closure for existing or approved disturbance (section 3.1, PRC Plan Guideline). The rehabilitation / improvement planning includes detail from when mining was first undertaken by Jackal up until planned surrender, as described in the mining plan, as there is no detailed information from the previous owners.

3.3 Rehabilitation / Improvement Planning

3.3.1 Progressive Rehabilitation

Consistent with Environmental Authority EA0001386, the approved PMLU is Natural Ecosystem.

This outcome is specified in EA0001386 (Schedule F – Table 2), and is replicated below in Table 11.

Table 11 Schedule F - Table 2 Final Land Use and Rehabilitation Outcome Schedule

Tenure ID	Disturbance Type	Projective Surface Area (Ha)	Rehabilitation Outcome
ML50070	Backfilled / rehabilitated old coal mining void (western sector of lease)	2.5	Native ecosystem
	Old coal mining spoil dump (western sector of lease)	0.7	Native ecosystem
	Mine excavation area	13.0	Native ecosystem

In line with condition F6-1 Rehabilitation Outcome – Native Ecosystem *For the purposes of Schedule F – Table 2 (Final Land Use and Rehabilitation Outcome Criteria), areas that are to be rehabilitated to native ecosystem must comply with the following outcomes:*

- (a) *Achievement of a self-sustaining native ecosystem with a species composition and distribution similar to the pre-mining species composition and distribution; and*

(b) The landform must be suitable to support the ecosystem in (F5-1) a) and be stable and non-polluting.

To facilitate progressive rehabilitation on site, the mine planning process has aimed to maximise progressive rehabilitation by scheduling the commencement and completion of rehabilitation as soon as practicable after land becomes available. This will be achieved by moving from west to east, in four stages, allowing rehabilitation to occur behind the pit.

The Kerwick #2 Pit will be retained until late in the mine life to provide for water / stormwater management together with overburden and / or topsoil storage areas, as required.

A small area (0.4963 Ha) will have a PMLU of Retained Infrastructure which will consist of the powerline and powerline access track. This is necessitated by obligations under the *Electricity Act 1994*.

The mining and progressive rehabilitation stages are shown in Figure 17 to Figure 24.

The final landform is shown in Figure 25.

Figure 17 – Kerwick #1 Pit Stage 1 Mining Area (from Ausrocks, 2023)



Figure 18 – Kerwick #1 Pit Stage 2 Mining Area (from Ausrocks, 2023)



Figure 19 – Kerwick #1 Pit Stage 3 Mining Area (from Ausrocks, 2023)



Figure 20 – Kerwick #1 Pit Stage 4 Mining Area (from Ausrocks, 2023)



Figure 21 – Progressive Rehabilitation Design – Stage 1 (from Ausrocks, 2023)

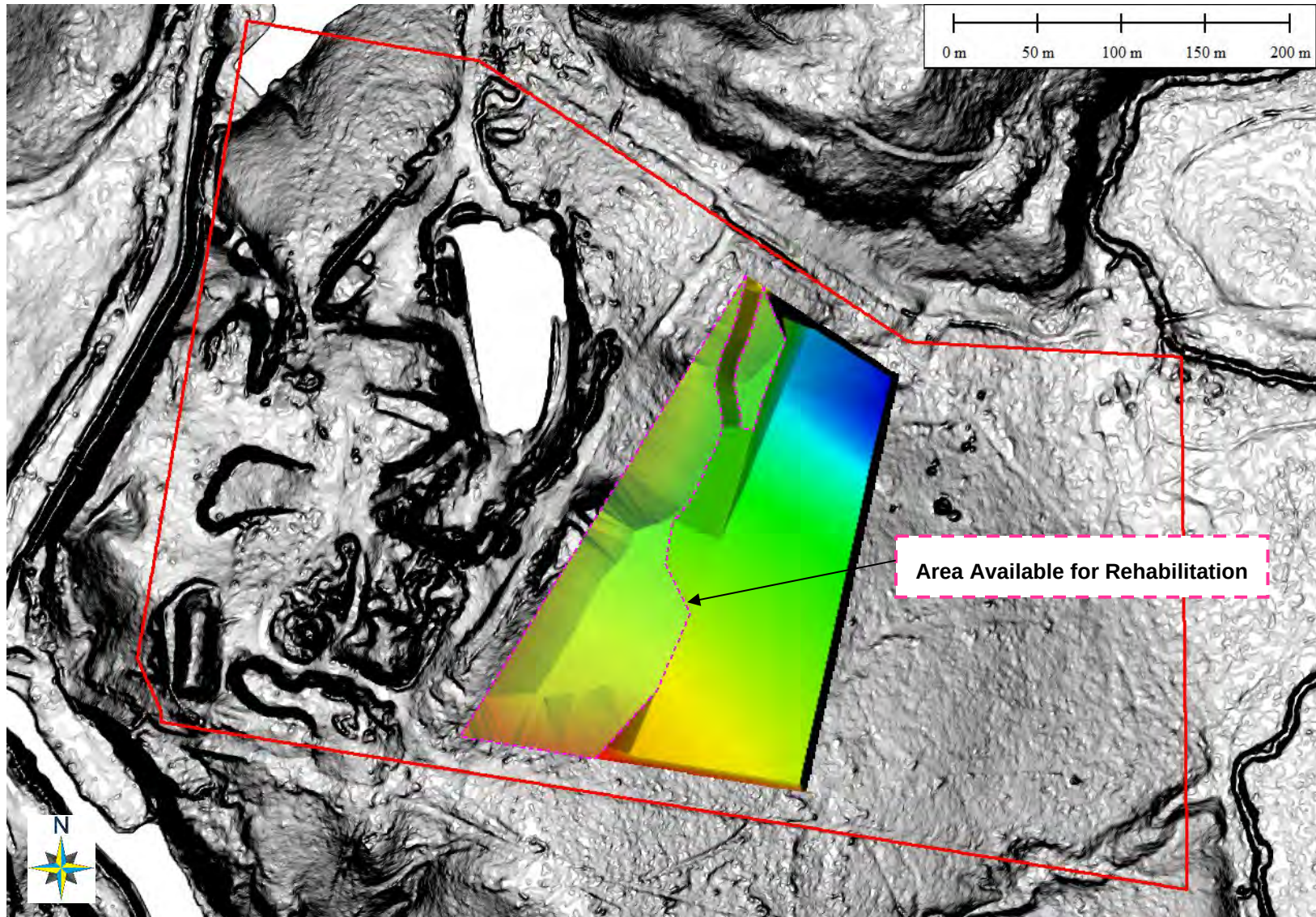


Figure 22 – Progressive Rehabilitation Design – Stage 2 (from Ausrocks 2023)

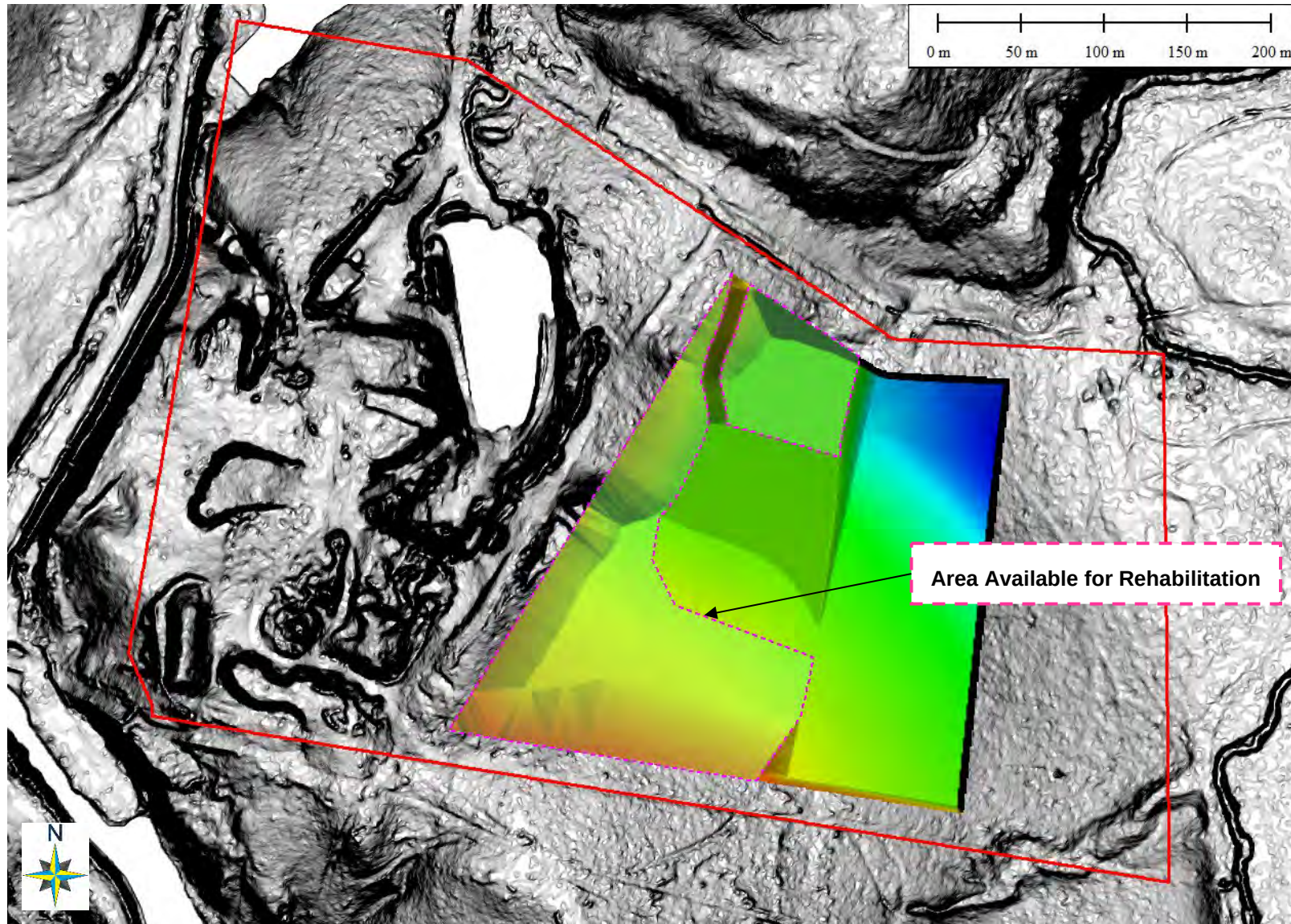


Figure 23 – Progressive Rehabilitation Design – Stage 3 (from Ausrocks 2023)

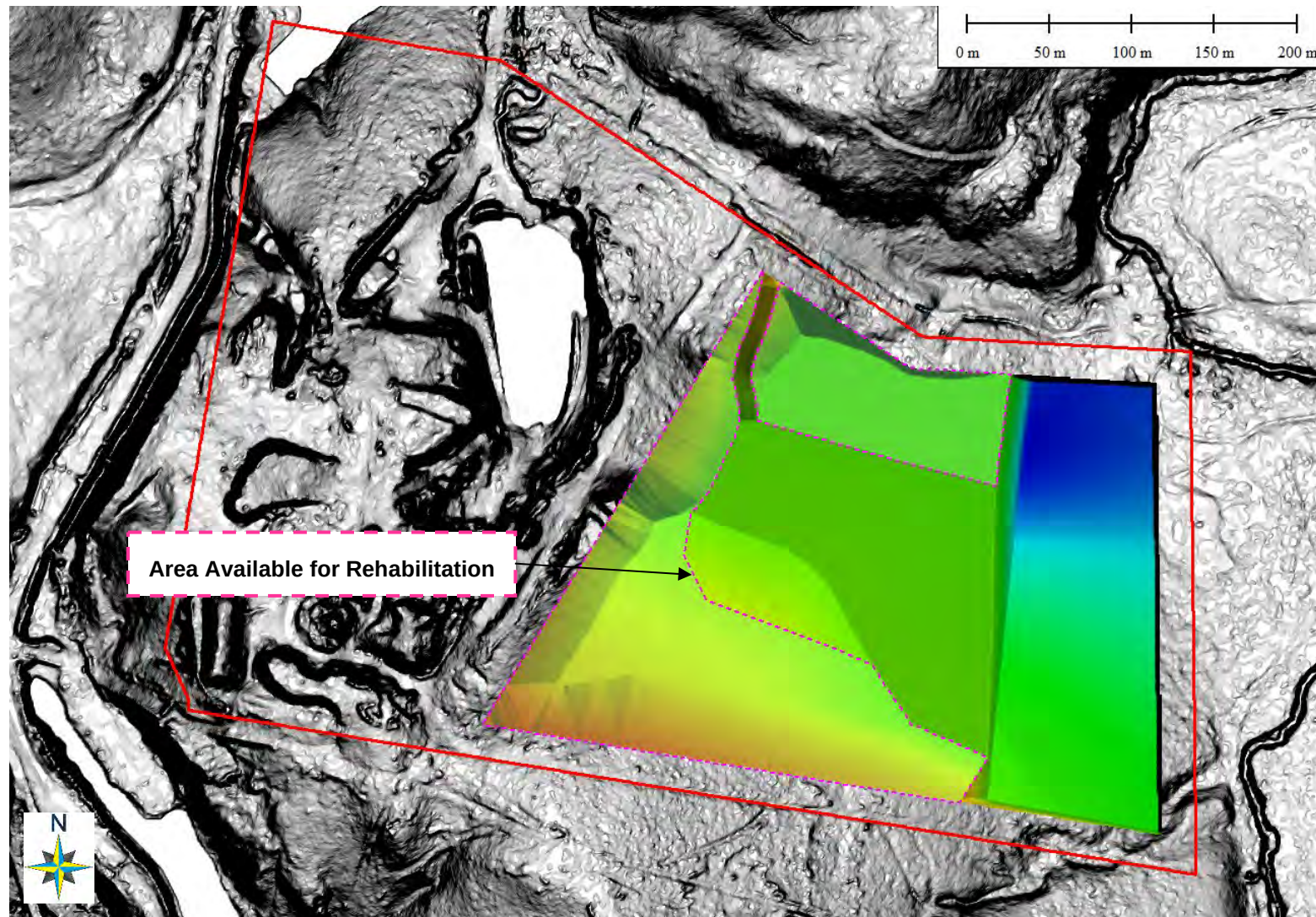


Figure 24 – Progressive Rehabilitation Design – Stage 4 (from Ausrocks, 2023)

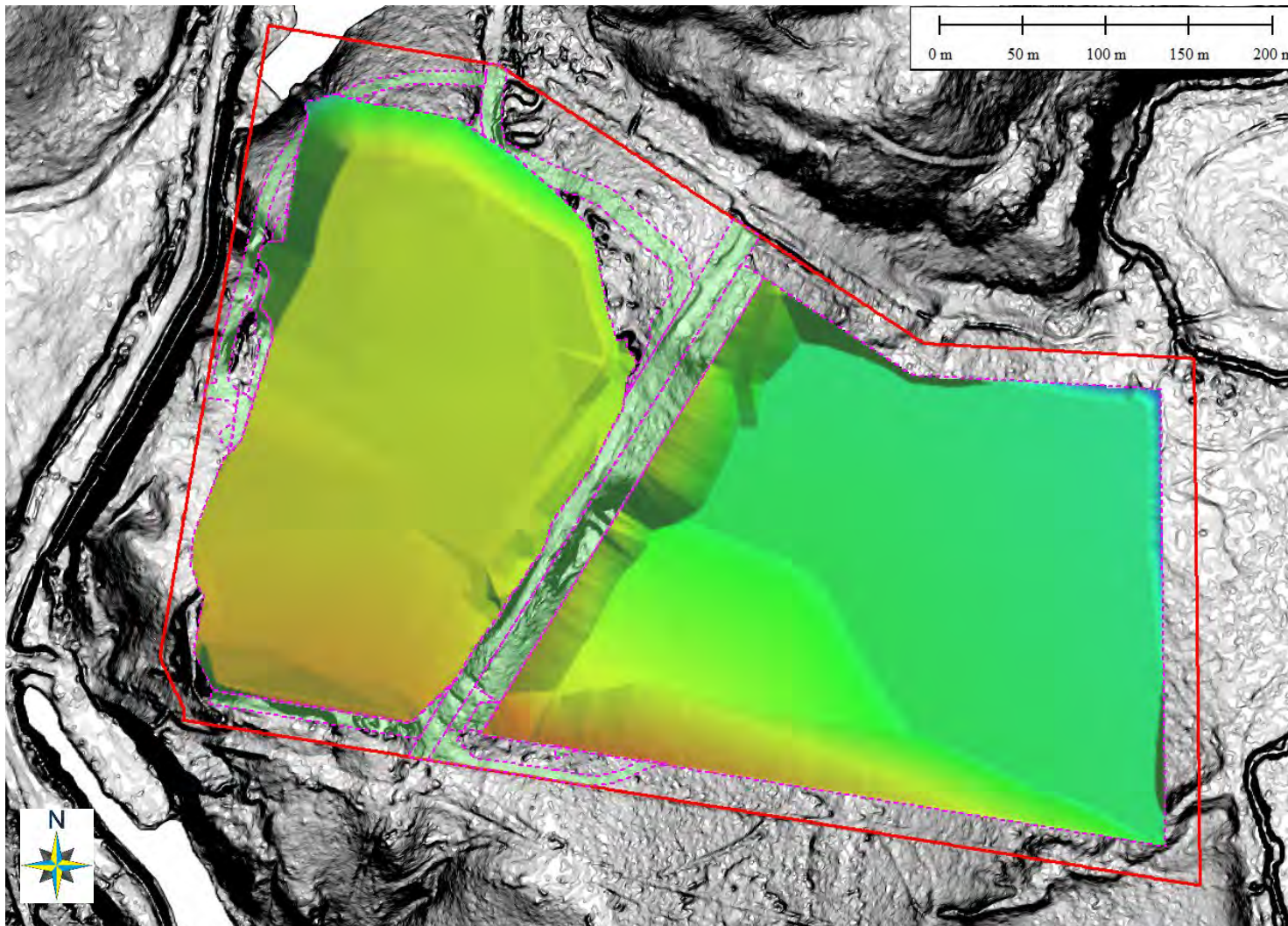
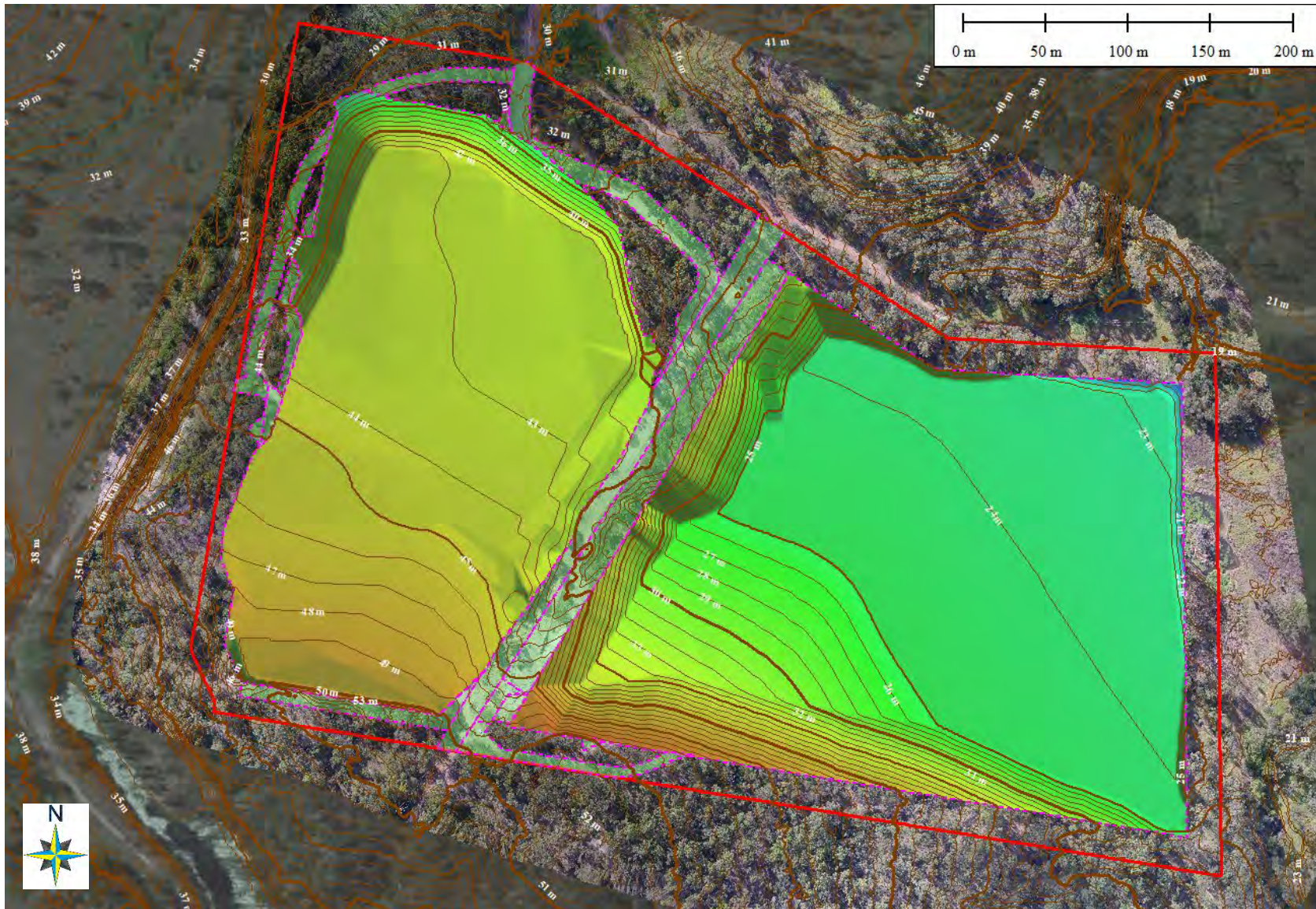


Figure 25 – Final Landform Design – ML50070 (from Ausrocks, 2023)



3.3.2 Rehabilitation Areas and Relevant Activities

For the purpose of this PRCP, Rehabilitation Areas have been defined and shown in Table 12. The mining duration is specified.

Each pit area will be available for rehabilitation once resources have been mined for that stage. It is anticipated that landform development, surface preparation and revegetation will take approximately 12 months from the cessation of mining activity, as described in section 7.2. Revegetation to the extent of achieving the specified rehabilitation criteria is estimated to be completed within 3-4 years. The power line infrastructure area (RA5) becomes available for rehabilitation following completion of all earthworks associated with RA4 (and confirmation of a stable landform in the RA4 areas).

Dates in the PRCP schedule have been selected based on the mine plan (Appendix 4).

Table 12 Rehabilitation Areas and Relevant Activities

Rehabilitation Area Name	Pit Name	Relevant Activity	Duration of Relevant Activity (Calendar Year)	Size/extent of Rehabilitation Area (Ha)	Progressive Rehabilitation Possible
RA1	Kerwick #1 Stage 1	Clay mining	2023-2028	1.6454	Yes
RA2	Kerwick #1 Stage 2	Clay mining	2028-2032	1.2619	Yes
RA3	Kerwick #1 Stage 3	Clay mining	2032-2036	0.9877	Yes
RA4	Kerwick #1 Stage 4	Clay mining	2036-2039	13.2306	Yes
	Kerwick #2	Clay Mining / water storage	Life of Mine		No
	n/a	Includes laydown/hardstand area, cleared area, access tracks.	Life of Mine		No
RA5	n/a	Powerline and powerline access track	Life of Mine	0.4963	No

The summary map of the rehabilitation areas is included as Figure 26.

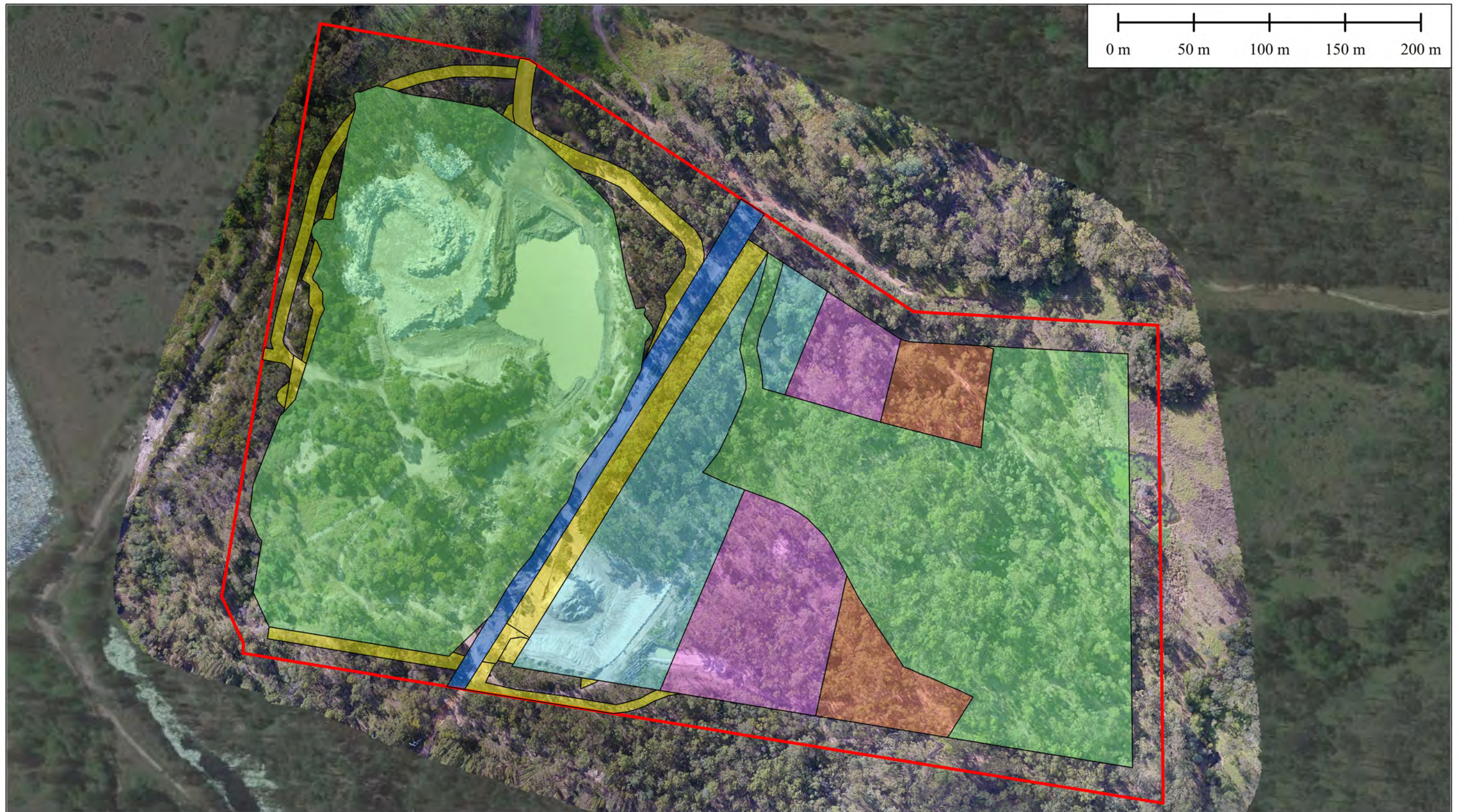
3.3.3 Rehabilitation Undertaken to Date

As required under section 126C(1)(j) of the EP Act, transitional PRCP's must include detail relating to the existing rehabilitation already completed.

No rehabilitation undertaken to date on site has been applied for or approved as progressively certified under the EP Act.

The history of the site is that it has been utilised for mining, stockpiling and re-mining over decades. There are few if any reliable records to help determine the history of many of the landforms. At the time of purchase of the site by Jackal in 2018, there were some backfilled voids, and levelled old voids and a high wall for the Kerwick #2 pit. Most of these areas are now in use as laydown areas, tracks, topsoil and overburden stockpiles, as well as stormwater storage and therefore have not been identified in this PRCP as an existing rehabilitated area (hence no shape file has been provided).

There were three historical overburden stockpiles onsite, which have naturally revegetated and are currently safe, stable and non-polluting. These historical overburden stockpiles are not considered a disturbance onsite that would in its current state require rehabilitation. These revegetated overburden stockpiles will be used during any future progressive landform management rehabilitation activities. If the overburden stockpiles are used in future landform management, these remaining areas will require ripping and amendment, prior to seeding.



LEGEND		
RA1	RA4	ML50070
RA2	RA4	
RA3	RA5	



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ABN: 64 056 939 014

Title		Jackal Renewables ML50070 Figure 26 - Rehabilitation Areas Summary Map	
Project No	AUQ00209	Drawing No	00209_RAP
Drawn	CM	Checked	NV
Scale	1:2,500 (A3)	Datum	GDA2020
Date	02/02/2023	Status	Version 1

4 Community Consultation

4.1 Details of Consultation in Developing PRCP

4.1.1 Stakeholder Identification

The application for ML and the accompanying EA (mining approval) was made in 1994 and the site has been operational since that time. A transfer of ownership most recently took place in 2018. Records relating to community consultation in relation to the mining activities and associated rehabilitation requirements are not available.

In 2018, an application was lodged for an MCU and was approved via a negotiated decision notice from Ipswich City Council (ICC) on 4 February 2020 for Development Approval No. 2491/2018/MCU for a Material Change of Use application for Special Industry (Waste recycling and reprocessing – waste transfer station, crushing, milling or grinding). As a part of this process, community consultation was required and the following primary stakeholders were identified:

- Landholder - owner
- DES
- Ipswich City Council
- Energex
- Adjacent landholders – Cleanaway (North), BMI (West), Boral (south), landowner (East)
- Community groups.

4.1.2 Community Consultation Register

In order to comply with section 126C(1)(c)(iii) of the EP Act, the rehabilitation planning part of this PRCP must include a community consultation register identifying the consultation undertaken in relation to developing the PRCP. This must include:

- Consultation date(s)
- Identification of each community member
- Description of consultation type
- Information provided to the community
- Issues raised and discussed by the community
- How issues have been considered
- Decisions/outcomes of the engagement
- Commitments made.

The Community Consultation Register is shown in the table below.

Table 13 Community Consultation Register

Date	Community Member / Stakeholder	Type	Information Provided	Issues Raised	How issues were considered	Decisions / Outcomes	Commitments
Ongoing	Directly and indirectly affected landholders (neighbors)	Conversations	Discussions on mining operation progress and development of resource recovery centre Identification of concerns	No specific issues or concerns raised relating to rehabilitation or mine closure	Not applicable	Continue engagement with landholders, as required	Continue engagement with landholders, as required
2022	Regulatory Body	Meeting with DES related to PMLU	Review conditions relating to rehabilitation outcomes in EA0001386. Draft EA amendment Application	Confirmed PMLU native ecosystem	Reviewed legislative framework to decide on actions required	PRCP to document PMLU as native ecosystem	Submit PRCP by due date 6 February 2023
September 2021	Regulatory Body	Meeting with DES to discuss PRC Planning	Summary of operations and future plans	No specific issues raised	Not applicable	Jackal to prepare and lodge a PRC Plan in accordance with legislative requirements	Submit PRCP by due date 6 February 2023
2018 -2022	Regulatory Bodies	Annual reporting ERC meetings, discussions and applications	Legislated annual reporting requirements ERC calculations and financial assurance requirements	Discussed ERC calculations and transition from financial assurance framework	By discussion	ERC calculations	Jackal Renewables to transition to new ERC framework.

Date	Community Member / Stakeholder	Type	Information Provided	Issues Raised	How issues were considered	Decisions / Outcomes	Commitments
2018-2020	Regulatory Bodies	Ipswich City Council MCU Application	Development Application	No specific issues or concerns raised relating to rehabilitation or mine closure	No specific issues raised	Continue to keep Council informed	Jackal to provide updates to Council
2019	Community Submissions	Ipswich City Council MCU Application	Submission letters from the Community on the MCU application	No specific issues or concerns raised relating to rehabilitation or mine closure	No specific issues raised	No specific decision or outcomes	No specific commitments
2018	Energex	Land and ML purchase	Letter	Power line access to remain clear, power line to be protected from potential mining impact by buffer zone	Mine plan will retain a buffer to the power line and power line access track	Mining Plan amended to protect power line corridor	No specific commitment
27 July 2018	Regulatory Body	Transfer of EA	Transfer Application	No specific issues or concerns raised relating to rehabilitation	No specific issues raised	No specific decision or outcomes	EA0001386 transferred to Jackal Renewables

Date	Community Member / Stakeholder	Type	Information Provided	Issues Raised	How issues were considered	Decisions / Outcomes	Commitments
				or mine closure			

4.2 Rehabilitation Community Consultation Plan

In order to comply with section 126C(1)(c)(iv) of the EP Act, the rehabilitation planning part of this PRCP must include a community consultation plan detailing how ongoing consultation will be carried out in relation to the rehabilitation to be carried out under the PRCP.

The objectives for community consultation, method of community engagement, frequency, information to be released and consideration of feedback and comments are included, as required, and documented in the Community Consultation Plan.

Information will include the final landform design implementation and rate, primarily with the key government stakeholders. Progress toward milestone criteria will be shared. Any issues arising will be managed through a process of: regular communication; feedback and follow-up on issues raised; and close out of issues raised with the stakeholder.

As the Project progresses with the rehabilitation activities for the site, a series of engagement phases will be initiated with the primary stakeholders for the project, as required. The objective of this engagement will be to inform the stakeholders of the near future and long-term activities on the site to gauge their level of interest and to identify any local experience and knowledge relevant to the rehabilitation methodology.

As described in section 2.3, Jackal Renewables is the owner of the free hold land parcel to which this PRCP applies.

Table 14 outlines the consultation program for this PRCP.

Table 14 Community Consultation Plan for PRCP

Objective	Engagement Type	Proposed consultation frequency	Released information
Inform primary stakeholders	Letter to present information on the project and timeframes for activities	On an as required basis	Dependent on contact, but may involve maps and relevant specialist information
Maintain contact with key state government stakeholders (DES and Department of Resources) to maintain understanding of project developments	Regulatory authority information	Annual	Phone call to delegates on project status
Inform wider community of changes to Post Mining Land Use or schedule	Media release News on website	In the event of significant milestones or change to post mine land use	Maps and summary information relevant to the community

Objective	Engagement Type	Proposed consultation frequency	Released information
		that may have interest to the local region.	
Fulfil reporting obligations under PRCP	Statutory reporting	Annual	Compile and present annual report to DES
Ensure Local Government is informed of any proposed changes to Post Mining Land Use or schedule	Phone call and meeting with relevant Planning Department	As required basis	Phone and discussions at meetings, maps
Ensure Local Councillor and State Member of Parliament is informed of any changes proposed to Post Mining Land Use or schedule	Phone call and follow up meeting with relevant Councillor / MP	As required basis	Phone and discussions at meetings, maps

Feedback and comments received from the Community Consultation will be considered in the following way;

1. Feedback will be summarised and key themes identified.
2. Feedback will be reviewed by management and key site personnel.
3. Assessment on how the feedback can be used to improve the relevant outcomes or site management, considering the relevant business needs, approval conditions and legislative requirements.
4. Decision by management on the implementation
5. Response provided to the stakeholder, using appropriate communication channels.

5 Post-Mining Land Use

5.1 Overview

The Post Mining Land Use for ML50070 is outlined in Table 15 the table below, and illustrated in Figure 27.

Table 15 Post Mining Land Use

Post Mining Land Use	Area (Ha)	Comment
Native Ecosystem	17.1257	Rehabilitated Areas
Native Ecosystem	3.8998	Buffer and undisturbed areas
Retained Infrastructure	0.4963	Power line and access track
Total	21.5218	

The vegetated buffer area (20m to the ML boundary) remains in its current vegetated state.

The entire area of ML50070 is proposed in the final site design as planned for surrender.

5.2 Consistency of PMLU and Community Outcomes

The land outcome identified in EA0001386 for the ML50070 area is Native Ecosystem. To address obligations under the *Electricity Act* 1994, a small area (0.4963Ha) will have a PMLU of Retained Infrastructure to ensure the maintenance of the power line and power line access track. Consistent with the process outlined in the PRCP Guideline, Jackal has transitioned the approved PMLU for the site PRCP and PRCP Schedule and is not required to complete the information requirements under section 126C(1)(j) of the EP Act.

Consultation has been undertaken with the relevant stakeholders in the preparation of this PRCP and PRCP Schedule. The approved PMLU of natural ecosystem is consistent with the outcomes of the community consultation undertaken to date as there were no queries or issues raised by adjacent landholders or other members of the local community.

No queries or issues were raised relating to the PMLU of retained infrastructure for the area under the power line easement.

5.3 Consistency of PMLU and Planned Government Land Outcomes

The South East Queensland Regional Plan 2017 identifies the area of the ML as “regional economic cluster”, with “urban footprint” land. The ML has been identified as within “urban footprint” land since the first SEQ Regional Plan was published in 2005.

The current Ipswich City Council (ICC) Planning Scheme, which was prepared after the granting of the ML, identifies the majority of ML 50070 as being located in the ‘Regional Business and Industry Investigation’

zone within the 'Regionally Significant Business Enterprise and Industry Area' (Figure 28). Under the ICC Planning Scheme, the Regional Business and Industry Investigation zone has the overall outcome of providing regional business enterprise and industry employment opportunities subject to resolution of applicable constraints such as potential amenity impacts on nearby residential areas, mining, flooding and availability of services. The remainder of the ML on the eastern side is zoned as 'Recreation and Open Space', as outlined in Figure 28.

The western sector of ML 50070 is being used by the landowner (who is also the ML holder) for industrial purposes under Development Approval 2491_2018_MAMC_B issued by the ICC and EA0001872 issued by DES. The land in the western sector will continue to be used for industrial purposes as well as mining activities until the expiry of the mining lease. The development approval with permit EA0001872 requires the old clay mining void (Kerwick #2 Pit) to be retained as a stormwater control structure for the duration of the activity. In addition, the Kerwick #2 pit will be utilised for stormwater management on the mining lease, water balance management for active mining areas, and stockpiling of overburden and/or topsoil during ongoing mining activities.

The PMLU of native ecosystem is not consistent with the Local Government Town Plan, or the State Government Regional Plan. However, to change the PMLU outcome requires an EA amendment. Consultation with the DES on this amendment indicated that this would be a major amendment. There was not enough time to complete a major amendment process before the PRC Plan was required to be lodged.

A small area (0.4963 Ha) traversing the power line easement is allocated a PMLU of Retained Infrastructure. In accordance with the *Electricity Act 1994*, there is an entitlement to unrestricted access to an electricity entity's works (s98) and it is an offence to interfere with an electricity entity's works (s230). Therefore there is a legal requirement to ensure that the area under the power line remains clear, hence the PMLU of Retained Infrastructure is consistent with the legislation.



LEGEND

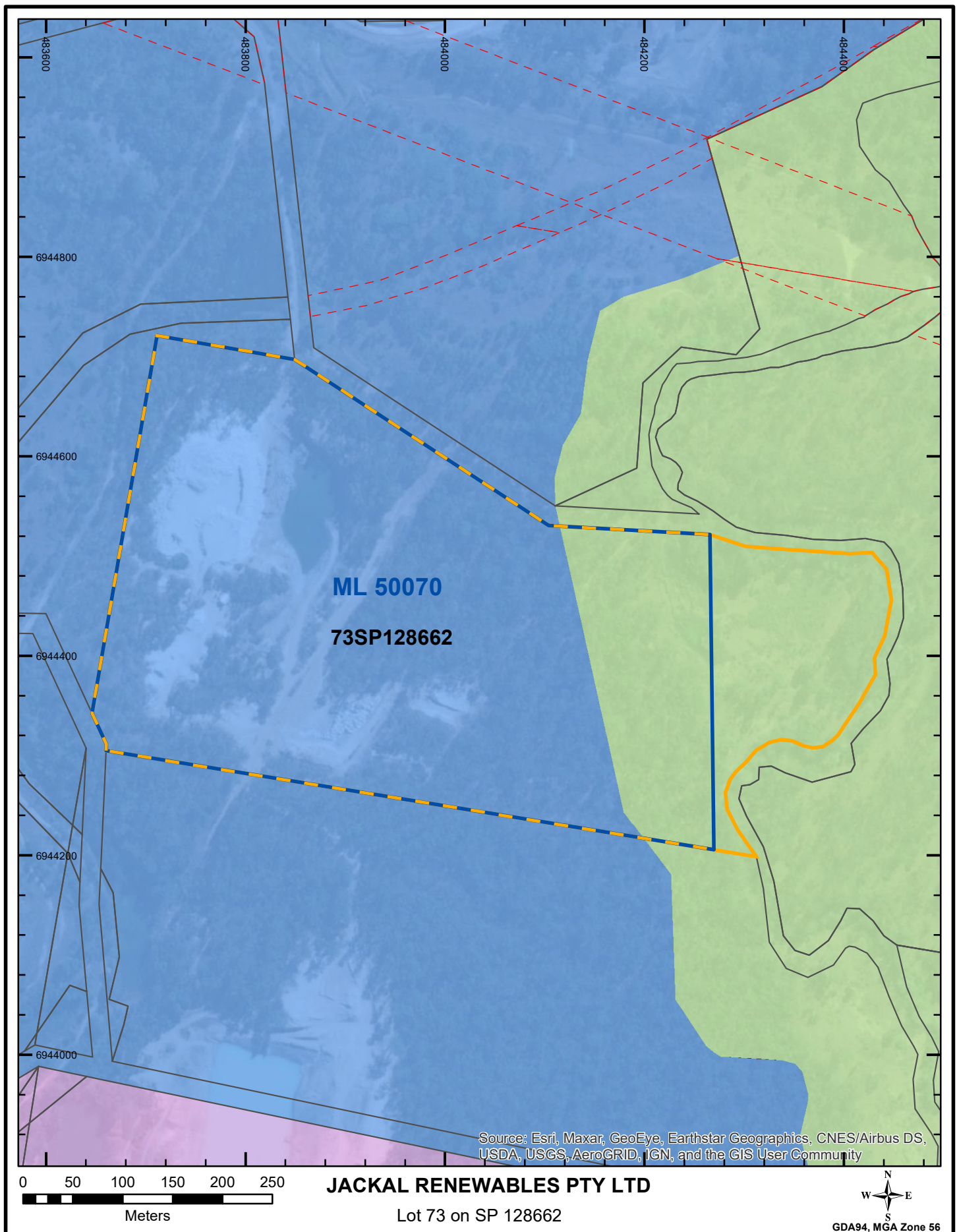
- PMLU Native Ecosystem
- PMLU Native Ecosystem (undisturbed)
- PMLU Retained Infrastructure



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Title Jackal Renewables ML50070 Figure 27 - Post-Mining Land Use Plan			
Project No	AUQ00209	Drawing No	00209_PMLUP
Drawn	CM	Checked	NV
Scale	1:2,500 (A3)	Datum	GDA2020
Date	02/02/2023	Status	Version 1



	Ipswich City Council Planning Scheme Zoning	Legend  ML 50070  73 SP128662  Property boundary  Easement	ICC Planning Scheme (at 2020)  Regional Business and Industry Investigation (RBIA2)  Recreation and Open Space (REC)  Special Uses (SU15)
Figure 28 Sheet No. RTPL_ARD_STW001_MAP_1002_A	Drawn By: Chris Schlebusch Requested by: Jacob Arnold Date: 20/10/2021		

Data sources:
 ©Queensland Department of Resources
 ©Ipswich City Council

6 Non-Use Management Areas

A non-use management area (NUMA) is an area of land that cannot be rehabilitated to a stable condition after all the relevant activities for the PRCP carried out on the land have ended (§112 EP Act).

There are no non-use management areas proposed as it is planned for the entire area to be rehabilitated to a stable condition once the relevant activities carried out on the land have ended.

7 Rehabilitation Management Methodology

7.1 Rehabilitation Objectives

The EP Act requires that mine rehabilitation be conducted for land disturbed by mining activities to ensure that:

- The land is safe and structurally stable;
- There is no environmental harm being caused by anything on or in the land; and
- The land can sustain a post-mining land use.

7.2 Rehabilitation Milestones and Criteria

The following milestones (Table 16) are applicable to any of the disturbance areas and are numbered in sequence of application and expected achievement. Milestones are to be:

- Outcome based
- Flexible to changing circumstances
- Include metrics
- Be reviewed
- Measurement to demonstrate achievement of milestone.

In the absence of suitable analogue sites being identified, a pre-disturbance baseline assessment of the vegetation will be undertaken to establish key metrics / milestone criteria for demonstrating achievement of the relevant milestone. This pre-disturbance baseline assessment will be completed before 1 December 2024.

Table 16 Rehabilitation Milestones and Criteria

Milestone Reference	Applicable Rehabilitation Area	Rehabilitation Milestone	Milestone Criteria
RM1 Infrastructure Removal	RA1, RA2, RA3, RA4, RA5	No mine infrastructure equipment or materials not required for PMLU.	• All buildings demolished and removed • All concrete, bitumen and gravel removed, where not required • All non-required fencing removed • All machinery and equipment removed • All non-required surface water drainage infrastructure removed • All waste removed
RM2 Landform development and reshaping / reprofiling	RA1, RA2, RA3, RA4, RA5	Landform development and reshaping / reprofiling	• Batter slopes achieve approx. 1 in 3 slope angle for final landform design • Floor of pits achieve design slope • All major earthworks completed

Milestone Reference	Applicable Rehabilitation Area	Rehabilitation Milestone	Milestone Criteria
RM3 Land Surface Preparation	RA1, RA2, RA3, RA4, RA5	Appropriate landform surface preparation including contour ripping, topdressing, application of ameliorants (where required).	• Earthworks completed • Adequate topsoil material spread over shaped surfaces • Ameliorants applied where required to address soil quality • Ripping and discing
RM4 Revegetation	RA1, RA2, RA3, RA4, RA5	Revegetation including seeding and planting, as required. Seed germination and establishment of groundcover.	• Records of seeding, planting showing species and density in accordance with design • Monitoring of rehabilitation showing successful revegetation in line with targets: ○ 70% germination of groundcover species ○ Recruitment 50% naturally regenerating ○ 70% planted specimens have survived
RM5 Stable Landform	RA1, RA2, RA3, RA4, RA5	As per final design for landform slope Geotechnical assessment completed by appropriately qualified person assessing safety of final landform Drainage design determined by appropriately qualified person	• 90% of the landform achieves slope gradients of 30% or less and 80% of the final landform achieves slope gradients of 20% or less • Drainage meets design criteria
RM6 Stable PMLU (Native Ecosystem)	RA1, RA2, RA3, RA4	Vegetation cover determined via rehabilitation monitoring and maintenance program Erosion classification based on results of rehabilitation monitoring and maintenance program	• Key species present include: ○ <i>Corymbia citriodora</i> ○ <i>Eucalyptus crebra</i> ○ <i>Eucalyptus tereticornis</i> ○ <i>Eucalyptus moluccana</i> ○ <i>Corymbia intermedia</i> • >30% of Foliage Projective Cover at analogue site • Landform shows suitable slope gradients as defined in RM5 • No erosion classification of Severe or Extreme
RM7 Achieved PMLU (Native Ecosystem)	RA1, RA2, RA3, RA4	Vegetation cover and species diversity determined via rehabilitation monitoring and maintenance program	• Key species present include: ○ <i>Corymbia citriodora</i> ○ <i>Eucalyptus crebra</i> ○ <i>Eucalyptus tereticornis</i> ○ <i>Eucalyptus moluccana</i> ○ <i>Corymbia intermedia</i>

Milestone Reference	Applicable Rehabilitation Area	Rehabilitation Milestone	Milestone Criteria
		Erosion classification based on results of rehabilitation monitoring and maintenance program	• >50% of number of native flora species/ha as present at analogue site • >50% of Foliage Projective Cover at analogue site • Landform shows suitable slope gradients as defined in RM5 • No erosion classification of Severe or Extreme • Erosion classification comparable to similar landforms in near vicinity with equivalent land uses
RM8 Achieved PMLU Retained Infrastructure	RA5	Absence of mine equipment and materials not required. Absence of contaminating materials. Erosion classification based on results of rehabilitation monitoring and maintenance program. Stable landform development. Hazard and Safety Assessment by an appropriately qualified person.	• Final landform survey confirms no structures or equipment remain other than those documented in a landholder agreement, or specified by the <i>Electricity Act 1994</i>. • All contaminants removed or remediated. • No erosion classification of Severe or Extreme. • Landform shows suitable slope gradients e.g. <20% except to connect with surrounding natural topography. • Hazard and Safety Assessment completed by an appropriately qualified person demonstrating hazards in rehabilitation areas are consistent with the nature and severity of hazards typical of neighboring equivalent land use. Identified residual hazards are low risk with no significant increase in risk expected over time. • Agreement with Energex regarding maintenance of power line easement

8 General Rehabilitation Practices

8.1 Hydrogeology

There are no groundwater monitoring bores on site. Review of public information has indicated that the shallowest aquifer is deeper than approximately 12m AHD. The mine plan is not anticipated to intersect with groundwater as the pit floor in the active mining area will be above 17m AHD (i.e. 5 metres above the groundwater level). Therefore, there will be no requirement to dewater the pit, or lower groundwater levels in advance of mining. For this reason, there is no need to undertake a detailed groundwater modelling exercise assessment or develop a conceptual model of the groundwater system to guide the preparation of this PRCP.

8.2 Flooding

Flood plain modelling is not required as there are no voids located within a flood plain being rehabilitated.

As shown in Figure 11 the flood risk profile is low.

Rehabilitated areas will be re-contoured to achieve a safe and stable landform. Permanent surface water diversions will be incorporated into the final landform to ensure that surface waters are directed into the surrounding drainage lines. The stockpiled overburden may be re-used to assist in achieving the final landform.

8.3 Soil and Capping Material Assessment

The material to be mined is oxidised benign clay and clay-shale. The overburden rock is oxidised and benign sandstone. For this reason, there are no contamination, acid or neutral mine drainage concerns and therefore a specific capping material assessment is not required.

During the development of extraction areas in areas that have been undisturbed, all topsoil/subsoil will be selectively lifted and stored for later use in the rehabilitation stage of the project.

When mining is complete, extraction areas will be profiled to the final desired landform specifications to ensure that is safe and stable. Progressive rehabilitation of extraction areas will be a priority, as and when they become available. Subsoil and topsoil will be replaced on the profiled landform in the reverse order to which it was stripped; that is the subsoil is placed on top of any returned overburden and the topsoil on top of the subsoil at an appropriate thickness.

Before the topsoil is spread, the profiled landform will be scarified parallel to the contour to a nominal depth of 50 to 100mm to break up any hard setting surfaces and prevent lamination of the topsoil and profiled landform.

Where required, contour banks will be progressively installed to minimise rill erosion and direct water off the profiled landform to either a stable surface or dedicated stabilised drainage paths or flumes constructed on the final landform. The heights and depths of these contour banks will be determined through ongoing landform design. At the finalisation of this process a pre-vegetation landform will have

been constructed. Finalised landforms will be sown with a cover crop and grass species to provide erosion protection before the native species become established.

8.4 Soil Management

8.4.1 Topsoil

Topsoils are thinly developed over the sandstones and interbedded siltstones of the Bundamba Sandstone which underlies the western portion of the site. Prior to stripping, all vegetation would be progressively cleared to the minimum extent required for the impending future works. Supervisors and earthmoving plant operators will be trained to visually identify the topsoil layers to ensure that stripping operations are conducted in accordance with stripping plans and in situ soil conditions. Care will be taken to ensure soil moisture conditions are appropriate for stripping and stockpiling.

Topsoil will be stripped to a depth of at least 150mm. Ideally soil will not be stockpiled but will be lifted, transported and spread on a re-contoured area in one operation. There is limited requirement for the stockpiling of overburden during the project however if weather conditions or rehabilitation timing do not allow for direct transfer, topsoil may be temporarily stockpiled. Topsoil stockpiles will be vegetated and stabilised. These will be formed in low mounds with a height up to 2.5 metres. These stockpiles may be temporarily located within active pit areas.

An inventory of available soils will be maintained to ensure adequate materials are available for planned rehabilitation activities. The current estimated volume of stockpiled topsoil on site within and adjacent extraction areas is 4,500m³, this volume will increase as new areas are pre-stripped before mining.

8.4.2 Sub-soil

Material that has been stockpiled for reuse will be protected from excessive disturbance or traffic, and stockpiled away from any drainage lines. Drainage will be constructed to manage or divert surface water flows around stockpiles and maintained to ensure proper functioning.

In the event that long-term stockpiles are required (present for greater than six months) they will be deep ripped and provided with a vegetative cover to maintain the soil heath, maintain biological activity and minimise erosion potential. Stockpiled material will be constructed with batters or gradients of 1:4 wherever possible. Appropriate sediment controls will be installed to prevent soil loss; and weeds and pests will be monitored and controlled as required. These stockpiles may be temporarily located within active pit areas.

8.4.3 Site Soil Assessment

As outlined in section 2.7 there will be 408,537m³ available topsoil, sub-soil and competent rock on the site to address the rehabilitation requirements. It is expected that no material will be imported on to site to complete the rehabilitation of the pits to the east of the power line. Due to the small size of the site, minimal haul distances apply. Achievement of the final landform in Kerwick #2 pit may require the import of suitable subsoils and topsoils. Resources of this material are commercially available locally (i.e. within 2km of the site). If materials are to be imported, they will be subject to an appropriate testing regime to ensure that they are suitable.

Soil testing of stockpiled grown media on site has occurred that shows available material requires amendment with fertiliser to improve nutrient levels. Low phosphorus content also poses less of an issue for native species, as they are generally not tolerant of high phosphorus levels. The pH results of the soil samples were 5.0 – 5.6, which is in the correct range for native plant growth. Low calcium levels may be amended by the addition of gypsum, so as not to increase the soil pH. Additionally, low organic matter content may be amended by top dressing with biosolids.

As the soil will be used from the site, there will be no concerns relating to supporting the vegetation ecosystem to support for PMLU.

8.5 Waste Characterisation

There are no waste rock dumps or leach pads on site. The overburden rock is predominantly weathered and oxidised sandstone.

There are no tailings on site as all excavated material is sold “as is” and overburden materials are re-used in rehabilitation.

Therefore, no specific waste characterisation is required to guide the preparation of this PRCP.

8.6 Landform Design

The following factors were considered when determining the appropriate design parameters for the mine:

- Geological factors and geotechnical stability of the materials (topsoil, sandstone, shale, clay, mudstone and gravel).
- Groundwater runoff (assuming water table is below the pit floor).
- Site specific boundaries (property and mining lease boundaries) and buffers (power line).
- Final land use.

The Mine Plan in Appendix 4 contains specific details on the landform design and 3D models.

In summary, the landform design has been created within the following design parameters:

- Road width 10m based on two road truck width with standard including provision for drainage and bunding.
- Road gradient 1 in 10 which is suitable for road trucks.
- Power line track 25m width.
- Bench height less than 12m as risk assessment is required if the height is greater. Forward planning restricts bench height to this level.
- Batter angle for benches is 70 degrees which is consistent with similar operations. This is a low geotechnical risk.
- Final landform batter angle is 1 in 3 which is a geotechnically stable final landform.
- The pit floor is backfilled to RL25 to achieve a free draining final landform.
- Floor slope is 2% so that the pit floor is backfilled with a gentle slope towards the north to achieve a free draining final landform.
- The buffer to the ML boundary of at least 20m is maintained.

The 3-D model of the mine plan is included within Appendix 4.

The long term stability of the proposed design is considered to be within the standard parameters for the use of weathered sandstone and clay-shale materials in quarries and on construction sites in south east Queensland. There will be no remnant highwall in the final landform design, and therefore no geotechnical analysis of the long term stability is required. What is being proposed is neither unique or radical and for this reason modelling to predict the long term stability is not considered necessary for confirming the parameters proposed in this PRC Plan. The landform has been designed by an RPEQ who has extensive experience in similar mine sites and materials.

The details of the construction method and the QA/QC that will apply will be specified by an RPEQ at the appropriate time.

The final landform design is consistent with similar locations within the region for either mine, quarry or civil development and therefore trials are not considered necessary at this stage to verify the predicted success of the proposed landform.

8.7 Cover design

No specific cover design is required over the rehabilitated area, as the materials to be used to create the post mining landform are benign weathered oxidised sandstones and clay-shales from the overburden.

The rehabilitated areas will be covered by a topsoil cover of minimum 150mm thickness on slopes and batters. This topsoil will be sourced from existing stockpiles, pre-stripped topsoil in advance of mining, and in the event of a shortfall, purchased from nearby suppliers. The objective of the cover system is to provide a growth media for the re-establishment of vegetation over the rehabilitated area.

Prior to soil movement, any stockpiles that have evidence of any weed growth will be treated prior to the use in rehabilitation. Movement and handling from stockpiles to be conducted to minimise structural degradation such as compaction. The cover will be constructed by end dumping topsoil over the area to be covered, spreading by grader to the nominated minimum thickness.

The soil will be ripped if compacted, otherwise will have the surface roughened and then seeded. Contour ripping may be conducted on sloped areas to encourage soil keying, water infiltration and minimise runoff.

Mulch, jute netting or other temporary soil covers may be used in selected areas during the revegetation program to reduce the risk of heavy rain eroding the seed bed soil. In addition, slope drainage control features may be used to minimize erosion, together with catch dams to collect runoff and remove suspended solids.

Where rehabilitation trials or chemical and physical tests suggest surface media has undesirable properties for plant growth, soil ameliorants may be used (e.g. gypsum, for sodicity). Fertiliser may also be used.

Logs and rocks retained for fauna habitat will be moved into rehabilitated areas at the final stage of surface preparation.

Specific QA/QC requirements will be documented at the appropriate time by and RPEQ. These requirements may include (but not be limited to); testing of soils to confirm chemical and physical specification is met (where not met, the use of soil ameliorants will be incorporated), confirmation of thickness of soil cover and confirmation of slope angles.

Vegetation which has been stockpiled as a result of clearing activities will be mulched on site and this will also be incorporated into the rehabilitation activities.

8.8 Water Management

8.8.1 Overview

The transport of sediment has the potential to impact the environmental values of both waters and land and is dependent on the scale and location of the activity, its proximity to sensitive receiving environments and the site ESC response.

Erosion and sediment transport risk exists throughout the lifecycle of mining activities, including earthworks and reducing through operational project phases to decommissioning; as disturbances are increasingly stabilised and progressively rehabilitated. Accordingly, erosion and sediment control measures differ during different phases of the project and are dependent on generally consistent seasonal patterns. Ground disturbing activities beyond mining should be planned to occur during the dry season to limit the potential for erosion and sedimentation.

Due to the nature of operation, there is no seepage and infiltration intervention requirements. Dewatering requirements are not expected.

8.8.2 Drainage Control

There is a range of potential drainage controls that will be used in site-specific mitigation methods depending on site-specific characteristics. These potential drainage controls include the following:

- diversion of up-slope stormwater runoff around disturbed areas including stockpiles and waste storage areas;
- installation of lateral catch drains or flow diversion banks to minimise rill erosion along steep continuous slopes (i.e. >10%) especially associated with linear infrastructure construction (i.e. roads, tracks and power lines);
- placement of velocity control structures such as rock check dams to reduce the flow velocity in channels; and/or
- lining of channel with scour resistant materials including erosion control matting or rock lining; and use of energy dissipation structures at the outlets of banks, drains and chutes.

8.8.3 Erosion and Sediment Control

The following are a range of potential erosion and sediment controls that will be used in site-specific erosion and sediment control plans depending on site-specific characteristics. These potential erosion and sediment controls include the following:

- Prioritising drainage and erosion control measures, rather than allowing erosion to occur and trying to trap the resulting sediment;

- Spreading mulch or retained native vegetation over disturbed areas as soon as practicable after construction to reduce splash impact erosion and to stabilise disturbed landforms;
- Use of erosion blankets (i.e. jute and coir matting or geosynthetics) as an alternative to mulching in drainage channels or areas of strong winds or overland flow;
- Use of sediment traps (i.e. sheet flow and field inlet sediment traps) and sediment basins;
- Amelioration of problem soils (i.e. gypsum treatment of sodic soils);
- Use of 'ripping' or similar techniques on finished soil surfaces to encourage revegetation where required;
- Use of binding polymers; and/or
- Programming and scheduling of works to suit climatic conditions.

8.8.4 Erosion and Sediment Control Plans

Erosion and sediment control plans must be implemented and are to consider potential for environmental impacts within the documents. These should include:

- Quality and quantity of water stored in pit and sediment controls;
- Management of rainwater from cleared areas;
- Installation of permanent drainage structures including diversion drains, culverts and flow control e.g. rock checks;
- Propagation of native matting grasses and vegetation on batters and in drains, if required;
- Stabilisation of batters.

8.8.5 Rehabilitation Erosion and Sediment Controls

Achieving and maintaining groundcover is key to reducing erosion. Progressive stabilisation and rehabilitation of disturbed areas will be undertaken to reduce erosion and sediment risk. Stabilisation / rehabilitation will be undertaken to achieve the rehabilitation objectives of the approved Progressive Rehabilitation and Closure Plan.

Typical post-mine use rehabilitation strategies aimed at long term ESC include:

- Backfilling of open pit excavations;
- Reprofilng disturbed areas to be consistent with pre-mining topography;
- Reshaping disturbed areas into stable landforms;
- Permanent stabilisation of any remaining batters/roads;
- Revegetation of disturbed areas with indigenous plant species contiguous with the surrounding landscape;
- Reinstatement of stockpiled topsoil;
- Installation of permanent infrastructure e.g. rock checks, whoa boys and drainage to slow water flow rates without requiring ongoing maintenance or inspection.

8.8.6 Water Management Infrastructure

Currently Kerwick #2 pit provides enough water storage capacity for operation requirements and can accommodate all the stormwater from existing mined areas in the case of a storm event (as demonstrated by not overflowing despite record rainfalls received in February 2022). As the Kerwick #1 pit is opened up, a suitably sized sediment pond (or ponds) will be incorporated in the design to detain stormwater from mining areas.

8.8.7 Water Quality Monitoring

All erosion and sediment controls will be maintained in a functioning condition until individual areas have been certified as rehabilitated. Where controls are observed to be not functioning correctly, the controls are restored to meet the required standard.

Sediment control structures, e.g. sediment basins, rock check dams, sediment fences, drainage controls etc will be inspected for capacity and structural integrity on a monthly basis and/or following rainfall events ≥ 20 mm/day.

These inspections shall be documented on a site inspection form and photographed for evidence of condition. Water from sediment control structures may be tested for pH, EC and total suspended solids (TSS), assess the effectiveness of the sediment control structures. Results from water monitoring will be compared with the Water Quality Objectives for Six Mile Creek.

Actions shall be raised from each inspection should maintenance or repair be required, with the action assigned formally to an appropriate person in the management structure and an appropriate and realistic timeframe assigned for rectification of the erosion and sediment control measure.

8.9 Revegetation Method

Species known to occur in the immediate area and considered suitable for inclusion in the native ecosystem rehabilitation area will be used. Species selection will be based on the mapped regional ecosystems across the site, together with the species identified in recent site ecology assessments.

Planting will occur with a seed mix or nursery raised seedlings. Where there is grass or weed competition from seed present in the topsoil, the area will be thoroughly cultivated or herbicide will be applied to destroy competing grass/weeds prior to planting or sowing.

8.10 Tailings Storage Facilities

There are no tailings storage facilities on site and none will be created throughout the life of mine. This section is therefore not applicable to the PRC Plan.

8.11 Voids

The open pit Kerwick #2 will be used for water storage until the end of mine life. This open pit will provide water to support the rehabilitation programs across the site, as well as providing additional stormwater storage capacity; which is specified in EA0001872.

At the conclusion of mining, it is planned that Kerwick #2 will be backfilled, and achieve the native ecosystem PMLU.

8.12 Underground Mining

Underground coal mining has historically occurred however the depth to the underground mining is at least 90m below ground level at this location (i.e. at least 60m below the base of the designed pit). Therefore, underground mining does not need to be considered in the preparation of this PRCP.

8.13 Built Infrastructure

There is no built infrastructure (current or planned) on site for mining activities so no decommissioning is required in relation to the mining activity.

The decommissioning requirements of the Resource Recovery Centre in the western sector of the site will be defined in more detail as the project progresses.

9 Risk Assessment

9.1 Risk Assessment Purpose

Section 1236C(1)(f) of the EP Act requires the PRCP to identify the risks for each PMLU of a stable condition not being achieved, and how the applicant intends to manage or minimise the risk.

The purpose of the risk assessment was to identify and assess the risks of a stable condition for the land not being achieved for the agreed PMLU of native ecosystem and any related potential for environmental harm. The purpose of the risk assessment is to also identify that action to be taken to manage and minimise any identified high risk.

The scope of the risk assessment is restricted to rehabilitation matters including the potential risks associated with the period following rehabilitation and mine closure. The scope covers risks that affect the successful achievement of PMLU type (native ecosystem).

9.2 Risk Assessment Process

The risk assessment has been conducted in accordance with the principles outlined in AS/NZS ISO 31000:2018 *Risk Management – Guidelines* (Standards Australia, 2018).

Potential hazards were identified and considered for each rehabilitation area for the Project.

A risk assessment has been undertaken in accordance with the principles outlined in ISO31000:2018 taking into account the areas of impact, events and their causes and potential consequences for the period following mine closure. An assessment of likelihood and consequence of associated risks have been made based to determine unmitigated risk. Definitions of likelihood and consequence of the risk are shown in Table 17 and Table 18.

Table 19 describes how the overall risk level is determined.

A risk assessment relating to mine closure is shown in Table 20. Proposed mitigation measures are specified. The residual risk based on effective and ongoing implementation of the mitigation measures is also included.

Table 17 Likelihood Definitions

Likelihood	Definition
Almost Certain; >90%; (5)	Greater than 90% likelihood of occurring. Has happened, will probably happen during the mine life and there is no reason to suspect it will not happen in the post-closure period.
Likely; 30% - 90%; (4)	Likelihood of occurring is equal to or more than 30% and less than 90%. This consequence is not uncommon in the mining industry/local area
Possible 10-29%; (3)	Likelihood of occurring is equal to or more than 10% and less than 30%. There is a possibility of this risk occurring as it has occurred before (albeit infrequently) in the mining industry/local area
Unlikely; 3% - 9% (2)	Likelihood of occurring is more than or equal to 3% and less than 10%. There are no specific circumstances to suggest this could happen.
Improbable; <3%; (1)	Likelihood of occurring is less than 3%. It would require a substantial change in circumstances to create an environment for this to occur, and even then, this is a rare occurrence.

Table 18 Consequence Definition

Consequence Type	Insignificant (1)	Minor (2)	Moderate (3)	High (4)	Major (5)
PMLU not being achieved	Lasting days or less; affecting small area (metres); groundcover affected with no loss of stability.	Lasting weeks; affecting limited area (tens of metres); groundcover affected on rehabilitated surfaces only and/or land slip of rehabilitated surface/profile or one incident of surface water quality deterioration.	Lasting months; affecting extended area (hundreds of metres); groundcover affected within Mine Activity Area only and/or erosion or slumping of rehabilitated surface/profile or successive incidents of surface water quality deterioration.	Lasting years; affecting area on ML area beyond the Mine Activity Area and undisturbed land; landform failure requiring re-mobilisation of rehabilitation efforts. Off lease impacts potential to cause environmental harm.	Permanent impact; affecting area beyond ML area and landholder property, reducing productivity of affected land permanently.

Table 19 Risk Level Matrix

Likelihood	Consequence Scale				
	Insignificant (1)	Minor (2)	Moderate (3)	High (4)	Major (5)
Almost Certain; >90%; (5)	5 (Medium)	10 (Significant)	15 (Significant)	20 (High)	25 (High)
Likely; 30% - 90%; (4)	4 (Medium)	8 (Medium)	12 (Significant)	16 (High)	20 (High)
Possible 10-29%; (3)	3 (Low)	6 (Medium)	9 (Medium)	12 (Significant)	15 (Significant)
Unlikely; 3% - 9% (2)	2 (Low)	4 (Medium)	6 (Medium)	8 (Medium)	10 (Significant)
Improbable; <3%; (1)	1 (Low)	2 (Low)	3 (Low)	4 (Medium)	5 (Medium)

Table 20 Risk Assessment for Achievement of PMLU

C = Consequence L= Likelihood R = Risk

The risk assessment outcome, including proposed mitigation measures are shown in Table 20.

RISK TO PMLU OUTCOME		Unmitigated Risk			Residual Risk			
Event	Cause	C	L	R	Mitigation	C	L	R
Revegetation fails	Weed invasion of rehabilitated areas	3	4	12	Complete weed eradication from topsoil stockpile prior to use. Ensure fertiliser use is slow release to allow native species to out compete weeds. Keep weed hygiene measures in place for entire rehabilitation activity schedule. Consider weed control on areas adjacent to the Mine Activity Area. Selective weed eradication on revegetated areas based on weed type and control susceptibility.	2	3	6
	Unsuitable seed blend used	3	3	9	Reseed area with appropriate seed mix if inundation or persistent water accumulation.	2	3	6
	Extended drought event	3	3	9	Reseed area in the first available wet season following extended drought.	2	2	4
	Vehicle access prior to appropriate timing	3	3	9	Maintain fence until rehabilitation achieved.	2	2	4
	Native fauna access prior to rehabilitation achievement	3	3	9	Install tree guards around base of immature tree/shrubs in critical areas.	2	2	4
Instability of landform surface	Soil loss from topsoiled areas	3	3	9	Installation of runoff controls to limit the potential for erosive events. Confirmation of final design profile over backfilled and topsoiled areas. Maintain fence until rehabilitation criteria met.	2	2	4
	Slumping of placed materials on slope	3	3	9	Confirmation of final design profile over backfilled and topsoiled areas. Where placed material meets in situ materials key into slope and install water management to direct runoff to dedicated structures and away from placed materials.	2	2	4
	Erosion and Sediment Control management controls fail	3	3	9	Maintain erosion and sediment control management installations throughout rehabilitation schedule and annually prior to each wet season. Inspect status of installations following wet season.	2	2	4
	Final landform design not suitable	3	3	9	Geotechnical assessment to confirm available material can be installed as stable and if not include benching to final profile to decrease slope angle and length.	2	2	4

9.3 Risk Treatment Plan

The basis for selection of the various risk treatments are recorded in Table 21. The risk mitigations are presented in approximate sequence of application for each cause. It is possible that early treatments may be sufficient for risk eradication and that the full range of options may not be necessary for the mitigative effect to be completed.

Table 21 Risk Treatment

RISK TO PMLU OUTCOME		Treatment of Risk		
Cause	Mitigation	Selection rationale	Actions and Performance measures	Reporting/Monitoring/Timing
Revegetation fails				
Weed invasion of rehabilitated areas	Complete weed eradication from topsoil stockpile prior to use.	Timely application of control in rehabilitation schedule	Apply suitable herbicide to weed infested areas seasonally.	Record weed status of stockpiled soils prior to re-spreading on regraded landforms.
	Ensure fertiliser use is slow release to allow native species to out compete weeds.	Meets native species recommended outcome	Source suitable fertiliser for use throughout rehabilitation period	Record rate of use and weed emergence.
	Apply weed hygiene measures for entire rehabilitation activity schedule.	Protection of surrounding environment	Keep operational weed hygiene measures in place for entire rehabilitation activity schedule.	Record equipment and maintain hygiene records
	Selective weed eradication on revegetated areas based on weed type and control susceptibility.	Protection of surrounding environment	Surveillance of rehabilitation areas for weed emergence	Record weed emergence

RISK TO PMLU OUTCOME		Treatment of Risk		
Cause	Mitigation	Selection rationale	Actions and Performance measures	Reporting/Monitoring/Timing
Extended drought event	Reseed area in the first available wet season following extended drought.	Cost-benefit in post-closure period.	Check Ipswich rainfall records to confirm suitable conditions	Record timing and rate of seed application.
Vehicle access prior to rehabilitation achievement	Maintain fence or demarcation until rehabilitation criteria are met.	Timely application of control in rehabilitation schedule	Maintenance inspections to ensure integrity of fence.	Implement prior to completion of rehabilitation works.
Native fauna access prior to rehabilitation achievement	Install tree guards around base of immature tree/shrubs in critical areas.	Cost-benefit in post-closure period	Observations of growth and groundcover to include signs of predation on emerging vegetation	Photo-monitoring of emerging tree/shrubs
Instability of regraded surface				
Soil loss from topsoiled areas	Installation of runoff controls to limit the potential for erosive events.	Timely application of control in rehabilitation schedule	Final landform design plan/schematic to include location and materials for installation	Photo-monitoring of installed feature
	Confirmation of final design profile over backfilled and topsoiled areas	Timely application of control in rehabilitation schedule	Measure profiles as installed, prior to topsoiling and revegetating final landforms	Photo-monitoring of completed earthworks

Slumping placed materials slope	of	Confirmation of final design profile over backfilled and topsoiled areas	Timely application of control in rehabilitation schedule	Measure profiles as installed, prior to topsoiling and revegetating final landforms	Photo-monitoring of completed earthworks
	on	Where placed material meets in situ materials key into slope and install water management to direct runoff to dedicated structures and away from placed materials.	Timely application of control in rehabilitation schedule	Final landform design plan/schematic to include areas for keying and locations for installation of water management structures	Photo-monitoring of completed earthworks

10 Monitoring and Maintenance

The program of monitoring and maintenance of the milestones and milestone criteria are presented in Table 22. Monitoring will occur after the completion of actions specified in the milestone criteria.

Table 22 Rehabilitation Milestone Management and Rehabilitation Criteria Monitoring Program

Milestone Reference	Rehabilitation Milestone	Milestone Criteria	Method of monitoring
RM1	Infrastructure Removal	• All buildings demolished and removed • All concrete, bitumen and gravel removed, where not required • All non-required fencing removed • All machinery and equipment removed • All non-required surface water drainage infrastructure removed • All waste removed	Photo of location with date
RM2	Landform development and reshaping / reprofiling	• Batter slopes achieve approx. 1 in 3 slope angle for final landform design • Floor of pits achieve design slope • All major earthworks completed	Site survey records Photo of location with date
RM3	Land Surface Preparation	• Earthworks completed • Adequate topsoil or growth media material spread over shaped surfaces – 15cm	Photo of location with date Topsoil depth measurement every 100m Record of ameliorants applied

Milestone Reference	Rehabilitation Milestone	Milestone Criteria	Method of monitoring
		• Ameliorants applied where required to address soil quality • Ripping and discing	
RM4	Revegetation	• Records of seeding, planting showing species and density in accordance with design • Monitoring of rehabilitation showing successful revegetation in line with targets: a. 70% germination of groundcover species b. Recruitment 50% naturally regenerating • 70% planted specimens have survived	Record of actions and amount applied Field assessment by suitably qualified person Record of rehabilitation monitoring
RM5	Stable Landform	• 90% of the landform achieves slope gradients of 30% or less and 80% of the final landform achieves slope gradients of 20% or less • Drainage meets design criteria	Statement by suitably qualified person
RM6	Stable PMLU Native Ecosystem	• Key species present include: ○ <i>Corymbia citriodora</i> ○ <i>Eucalyptus crebra</i> ○ <i>Eucalyptus tereticornis</i> ○ <i>Eucalyptus moluccana</i> ○ <i>Corymbia intermedia</i> • >30% of Foliage Projective Cover at analogue site	Field assessment by suitably qualified person Record of rehabilitation monitoring Statement by suitably qualified person Photo of location with date

Milestone Reference	Rehabilitation Milestone	Milestone Criteria	Method of monitoring
		- Landform shows suitable slope gradients as defined in RM5 - No erosion classification of Severe or Extreme	
RM7	Achieved PMLU (Native Ecosystem)	- Key species present include: <i>Corymbia citriodora</i> <i>Eucalyptus crebra</i> <i>Eucalyptus tereticornis</i> <i>Eucalyptus moluccana</i> <i>Corymbia intermedia</i> >50% of number of native flora species/ha as present at analogue site >50% of Foliage Projective Cover at analogue site - Landform shows suitable slope gradients as defined in RM4 - No erosion classification of Severe or Extreme - Erosion classification comparable to similar landforms in near vicinity with equivalent land uses	Field assessment by suitably qualified person Record of rehabilitation monitoring Statement by suitably qualified person Photo of location with date
RM8	Achieved PMLU Retained Infrastructure	- Final landform survey confirms no structures or equipment remain other than those documented in a landholder agreement. - All contaminants removed or remediated.	Statement from suitably qualified person Photo of location with date Landholder Agreement

Milestone Reference	Rehabilitation Milestone	Milestone Criteria	Method of monitoring
		• No erosion classification of Severe or Extreme. • Landform shows suitable slope gradients e.g. <20% except to connect with surrounding natural topography. • Hazard and Safety Assessment completed by an appropriately qualified person demonstrating hazards in rehabilitation areas are consistent with the nature and severity of hazards typical of neighboring equivalent land use. Identified residual hazards are low risk with no significant increase in risk expected over time. • Agreement with Energex regarding maintenance of power line easement	Hazard and Safety Assessment Agreement from DEPW

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PART B — ATTACHMENTS PRCP SCHEDULE

Appendix 1 – PRCP Schedule
Appendix 2 – EA0001386 – Land Outcome Document
Appendix 3 – Ecological Studies
Appendix 4 – Mine Planning Report

Jackal Renewables Pty Ltd; ML50070

Appendix 1 – PRCP Schedule

Jackal Renewables Pty Ltd; ML50070

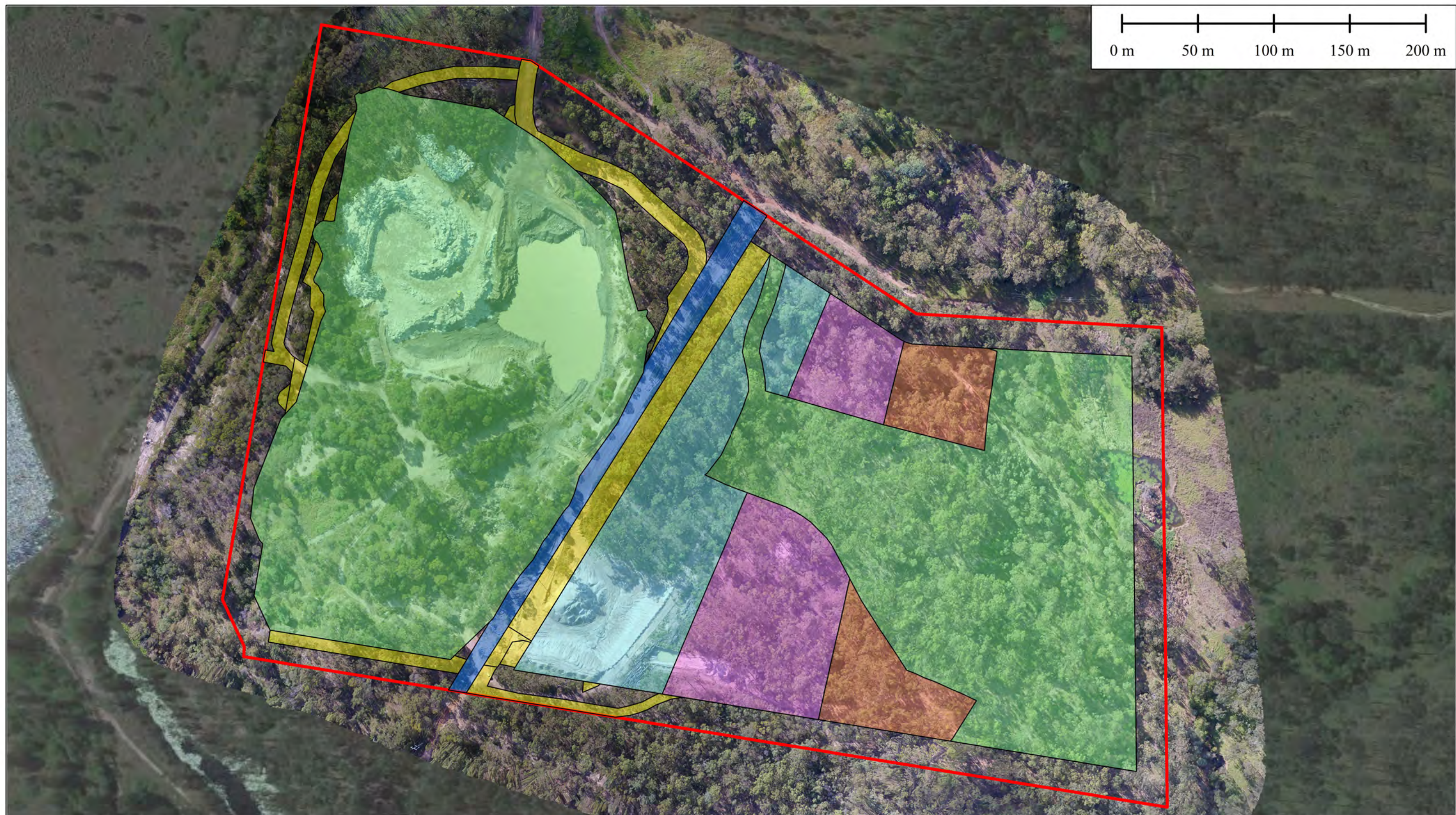
Appendix 2 – EA0001386 – Land Outcome Document

Jackal Renewables Pty Ltd; ML50070

Appendix 3 – Ecological Studies

Jackal Renewables Pty Ltd; ML50070

Appendix 4 – Mine Planning Report



LEGEND		
RA1	RA4	ML50070
RA2	RA4	
RA3	RA5	



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Title Jackal Renewables ML50070 Figure 26 - Rehabilitation Areas Summary Map			
Project No	AUQ00209	Drawing No	00209_RAP
Drawn	CM	Checked	NV
Scale	1:2,500 (A3)	Datum	GDA2020
Date	02/02/2023	Status	Version 1



LEGEND

- PMLU Native Ecosystem
- PMLU Native Ecosystem (undisturbed)
- PMLU Retained Infrastructure



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Title Jackal Renewables ML50070 Figure 27 - Post-Mining Land Use Plan			
Project No	AUQ00209	Drawing No	00209_PMLUP
Drawn	CM	Checked	NV
Scale	1:2,500 (A3)	Datum	GDA2020
Date	02/02/2023	Status	Version 1

PART B

ATTACHMENTS

PRCP SCHEDULE

Appendix 1 – PRCP Schedule
Appendix 2 – EA0001386 – Land Outcome Document
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Jackal Renewables Pty Ltd; ML50070

Appendix 2 – EA0001386 – Land Outcome Document

Permit

Environmental Protection Act 1994

Environmental authority EA0001386

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: EA0001386

Environmental authority takes effect on 27 July 2018

Environmental authority holder(s)

Name(s)	Registered address
JACKAL RENEWABLES PTY LTD	149 Rhondda Rd NEW CHUM QLD 4303 Australia

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Resource Activity, Schedule 2A, 20: Clay pit mining, dimension stone mining or mining gemstones (including the material from which gemstones are extracted), (a) at least 5,000t but not more than 100,000t in a year	ML50070

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the Environmental Protection Act 1994 (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days);

that is causing, or is reasonably likely to cause, serious or material environmental harm.

Environmental authority

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

- a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority-on the nominated day; or
- b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or
- c) otherwise-on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the Sustainable Planning Act 2009 or an SDA Approval under the State Development and Public Works Organisation Act 1971), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.

Dannielle Tela
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Minerals Business Centre
Department of Environment and Science
Phone: 07 4222 5352
Email: ESCairns@des.qld.gov.au

Date issued: 27 July 2018

Conditions of environmental authority

Schedule A – General conditions

Prevent and /or Minimise Likelihood of Environmental Harm

- (A1-1) In carrying out the environmentally relevant activities, you must take all reasonable and practicable measures to prevent and / or to minimise the likelihood of environmental harm being caused. Any environmentally relevant activity, that, if carried out incompetently, or negligently, may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this authority.

NOTE: This authority authorises the environmentally relevant activity. It does not authorise environmental harm unless a condition contained within this authority explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

Maintenance of Measures, Plant and Equipment

- (A2-1) The holder must:
- (a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; and
 - (b) maintain such measures, plant and equipment in a proper and efficient condition; and
 - (c) operate such measures, plant and equipment in a proper and efficient manner.

Monitoring

- (A3-1) Record, compile and keep for a minimum of five (5) years all monitoring results required by this environmental authority and make available for inspection all or any of these records upon request by the administering authority.
- (A3-2) Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

Storage and Handling of Flammable and Combustible Liquids

- (A4-1) Spillage of all flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and storage of such liquids shall comply with *AS 1940 - Storage and Handling of Flammable and Combustible Liquids of 1993*.

Integrated Environmental Management System (IEMS)

- (A5-1) The holder of this environmental authority must:
- (a) develop an Integrated Environmental Management System (IEMS) which provides for the effective management by the registered operator of the actual and potential environmental impacts resulting from the carrying out of the ERAs; and
 - (b) implement and maintain the IEMS for carrying out the ERAs and;

- (c) for the purposes of condition (A5-1) an IEMS includes the document entitled “Environmental Management Overview Strategy incorporating Integrated Environmental Management System (Mining and Manufacturing Activities), Claypave Pty Ltd, October 2002 lodged in connection with the relevant application.

(A5-2) The IEMS must provide for at least the following functions:

- (a) Training staff in the awareness of environmental issues related to carrying out the ERAs, which must include at least:
- The environmental policy of the registered operator, so that all persons that carry out the ERAs are aware of all relevant commitments to environmental management;
 - Any relevant environmental objectives and targets, so that all staff are aware of the relevant performance objectives and can work towards these;
 - Control procedures to be implemented for routine operations for day to day activities to minimise likelihood of environmental harm, however occasioned or caused;
 - Contingency plans and emergency procedures to be implemented for non-routine situations to deal with foreseeable risks and hazards including corrective responses to prevent and mitigate environmental harm (including any necessary site rehabilitation);
 - Organisational structure and responsibility to ensure that roles, responsibilities and authorities are appropriately defined to manage environmental issues effectively;
 - Effective communication to ensure two-way communication on environmental matters between operational staff and higher management; and
 - Their obligations in respect of monitoring, notification and record keeping obligations under the IEMS and relevant environmental authorities and/or environmental authority;
- (b) Monitoring of the release of contaminants into the environment including procedures, methods, record keeping and notification of results;
- (c) Mining without explosive blasting;
- (d) Conducting assessment of the environmental impact of any release of contaminants into the environment;
- (e) Periodic conduct of energy audits and review of environmental performance and procedures adopted, not less frequently than annually;
- (f) Waste prevention, treatment and disposal; and
- (g) A program for continuous improvement.

(A5-3) The holder of this environmental authority must not implement or amend an IEMS (including any environmental management plan) that contravenes any condition of this environmental authority or any development condition applicable to carrying out the ERAs.

Definitions

(A6-1) Words and phrases used throughout this environmental authority are defined in Schedule H – Definitions. Where a definition for a term used in this integrated authority is sought and the term is not defined within this integrated authority, the definitions in the *Environmental Protection Act 1994*, its Regulations and Environmental Protection Policies must be used.

Financial Assurance

- (A7-1) Provide a financial assurance in the amount and form required by the administering authority prior to the commencement of activities proposed under this environmental authority.

NOTE: The calculation of financial assurance for condition (A7-1) must be in accordance with Guideline 17 and may include a performance discount. The amount is defined as the maximum total rehabilitation cost for complete rehabilitation of all disturbed areas, which may vary on an annual basis due to progressive rehabilitation. The amount required for the financial assurance must be the highest Total Rehabilitation Cost calculated for any year of the Plan of Operations and calculated using the formula: (Financial Assurance = Highest Total Annual Rehabilitation Cost x Percentage Required)

- (A7-2) The financial assurance is to remain in force until the administering authority is satisfied that no claim on the assurance is likely.

NOTE: Where progressive rehabilitation is completed and acceptable to the administering authority, progressive reductions to the amount of financial assurance will be applicable where rehabilitation has been completed in accordance with the acceptance criteria defined within this environmental authority.

Environmentally Sensitive Areas

- (A8-1) Mining activities must not be carried out in a Category B Environmentally Sensitive Area.

End of Conditions for Schedule A

Schedule B – Air

Dust nuisance

- (B1-1) The release of dust and/or particulate matter resulting from the ERAs must not cause an environmental nuisance at any dust sensitive place.
- (B1-2) Exceedance of any of the following levels when measured at any dust sensitive place is an environmental nuisance for the purposes of condition (B1-1).
- (a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10 of 1991; OR
 - (b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (μm) (PM10) suspended in the atmosphere of 150 micrograms per cubic metre over a twenty-four (24) hour averaging time, at a dust sensitive place downwind of the site, when monitored in accordance with:
 - Australian Standard AS 3580.9.6 'Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet - Gravimetric method'; or
 - any alternative method of monitoring PM10 which may be permitted by the 'Air Quality Sampling Manual' as published from time to time by the administering authority.
- (B1-3) When requested by the Administering Authority, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and the results notified within fourteen (14) days to the administering authority following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place and at upwind control site and must include:
- (a) for a complaint alleging dust nuisance, dust deposition; and
 - (b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (μm) (PM10) suspended in the atmosphere over a twenty-four (24) hour averaging time.
- (B1-4) If monitoring indicates exceedance of the relevant limits in Condition (B1-2), then the environmental authority holder must:
- (a) address the complaint including the use of appropriate dispute resolution if required; or
 - (b) immediately implement dust abatement measures so that emissions of dust from the ERAs do not result in further environmental nuisance.

Odour nuisance

- (B2-1) Subject to condition (B2-2), the release of noxious or offensive odour(s) or any other noxious or offensive airborne contaminant(s) resulting from the ERAs must not cause an environmental nuisance at any sensitive or commercial place.

- (B2-2) When requested by the administering authority, odour monitoring must be undertaken within a reasonable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of an authorised person) of environmental nuisance at any sensitive or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.
- (B2-3) If monitoring indicates Condition (B2-2) is not being met then the environmental authority holder must:
- (a) address the complaint including the use of appropriate dispute resolution if required; or
 - (b) immediately implement odour abatement measures so that emissions of odour from the ERAs do not result in further environmental nuisance.

End of Conditions for Schedule B

Schedule C – Water

Release to Waters and Monitoring

- (C1-1) Contaminants must not be released from the site to any waters or the bed and banks of any waters.

Stormwater management

- (C2-1) There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.

End of Conditions for Schedule C

Schedule D - Noise

Noise nuisance

- (D1-1) Subject to Conditions (D1-2) and (D1-3) noise from the ERAs must not cause an environmental nuisance, at any sensitive or commercial place.
- (D1-2) When requested by the administering authority, noise monitoring must be undertaken within a reasonable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of an authorised person) of environmental nuisance at any sensitive or commercial place, and the results must be notified within fourteen (14) days to the administering authority following completion of monitoring.
- (D1-3) Where the noise limits defined in Schedule D - Table 1 are not being exceeded by the conduct of the ERAs, then condition (D1-1) is not breached. For the purposes of this condition, noise monitoring must include:
- (a) $L_{A, \max \text{ adj, T}}$; and
 - (b) the level and frequency of occurrence of impulsive or tonal noise; and
 - (c) atmospheric conditions including wind speed and direction; and
 - (d) location, date and time of recording.
- (D1-4) If noise monitoring indicates exceedance of the limits in Schedule D - Table 1, then the environmental authority holder must:
- (a) address the complaint including the use of appropriate dispute resolution if required; or
 - (b) immediately implement noise abatement measures so that emissions of noise from the ERAs do not result in further environmental nuisance.

Schedule D - Table 1 (Noise limits)

Noise level dB(A) measured as	Monday to Saturday			Sundays and public holidays		
	7am - 6pm	6pm - 10pm	10pm - 7am	9am - 6pm	6pm - 10pm	10pm - 9am
	Noise measured at a 'Noise sensitive place'					
$L_{A10, \text{ adj, 10 mins}}$	50	45	35	50	45	35
$L_{A1, \text{ adj, 10 mins}}$	55	50	40	55	50	40
	Noise measured at a 'Commercial place'					
$L_{A10, \text{ adj, 10 mins}}$	55	50	40	55	50	40
$L_{A1, \text{ adj, 10 mins}}$	60	55	45	60	55	45

Note: The method of measurement and reporting of noise levels must comply with the latest edition of the Environmental Protection Agency's Noise Manuals.

End of Conditions for Schedule D

Schedule E – Waste

General

- (E1-1) The holder of this environmental authority must not:
- (a) burn waste at or on the site; nor
 - (b) allow waste to burn or be burnt at or on the site; nor
 - (c) remove waste from the site and burn such waste elsewhere.
- (E1-2) Records of agreements for disposal, treatment or transport of waste must be made available for inspection on request.

Notification of Improper Disposal of Regulated Waste

- (E2-1) If the holder of this environmental authority becomes aware that a person has removed regulated waste from the site and disposed of the regulated waste in a manner which is not authorised by this environmental authority, or is improper or unlawful, then the registered operator of this environmental authority must, as soon as practicable, notify the administering authority of all relevant facts, matters and circumstances known concerning such removal or disposal.

On site waste disposal

- (E3-4) Any waste which is not authorised to be disposed of on the site must be disposed of at a facility that lawfully accepts such waste, or removed from the site for lawful recycling.

Storage of waste on the site

- (E4-1) Waste stored on the site must be stored in a manner sufficient to prevent any unauthorised environmental contamination.

End of Conditions for Schedule E

Schedule F - Land

Buffer zones

- (F1-1) There must be no mining activities conducted in the buffer zones identified on figure 1 of Schedule I of this environmental authority, other than for the construction or removal of amenity banks, environmental control works, and activities involved with access or provision of services to the lease areas.

Rehabilitation landform criteria

- (F3-1) All areas significantly disturbed by mining activities must be rehabilitated in accordance with Schedule F – Table 2.

Schedule F - Table 2 (Final Land Use and Rehabilitation Outcome Schedule)

Tenure ID	Disturbance Type	Projective Surface Area (ha)	Rehabilitation Outcome
ML50070	Backfilled/rehabilitated old coal mining void (western sector of lease)	2.5	Native ecosystem
	Old coal mining spoil dump (western sector of lease)	0.7	Native ecosystem
	Mine excavation area	13.0	Native ecosystem

Rehabilitation Outcome – Native Ecosystem

- (F6-1) For the purposes of Schedule F – Table 2 (Final Land Use and Rehabilitation Outcome Criteria), areas that are to be rehabilitated to native ecosystem must comply with the following outcomes:
- (a) achievement of a self-sustaining native ecosystem with a species composition and distribution similar to the pre-mining species composition and distribution; and
 - (b) the landform must be suitable to support the ecosystem in (F5-1) a) and be stable and non-polluting.
- (F6-2) Complete an investigation into rehabilitation of disturbed areas and submit a report to the administering authority proposing acceptance criteria for the outcomes in (F5-1). A report on that investigation and acceptance criteria must be submitted to the administering authority by 30 June 2010.

Rehabilitation Outcome – water storage

- (F8-1) Complete an investigation into rehabilitation of disturbed areas for a water storage outcome and submit a report to the administering authority proposing rehabilitation acceptance criteria. A report on that investigation and acceptance criteria must address:
- (a) water quality to be achieved in the water filled void;
 - (b) water quality to be achieved for any discharges from the void;
 - (c) revegetation standards to be met for the fringes of the void; and
 - (d) and the report must be submitted to the administering authority at least 24 months prior to the expiry date or proposed surrender, whichever is sooner, of the relevant tenure.

Progressive Rehabilitation

- (F8-1) Progressive rehabilitation must commence within three years of areas become available within the operational land.

Infrastructure

- (F9-1) All infrastructure, constructed by or for the environmental authority holder during the mining activities including water storage structures, must be removed from the site prior to mining lease surrender, except where agreed in writing by the post mining land owner / holder.
- NOTE: This is not applicable where the landowner / holder is also the environmental authority holder.

End of Conditions for Schedule F

Schedule G - Community

Complaint response

- (G1-1) All complaints received must be recorded including investigations undertaken, conclusions formed and action taken. This information must be made available to the administering authority on request.

End of Conditions for Schedule G

Schedule H - Definitions

“acceptance criteria” means the measures by which the actions implemented to rehabilitate the land are deemed to be complete. The acceptance criteria indicate the success of the rehabilitation outcome or remediation of areas which have been significantly been disturbed by the mining activities. Acceptance criteria may include information regarding:

- vegetation establishment, survival and succession;
- vegetation productivity, sustained growth and structure development;
- fauna colonisation and habitat development;
- ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes;
- microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;
- effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;
- resilience of vegetation to disease, insect attack, drought and fire;
- vegetation water use and effects on ground water levels and catchment yields.

“administering authority” means the Environmental Protection Agency or its successor.

“ambient (or total) noise” at a place, means the level of noise at the place from all sources (near and far), measured as the Leq for an appropriate time interval.

“annual return” means the return required by the annual notice (under section 316 of the *Environment Protection Act, 1994*) for the section 86(2) environmental authority that applies to the environmental authority.

“authority” means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

“commercial place” means a place used as an office or for business or commercial purposes, other than a place within the boundaries of the land the subject of this environmental authority.

“competent person” means a person with the demonstrated skill and knowledge required to carry out the task to a standard necessary for the reliance upon collected data or protection of the environment.

“dam” means a containment or proposed containment whether permanent or temporary, which is designed to contain, divert or control flowable substances. However this does not include a fabricated or manufactured tank or container designed to a recognised standard.

“dust sensitive place” means -

- a dwelling, mobile home or caravan park, residential marina or other residential place;
- a motel, hotel or hostel;
- a kindergarten, school, university or other educational institution;
- a medical centre or hospital;
- a protected area;
- a park or gardens; or
- a place used as an office or for business or commercial purposes.
- and includes the curtilage of any such place.

“dwelling” means any of the following structures or vehicles that is principally used as a residence-

- a house, unit, motel, nursing home or other building or part of a building;
- a caravan, mobile home or other vehicle or structure on land;
- a water craft in a marina.

“environmental authority registered operator” means the registered operator of this environmental authority.

“event release” means when water is released or at least four times a year.

“hazardous waste” means any substance, whether liquid, solid or gaseous, derived by or resulting from, the processing of minerals that tends to destroy life or impair or endanger health.

“ $L_{A\ 10, \text{adj}, 10 \text{ mins}}$ ” means the A-weighted sound pressure level, (*adjusted for tonal character and impulsiveness of the sound*) exceeded for ten percent (10%) of any 10-minute measurement period, using Fast response.

“ $L_{A\ 1, \text{adj}, 10 \text{ mins}}$ ” means the A-weighted sound pressure level, (*adjusted for tonal character and impulsiveness of the sound*) exceeded for one percent (1%) of any 10-minute measurement period, using Fast response

“ $L_{A, \text{max adj}, T}$ ” means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

“land” in the “land schedule” of this document means land excluding waters and the atmosphere.

“land use” term to describe the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

“mg/L” means milligrams per litre.

“ $\mu\text{s/cm}$ ” means micro semen per centimetre.

“mineral” means a substance which normally occurs naturally as part of the earth’s crust or is dissolved or suspended in water within or upon the earth’s crust and includes a substance which may be extracted from such a substance, and includes—

- (a) clay if mined for use for its ceramic properties, kaolin and bentonite;
 - (b) foundry sand;
 - (c) hydrocarbons and other substances or matter occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connection with mining for shale or coal or for the purpose of enhancing the safety of current or future mining operations for coal or the extraction or production of mineral oil therefrom;
 - (d) limestone if mined for use for its chemical properties;
 - (e) marble;
 - (f) mineral oil or gas extracted or produced from shale or coal by in situ processes;
 - (g) peat;
 - (h) salt including brine;
 - (i) shale from which mineral oil may be extracted or produced;
 - (j) silica, including silica sand, if mined for use for its chemical properties;
 - (k) rock mined in block or slab form for building or monumental purposes;
- but does not include—
- (l) living matter;
 - (m) petroleum within the meaning of the *Petroleum Act 1923*;
 - (n) soil, sand, gravel or rock (other than rock mined in block or slab form for building or monumental purposes) to be used or to be supplied for use as such, whether intact or in broken form;
 - (o) water.

“noxious” means harmful or injurious to health or physical well being, other than trivial harm.

“nuisance sensitive place” includes -

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
 - a motel, hotel or hostel; or
 - a kindergarten, school, university or other educational institution; or
 - a medical centre or hospital; or
 - a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or
 - a public thoroughfare, park or gardens; or
 - a place used as a workplace, an office or for business or commercial purposes.
- and includes a place within the curtilage of such a place reasonably used by persons at that place.

“odour sensitive place” has the same meaning as a “dust sensitive place”

“offensive” means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

“progressive rehabilitation” means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as mining operations are ongoing.

“reference site” (or analogue site) may reflect the original location, adjacent area or another area where rehabilitation success has been completed for a similar biodiversity. Details of the reference site may be as photographs, computer generated images and vegetation models etc.

“rehabilitation” the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

“representative” means a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the mining activities.

“self sustaining” means an area of land which has been rehabilitated and has maintained the required acceptance criteria without human intervention for a period nominated by the administering authority.

“sensitive place” means;

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- a motel, hotel or hostel; or
- an educational institution; or
- a medical centre or hospital; or
- a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or
- a public park or gardens; or
- a place used as a workplace, an office or for business or commercial purposes which is not part of the mining activity and does not include employees accommodation or public roads.

“site” means the place to which this environmental authority relates or the premises to which this environmental authority relates.

"stable" means geotechnical stability of the rehabilitated landform where instability related to the excessive settlement and subsidence caused by consolidation / settlement of the wastes deposited, and sliding / slumping instability has ceased.

"this authority" means this environmental authority/environmental authority.

"trivial harm" means environmental harm which is not material or serious environmental harm and will not cause actual or potential loss or damage to property of an amount of, or amounts totalling more than \$5,000.

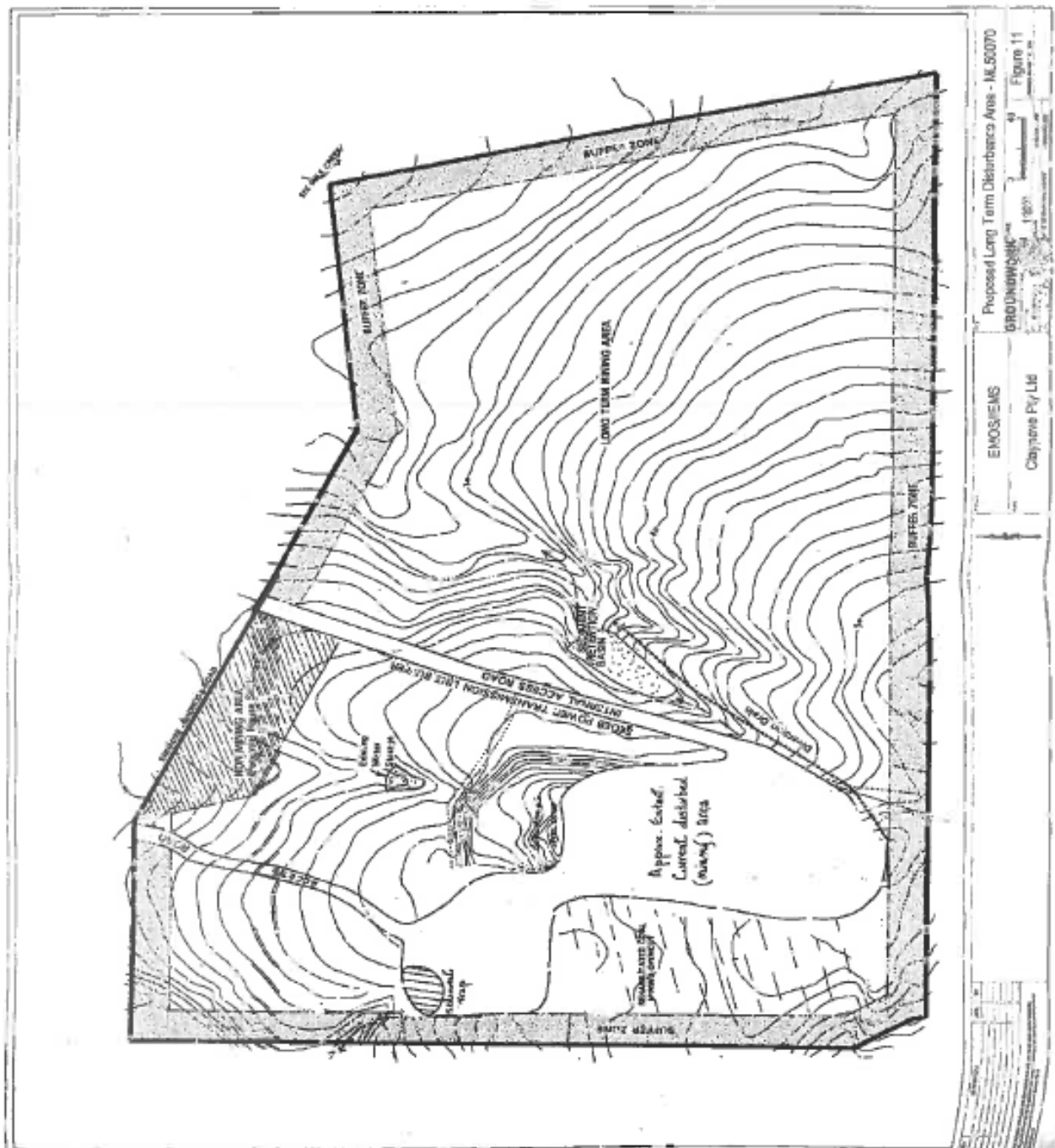
"you" means the registered operator of this environmental authority or owner / occupier of the land which is the subject of this environmental authority.

"waters" includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater and any part thereof.

End of Conditions for Schedule H

Schedule I - Maps / Plans

Figure 1 – ML50070 Buffer Zones.



End of Conditions for Schedule I

END OF ENVIRONMENTAL AUTHORITY

PART B — ATTACHMENTS PRCP SCHEDULE

Appendix 1 – PRCP Schedule
Appendix 2 – EA0001386 – Land Outcome Document
Appendix 3 – Ecological Studies
Appendix 4 – Mine Planning Report

Jackal Renewables Pty Ltd; ML50070

Appendix 3 – Ecological Studies

Ecological Report for Lot 73 on SP128662, 149 Rhondda Road, New Chum

Ardent Group Pty Ltd

31st October 2018



DOCUMENT CONTROL SHEET

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02					
03					
04					

ECOLOGICAL REPORT FOR LOT 73 ON SP128662, 149 RHONDDA ROAD, NEW CHUM

EXECUTIVE SUMMARY

Sticks & Stones Environmental was commissioned by Ardent Group Pty. Ltd., to undertake a vegetation, fauna and flora survey of the location of a proposed development site at Lot 73 on SP128662 (149 Rhondda Road, New Chum). The survey was conducted on September 27th 2018 and found that no conservation significant plants or animals were observed during the survey; and that no Endangered Regional Ecosystems or Threatened Ecological Communities were observed during the survey. It was considered that in general the Lot provides some habitat opportunity for animals, birds and reptiles; however, within the Lot the proposed development site has limited habitat opportunity available, and that it is unlikely that the proposed development will have an adverse impact on any protected plant or animal species or vegetation associations.

Statement of Limitations

This report has been prepared in accordance with the agreement between Ardent Group Pty. Ltd. and Sticks & Stones Environmental.

Within the limitations of the agreed upon scope of services, this work has been undertaken and performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by members of its profession and consulting practice. No other warranty, expressed or implied, is made.

This report is solely for the use of Ardent Group Pty. Ltd. and Jackal Renewables Pty Ltd and any reliance on this report by third parties shall be at such parties' sole risk and may not contain sufficient information for the purposes of other parties or for other uses. This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval with comments are provided by Sticks & Stones Environmental.

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1 INTRODUCTION

1.1 OBJECTIVES AND SCOPE

Sticks & Stones Environmental was commissioned by Ardent Group Pty. Ltd., to undertake a vegetation, fauna and flora survey of the location of a proposed development site at Lot 73 on SP128662 (149 Rhondda Road, New Chum (the Lot)) (the proposed development site) (**Figure 1**). The Lot is zoned RBIA02 - Regional Bus & Industry Investigation (New Chum) and REC - Recreation (**Appendix I**) under the 2006 Consolidated Ipswich City Council Planning Scheme. The Lot largely is co-incident with Mining Lease ML 50070, also held by the land owner and project proponent, Jackal Renewables Pty Ltd.

The scope of this report is as follows:

- Describe the methods used to survey the vegetation associations, flora, fauna and habitat present on site;
- On the basis of desktop and field ecological surveys of the site -
 - Describe the vegetation associations, flora, fauna and habitat present on site, and potentially present on site - with particular reference to vegetation associations, fauna, and flora protected by Commonwealth, State or Local legislation, and demonstrating the presence or absence of Koala on the site;
 - Identify the biodiversity values on and neighbouring the site including important linkages;
 - Describe ecological functionality and habitat values such as hollows, fire scars, nests, canopy size, foraging resources, stags, or fallen timber;
- Analyse the results of the surveys and present the findings;
- Discuss the potential impacts on identified site ecological values, that may be caused by the proposed development;
- Recommend measures to conserve and link important habitat for significant species with potential habitat on the site; and
- Provide a summary of the findings and recommendations for ecological management of the site before, during, and after development activities occur.

1.1.1 The Need for this Survey

The need for this survey has come from the Council information request dated 26 April 2018. The request included;

6. Ecological Report

Aerial photography of the site indicates that approximately 1 hectare of native vegetation along the western property boundary has already been cleared to

accommodate the footprint of this development. This vegetation borders onto a Stream Order 2. Further, Ipswich City Council (ICC) has several koala siting records from nearby locations.

(a) Therefore, in accordance with the TLPI No.1/2018 (Waste Activity Regulation) and the Specific Outcome 1 in Table 12.4.1 of the Ipswich City Council Vegetation Management Code, the applicant is requested to demonstrate how “clearing of vegetation does not cause or exacerbate land degradation within environmentally sensitive areas including steeply sloping land, areas prone to erosion or salinity, riparian corridors, wetlands or water catchment areas”. The applicant is therefore requested to submit a vegetation survey in order to demonstrate compliance with sections 4.3.3 (4)(f); 4.3.3(4)(g) of the Urban Areas Code. (note this reference was subsequently corrected to section 6.7 (j) (a)(d) by ICC.)

1.2 PROPOSED DISTURBANCE

The proposed disturbance is a Material Change of Use - Special Industry (Waste recycling and reprocessing - waste transfer station, crushing, milling or grinding), Minor Utility, Caretakers Residence and Environmentally Relevant Activities (ERA33, ERA61 (B) and ERA62), and involves battering and levelling the existing fibre cement sheet stockpile area and part of the relict mine overburden and topsoil storage area, constructing a ring road, and constructing ancillary infrastructure. The development proposal is shown in **Appendix II**. As far as practical it is intended to use existing roads, tracks and other cleared areas for infrastructure development.

1.3 DESCRIPTION OF THE DEVELOPMENT SITE

The Site

The Lot covers 25.38ha with access frontage on Rhondda Road and frontage to Six Mile Creek to the to the east (**Figure 1**). The Lot is in the New Chum mining area and generally is heavily disturbed with relict open cut pits, excavations, trenches and piles of mine overburden and topsoil (**Plates 1 and 2**). The proposed development will be largely located on an area of reject fibre cement-sheet and fibre cement-sheet by-product (**Plate 3**), and on levelled and battered relict mine overburden stockpiles (**Plates 2 and 10**). The Lot is unequally divided by a power line right of way which also provides a north-south access synonymous with the east part of the proposed ring road (**Figure 1**). The open cut pit and land-fill area is to the west of the power easement - this area generally is the area proposed for development. To the east of the power line right of way, and outside the proposed development footprint, is an active clay pit (**Figure 1, Plate 4**).

Historical aerial photography shows that, although surrounded by active mining, the Lot was largely undeveloped until the early 1980s. Since that time the pit has remained active, unfilled, or otherwise unrehabilitated (**Plates 5, 6 and 7**) [For note, because the ‘QImagery’ rectification process is predominantly automated, the location of the Lot on the aerial photography, as provided by the Queensland Department of State Development, is not precise]. However, it appears that parts of the eastern portion of the Lot were cleared in 1971, but over intervening decades it has started to regenerate. Although aerial photography does not indicate disturbance

on the site until the early 1980s, there is evidence of extensive minor disturbance across the entire site, including excavations, drill holes, temporary camp/accommodation infrastructure, and limited fly tipping.



Plate 1 The Clay-Shale Mine Pit



Plate 2 Acacia and Eucalypt Natural Regeneration on Topsoil Stockpile



Plate 3 Fibre Cement Sheet Stockpile Adjacent to the Clay-Shale Mine Pit



Plate 4 Clay Pit Outside the Proposed Development Area

Adjoining Properties

The Lot is surrounded by mine sites, some of which are still active, some of which are being used for other industrial purposes such as landfill or broadscale industrial activities such as compost preparation, or clay extraction and masonry production; other areas are holding water or are actively or naturally regenerating (**Figure 2**).

A small wetland, assumed to be an inundated mine pit, adjoins the Lot to the north-west, and a larger wetland, also assumed to be a relict mine pit, runs parallel to the southern and western boundaries of the Lot (**Figure 1**). Six Mile Creek, which forms the eastern boundary of the Lot is in the northernmost part of a relatively contiguous corridor that runs from slightly south of Ipswich Motorway to an extensive area of native vegetation south of Centenary Highway (**Figure 3**). However, urban development surrounds the corridor to the east and west, consequently, although of local significance, the corridor along Six Mile Creek has limited regional importance.



Plate 5 QAP 2258 Frame 24 May 1971



Plate 6 QAP 4019 Frame 128 May 1982



Plate 7 QAP 5588 Frame 28 October 1997

2 LEGISLATION AND PLANNING

This Section provides an overview of legislation and agreements that generally apply to development where vegetation needs to be cleared in the Brisbane Region. Reference to any piece of legislation or policy does not infer that that piece of legislation or policy is triggered by the proposed development. The findings of the desktop and field survey will be assessed against the following legislative requirements.

2.1 INTERNATIONAL AGREEMENTS

2.1.1 RAMSAR CONVENTION ON WETLANDS 1971

The aims of the Ramsar Convention on Wetlands 1971 are to halt the worldwide loss of wetlands and to conserve those that remain. The Ramsar Convention encourages the designation of sites containing representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity. Once designated, these sites are added to the Convention's List of Wetlands of International Importance and become known as Ramsar sites. In designating a wetland as a Ramsar site, countries agree to establish and oversee a management framework aimed at conserving the wetland and ensuring its wise use. Australia currently has 65 Wetlands of International Importance listed under the Ramsar Convention.

In Australia, primary responsibility for managing wetlands and their associated flora and fauna is vested in the appropriate landholders or land managers. National Guidelines for Ramsar Wetlands are being developed by the Commonwealth Department of the Environment to facilitate improved management of Ramsar sites in line with Australia's commitments under the Ramsar Convention and responsibilities under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

2.2 COMMONWEALTH LEGISLATION

2.2.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places as defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The nine Matters of National Environmental Significance which the EPBC Act applies to are:

- World heritage properties,
- National heritage places,
- Wetlands of international importance (called 'Ramsar' wetlands),
- Nationally threatened species and ecological communities,
- Migratory species,
- Commonwealth marine areas,

-
- The Great Barrier Reef marine park,
 - Nuclear actions (including uranium mining), and
 - A water resource in relation to coal seam gas development and large coal mining development.

An on-line database, 'EPBC Act Protected Matters Report', provides geospatial information of the sightings or locations of MNES. If MNES are, or are likely, to be affected by a proposed development, the matter must be referred to the Commonwealth Department of the Environment (DotE). On the basis of the Referral, the Commonwealth Minister for the Environment will determine if the project is a 'Controlled Action'. The Referral includes an assessment of the Significance of the Impact on any MNES present, or likely to be present, in the impact area. If an action is considered to be a Controlled Action there may be a requirement to provide offsets under the *EPBC Act Environmental Offsets Policy 2012*.

2.2.2 RED IMPORTED FIRE ANT

Under the EPBC Act the Australian Government, in consultation with the States and Territories and other key stakeholders, has developed a threat abatement plan to provide a national framework to mitigate the potential impact of the group of ants known as tramp ants, including the Red Imported Fire Ant. The National Red Imported Fire Ant Eradication Program is administered in Queensland by Biosecurity Queensland, Department of Agriculture and Fisheries (Section 2.3.8).

2.3 STATE LEGISLATION

2.3.1 VEGETATION MANAGEMENT ACT 1999

Clearing native vegetation in Queensland is regulated by the *Vegetation Management Act 1999* (VM Act), and subordinate legislation, Policies and Codes. The purpose of the VM Act is to regulate the clearing of Endangered, Of Concern and Least Concern Regional Ecosystems (REs), to manage the environmental effects of clearing, to prevent land degradation and loss of biodiversity, and to maintain ecological processes. This is achieved by developing a decision-making framework, preparing Codes which relate to the assessment of vegetation clearing, and protecting some regrowth vegetation in certain circumstances.

Many routine clearing activities can be undertaken under an exemption or by simply notifying the Department of Natural Resources and Mines (DNRM). Whether or not a permit will be needed depends on the type of vegetation, the land tenure of the land, and the location, extent and purpose of the proposed clearing. Self-assessable Codes apply to a range of activities such as fodder harvesting and weed control; the practices listed in the Code must be followed and DNRM must be notified before clearing starts. Area Management Plans which apply to certain clearing activities can be prepared by groups of landholders or rural organisations.

Development approvals may be required if the clearing cannot be conducted under an exemption, self-assessable Code, or Area Management Plan. Any Remnant Vegetation on freehold or leasehold land tenure, and any High Value Regrowth vegetation on leasehold land, may only be cleared under a Development Authority (DA) for Operational Works - Vegetation

Clearing. The application for a DA is assessed against State Development Assessment Provisions (SDAP) Module 8 under the *Sustainable Planning Act 2009* (SP Act).

Geospatially referenced mapping of Remnant Vegetation and Regional Ecosystems is available on-line. The mapping indicates areas of Endangered, Of Concern and Least Concern vegetation under the VM Act; it also indicates areas of High Value Regrowth and of known Essential Habitat.

It is noted that clearing vegetation for a resource activity under the Environmental Protection Act is exempt under Schedule 21, Part 1 (6) of the *Planning Regulation 2017*. Jackal Renewables has advised that the proposed development the subject of the MCU application will be located in an area cleared during the mining activities on ML 50070.

2.3.2 REFERABLE WETLANDS

The map of Referable Wetlands identifies the location of wetland protection areas (WPA) in Great Barrier Reef catchments. The Queensland wetland mapping was produced using existing information including water body mapping derived from Landsat satellite imagery, regional ecosystem mapping, topographic data, and a springs database. The result is a consistent wetland map for the whole of Queensland.

High impact earthworks within WPAs indicated on the map of referable wetlands are regulated under the SP Act. SDAP Module 11 regulates development in and near wetlands in a WPA. Development applications for Material Change of Use, Reconfiguring a Lot or Operational Works involving high impact earthworks either wholly or partly within a WPA are assessed by Local Government or the Department of State Development (DSD) as an assessment manager or referral agency. High impact earthworks include the construction of new drains, placing fill, or constructing levies that will significantly alter the hydrology of a WPA wetland.

2.3.3 NATURE CONSERVATION ACT 1992

Much of Queensland's native wildlife is protected under the *Nature Conservation Act 1992* (NC Act) to ensure its survival and to protect biodiversity. All native birds, reptiles, mammals and amphibians are protected in Queensland, as well as a limited range of invertebrates, freshwater fish, and the grey nurse shark. All plants that are indigenous to Australia are protected. A licensing system helps protect native wildlife from over-exploitation and from the impacts of exotic species. These controls ensure that viable wild populations of plants and animals are maintained and that taking, keeping, using or moving wildlife for commercial, recreational or other purposes is monitored.

In Queensland, all plants that are native to Australia are protected plants under the NC Act. The *Nature Conservation (Wildlife) Regulation 2006* schedules plants and animals that are protected under statutory provisions in Queensland. These include Extinct in the Wild, Endangered, Near Threatened, Vulnerable, Special Least Concern, and Least Concern (EVNT, SLC and LC)

The NC Act endeavours to ensure that protected plants (whole plants or protected plant parts) and protected animals are not illegally removed from the wild, or illegally traded. The *Nature Conservation (Wildlife Management) Regulation 2006* regulates the clearing, growing, harvesting and trade of protected plants in Queensland. In most instances, commonly occurring native plants can be taken and used for a range of commercial, operational and recreational purposes in Queensland without a license or permit. However, a license, permit or authority

may be required to take and use native plants or animals listed as Special Least Concern (SLC), Endangered, Vulnerable or Near Threatened (EVNT) under the *Nature Conservation Act 1992*.

An on-line database, 'Wildlife On-line', provides geospatial information of the sightings of plants and animals. Geospatially referenced mapping of Remnant Vegetation and Regional Ecosystems also indicates areas of known Essential Habitat. The 'Protected Plants Flora Survey Trigger Map' indicates areas of known protected plant habitat. If a proposed impact site falls within the 'Protected Plants Flora Survey Trigger Map' a survey of the site must be done to determine if any EVNT plants are present on that site. ([HTTP://WWW.EHP.QLD.GOV.AU/LICENCES-PERMIT/PLANTS-ANIMALS/PROTECTED-PLANTS/FRAMEWORK-GUIDE.HTML](http://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/framework-guide.html)).

2.3.4 SOUTH-EAST QUEENSLAND KOALA CONSERVATION STATE PLANNING REGULATORY PROVISIONS

The South-East Queensland Koala Conservation State Planning Regulatory Provisions (SPRP) is an overarching state planning instrument that regulates new development at the development assessment stage. The SPRP covers areas of the highest priority for koala conservation action. This incorporates Priority Koala Assessable Development Areas which are made up of the Koala Coast and Pine Rivers areas, and Koala Assessable Development Areas which are made up of areas managed under previous State Koala conservation initiatives.

The SPRP prohibits clearing bushland habitat in the priority areas of Koala Coast and Pine Rivers, and in areas outside the urban footprint. Urban development is also prohibited in conservation, open space, rural and rural-residential zones within the Koala Coast and Pine Rivers areas. This approach aims to support habitat for the koala populations at risk. The SPRP provides requirements for all development activity to minimise its impact on koalas. Depending on the development type and koala habitat type, requirements may include:

- Avoiding, minimising or offsetting clearing non-juvenile koala habitat trees,
- Site design that provides safe koala movement opportunities appropriate to the development type and habitat connectivity values of the site,
- Construction phases that do not increase the risk of death or injury to koalas,
- Clearing native vegetation sequentially, and
- Clearing koala habitat trees in the presence of a koala spotter.

Koala Habitat for South-East Queensland Local Government Authorities includes:

Non-juvenile koala habitat tree means a tree of any of the following genera:

- Angophora,
- Corymbia,
- Eucalyptus,
- Lophostemon,
- Melaleuca,

which is more than 4m high; or has a trunk with a circumference of more than 31.5cm at 1.3m above the ground (*Nature Conservation (Koala) Conservation Plan 2006*).

Essential habitat is an area of essential habitat on the essential habitat map for an animal that is endangered wildlife or vulnerable wildlife or a plant that is endangered wildlife or vulnerable wildlife.

Habitat for koalas as a Matter of State Environmental Significance (MSES).

2.3.5 NATURE CONSERVATION (KOALA) CONSERVATION PLAN 2006 AND MANAGEMENT PROGRAM 2006-2016

The Koala Plan, in relation to planning and development assessment, has now been replaced by the SPRP. Other elements of the Koala Plan, such as policies relating to sequential clearing, use of a koala spotter, the rehabilitation of injured or sick koalas and translocation remain in place. The Koala Conservation Plan established three Koala Districts (A, B and C) (**Plate 8**). The boundaries of the districts have been determined on the basis of the conservation status of the species and the significance of threatening processes affecting the species. Sequential clearing requirements of Koala Habitat Trees defined under the NC Act is in place in Koala Districts A and B, and koala spotters are required in Koala Habitat Areas in district A.

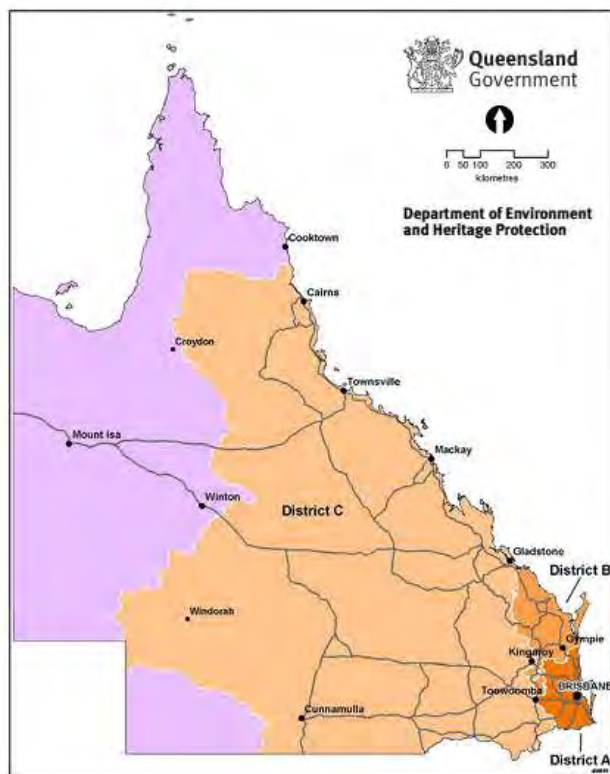


Plate 8 Koala Districts A, B and C (Koala Conservation Plan)

2.3.6 THE *ENVIRONMENTAL OFFSETS ACT 2014* AND SUBORDINATE LEGISLATION

Under a number of existing Queensland laws, if there is an unavoidable impact on significant environmental values, offsets may be required for certain developments. Offset actions, which can include improvement and protection of alternative sites and/or actions that improve environmental viability, can provide a conservation outcome that is equivalent to the environmental value being lost. The *Environmental Offsets Act 2014* (EO Act) is the overarching legislative instrument that administers Environmental Offsets for matters which require offsetting under some Queensland legislation.

The EO Act has provision for Offsets to be provided under the VM Act, the NC Act, the SPRP and the *Fisheries Act 1994*. Section 2.3.1.6 of the Queensland Environmental Offsets Policy (Version 1.1) December 2014 details requirements for offsetting Koala habitat. The EO Act also makes provision for Local Government to nominate Matters of Local Environmental Significance (MLES) and gives Local Governments the authority to require offset arrangements for MLES that may be affected by development or disturbance.

2.3.7 BIOSECURITY ACT 2014

The Queensland *Biosecurity Act 2014* (Biosecurity Act) which commenced in July 2016, refers to 'Designated Biosecurity Matter' which includes pest plants and animals. These are further classified as either 'Prohibited' or 'Restricted':

- Prohibited Matter is biosecurity matter not currently present or known to be present in Queensland. It is prohibited because it may have a significant adverse effect on a biosecurity consideration if it did enter Queensland, and
- Restricted Matter is biosecurity matter found in Queensland that may have adverse effects on a biosecurity consideration if conditions or restrictions under the Act were not imposed.

Prohibited Plants are listed in Schedule 1 Part 3 of the Biosecurity Act, and Prohibited Animals are listed in Schedule 1 Part 4 of the Biosecurity Act. Restricted Plants and Restricted Animals are listed in Schedule 2 Part 2 of the Biosecurity Act.

Restricted Plants and Animals may be allocated one or more 'Categories':

Category 1 includes red imported fire ants, electric ants, Asian honey bees, and certain animal diseases, aquatic diseases and pathogens. Category 1 restricted matter must be reported to an inspector within 24 hours.

Category 2 restricted matter includes certain noxious fish, weeds and pest animals such as spotted gar and red-eared slider turtle. Category 2 restricted matter must be reported to an inspector or authorised person within 24 hours.

Category 3 includes weeds, pest animals and noxious such as: gambusia, dingoes, or yellow crazy ants. This restricted matter must not be distributed: it must not be given as a gift, sold, traded or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit. Deliberate human distribution or disposal contrary to the legislation is a key source of spread into other areas of the state.

Category 4 includes specific weeds, pest animals and noxious fish such as: the bitou bush, feral pig or giant cichlid. To ensure that it does not spread into other areas of the state this restricted matter must not be moved.

Category 5 includes weeds, pest animals and noxious fish such as: Mexican feather grass, rabbits and carp. This restricted matter cannot be possessed or kept under your control. These pests have a high risk of having a negative impact on the environment.

This restricted matter may only be kept under a permit of the *Biosecurity Act 2014* or another Act.

Category 6 includes invasive animals such as: feral deer, foxes, rabbits and wild dogs and noxious fish such as carp, gambusia and tilapia. This category of restricted matter cannot be purposefully or intentionally fed. Feeding this restricted matter may cause their numbers to increase and have a negative impact the economy or the environment. Feeding for the purpose of preparing for or undertaking a control program is exempted.

Category 7 includes noxious fish such as: carp, weatherloach, climbing perch, gambusia and tilapia. These animals may not be kept. They must be killed and the carcass disposed of by burying the whole carcass, with no parts removed, in the ground above the high tide water mark, or by placing it in a waste disposal receptacle.

2.3.8 RED IMPORTED FIRE ANTS

The National Red Imported Fire Ant Eradication Program (NRIFAEP) is a nationally funded program which aims to eradicate this exotic pest (**Section 2.2.2**). In Queensland the NRIFAEP is administered under provisions in the *Plant Protection Act 1989*, and subordinate legislation. Within a High Risk Restricted Area for Red Imported Fire Ants, movement of restricted items is controlled, and an Approved Risk Management Plan or an Inspector's Approval is required to move restricted items from the site. The National Red Imported Fire Ant Eradication Program is administered in Queensland by Biosecurity Queensland, Department of Agriculture and Fisheries.

2.4 IPSWICH CITY COUNCIL PLANNING SCHEME

2.4.1 DESIRED ENVIRONMENTAL OUTCOMES AND PERFORMANCE INDICATORS

The Ipswich City Councils Desired Environmental Outcomes and Performance Indicators under the Ipswich Planning Scheme requires:

The desired environmental outcomes for the Local Government area are as follows—

- (a) the values of significant natural features, including the principal conservation areas are not compromised;
- (b) adverse effects on the natural environment are minimised or prevented with respect to the loss of natural vegetation and associated habitat, soil degradation, air pollution and water pollution owing to erosion, chemical contamination, acidification, salinity, sewage and wastewater treatment, management and effluent disposal and the like...

Performance Indicators listed are:

Where development has occurred, has it—

- (a) adversely affected the significant natural features in the local government area;
- (b) resulted in soil degradation, water pollution, air pollution or inappropriate clearing of natural vegetation.

2.4.2 IMPLEMENTATION GUIDELINE NO. 19 VEGETATION RETENTION

The Ipswich City Councils Implementation Guideline No.19 Vegetation, under the Ipswich Planning Scheme states:

The purpose of this guideline is to create opportunities and provide solutions to retain vegetation on land identified as suitable for development. Where Council accepts that the retention of vegetation is not appropriate or feasible (e.g. on part or all of the site), the development should provide for nil net loss of vegetation in the general locality.

However, the Guideline further states:

The guideline does not apply in respect to land which is zoned for dense forms of development, such as Residential Medium and High Density, Commercial, Retail, Business and Industry and similar zoned areas except where vegetation clearing is proposed within greenfield locations.

Therefore this guideline does not apply to the proposed development (as it is zoned Regional Business and Industry Investigation) and has not been addressed in this report.

Ipswich Planning Scheme - Part 12 Division 4 Vegetation Management Code

The specific outcomes for the management of vegetation are set out in Table 12.4.1 of this Code. Council has advised in the information request that consideration needs to be given to achieving specific outcome 1 of Table 12.4.1, namely *“the clearing of vegetation does not cause or exacerbate land degradation within environmentally sensitive areas including steeply sloping land, areas prone to erosion or salinity, riparian corridors, wetlands or water catchment areas”*.

2.4.3 FACT SHEET NO 4 VEGETATION MANAGEMENT

The Ipswich City Councils Fact Sheet No 4 Vegetation Management, under the Ipswich Planning Scheme summarises Commonwealth and State Government legislation relevant to vegetation clearing, and details Ipswich City Councils vegetation management arrangements. Table 5.1 of the Fact Sheet states that for Regional Business and Industry Investigation zoning, if the clearing is less than 0.5ha in a five year period it is Self-Assessable, however if more than 0.5ha are to be cleared the clearing is Code Assessable and planning approval is required.

3 METHOD

3.1 DESKTOP STUDY

The desktop study drew from information derived from publicly available datasets. The information was collected and collated to provide a detailed overview of Commonwealth, State and Local environmentally significant matters potentially present on site.

A desktop study of Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and potentially present on site, was downloaded from:

[HTTP://WWW.ENVIRONMENT.GOV.AU/WEBGIS-FRAMEWORK/APPS/PMST/PMST-COORDINATE.JSF](http://www.environment.gov.au/webgis-framework/apps/pmst/pmst-coordinate.jsf)
(27/09/2018) (**Appendix III**);

A desktop study of Protected Plants and Animals under the NC Act, and potentially present in the proposed disturbance area was downloaded from:

[HTTPS://ENVIRONMENT.EHP.QLD.GOV.AU/REPORT-REQUEST/SPECIES-LIST/](https://environment.ehp.qld.gov.au/report-request/species-list/) (29/09/2018)
(**Appendix IV**);

Vegetation Management maps and data and the Protected Plants Flora Survey Trigger Map were downloaded from:

[HTTPS://WWW.DNRM.QLD.GOV.AU/QLD/ENVIRONMENT/LAND/VEGETATION/VEGETATION-MAP-REQUEST-FORM](https://www.dnrm.qld.gov.au/QLD/ENVIRONMENT/LAND/VEGETATION/VEGETATION-MAP-REQUEST-FORM) (04/09/2018) and [HTTPS://ENVIRONMENT.EHP.QLD.GOV.AU/MAP-REQUEST/RE-BROAD-VEG-GROUP/](https://environment.ehp.qld.gov.au/map-request/re-broad-veg-group/) (29/09/2018) (**Appendix V**);

State Planning Policy and Development Assessment mapping were viewed on-line, and relevant maps were downloaded from:

[HTTPS://PLANNING.DSDMIP.QLD.GOV.AU/MAPS](https://planning.dsdmip.qld.gov.au/maps) (28/09/2018) (**Appendix VI**);

Archival Aerial Photography was downloaded from:

[HTTPS://QIMAGERY.INFORMATION.QLD.GOV.AU/](https://qimagery.information.qld.gov.au/) (28/09/2018) (**Figures 5, 6 and 7**);

Red Imported Fire Ant Mapping was downloaded from:

[HTTPS://WWW.DAF.QLD.GOV.AU/___DATA/ASSETS/PDF_FILE/0006/1384476/FIRE_ANT_BIOSECURITY_ZONE_MAP.PDF](https://www.daf.qld.gov.au/__DATA/ASSETS/PDF_FILE/0006/1384476/FIRE_ANT_BIOSECURITY_ZONE_MAP.PDF) (**Appendix VII**), and

Ipswich City Council City Plan 2014 mapping - overlays were viewed on-line, and relevant maps were downloaded from:

[HTTP://PDONLINE.IPSWICH.QLD.GOV.AU/PDONLINE/USER/HOME/DEFAULT.ASPX?PAGE=WELCOME](http://pdonline.ipswich.qld.gov.au/pdonline/user/home/default.aspx?page=welcome)
(28/09/2018) (**Appendix I**).

Information on the distribution, ecology, and preferred habitat of EVNT plant species and protected vegetation potentially present on site, was collated, reviewed, and used to determine the field survey methods.

The information collated is summarised in **Section 4.2**, **Section 4.3**, **Section 4.4** and **Section 4.5**, and discussed in **Section 4.6**. The results of the desk-top study were used to focus the ecology field surveys.

3.2 FIELD SURVEY

An ecology, and protected plant survey in accordance with Queensland State Guidelines, and to meet requirements under Ipswich City Council's guidelines, was conducted of the site on the 27th of September 2018 by Sticks & Stones Environmental's Principal Ecologist Michele Deveze.

Michele Deveze has over 25 years' experience in ecological management and assessment. Her area of expertise includes: fauna and flora survey and identification, Regional Ecosystem verification, Biocondition Assessment, and vegetation management planning.

The weather on the day of the survey was warm and generally overcast with a maximum temperature of 27°C and a very light breeze. There had been consistently light and irregular rainfall during the six months preceding the survey, consequently, although the waterbodies surrounding the Lot were well filled, the groundcover and shrubs were generally desiccated, grasses had no inflorescence or seed, and in many instances shrubs were completely or partially defoliated.

3.2.1 VEGETATION SURVEY

The details of all observed shrub and tree species within the proposed development site were recorded during the survey. Collections were made of unfamiliar plants for later identification.

Details including: component species, structure, density, and the predominant height of strata were recorded for all vegetation associations on the proposed development site, and in accordance with Neldner *et al* (2012). The information recorded was used to determine the accuracy of existing vegetation mapping.

3.2.2 PROTECTED PLANT SURVEY

The method employed for the survey followed the preferred method in 'Flora Survey Guidelines - Protected Plants *Nature Conservation Act 1992*' (2014), based on the 'Timed Random Meander' survey method designed by Cropper (1993), and Goff *et al.* (1982).

The ecology of the EVNTs listed as potentially present on site was reviewed (**Table 1**) and descriptions were obtained of each of the species potentially present in the proposed impact area. A record was made of each species observed during the survey (**Table 4**). Any species not able to be identified in the field and any potential threatened species found during the survey were collected for positive identification. The survey ceased when either no new species was recorded for 30 minutes or when the entire area of habitat type was surveyed.

The timed meander method has been demonstrated as a means of discovering threatened and endangered species that have low incidence or an uneven distribution across a site, and as a means of documenting a low probability of occurrence of such species if they have not been found during the procedure (Goff *et al.*, 1982).

3.2.3 FAUNA SURVEY

Information was also collected on fauna observed on site, and signs and indicators of fauna - including scratch marks and faeces, hollows and nests, and other indicators of the presence or use of fauna on site, such as trails, and diggings. The quality of potential terrestrial habitat and connectivity was assessed.

3.2.4 SPOT ASSESSMENT TECHNIQUE SURVEY

The Spot Assessment Technique (SAT) survey method of indirect survey was used to assess the probability and intensity of Koala use of the site. The method quickly establishes presence of Koalas and activity levels within a survey area (Phillips and Callaghan, 2011). The method requires a centre tree to be selected, and a one metre radius around it to be searched for two person minutes for Koala pellets.

3.2.5 WEED AND PEST SURVEY

Other information collected during the survey included the presence, distribution and abundance of weeds and pest plants, and any indication of the presence of feral animals. To complete the vegetation survey, the natural and physical environment, the topography, and soils and geology of the site and the surrounding area was described.

3.3 SURVEY LIMITATIONS

3.3.1 FLORA AND VEGETATION

The Lot is generally heavily disturbed and some parts are inaccessible by foot or vehicle. Much of the generally undeveloped area is scattered with relict earthworks and excavations which provide access hazards. Some parts of the site have a dense and impenetrable Lantana (*Lantana camara**) cover, or are covered with tall rank grasses. Given the access restrictions, a complete survey of the site was not possible.

Generally, the site was very dry. It is possible that cryptic or ground dwelling plant species present may not have been recorded because they were not evident under the weather conditions, or were concealed by dense Lantana or grass growth. Repeat assessments to address seasonality were not included in the survey.

3.3.2 FAUNA

The fauna survey was dependent on direct observation, and observation of tracks, scats or signs and did not employ quantitative ecological assessment techniques, such as fauna trapping. Also, repeat assessments to address seasonality were not included in the survey.

4 RESULTS

4.1 DESKTOP STUDY

The results of the searches described in **Section 3.1** are summarised in **Section 4.2**, **Section 4.3**, **Section 4.4** and **Section 4.5**, and are discussed in **Section 4.6**.

4.2 DESKTOP STUDY – FLORA AND VEGETATION ASSOCIATIONS

The desktop study for flora and vegetation associations is based on the Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (**Appendix III**), the ‘Wildlife On-Line Report’ (**Appendix IV**), and the Vegetation Management Property Report (**Appendix V**).

Three Threatened Ecological Communities (TEC) listed under the EPBC Act were indicated as potentially present on the site (**Appendix III**):

- Lowland Rainforest of Subtropical Australia Critically Endangered Community may occur within the area
- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community Endangered community likely to occur within area
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Community may occur within the area

A small area of mapped Category C Regional Ecosystem (RE) 12.3.3 is mapped in the north-western corner of the Lot, and the proposed development site is generally surrounded by Category C RE 12.9-10.2, 12.9-10.7, and 12.9-10.19. A small area of RE 12.9-10.2 is mapped on the south-eastern part of the proposed development site and extends into the eastern part of the Lot, as does the RE 12.9-10.2, 12.9-10.7 mixed polygon. the mapping for Six Mile Creek and the adjacent creek flats shows Category C Regional Ecosystem (RE) 12.3.3 (**Appendix V**).

RE 12.3.3 (Endangered) is described as:

Eucalyptus tereticornis woodland on Quaternary alluvium

Eucalyptus tereticornis woodland. *Eucalyptus crebra* and *E. moluccana* are sometimes present and may be relatively abundant in places, especially on edges of plains and higher level alluvium. Other species that may be present as scattered individuals or clumps include *Angophora subvelutina* or *A. floribunda*, *Corymbia clarksoniana*, *C. intermedia*, *C. tessellaris*, *Lophostemon suaveolens* and *E. melanophloia*. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000mm/y. (BVG1M: 16c)

Vegetation communities in this regional ecosystem include:

12.3.3a: *Eucalyptus crebra*, *C. tessellaris* woodland to open forest. Other species that may be present as scattered individuals or clumps include *Corymbia clarksoniana*, *Eucalyptus melanophloia*, *E. tereticornis* and *C. citriodora* subsp. *variegata*. Occurs on

high level alluvial plains often of Pleistocene age, terraces and fans where rainfall is usually less than 1000mm/y. Floodplain (other than floodplain wetlands). (BVG1M: 18b)

12.3.3b: [Not in RE version 10.1]²: Open forest to woodland of *Eucalyptus moluccana* and/or *Eucalyptus tereticornis* and *E. crebra*, with a sparse to mid-dense understorey of *Melaleuca irbyana*. Occurs on margins of Quaternary alluvial plains. Floodplain (other than floodplain wetlands). (BVG1M: 13d)

12.3.3c: [Not in RE version 10.1]²: *Melaleuca irbyana* low open forest or thicket. Emergent *Eucalyptus moluccana*, *E. crebra*, *E. tereticornis* or *Corymbia citriodora* subsp. *variegata* may be present. Occurs on Quaternary alluvial plains where drainage of soils is impeded. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 21b)

12.3.3d: *Eucalyptus moluccana* woodland. Other frequently occurring species include *Eucalyptus tereticornis*, *E. crebra*, *E. siderophloia*, *Corymbia citriodora* subsp. *variegata*, *Angophora leiocarpa* and *C. intermedia*. Occurs on margins of Quaternary alluvial plains often adjacent sedimentary geologies. May also occur on stranded Pleistocene river terraces. Floodplain (other than floodplain wetlands). (BVG1M: 13d)

² Superseded: Revision of the regional ecosystem classification removed this regional ecosystem code from use in version 10 RE mapping. It is included in the regional ecosystem description database because the RE code may appear in older versions of RE mapping and regulation.

12.9-10.2 (Least Concern) is described as:

Corymbia citriodora subsp. *variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks

Corymbia citriodora subsp. *variegata* open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis*, *E. moluccana*, *E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b)

12.9-10.7 (Of Concern) is described as:

Eucalyptus crebra +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora* spp., *E. melanophloia* woodland on sedimentary rocks

Eucalyptus crebra +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c)

Vegetation communities in this regional ecosystem include:

12.9-10.7a: *Eucalyptus siderophloia*, *Corymbia intermedia* +/- *E. tereticornis* and *Lophostemon confertus* open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas. (BVG1M: 12a)

12.9-10.19 (Least Concern) is described as:

Eucalyptus fibrosa subsp. *fibrosa* woodland on sedimentary rocks

Eucalyptus fibrosa subsp. *fibrosa* woodland +/- *Corymbia citriodora* subsp. *variegata*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major*. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 12a)

Vegetation communities in this regional ecosystem include:

12.9-10.19a: *Corymbia henryi* and/or *Eucalyptus fibrosa* subsp. *fibrosa* open forest. Other commonly associated species include, *Corymbia citriodora* subsp. *variegata*, *E. carnea*, *E. siderophloia*, *E. crebra* and *E. major*. Occurs in coastal areas on Cainozoic and Mesozoic sediments. (BVG1M: 10b)

Pre-clearing Regional ecosystems mapped for the site include 12.3.3, 12.9-10.2, 12.9-10.7, and 12.9-10.19. (**Appendix V**).

The Vegetation Management Report also indicated that the proposed development site is mapped as a High Risk Area on the Protected Plants Flora Survey Trigger Map (**Appendix V**). Consequently, a Protected Plant survey was conducted in accordance with the Flora Survey Guidelines - Protected Plants prepared under the *Nature Conservation Act 1992*.

EVNT plants listed in the two on-line reports (**Appendix III** and **Appendix IV**) are presented in **Table 1**.

Table 1 EVNT Plant Species Listed in On-Line Data-Searches as Potentially Present on Site and Preferred Habitat

Scientific Name	Common Name	Habit	NCA Status	EPBC Status	EPBC Comment	Preferred Habitat
<i>Bosistoa transversa</i>	Three-leaved Bosistoa, Yellow Satinheart	small tree		Vulnerable	Species or species habitat likely to occur within area	<i>Bosistoa transversa</i> grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude. Associated vegetation includes <i>Argyrodendron trifoliolatum</i> , <i>Syzygium hodgkinsoniae</i> , <i>Endiandra pubens</i> , <i>Dendrocnide photinophylla</i> , <i>Acmena ingens</i> , <i>Diploglottis australis</i> and <i>Diospyros mabacea</i> . HTTP://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?BOSISTOA-TRANSVERSA
<i>Callitris baileyi</i>	Bailey's cypress		Near Threatened			<i>Callitris baileyi</i> grows on rocky slopes, hilly or mountainous areas, in shallow and often clay soils. It is found in eucalypt woodland, commonly associated with ironbark, blue gum and spotted gum. HTTPS://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?CALLITRIS-BAILEYI
<i>Cycas ophiolitica</i>				Endangered	Species or habitat likely to occur within area	<i>Cycas ophiolitica</i> grows on hills and slopes in sparse, grassy open forest at altitude ranges from 80-400 m above sea level. Although this species reaches its best development on red clay soils near Marlborough, it is more frequently found on shallow, stony, infertile soils, which are developed on sandstone and serpentinite, and is associated with species such as <i>Corymbia dallachiana</i> , <i>C. erythrophloia</i> , <i>C. xanthope</i> and <i>Eucalyptus fibrosa</i> . HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=55797
<i>Dichanthium setosum</i>	Bluegrass			Vulnerable	Species or species habitat likely to occur within area	<i>Dichanthium setosum</i> is associated with heavy basaltic black soils and red-brown loams with clay subsoil (NSW OEH 2013a). Associated species include White Box (<i>Eucalyptus albens</i>), Silver-

Scientific Name	Common Name	Habit	NCA Status	EPBC Status	EPBC Comment	Preferred Habitat
						leaved Ironbark (<i>Eucalyptus melanophloia</i>), Yellow Box (<i>Eucalyptus melliodora</i>), Manna Gum (<i>Eucalyptus viminalis</i>), Amulla (<i>Myoporum debile</i>), Purple Wire-grass (<i>Aristida ramosa</i>), Kangaroo Grass (<i>Themeda triandra</i>), Fine-leaved Tussock-grass (<i>Poa sieberiana</i>), Red-leg Grass (<i>Bothriochloa ambigua</i>), Pitted Blue-grass (<i>Bothriochloa decipiens</i>), <i>Macrozamia stenomera</i>, Small Woolly Burr-medic (<i>Medicago minima</i>), Scaly Buttons (<i>Leptorhynchus squamatus</i>), <i>Lomandra</i> aff. <i>longifolia</i>, Australian Bugle (<i>Ajuga australis</i>), Bogan-flea (<i>Calotis hispidula</i>) and <i>Austrodanthonia</i> spp., <i>Dichopogon</i> spp., <i>Brachyscome</i> spp., <i>Vittadinia</i> spp., <i>Wahlenbergia</i> spp. and <i>Psoralea</i> spp. (Ayers <i>et al.</i> 1996; NSW OEH 2013a). <i>Dichanthium setosum</i> is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. It is often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched. The species may tolerate or benefit from disturbance, otherwise, disturbance is indicative of threatening processes in its habitat (NSW OEH 2013a). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=14159

Scientific Name	Common Name	Habit	NCA Status	EPBC Status	EPBC Comment	Preferred Habitat
<i>Eucalyptus curtisii</i>	Plunkett Mallee		Near Threatened			<i>Eucalyptus curtisii</i> has two growth forms that occur in different habitats. The shorter mallee form is more likely to occur as the only eucalypt species on poorly drained lowland sites in shrubland dominated by banksia, with an understorey of heath plants, and sometimes <i>E. conglomerata</i> may also be present. The larger growth form occurs as scattered individuals on better drained soils in the more open areas of mixed eucalypt forests. Commonly associated species include <i>Corymbia citriodora</i> subsp. <i>variegata</i>, <i>C. trachyphloia</i> and <i>Callitris endlicheri</i>, less commonly associated with <i>E. fibrosa</i>, <i>E. planchoniana</i> and <i>E. acmenoides</i>. <i>E. curtisii</i> occurs on sandy podsoils with impeded drainage, shallow stony soils, clay loams and stony clays with a surface layer of loose stones. HTTPS://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?EUCALYPTUS-CURTISII
<i>Hernandia bivalvis</i>	Cudgerie		Near Threatened			<i>Hernandia bivalvis</i> mainly grows in rainforest on rock pavements and outcrops with shallow soils. Most Queensland Herbarium records are from either vine thicket or microphyll vine forest. It occurs up to 620 m altitude. HTTPS://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?HERNANDIA-BIVALVIS
<i>Lilaeopsis brisbanica</i>			Endangered			<i>Lilaeopsis brisbanica</i> grows along tidal riverbanks in grey saline mud, in association with mangrove trees. Although occurring naturally in areas near saline waters, fresh water is satisfactory for the growth of <i>Lilaeopsis brisbanica</i>. HTTPS://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?LILAEOPSIS-BRISBANICA

Scientific Name	Common Name	Habit	NCA Status	EPBC Status	EPBC Comment	Preferred Habitat
<i>Marsdenia coronata</i>	Slender Milkvine		Vulnerable			<i>Marsdenia coronata</i> is restricted to south-east Queensland where it commonly grows in rainforest or moist areas of open forest, especially in eucalypt forest. It has been observed on rainforest margins. Also recorded from an area of natural grassland on the top of Mt Kandanga, Imbil State Forest. The vine has been found between 40 and 780 m asl, and usually occurs on sandstone or stony soils. Associated vegetation includes: eucalypt open forest with <i>Corymbia maculata</i> and <i>Eucalyptus crebra</i>; tall open forest of <i>E. propinqua</i> and <i>E. siderophloia</i> with developing shrubby vineforest understorey; open forest of <i>E. pilularis</i>, <i>E. microcorys</i>, <i>Corymbia intermedia</i>; grassy open forest of <i>E. propinqua</i>, <i>E. carnea</i>, and <i>Themeda</i>; Open, grassy forest 25-30m high of <i>Lophostemon confertus</i>, <i>C. intermedia</i>, <i>E. acmenoides</i>, <i>Casuarina littoralis</i>, <i>Banksia integrifolia</i>; in open forest with <i>E. carnea</i> and <i>E. propinqua</i>; open forest of <i>Eucalyptus siderophloia</i>, <i>E. propinqua</i>, <i>Lophostemon confertus</i>; woodland of <i>E. tindaliae</i> with <i>Corymbia</i> and <i>E. carnea</i> with shrubby understorey dominated by <i>Pultenaea euchila</i>. HTTPS://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?MARSDENIA-CORONATA
<i>Notelaea ipsviciensis</i>	Cooneana Olive		Endangered	Critically Endangered	Species or species habitat likely to occur within area	The Cooneana Olive survives as an understorey plant in degraded, eucalypt dominated dry sclerophyll vegetation communities. Soils in the area are of low fertility, depauperate and sandstone-based. This species prefers open woodland communities with open canopies. The known population is adjacent to subdivided, modified and developed land. HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=81858

Scientific Name	Common Name	Habit	NCA Status	EPBC Status	EPBC Comment	Preferred Habitat
<i>Notelaea lloydii</i>	Lloyd's Olive		Vulnerable	Vulnerable	Species or species habitat likely to occur within area	The species occurs on undulating to hilly terrain either in moist gullies or on gentle to steep dry slopes, but is rarely found on rocky outcrops. Soil types are mostly shallow, well drained and stony to very rocky in texture. Lloyd's Olive is found in the ecotone between eucalypt open forests and vine thickets at 80-480 m above sea level (asl). The more frequent tree species recorded with this species are Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>), Spotted Gum (<i>Corymbia maculata</i>), White Mahogany (<i>E. acmenoides</i>), Lemon-scented gum (<i>C. citriodora</i>) and Curracabah (<i>Acacia concurrens</i>) with associated trees and shrubs of Kurrajong (<i>Brachychiton populneus</i>), Red Ash (<i>Alphitonia excelsa</i>), Brown Salwood (<i>A. aulacocarpa</i>), Burra (<i>A. falcata</i>) and Ebony (<i>Diospyros ferrea</i> var. <i>geminata</i>). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=15002
<i>Phaius australis</i>	Lesser Swamp-orchid	ground orchid		Endangered	Species or species habitat may occur within area	<i>Phaius australis</i> grows in areas where soils are almost always damp, but not flooded for lengthy periods. Sands are generally the underlying soil type. <i>P. australis</i> are usually found in coastal habitats between swamps and forests or in suitable areas further inland. This includes swampy sclerophyll forest dominated by melaleucas, swampy forest that often have sclerophyll emergents, or fringing open forest and melaleuca swamp forest associated with rainforest species. <i>P. australis</i> has also been recorded in wallum, sedgeland, rainforest and closed forest. They often grow in deep shade, but can also occur in full sun. This species occurs at higher altitudes in northern Queensland. HTTP://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?PHAIUS-AUSTRALIS

Scientific Name	Common Name	Habit	NCA Status	EPBC Status	EPBC Comment	Preferred Habitat
<i>Plectranthus habrophyllus</i>			Endangered	Endangered		Plants have been recorded growing on chert or sandstone outcrops, in open woodlands often in shaded situations near vine forest. HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=64589
<i>Samadera bidwillii</i>	Quassia	small shrub or tree		Vulnerable	Species or species habitat likely to occur within area	Lowland rainforest or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland. Quassia is commonly found in areas adjacent to both temporary and permanent watercourses in locations up to 510 m altitude. The species occurs on lithosols, skeletal soils, loam soils, sands, silts and sands with clay subsoils. HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=29708
<i>Thesium australe</i>	Austral Toadflax, Toadflax	erect herb		Vulnerable	Species or species habitat may occur within area	<i>Thesium australe</i> grows in grassland or woodland, often in damp sites. Examples of associated vegetation includes: open woodland with <i>Eucalyptus tereticornis</i> and <i>E. tindaliae</i> on skeletal soils; on heavy alluvium soil in grassy <i>E. populnea</i> woodland; on black cracking clay in grassland of <i>Dichanthium sericeum</i> ; and grassland dominated by <i>Themeda triandra</i> and <i>Heteropogon contortus</i> on basaltic, rocky soils. HTTP://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?THESIUM-AUSTRALE

4.3 DESKTOP STUDY - FAUNA

EVNT fauna listed in the two on-line reports (**Appendix III** and **Appendix IV**) for the proposed development site are presented in **Table 2**. Migratory species protected under international agreements are presented in **Table 3**.

Table 2 EVNT Animal Species Listed in On-Line Data-Searches as Potentially Present on Site and their Preferred Habitat

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
Birds					
<i>Actitis hypoleucos</i>	Common Sandpiper	Special Concern	Least		Salt-water and fresh-water ecosystems The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags (Geering et al. 2007; Higgins & Davies 1996). Foraging environments Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands (Higgins & Davies 1996). Roost sites Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species is known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks (Higgins & Davies 1996).

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=59309
<i>Anthochaera phrygia</i>	Regent Honeyeater		Critically Endangered	Foraging, feeding or related behavior likely to occur within area	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. HTTP://WWW.ENVIRONMENT.NSW.GOV.AU/THREATENEDSPECIESAPP/PROFILE.ASPX?ID=10841
<i>Botaurus poiciloptilus</i>	Australasian Bittern		Endangered	Species or species habitat likely to occur within area	The Australasian Bittern inhabits shallow (less than 30cm deep), permanent freshwater and brackish swamps or lagoons that are densely vegetated (e.g. tall reeds, sedges, lignum). They also inhabit bore drains with tussocky vegetation and occasionally saltmarsh. They use temporary pools when population densities are high and deep swamps when breeding. HTTP://WETLANDINFO.EHP.QLD.GOV.AU/WETLANDS/ECOLOGY/COMPONENTS/SPECIES/?BOTAURUS-POICILOPTILUS
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Special Least Concern			In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, salt pans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgeland and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs (Higgins & Davies 1996). Foraging They forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. They also forage among inundated vegetation of saltmarsh, grass or sedges. They forage in sewage ponds, and often in hypersaline environments. After rain, they may forage in paddocks of short grass, well away from water. They may forage on coastal mudflats at low tide, and move to freshwater wetlands near the coast to feed at high tide. Occasionally they forage on wet or dry mats of algae and among rotting beachcast seagrass or seaweed, and sometimes they are recorded foraging around the edges of stony wetlands or among rocks in water, and rarely on exposed reef (Higgins & Davies 1996). Roosting Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh. Occasionally, they roost on sandy beaches, stony shores or on rocks in water (Higgins & Davies 1996). They have also been recorded roosting in mangroves (Minton & Whitelaw 2000). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=874

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
<i>Calidris ferruginea</i>	Curlew Sandpiper		Critically Endangered	Species or species habitat known to occur within area	Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. HTTP://WWW.ENVIRONMENT.GOV.AU/BIODIVERSITY/THREATENED/SPECIES/PUBS/856-CONSERVATION-ADVICE.PDF
<i>Cuculus optatus</i>	Oriental Cuckoo	Special Least Concern			It mainly inhabits forests, occurring in coniferous, deciduous and mixed forest. It feeds mainly on insects and their larvae, foraging for them in trees and bushes as well as on the ground. It is usually secretive and hard to see. HTTPS://EN.WIKIPEDIA.ORG/WIKI/ORIENTAL_CUCKOO
<i>Dasyornis brachypterus</i>	Eastern Bristlebird		Endangered	Species or species habitat may occur within area	Habitat occurs in open forest with dense tussocky grass understorey and sparse mid-storey near rainforest ecotone; all of these vegetation types are fire prone. HTTP://WWW.ENVIRONMENT.NSW.GOV.AU/THREATENEDSPECIESAPP/PROFILE.ASPX?ID=10206
<i>Erythrotriorchis radiatus</i>	Red Goshawk	Endangered	Vulnerable	Species or species habitat likely to occur within area	Found in coastal and sub-coastal areas with tall open forest, woodland, lightly treed savannah and at the edge of rainforest. However, the breeding habitat is much more specific, with nesting only occurring in very tall trees, close to water. HTTP://WWW.ARKIVE.ORG/RED-GOSHAWK/ERYTHROTRIORCHIS-RADIATUS/
<i>Gallinago hardwickii</i>	Latham's Snipe, Japanese Snipe	Special Least Concern			In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level (Chapman 1969; Naarding 1981). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands,

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					around bogs and other water bodies) (Frith et. al. 1977; Naarding 1983; Weston 2006, pers. comm.). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (Frith et al. 1977; Naarding 1983). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=863
<i>Geophaps scripta</i>	Squatter Pigeon (southern)		Vulnerable	Species or species habitat may occur within area	Their habitat is dominated by a canopy of Eucalyptus, Corymbia, Acacia or Callitris species. They can also be found in regrowth or partially modified vegetation. Squatter pigeons are only found within 3 km of a water body or water course, and when breeding must be within 1 km. Their breeding habitat is in well-drained gravelly, sandy or loamy soil, where they nest in a shallow depression lined with grass and leaves. HTTP://REEFCATCHMENTS.COM.AU/SPECIES_ECOSYSTEMS/SQUATTER-PIGEON-SOUTHERN/
<i>Grantiella picta</i>	Painted Honeyeater		Vulnerable	Species or species habitat may occur within area	Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema. Insects and nectar from mistletoe or eucalypts are occasionally eaten. HTTPS://WWW.ENVIRONMENT.NSW.GOV.AU/THREATENEDSPECIESAPP/PROFILE.ASPX?ID=10357
<i>Hirundapus caudacutus</i>	White Throated Needletail	Special Least Concern			In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground (Coventry 1989; Tarburton 1993; Watson 1955). Because

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					they are aerial, it has been stated that conventional habitat descriptions are inapplicable (Cramp 1985), but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland (Higgins 1999). They also commonly occur over heathland (Cooper 1971; Learmonth 1951; McFarland 1988), but less often over treeless areas, such as grassland or swamps (Cooper 1971; Gosper 1981; Learmonth 1951). When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (Emison & Porter 1978; Friend 1982; Tarburton 1993). In coastal areas, they are sometimes seen flying over sandy beaches or mudflats (Cooper 1971; Crompton 1936; Davis 1965), and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes (Cooper 1971; Dawson et al. 1991; Loyn 1980; Mitchell et al. 1996; Schulz & Kristensen 1994). They are sometimes recorded above islands well out to sea (Brandis et al. 1992; Cooper 1971; Warham 1957). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=682
<i>Lathamus discolor</i>	Swift Parrot	Endangered	Critically Endangered	Species or species habitat may occur within area	On the mainland, it lives in eucalypt forest and woodlands, mainly box-ironbark habitats on the inland slopes of the Great Dividing Range. In some years, urban landscapes containing indigenous or non-local flowering eucalypts are also readily used. The importance of larger trees as a food source has been shown in this species' breeding range and wintering range, as such trees tend to offer a more reliable

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					and abundant source of nectar. HTTP://WWW.BIRDLIFE.ORG/DATAZONE/SPECIESFACTSHEET.PHP?ID=1488
<i>Limosa limosa</i>	Black Tailed Godwit	Special Least Concern			In Australia the Black-tailed Godwit has a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. The use of habitat often depends on the stage of the tide. It is also found in shallow and sparsely vegetated, near-coastal, wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains. There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflows. They also use lagoons in sewage farms and saltworks (Higgins & Davies 1996). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=845
<i>Monarcha melanopsis</i>	Black-faced Monarch	Special Least Concern			The Black-faced Monarch is found in rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating. HTTP://WWW.BIRDSINBACKYARDS.NET/SPECIES/MONARCHA-MELANOPSIS
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Special Least Concern			Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests (Blakers et al. 1984; Emison et al. 1987; Officer 1969). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=612
<i>Ninox strenua</i>	Powerful Owl	Vulnerable			The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine <i>Syncarpia glomulifera</i>, Black She-oak <i>Allocasuarina littoralis</i>, Blackwood <i>Acacia melanoxylon</i>, Rough-barked Apple <i>Angophora floribunda</i>, Cherry Ballart <i>Exocarpus cupressiformis</i> and a number of eucalypt species. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds that harass him. HTTPS://WWW.ENVIRONMENT.NSW.GOV.AU/THREATENEDSPECIESAPP/PROFILE.ASPX?ID=10562
<i>Numenius madagascariensis</i>	Eastern Curlew	Vulnerable	Critically Endangered		During the non-breeding season in Australia, the eastern curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (Zosteraceae). Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves. The birds are also found in coastal salt works and sewage farms. HTTP://WWW.ENVIRONMENT.GOV.AU/BIODIVERSITY/THREATENED/SPECIES/PUBS/847-CONSERVATION-ADVICE.PDF

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
<i>Phaethon lepturus</i>	White-Tailed Tropicbird	Special Least Concern			At the species level, the White-tailed Tropicbird occupies marine habitats in tropical waters with sea-surface temperatures of more than 22°C. The tropicbird breeds on islands and atolls, where it nests in a variety of habitats including on bare sandy ground, in closed-canopy rainforest, on rocky cliffs and in quarries. In Australia, the White-tailed Tropicbird (Indian Ocean) nests in <i>Pisonia</i> trees amongst <i>Pisonia</i> -coconut vegetation, and on sandy ground. HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=66986
<i>Plegadis falcinellus</i>	Glossy Ibis	Special least Concern			The Glossy Ibis' preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons (del Hoyo et al. 1992; Hancock et al. 1992; Marchant & Higgins 1990). Within Australia, the largest contiguous areas of prime habitat is inland and northern floodplains. The Glossy Ibis is commonly in largest numbers in drying Top End grass/sedge swamps and Channel Country grass/forb meadows. The species is sometimes recorded in wooded swamps, artificial wetlands (such as irrigated fields), and in mangroves for breeding (Chatto 2000; Marchant & Higgins 1990). The species may retreat to permanent wetlands and/or coastal areas (including tidal wetlands) during drought (Marchant & Higgins 1990). Glossy Ibis roost in trees or shrubs usually near, but sometimes far, from water bodies (Brown et al. 1982; Marchant & Higgins 1990). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=991

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
<i>Poephila cincta</i>	Southern Black-throated Finch		Endangered	Species or species habitat may occur within area	The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by <i>Eucalyptus</i> , <i>Corymbia</i> and <i>Melaleuca</i> , and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water (Baldwin 1976; Britton & Britton 2000; BTF Recovery Team 2004; Ley & Cook 2001; NRA 2005; Wieneke 1989). Almost all recent records of the finch from south of the tropics have been in riparian habitat (Baldwin 1976; BTF Recovery Team 2004; Ley & Cook 2001). The subspecies is thought to require a mosaic of different habitats in which it can find seed during the wet season (Mitchell 1996). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=64447
<i>Rhipidura rufifrons</i>	Rufous Fantail	Special Least Concern			In east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (<i>Eucalyptus microcorys</i>), Mountain Grey Gum (<i>E. cypellocarpa</i>), Narrow-leaved Peppermint (<i>E. radiata</i>), Mountain Ash (<i>E. regnans</i>), Alpine Ash (<i>E. delegatensis</i>), Blackbutt (<i>E. pilularis</i>) or Red Mahogany (<i>E. resinifera</i>); usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; for example near Bega in south-east NSW, where they are recorded in temperate Lilly Pilly (<i>Acmena smithi</i>) rainforest, with Grey Myrtle (<i>Backhousia myrtifolia</i>), Sassafras (<i>Doryphora sassafras</i>) and Sweet Pittosporum (<i>Pittosporum undulatum</i>) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including Spotted Gum (<i>Eucalyptus maculata</i>), Yellow Box (<i>E. melliodora</i>), ironbarks or stringybarks,

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					often with a shrubby or heath understorey. They are also recorded from parks and gardens when on passage. In north and north-east Australia, they often occur in tropical rainforest and monsoon rainforests, including semi-evergreen mesophyll vine forests, semi-deciduous vine thickets or thickets of Paperbarks (<i>Melaleuca</i> spp.) (Higgins et al. 2006). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=592
<i>Rostratula australis</i>	Australian Painted Snipe	Vulnerable	Endangered	Species or species habitat likely to occur within area	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. HTTP://WWW.ENVIRONMENT.NSW.GOV.AU/THREATENEDSPECIESAPP/PROFILE.ASPX?ID=10734
<i>Sternula albifrons</i>	Little Tern	Special Least Concern			In Australia, Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches. Little Terns are widespread on islands off the Northern Territory coast but appear to be less often on offshore continental islands or coral cays off Queensland (Chatto 2001; Higgins & Davies 1996; Hill et al. 1988; Johnstone & Storr 1996; NSW National Parks and Wildlife Service 2003). In the Northern Territory, Little Terns are commonly seen in sandy coastal habitats and in mangrove-mudflat habitats along the coast or in bays and estuaries, but not recorded on wetlands more than 1 km from the coast (Chatto 2001). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=813
<i>Tringa nebularia</i>	Common Greenshank, Greenshank	Special Least Concern			The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts (<i>Himantopus himantopus</i>) in pasture, but are generally not found in dry grassland (Higgins & Davies 1996). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=832
<i>Turnix melanogaster</i>	Black-breasted Button-quail	Vulnerable	Vulnerable	Species or species habitat likely to occur within area	The Black-Breasted Buttonquail inhabits rainforests and forests. They prefer forest with an annual rainfall of 770 - 1,200 mm, a largely closed canopy and a deep layer of leaf litter. However, they can also be found in low, dense thickets, of the flowering plant Lantana, and in vegetation behind sand dunes. HTTP://WWW.ARKIVE.ORG/BLACK-BREASTED-BUTTONQUAIL/TURNIX-MELANOGASTER/
Mammals					
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat		Vulnerable	Species or species habitat likely to occur within area	Sandstone cliffs and fertile woodland valley habitat within close proximity of each other is habitat of importance to the Large-eared Pied Bat. Rainforest and moist eucalypt forest habitats on other geological substrates (rhyolite, trachyte and basalt) at high elevation are of similar importance to the species.

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=183
<i>Dasyurus hallucatus</i>	Northern Quoll		EWndangered	Species or species habitat may occur within area	This quoll species is most abundant in rocky ranges and open eucalypt forest.
<i>Dasyurus maculatus maculatus</i>	Spotted-tail Quoll		Endangered	Species or species habitat likely to occur within area	The Spot-tailed Quoll has a preference for mature wet forest habitat, especially in areas with rainfall 600 mm/year. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This subspecies has been recorded from a wide range of habitats, including: temperate and subtropical rainforests in mountain areas, wet sclerophyll forest, lowland forests, open and closed eucalypt woodlands, inland riparian and River Red Gum (<i>Eucalyptus camaldulensis</i>) forests, dry 'rainshadow' woodland, sub-alpine woodlands, and coastal heathlands. HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=75184
<i>Petauroides volans</i>	Greater Glider	Vulnerable	Vulnerable	Species or species habitat likely to occur within area	It is a strictly nocturnal, and largely solitary, arboreal species of various undisturbed eucalypt-dominated woodland and forest habitat types. It does not inhabit rainforest or pine plantations. It requires large tree hollows so it is therefore dependent on mature forest. HTTP://WWW.IUCNREDLIST.ORG/DETAILS/40579/0
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby		Vulnerable	Species or species habitat may occur within area	This species prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks (Murray et al. 2008; Short 1982). It also utilises tree limbs (Maxwell et al. 1996; Sharman & Maynes 1983). While it appears that most Brush-tailed Rock-wallaby colonies are on north-facing slopes and cliff lines (Short 1982), colonies have been found on south-facing

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					cliffs in Kangaroo Valley (Kutzner & Dodd 1996; Wong 1997), in the Macleay River Gorge (Bayne 1994), in the Warrumbungles and at Mt Kaputar (Soderquist undated, pers. comm., cited in NSW NPWS 2003a), although usually in lower densities. Rocky outcrops appear crucial to current habitat selection by rock-wallabies, however, vegetation structure and composition is also considered to be an important factor (Bugg 1995; Lim & Giles 1987; Pearson 1992). In many parts of their range, including at the Warrumbungles, rock-wallabies are closely associated with dense arboreal cover, especially fig trees (NSW NPWS 2003a). The vegetation on and below the cliff appear to be important to this species as a source of food and shelter and in some cases may provide some protection from predation (Wong 1993; 1997). A range of vegetation types are associated with Brush-tailed Rock-wallaby habitat, including dense rainforest, wet sclerophyll forest, vine thicket, dry sclerophyll forest, and open forest (Murray et al. 2008). HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=225
<i>Phascolarctos cinereus</i> (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian	Vulnerable	Vulnerable	Species or species habitat known to occur within area	Koalas occupy forests and woodlands where there are acceptable food trees. They are largely nocturnal and feed almost exclusively on eucalypts, but preferred food tree species vary with locality and there are quite distinct regional preferences. They are able to persist in fragmented habitats, and even survive in isolated trees across a predominantly agricultural landscape. HTTP://WWW.IUCNREDLIST.ORG/DETAILS/16892/0

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
	Capital Territory)				
<i>Potorous tridactylus</i>	Long-nosed Potoroo (SE mainland)		Vulnerable	Species or species habitat may occur within area	Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature. HTTP://WWW.ENVIRONMENT.NSW.GOV.AU/THREATENEDSPECIESAPP/PROFILE.ASPX?ID=10662
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox		Vulnerable	Foraging, feeding or related behaviour known to occur within area	Urban areas, forests and woodlands, intertidal mangroves. HTTP://AUSTRALIANMUSEUM.NET.AU/GREY-HEADED-FLYING-FOX Occurs in “subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps. Urban gardens and cultivated fruit crops also provide habitat for this species. HTTP://WWW.ENVIRONMENT.NSW.GOV.AU/RESOURCES/NATURE/TSPFILEGREYHEADEDFLYINGFOX.PDF
<i>Tachyglossus aculeatus</i>	Short Beaked Echidna	Special Least Concern			In Australia, they are most common in forested areas with abundant, termite-filled, fallen logs. In agricultural areas, they are most likely to be found in uncleared scrub; they may be found in grassland, arid areas, and in the outer suburbs of the capital cities. HTTPS://EN.WIKIPEDIA.ORG/WIKI/SHORT-BEAKED_ECHIDNA
Amphibians					
<i>Adelotus brevis</i>	Tusked Frog	Vulnerable			Inhabits wet eucalypt forest, rainforest, and sometimes dry eucalypt forest, where it can be found in close proximity to suitable breeding habitat such as ponds and slow-moving sections of streams (Cogger 2000; Meyer et al. 2001; Hines 2012)

Scientific Name	Common Name	NCA Status	EPBC Status	EPBC Comments	Preferred Habitat
					HTTPS://WWW.QLD.GOV.AU/ENVIRONMENT/ASSETS/DOCUMENTS/PLANTS-ANIMALS/BIODIVERSITY/TUSKED-FROG.PDF
Insects					
<i>Argynnis hyperbius inconstans</i>	Australian Fritillary		Critically Endangered	Species or species habitat may occur within area	The Australian fritillary usually occurs around river estuaries or open, swampy coastal regions. While the Australian fritillary has been successfully reared on <i>Viola hederaceae</i> in captivity, the subspecies is believed to be host-plant specific in the wild and therefore only occurs in areas where its larval food plant, the arrowhead violet, occurs. The arrowhead violet is a small perennial herb which usually grows in damp niches in open habitats. It often grows beneath grasses and other plants, often in association with <i>Lomandra longifolia</i> (long leaved matrush) and <i>Imperata cylindrica</i> (bladey grass). HTTP://WWW.ENVIRONMENT.GOV.AU/BIODIVERSITY/THREATENED/SPECIES/PUBS/88056-CONSERVATION-ADVICE-15082017.PDF
Reptiles					
<i>Delma torquata</i>	Collared Delma		Vulnerable	Species or species habitat may occur within area	This species occurs on rocky outcroppings in dry, open eucalyptus-acacia woodlands with an under-storey of grass and shrubs. It is known to inhabit leaf litter and has also been found under logs and stones. HTTP://WWW.IUCNREDLIST.ORG/DETAILS/6317/0
<i>Furina dunmalli</i>	Dunmall's Snake		Vulnerable	Species or species habitat may occur within area	A broad range of habitats, including: Forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow (<i>Acacia harpophylla</i>), other Wattles (<i>A. burowii</i> , <i>A. deanii</i> , <i>A. leioclyx</i>), native Cypress (<i>Callitris</i> spp.) or Bull-oak (<i>Allocasuarina luehmannii</i>); and various Blue Spotted Gum (<i>Corymbia citriodora</i>), Ironbark (<i>Eucalyptus crebra</i> and <i>E. melanophloia</i>), White Cypress Pine (<i>Callitris glaucophylla</i>) and Bulloak open forest and woodland associations on sandstone derived soils. HTTP://WWW.ENVIRONMENT.GOV.AU/CGI-BIN/SPRAT/PUBLIC/PUBLICSPECIES.PL?TAXON_ID=59254

Table 3 Migratory Species Protected Under International Agreements Potentially Present on Site

Scientific Name	Common Name	EPBC Status	Comments
Migratory Marine Birds			
<i>Apus pacificus</i>	Fork-tailed Swift	Vulnerable	Species or species habitat likely to occur within area
Migratory Terrestrial Species			
<i>Cuculus optatus</i>	Oriental Cuckoo, Horsfield's Cuckoo		Species or species habitat may occur within area
<i>Hirundapus caudacutus</i>	White-throated Needletail		Species or species habitat known to occur within area
<i>Monarcha melanopsis</i>	Black-faced Monarch		Species or species habitat known to occur within area
<i>Monarcha trivirgatus</i>	Spectacled Monarch		Species or species habitat known to occur within area
<i>Myiagra cyanoleuca</i>	Satin Flycatcher		Species or species habitat known to occur within area
<i>Rhipidura rufifrons</i>	Rufous Fantail		Species or species habitat known to occur within area
Migratory Wetlands Species			
<i>Actitis hypoleucos</i>	Common Sandpiper		Species or species habitat may occur within area
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper		Species or species habitat may occur within area
<i>Calidris ferruginea</i>	Curlew Sandpiper	Critically Endangered	Species or species habitat may occur within area
<i>Calidris melanotos</i>	Pectoral Sandpiper		Species or species habitat may occur within area
<i>Gallinago hardwickii</i>	Latham's Snipe, Japanese Snipe		Species or species habitat may occur within area
<i>Numenius madagascariensis</i>	Eastern Curlew, Far Eastern Curlew	Critically Endangered	Species or species habitat may occur within area
<i>Pandion haliaetus</i>	Osprey		Species or species habitat known to occur within area

Scientific Name	Common Name	EPBC Status	Comments
<i>Tringa nebularia</i>	Common Greenshank,		Species or species habitat likely to occur within area

4.4 DESKTOP STUDY - OTHER STATE GOVERNMENT MATTERS

4.4.1 VEGETATION MANAGEMENT PROPERTY REPORT - ESSENTIAL HABITAT

The Vegetation Management Property Report (**Appendix V**) shows almost all of the Lot and most of the vegetated area in the proposed development site as Essential Habitat. Species listed in the Report are: *Phascolarctos cinereus* (Koala), *Petauroides Volans* (Greater Glider), *Ninox strenua* (Powerful Owl), *Notelaea ipsviciensis* (Cooneana Olive), and *Marsdenia coronata* (Slender Milkvine).

4.4.2 SPP BIODIVERSITY.

The SPP Biodiversity mapping (**Appendix VI**) indicated that there is wildlife habitat, regulated vegetation (Category C), and regulated vegetation intersecting a watercourse on the proposed development site. The area of regulated vegetation is synonymous with that marked in the Vegetation Management Property Report (**Section 4.2**). A part of the Category B area to the east of the power-line easement is mapped as Essential Habitat; this area is not consistent with the area mapped as Essential Habitat in the Vegetation Management Property Report.

4.4.3 DA VEGETATION MAPPING

The DA Vegetation mapping (**Appendix VI**) shows Category C Regulated Vegetation and Essential Habitat on the proposed development site. The area of regulated vegetation is synonymous with that marked in the Vegetation Management Property Report (**Section 4.2**). The Essential Habitat area is inconsistent with the wildlife habitat area mapped in the SPP Biodiversity mapping but is consistent with that marked in the Vegetation Management Property Report.

4.4.4 SPP BUSHFIRE HAZARD.

The SPP Natural Hazard mapping (**Appendix VI**) indicates that there is Medium and High Potential Bushfire Intensity Hazard and Potential Impact Buffer mapped on or adjacent to the proposed development site. The Bushfire Hazard area is associated with the mapped native vegetation cover, generally with High Potential Bushfire Intensity Hazard in the Category A or B Regulated Vegetation areas, and the Medium Potential Bushfire Intensity Hazard correlates with the Category C Regulated Vegetation.

4.4.5 RED IMPORTED FIRE ANTS.

The site is in Fire Ant Biosecurity Zone 1 (**Appendix VII**). To move soil from a property within Biosecurity Zone 1 you must have a Biosecurity Instrument Permit unless the soil remains within Zone 1 or the soil is moved to a waste facility within Zone 1 or Zone 2. To move mulch, manure, baled hay or straw, potted plants or turf or other fire ant carriers such as mining or quarrying products or compost, from a property within biosecurity Zone 1 you must either follow procedures outlined in the *Biosecurity Regulation 2016*; or move the material to a waste facility within Zone 1 or 2; or move the material within 24 hours of being

on the property. If you are unable to fulfil the above conditions then you must request a Biosecurity Instrument Permit from an inspector.

4.5 DESKTOP STUDY - IPSWICH CITY COUNCIL PLANNING SCHEME

The Planning Scheme Property Report (**Appendix I**) shows the subject Lot as RBIA02 - Regional Bus & Industry Investigation (New Chum) and REC - Recreation. The Property Report and mapping did not show any ecological attributes or bushfire hazard for the proposed development site and surrounding areas.

4.6 DESKTOP STUDY DISCUSSION

Fourteen plant species listed as Endangered, Vulnerable or Near Threatened under State and/or Commonwealth Legislation were indicated for the site (**Table 1**), and 26 bird species, ten mammal species, one amphibian, one insect and two reptile species listed in State and/or Commonwealth legislation as Endangered, Vulnerable, Near Threatened or Special Least Concern conservation status, were indicated as potentially present on site (**Table 2**). Another 15 migratory bird species, protected under international conventions, were also indicated as potentially present on site.

With the exception of the existing excavation and fill sites, the Lot is generally covered with *Vegetation Management Act 1999* regulated remnant vegetation, however, with the exception of the north-east corner the Lot is vegetated with Category C vegetation. The majority of the mapped vegetation on the proposed development site is vegetated with Category C Of Concern vegetation, however the north-west corner is mapped as Category C Endangered vegetation. The entire Lot is mapped as a Protected Plant Survey Trigger Area.

The State Planning Policy mapping shows a Matter of State Environmental Significance - 'regulated vegetation intersecting a watercourse' generally in the location of the power-line easement and associated track, however the Property Vegetation Management Report describes this only as 'watercourse and drainage features on the vegetation management watercourse and drainage features map'.

The Vegetation Mapping and the DA mapping indicate almost all of the Lot and most of the vegetated area in the proposed development site as Essential Habitat, while the SPP Biodiversity Mapping only indicates the north-west corner and the Category B area to the east of the power-line easement, part of which is also mapped on the SPP Biodiversity Mapping, as Essential Habitat.

The State Planning Policy mapping show the Lot and adjoining areas to be Medium and High Potential Bushfire Intensity Hazard and Potential Impact Buffer however the Ipswich City Council mapping shows no Bushfire Hazard in or near the proposed development site (**Appendix VI**).

5 RESULTS - FIELD STUDY

5.1 FIELD SURVEY - VEGETATION ASSOCIATIONS

The field survey traverse is illustrated in **Figure 4** and a list of all plant species recorded during the survey is presented in **Table 4**. There are numerous mature trees on the Lot; however, the majority are to the east of the power-line right of way and are outside the proposed development area. Historic aerial imagery indicates that the proposed development site remained generally vegetated until the 1980s, when the existing mine was established on the site, however the eastern creek flats were cleared in the 1970s and have gradually regenerated over the intervening years (Habitat Area 5 on **Figure 4**).

The proposed development site is very degraded and heavily disturbed. A large portion of the site has been raised by stockpiling of fibre cement sheet (**Plate 3**), and the area immediately adjacent and to the east of this is an existing open cut mine (**Plate 1**). The area under the power lines is clear of woody vegetation and is used as a road (**Plate 9**). The area to the south-west of the existing disturbance appears to comprise stockpiled topsoil (**Plate 2**) and mine overburden (**Plate 10**), and is supporting naturally regenerated vegetation comprising almost entirely of *Acacia disparrima* with a few scattered juvenile *Eucalyptus fibrosa* (Habitat Area 3 on **Figure 4**).



Plate 9 Cleared Road Under Power-Line Easement



Plate 10 Acacia Growing on Relict Mine Spoil

The area to the north-west and to the north-east of the proposed development site is supporting better developed and more intact native vegetation (Habitat Area 1 and 2 on **Figure 4**), however the site is evidently very disturbed with indications of minor excavations through the vegetation, and areas of domestic and industrial fly tipping. There is a small amount of dead timber on the ground, sufficient to provide habitat for small reptiles.

Dominant and structural species recorded in this area include:

Corymbia citriodora subsp. *variegata*
Corymbia intermedia
Corymbia tessellaris
Eucalyptus acmenoides
Eucalyptus crebra
Eucalyptus fibrosa
Eucalyptus major
Eucalyptus moluccana
Eucalyptus tereticornis
Lophostemon confertus
Lophostemon suaveolens

The area to the north-east of the proposed development site mapped as supporting the Endangered Regional Ecosystem 12.3.3 has been inundated and the Eucalypts are all dead although most are still

standing (Habitat Area 1a on **Figure 4**). The inundation appears to have occurred many years ago, possibly as a result of change to flow regimes during historical mining activities.

Within the constraints of allocating regenerating heavily disturbed vegetation to a Regional Ecosystem, the vegetation to the north and east of the proposed development site best meets the description of 12.9-10.19 (Least Concern) and 12.9-10.2 (Least Concern).

Approximately 87 Eucalypt, Corymbia and Lophostomen trees with a diameter over bark at breast height (DBHOB) of 20cm or greater were recorded in the vicinity of the development site. Because of access constraints, the tree count is not precise and trees were not marked. It is understood that the majority of the clearing for the proposed development will occur in the area immediately to the south and west of the existing disturbance. This area generally comprises relict spoil heap from earlier mining operations, and is predominantly vegetated with regrowth Acacia (Habitat Area 3 on **Figure 4**).

It is not anticipated that 87 trees will be cleared for the proposed development - the only clearing that is planned for the area to the north and east of the existing disturbance, where the trees are larger, is widening and forming the existing road around the proposed disturbance site. When a final site layout is confirmed, an accurate survey of all Eucalypt, Corymbia, Lophostomen and Angophora trees larger than 20cm DBHOB in the disturbance footprint will be conducted, and subsequently this report will be updated.

Table 4 Terrestrial Plants Recorded during the Survey

Species	Common Name	Exotic	Biosecurity Act Listing	WONs
<i>Acacia amblygona</i>				
<i>Acacia complanata</i>	Flat Stemmed Wattle			
<i>Acacia disparrima</i>	Hickory Wattle			
<i>Acacia fimbriata</i>	Brisbane Wattle			
<i>Acacia spectabilis</i>	Glory Wattle			
<i>Ageratum houstonianum</i> *	Billy goat weed	*		
<i>Allocasuarina torulosa</i>	Forest Oak			
<i>Alphitonia excelsa</i>	Pink Ash			
<i>Asparagus aethiopicus</i> *	Sprenger Fern	*	Restricted Invasive 3	WoNS
<i>Baccharis halimifolia</i> *	Groundsel	*	Restricted Invasive 3	
<i>Breynia oblongifolia</i>				
<i>Bryophyllum delagoense</i> syn. <i>Bryophyllum tubiflorum</i> , (<i>Kalanchoe delagoensis</i>)	Mother Of Millions	*	Restricted Invasive 3	
<i>Casuarina glauca</i>	Swamp She Oak			
<i>Celtis sinensis</i> *	Chinese Celtis	*	Restricted Invasive 3	
<i>Cestrum parqui</i> *	Green Cestrum	*	Invasive	
<i>Chloris</i> sp.*		*		
<i>Cirsium vulgare</i> *	Spear Thistle	*		
<i>Clerodendrum floribundum</i>	Lolly Bush			
<i>Corymbia citriodora</i> subsp. <i>variegata</i>	Spotted Gum			
<i>Corymbia intermedia</i>	Pink Bloodwood			
<i>Corymbia tessellaris</i>	Moreton Bay Ash			
<i>Corymbia torelliana</i>	Cadaghi			
<i>Daviesia</i> sp.				

Species	Common Name	Exotic	Biosecurity Act Listing	WONs
<i>Dianella</i> sp.	Flax Lilly			
<i>Dodonaea viscosa</i> ssp. <i>cuneata</i>				
<i>Duboisia myoporoides</i>	Dubosia			
<i>Duranta repens</i> *	Duranta	*	Invasive	
<i>Eucalyptus acmenoides</i>	White Mahogany			
<i>Eucalyptus crebra</i>	Narrow Leaved Ironbark			
<i>Eucalyptus fibrosa</i>	Broad-Leaved Ironbark	Red		
<i>Eucalyptus major</i>	Grey Gum			
<i>Eucalyptus moluccana</i>	Gum Topped Box			
<i>Eucalyptus tereticornis</i>	Forest Red Gum			
<i>Eustrephus latifolius</i>	Wombat Vine			
<i>Flindersia collina</i>	Leopard Ash			
<i>Heliotropium amplexicaule</i> *	Buke Heliotrope	*		
<i>Heteropogon contortus</i>	Black Spear Grass			
<i>Imperata cylindrica</i> *	Blady Grass	*		
<i>Indigofera</i> sp.	Native Indigo			
<i>Ipomoea cairica</i> *	Mile a Minute	*	Invasive	
<i>Lantana camara</i> *	Lantana	*	Restricted Invasive 3	WoNS
<i>Lantana montevidensis</i> *	Creeping Lantana	*	Restricted Invasive 3	
<i>Leucaena leucocephala</i> *	Leucaena	*	Invasive	
<i>Lomandra</i> sp.	Lomandra			
<i>Lophostemon confertus</i>	Brush Box			
<i>Lophostemon suaveolens</i>	Swamp Box			
<i>Ludwigia peploides</i> *		*		
<i>Maclura cochinchinensis</i>	Cockspur			

Species	Common Name	Exotic	Biosecurity Act Listing	WONs
<i>Melaleuca salicina</i> syn <i>Callistemon salignus</i>	White Bottlebrush			
<i>Melaleuca viminalis</i> syn. <i>Callistemon viminalis</i>	Weeping Red Bottlebrush			
<i>Neontonia wightii</i> *	Glycine	*	Invasive	
<i>Nymphea caerulea</i>	Blue Water Lilly			
<i>Opuntia stricta</i> *	Prickly Pear	*	Restricted Invasive 3	WoNS
<i>Panicum decompositum</i>	Native Millet			
<i>Parsonsia straminea</i>	Monkey Rope			
<i>Passiflora foetida</i> *	Stinking Passionfruit	*	Invasive	
<i>Petalostigma triloculare</i>	Quinine			
<i>Phragmites australis</i>	Common Reed			
<i>Pimelea</i> sp.*	Pimelea			
<i>Pinus</i> sp.*		*		
<i>Pteridium</i> sp.	Bracken			
<i>Rumex</i> sp.*	Dock Weed	*		
<i>Schinus terebinthifolius</i> *	Broad Leafed Pepper Tree	*	Restricted Invasive 3	
<i>Senecio madagascariensis</i> *	Fireweed	*	Restricted Invasive 3	
<i>Sida cordifolia</i> *	Flannel Weed	*		
<i>Themeda australis</i>	Kangaroo Grass			
<i>Tipuana tipu</i> *	Pride Of Bolivia	*		
<i>Typha</i> sp.	Bullrush. Cumbungi			
<i>Verbena bonariensis</i> *		*		
<i>Westringia eremicola</i>				
<i>Xanthorrhoea</i> sp.	Grass tree			

5.2 FIELD SURVEY - PROTECTED PLANTS

A review of the preferred habitats of EVNT Plant Species potentially present on site (**Table 1**) suggests that of the 14 plants listed as potentially present, only two species - *Notelaea ipsviciensis* and *Thesium australe* were considered to potentially be present. No EVNT plant species were recorded during the survey.

5.3 FIELD SURVEY - WEEDS

The survey recorded 26 exotic plant species (**Table 4**). Of those, 15 are listed as either Restricted or Invasive plants under the *Biosecurity Act 2014*, and three are listed as Weeds of National Significance (WoNS). The remainder of the exotic species recorded during the survey are either low risk weeds or garden escapees.

5.4 FIELD SURVEY - FAUNA

A review of the preferred habitats of Conservation Significant Animal Species potentially present on site (**Table 2**) suggests that of the listed birds only *Anthochaera phrygia*, *Botaurus poiciloptilus*, *Calidris acuminata*, *Erythrorchis radiatus*, *Gallinago hardwickii*, *Poephila cincta cincta*, *Rostratula australis* and *Tringa nebularia* could potentially be present. Of the animals it was considered possible that *Adelotus brevis*, *Delma torquata*, *Phascolarctos cinereus*, and *Tachyglossus aculeatus* could be present.

Bird species observed during the survey are listed in **Table 5**. It should be noted that the weather at the time of the survey was warm to hot and overcast, consequently the full range of bird species using the site may not have been active and readily observed at the time of the survey. The majority of birds recorded were seen on or near the two waterbodies, with the Darter, Great Egret, Dusky Moor Hen, Little Pied Cormorant, Royal Spoonbill and Purple Swamp Hen (**Plates 12 to 17**) all found in the wetland to the north-west of the Lot.

Table 5 Bird Species Observed During the Survey

Species	Common Name
<i>Anas supersciliosa</i>	Pacific Black Duck
<i>Anhinga melanogaster</i>	Darter
<i>Ardea alba</i>	Great Egret
<i>Corvus orru</i>	Torresian Crow
<i>Coturnix ypsilophora</i>	Brown Quail
<i>Dacelo novaeguineae</i>	Kookaburra

Species	Common Name
<i>Gallinula tenebrosa</i>	Dusky Moor Hen
<i>Malurus</i> sp.	Fairy Wren
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant
<i>Platalea regia</i>	Royal Spoonbill
<i>Porphyrio porphyrio</i>	Purple Swamp Hen
<i>Rhipidura leucophrys</i>	Willy Wagtail



Plate 12 Darter *Anhinga melanogaster*



Plate 13 Great Egret *Ardea alba*



Plate 14 Dusky Moor Hen *Gallinula tenebrosa*



Plate 15 Little Pied Cormorant *Phalacrocorax melanoleucos*



Plate 16 Royal Spoonbill *Platalea regia*



Plate 17 Purple Swamp Hen *Porphyrio porphyrio*

Two Eastern Grey Kangaroos (*Macropus giganteus*) were observed during the survey. There were several sightings of two animals, but it is believed that the sightings were of the same animals. They were observed on the flats adjacent to Six Mile Creek (Habitat Area 5 on **Figure 4**), and in the native forest adjacent to the flats (Habitat Area 4 on **Figure 4**).

Only one tree, a *Eucalyptus major*, was observed to have scratch marks on it (**Plate 18**); the scratch marks were inconsistent with those normally made by Koala, and were probably made by possums (*Trichosurus vulpecula* (Brushtail Possum) or *Pseudocheirus peregrinus* (Ringtail Possum)). No other mammals were observed during the survey, and with the exception of scattered macropod scats, no other signs of mammals were observed during the survey.

Some old diggings were observed, potentially made by either *Tachyglossus aculeatus* (Echidna) or *Varanus* sp. (Monitor Lizard). No fresh diggings were observed. A Water Dragon (*Intellagama lesueurii*) was observed in the waterhole to the south-west of the Lot (**Plate 19**), and the Skink *Lampropholis guichenoti* was observed on trees in the mapped vegetation to the east of the power-line easement.

No animals listed as Conservation Significant were observed during the survey, and there was no evidence of the presence of Conservation Significant animals on the site.



Plate 18 Scratch Marks on *Eucalyptus major*



Plate 19 Water Dragon *Intellagama lesueurii*

5.5 KOALA SURVEY

The SAT survey method was used to determine the presence and abundance of Koala in and around the proposed disturbance area. Six Koala Habitat Trees (KHTs), including a *Eucalyptus major* with extensive scratch marks on the trunk (**Plate 18**), were selected at random locations within the proposed disturbance area for Spot Assessment. No Koala pellets were found in the vicinity of any of the trees, and no Koala pellets or other evidence of Koala presence was observed during the survey. Although absence of evidence does not constitute evidence of absence, it is considered highly unlikely that Koala recently or regularly uses the site.

5.6 HABITAT AND CONNECTIVITY

The areas on the Lot supporting the heaviest vegetation are:

- The area to the north-west of the current disturbance area (Habitat Area 1a and 1b on **Figure 4**),
- The area to the north and north-east of the current disturbance area (Habitat Area 2 on **Figure 4**), and
- The area east of the power-line right of way, which is not in the proposed development site (Habitat Area 4 on **Figure 4**).

The area to the north-west of the current disturbance area

Within the Lot the habitat in area to the north-west of the current disturbance area is limited in extent, however, it borders the wetland to the north of the site, where the majority of the water birds were observed (**Plate 20**). The wetland appears to be an important resource for native and feral birds and terrestrial animals in the area.



Plate 20 Wetland to the North of the Lot

To the west of this area is a track formed on a gazetted road and bordered on both sides by dense exotic and native vegetation. The thick grass had evidence of extensive use by animals, however, no scats, nests or other evidence of species using the area were observed. The tracks may have been made by the local population of Eastern Grey Kangaroo, or by feral animals such as a Pig (*Sus scrofa*) or Dog (*Canis lupus*) (**Plate 21**).

There is light fallen timber throughout this area, sufficient to provide habitat to small reptiles and mammals, and an excavation to the west, and draining into the wetland, has been filled with large rocks, which may also provide habitat to reptiles (**Plate 22**).



Plate 21 Animal tracks through long grass



Plate 22 Excavation filled with large rocks

The area to the north and north-east of the current and proposed disturbance area

The habitat in this area is well developed and complex with light fallen timber cover on the ground (**Plate 23**), however, being bordered to the north and east by a road and powerline and with adjoining lands to the north being generally cleared, its habitat value is limited by its extent and it is considered to only have habitat value to small birds, reptiles and mammals, with larger animals only using the area from time to time for foraging or access to the wetland to the north of the site.



Plate 23 Well Developed and Complex Habitat in the Area to the North and North-East of the Current and Proposed Disturbance Area

The area east of the power-line right of way

The area east of the power-line right of way is not in the proposed development site, however it has linkages to the area to the north-east of the current and proposed disturbance area and consequently to the wetland to the north of the site; and it connects these areas to Six Mile Creek and associated creek flats. The vegetation in this area is generally well developed and complex, with evidence of timber harvesting activities, large fallen logs and standing trees with extensive hollow development (**Plate 24**) consequently offering habitat opportunity to a wide range of terrestrial reptile, mammal and bird species. The creek flats are generally open with a dense grass layer, while the slopes, although disturbed provides open forest habitat, and open forest with a dense shrub layer of Acacia, Lantana or Dodonaea (**Plate 25 and 26**).



Plate 24 Spotted Gum (*Corymbia citriodora* subsp. *variegata*) with Hollow Development in the Area Outside the Proposed Development Footprint

Six Mile Creek provides continuous habitat corridor that runs from slightly south of Ipswich Motorway to an extensive area of native vegetation south of Centenary Highway (**Figure 3**) (**Section 1.3**). The vegetation and adjacent to Six Mile Creek comprises predominantly *Melaleuca viminalis*, *Eucalyptus tereticornis* and *Celtis sinensis* (**Plate 27**). Because of urban encroachment, although of local significance, the corridor along Six Mile Creek has limited regional importance.



Plate 25 Open Forest with a Dense Shrub Layer of Acacia and Lantana in the Area East of the Power-Line Easement



Plate 26 Open Forest with a Dense Shrub Layer of Acacia and Dodonaea in the Area East of the Power-Line Easement



Plate 27 Vegetation on Six Mile Creek

The area to the south-west of the Lot

To the south-west of the proposed development site is an extensive area of excavation and rehabilitated mines (**Plate 28**). An elongated wetland, understood to be an inundated relict mine open pit, runs along the boundary and outside of the subject Lot (**Plate 29**). The wetland supported a large number of water birds, however, at the time of the survey the diversity of water birds was greater on the wetland to the north-east of the Lot. Nevertheless, it is apparent that this wetland is an important resource for native and feral animals in the area.



Plate 28 Naturally Regenerated Acacia and Eucalypt on Mine Spoil to the South of the Proposed Disturbance Area



Plate 29 Wetland to the South of the Lot

Overall, with the exception of the vegetation between the proposed development site and the waterbody to the north, and the waterbody itself - which is not in the development footprint, the vegetation in and near the proposed development site offered little fauna habitat opportunity and limited connectivity to other areas of habitat. However, the area to the east of the powerline, and not in the development footprint, provides complex fauna habitat and connectivity to the Six Mile Creek corridor.

6 DISCUSSION

6.1 VEGETATION, VEGETATION ASSOCIATIONS AND HABITAT

During the survey 71 plant species were recorded, of which 26 were exotic species and 1 native species (*Corymbia torelliana*) was thought to be an off-site native species. Of the exotic species, 15 are 'Invasive' or 'Restricted Invasive 3' plants under the *Biosecurity Act 2014*, and three species are WoNS. Forty-four native and endemic plant species were recorded across the site. Generally, the native species recorded during the survey were consistent with the current and pre-clearing Regional Ecosystems mapped for the location (Section 4.2, Appendix V).

None of the Threatened Ecological Communities identified in the EPBC Protected Matters Report (Appendix III) were observed in the proposed development area and the observed ecological characteristics of the site are unlikely to support those communities. The existing vegetation does not consist of regionally or locally significant species, protected species or ecosystems, plants and plant communities that have heritage or landscape significance.

The proposed development will remove a small area of the regenerating Acacia dominated vegetation to the south-west of the current disturbance area, and a small area of the structurally more complex vegetation to the north of the existing disturbance (Figure 1). It is considered that the proposed vegetation clearing will not have a significant impact on the habitat and connectivity values of the Lot or surrounding areas, however, it is recommended that the habitat values associated with the two wetlands adjoining the proposed development site are protected. With appropriate weed control and rehabilitation management the habitat values of the vegetation on the remainder of the Lot would be enhanced.

The proposed disturbance site does not have important habitat or biodiversity values, however the two waterbodies adjacent to the Lot provide habitat to water birds and terrestrial reptiles and mammals. The proposed disturbance site does not have old or dead trees with hollows or nests that potentially could be used by hollow dwelling fauna, however old hollow-bearing trees were observed in the vegetation to be retained to the east of the development site (Plate 24). Generally, the existing vegetation does enhance the landscape amenity of the site although it does not comprise visually prominent hillsides, or ridgelines. However, the vegetation proposed to be cleared is Acacia regrowth on the relict mine spoil heaps to the south of the current disturbance, which do not provide visual amenity.

In places the landform underlying vegetation proposed to be cleared, is over 15% slope. However, this is local and artificial landform, largely comprising relict mine spoil heaps, and will be levelled and stabilised for the proposed development. The existing vegetation proposed to be cleared does not assist in the stabilisation of creeks and natural drainage paths. The catchment of the proposed development is draining into the two artificial waterbodies thought to be inundated mine excavations, those waterbodies are isolated from the local drainage system, consequently the vegetation proposed to be cleared does not contribute to water quality management and the natural behaviour of the catchment. Rainfall falling on the eastern portion of the site drains into the Six Mile Creek catchment, however, this area is not proposed to be cleared for this development.

6.2 PROTECTED FLORA

No EVNT plant species were recorded during the survey.

6.3 PROTECTED FAUNA

The preferred habitat for protected fauna potentially present on site was researched and is tabulated in **Table 2**. Analysis of the animals' preferred habitat and the degree of disturbance that the site has been subjected to, suggests that:

- It is unlikely that any of the pelagic or coastal birds listed in **Table 2** would be present on site;
- It would be possible although not probable for most of the other indicated birds to be occasionally on site, for example, when travelling through or over the site;
- It would be unlikely for many of the protected terrestrial animal species to be present on site.

A SAT survey was conducted for Koala in and adjacent to the proposed development site. No signs or indications of Koala presence or use were recorded during the survey.

No protected animals or their signs were observed or recorded during the survey.

6.4 WEEDS AND PEST ANIMALS

The survey recorded 26 exotic species of which, 15 are 'Invasive' or 'Restricted Invasive 3' plants under the Biosecurity Act 2014, and three species are Weeds of National Significance. Under the *Biosecurity Act 2014* Restricted Invasive Plants and Animals must not be kept, moved, fed, given away, sold, or released into the environment, without a permit, and everyone must take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control.

It is recommended that a pest control program is undertaken to manage and control:

<i>Asparagus aethiopicus*</i>	Sprengeri Fern
<i>Baccharis halimifolia</i>	Groundsel
<i>Bryophyllum delagoense syn. Bryophyllum tubiflorum</i>	Mother Of Millions
<i>Celtis sinensis</i>	Chinese Celtis
<i>Lantana camara*</i>	Lantana
<i>Lantana montevidensis</i>	Creeping Lantana
<i>Opuntia stricta*</i>	Prickly Pear
<i>Schinus terebinthifolius</i>	Broad Leafed Pepper Tree
<i>Senecio madagascariensis</i>	Fireweed

All of the above species are Restricted Invasive Plants under the *Biosecurity Act 2014*. Those marked with an asterix (*) are also WoNS.

No Restricted Invasive Animals were observed or recorded during the survey, although it is likely that feral cats (*Felis catus*) and possibly foxes (*Vulpes vulpes*), feral pigs and wild dogs are present. It is not

considered appropriate to undertake a targeted control program for feral cat, dog, pig or fox on this site, nevertheless, it should be noted that during and after construction, feral animals should not be encouraged, kept or fed by employees, contractors or occupants.

The site is in Fire Ant Biosecurity Zone 1. Consequently, the movement of biosecurity matter off the property must be in accordance with the *Biosecurity Regulation 2016* or under a Biosecurity Instrument Permit from an inspector.

7 IPSWICH CITY COUNCIL ASSESSMENT REQUIREMENTS

7.1 VEGETATION MANAGEMENT CODE

Assessment of the proposed development against Specific Outcome 1 of Table 12.4.1 of the Vegetation Management Code is outlined below.

Specific Outcomes	Acceptable / Probable Solutions	How the Proposed Development Meets the Code Provisions
Environmentally Sensitive Areas (1) The clearing of vegetation does not cause or exacerbate land degradation within environmentally sensitive areas including steeply sloping land, areas prone to erosion or salinity, riparian corridors, wetlands or water catchment areas.	Environmentally Sensitive Areas (1) The clearing does not involve the removal of native vegetation from— (a) land with a slope of 15% or more; or (b) land within a Designated Watercourse or land within 30m of a Designated Watercourse or within 10 metres of the top of the bank of a Designated Watercourse where the slope of the bank exceeds 15%.	With the exception of the removal of vegetation from relict spoil heaps, which will be subsequently levelled and stabilised for the development, the clearing will not involve the removal of native vegetation from land with a slope of 15% or more; or land within a Designated Watercourse or land within 30m of a Designated Watercourse or within 10 metres of the top of the bank of a Designated Watercourse where the slope of the bank exceeds 15%

7.2 IPSWICH PLANNING SCHEME

Part 6(a) of the Information Request issued by Ipswich City Council on 26 April 2018 required that:

‘...the applicant is requested to demonstrate how “clearing of vegetation does not cause or exacerbate land degradation within environmentally sensitive areas including steeply sloping land, areas prone to erosion or salinity, riparian corridors, wetlands or water catchment areas”. The applicant is therefore requested to submit a vegetation survey in order to demonstrate compliance with sections 4.3.3 (4)(f); 4.3.3(4)(g) of the Urban Areas Code.’ (note this reference was subsequently corrected to section 6.7 (j) (a)(d) by ICC).

The only steeply sloping land that will be cleared is relict mine spoil heaps, which are only locally steep as an artifact of their construction. This area will be levelled and stabilised to provide building pads and operational areas for the proposed activities.

No riparian areas or wetlands will be cleared for the proposed development; however, it is recommended that erosion and sedimentation controls are erected to protect the identified waterbodies on adjoining

properties from siltation during construction. The road that passes close to the waterbody to the north of the proposed development site should be formed, battered and drained to protect the waterbody from siltation.

No historic buildings, large mature trees, significant stands of vegetation, skyline elements, vegetated ridgelines or significant views will be affected by the proposed development.

The waterbodies on adjoining Lots will not be directly affected by the proposed activities, and will be protected from siltation and sedimentation during construction and operation of the proposed development.

8 POTENTIAL IMPACTS

No conservation significant plants or animals were observed during the survey. No Endangered Regional Ecosystems or Threatened Ecological Communities were observed during the survey. Generally, the proposed development site provides little habitat opportunity for animals other than small mammals and reptiles, and opportunistic arboreal mammals and scavenger birds.

However, the wetlands adjoining the Lot, and the vegetation on the Lot between the power-line right of way and Six Mile Creek offer habitat and connectivity to a range of terrestrial, arboreal and aquatic animals.

These areas will not be affected by the proposed development. It is unlikely that the proposed development will have an impact on any protected plant or animal species or vegetation association; and it is considered that appropriate management of the undisturbed portion of the site will enhance habitat opportunities for aquatic, terrestrial and arboreal animal species.

9 RECOMMENDATIONS

It is not considered likely that the proposed development will have a significant impact on the ecological values of the site, and will not have an adverse impact on any important local or regional habitat linkages. However, to improve the ecological values on the undeveloped portions of the site it is recommended that:

- Water quality and aquatic habitat values of the dam are protected and maintained through erosion and sediment control measures, and by managing surface runoff contamination and other potential water contamination sources;
- Retained vegetation on the batter and foot slopes of the existing development fill, and within and adjacent to the development site, is protected during construction and development works by a temporary fence and 'no-go' zone;
- A weed control program is implemented to manage State Government listed species on the site, in particular in the vegetation adjacent to the proposed development.

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FIGURES

FIGURE 1 THE LOCATION OF THE PROPOSED DEVELOPMENT AT 149 RHONDDA ROAD, NEW CHUM

FIGURE 2 SURROUNDING LANDUSE OF THE PROPOSED DEVELOPMENT SITE

FIGURE 3 LANDSCAPE CONTEXT OF THE PROPOSED DEVELOPMENT SITE

FIGURE 4 FIELD SURVEY TRAVERSE

149 Rhondda Road Lot 273 on SP 128662

Site Details

27°37'14"S 152°50'1"E

27°37'14"S 152°50'35"E



27°37'38"S 152°50'1"E

27°37'38"S 152°50'35"E

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 Legend

Road crossing

-  Bridge
-  Tunnel

Road

-  Highway
-  Main
-  Local
-  Private

Railway



Coastline



Lake

Reservoir

Canal line



Canal area

Watercourse line

-  Minor Watercourse
-  Major Watercourse
-  Minor Culvert
-  Major Culvert

Watercourse area

-  Perennial
-  Non Perennial

Water area edge



Land parcel

-  Parcel

Land parcel label

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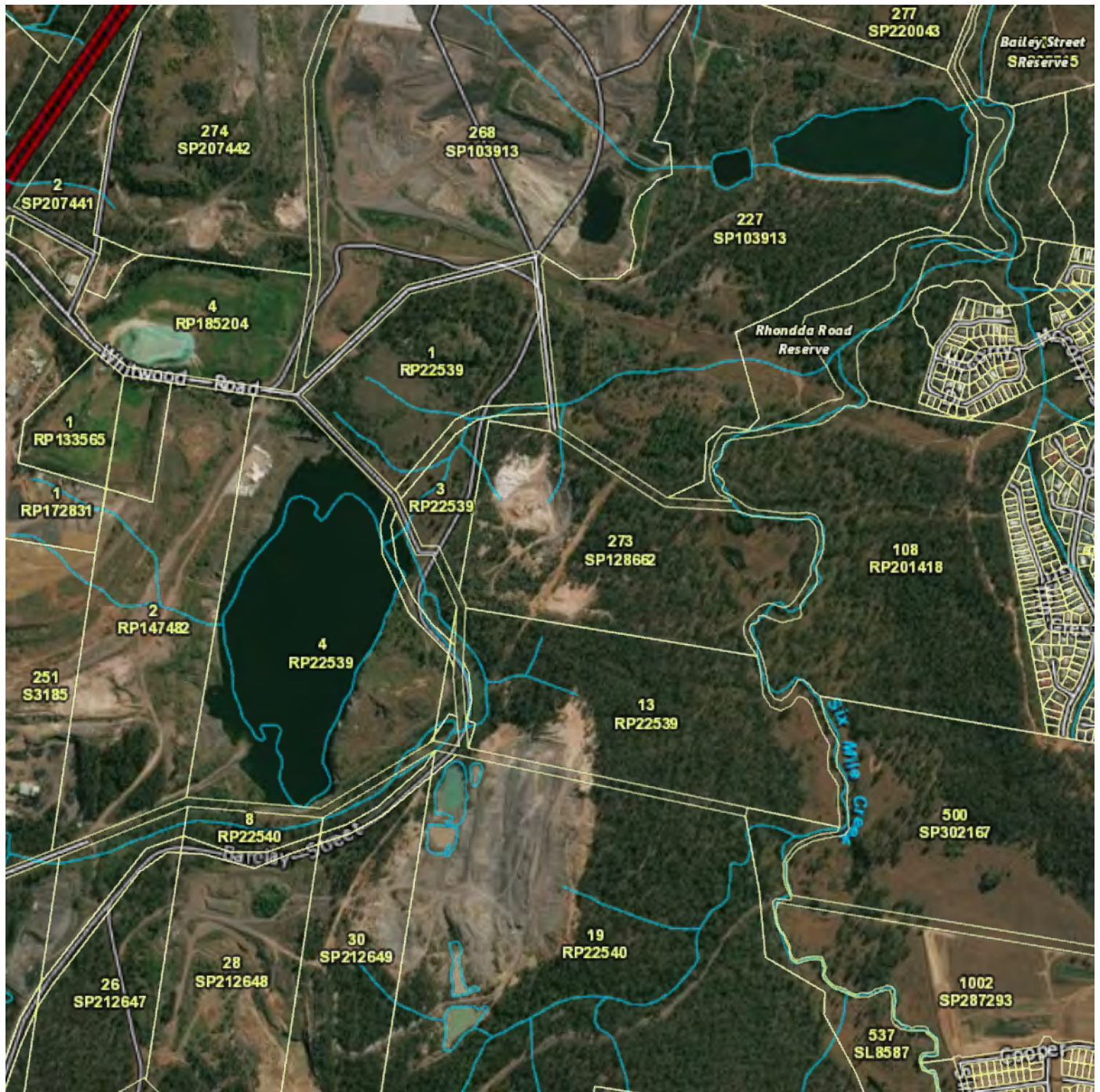
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149 Rhondda Road

Surrounding Landuse Lot 273 on SP128662

27°36'47"S 152°49'26"E

27°36'47"S 152°50'54"E



27°38'5"S 152°49'26"E

27°38'5"S 152°50'54"E



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 Legend

 Attribution

Road

-  Highway
-  Main
-  Local
-  Private

Coastline



Lake

Reservoir

Canal line



Canal area

Watercourse line

-  Minor Watercourse
-  Major Watercourse
-  Minor Culvert
-  Major Culvert

Water area edge



Watercourse area

-  Perennial
-  Non Perennial

Railway



Land parcel

-  Parcel

Land parcel label

Cities and Towns



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149 Rhondda Road

Broad Environmental Context

27°35'47"S 152°47'58"E

27°35'47"S 152°55'17"E



27°42'16"S 152°47'58"E

27°42'16"S 152°55'17"E



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purposes.

The State of Queensland makes
no representation or warranties in
relation to the map contents and
disclaims all liability.

 Legend

 Attribution

Road

-  Highway
-  Main
-  Local
-  Private

Coastline



Lake

Reservoir

Canal area

Watercourse line

-  Minor Watercourse
-  Major Watercourse
-  Minor Culvert
-  Major Culvert

Watercourse area

-  Perennial
-  Non Perennial

Land parcel label - gt 1 ha

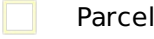
Water area edge



Railway



Land parcel - gt 1 ha



Cities and Towns

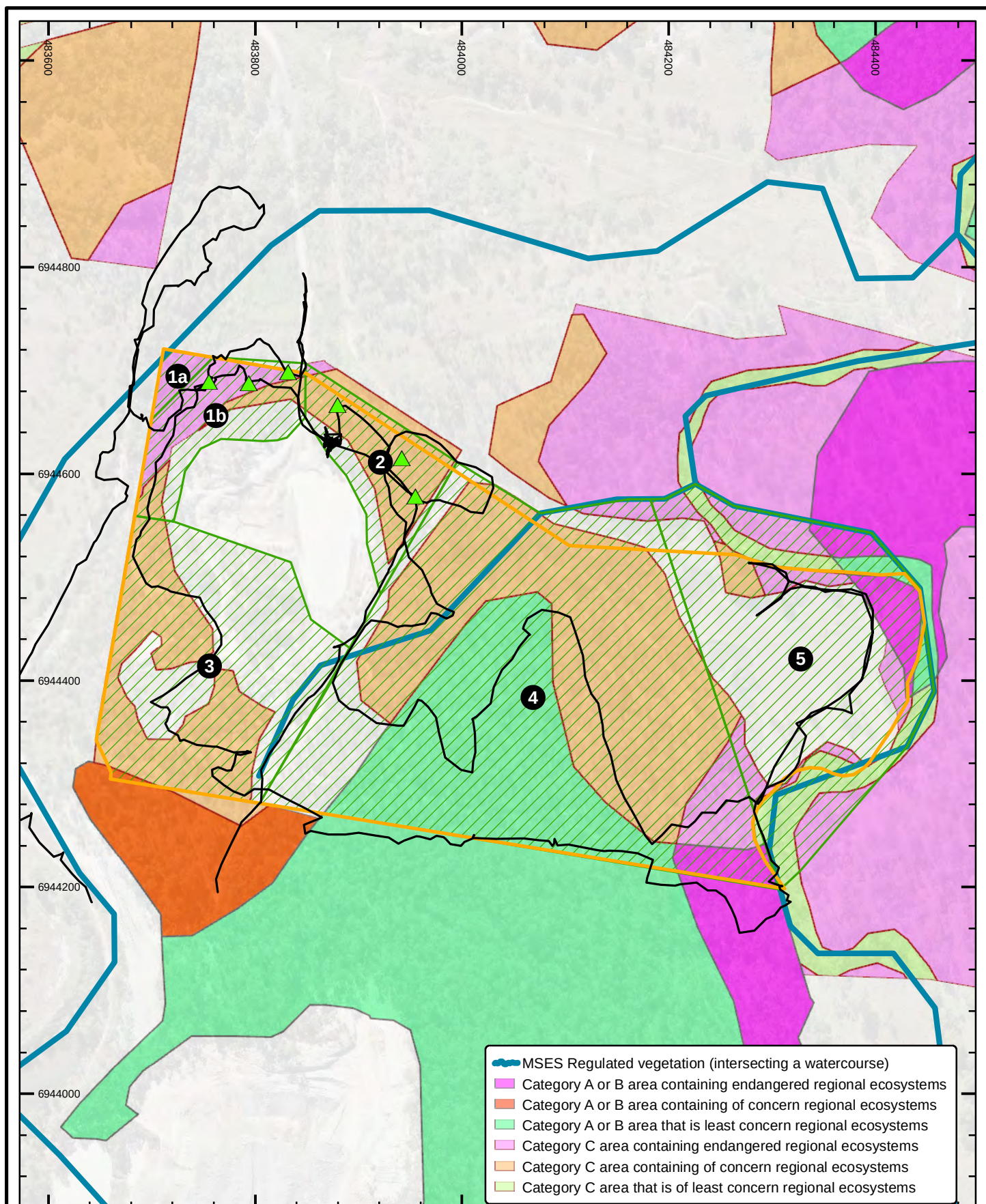


Earthstar Geographics

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© State of Queensland (Department of Natural Resources and Mines), 2016



0 50 100 150 200 250
Meters

JACKAL RENEWABLES PTY LTD

Lot 73 on SP 128662

N
W E
S
GDA94, MGA Zone 56



Field and Habitat Assessment

Drawn By: Chris Schlebusch

Requested by: Richard Davis

Date: 18/10/2018

Figure 4
Sheet No.

ADMG_ARD_JKRGEN_MAP_0015_B

Legend

- 73 SP128662
- Property boundary
- GPS Tracklog (2018-09-28)

- Habitat Area (boundaries approximate)
- SAT Survey Site

Data sources:
Old Department of Natural Resources, Mines & Energy, Geoscience Australia

APPENDIX I

IPSWICH CITY COUNCIL CITY PLAN REPORT AND MAPS

Property Details



149 Rhondda Road NEW CHUM QLD 4303



Details

Property Number: 245135
Lot RPD: Lot 273 SP 128662
Land Number(s): **123721**
Division 3



Valuations

Land Valuation:



Dimension

Area: 25.38 Ha



Zoning

RBIA02 - Regional Bus & Industry Investigation (New Chum)
REC - Recreation



Applications

No applications recorded against this property.



Constraints

Constraints applied against a property or land.

Parcel Conditions

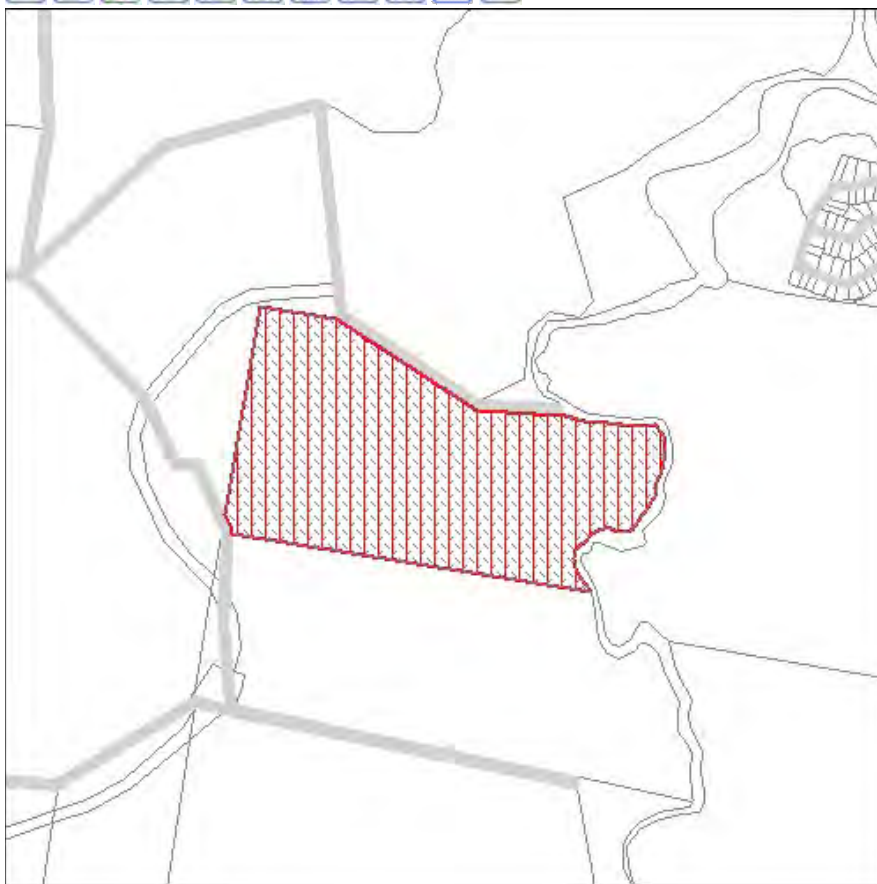
OV2-Key Resource Area Overlay - 18/10/2006
OV2-Known Resources Overlay - 18/10/2006
OV2-Mining Leases - 20/11/2013
OV3-Mining Influence Area Overlay - 05/04/2004
OV4-Difficult Topography Overlay - 05/04/2004
OV5-Adopted Flood Regulation Line - 29/09/2014
OV5-Flood Development Line 1 in 20 - 29/09/2014
OV5-Urban Catchment Flow Path - 29/09/2014
OV7A-90m Building Height Restriction Overlay - 05/04/2004



Map

Select map layers from the drop-down list below:

1 - Base Map



 **To Print:** Right click on map image and select "Print Picture..."

To obtain a property certificate for this property, click the link below:

 [Property Certificate](#)

 [Contact us](#)

APPENDIX II

SITE LAYOUT PLAN FOR 149 RHONDDA ROAD, NEW CHUM, DRAWING NUMBER C1 DEVELOPMENT PLAN

EXISTING SURFACE CONTOURS



24 DARLING STREET
IPSWICH Q 4305
CONSULTING CHARTERED ENGINEERS
CIVIL AND STRUCTURAL
A.B.N. 75 074 746 599

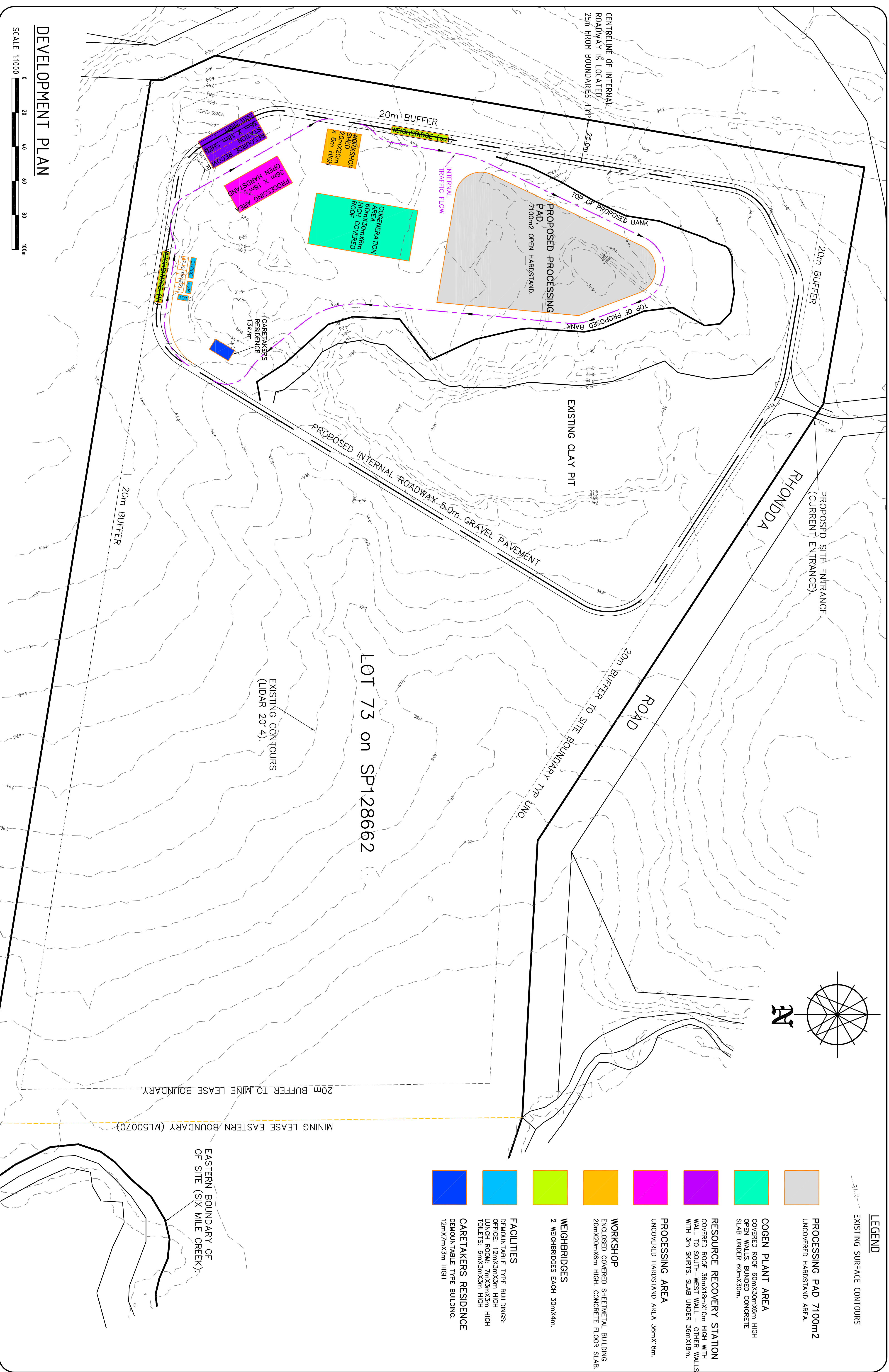
1000

149 RHONDDA ST NEW CHUM

SITE LAYOUT PLAN

REV	DATE	REV	DATE
APPROVED: _____ RPEC 376a			
DIRECTOR HUNT MICHEL & PARTNERS			

DESIGNED: D.A.	JOB No.
DRAWN: D.A.	218010
CHECKED: D.M.	DWG No.
SCALE: 1:1000 AT A1	C1
DATE:	



APPENDIX III

MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE UNDER THE EPBC ACT



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 27/09/18 08:36:18

[Summary](#)

[Details](#)

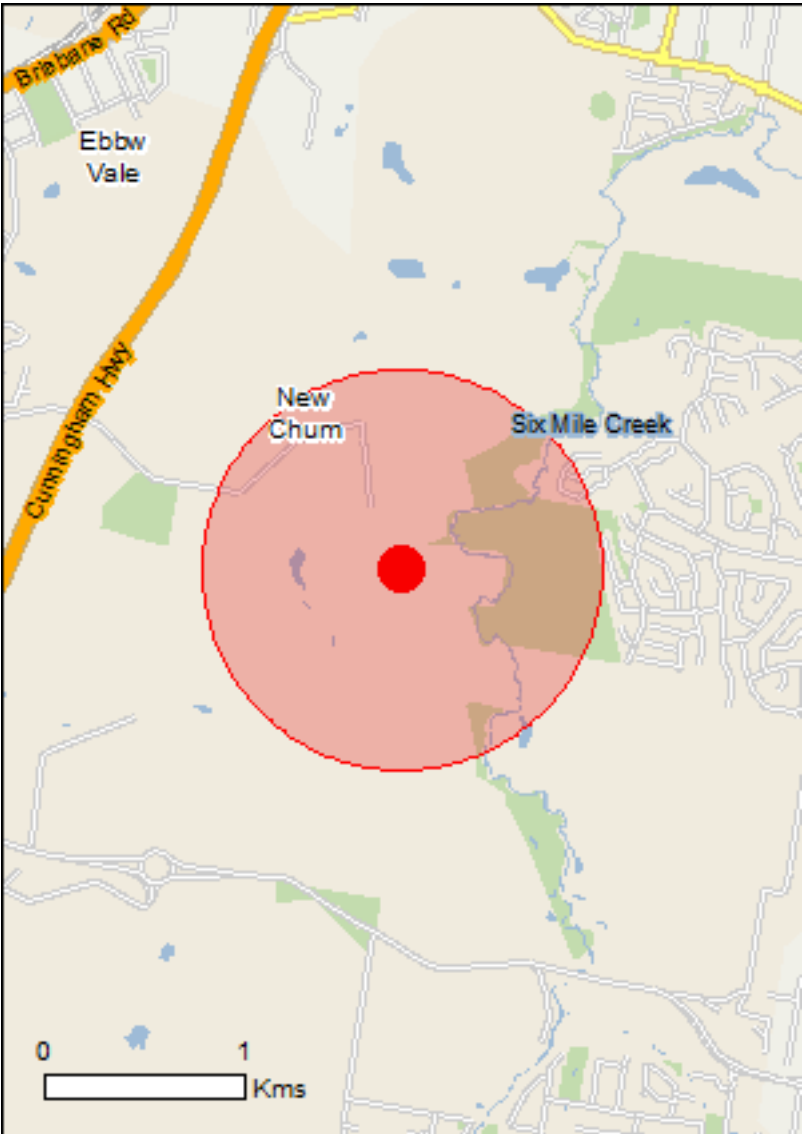
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

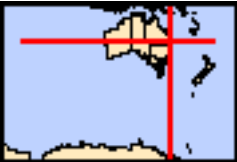
[Acknowledgements](#)



This map may contain data which are
©Commonwealth of Australia
(Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	31
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	33
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species

Name	Status	Type of Presence
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	habitat may occur within area Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cycas ophiolitica [55797]	Endangered	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Notelaea ipsviciensis Cooneana Olive [81858]	Critically Endangered	Species or species habitat likely to occur within area
Notelaea lloydii Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		
[Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]	
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Invasive Species

[[Resource Information](#)]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		

Name	Status	Type of Presence
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area Species or species habitat may occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-27.624 152.8378

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

APPENDIX IV

WILDNET ONLINE REPORT



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point

Species: All

Type: All

Status: All

Records: All

Date: All

Latitude: -27.624

Longitude: 152.8378

Distance: 5

Email: sticksandstonesenv@bigpond.com

Date submitted: Saturday 29 Sep 2018 11:53:00

Date extracted: Saturday 29 Sep 2018 12:00:02

The number of records retrieved = 1000

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			51/1
animals	amphibians	Hylidae	<i>Litoria nasuta</i>	striped rocketfrog		C		8
animals	amphibians	Hylidae	<i>Litoria dentata</i>	bleating treefrog		C		9
animals	amphibians	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog		C		3
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		17
animals	amphibians	Hylidae	<i>Litoria wilcoxii</i>	eastern stony creek frog		C		1
animals	amphibians	Hylidae	<i>Litoria gracilentia</i>	graceful treefrog		C		23
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		7
animals	amphibians	Hylidae	<i>Litoria brevipalmata</i>	green thighed frog		C		3
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		1
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		40
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		48
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		4
animals	amphibians	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk		C		15
animals	amphibians	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog		C		23
animals	amphibians	Limnodynastidae	<i>Limnodynastes peronii</i>	striped marshfrog		C		27
animals	amphibians	Limnodynastidae	<i>Adelotus brevis</i>	tusked frog		V		6
animals	amphibians	Myobatrachidae	<i>Pseudophryne raveni</i>	copper backed broodfrog		C		4/1
animals	amphibians	Myobatrachidae	<i>Crinia parinsignifera</i>	beeping froglet		C		11
animals	amphibians	Myobatrachidae	<i>Mixophyes fasciolatus</i>	great barred frog		C		5
animals	amphibians	Myobatrachidae	<i>Pseudophryne coriacea</i>	red backed broodfrog		C		2
animals	amphibians	Myobatrachidae	<i>Uperoleia sp.</i>					1
animals	amphibians	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan		C		2
animals	amphibians	Myobatrachidae	<i>Crinia signifera</i>	clicking froglet		C		2
animals	amphibians	Myobatrachidae	<i>Uperoleia fusca</i>	dusky gungan		C		2
animals	amphibians	Myobatrachidae	<i>Pseudophryne major</i>	great brown broodfrog		C		1
animals	birds	Acanthizidae	<i>Smicronis brevirostris</i>	weebill		C		30
animals	birds	Acanthizidae	<i>Chthonicola sagittata</i>	speckled warbler		C		15
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		2
animals	birds	Acanthizidae	<i>Gerygone mouki</i>	brown gerygone		C		3
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		9
animals	birds	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill		C		5
animals	birds	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone		C		46
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		8
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		21
animals	birds	Acanthizidae	<i>Acanthiza lineata</i>	striated thornbill		C		2
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		6
animals	birds	Accipitridae	<i>Erythrotriorchis radiatus</i>	red goshawk		E	V	1
animals	birds	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk		C		4
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		26
animals	birds	Accipitridae	<i>Haliastur indus</i>	brahmny kite		C		12
animals	birds	Accipitridae	<i>Circus assimilis</i>	spotted harrier		C		1
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		20
animals	birds	Accipitridae	<i>Circus approximans</i>	swamp harrier		C		3
animals	birds	Accipitridae	<i>Lophoictinia isura</i>	square-tailed kite		C		2
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		12

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animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		10
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		17
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		13
animals	birds	Accipitridae	<i>Hieraaetus morphnoides</i>	little eagle		C		1
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		4
animals	birds	Acrocephalidae	<i>Acrocephalus australis</i>	Australian reed-warbler		C		25
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		12
animals	birds	Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher		C		16
animals	birds	Anatidae	<i>Anas sp.</i>					2
animals	birds	Anatidae	<i>Anas castanea</i>	chestnut teal		C		4
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		13
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		10
animals	birds	Anatidae	<i>Anas rhynchotis</i>	Australasian shoveler		C		1
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		16
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		67
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		78
animals	birds	Anatidae	<i>Anas platyrhynchos</i>	northern mallard	Y			1
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		3
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		2
animals	birds	Anatidae	<i>Stictonetta naevosa</i>	freckled duck		C		1
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		25
animals	birds	Anseranatidae	<i>Anseranas semipalmata</i>	magpie goose		C		6
animals	birds	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail		SL		4
animals	birds	Ardeidae	<i>Egretta garzetta</i>	little egret		C		4
animals	birds	Ardeidae	<i>Butorides striata</i>	striated heron		C		2
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		13
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		13
animals	birds	Ardeidae	<i>Bubulcus ibis</i>	cattle egret		C		48
animals	birds	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret		C		7
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		38
animals	birds	Ardeidae	<i>Nycticorax caledonicus</i>	nankeen night-heron		C		5
animals	birds	Artamidae	<i>Cracticus tibicen</i>	Australian magpie		C		147
animals	birds	Artamidae	<i>Strepera graculina</i>	pied currawong		C		17
animals	birds	Artamidae	<i>Artamus cyanopterus</i>	dusky woodswallow		C		6
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		61
animals	birds	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow		C		2
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		9
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird		C		95
animals	birds	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew		C		6/1
animals	birds	Cacatuidae	<i>Cacatua sanguinea</i>	little corella		C		33
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		108
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		2
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		64
animals	birds	Cacatuidae	<i>Cacatua tenuirostris</i>	long-billed corella	Y	C		3
animals	birds	Campephagidae	<i>Lalage tricolor</i>	white-winged triller		C		4
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		2

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animals	birds	Campephagidae	<i>Coracina tenuirostris</i>	cicadabird		C		21
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		138
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		7
animals	birds	Campephagidae	<i>Lalage leucomela</i>	varied triller		C		1
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		76
animals	birds	Charadriidae	<i>Vanellus miles</i>	masked lapwing		C		15
animals	birds	Charadriidae	<i>Erythronyx cinctus</i>	red-kneed dotterel		C		4
animals	birds	Charadriidae	<i>Elseya melanops</i>	black-fronted dotterel		C		12
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		C		6
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		79
animals	birds	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)		C		27
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		42
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		100
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		7
animals	birds	Columbidae	<i>Chalcophaps indica</i>	emerald dove		C		1
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		42
animals	birds	Columbidae	<i>Macropygia amboinensis</i>	brown cuckoo-dove		C		8
animals	birds	Columbidae	<i>Streptopelia chinensis</i>	spotted dove	Y			62
animals	birds	Columbidae	<i>Geopelia cuneata</i>	diamond dove		C		1
animals	birds	Columbidae	<i>Lopholaimus antarcticus</i>	topknot pigeon		C		6
animals	birds	Columbidae	<i>Leucosarcia melanoleuca</i>	wonga pigeon		C		1
animals	birds	Columbidae	<i>Columba livia</i>	rock dove	Y			27
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		59
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		2
animals	birds	Corvidae	<i>Corvus coronoides</i>	Australian raven		C		2
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		214
animals	birds	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo		C		9
animals	birds	Cuculidae	<i>Eudynamis orientalis</i>	eastern koel		C		31
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		7
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		6
animals	birds	Cuculidae	<i>Chalcites basalus</i>	Horsfield's bronze-cuckoo		C		10
animals	birds	Cuculidae	<i>Cuculus optatus</i>	oriental cuckoo		SL		1
animals	birds	Cuculidae	<i>Chalcites minutillus barnardi</i>	little bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		31
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		39
animals	birds	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo		C		32
animals	birds	Dicruridae	<i>Dicrurus bracteatus bracteatus</i>	spangled drongo (eastern Australia)		C		1
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		33
animals	birds	Estrildidae	<i>Neochmia temporalis</i>	red-browed finch		C		28
animals	birds	Estrildidae	<i>Lonchura punctulata</i>	nutmeg mannikin	Y			4
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		32
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		58
animals	birds	Eurostopodidae	<i>Eurostopodus mystacalis</i>	white-throated nightjar		C		8
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		5
animals	birds	Falconidae	<i>Falco subniger</i>	black falcon		C		1
animals	birds	Falconidae	<i>Falco longipennis</i>	Australian hobby		C		3

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animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		22
animals	birds	Falconidae	<i>Falco peregrinus</i>	peregrine falcon		C		10
animals	birds	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher		C		19
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		59
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		95
animals	birds	Hirundinidae	<i>Cheramoeca leucosterna</i>	white-backed swallow		C		9
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		43
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		28
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		117
animals	birds	Jacanidae	<i>Irediparra gallinacea</i>	comb-crested jacana		C		7
animals	birds	Laridae	<i>Chlidonias hybrida</i>	whiskered tern		C		1
animals	birds	Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull		C		1
animals	birds	Laridae	<i>Sternula albifrons</i>	little tern		SL		1
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		54
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		34
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		103
animals	birds	Megaluridae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		2
animals	birds	Megaluridae	<i>Cincloramphus cruralis</i>	brown songlark		C		5
animals	birds	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird		C		26
animals	birds	Megaluridae	<i>Megalurus gramineus</i>	little grassbird		C		5
animals	birds	Megapodiidae	<i>Alectura lathamii</i>	Australian brush-turkey		C		10
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		56
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		7
animals	birds	Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	eastern spinebill		C		3
animals	birds	Meliphagidae	<i>Anthochaera carunculata</i>	red wattlebird		C		1
animals	birds	Meliphagidae	<i>Anthochaera chrysoptera</i>	little wattlebird		C		2
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		135
animals	birds	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater		C		61
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		17
animals	birds	Meliphagidae	<i>Manorina melanophrys</i>	bell miner		C		1
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		100
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		29
animals	birds	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater		C		53
animals	birds	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater		C		10
animals	birds	Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater		C		2
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		74
animals	birds	Meliphagidae	<i>Lichenostomus melanops</i>	yellow-tufted honeyeater		C		11
animals	birds	Meliphagidae	<i>Ptilotula fusca</i>	fuscous honeyeater		C		28
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		17
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		74
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		18
animals	birds	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher		C		2
animals	birds	Monarchidae	<i>Monarcha sp.</i>					1
animals	birds	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch		SL		2
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	maggie-lark		C		127
animals	birds	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher		SL		3

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animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		20
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		58
animals	birds	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella		C		26
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		66
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		29
animals	birds	Pachycephalidae	<i>Falcunculus frontatus</i>	crested shrike-tit		C		1
animals	birds	Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush		C		1
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		55
animals	birds	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler		C		33
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		45
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		109
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		16
animals	birds	Passeridae	<i>Passer domesticus</i>	house sparrow	Y			20
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		21
animals	birds	Petroicidae	<i>Petroica rosea</i>	rose robin		C		22
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		9
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		24
animals	birds	Phaethontidae	<i>Phaethon lepturus</i>	white-tailed tropicbird		SL		1/1
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		26
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		35
animals	birds	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant		C		14
animals	birds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant		C		7
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		15
animals	birds	Phasianidae	<i>Coturnix pectoralis</i>	stubble quail		C		2
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		32
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		24
animals	birds	Podicipedidae	<i>Podiceps cristatus</i>	great crested grebe		C		9
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		6
animals	birds	Psittacidae	<i>Platycercus adscitus palliceps</i>	pale-headed rosella (southern form)		C		3
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		136
animals	birds	Psittacidae	<i>Lathamus discolor</i>	swift parrot		E	CE	1
animals	birds	Psittacidae	<i>Neophema pulchella</i>	turquoise parrot		C		1
animals	birds	Psittacidae	<i>Barnardius zonarius</i>	Australian ringneck		C		4
animals	birds	Psittacidae	<i>Parvipsitta pusilla</i>	little lorikeet		C		52
animals	birds	Psittacidae	<i>Platycercus elegans</i>	crimson rosella		C		4
animals	birds	Psittacidae	<i>Platycercus eximius</i>	eastern rosella		C		2
animals	birds	Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot		C		5
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		144
animals	birds	Psittacidae	<i>Melopsittacus undulatus</i>	budgerigar		C		2
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		150
animals	birds	Psophodidae	<i>Psophodes olivaceus</i>	eastern whipbird		C		38
animals	birds	Psophodidae	<i>Cinclosoma punctatum</i>	spotted quail-thrush		C		5
animals	birds	Rallidae	<i>Lewinia pectoralis</i>	Lewin's rail		C		4
animals	birds	Rallidae	<i>Gallirallus philippensis</i>	buff-banded rail		C		3
animals	birds	Rallidae	<i>Amaurornis moluccana</i>	pale-vented bush-hen		C		1
animals	birds	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen		C		32

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animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		46
animals	birds	Rallidae	<i>Porzana tabuensis</i>	spotless crane		C		6
animals	birds	Rallidae	<i>Porzana fluminea</i>	Australian spotted crane		C		6
animals	birds	Rallidae	<i>Porzana pusilla</i>	Baillon's crane		C		12
animals	birds	Rallidae	<i>Fulica atra</i>	Eurasian coot		C		18
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		13
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		63
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		132
animals	birds	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		SL		10
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys leucophrys</i>	willie wagtail (southern)		C		1
animals	birds	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe		V	E	6
animals	birds	Scolopacidae	<i>Gallinago hardwickii</i>	Latham's snipe		SL		4
animals	birds	Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper		SL		1
animals	birds	Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper		SL		1
animals	birds	Scolopacidae	<i>Limosa limosa</i>	black-tailed godwit		SL		3
animals	birds	Scolopacidae	<i>Actitis hypoleucos</i>	common sandpiper		SL		8
animals	birds	Strigidae	<i>Ninox strenua</i>	powerful owl		V		2
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		24
animals	birds	Sturnidae	<i>Sturnus vulgaris</i>	common starling	Y			47
animals	birds	Sturnidae	<i>Acridotheres tristis</i>	common myna	Y			69
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		20
animals	birds	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis		SL		1
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		38
animals	birds	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill		C		9
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		11
animals	birds	Timaliidae	<i>Zosterops lateralis cornwalli</i>	silveryeye (eastern)		C		1
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		126
animals	birds	Turnicidae	<i>Turnix maculosus</i>	red-backed button-quail		C		2
animals	birds	Turnicidae	<i>Turnix melanogaster</i>	black-breasted button-quail		V	V	2
animals	birds	Turnicidae	<i>Turnix varius</i>	painted button-quail		C		5
animals	birds	Tytonidae	<i>Tyto novaehollandiae</i>	masked owl		C		1
animals	birds	Tytonidae	<i>Tyto delicatula</i>	eastern barn owl		C		3
animals	birds	Tytonidae	<i>Tyto novaehollandiae novaehollandiae</i>	masked owl (southern subspecies)		C		1
animals	cartilaginous fishes	Dasyatidae	<i>Hemirhamphys fluviorum</i>	estuary stingray		NT		1
animals	insects	Aeshnidae	<i>Adversaeschna brevistyla</i>	blue-spotted hawk				1
animals	insects	Aeshnidae	<i>Anax papuensis</i>	Australian Emperor				1
animals	insects	Coenagrionidae	<i>Ischnura heterosticta heterosticta</i>	common bluetail				1
animals	insects	Corduliidae	<i>Hemicordulia australiae</i>	Australian emerald				1
animals	insects	Corduliidae	<i>Hemicordulia continentalis</i>	fat-bellied emerald				1
animals	insects	Hesperiidae	<i>Suniana sunias reactiva</i>	wide-brand grass-dart				1
animals	insects	Hesperiidae	<i>Toxidia peron</i>	dingy grass-skipper				1
animals	insects	Hesperiidae	<i>Ocybadistes walkeri sothis</i>	green grass-dart				1
animals	insects	Lestidae	<i>Austrolestes leda</i>	wandering ringtail				1
animals	insects	Libellulidae	<i>Diplacodes bipunctata</i>	wandering percher				1
animals	insects	Libellulidae	<i>Orthetrum villositatum</i>	fiery skimmer				1
animals	insects	Libellulidae	<i>Crocothemis nigrifrons</i>	black-headed skimmer				1

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animals	insects	Libellulidae	<i>Orthetrum caledonicum</i>	blue skimmer				1
animals	insects	Libellulidae	<i>Diplacodes haematodes</i>	scarlet percher				1
animals	insects	Libellulidae	<i>Pantala flavescens</i>	wandering glider				1
animals	insects	Libellulidae	<i>Orthetrum sabina</i>	slender skimmer				1
animals	insects	Libellulidae	<i>Macrodiplax cora</i>	wandering pennant				1
animals	insects	Libellulidae	<i>Tramea loewii</i>	common glider				1
animals	insects	Lycaenidae	<i>Catopyrops florinda</i>					1
animals	insects	Lycaenidae	<i>Zizina otis labradus</i>	common grass-blue (Australian subspecies)				2
animals	insects	Lycaenidae	<i>Psychonotis caelius taygetus</i>	small green-banded blue				2
animals	insects	Lycaenidae	<i>Prosotas dubiosa dubiosa</i>	purple line-blue				1
animals	insects	Nymphalidae	<i>Charaxes sempronius sempronius</i>	tailed emperor				2
animals	insects	Nymphalidae	<i>Phaedyma shepherdii shepherdii</i>	white-banded plane (southern subspecies)				1
animals	insects	Nymphalidae	<i>Danaus sp.</i>					1
animals	insects	Nymphalidae	<i>Heteronympha merope merope</i>	common brown				1
animals	insects	Nymphalidae	<i>Acraea andromacha andromacha</i>	glasswing				8
animals	insects	Nymphalidae	<i>Danaus petilia</i>	lesser wanderer				7
animals	insects	Nymphalidae	<i>Euploea corinna</i>	common crow				9
animals	insects	Nymphalidae	<i>Vanessa kershawi</i>	Australian painted lady				1
animals	insects	Nymphalidae	<i>Melanitis leda bankia</i>	evening brown				7
animals	insects	Nymphalidae	<i>Tirumala hamata hamata</i>	blue tiger				3
animals	insects	Nymphalidae	<i>Junonia villida villida</i>	meadow argus				7
animals	insects	Nymphalidae	<i>Hypolimnias bolina nerina</i>	varied eggfly				2
animals	insects	Nymphalidae	<i>Hypocysta adiante adiante</i>	orange ringlet				1
animals	insects	Nymphalidae	<i>Danaus plexippus</i>	monarch	Y			11
animals	insects	Papilionidae	<i>Cressida cressida cressida</i>	clearwing swallowtail				2
animals	insects	Papilionidae	<i>Papilio demoleus sthenelus</i>	chequered swallowtail				3
animals	insects	Papilionidae	<i>Papilio aegaeus</i>					1
animals	insects	Papilionidae	<i>Papilio anactus</i>	dainty swallowtail				1
animals	insects	Papilionidae	<i>Graphium choredon</i>	blue triangle				2
animals	insects	Papilionidae	<i>Papilio aegaeus aegaeus</i>	orchard swallowtail (Australian subspecies)				2
animals	insects	Papilionidae	<i>Graphium eurypylus lycaon</i>	pale triangle				1
animals	insects	Pieridae	<i>Catopsilia pyranthe crokera</i>	white migrant				2
animals	insects	Pieridae	<i>Delias nigrina</i>	black jezebel				2
animals	insects	Pieridae	<i>Cepora perimale scyllara</i>	caper gull (Australian subspecies)				1
animals	insects	Pieridae	<i>Delias argenthona argenthona</i>	scarlet jezebel				3
animals	insects	Pieridae	<i>Eurema brigitta australis</i>	no-brand grass-yellow				1
animals	insects	Pieridae	<i>Eurema hecabe</i>	large grass-yellow				6
animals	insects	Pieridae	<i>Pieris rapae</i>	cabbage white	Y			2
animals	insects	Pieridae	<i>Catopsilia pomona</i>	lemon migrant				5
animals	insects	Pieridae	<i>Belenois java teutonia</i>	caper white				4
animals	insects	Pieridae	<i>Eurema smilax</i>	small grass-yellow				3
animals	mammals	Canidae	<i>Canis lupus dingo</i>	dingo				1
animals	mammals	Canidae	<i>Canis lupus familiaris</i>	dog	Y			3

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animals	mammals	Canidae	<i>Vulpes vulpes</i>	red fox	Y			8
animals	mammals	Dasyuridae	<i>Antechinus flavipes flavipes</i>	yellow-footed antechinus (south-east Queensland)		C		5
animals	mammals	Dasyuridae	<i>Planigale maculata</i>	common planigale		C		1
animals	mammals	Dasyuridae	<i>Sminthopsis murina</i>	common dunnart		C		1
animals	mammals	Delphinidae	<i>Orcaella heinsohni</i>	Australian snubfin dolphin		V		1
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat		C		1
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			1
animals	mammals	Leporidae	<i>Lepus europaeus</i>	European brown hare	Y			13
animals	mammals	Macropodidae	<i>Macropus rufogriseus</i>	red-necked wallaby		C		29
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby		C		6
animals	mammals	Macropodidae	<i>Macropus parryi</i>	whiptail wallaby		C		2
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo		C		9
animals	mammals	Macropodidae	<i>Macropus sp.</i>					2
animals	mammals	Miniopteridae	<i>Miniopterus schreibersii oceanensis</i>	eastern bent-wing bat		C		2
animals	mammals	Molossidae	<i>Mormopterus ridei</i>	eastern free-tailed bat		C		1
animals	mammals	Molossidae	<i>Mormopterus norfolkensis</i>	east coast freetail bat		C		1
animals	mammals	Molossidae	<i>Mormopterus lumsdenae</i>	northern free-tailed bat		C		1
animals	mammals	Molossidae	<i>Tadarida australis</i>	white-striped freetail bat		C		19
animals	mammals	Molossidae	<i>Mormopterus sp.</i>					5
animals	mammals	Muridae	<i>Mus musculus</i>	house mouse	Y			15
animals	mammals	Muridae	<i>Rattus rattus</i>	black rat	Y			13
animals	mammals	Muridae	<i>Rattus tunneyi</i>	pale field-rat		C		3
animals	mammals	Muridae	<i>Rattus lutreolus</i>	swamp rat		C		3
animals	mammals	Muridae	<i>Hydromys chrysogaster</i>	water rat		C		1
animals	mammals	Muridae	<i>Pseudomys gracilicaudatus</i>	eastern chestnut mouse		C		1
animals	mammals	Muridae	<i>Rattus fuscipes</i>	bush rat		C		1
animals	mammals	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot		C		11
animals	mammals	Petauridae	<i>Petaurus norfolcensis</i>	squirrel glider		C		23
animals	mammals	Petauridae	<i>Petaurus australis australis</i>	yellow-bellied glider (southern subspecies)		C		1
animals	mammals	Petauridae	<i>Petaurus breviceps</i>	sugar glider		C		6
animals	mammals	Petauridae	<i>Petaurus sp.</i>					2
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		51
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	171
animals	mammals	Pseudocheiridae	<i>Petauroides volans volans</i>	southern greater glider		V	V	11/1
animals	mammals	Pseudocheiridae	<i>Pseudocheirus peregrinus</i>	common ringtail possum		C		4
animals	mammals	Pteropodidae	<i>Pteropus poliocephalus</i>	grey-headed flying-fox		C	V	12
animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		4
animals	mammals	Pteropodidae	<i>Pteropus sp.</i>					1
animals	mammals	Pteropodidae	<i>Pteropus alecto</i>	black flying-fox		C		11
animals	mammals	Suidae	<i>Sus scrofa</i>	pig	Y			1
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		SL		4
animals	mammals	Vespertilionidae	<i>Scotorepens sp. (Parnaby)</i>	central-eastern broad-nosed bat		C		1
animals	mammals	Vespertilionidae	<i>Vespadelus troughtoni</i>	eastern cave bat		C		1
animals	mammals	Vespertilionidae	<i>Nyctophilus geoffroyi</i>	lesser long-eared bat		C		1

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animals	mammals	Vespertilionidae	<i>Myotis macropus</i>	large-footed myotis		C		1
animals	mammals	Vespertilionidae	<i>Scotorepens orion</i>	south-eastern broad-nosed bat		C		1
animals	mammals	Vespertilionidae	<i>Chalinolobus morio</i>	chocolate wattled bat		C		1
animals	mammals	Vespertilionidae	<i>Nyctophilus gouldi</i>	Gould's long-eared bat		C		1
animals	mammals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		C		9
animals	mammals	Vespertilionidae	<i>Scoteanax rueppellii</i>	greater broad-nosed bat		C		1
animals	mammals	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat		C		5
animals	ray-finned fishes	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish				2
animals	ray-finned fishes	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel				15
animals	ray-finned fishes	Anguillidae	<i>Anguilla australis</i>	southern shortfin eel				6
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead				3
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus marjoriae</i>	silverstreak hardyhead				1
animals	ray-finned fishes	Cichlidae	<i>Oreochromis mossambica</i>	Mozambique mouthbrooder	Y			3
animals	ray-finned fishes	Clupeidae	<i>Nematalosa erebi</i>	bony bream				1
animals	ray-finned fishes	Eleotridae	<i>Gobiomorphus australis</i>	striped gudgeon				10
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris klunzingeri</i>	western carp gudgeon				1
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris sp.</i>					1
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris galii</i>	firetail gudgeon				12
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris compressa</i>	empire gudgeon				12
animals	ray-finned fishes	Melanotaeniidae	<i>Melanotaenia duboulayi</i>	crimsonspotted rainbowfish				5
animals	ray-finned fishes	Mugilidae	<i>Mugil cephalus</i>	sea mullet				6
animals	ray-finned fishes	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish				5
animals	ray-finned fishes	Poeciliidae	<i>Xiphophorus hellerii</i>	swordtail	Y			1
animals	ray-finned fishes	Poeciliidae	<i>Xiphophorus maculatus</i>	platy	Y			8
animals	ray-finned fishes	Poeciliidae	<i>Poecilia reticulata</i>	guppy	Y			1
animals	ray-finned fishes	Poeciliidae	<i>Gambusia holbrooki</i>	mosquitofish	Y			19
animals	ray-finned fishes	Pseudomugilidae	<i>Pseudomugil signifer</i>	Pacific blue eye				5
animals	ray-finned fishes	Retropinnidae	<i>Retropinna semoni</i>	Australian smelt				5
animals	ray-finned fishes	Scorpaenidae	<i>Notesthes robusta</i>	bullrout				3
animals	ray-finned fishes	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				8
animals	reptiles	Agamidae	<i>Diporiphora australis</i>	tommy roundhead		C		13
animals	reptiles	Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon		C		18
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		25
animals	reptiles	Agamidae	<i>Diporiphora nobbi</i>	nobbi		C		1
animals	reptiles	Boidae	<i>Antaresia maculosa</i>	spotted python		C		2
animals	reptiles	Boidae	<i>Morelia spilota</i>	carpet python		C		13
animals	reptiles	Chelidae	<i>Emydura macquarii macquarii</i>	Murray turtle		C		4/1
animals	reptiles	Colubridae	<i>Dendrelaphis punctulatus</i>	green tree snake		C		10
animals	reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake		C		3
animals	reptiles	Colubridae	<i>Boiga irregularis</i>	brown tree snake		C		3
animals	reptiles	Diplodactylidae	<i>Nebulifera robusta</i>	robust velvet gecko		C		4
animals	reptiles	Diplodactylidae	<i>Diplodactylus vittatus</i>	wood gecko		C		5
animals	reptiles	Elapidae	<i>Pseudechis guttatus</i>	spotted black snake		C		2
animals	reptiles	Elapidae	<i>Pseudechis porphyriacus</i>	red-bellied black snake		C		7
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake		C		7/1
animals	reptiles	Elapidae	<i>Cacophis harriettae</i>	white-crowned snake		C		2

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animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whipsnake		C		15
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		12
animals	reptiles	Elapidae	<i>Vermicella annulata</i>	bandy-bandy		C		1
animals	reptiles	Elapidae	<i>Cryptophis nigrescens</i>	eastern small-eyed snake		C		2
animals	reptiles	Elapidae	<i>Brachyuropsis australis</i>	coral snake		C		5/1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>	dubious dtella		C		18
animals	reptiles	Gekkonidae	<i>Hemidactylus frenatus</i>	house gecko	Y			3
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		5/2
animals	reptiles	Pygopodidae	<i>Delma plebeia</i>	common delma		C		1
animals	reptiles	Scincidae	<i>Ctenotus spaldingi</i>	straight-browed ctenotus		C		12
animals	reptiles	Scincidae	<i>Carlia pectoralis</i>	open-litter rainbow skink		C		2
animals	reptiles	Scincidae	<i>Lygisaurus foliorum</i>	tree-base litter-skink		C		4
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink		C		2
animals	reptiles	Scincidae	<i>Anomalopus verreauxii</i>	three-clawed worm-skink		C		4
animals	reptiles	Scincidae	<i>Lampropholis delicata</i>	dark-flecked garden sunskink		C		17
animals	reptiles	Scincidae	<i>Morethia taeniopleura</i>	fire-tailed skink		C		6
animals	reptiles	Scincidae	<i>Calyptotis scutirostrum</i>	scute-snouted calyptotis		C		2
animals	reptiles	Scincidae	<i>Lampropholis guichenoti</i>	pale-flecked garden sunskink		C		1
animals	reptiles	Scincidae	<i>Carlia pectoralis sensu lato</i>			C		1
animals	reptiles	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink		C		18
animals	reptiles	Scincidae	<i>Tiliqua scincoides</i>	eastern blue-tongued lizard		C		4
animals	reptiles	Scincidae	<i>Carlia vivax</i>	tussock rainbow-skink		C		11/2
animals	reptiles	Scincidae	<i>Karma murrayi</i>	Murray's skink		C		2/1
animals	reptiles	Typhlopidae	<i>Anilius sp.</i>					1
animals	reptiles	Varanidae	<i>Varanus varius</i>	lace monitor		C		9/1
animals	uncertain	Indeterminate	<i>Indeterminate</i>	Unknown or Code Pending		C		6
fungi	uncertain	Ascomycota	<i>Mycocalicium fulvofusum</i>			C		1/1
fungi	uncertain	Ascomycota	<i>Ascobolus australis</i>			C		1/1
fungi		Basidiomycota	<i>Agrocybe</i>			C		1/1
fungi		Basidiomycota	<i>Conocybe</i>			C		1/1
fungi		Basidiomycota	<i>Coprinus</i>			C		3/3
fungi		Basidiomycota	<i>Tylopilus</i>			C		1/1
fungi		Basidiomycota	<i>Inocybe</i>			C		5/5
fungi		Basidiomycota	<i>Amanita flavella</i>			C		1/1
fungi		Basidiomycota	<i>Gloeophyllum striatum</i>			C		1/1
fungi		Basidiomycota	<i>Trichaptum byssogenum</i>			C		1/1
fungi		Basidiomycota	<i>Scleroderma verrucosum</i>			C		1/1
fungi		Basidiomycota	<i>Agaricus</i>			C		1/1
fungi		Basidiomycota	<i>Russula</i>			C		1/1
fungi		Basidiomycota	<i>Tricholoma</i>			C		1/1
plants	conifers	Araucariaceae	<i>Araucaria bidwillii</i>	bunya pine		C		1
plants	conifers	Cupressaceae	<i>Callitris baileyi</i>	Bailey's cypress		NT		1
plants	ferns	Aspleniaceae	<i>Asplenium attenuatum var. attenuatum</i>			C		1
plants	ferns	Blechnaceae	<i>Blechnum indicum</i>	swamp water fern		C		1
plants	ferns	Blechnaceae	<i>Doodia caudata</i>			C		1/1
plants	ferns	Blechnaceae	<i>Doodia australis</i>			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	ferns	Cyatheaceae	<i>Cyathea cooperi</i>			C		1
plants	ferns	Dennstaedtiaceae	<i>Histiopteris incisa</i>	bats-wing fern		C		1
plants	ferns	Dennstaedtiaceae	<i>Pteridium esculentum</i>	common bracken		C		1
plants	ferns	Dicksoniaceae	<i>Calochlaena dubia</i>			C		1
plants	ferns	Gleicheniaceae	<i>Gleichenia dicarpa</i>	pouched coral fern		C		1
plants	ferns	Polypodiaceae	<i>Pyrrosia rupestris</i>	rock felt fern		C		1
plants	ferns	Polypodiaceae	<i>Drynaria rigidula</i>			C		1
plants	ferns	Pteridaceae	<i>Adiantum aethiopicum</i>			C		1
plants	ferns	Pteridaceae	<i>Adiantum hispidulum</i> var. <i>hispidulum</i>			C		1
plants	ferns	Pteridaceae	<i>Cheilanthes sieberi</i>			C		1
plants	ferns	Pteridaceae	<i>Pellaea paradoxa</i>	heart fern		C		1
plants	ferns	Pteridaceae	<i>Pteris vittata</i>	Chinese bracken		C		1/1
plants	ferns	Pteridaceae	<i>Acrostichum speciosum</i>	mangrove fern		C		2/1
plants	higher dicots	Acanthaceae	<i>Ruellia simplex</i>		Y			7/7
plants	higher dicots	Acanthaceae	<i>Thunbergia alata</i>	black-eyed Susan	Y			1
plants	higher dicots	Acanthaceae	<i>Brunoniella australis</i>	blue trumpet		C		3/2
plants	higher dicots	Acanthaceae	<i>Rostellularia adscendens</i>			C		1/1
plants	higher dicots	Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower		C		2/1
plants	higher dicots	Adoxaceae	<i>Sambucus nigra</i>		Y			2/2
plants	higher dicots	Aizoaceae	<i>Aptenia cordifolia</i>		Y			1/1
plants	higher dicots	Amaranthaceae	<i>Alternanthera brasiliana</i>		Y			1/1
plants	higher dicots	Amaranthaceae	<i>Alternanthera pungens</i>	khaki weed	Y			2/2
plants	higher dicots	Amaranthaceae	<i>Alternanthera nana</i>	hairy joyweed		C		2/2
plants	higher dicots	Amaranthaceae	<i>Alternanthera denticulata</i>	lesser joyweed		C		3/3
plants	higher dicots	Anacardiaceae	<i>Schinus terebinthifolius</i>		Y			3/3
plants	higher dicots	Aphanopetalaceae	<i>Aphanopetalum resinosum</i>	gumvine		C		1
plants	higher dicots	Apiaceae	<i>Cyclospermum leptophyllum</i>		Y			2/2
plants	higher dicots	Apiaceae	<i>Lilaeopsis brisbanica</i>			E		1/1
plants	higher dicots	Apiaceae	<i>Platysace ericoides</i>	heath platysace		C		1/1
plants	higher dicots	Apiaceae	<i>Apium prostratum</i>			C		1
plants	higher dicots	Apiaceae	<i>Ammi majus</i>	bishop's weed	Y			3/3
plants	higher dicots	Apiaceae	<i>Daucus carota</i>	wild carrot	Y			2/2
plants	higher dicots	Araliaceae	<i>Polyscias elegans</i>	celery wood		C		1
plants	higher dicots	Araliaceae	<i>Astrotricha latifolia</i>			C		1
plants	higher dicots	Araliaceae	<i>Hydrocotyle laxiflora</i>	stinking pennywort		C		1/1
plants	higher dicots	Araliaceae	<i>Trachymene procumbens</i>	creeping wild parsnip		C		1
plants	higher dicots	Asteraceae	<i>Vittadinia sulcata</i>	native daisy		C		1/1
plants	higher dicots	Asteraceae	<i>Cassinia subtropica</i>			C		1
plants	higher dicots	Asteraceae	<i>Erigeron canadensis</i>		Y			1/1
plants	higher dicots	Asteraceae	<i>Glossocardia bidens</i>	native cobbler's pegs		C		1/1
plants	higher dicots	Asteraceae	<i>Arctotheca calendula</i>	Cape weed	Y			1/1
plants	higher dicots	Asteraceae	<i>Calyptocarpus vialis</i>	creeping cinderella weed	Y			3/3
plants	higher dicots	Asteraceae	<i>Hypochaeris radicata</i>	catsear	Y			1/1
plants	higher dicots	Asteraceae	<i>Vittadinia pustulata</i>			C		2/2
plants	higher dicots	Asteraceae	<i>Ageratum houstonianum</i>	blue billygoat weed	Y			3/2
plants	higher dicots	Asteraceae	<i>Brachyscome basaltica</i>			C		2/2

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plants	higher dicots	Asteraceae	<i>Carduus pycnocephalus</i>		Y			1/1
plants	higher dicots	Asteraceae	<i>Cyanthillium cinereum</i>			C		2/1
plants	higher dicots	Asteraceae	<i>Hypochaeris albiflora</i>		Y			1/1
plants	higher dicots	Asteraceae	<i>Leiocarpa brevicompta</i>			C		2/2
plants	higher dicots	Asteraceae	<i>Dimorphotheca ecklonis</i>		Y			2/2
plants	higher dicots	Asteraceae	<i>Sigesbeckia orientalis</i>	Indian weed		C		1
plants	higher dicots	Asteraceae	<i>Ambrosia artemisiifolia</i>	annual ragweed	Y			2/2
plants	higher dicots	Asteraceae	<i>Gamochaeta pensylvanica</i>		Y			1/1
plants	higher dicots	Asteraceae	<i>Ozothamnus diosmifolius</i>	white dogwood		C		1/1
plants	higher dicots	Asteraceae	<i>Sphagneticola trilobata</i>		Y			1/1
plants	higher dicots	Asteraceae	<i>Senecio madagascariensis</i>	fireweed	Y			2
plants	higher dicots	Asteraceae	<i>Lactuca serriola forma serriola</i>		Y			2/2
plants	higher dicots	Asteraceae	<i>Solidago altissima subsp. altissima</i>	goldenrod	Y			1/1
plants	higher dicots	Asteraceae	<i>Thymophylla tenuiloba var. tenuiloba</i>		Y			1/1
plants	higher dicots	Asteraceae	<i>Verbesina encelioides var. encelioides</i>		Y			1/1
plants	higher dicots	Asteraceae	<i>Olearia nernstii</i>	Ipswich daisy		C		3/2
plants	higher dicots	Asteraceae	<i>Bidens bipinnata</i>	bipinnate beggar's ticks	Y			1
plants	higher dicots	Asteraceae	<i>Cirsium vulgare</i>	spear thistle	Y			1/1
plants	higher dicots	Asteraceae	<i>Centaurea jacea</i>		Y			9/9
plants	higher dicots	Asteraceae	<i>Tagetes minuta</i>	stinking roger	Y			1/1
plants	higher dicots	Asteraceae	<i>Bidens pilosa</i>		Y			2/1
plants	higher dicots	Asteraceae	<i>Sonchus oleraceus</i>	common sowthistle	Y			2/2
plants	higher dicots	Asteraceae	<i>Cichorium intybus</i>	chicory	Y			2/2
plants	higher dicots	Asteraceae	<i>Zinnia peruviana</i>	wild zinnia	Y			1
plants	higher dicots	Asteraceae	<i>Ageratina riparia</i>	mistflower	Y			1/1
plants	higher dicots	Asteraceae	<i>Camptacra barbata</i>			C		1/1
plants	higher dicots	Basellaceae	<i>Anredera cordifolia</i>	Madeira vine	Y			2/2
plants	higher dicots	Bignoniaceae	<i>Campsis radicans</i>		Y			1/1
plants	higher dicots	Bignoniaceae	<i>Pyrostegia venusta</i>		Y			1/1
plants	higher dicots	Bignoniaceae	<i>Pandorea floribunda</i>			C		3/3
plants	higher dicots	Bignoniaceae	<i>Jacaranda mimosifolia</i>	jacaranda	Y			1
plants	higher dicots	Bignoniaceae	<i>Pandorea</i>			C		1
plants	higher dicots	Bignoniaceae	<i>Tecoma stans var. stans</i>		Y			1/1
plants	higher dicots	Brassicaceae	<i>Cardamine hirsuta</i>	common bittercress	Y			2/2
plants	higher dicots	Brassicaceae	<i>Brassica chinensis</i>	Chinese cabbage	Y			1/1
plants	higher dicots	Brassicaceae	<i>Raphanus raphanistrum</i>	wild radish	Y			2/2
plants	higher dicots	Brassicaceae	<i>Capsella bursapastoris</i>	shepherd's purse	Y			2/2
plants	higher dicots	Brassicaceae	<i>Lepidium didymum</i>		Y			1/1
plants	higher dicots	Cactaceae	<i>Opuntia aurantiaca</i>	tiger pear	Y			1/1
plants	higher dicots	Caesalpiniaceae	<i>Senna artemisioides subsp. filifolia</i>			C		1/1
plants	higher dicots	Caesalpiniaceae	<i>Senna pendula var. glabrata</i>	Easter cassia	Y			1
plants	higher dicots	Caesalpiniaceae	<i>Senna septemtrionalis</i>		Y			1/1
plants	higher dicots	Caesalpiniaceae	<i>Biancaea decapetala</i>		Y			1/1
plants	higher dicots	Campanulaceae	<i>Lobelia concolor</i>			C		1/1
plants	higher dicots	Campanulaceae	<i>Lobelia browniana</i>			C		1/1
plants	higher dicots	Campanulaceae	<i>Lobelia purpurascens</i>	white root		C		2/1

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plants	higher dicots	Campanulaceae	<i>Wahlenbergia gracilis</i>	sprawling bluebell		C		4/4
plants	higher dicots	Campanulaceae	<i>Wahlenbergia capillaris</i>			C		1/1
plants	higher dicots	Campanulaceae	<i>Wahlenbergia littorcola</i>			C		1/1
plants	higher dicots	Campanulaceae	<i>Lobelia stenophylla</i>			C		1/1
plants	higher dicots	Capparaceae	<i>Capparis arborea</i>	brush caper berry		C		1
plants	higher dicots	Capparaceae	<i>Capparis sarmentosa</i>	scrambling caper		C		1
plants	higher dicots	Caryophyllaceae	<i>Sagina procumbens</i>	spreading pearlwort	Y			1/1
plants	higher dicots	Caryophyllaceae	<i>Polycarpaea corymbosa</i> var. <i>minor</i>			C		1/1
plants	higher dicots	Caryophyllaceae	<i>Drymaria cordata</i> subsp. <i>cordata</i>		Y			1/1
plants	higher dicots	Caryophyllaceae	<i>Stellaria media</i>	chickweed	Y			1/1
plants	higher dicots	Casuarinaceae	<i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i>			C		1/1
plants	higher dicots	Casuarinaceae	<i>Casuarina cunninghamiana</i>			C		1
plants	higher dicots	Casuarinaceae	<i>Allocasuarina torulosa</i>			C		1
plants	higher dicots	Casuarinaceae	<i>Allocasuarina littoralis</i>			C		1
plants	higher dicots	Celastraceae	<i>Denhamia celastroides</i>	broad-leaved boxwood		C		1
plants	higher dicots	Celastraceae	<i>Denhamia bilocularis</i>			C		1
plants	higher dicots	Celastraceae	<i>Elaeodendron australe</i> var. <i>australe</i>			C		1
plants	higher dicots	Celastraceae	<i>Denhamia cunninghamii</i>			C		2/2
plants	higher dicots	Celastraceae	<i>Denhamia silvestris</i>			C		1/1
plants	higher dicots	Chenopodiaceae	<i>Einadia nutans</i> subsp. <i>linifolia</i>			C		1/1
plants	higher dicots	Chenopodiaceae	<i>Einadia hastata</i>			C		1
plants	higher dicots	Clusiaceae	<i>Hypericum gramineum</i>			C		1/1
plants	higher dicots	Combretaceae	<i>Combretum paniculatum</i>		Y			1/1
plants	higher dicots	Crassulaceae	<i>Bryophyllum beauverdii</i>		Y			1/1
plants	higher dicots	Crassulaceae	<i>Bryophyllum delagoense</i>		Y			1
plants	higher dicots	Crassulaceae	<i>Bryophyllum daigremontianum</i>		Y			1/1
plants	higher dicots	Crassulaceae	<i>Bryophyllum fedtschenkoi</i>		Y			2/2
plants	higher dicots	Crassulaceae	<i>Crassula sieberiana</i>			C		1/1
plants	higher dicots	Cucurbitaceae	<i>Cucumis metuliferus</i>	prickly cucumber	Y			1/1
plants	higher dicots	Dilleniaceae	<i>Hibbertia diffusa</i>			C		1
plants	higher dicots	Dilleniaceae	<i>Hibbertia linearis</i> var. <i>obtusifolia</i>			C		1
plants	higher dicots	Dilleniaceae	<i>Hibbertia stricta</i>			C		1
plants	higher dicots	Ebenaceae	<i>Diospyros fasciculosa</i>	grey ebony		C		1
plants	higher dicots	Ebenaceae	<i>Diospyros geminata</i>	scaly ebony		C		1
plants	higher dicots	Elaeocarpaceae	<i>Elaeocarpus obovatus</i>	blueberry ash		C		1
plants	higher dicots	Ericaceae	<i>Brachyloma daphnoides</i> subsp. <i>daphnoides</i>			C		1/1
plants	higher dicots	Ericaceae	<i>Leucopogon juniperinus</i>	prickly heath		C		1
plants	higher dicots	Ericaceae	<i>Acrotriche aggregata</i>	red cluster heath		C		2/1
plants	higher dicots	Ericaceae	<i>Melichrus adpressus</i>			C		1
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum</i> sp. (Splityard Creek L.Pedley 5360)			C		1
plants	higher dicots	Euphorbiaceae	<i>Mallotus philippensis</i>	red kamala		C		1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia hyssopifolia</i>		Y			2/2
plants	higher dicots	Euphorbiaceae	<i>Mallotus claoxyloides</i>	green kamala		C		1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia ophthalmica</i>		Y			2/2
plants	higher dicots	Euphorbiaceae	<i>Euphorbia dallachyana</i>			C		1/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia cyathophora</i>	dwarf poinsettia	Y			1

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plants	higher dicots	Euphorbiaceae	<i>Alchornea ilicifolia</i>	native holly		C		1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia umbellata</i>		Y			1/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia peplus</i>	petty spurge	Y			1/1
plants	higher dicots	Euphorbiaceae	<i>Acalypha nemorum</i>	hairy acalypha		C		1
plants	higher dicots	Euphorbiaceae	<i>Ricinus communis</i>	castor oil bush	Y			1/1
plants	higher dicots	Fabaceae	<i>Galactia tenuiflora</i> var. <i>lucida</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Neonotonia wightii</i> var. <i>wightii</i>		Y			3/3
plants	higher dicots	Fabaceae	<i>Sesbania cannabina</i> var. <i>cannabina</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Vigna vexillata</i> var. <i>angustifolia</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Indigofera australis</i> subsp. <i>australis</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Erythrina vespertilio</i> subsp. <i>vespertilio</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Glycine</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Cullen tenax</i>	emu-foot		C		2/2
plants	higher dicots	Fabaceae	<i>Hovea lorata</i>			C		4/4
plants	higher dicots	Fabaceae	<i>Vigna luteola</i>	dalrymple viona	Y			2/2
plants	higher dicots	Fabaceae	<i>Desmodium gunnii</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Glycine tabacina</i>	glycine pea		C		1/1
plants	higher dicots	Fabaceae	<i>Hovea lanceolata</i>			C		1
plants	higher dicots	Fabaceae	<i>Hovea planifolia</i>			C		2/2
plants	higher dicots	Fabaceae	<i>Trifolium dubium</i>	yellow sucking clover	Y			1/1
plants	higher dicots	Fabaceae	<i>Desmodium varians</i>	slender tick trefoil		C		1/1
plants	higher dicots	Fabaceae	<i>Melilotus indicus</i>	hexham scent	Y			1/1
plants	higher dicots	Fabaceae	<i>Pultenaea euchila</i>	orange pultenaea		C		2/1
plants	higher dicots	Fabaceae	<i>Pultenaea spinosa</i>			C		1
plants	higher dicots	Fabaceae	<i>Pultenaea villosa</i>	hairy bush pea		C		1
plants	higher dicots	Fabaceae	<i>Daviesia villifera</i>	prickly daviesia		C		1
plants	higher dicots	Fabaceae	<i>Daviesia wyattiana</i>	long-leaved bitter pea		C		1
plants	higher dicots	Fabaceae	<i>Indigofera baileyi</i>			C		3/3
plants	higher dicots	Fabaceae	<i>Indigofera spicata</i>	creeping indigo	Y			2/2
plants	higher dicots	Fabaceae	<i>Jacksonia scoparia</i>			C		1
plants	higher dicots	Fabaceae	<i>Kennedia rubicunda</i>	red Kennedy pea		C		1
plants	higher dicots	Fabaceae	<i>Neonotonia wightii</i>		Y			1
plants	higher dicots	Fabaceae	<i>Sesbania cannabina</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Daviesia ulicifolia</i>	native gorse		C		1
plants	higher dicots	Fabaceae	<i>Desmodium triflorum</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Glycine clandestina</i>			C		1
plants	higher dicots	Fabaceae	<i>Glycine microphylla</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Medicago polymorpha</i>	burr medic	Y			1/1
plants	higher dicots	Fabaceae	<i>Stylosanthes scabra</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Pultenaea petiolaris</i>			C		1
plants	higher dicots	Fabaceae	<i>Chorizema parviflorum</i>	eastern flame pea		C		1/1
plants	higher dicots	Fabaceae	<i>Genista monspessulana</i>	Montpellier broom	Y			1/1
plants	higher dicots	Fabaceae	<i>Swainsona brachycarpa</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Erythrina crista-galli</i>		Y			2/2
plants	higher dicots	Fabaceae	<i>Austrosteenisia blackii</i>	bloodvine		C		1
plants	higher dicots	Fabaceae	<i>Castanospermum australe</i>	black bean		C		1

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plants	higher dicots	Fabaceae	<i>Swainsona queenslandica</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Desmodium rhytidophyllum</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Tephrosia glomeruliflora</i>	pink tephrosia	Y			1/1
plants	higher dicots	Fabaceae	<i>Vicia sativa</i> subsp. <i>nigra</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Macroptilium atropurpureum</i>	siratro	Y			1/1
plants	higher dicots	Geraniaceae	<i>Geranium homeanum</i>			C		1/1
plants	higher dicots	Geraniaceae	<i>Pelargonium</i>			C		2/2
plants	higher dicots	Geraniaceae	<i>Geranium solanderi</i> var. <i>solanderi</i>	native geranium		C		3/2
plants	higher dicots	Goodeniaceae	<i>Goodenia hederacea</i> subsp. <i>hederacea</i>			C		3/3
plants	higher dicots	Goodeniaceae	<i>Goodenia bellidifolia</i> subsp. <i>argentea</i>			C		1/1
plants	higher dicots	Goodeniaceae	<i>Goodenia rotundifolia</i>			C		1
plants	higher dicots	Loranthaceae	<i>Amyema pendula</i> subsp. <i>longifolia</i>			C		1/1
plants	higher dicots	Loranthaceae	<i>Amyema miquelii</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Pavonia hastata</i>	pink pavonia	Y			2/1
plants	higher dicots	Malvaceae	<i>Abutilon oxycarpum</i> var. <i>oxycarpum</i>			C		1
plants	higher dicots	Malvaceae	<i>Hibiscus heterophyllus</i>			C		1
plants	higher dicots	Malvaceae	<i>Malvaviscus arboreus</i>		Y			1/1
plants	higher dicots	Malvaceae	<i>Gossypium hirsutum</i>		Y			1/1
plants	higher dicots	Malvaceae	<i>Sida rhombifolia</i>		Y			1
plants	higher dicots	Malvaceae	<i>Sida cordifolia</i>		Y			1
plants	higher dicots	Meliaceae	<i>Melia azedarach</i>	white cedar		C		1
plants	higher dicots	Mimosaceae	<i>Acacia hispidula</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia penninervis</i> var. <i>penninervis</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia penninervis</i> var. <i>longiracemosa</i>			C		2/2
plants	higher dicots	Mimosaceae	<i>Acacia maidenii</i>	Maiden's wattle		C		1
plants	higher dicots	Mimosaceae	<i>Leucaena leucocephala</i> subsp. <i>leucocephala</i>		Y			2/2
plants	higher dicots	Mimosaceae	<i>Acacia falcata</i>	sickle wattle		C		2/1
plants	higher dicots	Mimosaceae	<i>Acacia fimbriata</i>	Brisbane golden wattle		C		2/1
plants	higher dicots	Mimosaceae	<i>Neptunia gracilis</i> forma <i>gracilis</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia julifera</i> subsp. <i>julifera</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia glaucocarpa</i>	hickory wattle		C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia macradenia</i>	zig-zag wattle		C		1
plants	higher dicots	Mimosaceae	<i>Acacia juncifolia</i>			C		3/2
plants	higher dicots	Mimosaceae	<i>Acacia complanata</i>	flatstem wattle		C		4/3
plants	higher dicots	Mimosaceae	<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia disparrima</i> subsp. <i>disparrima</i>			C		1
plants	higher dicots	Moraceae	<i>Trophis scandens</i> subsp. <i>scandens</i>			C		1
plants	higher dicots	Moraceae	<i>Maclura cochinchinensis</i>	cockspur thorn		C		1
plants	higher dicots	Moraceae	<i>Streblus brunonianus</i>	whalebone tree		C		1
plants	higher dicots	Moraceae	<i>Ficus opposita</i>			C		1
plants	higher dicots	Moraceae	<i>Ficus coronata</i>	creek sandpaper fig		C		1
plants	higher dicots	Moraceae	<i>Morus alba</i>	white mulberry	Y			2/2
plants	higher dicots	Moraceae	<i>Ficus obliqua</i>			C		1
plants	higher dicots	Myrsinaceae	<i>Myrsine variabilis</i>			C		1
plants	higher dicots	Myrsinaceae	<i>Embelia australiana</i>	embelia		C		1
plants	higher dicots	Myrsinaceae	<i>Lysimachia arvensis</i>		Y			2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Myrtaceae	<i>Acmena smithii</i>	lillypilly satinash		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia henryi</i>	large-leaved spotted gum		C		3/2
plants	higher dicots	Myrtaceae	<i>Eucalyptus dura</i>			C		5/4
plants	higher dicots	Myrtaceae	<i>Eucalyptus major</i>	mountain grey gum		C		1
plants	higher dicots	Myrtaceae	<i>Gossia bidwillii</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus carnea</i>			C		1
plants	higher dicots	Myrtaceae	<i>Sannantha collina</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia gummifera</i>	red bloodwood		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus fibrosa</i>			C		1
plants	higher dicots	Myrtaceae	<i>Angophora leiocarpa</i>	rusty gum		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia citriodora</i>	spotted gum		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia intermedia</i>	pink bloodwood		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia torelliana</i>	cadaghi		C		2/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus curtisii</i>	Plunkett mallee		NT		12/11
plants	higher dicots	Myrtaceae	<i>Melaleuca bracteata</i>			C		1
plants	higher dicots	Myrtaceae	<i>Melaleuca viminalis</i>			C		2/1
plants	higher dicots	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus moluccana</i>	gum-topped box		C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus tindaliae</i>	Queensland white stringybark		C		1
plants	higher dicots	Myrtaceae	<i>Backhousia myrtifolia</i>	carrol		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus acmenoides</i>			C		2/2
plants	higher dicots	Myrtaceae	<i>Lophostemon confertus</i>	brush box		C		1
plants	higher dicots	Myrtaceae	<i>Tristaniopsis laurina</i>			C		1
plants	higher dicots	Myrtaceae	<i>Leptospermum neglectum</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Lophostemon suaveolens</i>	swamp box		C		1
plants	higher dicots	Myrtaceae	<i>Rhodomyrtus psidioides</i>	native guava		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus siderophloia</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus tereticornis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Leptospermum trinervium</i>	woolly tea-tree		C		1
plants	higher dicots	Myrtaceae	<i>Leptospermum polygalifolium</i>	tantoon		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia henryi</i> x <i>C. torelliana</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>			C		5/5
plants	higher dicots	Myrtaceae	<i>Eucalyptus melanophloia</i> subsp. <i>melanophloia</i>			C		1/1
plants	higher dicots	Ochnaceae	<i>Ochna serrulata</i>	ochna	Y			2/1
plants	higher dicots	Oleaceae	<i>Notelaea lloydii</i>	Lloyd's native olive		V	V	10/10
plants	higher dicots	Oleaceae	<i>Jasminum didymum</i> subsp. <i>racemosum</i>			C		1
plants	higher dicots	Oleaceae	<i>Olea europaea</i> subsp. <i>cuspidata</i>		Y			2/2
plants	higher dicots	Oleaceae	<i>Notelaea</i>			C		3/3
plants	higher dicots	Oleaceae	<i>Olea europaea</i>	common olive	Y			1
plants	higher dicots	Oleaceae	<i>Notelaea ovata</i>	forest olive		C		3/2
plants	higher dicots	Oleaceae	<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>			C		1
plants	higher dicots	Oleaceae	<i>Notelaea punctata</i>			C		1
plants	higher dicots	Oleaceae	<i>Notelaea microcarpa</i>			C		1/1
plants	higher dicots	Oleaceae	<i>Notelaea ipsviciensis</i>			E	CE	10/10
plants	higher dicots	Oleaceae	<i>Chionanthus ramiflorus</i>	northern olive		C		1/1
plants	higher dicots	Oleaceae	<i>Jasminum dianthifolium</i>			C		1/1

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plants	higher dicots	Onagraceae	<i>Oenothera rosea</i>	rose evening primrose	Y			1/1
plants	higher dicots	Onagraceae	<i>Oenothera indecora</i> subsp. <i>bonariensis</i>		Y			1/1
plants	higher dicots	Onagraceae	<i>Oenothera stricta</i> subsp. <i>stricta</i>		Y			1/1
plants	higher dicots	Passifloraceae	<i>Passiflora foetida</i>		Y			1/1
plants	higher dicots	Passifloraceae	<i>Passiflora pallida</i>		Y			1/1
plants	higher dicots	Passifloraceae	<i>Passiflora suberosa</i>	corky passion flower	Y			1
plants	higher dicots	Passifloraceae	<i>Passiflora subpeltata</i>	white passion flower	Y			1
plants	higher dicots	Passifloraceae	<i>Passiflora suberosa</i> subsp. <i>litoralis</i>		Y			1/1
plants	higher dicots	Passifloraceae	<i>Passiflora herbertiana</i> subsp. <i>herbertiana</i>	native passionfruit		C		1
plants	higher dicots	Petiveriaceae	<i>Rivina humilis</i>		Y			1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus similis</i>			C		3/3
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus simplex</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Breynia oblongifolia</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus virgatus</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Bridelia exaltata</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus hirtellus</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Glochidion ferdinandi</i>			C		1
plants	higher dicots	Pittosporaceae	<i>Bursaria spinosa</i> subsp. <i>spinosa</i>			C		1
plants	higher dicots	Pittosporaceae	<i>Auranticarpa rhombifolia</i>			C		1
plants	higher dicots	Pittosporaceae	<i>Pittosporum revolutum</i>	yellow pittosporum		C		1
plants	higher dicots	Plantaginaceae	<i>Plantago lanceolata</i>		Y			2/2
plants	higher dicots	Plantaginaceae	<i>Veronica plebeia</i>	trailing speedwell		C		1
plants	higher dicots	Polygonaceae	<i>Rumex hypogaeus</i>		Y			1/1
plants	higher dicots	Polygonaceae	<i>Persicaria decipiens</i>	slender knotweed		C		1/1
plants	higher dicots	Polygonaceae	<i>Persicaria attenuata</i>			C		1/1
plants	higher dicots	Polygonaceae	<i>Antigonon leptopus</i>		Y			2/2
plants	higher dicots	Polygonaceae	<i>Rumex crispus</i>	curled dock	Y			1/1
plants	higher dicots	Polygonaceae	<i>Acetosa vesicaria</i>		Y			2/2
plants	higher dicots	Portulacaceae	<i>Calandrinia pickeringii</i>			C		1/1
plants	higher dicots	Proteaceae	<i>Persoonia sericea</i>	silky geebung		C		1/1
plants	higher dicots	Proteaceae	<i>Grevillea robusta</i>			C		1
plants	higher dicots	Putranjivaceae	<i>Drypetes deplanchei</i>	grey boxwood		C		1
plants	higher dicots	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		1
plants	higher dicots	Rhamnaceae	<i>Cryptandra longistaminea</i>			C		1/1
plants	higher dicots	Rhamnaceae	<i>Pomaderris lanigera</i>			C		1/1
plants	higher dicots	Rosaceae	<i>Malus pumila</i>		Y			1/1
plants	higher dicots	Rosaceae	<i>Eriobotrya japonica</i>	loquat	Y			1
plants	higher dicots	Rosaceae	<i>Rhaphiolepis indica</i>	Indian hawthorn	Y			1
plants	higher dicots	Rubiaceae	<i>Gynochthodes canthoides</i>			C		1
plants	higher dicots	Rubiaceae	<i>Hodgkinsonia ovatiflora</i>	golden ash		C		1
plants	higher dicots	Rubiaceae	<i>Cyclophyllum coprosmoides</i>			C		2
plants	higher dicots	Rubiaceae	<i>Psydrax odorata</i>			C		1
plants	higher dicots	Rubiaceae	<i>Everistia vacciniifolia</i>			C		1
plants	higher dicots	Rubiaceae	<i>Spermacoce multicaulis</i>			C		2/2
plants	higher dicots	Rubiaceae	<i>Opercularia diphylla</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Asperula geminifolia</i>			C		2/1

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plants	higher dicots	Rubiaceae	<i>Richardia stellaris</i>		Y			4/4
plants	higher dicots	Rubiaceae	<i>Asperula conferta</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Pomax umbellata</i>			C		2/1
plants	higher dicots	Rutaceae	<i>Sarcomelicope simplicifolia subsp. simplicifolia</i>	yellow aspen		C		1
plants	higher dicots	Rutaceae	<i>Zieria smithii</i>			C		1
plants	higher dicots	Rutaceae	<i>Bergera koenigii</i>		Y			1/1
plants	higher dicots	Rutaceae	<i>Acronychia laevis</i>	glossy acronychia		C		1/1
plants	higher dicots	Rutaceae	<i>Boronia rosmarinifolia</i>	forest boronia		C		3/2
plants	higher dicots	Rutaceae	<i>Flindersia australis</i>	crow's ash		C		1
plants	higher dicots	Rutaceae	<i>Flindersia bennettii</i>			C		1
plants	higher dicots	Rutaceae	<i>Acronychia pauciflora</i>	soft acronychia		C		1
plants	higher dicots	Rutaceae	<i>Flindersia xanthoxyla</i>	yellow-wood		C		1
plants	higher dicots	Rutaceae	<i>Flindersia collina</i>	broad-leaved leopard tree		C		1
plants	higher dicots	Sapindaceae	<i>Mischocarpus pyramidalis</i>			C		1
plants	higher dicots	Sapindaceae	<i>Cardiospermum grandiflorum</i>	heart seed vine	Y			6/5
plants	higher dicots	Sapindaceae	<i>Toeckia tenax</i>	pitted-leaf steelwood		C		1
plants	higher dicots	Sapindaceae	<i>Harpullia hillii</i>			C		1
plants	higher dicots	Sapindaceae	<i>Jagera pseudorhus</i>			C		1
plants	higher dicots	Sapindaceae	<i>Alectryon connatus</i>	grey birds-eye		C		1
plants	higher dicots	Sapindaceae	<i>Mischocarpus anodontus</i>	veiny pearfruit		C		1
plants	higher dicots	Sapindaceae	<i>Alectryon tomentosus</i>			C		2/1
plants	higher dicots	Sapindaceae	<i>Alectryon subcinereus</i>			C		1
plants	higher dicots	Sapindaceae	<i>Dodonaea triangularis</i>			C		2/2
plants	higher dicots	Sapindaceae	<i>Elaeagnus argentea</i>	green tamarind		C		2/1
plants	higher dicots	Sapindaceae	<i>Cupaniopsis parvifolia</i>	small-leaved tuckeroo		C		1
plants	higher dicots	Sapindaceae	<i>Arytera divaricata</i>	coogera		C		1
plants	higher dicots	Sapotaceae	<i>Planchonella pohlmanna</i>			C		1
plants	higher dicots	Sapotaceae	<i>Planchonella cotinifolia var. pubescens</i>			C		1
plants	higher dicots	Scrophulariaceae	<i>Eremophila debilis</i>	winter apple		C		1/1
plants	higher dicots	Scrophulariaceae	<i>Myoporum acuminatum</i>	coastal boobialla		C		1/1
plants	higher dicots	Simaroubaceae	<i>Ailanthus triphylla</i>	white siris		C		1
plants	higher dicots	Sparrmanniaceae	<i>Corchorus olitorius</i>	jute		C		1/1
plants	higher dicots	Stackhousiaceae	<i>Stackhousia muricata</i>			C		1/1
plants	higher dicots	Stylidiaceae	<i>Stylidium graminifolium</i>	grassy-leaved trigger-flower		C		1/1
plants	higher dicots	Stylidiaceae	<i>Stylidium debile</i>	frail trigger plant		C		1/1
plants	higher dicots	Thymelaeaceae	<i>Wikstroemia indica</i>	tie bush		C		1
plants	higher dicots	Thymelaeaceae	<i>Pimelea glauca</i>	smooth riceflower		C		3/3
plants	higher dicots	Thymelaeaceae	<i>Pimelea linifolia</i>			C		1
plants	higher dicots	Tropaeolaceae	<i>Tropaeolum majus</i>	garden nasturtium	Y			1/1
plants	higher dicots	Ulmaceae	<i>Aphananthe philippinensis</i>			C		1
plants	higher dicots	Ulmaceae	<i>Trema tomentosa var. aspera</i>			C		1
plants	higher dicots	Ulmaceae	<i>Celtis sinensis</i>	Chinese elm	Y			3/2
plants	higher dicots	Urticaceae	<i>Dendrocnide photinophylla</i>	shiny-leaved stinging tree		C		1
plants	higher dicots	Urticaceae	<i>Urtica incisa</i>	stinging nettle		C		1
plants	higher dicots	Violaceae	<i>Afrohybanthus stellarioides</i>			C		2/1
plants	higher dicots	Vitaceae	<i>Cayratia clematidea</i>	slender grape		C		1

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plants	higher dicots	Vitaceae	<i>Clematicissus opaca</i>			C		1
plants	lower dicots	Annonaceae	<i>Polyalthia nitidissima</i>	polyalthia		C		1
plants	lower dicots	Apocynaceae	<i>Cascabela thevetia</i>	yellow oleander	Y			2/2
plants	lower dicots	Apocynaceae	<i>Marsdenia coronata</i>	slender milkvine		V		13/13
plants	lower dicots	Apocynaceae	<i>Secamone elliptica</i>			C		1
plants	lower dicots	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		2/1
plants	lower dicots	Apocynaceae	<i>Parsonsia straminea</i>	monkey rope		C		1
plants	lower dicots	Apocynaceae	<i>Alyxia ruscifolia</i>			C		1
plants	lower dicots	Apocynaceae	<i>Gomphocarpus physocarpus</i>	balloon cottonbush	Y			1/1
plants	lower dicots	Apocynaceae	<i>Araujia sericifera</i>	white moth vine	Y			1/1
plants	lower dicots	Apocynaceae	<i>Parsonsia brisbanensis</i>	broad-leaved monkey vine		C		9/9
plants	lower dicots	Apocynaceae	<i>Marsdenia</i>			C		1
plants	lower dicots	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		1
plants	lower dicots	Apocynaceae	<i>Nerium oleander</i>	oleander	Y			2/2
plants	lower dicots	Aristolochiaceae	<i>Aristolochia meridionalis subsp. meridionalis</i>			C		3/3
plants	lower dicots	Boraginaceae	<i>Cordia myxa</i>		Y			1/1
plants	lower dicots	Boraginaceae	<i>Echium plantagineum</i>	Paterson's curse	Y			1/1
plants	lower dicots	Convolvulaceae	<i>Ipomoea cairica</i>		Y			1/1
plants	lower dicots	Convolvulaceae	<i>Dichondra repens</i>	kidney weed		C		1
plants	lower dicots	Convolvulaceae	<i>Cuscuta campestris</i>	dodder	Y			1
plants	lower dicots	Convolvulaceae	<i>Polymeria calycina</i>	pink bindweed		C		1
plants	lower dicots	Hernandiaceae	<i>Hernandia bivalvis</i>	cudgerie		NT		1
plants	lower dicots	Lamiaceae	<i>Plectranthus amboinicus</i>	allspice	Y			1/1
plants	lower dicots	Lamiaceae	<i>Clerodendrum floribundum</i>			C		1
plants	lower dicots	Lamiaceae	<i>Plectranthus habrophyllus</i>			E	E	1/1
plants	lower dicots	Lamiaceae	<i>Westringia eremicola</i>	slender westringia		C		1/1
plants	lower dicots	Lamiaceae	<i>Leonotis nepetifolia</i>		Y			2/2
plants	lower dicots	Lamiaceae	<i>Mentha satureioides</i>	native pennyroyal		C		2/2
plants	lower dicots	Lamiaceae	<i>Lamium amplexicaule</i>	deadnettle	Y			1/1
plants	lower dicots	Lamiaceae	<i>Salvia coccinea</i>	red salvia	Y			1
plants	lower dicots	Lamiaceae	<i>Stachys arvensis</i>	stagger weed	Y			1/1
plants	lower dicots	Lamiaceae	<i>Plectranthus verticillatus</i>		Y			1/1
plants	lower dicots	Lauraceae	<i>Cryptocarya triplinervis var. triplinervis</i>			C		1/1
plants	lower dicots	Lauraceae	<i>Cryptocarya triplinervis</i>			C		1
plants	lower dicots	Lauraceae	<i>Cryptocarya sclerophylla</i>	totempole		C		1
plants	lower dicots	Lauraceae	<i>Cassytha filiformis</i>	dodder laurel		C		1/1
plants	lower dicots	Lauraceae	<i>Endiandra sieberi</i>	hard corkwood		C		1
plants	lower dicots	Menispermaceae	<i>Stephania japonica var. discolor</i>			C		1
plants	lower dicots	Menispermaceae	<i>Tinospora smilacina</i>	snakevine		C		1
plants	lower dicots	Menispermaceae	<i>Legnephora moorei</i>			C		1
plants	lower dicots	Menispermaceae	<i>Pleogyne australis</i>	wiry grape		C		1
plants	lower dicots	Papaveraceae	<i>Argemone ochroleuca subsp. ochroleuca</i>	Mexican poppy	Y			2/2
plants	lower dicots	Papaveraceae	<i>Fumaria officinalis subsp. officinalis</i>		Y			1/1
plants	lower dicots	Ranunculaceae	<i>Ranunculus sessiliflorus var. sessiliflorus</i>			C		1/1
plants	lower dicots	Ranunculaceae	<i>Ranunculus lappaceus</i>	common buttercup		C		1/1
plants	lower dicots	Ranunculaceae	<i>Ranunculus sceleratus subsp. sceleratus</i>		Y			3/3

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plants	lower dicots	Solanaceae	<i>Solanum chrysotrichum</i>		Y			2/2
plants	lower dicots	Solanaceae	<i>Cestrum parqui</i>	green cestrum	Y			4/3
plants	lower dicots	Solanaceae	<i>Nicotiana glauca</i>	tree tobacco	Y			1/1
plants	lower dicots	Solanaceae	<i>Solanum nodiflorum</i>		Y			2/2
plants	lower dicots	Solanaceae	<i>Solanum pseudolulo</i>		Y			1/1
plants	lower dicots	Solanaceae	<i>Solanum mauritianum</i>	wild tobacco	Y			1/1
plants	lower dicots	Solanaceae	<i>Solanum stelligerum</i>	devil's needles		C		1
plants	lower dicots	Solanaceae	<i>Solanum elaeagnifolium</i>	silverleaf nightshade	Y			1/1
plants	lower dicots	Solanaceae	<i>Solanum seaforthianum</i>	Brazilian nightshade	Y			2/1
plants	lower dicots	Solanaceae	<i>Salpichroa organifolia</i>	pampas lily of the valley	Y			1/1
plants	lower dicots	Solanaceae	<i>Datura ferox</i>	fierce thornapple	Y			1/1
plants	lower dicots	Verbenaceae	<i>Lantana camara</i>	lantana	Y			1
plants	lower dicots	Verbenaceae	<i>Lantana montevidensis</i>	creeping lantana	Y			3/2
plants	lower dicots	Verbenaceae	<i>Verbena bonariensis</i>	purpletop	Y			1
plants	monocots	Amaryllidaceae	<i>Crinum pedunculatum</i>	river lily		C		2/1
plants	monocots	Amaryllidaceae	<i>Zephyranthes carinata</i>		Y			1/1
plants	monocots	Araceae	<i>Pistia stratiotes</i>	water lettuce	Y			1/1
plants	monocots	Araceae	<i>Colocasia esculenta</i>	taro	Y			3/3
plants	monocots	Arecaceae	<i>Syagrus romanzoffiana</i>	Queen palm	Y			1
plants	monocots	Asparagaceae	<i>Asparagus virgatus</i>		Y			1/1
plants	monocots	Asparagaceae	<i>Asparagus africanus</i>	ornamental asparagus	Y			3/2
plants	monocots	Asparagaceae	<i>Asparagus plumosus</i>	feathered asparagus fern	Y			1
plants	monocots	Asphodelaceae	<i>Aloe maculata</i>		Y			2/2
plants	monocots	Asphodelaceae	<i>xGastrolea</i>			C		1/1
plants	monocots	Colchicaceae	<i>Iphigenia indica</i>			C		1/1
plants	monocots	Commelinaceae	<i>Commelina benghalensis</i>		Y			1/1
plants	monocots	Commelinaceae	<i>Aneilema acuminatum</i>			C		1
plants	monocots	Commelinaceae	<i>Commelina diffusa</i>	wandering jew		C		2/1
plants	monocots	Commelinaceae	<i>Callisia repens</i>		Y			1/1
plants	monocots	Commelinaceae	<i>Callisia fragrans</i>		Y			2/1
plants	monocots	Cyperaceae	<i>Fimbristylis microcarya</i>			C		1/1
plants	monocots	Cyperaceae	<i>Fimbristylis dichotoma</i>	common fringe-rush		C		1/1
plants	monocots	Cyperaceae	<i>Lepidosperma laterale</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus victoriensis</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus involucratus</i>		Y			1/1
plants	monocots	Cyperaceae	<i>Cyperus brevifolius</i>	Mullumbimby couch	Y			1/1
plants	monocots	Cyperaceae	<i>Abildgaardia ovata</i>			C		1/1
plants	monocots	Cyperaceae	<i>Gahnia aspera</i>			C		2/1
plants	monocots	Cyperaceae	<i>Cyperus fulvus</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus papyrus</i>	papyrus	Y			1/1
plants	monocots	Cyperaceae	<i>Caustis blakei</i>			C		1
plants	monocots	Dioscoreaceae	<i>Dioscorea transversa</i>	native yam		C		1
plants	monocots	Dracaenaceae	<i>Sansevieria trifasciata</i>	mother-in-law's tongue	Y			1
plants	monocots	Dracaenaceae	<i>Sansevieria trifasciata</i> cv. <i>Laurentii</i>		Y			1/1
plants	monocots	Hemerocallidaceae	<i>Dianella caerulea</i>			C		1
plants	monocots	Hemerocallidaceae	<i>Dianella longifolia</i>			C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Hemerocallidaceae	<i>Geitonoplesium cymosum</i>	scrambling lily		C		1
plants	monocots	Hemerocallidaceae	<i>Dianella brevipedunculata</i>			C		1/1
plants	monocots	Hemerocallidaceae	<i>Dianella longifolia</i> var. <i>stenophylla</i>			C		3/3
plants	monocots	Hypoxidaceae	<i>Hypoxis pratensis</i> var. <i>tuberculata</i>			C		2/2
plants	monocots	Iridaceae	<i>Patersonia sericea</i>			C		1
plants	monocots	Laxmanniaceae	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>			C		1/1
plants	monocots	Laxmanniaceae	<i>Lomandra filiformis</i> subsp. <i>coriacea</i>			C		1/1
plants	monocots	Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry		C		1
plants	monocots	Laxmanniaceae	<i>Lomandra multiflora</i>			C		1
plants	monocots	Laxmanniaceae	<i>Lomandra longifolia</i>			C		1
plants	monocots	Laxmanniaceae	<i>Laxmannia gracilis</i>	slender wire lily		C		2/2
plants	monocots	Laxmanniaceae	<i>Lomandra confertifolia</i> subsp. <i>pallida</i>			C		2/2
plants	monocots	Orchidaceae	<i>Chiloglottis</i>			C		1
plants	monocots	Orchidaceae	<i>Pterostylis nutans</i>			C		1
plants	monocots	Orchidaceae	<i>Microtis parviflora</i>	slender onion orchid		C		1
plants	monocots	Orchidaceae	<i>Chiloglottis diphylla</i>			C		2/2
plants	monocots	Orchidaceae	<i>Pterostylis ophioglossa</i>			C		1
plants	monocots	Orchidaceae	<i>Epidendrum x obrienianum</i>		Y			1/1
plants	monocots	Orchidaceae	<i>Acianthus</i>			C		1
plants	monocots	Poaceae	<i>Digitaria parviflora</i>			C		1
plants	monocots	Poaceae	<i>Dichanthium annulatum</i>	sheda grass	Y			1/1
plants	monocots	Poaceae	<i>Dichanthium aristatum</i>	angleton grass	Y			2/2
plants	monocots	Poaceae	<i>Dichelachne micrantha</i>	shorthair plumegrass		C		1
plants	monocots	Poaceae	<i>Eremochloa bimaculata</i>	poverty grass		C		2/2
plants	monocots	Poaceae	<i>Chrysopogon sylvaticus</i>			C		1/1
plants	monocots	Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>			C		1/1
plants	monocots	Poaceae	<i>Anthosachne kingiana</i> subsp. <i>multiflora</i>			C		1/1
plants	monocots	Poaceae	<i>Enteropogon unispiceus</i>			C		1
plants	monocots	Poaceae	<i>Aristida leichhardtiana</i>			C		1/1
plants	monocots	Poaceae	<i>Eragrostis leptostachya</i>			C		1/1
plants	monocots	Poaceae	<i>Lachnagrostis filiformis</i>			C		1/1
plants	monocots	Poaceae	<i>Hyparrhenia rufa</i> subsp. <i>rufa</i>		Y			1/1
plants	monocots	Poaceae	<i>Cynodon dactylon</i> var. <i>dactylon</i>		Y			1/1
plants	monocots	Poaceae	<i>Echinopogon nutans</i> var. <i>nutans</i>			C		2/2
plants	monocots	Poaceae	<i>Austrostipa rudis</i> subsp. <i>nervosa</i>			C		1/1
plants	monocots	Poaceae	<i>Dinebra decipiens</i> var. <i>decipiens</i>			C		1/1
plants	monocots	Poaceae	<i>Megathyrsus maximus</i> var. <i>maximus</i>		Y			1
plants	monocots	Poaceae	<i>Panicum decompositum</i> var. <i>tenuius</i>			C		1/1
plants	monocots	Poaceae	<i>Bothriochloa bladhii</i> subsp. <i>bladhii</i>			C		1/1
plants	monocots	Poaceae	<i>Megathyrsus maximus</i> var. <i>pubiglumis</i>		Y			2/1
plants	monocots	Poaceae	<i>Microlaena stipoides</i> var. <i>stipoides</i>			C		1/1
plants	monocots	Poaceae	<i>Cynodon nlemfuensis</i> var. <i>nlemfuensis</i>		Y			1/1
plants	monocots	Poaceae	<i>Chloris gayana</i>	rhodes grass	Y			1/1
plants	monocots	Poaceae	<i>Melinis repens</i>	red natal grass	Y			2/1
plants	monocots	Poaceae	<i>Panicum simile</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida vagans</i>			C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	<i>Panicum effusum</i>			C		1/1
plants	monocots	Poaceae	<i>Urochloa mutica</i>		Y			1/1
plants	monocots	Poaceae	<i>Cynodon dactylon</i>		Y			1
plants	monocots	Poaceae	<i>Dichelachne rara</i>			C		1
plants	monocots	Poaceae	<i>Panicum pygmaeum</i>	dwarf panic		C		1
plants	monocots	Poaceae	<i>Sarga leiocladum</i>			C		1/1
plants	monocots	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		1/1
plants	monocots	Poaceae	<i>Urochloa foliosa</i>			C		1/1
plants	monocots	Poaceae	<i>Cenchrus setaceus</i>		Y			1/1
plants	monocots	Poaceae	<i>Entolasia stricta</i>	wiry panic		C		1
plants	monocots	Poaceae	<i>Urochloa whiteana</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida personata</i>			C		1/1
plants	monocots	Poaceae	<i>Cenchrus purpureus</i>		Y			1
plants	monocots	Poaceae	<i>Eragrostis curvula</i>		Y			1/1
plants	monocots	Poaceae	<i>Oplismenus aemulus</i>	creeping shade grass		C		1
plants	monocots	Poaceae	<i>Urochloa decumbens</i>		Y			1/1
plants	monocots	Poaceae	<i>Digitaria ramularis</i>			C		1/1
plants	monocots	Poaceae	<i>Entolasia marginata</i>	bordered panic		C		1/1
plants	monocots	Poaceae	<i>Imperata cylindrica</i>	blady grass		C		2/1
plants	monocots	Poaceae	<i>Melinis minutiflora</i>	molasses grass	Y			1
plants	monocots	Poaceae	<i>Paspalidium distans</i>	shotgrass		C		1/1
plants	monocots	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		1
plants	monocots	Ripogonaceae	<i>Ripogonum album</i>	white supplejack		C		1
plants	monocots	Smilacaceae	<i>Smilax australis</i>	barbed-wire vine		C		1
plants	monocots	Xanthorrhoeaceae	<i>Xanthorrhoea latifolia subsp. latifolia</i>			C		1
plants	monocots	Xyridaceae	<i>Xyris complanata</i>	yellow-eye		C		1/1
plants	mosses	Bryophyte	<i>Bryophyte</i>			C		1/1
plants	mosses	Ptychomitriaceae	<i>Ptychomitrium australe</i>			C		1/1
plants		Rhodophyta	<i>Audouinella</i>			C		1/1
plants		Rhodophyta	<i>Caloglossa lepieurii var. angustata</i>			C		1/1
plants		Rhodophyta	<i>Caloglossa ogasawaraensis</i>			C		1/1
plants		Rhodophyta	<i>Compsopogon coeruleus</i>			C		1/1
protists	blue-green algae	Cyanophyceae	<i>Scytonema crispum</i>			C		1/1
protists	blue-green algae	Cyanophyceae	<i>Porphyrosiphon notarisii</i>			C		3/3
protists	blue-green algae	Cyanophyceae	<i>Aphanothece elabens</i>			C		1/1
protists	green algae	Chlorophyceae	<i>Cephaleuros parasiticus</i>			C		1/1
protists	green algae	Chlorophyceae	<i>Trentepohlia rigidula</i>			C		2/2
protists	green algae	Chlorophyceae	<i>Pithophora oedogonia var. oedogonia</i>			C		1/1
protists	uncertain	Algae	<i>Algae</i>			C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ().

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

APPENDIX V

VEGETATION MANAGEMENT REPORT AND PRE-CLEARING MAPPING



Vegetation management report

For Lot: 73 Plan: SP128662

Current as at 04/09/2018

This publication has been compiled by Operations Support, Department of Natural Resources, Mines and Energy.

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Recent changes

New vegetation clearing laws

New vegetation management laws were passed by the Queensland Parliament on 3 May 2018 and may affect the clearing you can undertake on your property.

For more information, read about the new vegetation management laws

(<https://www.dnrme.qld.gov.au/land-water/initiatives/vegetation-management-laws/>) or call 135VEG (13 58 34) between 8.30am and 4.30pm Monday to Friday.

Updated mapping

The Regulated Vegetation Management Map and Supporting Map was updated in March 2018 to reflect the most up to date information available in relation to regional ecosystems, essential habitat and wetland mapping (Version 10).

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

- *Vegetation management framework* - an explanation of the application of the framework.
- *Property details* - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s), catchment(s), coastal or non coastal status, and any applicable area management plans associated with your property.
- *Vegetation management details for the specified Lot on Plan* - specific information about your property including vegetation categories, regional ecosystems, watercourses, wetlands, essential habitat, and protected plants.
- *Contact information*.
- *Maps* - a series of colour maps to assist in identifying regulated vegetation on your property.
- *Other legislation contact information*.

This information will assist you to determine your options for managing vegetation, which may include:

- exempt clearing work
- accepted development vegetation clearing code
- an area management plan
- a development approval.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as Queensland's Protected Plants framework or the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 6 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Vegetation management framework

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

1.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify DNRME or obtain an approval. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 5.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval. For all other land tenures, contact DNRME before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

<https://www.qld.gov.au/environment/land/vegetation/exemptions/>.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Contact DNRME prior to clearing in any of these areas.

1.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

<https://www.qld.gov.au/environment/land/vegetation/codes/>

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify DNRME before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at

<https://apps.dnrm.qld.gov.au/vegetation/>

1.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

As a result of the new laws, AMPs for fodder harvesting, managing thickened vegetation and managing encroachment will continue for 2 years. New notifications cannot be made for these AMPs.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an area management plan applies to your property for which you can make a new notification, it will be listed in Section 2.2 of this report. Before clearing under one of these AMPs, you must first notify the DNRME and then follow the conditions and requirements listed in the AMP.

<https://www.qld.gov.au/environment/land/vegetation/area-plans/>

1.4 Development approvals

If your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

<https://www.qld.gov.au/environment/land/vegetation/applying/>

2. Property details

2.1 Tenure

All of the lot, plan and tenure information associated with property Lot: 73 Plan: SP128662, including links to relevant Smart Maps, are listed in Table 1. The tenure of the property (whether it is freehold, leasehold, or other) may be viewed by clicking on the Smart Map link(s) provided.

Table 1: Lot, plan and tenure information for the property

Lot	Plan	Tenure	Link to property on SmartMap
273	SP128662	State Land	https://apps.information.qld.gov.au/data/cadastre/GenerateSmartMap?q=273\SP128662
73	SP128662	Freehold	https://apps.information.qld.gov.au/data/cadastre/GenerateSmartMap?q=73\SP128662

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

2.2 Property location

Table 2 provides a summary of the locations for property Lot: 73 Plan: SP128662, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Ipswich City

Bioregion(s)	Subregion(s)
Southeast Queensland	Moreton Basin

Catchment(s)
Brisbane

For the purposes of the accepted development vegetation clearing codes and the State Development Assessment Provisions (SDAP), this property is regarded as*
Coastal

*See also Map 5.4

Area Management Plan(s): Nil

3. Vegetation management details for Lot: 73 Plan: SP128662

3.1 Vegetation categories

Vegetation categories are shown on the regulated vegetation management map in section 5.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 25.01ha

Vegetation category	Area (ha)
Category B	4.8
Category C	14.42
Category X	5.79

Table 4

Category	Colour on Map	Description	Requirements / options
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact DNRME to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing is considered accepted development on freehold land, indigenous land and leasehold land for agriculture and grazing purposes. Contact DNRME to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

This report does not confirm if a Property Map of Assessable Vegetation (PMAV) exists on a lot. To confirm whether or not a PMAV exists on a lot, please check the PMAV layer on the Queensland Globe2, or contact DNRME on 135VEG (135 834).

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 5.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at

<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/>

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
12.3.3	Endangered	B	0.52	Eucalyptus tereticornis woodland on Quaternary alluvium	Sparse
12.3.3	Endangered	C	3.72	Eucalyptus tereticornis woodland on Quaternary alluvium	Sparse
12.3.7	Least concern	B	0.03	Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp. fringing woodland	Sparse
12.3.7	Least concern	C	0.09	Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp. fringing woodland	Sparse
12.9-10.19	Least concern	C	1.59	Eucalyptus fibrosa subsp. fibrosa woodland on sedimentary rocks	Sparse
12.9-10.2	Least concern	B	4.13	Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks	Mid-dense
12.9-10.2	Least concern	C	6.89	Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks	Mid-dense
12.9-10.3	Of concern	B	0.03	Eucalyptus moluccana open forest on sedimentary rocks	Mid-dense
12.9-10.7	Of concern	B	0.09	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks	Sparse
12.9-10.7	Of concern	C	2.12	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks	Sparse
non-rem	None	X	5.79	None	None

Please note:

1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work
- accepted development vegetation clearing codes
- performance outcomes in State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 5.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA), and includes endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 5.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map as assessable vegetation -

- 1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
- 2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
860	Phascolarctos cinereus	koala	V	SEQ: Open eucalypt forest and woodland that has: a) multiple strata layers containing Eucalyptus, Corymbia, Angophora, Lophostemon or Melaleuca trees that-at 1.3 metres above the ground-have a diameter both greater and less than 30 centimetres; and b) at least 1 of the following species: Eucalyptus tereticornis, E. fibrosa, E. propinqua; E. umbra, E. grandis, E. microcorys, E. tindaliae, E. resinifera, E. populnea, E. robusta, E. nigra, E. racemosa, E. crebra, E. exserta, E. seeana, Lophostemon confertus, L. suaveolens, Melaleuca quinquenervia. Outside SEQ: Open eucalypt forest and woodland that contains Eucalyptus &/or Corymbia spp. Tree species used for food varies across State and can include Eucalyptus tereticornis, E. camaldulensis, E. coolabah; E. drepanophylla, E. platyphylla, E. orgadophylla, E. thozetiana, E. melanophloia, E. populnea, E. melliodora, E. dealbata, E. microtheca, E. crebra, E. exserta, E. blakelyi, E. papuana, Corymbia tessellaris, C. citriodora, Melaleuca quinquenervia, M. leucadendra.	Sea level to 1000m.	None	Riparian areas, plains and hill/escarpment slopes.
848	Petauroides volans	greater glider	V	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	None
1107	Ninox strenua	powerful owl	V	Wet and dry tall open eucalypt forest (Eucalyptus pilularis, E. acmenoides, E. tereticornis, E. camaldulensis, E. crebra, E. melliodora, Corymbia citriodora & C. intermedia), including mountain forest gullies/gorges; forests aged 60+ years (large & old) on fertile soils with suitable hollows; roosting in dense foliage of closed forest (occasionally caves) and foraging in open forest and woodland including areas adjacent to urban/rural development. Nest in large hollows (45-75cm diameter, 50-180cm deep) 6-45m above ground, in large (>100cm dbh) old eucalypts on the side or at the head of heavily wooded gully.	Sea level to 1000m.	None	Gully.
2180	Notelaea ipsviciensis	Cooneana olive	E	dry sclerophyll eucalypt forest.; open forest of Eucalyptus fibrosa, Corymbia citriodora and C. henryi	0 to 300 m	shallow sandy to loam soil derived from sandstone substrates or stony clay soils	hill sides, gullies in hilly terrain

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
11205	Marsdenia coronata	slender milkvine	V	open forest of Eucalyptus pilularis, E. microcorys, Corymbia intermedia, or Eucalyptus propinqua, E. carnea with Themeda understorey, or Lophostemon confertus, Corymbia intermedia, Eucalyptus carnea, Allocasuarina littoralis, Banksia integrifolia, or Eucalyptus carnea, E. propinqua, or Eucalyptus carnea, E. propinqua, E. acmenoides, or Allocasuarina littoralis, Lophostemon confertus, Corymbia citriodora, Eucalyptus carnea, E. tindalliae; woodland to open forest of Eucalyptus fibrosa, Corymbia citriodora, or Eucalyptus fibrosa, C. henryi, or Corymbia citriodora, Eucalyptus dura, C. henryi, or Eucalyptus dura, Eucalyptus acmenoides; rocky heathland with Acacia blakei; wet sclerophyll forest dominated by Eucalyptus andrewsii, E. biturbinata	0 to 800 m	red brown loam to clay or sandy soil occasionally skeletal	mostly on steep ridge or hill slope sometimes on rock ledges along cliffines rarely on alluvial terrace

Label	Regional Ecosystem (mandatory unless otherwise specified)
860	SEQ: 11.3.2, 11.3.4, 11.3.25, 11.3.26, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.9.9, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.14, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.6, 12.5.7, 12.5.10, 12.5.12, 12.8.1, 12.8.8, 12.8.9, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.24, 12.8.25, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.21, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.16, 12.11.17, 12.11.18, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.23, 12.12.24, 12.12.25, 12.12.28. Outside SEQ: 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.4.1, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.4.3, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.5, 10.3.6, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.17, 10.3.20, 10.3.27, 10.3.28, 10.4.3, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 10.5.12, 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.2, 10.9.3, 10.9.5, 10.10.1, 10.10.3, 10.10.4, 10.10.5, 10.10.7, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.5, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.21, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.11, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.13, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10.

Label	Regional Ecosystem (mandatory unless otherwise specified)
848	7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.38, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 9.3.1, 9.3.2, 9.3.3, 9.3.5, 9.3.6, 9.3.8, 9.3.10, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.24, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.13, 9.5.14, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.40, 9.12.44, 10.3.2, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.20, 11.7.1, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.10.1, 11.10.2, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.15, 11.11.16, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.11, 11.12.13, 11.12.14, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.2.11, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.12, 12.3.14, 12.3.15, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.5, 12.5.6, 12.5.7, 12.5.8, 12.5.10, 12.5.11, 12.5.12, 12.7.1, 12.7.2, 12.8.1, 12.8.2, 12.8.8, 12.8.10, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.23, 12.8.24, 12.8.25, 12.8.26, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.13, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.20, 12.9-10.21, 12.9-10.23, 12.9-10.24, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.19, 12.11.20, 12.11.21, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.20, 12.12.21, 12.12.22, 12.12.23, 12.12.24, 12.12.25, 12.12.26, 12.12.27, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10
1107	8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.13, 8.2.14, 8.3.1, 8.3.3, 8.3.6, 8.3.8, 8.3.9, 8.3.10, 8.3.11, 8.5.1, 8.8.1, 8.10.1, 8.11.2, 8.11.3, 8.11.5, 8.12.1, 8.12.2, 8.12.3, 8.12.4, 8.12.5, 8.12.7, 8.12.8, 8.12.11, 8.12.12, 8.12.14, 8.12.16, 8.12.17, 8.12.18, 8.12.19, 8.12.26, 8.12.27, 8.12.28, 8.12.29, 8.12.30, 8.12.31, 8.12.32, 11.2.2, 11.2.3, 11.3.1, 11.3.11, 11.3.12, 11.3.25, 11.3.26, 11.3.40, 11.4.1, 11.4.3, 11.4.7, 11.4.9, 11.5.7, 11.5.16, 11.8.1, 11.8.13, 11.9.1, 11.9.4, 11.9.5, 11.9.6, 11.9.10, 11.9.13, 11.10.1, 11.10.2, 11.10.5, 11.10.8, 11.10.9, 11.10.13, 11.11.3, 11.11.5, 11.11.13, 11.11.14, 11.11.18, 11.12.4, 11.12.13, 11.12.19, 11.12.21, 12.2.1, 12.2.2, 12.2.3, 12.2.4, 12.2.5, 12.2.7, 12.2.8, 12.3.1, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.15, 12.3.16, 12.3.17, 12.3.18, 12.3.19, 12.3.20, 12.3.21, 12.5.1, 12.5.3, 12.5.6, 12.5.7, 12.5.13, 12.8.1, 12.8.2, 12.8.3, 12.8.4, 12.8.5, 12.8.6, 12.8.7, 12.8.8, 12.8.9, 12.8.10, 12.8.11, 12.8.12, 12.8.13, 12.8.14, 12.8.18, 12.8.21, 12.8.22, 12.8.23, 12.8.24, 12.8.25, 12.8.26, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.6, 12.9-10.14, 12.9-10.16, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.20, 12.9-10.21, 12.9-10.23, 12.9-10.24, 12.9-10.25, 12.9-10.26, 12.9-10.29, 12.11.1, 12.11.2, 12.11.3, 12.11.4, 12.11.5, 12.11.6, 12.11.9, 12.11.10, 12.11.11, 12.11.12, 12.11.13, 12.11.16, 12.11.17, 12.11.18, 12.11.19, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.1, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.11, 12.12.13, 12.12.15, 12.12.16, 12.12.17, 12.12.18, 12.12.20, 12.12.26, 12.12.28, 13.3.2, 13.3.3, 13.3.5, 13.9.2, 13.11.2, 13.11.5, 13.11.6, 13.11.7, 13.12.1, 13.12.4, 13.12.11
2180	12.9-10.19
11205	12.3.11, 12.8.19, 12.8.20, 12.9-10.17, 12.9-10.19, 12.11.3, 12.11.5, 12.11.6

3.6 Protected plants (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA), with clearing of protected plants in the wild regulated by the [Nature Conservation \(Wildlife Management\) Regulation 2006](#). These requirements apply irrespective of the classification of the vegetation under the *Vegetation Management Act 1999*.

Prior to clearing, if the plants proposed to be cleared are in the wild (see [Operational policy: When a protected plant in Queensland is considered to be 'in the wild'](#)) and the exemptions under the [Nature Conservation \(Wildlife Management\) Regulation 2006](#) are not applicable to the proposed clearing, you must check the flora survey trigger map to determine if any part of the area to be cleared is within a high risk area. The trigger map for this property is provided in section 5.5. The exemptions relate to:

- imminent risk of death or serious injury (refer s261A)
- imminent risk of serious damage to a building or other structure on land, or to personal property (refer s261B)
- *Fire and Emergency Service Act 1990* (refer 261C)
- previously cleared areas (refer s261ZB)
- maintenance activities (refer s261ZC)
- firebreak or fire management line (refer s261ZD)

- accepted development vegetation clearing code (refer s261ZE)
- conservation purposes (refer s261ZG)
- authorised in particular circumstances (refer s385).

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) from the *Vegetation Management Act 1999* (i.e. listed in the Planning Regulations 2017) while some are different.

If the proposed area to be cleared is shown as blue (i.e. high risk) on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken in accordance with the flora survey guidelines. The main objective of a flora survey is to locate any endangered, vulnerable or near threatened plants (EVNT plants) that may be present in the clearing impact area.

If a flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An [exempt clearing notification form](#) must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing. The clearing must be conducted within two years after the flora survey report was submitted.

If a flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the [application form clearing permit](#).

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

Further information on protected plants is available at

<http://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/>

For assistance on the protected plants flora survey trigger map for this property, please contact the Department of Environment and Science at palm@des.qld.gov.au.

3.7 Emissions Reduction Fund (ERF)

The ERF is an Australian Government scheme which offers incentives for businesses and communities across the economy to reduce emissions.

Under the ERF, landholders can earn money from activities such as planting (and keeping) trees, managing regrowth vegetation and adopting more sustainable agricultural practices.

The purpose of a project is to remove greenhouse gases from the atmosphere. Each project will provide new economic opportunities for farmers, forest growers and land managers.

Further information on ERF is available at <https://www.qld.gov.au/environment/land/state/use/carbon-rights/>.

4. Contact information for DNRME

For further information on vegetation management:

Phone 135VEG (135 834)

Email vegetation@dnrme.qld.gov.au

Visit www.dnrme.qld.gov.au/our-department/contact-us/vegetation-contacts to submit an online enquiry.

For contact details for other State and Commonwealth agencies, please see Section 6.

5. Maps

The maps included in this report may also be requested individually at:

<https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form>

and

<http://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/map-request.php>

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new [property maps of assessable vegetation \(PMAV\)](#).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

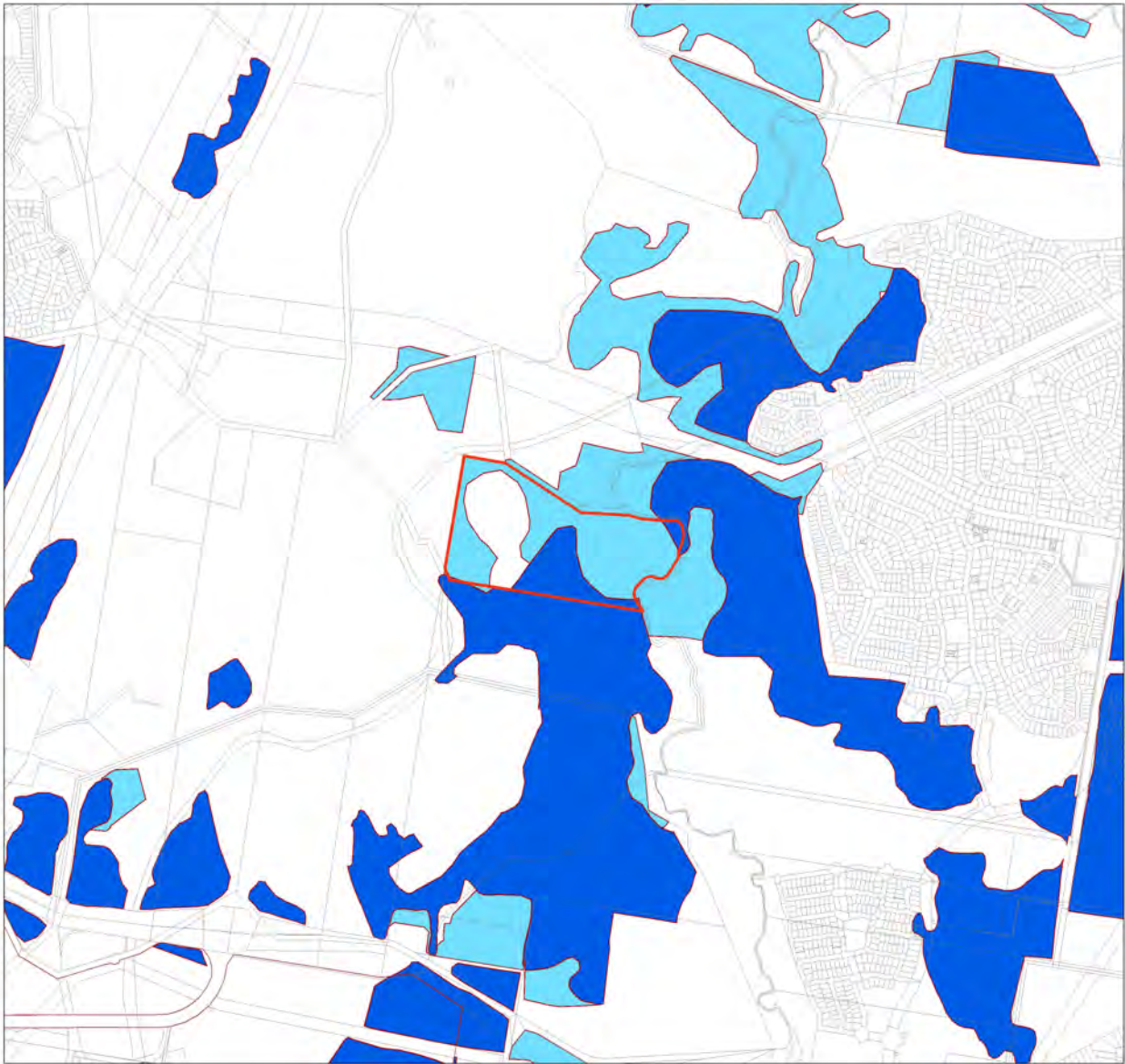
Coastal/non coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and the State Development Assessment Provisions (SDAP).

Protected plants map

The protected plants map shows areas where particular provisions of the *Nature Conservation Act 1992* apply to the clearing of protected plants.

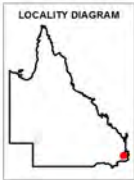
5.1 Regulated vegetation management map



Regulated Vegetation Management Map

Legend

- Lot and Plan
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Cadastral line
- Property boundaries shown are provided as a locational aid only



0 200 400 600 800 1,000 m

This product is projected into:
GDA 1994 MGA Zone 56

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Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources, Mines and Energy makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

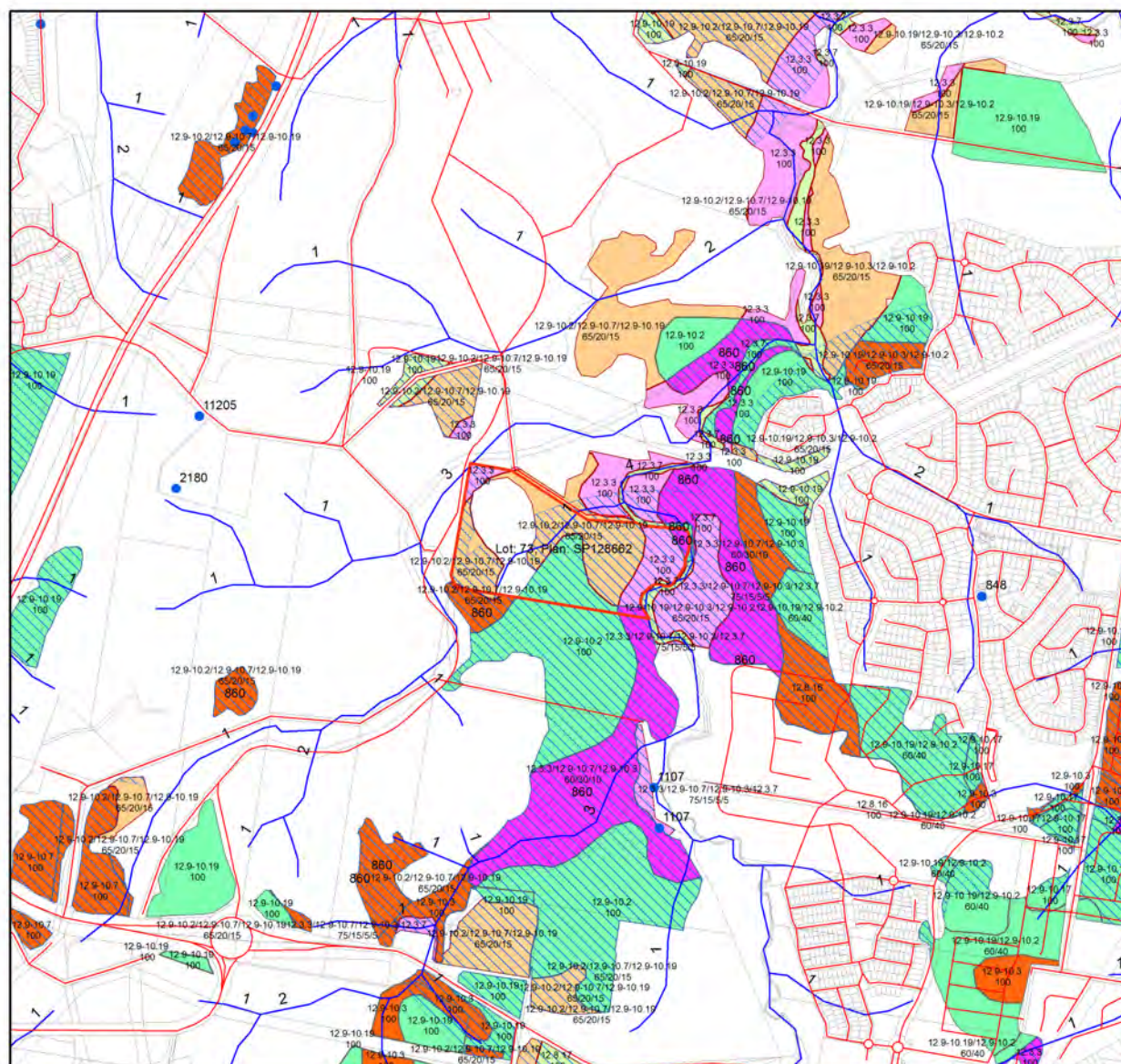
Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.dnrm.qld.gov.au or contact the Department of Natural Resources, Mines and Energy.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at <http://www.information.qld.gov.au/>

This map is updated on a monthly basis to ensure new PMAs are included as they are approved.



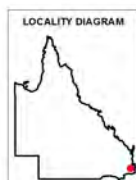
5.2 Vegetation management supporting map



Vegetation Management Supporting Map

Legend

- | | |
|---|---|
|  | Lot and Plan |
|  | Category A or B area containing endangered regional ecosystems |
|  | Category A or B area containing of concern regional ecosystems |
|  | Category A or B area that is a least concern regional ecosystem |
|  | Category A or B area under Section 20AH |
| | These areas are edged in yellow and filled with the remnant RE Status |
|  | Category C area containing endangered regional ecosystems |
|  | Category C area containing of concern regional ecosystems |
|  | Category C area that is a least concern regional ecosystem |
| | Category C area under Section 20AI |
| | These areas are edged in purple and filled with the remnant RE Status |
|  | Non Remnant |
|  | Water |
|  | Wetland on the vegetation management wetlands map |
|  | Essential habitat on the essential habitat map |
|  | Essential habitat species record |
| | Watercourses and drainage features on the vegetation management watercourse and drainage features map |
|  | (Stream order shown as black number against stream where available) |
|  | Roads |
|  | National Parks, State Forest and other reserves |
| | Cadastral line |
| | Property boundaries shown are provided as a locational aid only |



0 140 280 420 560 700 m

This product is projected into:
GDA 1994 MGA Zone 56

Labels for Essential Habitat are centred on the area of enquiry

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is ± 100 metres.

Disclaimer:

While every care is taken to ensure the accuracy of this product, the Department of Natural Resources, Mines and Energy makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.dnrme.qld.gov.au or contact the Department of Natural Resources, Mines and Energy.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at <http://www.information.qld.gov.au/>

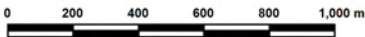
5.3 Coastal/non coastal map



Coastal/Non Coastal Map

Legend

- Lot and Plan
- Coastal
- Non Coastal
- Cadastral line
- Property boundaries shown are provided as a locational aid only



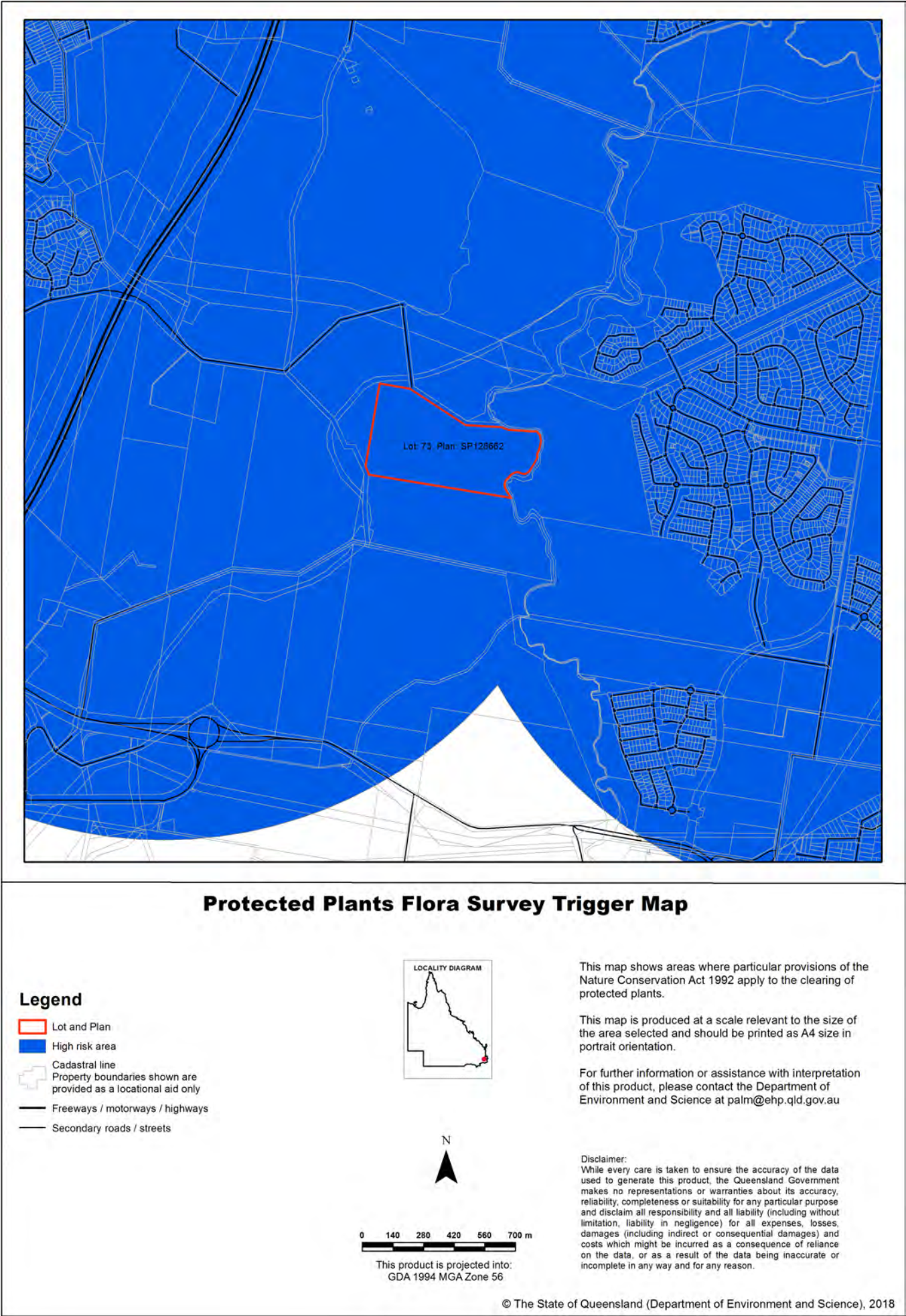
This product is projected into:
GDA 1994 MGA Zone 56

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Queensland
Government

5.4 Protected plants map administered by DES



6. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow Earthworks, significant disturbance	<i>Water Act 2000</i> <i>Soil Conservation Act 1986</i>	Department of Natural Resources, Mines and Energy (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
Indigenous Cultural Heritage	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Aboriginal and Torres Strait Islander Partnerships (Queensland Government)	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues Protected plants and protected areas ¹	<i>Environmental Protection Act 1994</i> <i>Coastal Protection and Management Act 1995</i> <i>Queensland Heritage Act 1992</i> <i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities ²	<i>Fisheries Act 1994</i> <i>Forestry Act 1959</i>	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
Development and planning processes	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Department of State Development, Manufacturing, Infrastructure and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
Local government requirements	<i>Local Government Act 2009</i>	Department of Local Government, Racing and Multicultural Affairs (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office

1. In Queensland, all plants that are native to Australia are protected plants under the [Nature Conservation Act 1992](http://www.des.qld.gov.au), which endeavours to ensure that protected plants (whether whole plants or protected plants parts) are not illegally removed from the wild, or illegally traded. Prior to clearing, you should check the flora survey trigger map to determine if the clearing is within a high-risk area by visiting www.des.qld.gov.au. For further information or assistance on the protected plants flora survey trigger map for your property, please contact the Department of Environment and Science on 13QGOV (13 74 68) or email palm@des.qld.gov.au.

2. Contact the Department of Agriculture and Fisheries before clearing:

- Any sandalwood on state-owned land (including leasehold land)
- On freehold land in a 'forest consent area'
- More than five hectares on state-owned land (including leasehold land) containing commercial timber species listed in parts 2 or 3 of Schedule 6 of the Vegetation Management Regulation 2012 and located within any of the following local government management areas-Banana, Bundaberg Regional, Fraser Coast Regional, Gladstone Regional, Isaac Regional, North Burnett Regional, Somerset Regional, South Burnett Regional, Southern Downs Regional, Tablelands Regional, Toowoomba Regional, Western Downs Regional.



Pre-clearing Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups
BVG5M Description (BVG1M codes)

-
- Lot and Plan**
1. Rainforests and scrubs (1-7b)
 2. Wet eucalypt open forests (8-8b)
 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
 4. Eucalypt open forests to woodlands on floodplains (16-16d)
 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
 7. Callitris woodland - open forests (20a)
 8. Melaleuca open woodlands on depositional plains (21-22c)
 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
 12. Other coastal communities or heaths (28-29b)
 13. Tussock grasslands, forblands (30-32b)
 14. Hummock grasslands (33-33b)
 15. Wetlands (swamps and lakes) (34-34g)
 16. Mangroves and saltmarshes (35-35b)
- Water
- Cadastral Boundaries
- LOCALITY C
- 0 0.2 0.4

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.

Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species.

and vegetational community – the dominant canopy species, e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework". Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

This product is projected into GDA 1994 MGA Zone 56



Remnant 2015 Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups
BVG5M Description (BVG1M codes)

-
- Legend:**
- 1. Rainforests and scrubs (1-7b)
 - 2. Wet eucalypt open forests (8-8b)
 - 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
 - 4. Eucalypt open forests to woodlands on floodplains (16-16d)
 - 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
 - 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
 - 7. Callitris woodland - open forests (20a)
 - 8. Melaleuca open woodlands on depositional plains (21-22c)
 - 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
 - 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
 - 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
 - 12. Other coastal communities or heaths (28-29b)
 - 13. Tussock grasslands, forblands (30-32b)
 - 14. Hummock grasslands (33-33b)
 - 15. Wetlands (swamps and lakes) (34-34g)
 - 16. Mangroves and saltmarshes (35-35b)
- Non-remnant vegetation, cultivated or built environment
- Water
- Cadastral Boundaries
- Scale:** 0 0.2 0.4
- Inset Map:** LOCALITY



A horizontal scale bar with tick marks at 0, 0.2, 0.4, 0.6, and 0.8 km. The bar is divided into four equal segments, each representing 0.2 km.

This product is projected into GDA 1994 MGA Zone 56

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.

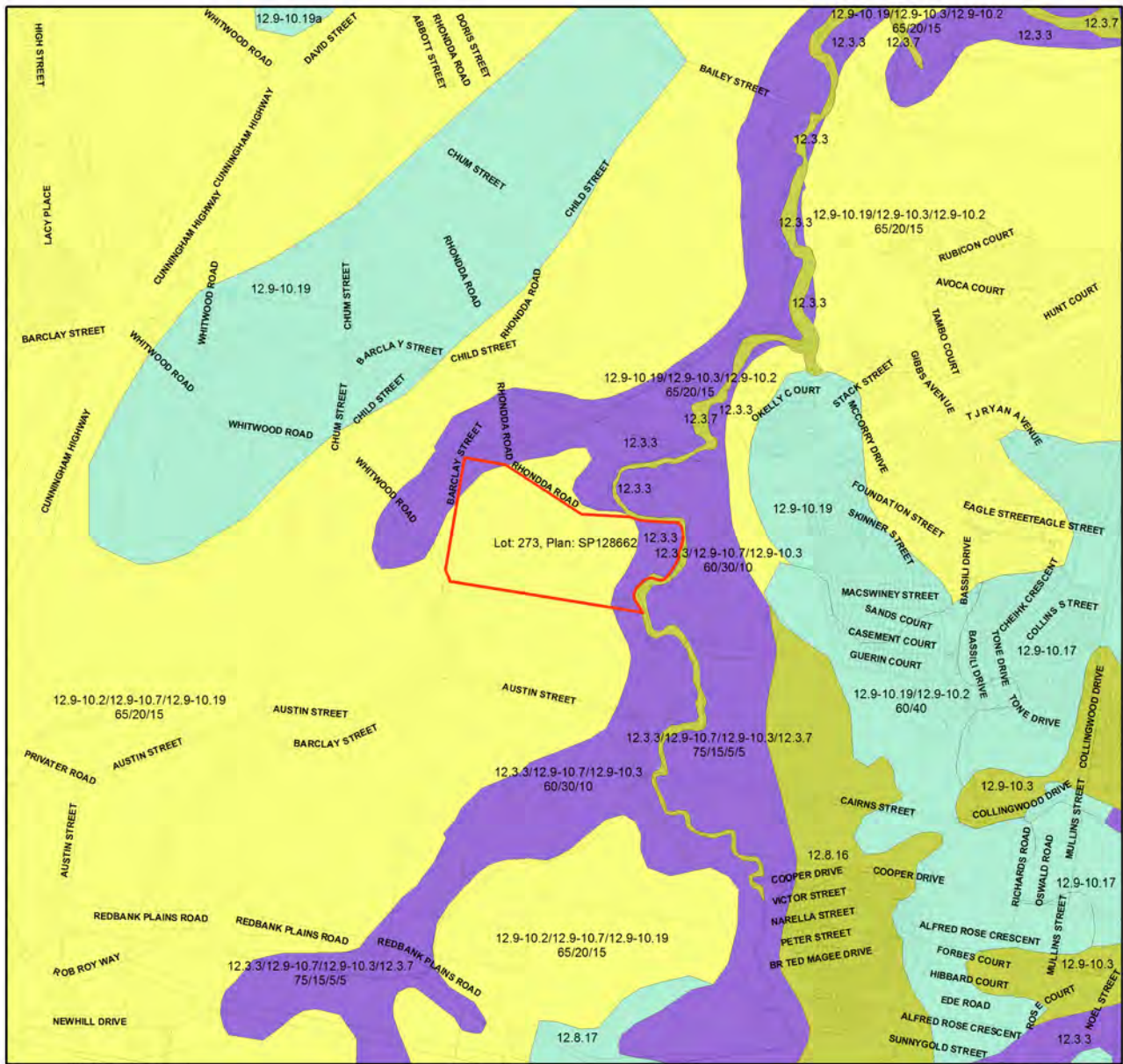
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".

Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

Remnant woody vegetation is defined as vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has $>70\%$ of the height and $>50\%$ of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy.

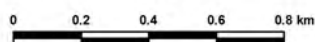
Non-remnant vegetation includes regrowth and disturbed native vegetation.



Pre-clearing Regional Ecosystems

Biodiversity Status

-  Lot and Plan
-  Endangered - Dominant vegetation
-  Endangered - Sub-dominant
-  Of Concern - Dominant
-  Of Concern - Sub-dominant
-  No concern at present
-  Water
-  Cadastral Boundaries

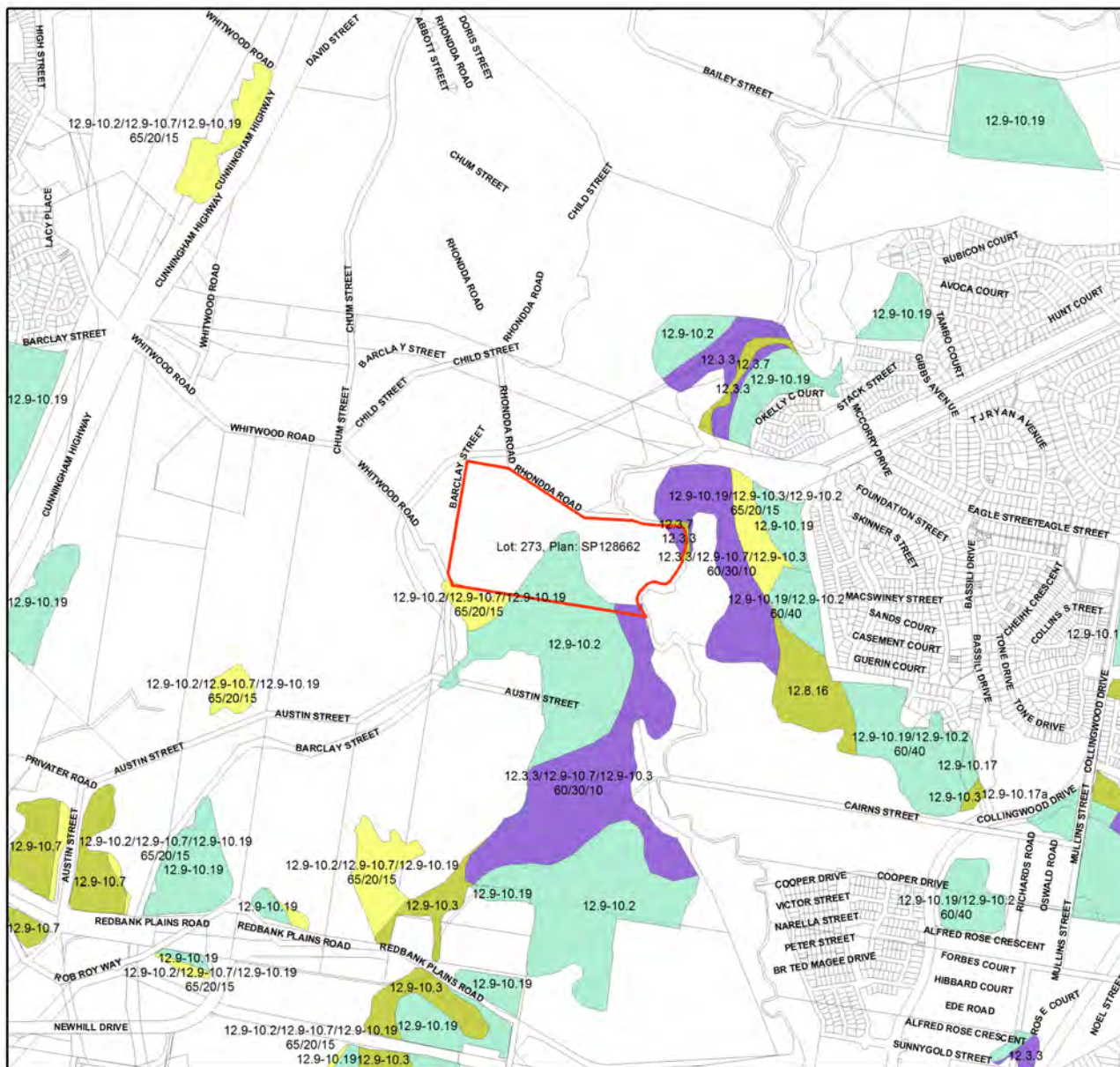


This product is projected into GDA 1994 MGA Zone 56

Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".

Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.



Remnant 2015 Regional Ecosystems

Biodiversity Status

- | | |
|---|---|
|  | Lot and Plan |
|  | Endangered - Dominant vegetation |
|  | Endangered - Sub-dominant |
|  | Of Concern - Dominant |
|  | Of Concern - Sub-dominant |
|  | No concern at present |
|  | Non-remnant vegetation, cultivated or built environment |
|  | Plantation |
|  | Water |
|  | Cadastral Boundaries |



0 0.2 0.4 0.6 0.8 km

This product is projected into GDA 1994 MGA Zone 56

Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

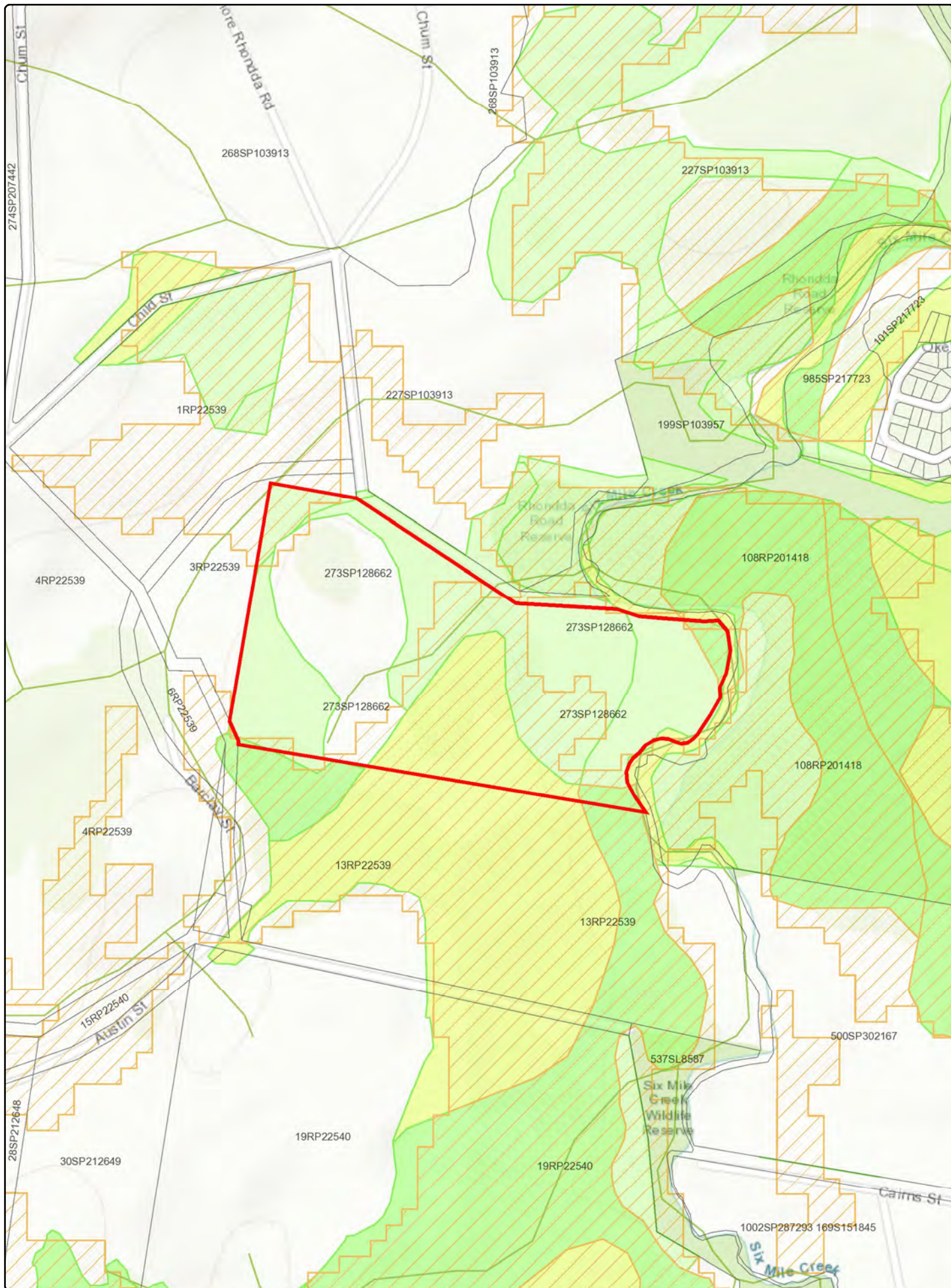
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species, e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".

Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

Remnant woody vegetation is defined as vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >70% of the height and >50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy. Non-remnant vegetation includes regrowth and disturbed native vegetation.

APPENDIX VI

STATE PLANNING POLICY AND DEVELOPMENT ASSESSMENT MAPPING



Date: 28/09/2018

State Planning Policy

Making or amending a local planning instrument
and designating land for community infrastructure

Department of State

0 140 280 420 560

Legend

Drawn Polygon Layer

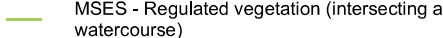
Override 1

Cadastre (10k)



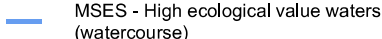
Cadastre (10k)

MSES - Regulated vegetation (intersecting a watercourse)



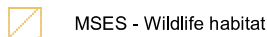
MSES - Regulated vegetation (intersecting a watercourse)

MSES - High ecological value waters (watercourse)



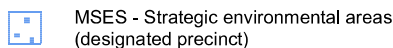
MSES - High ecological value waters (watercourse)

MSES - Wildlife habitat



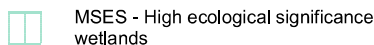
MSES - Wildlife habitat

MSES - Strategic environmental areas (designated precinct)



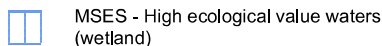
MSES - Strategic environmental areas (designated precinct)

MSES - High ecological significance wetlands



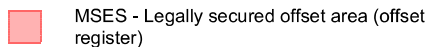
MSES - High ecological significance wetlands

MSES - High ecological value waters (wetland)



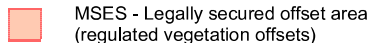
MSES - High ecological value waters (wetland)

MSES - Legally secured offset area (offset register)



MSES - Legally secured offset area (offset register)

MSES - Legally secured offset area (regulated vegetation offsets)



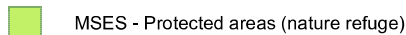
MSES - Legally secured offset area (regulated vegetation offsets)

MSES - Protected areas (estate)



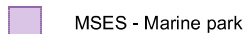
MSES - Protected areas (estate)

MSES - Protected areas (nature refuge)



MSES - Protected areas (nature refuge)

MSES - Marine park



MSES - Marine park

MSES - Declared fish habitat area



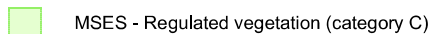
MSES - Declared fish habitat area

MSES - Regulated vegetation (category B)



MSES - Regulated vegetation (category B)

MSES - Regulated vegetation (category C)



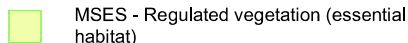
MSES - Regulated vegetation (category C)

MSES - Regulated vegetation (category R)



MSES - Regulated vegetation (category R)

MSES - Regulated vegetation (essential habitat)

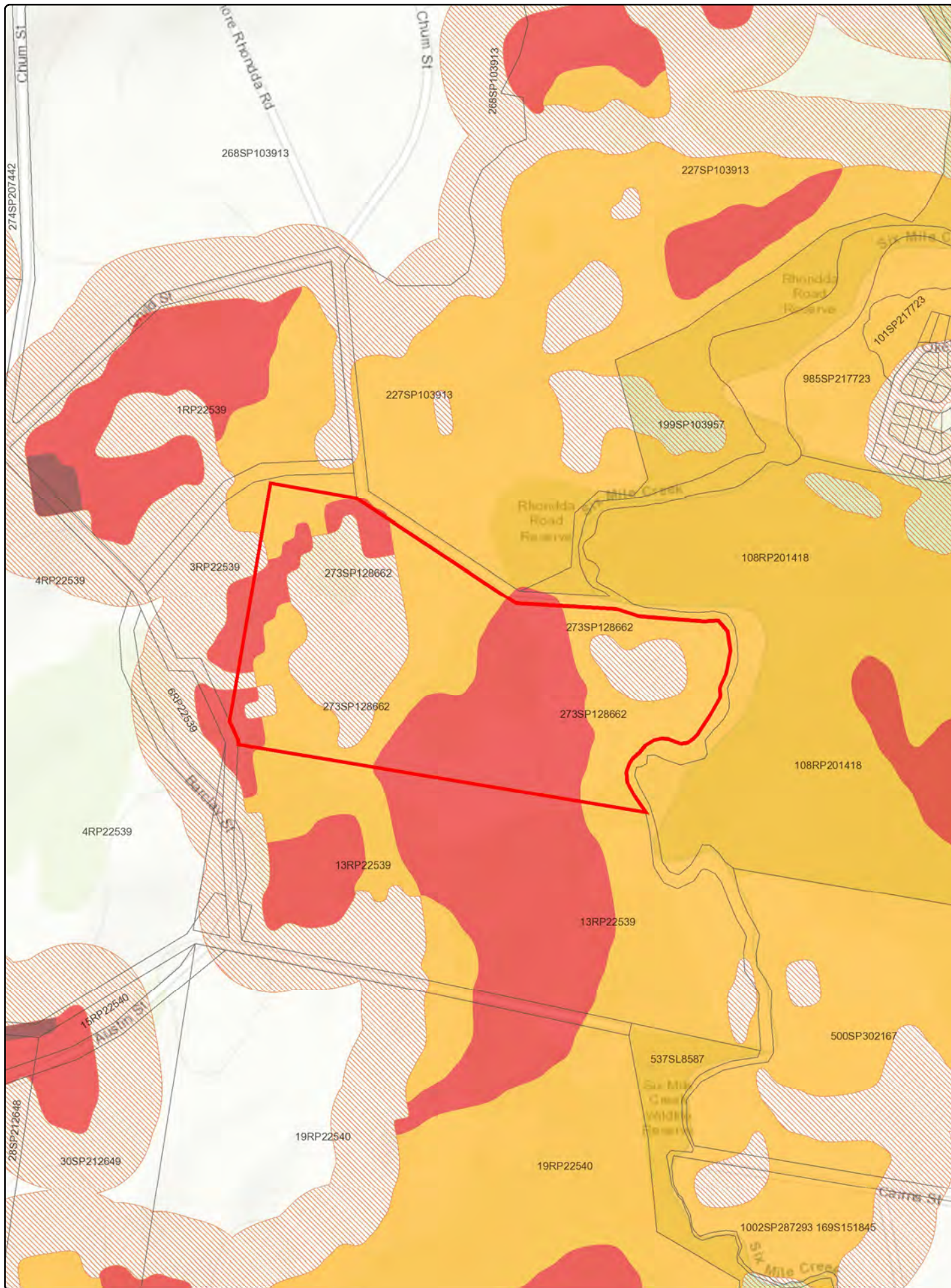


MSES - Regulated vegetation (essential habitat)

MSES - Regulated vegetation (wetland)



MSES - Regulated vegetation (wetland)



Date: 28/09/2018

State Planning Policy Making or amending a local planning instrument and designating land for community infrastructure

Department of State

0 140 280 420 560

Legend

Drawn Polygon Layer

Override 1

Cadastral (10k)

 Cadastral (10k)

High pressure gas pipeline

 High pressure gas pipeline

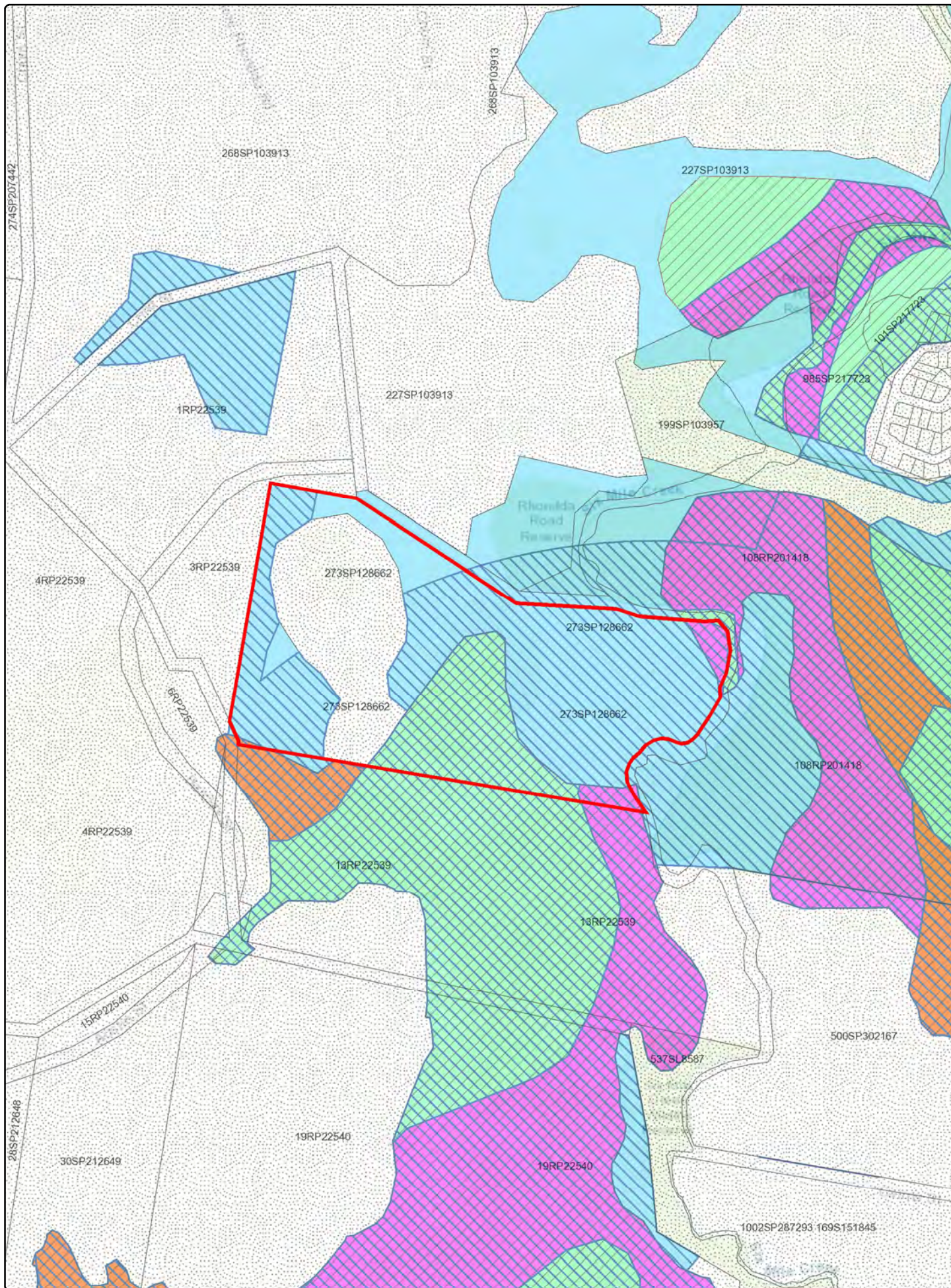
Bushfire prone area

 Very High Potential Bushfire Intensity

 High Potential Bushfire Intensity

 Medium Potential Bushfire Intensity

 Potential Impact Buffer



DA Mapping System – Print Screen

Date: 28/09/2018

0 140 280 420 560

Department of State

Metres

Legend

Drawn Polygon Layer

Override 1

Cadastral (10k)

 Cadastral (10k)

Regulated vegetation management map (Category A and B extract)

 Category A on the regulated vegetation management map

 Category B on the regulated vegetation management map

Essential habitat

 Essential habitat

Regulated vegetation management map (other vegetation categories)

 Category C on the regulated vegetation management map

 Category R on the regulated vegetation management map

 Category X on the regulated vegetation management map

Vegetation management regional ecosystem map

 Category A or B area containing endangered regional ecosystems

 Category A or B area containing of concern regional ecosystems

 Category A or B area that is a least concern regional ecosystem

Non remnant

 Water

Vegetation management coastal and non-coastal bioregions and sub-regions

 Coastal bioregions and sub-regions

 Non coastal bioregions and sub-regions

APPENDIX VII

RED IMPORTED FIRE ANT MAPPING

Fire ant biosecurity zone 1

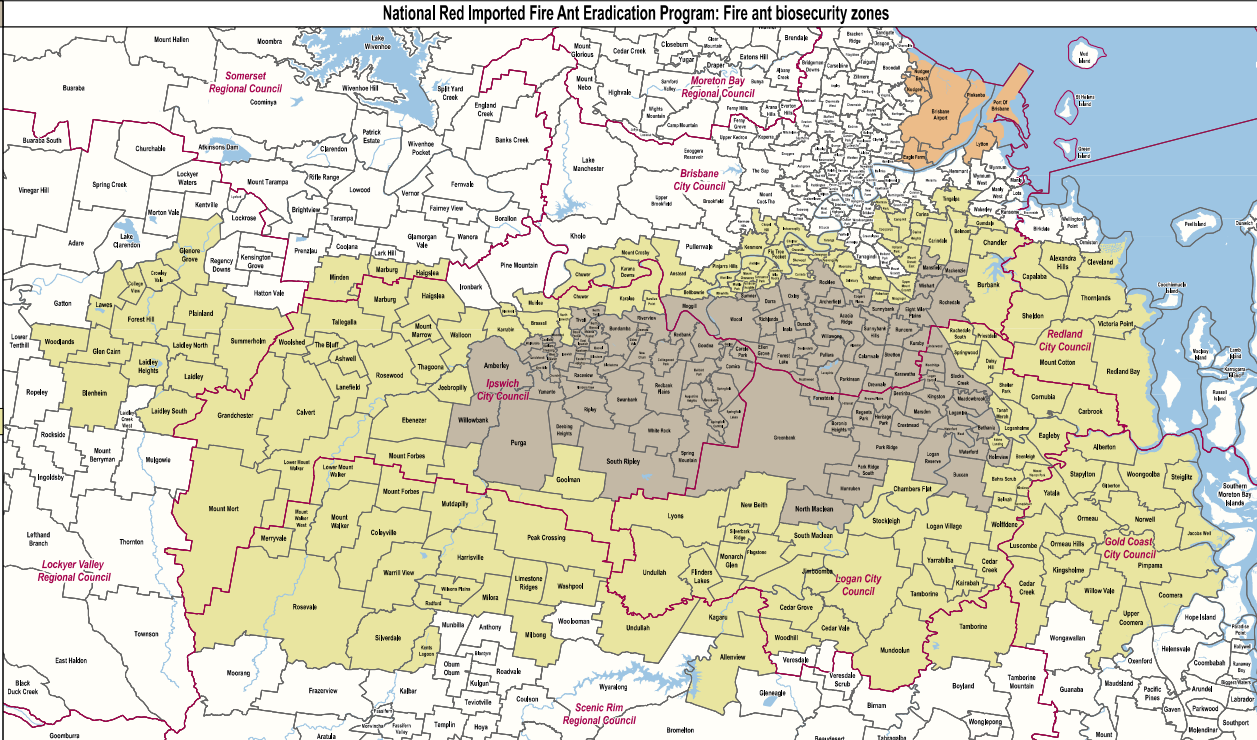
Fire ant biosecurity zone 2

[illegible]

Fire ant biosecurity zone 3

Brisbane Airport	Nudgee	Port Of Brisbane
Eagle Farm	Nudgee Beach	
Lytton	Pinkenba	

National Red Imported Fire Ant Eradication Program: Fire ant biosecurity zones



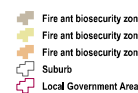
Fire ant carrier movement restrictions

Fire ant biosecurity zone 1	Fire ant biosecurity zone 2	Fire ant biosecurity zone 3
Moving soil? To move soil from a property within biosecurity zone 1 you must have a biosecurity instrument permit unless: - the soil remains within zone 1; or - the soil is moved to a waste facility within zone 1 or zone 2.	Moving soil? To move soil from a property within biosecurity zone 2 you must have a biosecurity instrument permit unless: - the soil remains within zone 2 or is moved to zone 1; or - the soil is moved to a waste facility within zone 1 or 2.	Moving soil? To move soil from a property within biosecurity zone 3 you must have a biosecurity instrument permit unless: - the soil remains within zone 3; or - the soil is moved to a waste facility within zone 3.
Moving mulch, manure, baled hay or straw, potted plants or turf? To move these fire ant carriers from a property within biosecurity zone 1 you must either: - follow procedures outlined in the Biosecurity Regulation 2016; or - move the material to a waste facility within zone 1 or 2; or - move the material within 24 hours of being on the property. If you are unable to fulfil the above conditions then you must request a biosecurity instrument permit from an inspector.	Moving mulch, manure, baled hay or straw, potted plants or turf? To move these fire ant carriers from a property within biosecurity zone 2 you must either: - follow procedures outlined in the Biosecurity Regulation 2016; or - move the material to a waste facility within zone 1 or 2; or - move the material within 24 hours of being on the property. If you are unable to fulfil the above conditions then you must request a biosecurity instrument permit from an inspector.	Moving mulch, manure, baled hay or straw, potted plants or turf? To move these fire ant carriers from a property within biosecurity zone 3 you must either: - follow procedures outlined in the Biosecurity Regulation 2016; or - move the material to a waste facility within zone 3; or - move the material within 24 hours of being on the property. If you are unable to fulfil the above conditions then you must request a biosecurity instrument permit from an inspector.
Moving other fire ant carriers i.e. mining/quarrying products or by-products; compost? To move these fire ant carriers from a property within biosecurity zone 1 you must either: - move the material to a waste facility within zone 1 or 2; or - move the material within 24 hours of being on the property; or - obtain a biosecurity instrument permit from an inspector.	Moving other fire ant carriers i.e. mining/quarrying products or by-products; compost? To move these fire ant carriers from a property within biosecurity zone 2 you must either: - move the material to a waste facility within zone 1 or 2; or - move the material within 24 hours of being on the property; or - obtain a biosecurity instrument permit from an inspector.	Moving other fire ant carriers i.e. mining/quarrying products or by-products; compost? To move these fire ant carriers from a property within biosecurity zone 3 you must either: - move the material to a waste facility within zone 3; or - move the material within 24 hours of being on the property; or - obtain a biosecurity instrument permit from an inspector.

*soil includes fill, clay, scoria and any material removed from the ground at a site where earthworks are being carried out

The State of Queensland does not warrant the accuracy of this map and disclaims any liability for loss arising from the use of this map beyond its intended purpose. Acknowledgements © State of Queensland (Department of Agriculture and Fisheries) 2018. © State of Queensland (Department of Natural Resources and Mines) 2018.

Fire Ant Biosecurity Zone Map – RIFA02
15 June 2018



Contact the Department of Agriculture and Fisheries for more information or request a biosecurity instrument permit:
www.daf.qld.gov.au/fireants
or call 13 25 23



13 August 2021

Conservation and Biodiversity Policy Unit
Department of Environment and Science

To whom it may concern,

RE: Certification by suitably qualified person, Protected Flora Survey

I, Dr Jarrah Wills, Senior Ecologist at Biodiversity Assessment and Management Pty Ltd (BAAM), completed a targeted flora survey within areas of vegetation proposed to be cleared at the 'Jackal Renewables' facility located at 149 Rhondda Road, New Chum (Lot 273 on SP128662)

In accordance with the Queensland *Flora Survey Guidelines – Protected Plants* (Version 2.01, 2020), I hereby certify that:

- a). I have adhered to all statutory requirements and flora survey guideline requirements; and
- b) In the area surveyed I have not found any plants (as detailed in this report) that are currently listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable or near threatened in the *Nature Conservation (Plants) Regulation 2020*; and
- c). The ecological assessment report provides an accurate and full account of the flora survey.

A copy of my CV that demonstrates I have the necessary qualifications and experience to undertake flora surveys in accordance with the Queensland *Flora Survey Guidelines – Protected Plants* (Version 2.01, 2020) is included in the attached report.



Dr Jarrah Wills
Senior Ecologist
Biodiversity Assessment and Management Pty Ltd

Document Control Sheet

File Number: 0410-005

Project Manager: Dr Jarrah Wills

Client: Ardent Group Pty Ltd

Project Title: Protected Flora Survey Report – Jackal Renewables

Project Author/s: Shelley Trevaskis

Project Summary: This report presents the results of a flora survey for protected plant species, undertaken in accordance with the Queensland *Flora Survey Guidelines – Protected Plants*, for a proposed clearing impact area at 149 Rhondda Road, New Chum (Lot 273 on SP128662), to accompany an application for a protected plant clearing permit or activity exemption under the Queensland *Nature Conservation Act 1992*.

Draft Preparation History

Draft	Date Issued	Checked By	Issued By
0410-005 Draft A	20/08/2021	Jedd Appleton	Shelley Trevaskis

Revision/Checking History Track

Version	Date Issued	Checked By	Issued By
0410-005 Version 0	8/09/2021	Jedd Appleton	Jarrah Wills

Destination	Revision					
		Date Dispatched		Date Dispatched		Date Dispatched
Client Copy 1 – digital	A	20/08/2021	0	8/09/2021		
Client Copy 1 – hard copy						
PDF server	A	20/08/2021	0	8/09/2021		
PDF backup – archived	A	20/08/2021	0	8/09/2021		
Hard copy – BAAM library						

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Purpose of Report

Biodiversity Assessment and Management Pty Ltd has produced this report in its capacity as {consultants} for and on the request of Ardent Group Pty Ltd (the "Client") for the sole purpose of documenting the results of a flora survey for protected plant species, undertaken in accordance with the Queensland *Flora Survey Guidelines – Protected Plants*, for a proposed clearing impact area at 149 Rhondda Road, New Chum (Lot 273 on SP128662), to accompany an application for a protected plant clearing permit or activity exemption under the Queensland *Nature Conservation Act 1992* (the "Specified Purpose"). This information and any recommendations in this report are particular to the Specified Purpose and are based on facts, matters and circumstances particular to the subject matter of the report and the Specified Purpose at the time of production. This report is not to be used, nor is it suitable, for any purpose other than the Specified Purpose. Biodiversity Assessment and Management Pty Ltd disclaims all liability for any loss and/or damage whatsoever arising either directly or indirectly as a result of any application, use or reliance upon the report for any purpose other than the Specified Purpose.

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Signed on behalf of
Biodiversity Assessment and Management Pty Ltd

Date: 8/09/2021



Director

PROTECTED FLORA SURVEY REPORT

‘JACKAL RENEWABLES’ - 149 RHONDDA ROAD, NEW CHUM

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List of Abbreviations

BAAM	Biodiversity Assessment and Management Pty Ltd
DES	Queensland Department of Environment and Science
EVNT	Endangered, Vulnerable or Near Threatened
NC Act	Queensland <i>Nature Conservation Act 1992</i>
RE	Regional Ecosystem

1.0 INTRODUCTION

1.1. BACKGROUND AND PURPOSE

Biodiversity Assessment and Management Pty Ltd (BAAM) has prepared this report for Ardent Group Pty Ltd to document the results of a survey undertaken in accordance with the Queensland *Flora Survey Guidelines - Protected Plants* (DES, 2020) for the clearing of vegetation at the 'Jackal Renewables Pty Ltd' facility located at 149 Rhondda Road, New Chum (Lot 273 on SP128662) (**Figure 1.1**).

As the vegetation proposed to be cleared is identified as occurring within a high risk area on the Queensland Department of Environment and Science (DES) flora survey trigger map (**Appendix 1**), targeted searches for flora species listed as Endangered, Vulnerable or Near Threatened (EVNT) under the Queensland *Nature Conservation Act 1992* (NC Act) are required to be undertaken in accordance with the Queensland *Flora Survey Guidelines - Protected Plants* (DES, 2020) before a clearing permit or exemption can be applied for under the NC Act.

1.2. REPORT CONTENT

In accordance with the Queensland *Flora Survey Guidelines - Protected Plants* (DES, 2020), the following information is provided in the subsequent sections of this report:

- A description of the location and map of the area to be cleared.
- A description of the survey methodology, including:
 - survey techniques;
 - a statement to justify the suitability and qualifications of the person undertaking the flora survey; and
 - justification of the timing of the flora survey (with details of any limitations associated with the timing).
- A description of the habitat types identified for the clearing impact area and a map of the GPS data showing the on-ground surveys undertaken and extent of the clearing impact area.

1.3. PROPOSED CLEARING AREA

The proposed works areas include three separate locations within the Jackal Renewables facility (Study Area) (**Figure 1.1**). The vegetation in these locations was generally disturbed and featured eucalypt open forest regrowth with a partially weed infested understorey.

The surrounding landscape includes cleared and highly disturbed lands, water bodies, minor roadways and bushland.

2.0 METHODOLOGY

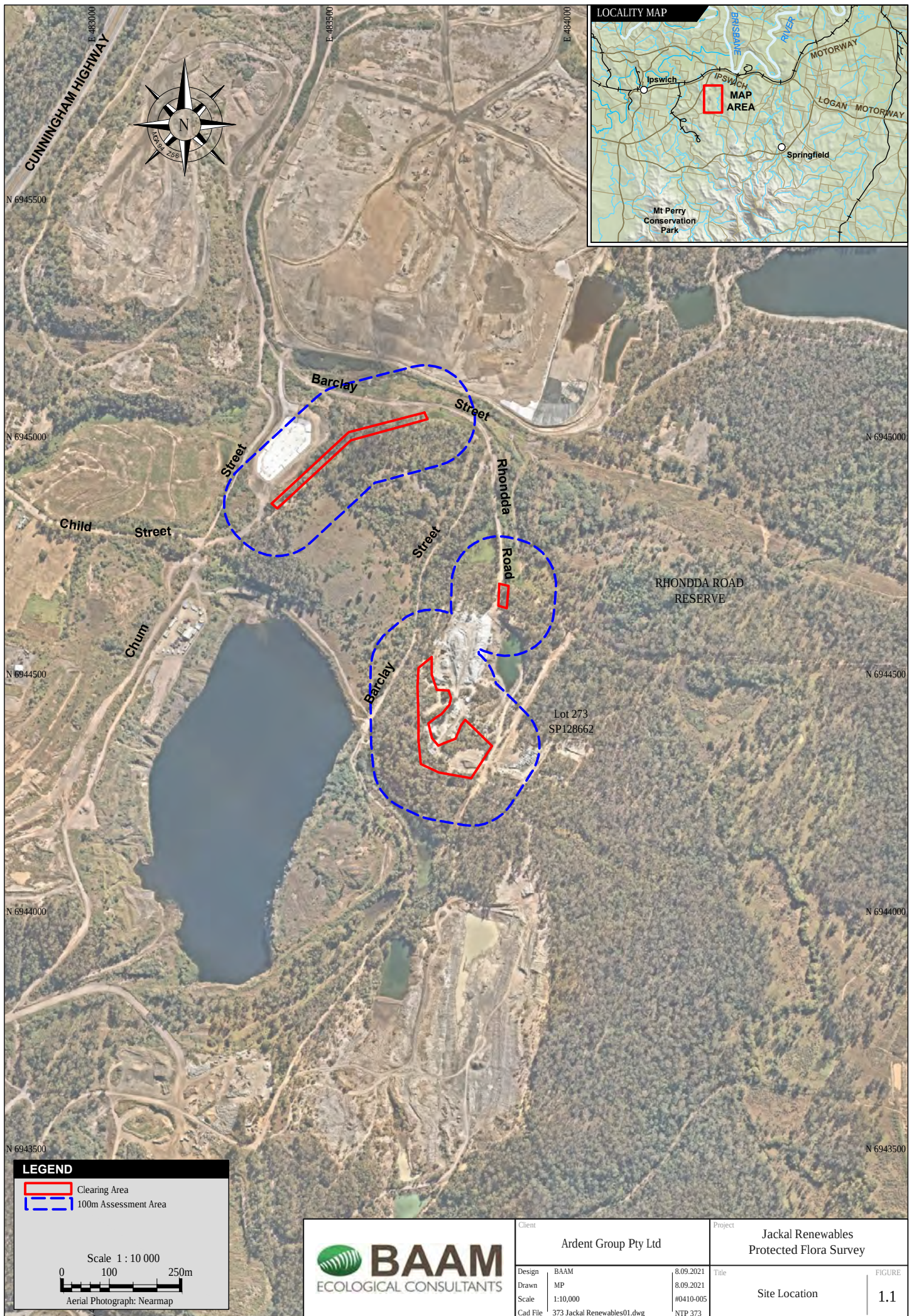
2.1. INITIAL DESKTOP REVIEW

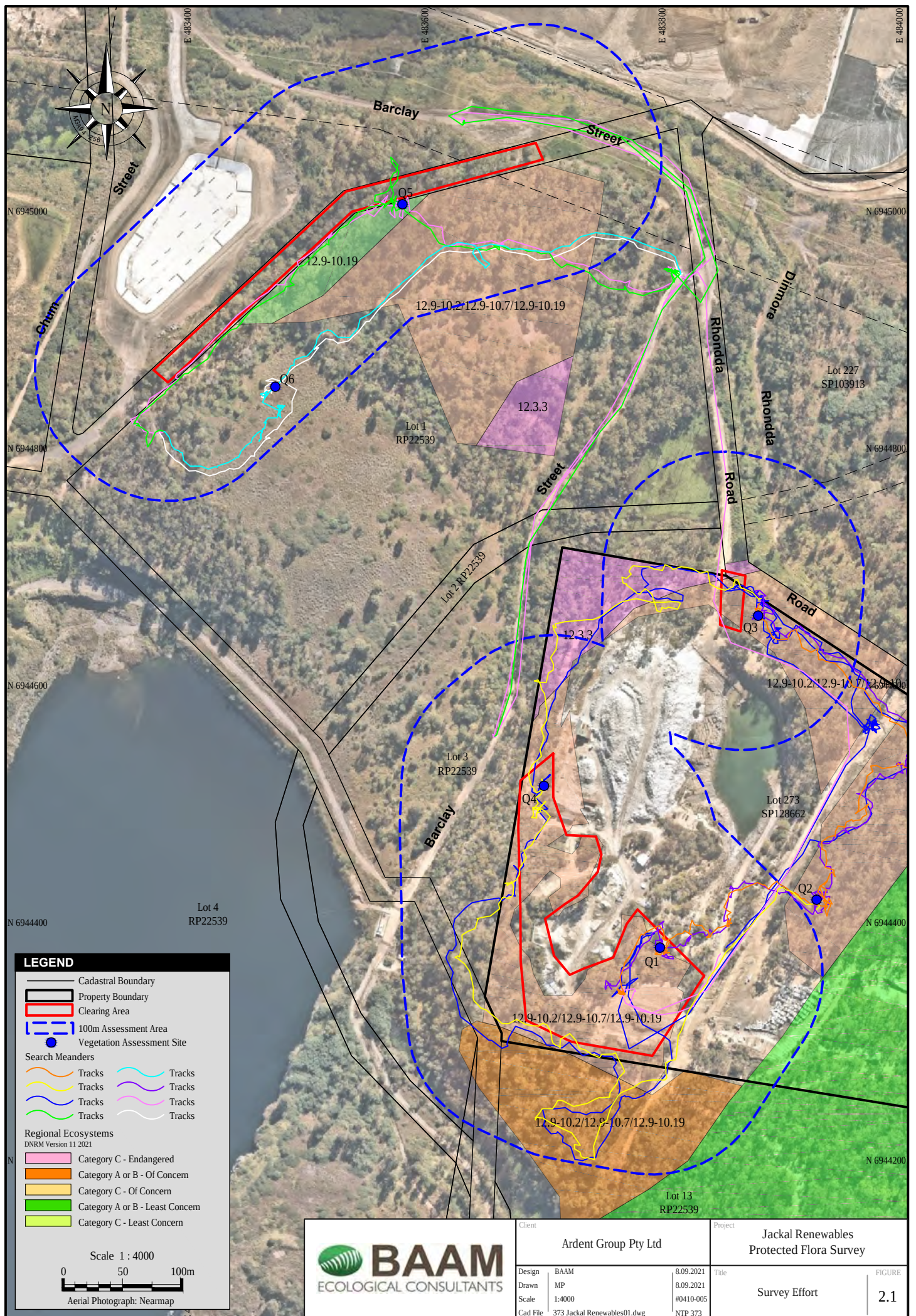
A review of available information was undertaken to determine which EVNT flora species may occur within the proposed clearing area and immediate surrounds, such that survey effort could be targeted towards confirming the presence or absence of these species. Specifically, this involved accessing and reviewing:

- DES's Wildlife Online Database (**Appendix 2**) and the Atlas of Living Australia online database, to determine whether any EVNT species listed under the NC Act have been previously recorded within the vicinity.
- State mapping of regulated vegetation and associated Essential Habitat (**Appendix 3**), to determine whether preferred habitats for potentially occurring EVNT flora species may occur; and
- Reference material on the target species (species profiles, etc.) to confirm habitat requirements and distinguishing features to assist field identification.

2.2. FIELD SURVEY APPROACH

The flora survey covered the areas to be cleared as well as a 100m buffer around each proposed clearing area. This combined area is hereafter referred to as the 'clearing impact area' (refer **Figure 2.1**).





In accordance with the *Flora Survey Guidelines - Protected Plants* (DES, 2020), the survey involved timed, random meander surveys of each habitat type within the clearing impact area.

The clearing impact area was dominated by one habitat type, this being eucalypt open forest/woodland. This community featured remnant, regrowth and non-remnant areas in a patchy mosaic – all of which were included in survey meanders.

All three clearing sites are located in regrowth vegetation mapped as a heterogeneous community of regional ecosystem (RE) 12.9-10.2/ RE12.9-10.7/RE12.9-10.19. For the southernmost clearing area, the clearing impact area (within the 100 metre buffer) also included one smaller area of remnant RE12.9-10.19.

For each clearing area, portions of the 100m buffer were completely cleared, highly disturbed land (highly modified environments) (refer **Figure 1.1**), which were not included in meanders.

Overall, eight meanders were completed in the clearing impact areas, as shown in **Figure 2.1**.

For the random meanders, a starting point was selected, and the starting time noted. The area of interest was then traversed as a random meander, searching carefully for EVNT plant species. Whenever the survey was interrupted, the survey time was paused until the survey started again. The random meander was terminated once no new species had been recorded for 30 minutes of active survey or when the entire area of the habitat type had been surveyed, whichever happened sooner.

2.3. QUALIFICATIONS OF FIELD TEAM

The targeted flora survey was led by Dr Jarrah Wills (Senior Ecologist) on 13th August 2021. Jarrah is suitably qualified to undertake protected plants assessments as prescribed under the Queensland *Flora Survey Guidelines - Protected Plants* (DES, 2020) – his certification statement is provided as a front cover to this report and his curriculum vitae is provided in **Appendix 4**.

2.4. SURVEY TIMING

The protected plant survey was commissioned to be undertaken in August 2021 to achieve operational timeframes. Rainfall during the months leading up to the survey was average. Conditions during the survey were mild and fine.

The protected plants survey methodology is designed to confirm the presence or absence of potentially occurring EVNT flora species, preferably at an optimal time for detection of species being targeted. All targeted species in this survey were expected to have identifiable foliage and bark characteristics present at the time of survey.

3.0 RESULTS

3.1. DESKTOP ASSESSMENT

A search of the DES Wildlife Online database (**Appendix 2**) and the ALA database found that nine EVNT flora species listed under the NC Act have been previously recorded within 5 km of the clearing impact area since 1980. The results of these searches, together with the preferred habitat and likelihood of occurrence of each species on this site, are presented in **Table 3.1**.

The State regulated vegetation mapping (**Appendix 3**) shows the clearing impact area predominantly occurs within non-remnant and regrowth vegetation, and one small area of remnant vegetation in the 100m buffer of the southernmost clearing area. No Essential Habitat mapping for flora species is associated with this RE.

3.2. FIELD ASSESSMENT

The habitat types recorded in the clearing impact area are described in **Table 3.2**. The location of vegetation assessment sites Q1 to Q6 are indicated in **Figure 2.1**.

Of the EVNT flora species recorded within 5km of the impact area, preferred habitat was present for *Eucalyptus curtissii*, *Marsdenia coronata* and *Notelaea ipsviciensis* (all of which occur in dry sclerophyll forest) (**Table 3.1**). However, no EVNT flora species were detected during the survey, despite thorough searching of the clearing area and adjacent vegetation.

Table 3.1. EVNT flora species recorded within 5km of the site and likelihood of occurrence

Species	Status (NCA)	Preferred Habitat	Likelihood of occurrence
<i>Callitris baileyi</i>	Near Threatened	Rocky slopes, hilly or mountainous areas, in shallow and often clay soils. It is found in eucalypt woodland, commonly associated with ironbark, blue gum and spotted gum (DES, 2019b).	Unlikely. Whilst marginal habitat for the species is present on site, extensive searches did not record the species. It is also noted that much of the Study Area displays landforms that have been historically disturbed.
<i>Coleus habrophyllus</i>	Endangered	Known only from near Ipswich and near Ormeau in south-east Queensland where it is associated with shaded gullies on rocky sediment substrates, often adjacent to dry rainforest (DoE, 2021a).	Unlikely. Dry rainforest was not recorded on site. Marginal habitat occurs in the form of gullies; however extensive searches in gully habitat did not record the species.
<i>Eucalyptus curtisii</i>	Near Threatened	The larger growth form occurs as scattered individuals on better drained soils in the more open areas of mixed eucalypt forests (DES, 2019d).	Unlikely. Whilst preferred habitat for the species is present on site, extensive searches did not record the species. It is also noted that much of the Study Area displays landforms that have been historically disturbed.
<i>Hernandia bivalvis</i>	Near Threatened	Mainly grows in rainforest on rock pavements and outcrops with shallow soils. Most Queensland Herbarium records are from either vine thicket or microphyll vine forest (DES, 2019c).	Unlikely. No suitable habitat occurs in the Study Area.
<i>Lilaeopsis brisbanica</i>	Endangered	Grows along tidal riverbanks in grey saline mud, in association with mangrove trees. Although occurring naturally in areas near saline waters, fresh water is satisfactory (DES, 2019).	Unlikely. Specimens have been recorded on the Bremer and Brisbane Rivers well north of the Study Area. No suitable habitat occurs in the Study Area.
<i>Marsdenia coronata</i>	Vulnerable	Commonly found in open eucalypt forest/woodland communities on hillslopes and ridge tops at altitudes of 40–780 m above sea level. Also known from rocky outcrops along cliff lines. Most commonly recorded with <i>E. carnea</i> , <i>Corymbia citriodora</i> , <i>C. henryi</i> , <i>E. acmenoides</i> and <i>E. propinqua</i> . (DoE, 2021b)	Unlikely Potentially suitable habitat occurs in the Study Area. However extensive searches of representative habitats did not record the species. It is also noted that much of the Study Area displays landforms that have been historically disturbed.
<i>Notelaea ipsviciensis</i>	Critically Endangered	Known from three closely clustered sub-populations in the Ipswich area. Occurs as an understorey plant in degraded, eucalypt dominated, dry sclerophyll vegetation communities (DoE, 2021c).	Unlikely. Whilst preferred habitat for the species is present on site, extensive searches did not record the species. It is also noted that much of the Study Area displays landforms that have been historically disturbed.
<i>Notelaea lloydii</i>	Vulnerable	Found in the ecotone between eucalypt open forests and vine thicket on undulating to hilly terrain either in moist gullies or on dry slopes, rarely on rocky outcrops. (DoE, 2021d).	Unlikely. Vine thicket is not present on site. No suitable habitat occurs in the Study Area.
<i>Rhodomyrtus psidioides</i>	Critically Endangered	Grows in warmer rainforest and on rainforest margins; coastal districts (PlantNet, 2021).	Unlikely. No suitable habitat occurs in the Study Area.

Table 3.2. Description of vegetation within the clearing impact area (* exotic species)

Site	Habitat description	Representative photo
Q1	Brief description: Disturbed regrowth and non-remnant vegetation on highly disturbed landform. Canopy (T1): Sparse. Height range 7-14m; median height 12m. <i>Eucalyptus tereticornis</i>, <i>Acacia disparrima</i>, <i>Eucalyptus fibrosa</i>. Sub-canopy (T2): Sparse. Height range 3-6m; median height 4m: <i>Acacia leiocalyx</i>. Shrub (S1) nil Groundcover: Very sparse. Height range 0.0-0.5m; median height 0.3m. <i>Entolasia stricta</i>.	
Q2	Brief description: Eucalypt open forest - mapped regrowth but has achieved remnant status. Canopy (T1): Mid-dense. Height range 16-21m; median height 19m. <i>Eucalyptus fibrosa</i>, <i>Corymbia citriodora</i>. Sub-canopy (T2): Dense. Height range 2-5m; median height 3m: <i>Acacia leiocalyx</i>, <i>Alphitonia excelsa</i>, <i>Hovea acutifolia</i>, <i>Dodonaea triangularis</i>, <i>Acacia</i> sp. Shrub (S1) Dense: Height range 1-2m; median height 1.5m. <i>Acacia</i> sp. Groundcover: Sparse. Height range 0.0-1.0m; median height 0.3m. <i>Entolasia stricta</i>, <i>Aristida</i> sp., <i>Lomandra multiflora</i>, <i>Eragrostis corrollii</i>.	
Q3	Brief description: Eucalypt open forest - mapped regrowth but has achieved remnant status. Disturbed understorey. Canopy (T1): Mid-dense. Height range 18-21m; median height 20m. <i>Corymbia citriodora</i>. Sub-canopy (T2): Dense. Height range 2-4m; median height 3m: <i>Acacia leiocalyx</i>. Shrub (S1) Mid-dense: Height range 1-2m; median height 1.2m. <i>Alphitonia excelsa</i>, <i>Lantana camara</i>* Groundcover: Sparse. Height range 0.0-1.0m; median height 0.5m. <i>Entolasia stricta</i>.	

Site	Habitat description	Representative photo
Q4	Brief description: non-remnant Acacia regrowth. Canopy (T1): Sparse. Height range 2.5-6m; median height 4m. <i>Acacia leiocalyx</i>, <i>Alphitonia excelsa</i>, <i>Eucalyptus tereticornis</i>. Sub-canopy (T2): nil Shrub (S1): nil Groundcover: Mid-dense. Height range 0.0-1.0m; median height 0.8m. <i>Melinis repens</i>*, <i>Pennisetum alopecuroides</i>*, <i>Senecio madagascariensis</i>*, <i>Cyanthillium cinereum</i>*	
Q5	Brief description: Eucalypt open forest – mapped regrowth but has achieved remnant status. Canopy (T1): Sparse. Height range 17-22m; median height 20m. <i>Eucalyptus fibrosa</i>, <i>Corymbia citriodora</i>. Sub-canopy (T2): Mid-dense. Height range 2-4m; median height 3m: <i>Acacia fimbriata</i>. Shrub (S1): nil Groundcover: Sparse. Height range 0.0-1.0m; median height 0.5m. <i>Entolasia stricta</i>.	
Q6	Brief description: non-remnant rank grassland Canopy (T1): nil Sub-canopy (T2): nil Shrub (S1): nil Groundcover: Dense. Height range 0.0-1.0m; median height 0.8m. <i>Andropogon virginicus</i>*	

4.0 POTENTIAL IMPACTS

As no EVNT species were detected within the clearing impact area, no direct or indirect impacts on EVNT plants are expected.

5.0 CONFIRMATION OF EXEMPT CLEARING NOTIFICATION AND SUBMISSION REQUIREMENTS

The *Flora Survey Guidelines – Protected Plants* (DES, 2020) stipulate that, where no EVNT species are identified within the clearing “impact” area (which includes the 100m buffer), an exempt clearing notification is required to be submitted to DES. This Protected Flora Survey Report should accompany the notification as an attachment.

Section 261ZA requires that the exemption and supporting report are submitted at least one week before clearing commences, but no later than one year after the completion of the flora survey that was undertaken for the report (i.e. by 13th August, 2022). Following submission of the exemption, the applicant will receive a receipt of the submission providing approval for the clearing to commence. Clearing under this exemption may be conducted within two years after the flora survey report is submitted.

6.0 REFERENCES

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(2021a). *Approved Conservation*

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(2019) *Lilaeopsis brisbanica*

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Department of Environment and Science

(2019b) *Callitris baileyi*

<https://apps.des.qld.gov.au/species-search/details/?id=14766>

Department of Environment and Science

(2019c) *Hernandia bivalvis*.

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(2019d) *Eucalyptus curtisii*.

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(DES) (2020). *Flora Survey Guidelines*

– *Protected Plants* (Version 2.01).

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Leiper et al (2008). *Mountain to Mangroves*

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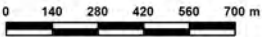
APPENDIX 1
FLORA SURVEY TRIGGER MAP FOR THE SITE



Protected Plants Flora Survey Trigger Map

Legend

- Selected Lot and Plan
- High risk area
- Other land parcel boundaries
- Freeways / motorways / highways
- Secondary roads / streets



This product is projected into:
GDA 1994 Queensland Albers

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science at palm@ehp.qld.gov.au

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

Protected plants flora survey trigger map

The protected plants flora survey trigger map identifies 'high risk areas' where endangered, vulnerable or near threatened plants are known to exist or are likely to exist. Under the *Nature Conservation Act 1992* (the Act) it is an offence to clear protected plants that are 'in the wild' unless you are authorised or the clearing is exempt, for more information see [section 89](#) of the Act.

Please see the Department of Environment and Science webpage on the [clearing of protected plants](#) for information on what exemptions may apply in your circumstances, whether you may need to undertake a flora survey, and whether you may need a protected plants clearing permit.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the [Queensland Spatial Catalogue](#), the Department of Environment and Science does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment and Science webpage on the [clearing of protected plants](#) for more information.

APPENDIX 2

WILDLIFE ONLINE DATABASE SEARCH RESULTS



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: Plants (including other non-animals such as fungi and protists)
Type: Native
Status: Rare and threatened species
Records: Confirmed
Date: Since 1980
Latitude: -27.621
Longitude: 152.831
Distance: 5
Email: jarrah@baamecology.com
Date submitted: Wednesday 13 Jan 2021 13:32:35
Date extracted: Wednesday 13 Jan 2021 13:40:02

The number of records retrieved = 9

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Apiaceae	<i>Lilaeopsis brisbanica</i>			E		3/3
plants	land plants	Apocynaceae	<i>Marsdenia coronata</i>	slender milkvine		V		13/13
plants	land plants	Cupressaceae	<i>Callitris baileyi</i>	Bailey's cypress		NT		1
plants	land plants	Hernandiaceae	<i>Hernandia bivalvis</i>	cudgerie		NT		1
plants	land plants	Lamiaceae	<i>Coleus habrophyllus</i>			E	E	1/1
plants	land plants	Myrtaceae	<i>Rhodomyrtus psidioides</i>	native guava		CR	CE	1
plants	land plants	Myrtaceae	<i>Eucalyptus curtisii</i>	Plunkett mallee		NT		6/5
plants	land plants	Oleaceae	<i>Notelaea lloydii</i>	Lloyd's native olive		V	V	13/13
plants	land plants	Oleaceae	<i>Notelaea ipsviciensis</i>	Cooneana olive		CR	CE	15/15

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ().

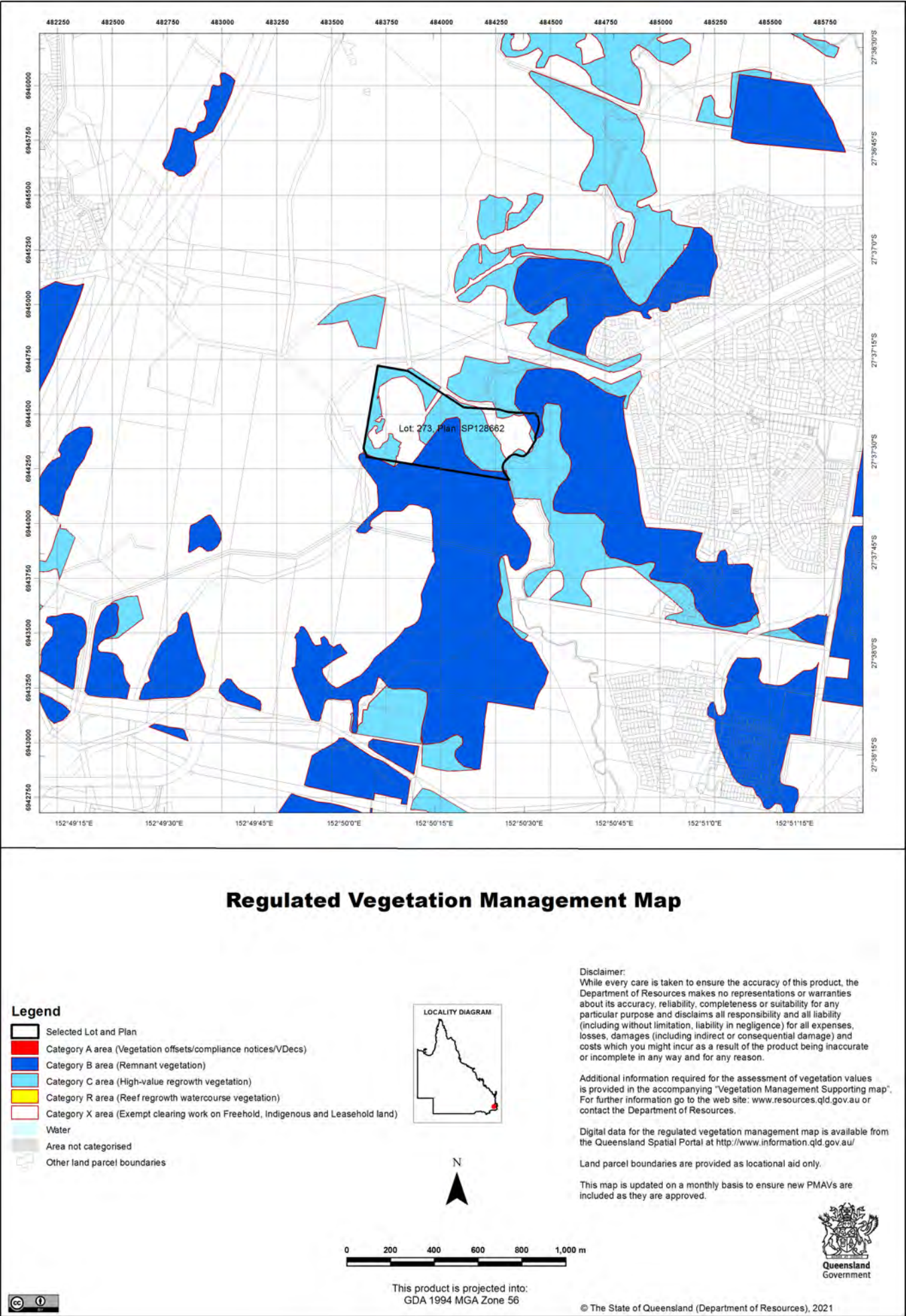
A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

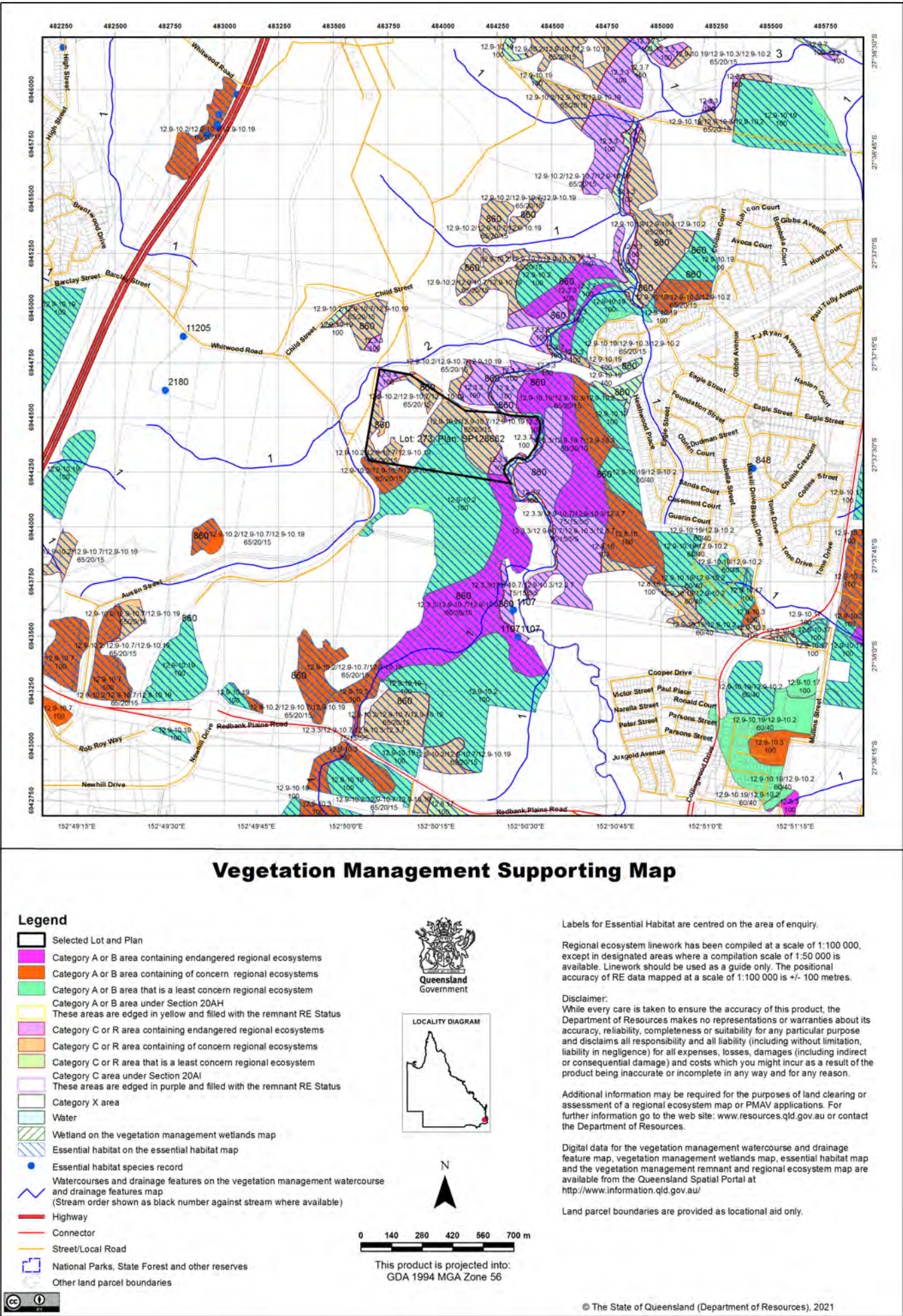
Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

APPENDIX 3
DNRM REGULATED VEGETATION AND ESSENTIAL
HABITAT MAPPING





Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Resources website (<http://www.dnrme.qld.gov.au>) has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

- 1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
- 2) in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
860	Phascolarctos cinereus	koala	V	SEQ: Open eucalypt forest and woodland that has: a) multiple strata layers containing Eucalyptus, Corymbia, Angophora, Lophostemon or Melaleuca trees that-at 1.3 metres above the ground-have a diameter both greater and less than 30 centimetres; and b) at least 1 of the following species: Eucalyptus tereticornis, E. fibrosa, E. propinqua, E. umbra, E. grandis, E. microcorys, E. tindaliae, E. resinifera, E. populnea, E. robusta, E. nigra, E. racemosa, E. crebra, E. exserta, E. seeana, Lophostemon confertus, L. suaveolens, Melaleuca quinquenervia. Outside SEQ: Open eucalypt forest and woodland that contains Eucalyptus &/or Corymbia spp. Tree species used for food varies across State and can include Eucalyptus tereticornis, E. camaldulensis, E. coolabah, E. drepanophylla, E. platyphylla, E. orgadophylla, E. thozetiana, E. melanophloia, E. populnea, E. melliodora, E. dealbata, E. microtheca, E. crebra, E. exserta, E. blakelyi, E. papuana, Corymbia tessellaris, C. citriodora, Melaleuca quinquenervia, M. leucadendra.	Sea level to 1000m.	None	Riparian areas, plains and hill/escarpment slopes.
848	Petauroides volans	greater glider	V	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	None
1107	Ninox strenua	powerful owl	V	Wet and dry tall open eucalypt forest (Eucalyptus pilularis, E. acmenoides, E. tereticornis, E. camaldulensis, E. crebra, E. melliodora, Corymbia citriodora & C. intermedia), including mountain forest gullies/gorges; forests aged 60+ years (large & old) on fertile soils with suitable hollows; roosting in dense foliage of closed forest (occasionally caves) and foraging in open forest and woodland including areas adjacent to urban/rural development. Nest in large hollows (45-75cm diameter, 50-180cm deep) 6-45m above ground, in large (>100cm dbh) old eucalypts on the side or at the head of heavily wooded gully.	Sea level to 1000m.	None	Gully.
2180	Notelaea ipsviciensis	Cooneana olive	E	dry sclerophyll eucalypt forest.; open forest of Eucalyptus fibrosa, Corymbia citriodora and C. henryii	0 to 300 m	shallow sandy to loam soil derived from sandstone substrates or stony clay soils	hill sides, gullies in hilly terrain
11205	Marsdenia coronata	slender milkvine	V	open forest of Eucalyptus pilularis, E. microcorys, Corymbia intermedia, or Eucalyptus propinqua, E. carnea with Themeda understorey, or Lophostemon confertus, Corymbia intermedia, Eucalyptus carnea, Allocasuarina littoralis, Banksia integrifolia, or Eucalyptus carnea, E. propinqua, or Eucalyptus carnea, E. propinqua, E. acmenoides, or Allocasuarina littoralis, Lophostemon confertus, Corymbia citriodora, Eucalyptus carnea, E. tindaliae; woodland to open forest of Eucalyptus fibrosa, Corymbia citriodora, or Eucalyptus fibrosa, C. henryi, or Corymbia citriodora, Eucalyptus dura, C. henryii, or Eucalyptus dura, Eucalyptus acmenoides; rocky heathland with Acacia blakei; wet sclerophyll forest dominated by Eucalyptus andrewsii, E. biturbinata	0 to 800 m	red brown loam to clay or sandy soil occasionally skeletal	mostly on steep ridge or hill slope sometimes on rock ledges along clifflines rarely on alluvial terrace

Label	Regional Ecosystem (mandatory unless otherwise specified)
860	SEQ 11.3.2, 11.3.4, 11.3.25, 11.3.26, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.9.9, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.14, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.6, 12.5.7, 12.5.10, 12.5.12, 12.8.1, 12.8.8, 12.8.9, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.24, 12.8.25, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.21, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.23, 12.12.24, 12.12.5, 12.12.26, 12.12.27, 12.12.28, 12.12.29, 12.12.31, 12.12.32, 12.12.33, 12.12.34, 12.12.35, 12.12.36, 12.12.37, 12.12.38, 12.12.39, 12.12.40, 12.12.41, 12.12.42, 12.12.43, 12.12.44, 12.12.45, 12.12.46, 12.12.47, 12.12.48, 12.12.49, 12.12.50, 12.12.51, 12.12.52, 12.12.53, 12.12.54, 12.12.55, 12.12.56, 12.12.57, 12.12.58, 12.12.59, 12.12.60, 12.12.61, 12.12.62, 12.12.63, 12.12.64, 12.12.65, 12.12.66, 12.12.67, 12.12.68, 12.12.69, 12.12.70, 12.12.71, 12.12.72, 12.12.73, 12.12.74, 12.12.75, 12.12.76, 12.12.77, 12.12.78, 12.12.79, 12.12.80, 12.12.81, 12.12.82, 12.12.83, 12.12.84, 12.12.85, 12.12.86, 12.12.87, 12.12.88, 12.12.89, 12.12.90, 12.12.91, 12.12.92, 12.12.93, 12.12.94, 12.12.95, 12.12.96, 12.12.97, 12.12.98, 12.12.99, 12.13.1, 12.13.2, 12.13.3, 12.13.4, 12.13.5, 12.13.6, 12.13.7, 12.13.8, 12.13.9, 12.13.10, 12.13.11, 12.13.12, 12.13.13, 12.13.14, 12.13.15, 12.13.16, 12.13.17, 12.13.18, 12.13.19, 12.13.21, 12.13.22, 12.13.23, 12.13.24, 12.13.25, 12.13.26, 12.13.27, 12.13.28, 12.13.29, 12.13.30, 12.13.31, 12.13.32, 12.13.33, 12.13.34, 12.13.35, 12.13.36, 12.13.37, 12.13.38, 12.13.39, 12.13.41, 12.13.42, 12.13.43, 12.13.44, 12.13.45, 12.13.46, 12.13.47, 12.13.48, 12.13.49, 12.13.50, 12.13.51, 12.13.52, 12.13.53, 12.13.54, 12.13.55, 12.13.56, 12.13.57, 12.13.58, 12.13.59, 12.13.60, 12.13.61, 12.13.62, 12.13.63, 12.13.64, 12.13.65, 12.13.66, 12.13.67, 12.13.68, 12.13.69, 12.13.70, 12.13.71, 12.13.72, 12.13.73, 12.13.74, 12.13.75, 12.13.76, 12.13.77, 12.13.78, 12.13.79, 12.13.80, 12.13.81, 12.13.82, 12.13.83, 12.13.84, 12.13.85, 12.13.86, 12.13.87, 12.13.88, 12.13.89, 12.13.90, 12.13.91, 12.13.92, 12.13.93, 12.13.94, 12.13.95, 12.13.96, 12.13.97, 12.13.98, 12.13.99, 12.14.1, 12.14.2, 12.14.3, 12.14.4, 12.14.5, 12.14.6, 12.14.7, 12.14.8, 12.14.9, 12.14.10, 12.14.11, 12.14.12, 12.14.13, 12.14.14, 12.14.15, 12.14.16, 12.14.17, 12.14.18, 12.14.19, 12.14.20, 12.14.21, 12.14.22, 12.14.23, 12.14.24, 12.14.25, 12.14.26, 12.14.27, 12.14.28, 12.14.29, 12.14.30, 12.14.31, 12.14.32, 12.14.33, 12.14.34, 12.14.35, 12.14.36, 12.14.37, 12.14.38, 12.14.39, 12.14.40, 12.14.41, 12.14.42, 12.14.43, 12.14.44, 12.14.45, 12.14.46, 12.14.47, 12.14.48, 12.14.49, 12.14.50, 12.14.51, 12.14.52, 12.14.53, 12.14.54, 12.14.55, 12.14.56, 12.14.57, 12.14.58, 12.14.59, 12.14.60, 12.14.61, 12.14.62, 12.14.63, 12.14.64, 12.14.65, 12.14.66, 12.14.67, 12.14.68, 12.14.69, 12.14.70, 12.14.71, 12.14.72, 12.14.73, 12.14.74, 12.14.75, 12.14.76, 12.14.77, 12.14.78, 12.14.79, 12.14.80, 12.14.81, 12.14.82, 12.14.83, 12.14.84, 12.14.85, 12.14.86, 12.14.87, 12.14.88, 12.14.89, 12.14.90, 12.14.91, 12.14.92, 12.14.93, 12.14.94, 12.14.95, 12.14.96, 12.14.97, 12.14.98, 12.14.99, 12.15.1, 12.15.2, 12.15.3, 12.15.4, 12.15.5, 12.15.6, 12.15.7, 12.15.8, 12.15.9, 12.15.10, 12.15.11, 12.15.12, 12.15.13, 12.15.14, 12.15.15, 12.15.16, 12.15.17, 12.15.18, 12.15.19, 12.15.20, 12.15.21, 12.15.22, 12.15.23, 12.15.24, 12.15.25, 12.15.26, 12.15.27, 12.15.28, 12.15.29, 12.15.30, 12.15.31, 12.15.32, 12.15.33, 12.15.34, 12.15.35, 12.15.36, 12.15.37, 12.15.38, 12.15.39, 12.15.40, 12.15.41, 12.15.42, 12.15.43, 12.15.44, 12.15.45, 12.15.46, 12.15.47, 1

APPENDIX 4
***CURRICULA VITA* OF FIELD PERSONNEL**

SPECIALISATION

- Ecological Survey
- Protected Plant Survey
- Vegetation and Rehabilitation Management Plans
- Biocondition Assessment
- Plant Identification
- Bush Regeneration
- Project Management

EDUCATION & PROFESSIONAL QUALIFICATIONS

PhD Plant Ecology, University of Queensland (2017)

BSc Ecology, Queensland University of Technology (2012)

Chemical Application Licence, Axiom College (2008)

Chainsaw Operations, In Training Systems (2008)



KEY EXPERIENCE

Jarrah Wills is a Senior Ecologist at BAAM Pty Ltd. His areas of expertise are botanical and ecological surveys, ecological restoration and how they relate to ecosystem functioning and subsequent services. Jarrah has over 10 years' experience in vegetation management, and 6 years' experience in undertaking vegetation surveys within Australia and Internationally.

RECENT PROJECT EXPERIENCE

- Comprehensive baseline ecological surveys for Saraji and Saraji South Mines for BHP, including vegetation assessment and ground-truthed mapping, biocondition assessment and habitat assessment.
- Ground-verification of ecological values for the Cooloola Great Walk project.
- Large scale tree surveys, Vegetation Mapping, Vegetation Condition Assessments and Comparisons, Food Web Analysis for the Terrestrial Ecology, and on-going technical advice for the rehabilitation of the Old Petrie Mill site.
- Planning, direction and monitoring of weeding and rehabilitation works at Hilliards Creek for Department of Agriculture and Fisheries.
- Protected Flora Surveys undertaken in accordance with state guidelines – various locations throughout south-east Queensland.
- National assessment of the impact of myrtle rust – Threatened Species Recovery Hub (NESP)
- Vegetation survey – Gulkula Mining vegetation assessment and comparative analysis, Gove
- Forest Resource Survey – Rio Tinto mining lease pre-clearing forest resource assessment, Gove and Weipa

PROFESSIONAL HISTORY

2019-present	BAAM Pty Ltd Senior Ecologist
2017-2018	University of Queensland Queensland Herbarium Post-doctoral research fellow
2016-2017	University of the Sunshine Coast Researcher
2013-2017	University of Queensland PhD Researcher
2006-2018	Mt Nebo and Mt Glorious Environmental Protection Agency Inc Ecologist/Bush Regenerator
2012-2013	Davanco Environmental Pty Ltd Bush Regenerator
2006-2010	Brisbane Bush Care Pty Ltd Bush Regenerator

SELECTED PUBLICATIONS

Fensham, R.J.et al. and **Wills, J** (2020) Imminent Extinction of Australian Myrtaceae by Fungal Disease. Trends in Ecology and Evolution.

Wills, J. et al (2018) Leaf economic trade-offs are stronger for sub-canopy trees: leaf traits reveal little about growth rates in canopy trees. Ecological Applications, 28: 1116-1125

Wills, J., (2018) Myrtle Rust Is Here. Science for Saving species, Threatened Species Recovery Hub.

Wills, J., et al. (2017) Next-generation tropical forests: reforestation type affects recruitment of species and functional diversity in a human-dominated landscape. Journal of Applied Ecology, 54: 772-783

PART B — ATTACHMENTS PRCP SCHEDULE

Appendix 1 – PRCP Schedule
Appendix 2 – EA0001386 – Land Outcome Document
Appendix 3 – Ecological Studies
Appendix 4 – Mine Planning Report

Jackal Renewables Pty Ltd; ML50070

Appendix 4 – Mine Planning Report



ML50070 Mine Planning Report

Prepared for Jackal Renewables

February 2022

AUQ00209

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Document Review and Sign Off

Name	Position	Role	Signature	Date Issued
Carl Morandy	Managing Director (Ausrocks)	RPEQ (22981) & QA Review		3/02/2023

This document has been prepared for the exclusive use of the Client based on instructions, information and data supplied by the Client as of February 2023. This document has been prepared by Ausrocks Pty Ltd (Ausrocks). Ausrocks has no financial association with the Client other than carrying out this report as requested by the Client.

Design Parameters

The following factors were considered when determining the appropriate design parameters for the mine:

- Geological factors and geotechnical stability of the materials (Topsoil, Sandstone, Shale, Clay, Mudstone and Gravel).
- Groundwater runoff (assuming water table is below the pit floor).
- Site specific boundaries (Property Boundary and Mining Lease Boundary) and buffers (Powerline).
- Final land use 'Final Landform Design'.

The design parameters selected for the mine are shown in **Table 1** below.

Table 1 – Design Parameters

Parameter		Value	Comment
Roads	Road Width	10m	Based on a 2x road truck width standard including provision for drainage and bunding.
	Road Gradient	10%	1 in 10 gradient which is suitable for road trucks.
Offsets	Mining Lease Boundary	20m	As per EA001386
	Powerline	25m	Powerline runs between the Western and Eastern Pits
Benches	Bench Height	12m	Risk assessment required for operations under benches >12m high. Forward planning restricts bench height to 12m.
	Batter Angle	70 degrees	Consistent with similar operations. Low geotechnical risk.
Rehabilitation	Batter Angle	1 in 3	Geotechnically stable final landform
	Floor Backfill	RL25	The pit floor is backfilled to RL25 to achieve a free draining final landform
	Floor Slope	2%	The pit floor is backfilled with a gentle slope towards the north of 2% to achieve a free draining final landform

Pit Floor

The pit floor was generated by the floor point of the drillholes provided by the client with minor amendments to BH3 (floor constrained), BH11 (excluded data) and BH15 (lithology assumption). Drillhole data was provided by the client from a drilling campaign in August 2014. In 2017/2018 a Resource Assessment was conducted on the site with a corresponding report titled “*ML50070 Shale Resource Assessment*” prepared for Jackal Renewables Pty Ltd by Ausrocks Pty Ltd in May 2018. This data is shown in **Table 2**.

Table 2 – Drillhole Data

Hole	From	To	Thickness	Rock Type	Comments
BH1	0	1	1	Topsoil	
BH1	1	2	1	Sandstone	
BH1	2	5	3	Shale	
BH1	5	7	2	Clay	
BH1	7	11	4	Mudstone	
BH1	11	12	1	Shale	
BH2	0	1	1	Shale	
BH2	1	4	3	Sandstone	
BH2	4	8	4	Clay	
BH2	8	11	3	Mudstone	
BH2	11	12	1	Shale	
BH3	0	1	1	Topsoil	
BH3	1	4	3	Sandstone	
BH3	4	8	4	Shale	
BH3	8	18	4	Mudstone	The pit floor was constrained to 12m
BH4	0	2	2	Shale	
BH4	2	3	1	Sandstone	
BH4	3	7	4	Shale	
BH4	7	11	4	Mudstone	
BH4	11	12	1	Shale	
BH5	0	1	1	Topsoil	
BH5	1	2	1	Sandstone	
BH5	2	5	3	Clay	
BH5	5	7	2	Sandstone	
BH5	7	10	3	Shale	
BH5	10	12	2	Mudstone	
BH6	0	1	1	Topsoil	
BH6	1	3	2	Gravel	
BH6	3	5	2	Sandstone	
BH6	5	7	2	Shale	
BH6	7	10	3	Mudstone	
BH7	0	1	1	Topsoil	
BH7	1	3	2	Sandstone	
BH7	3	5	2	Clay	
BH7	5	8	3	Shale	
BH7	8	12	4	Mudstone	

BH8	0	1	1	Topsoil	
BH8	1	4	3	Clay	
BH8	4	7	3	Shale	
BH8	7	12	5	Mudstone	
BH9	0	1	1	Sandstone	
BH9	1	2	1	Shale	
BH9	2	4	2	Clay	
BH9	4	5	1	Sandstone	
BH9	5	6	1	Clay	
BH9	6	7	1	Sandstone	
BH9	7	10	3	Shale	
BH9	10	12	2	Mudstone	
BH10	0	1	1	Shale	
BH10	1	6	5	Sandstone	
BH10	6	8	2	Shale	
BH10	8	9	1	Mudstone	
BH10	9	12	3	Shale	
BH11	0	3	3	Sandstone	
BH11	3	5	2	Clay	
BH11	5	6	1	Mudstone	Disregarded from floor grid – assumed DH terminated early
BH12	0	1	1	Sandstone	
BH12	1	3	2	Clay	
BH12	3	4	1	Sandstone	
BH12	4	5	1	Shale	
BH12	5	6	1	Sandstone	
BH12	6	7	1	Shale	
BH12	7	12	5	Mudstone	
BH13	0	2	2	Sandstone	
BH13	2	4	2	Shale	
BH13	4	6	2	Gravel	
BH13	6	12	6	Shale	
BH13	12	13	1	Mudstone	
BH14	0	4	4	Sandstone	
BH14	4	6	2	Clay	
BH14	6	9	3	Shale	
BH14	9	12	3	Mudstone	
BH15	0	1	1	-	No rock type provided - assumed to be topsoil
BH15	1	3	2	Sandstone	
BH15	3	7	4	Clay	
BH15	7	8	1	Shale	
BH15	8	9	1	Sandstone	
BH15	9	12	3	Mudstone	

In-Situ Pit Volume Estimation

The Resource and Waste volumes were determined by calculating the global ratio of Resource (Shale, Clay and 50% Mudstone) against Waste (Topsoil, Sandstone, Gravel and 50% Mudstone) as logged in the provided drillhole data. The ratio of Resource/Waste was 58% / 42%. The ratio of Resource/Waste was assumed consistent in each stage of the pit design (e.g., 58% Resource in Stage 1 with a volume of 215,511.78m³ is 124,573.18m³).

Table 3 – In-situ Volume Estimate

Pit Stages	Pit Surface Area (m ²)	Pit Design Total Volume (m ³)	Resource Volume (m ³)	Waste Volume (m ³)	Topsoil Volume (m ³)
Stage 1	22,619	215,512	124,573	90,939	3,393
Stage 2	21,255	246,560	142,520	104,040	3,188
Stage 3	23,109	274,361	158,590	115,771	3,466
Stage 4	23,399	187,767	108,536	79,231	3,510
Total		924,199	534,218	389,980	13,557

Pit Design and Extraction

A four staged pit design was generated as part of the ML50070 Mine Planning to underpin the PRCP. The pit design continues the sites extracting of the resource in the most economically viable, safe and environmentally sound methodology. Mining operations of the “Eastern Pit” are extracting the resource from the western area progressing towards the east. The Eastern Pit is constrained by a 20m buffer from the Mining Lease Boundary and a 25m buffer from the powerline that runs between the Western and Eastern Pits. The Eastern Pit is accessed via a 10% ramp from the north-western side which is 10m wide.

The upper surface of the assessment is defined by a LiDAR survey dated 2014 downloaded from the Elevation and Depth – Foundation Spatial Data (elevation.fsdf.org.au). The resource is a clay/shale/mudstone deposit and so the design parameters have been set accordingly to allow these materials to be less impactful on the long-term stability of the mine face. Table 4 details the estimated production for the mine and the expected timeframe for each of the Pit stages.

Table 4 – Mine Stage Volume Summary

Stages	Resource (m ³)	Number of Years Operation (yr)	Production Rate (m ³ /yr)	Calendar Year (start)	Calendar Year (finish)
Stage 1	124,573	5.0	25,000	2023	2028.0
Stage 2	142,520	4.1	35,000	2028.0	2032.1
Stage 3	158,590	4.5	35,000	2032.1	2036.6
Stage 4	108,536	3.1	35,000	2036.6	2039.7
Total	534,218	16.7			

Pit Design – Stage 1

Stage 1 of the Pit Design (**Figure 1**) commences immediately outside of the 25m buffer from the powerline. The pit is accessed from a 10% ramp in the northwestern corner which is 10m wide. The pit floor ranges from 17-39mRL with the floor plunging towards the north, following the resource floor. The pit is excavated with a 70° batter which is 12m high. The pit is constrained by a 20m buffer from the Mining Lease Boundary.

Figure 1 – Pit Design – Stage 1



Pit Design – Stage 2

Stage 2 of the Pit Design (**Figure 2**) continues the excavation towards the east. The pit access is expected to change due to progressive rehabilitation as shown in **Figure 13**. The pit floor ranges from 17-36mRL with the floor plunging towards the north, following the resource floor. The pit is excavated with a 70° batter which is 12m high. The pit is constrained by a 20m buffer from the Mining Lease Boundary.

Figure 2 – Pit Design – Stage 2



Pit Design – Stage 3

Stage 3 of the Pit Design (**Figure 3**) continues the excavation towards the east. The pit floor ranges from 17-30mRL with the floor plunging towards the north, following the resource floor. The pit is excavated with a 70° batter which is 12m high. The pit is constrained by a 20m buffer from the Mining Lease Boundary.

Figure 3 – Pit Design – Stage 3



Pit Design – Stage 4

Stage 4 of the Pit Design (**Figure 4**) continues the excavation towards the pit limit. The pit floor ranges from 17-24mRL with the floor plunging towards the north, following the resource floor. The pit is excavated with a 70° batter which is 12m high. The pit is constrained by a 20m buffer from the Mining Lease Boundary.

Figure 4 – Pit Design – Stage 4



Pit Design – Cross Sections

Figures 5-12 detail cross sections plotted roughly East-West and North-South through the pit design. The sections are vertically exaggerated 2x for viewing purposes.

Figure 5 – Pit Design – Stage 1 East-West Cross Section (Looking North)

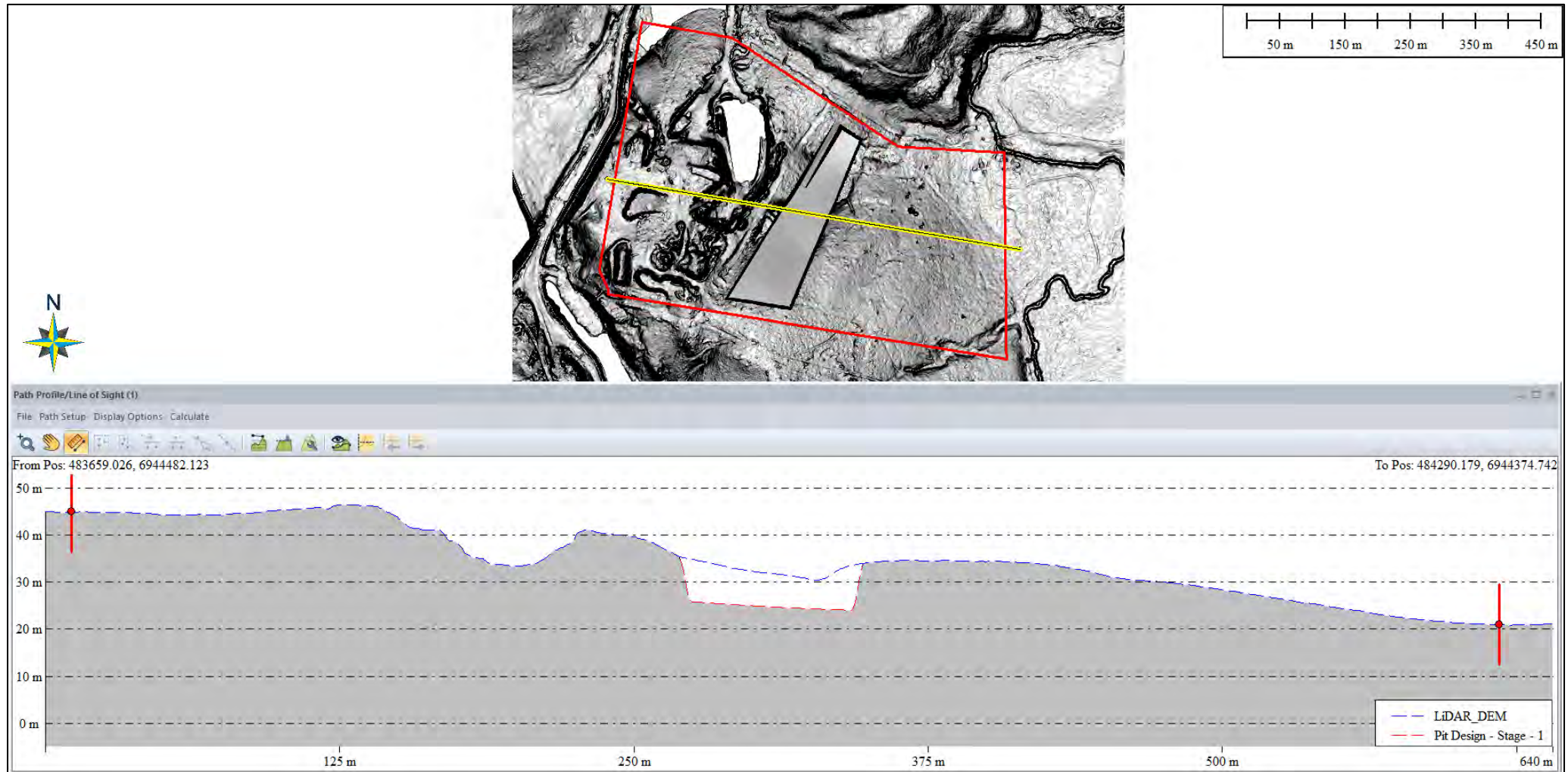


Figure 6 – Pit Design – Stage 1 South-North Cross Section (Looking West)

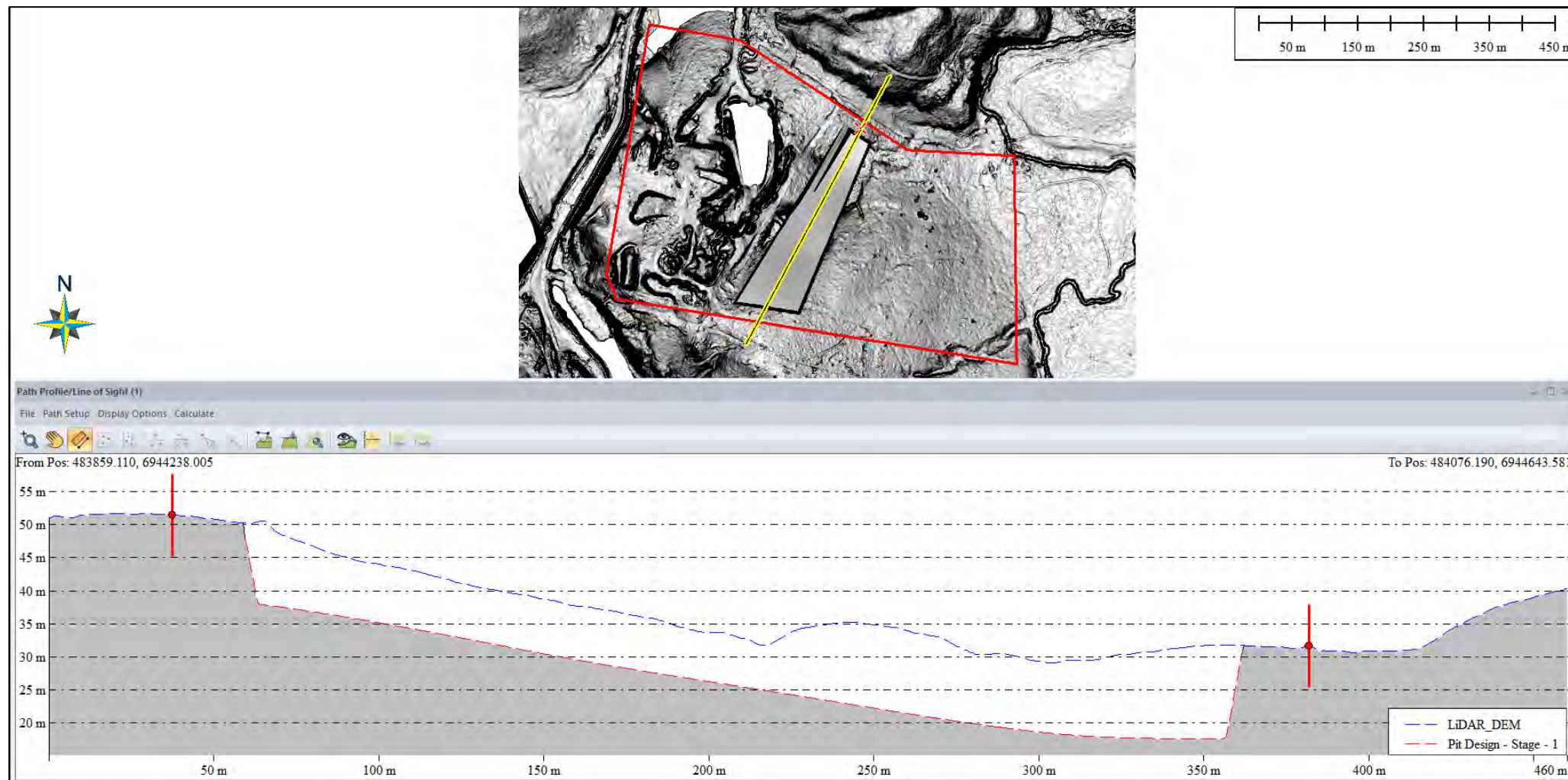


Figure 7 – Pit Design – Stage 2 East-West Cross Section (Looking North)

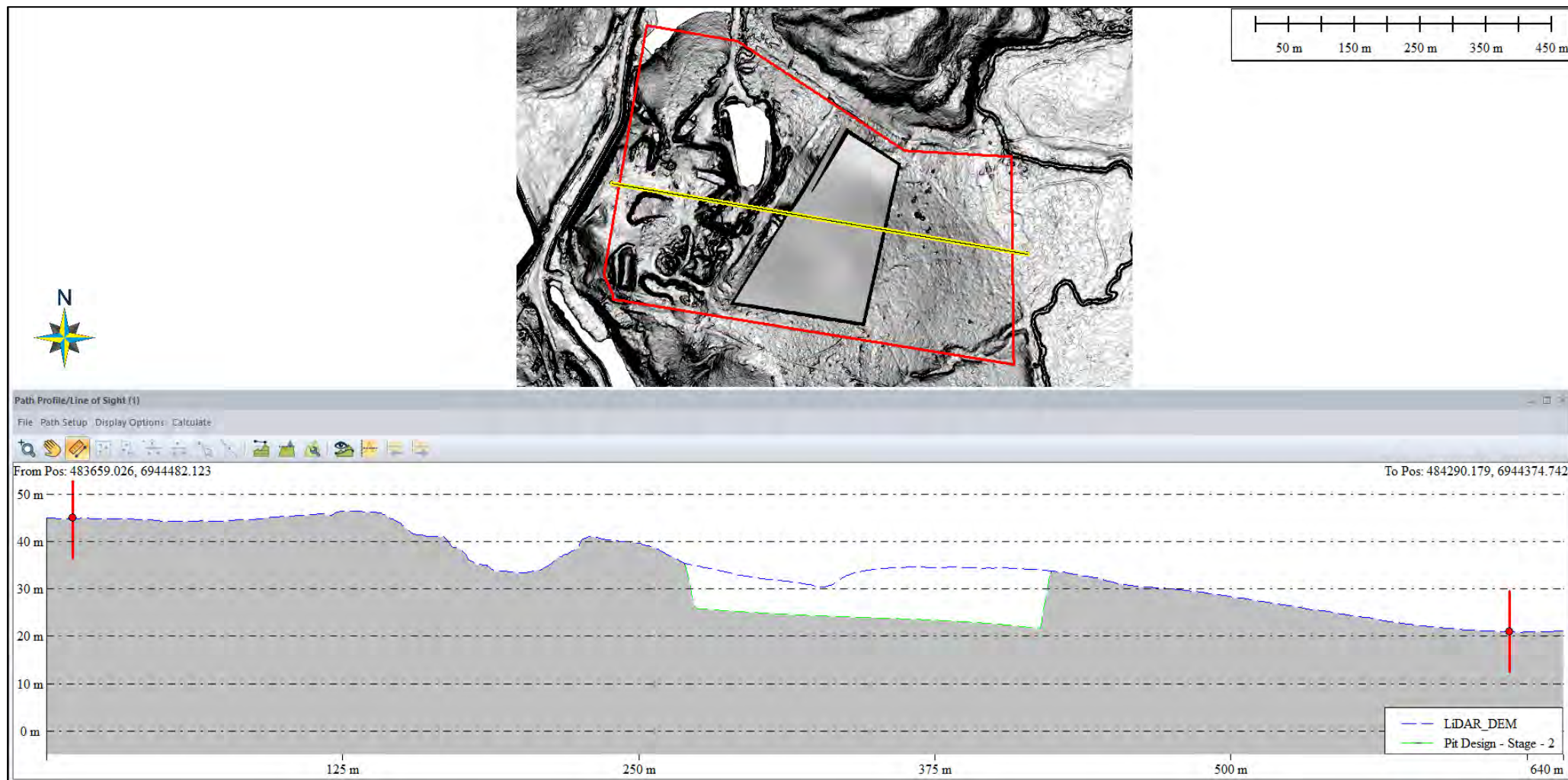


Figure 8 – Pit Design – Stage 2 South-North Cross Section (Looking West)

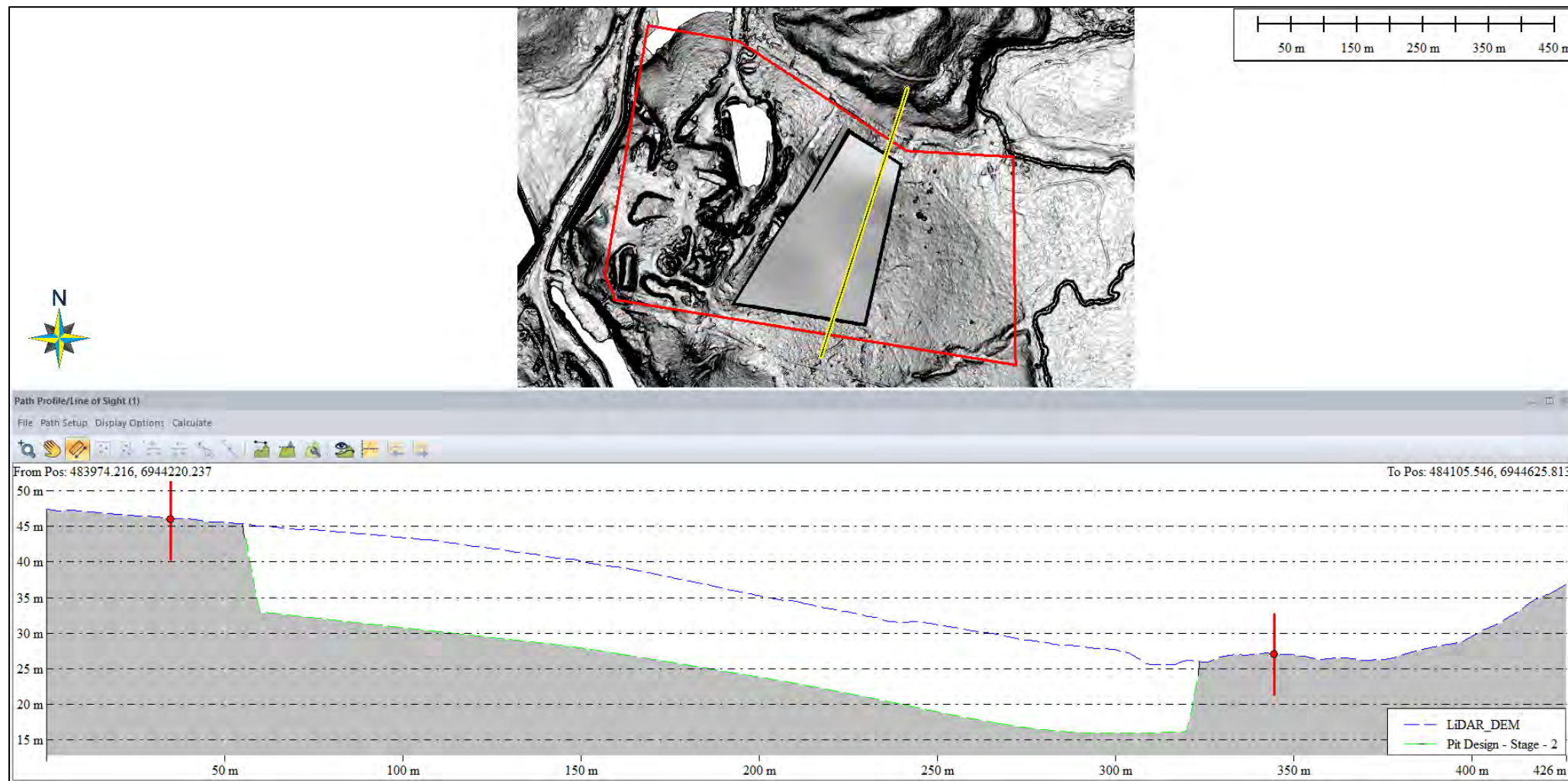


Figure 9 – Pit Design – Stage 3 East-West Cross Section (Looking North)

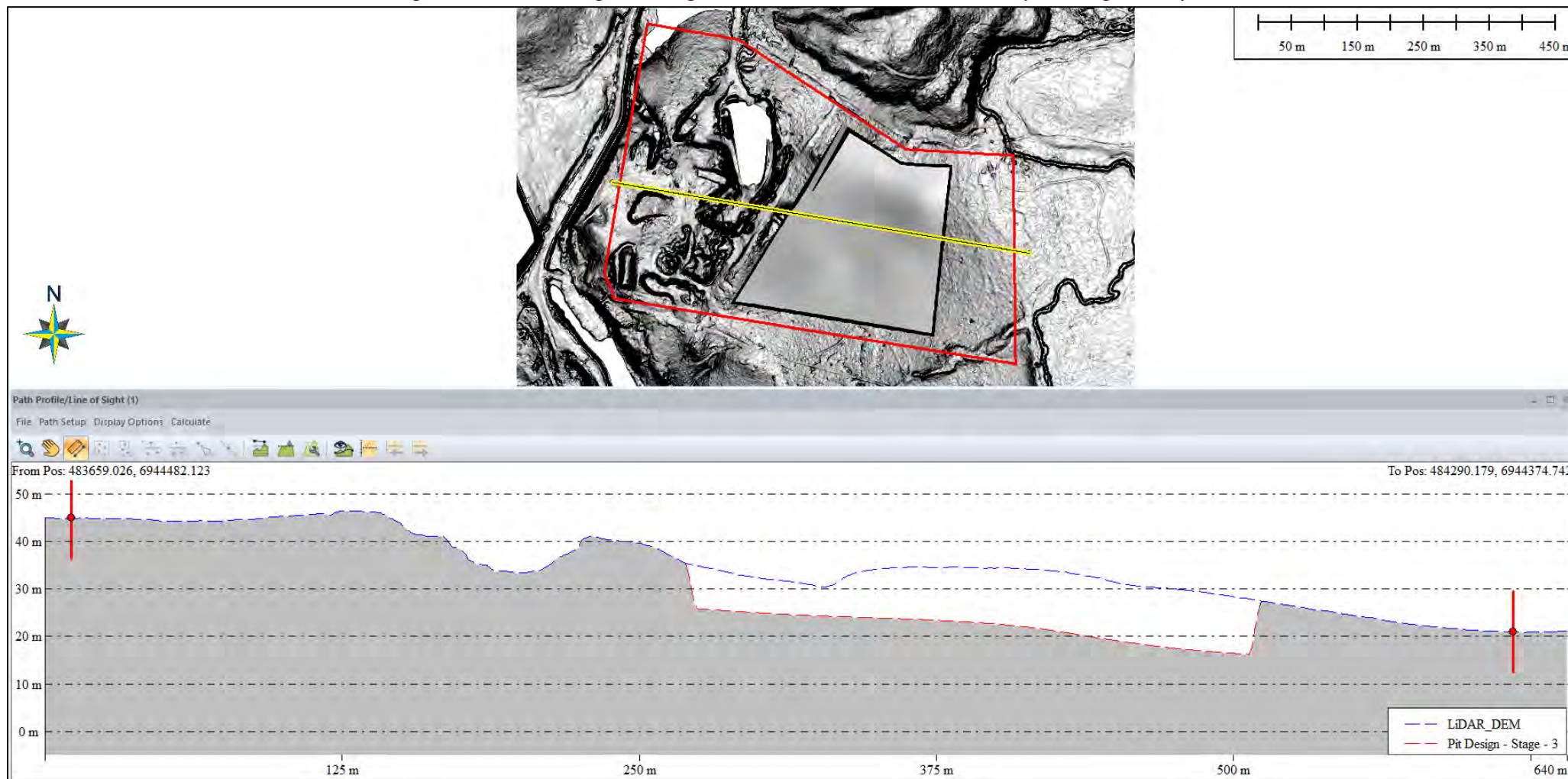


Figure 10 – Pit Design – Stage 3 South-North Cross Section (Looking West)

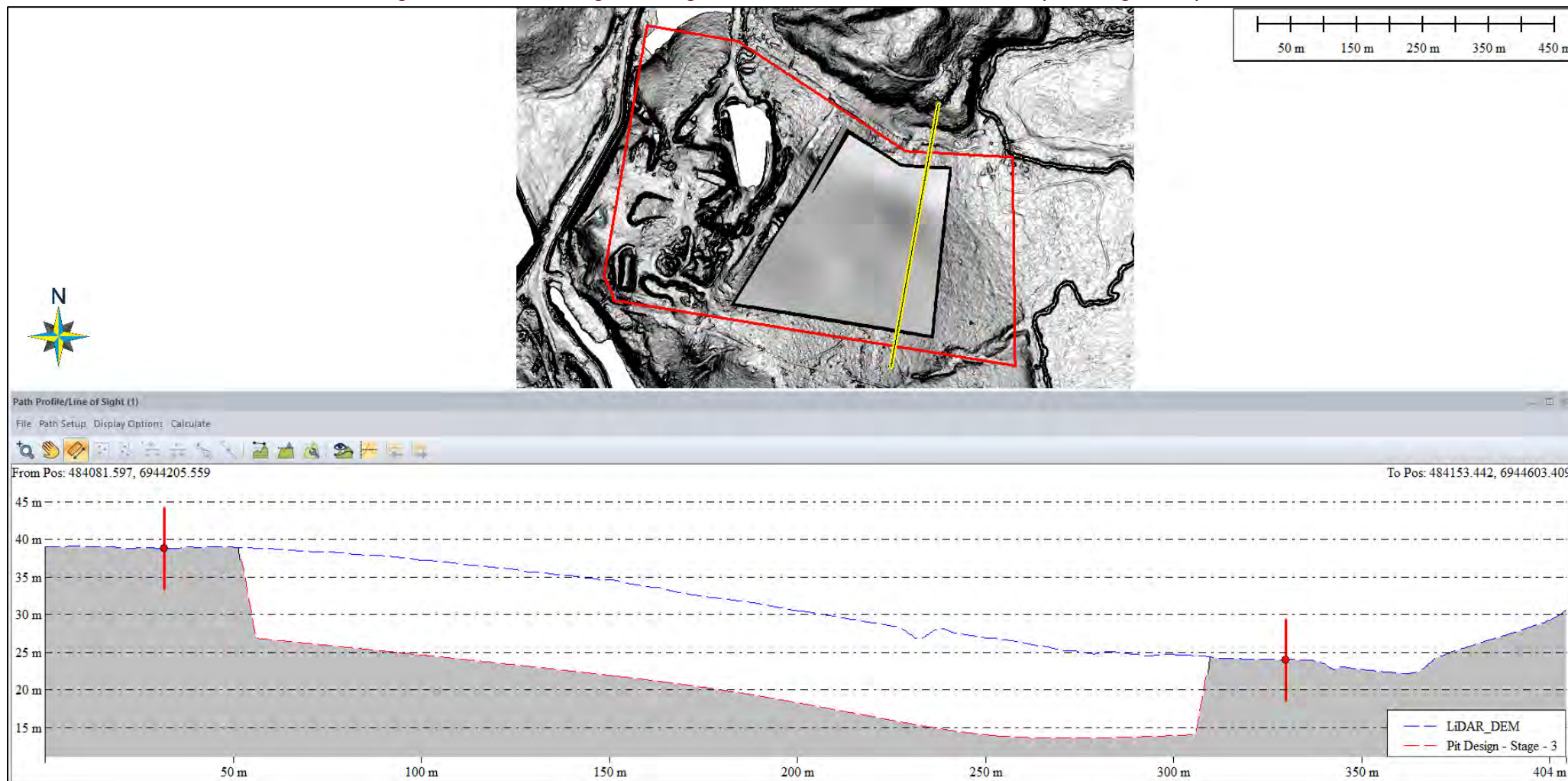


Figure 11 – Pit Design – Stage 4 East-West Cross Section (Looking North)

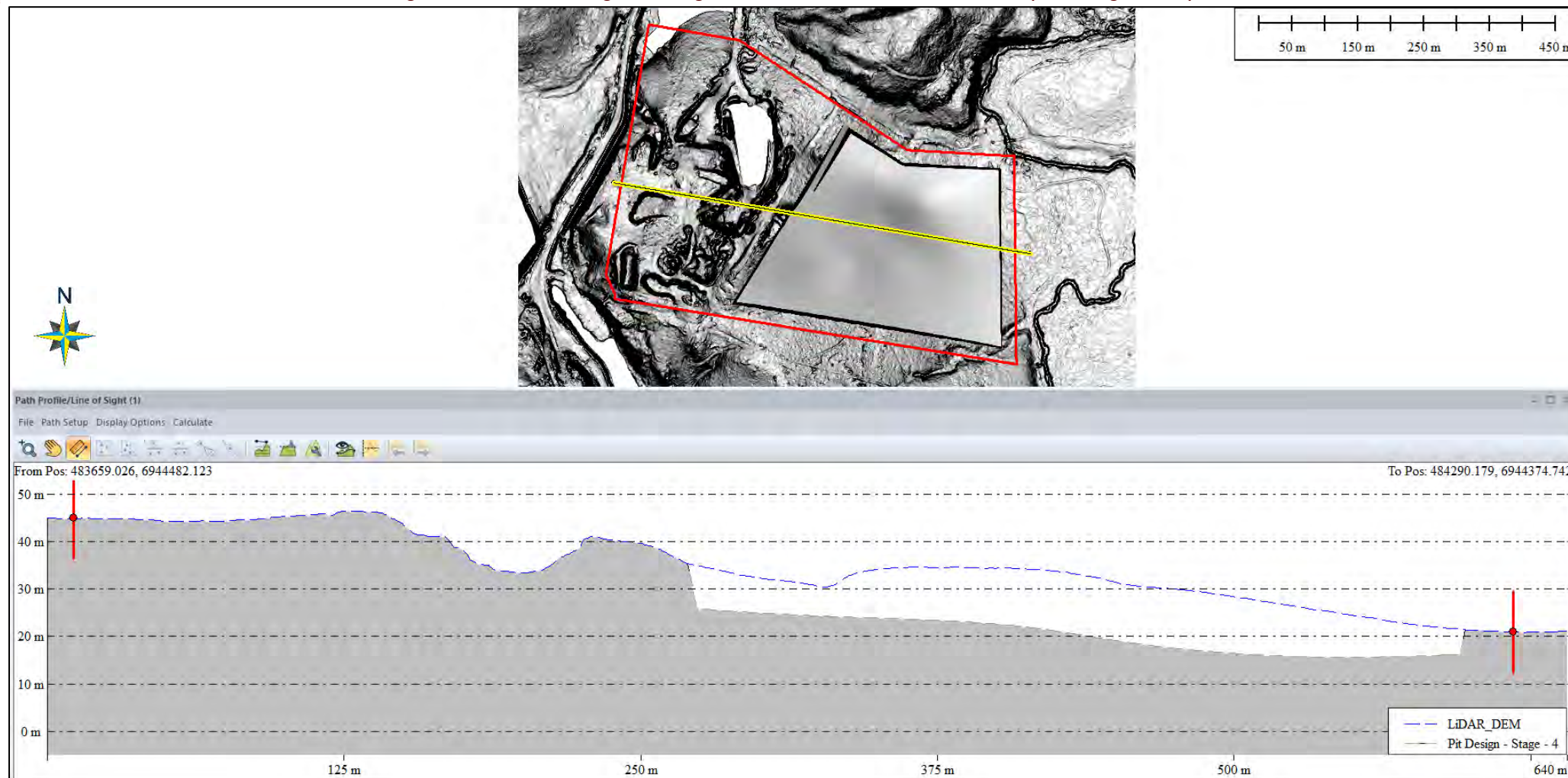
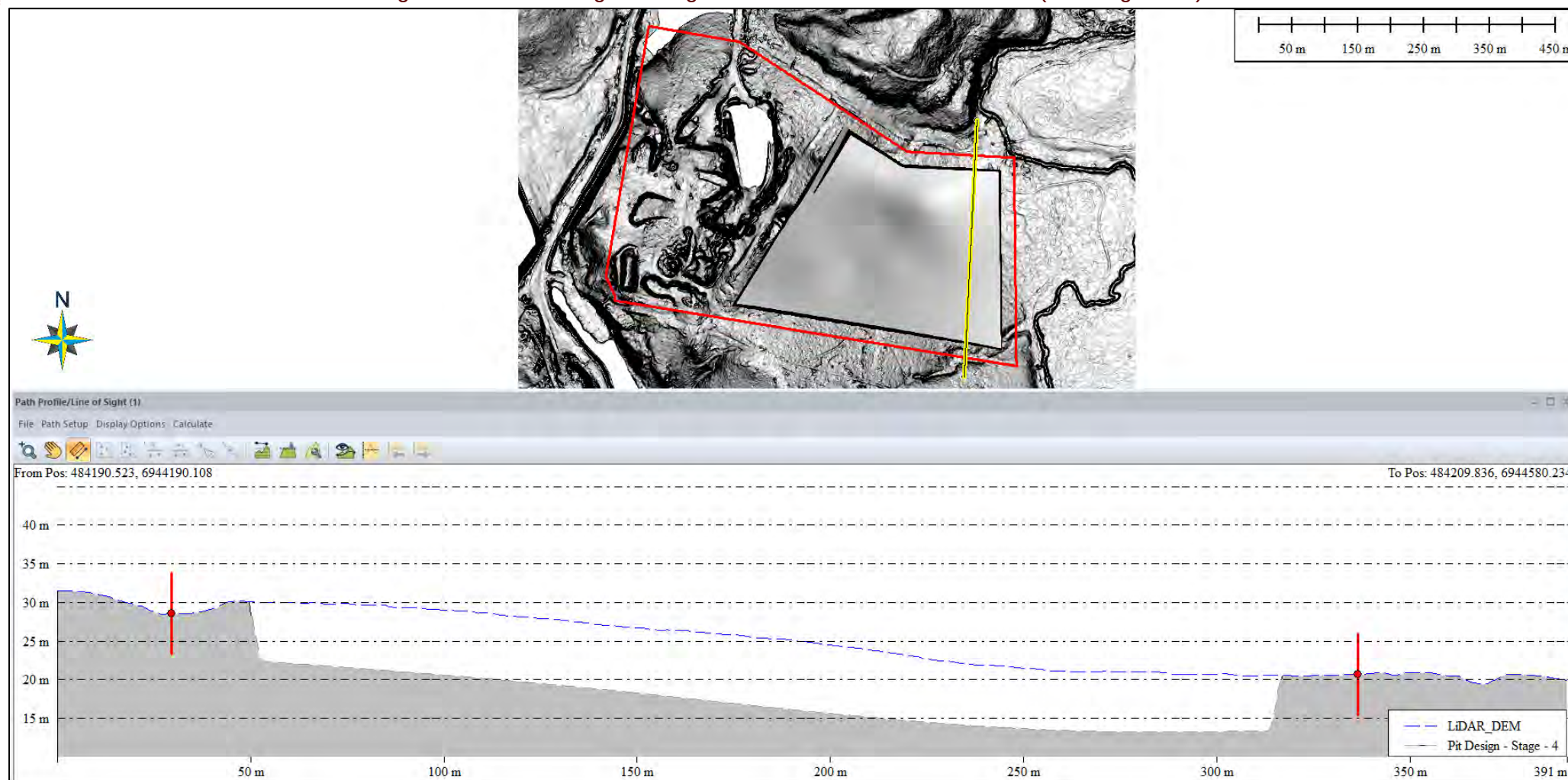


Figure 12 – Pit Design – Stage 4 South-North Cross Section (Looking West)



Progressive Rehabilitation Design

The mine is progressively rehabilitated to minimise environmental impact. The objective of the Final Landform Design is to be geotechnically stable and free draining. As such, the pit batters are reduced to a 1 in 3 slope and the floor is backfilled to RL25 with a gentle slope (2%) towards the north.

Table 5 – Rehabilitation Material Balance

Rehabilitation Stages	Rehabilitation Area((RA)	Surface Area (m ²)	Rehabilitation Cut (m ³)	Rehabilitation Fill (m ³)	Rehabilitation Total (m ³)	Topsoil Volume (m ³)
Stage 1	RA1	16,454	0	79,385	79,385	2,468
Stage 2	RA2	12,619	0	67,177	67,177	1,893
Stage 3	RA3	9,877	0	117,987	117,987	1,482
Stage 4 (Eastern Pit)	RA4	51,435	0	165,414	165,414	7,715
Stage 4 (Laydown/hardstand area, cleared area & access tracks)		80,871	36,070	267,977	231,907	12,131
Powerline	RA5	4,963	-	-	-	-
Total		176,219	36,070	697,940	661,870	25,688

Rehabilitation fill will be sourced from a number of locations, including:

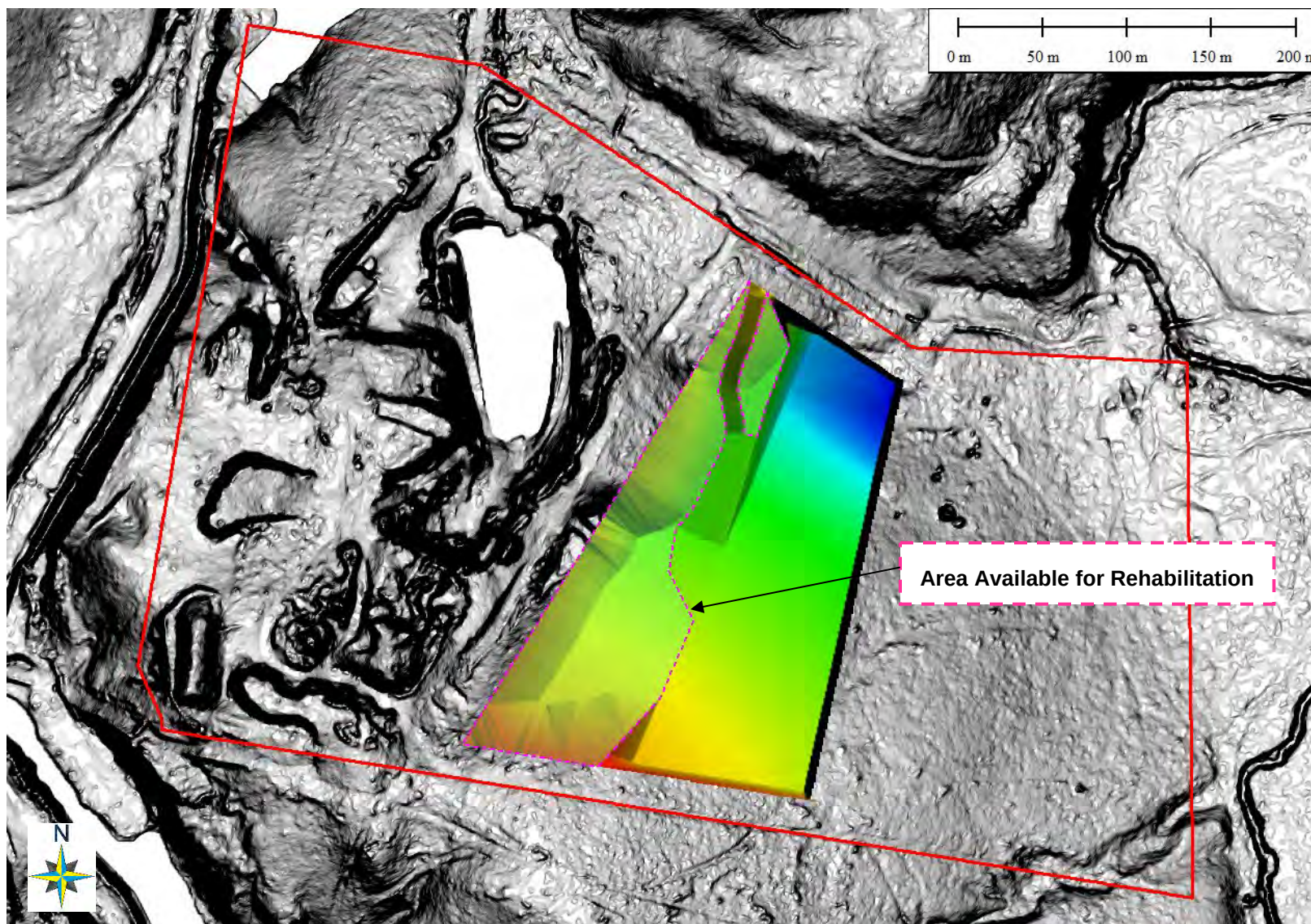
- Overburden/Waste Rock excavated from the Pit,
- Cut from the Western Pad
- Other sources of material as required.

Material excavated from site has been assumed with a swell factor of ~15%, resulting in a shortfall of ~171,913m³

Progressive Rehabilitation Design – Stage 1

Stage 1 of the Progressive Rehabilitation Design is shown in **Figure 13**. The pit access is changed to allow for rehabilitation of the original pit access. The pit batters are reduced to a 1 in 3 slope and the floor is backfilled to RL25 with a gentle slope (2%) towards the north to ensure a geotechnically stable and free draining final landform.

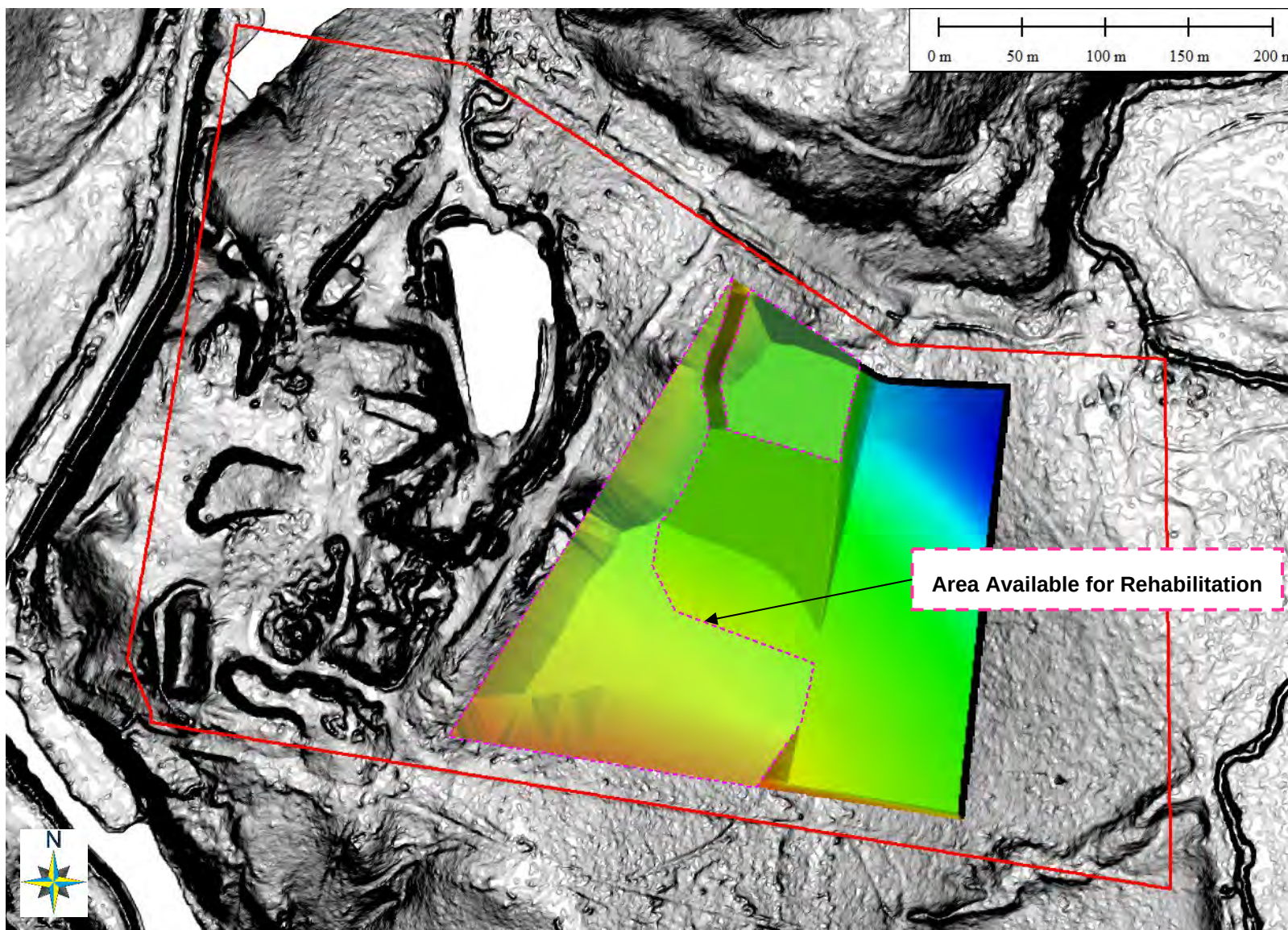
Figure 13 – Progressive Rehabilitation Design – Stage 1



Progressive Rehabilitation Design – Stage 2

Stage 2 of the Progressive Rehabilitation Design is shown in **Figure 14**. The pit batters are reduced to a 1 in 3 slope and the floor is backfilled to RL25 with a gentle slope (2%) towards the north to ensure a geotechnically stable and free draining final landform.

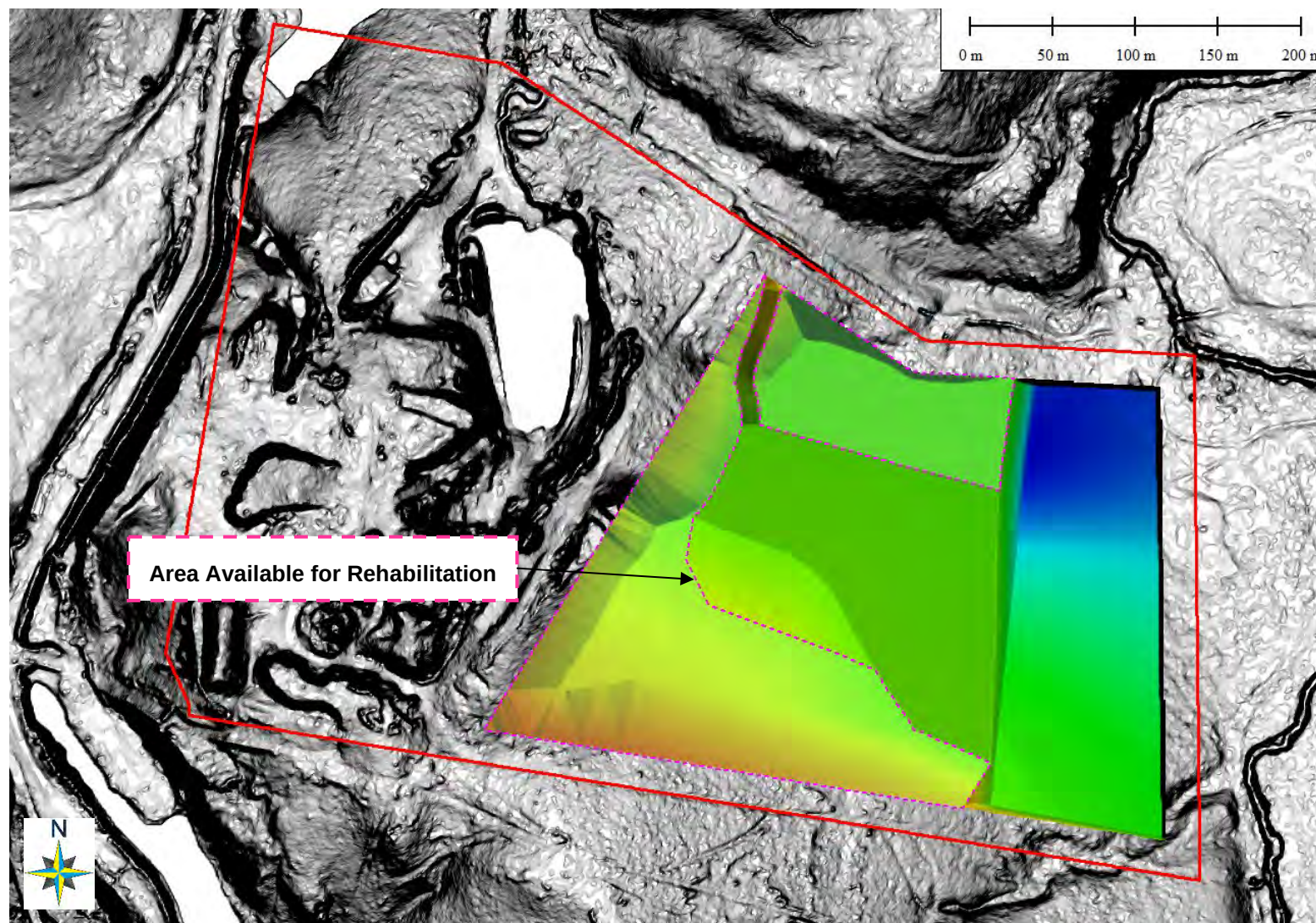
Figure 14 – Progressive Rehabilitation Design – Stage 2



Progressive Rehabilitation Design – Stage 3

Stage 3 of the Progressive Rehabilitation Design is shown in **Figure 15**. The pit batters are reduced to a 1 in 3 slope and the floor is backfilled to RL25 with a gentle slope (2%) towards the north to ensure a geotechnically stable and free draining final landform.

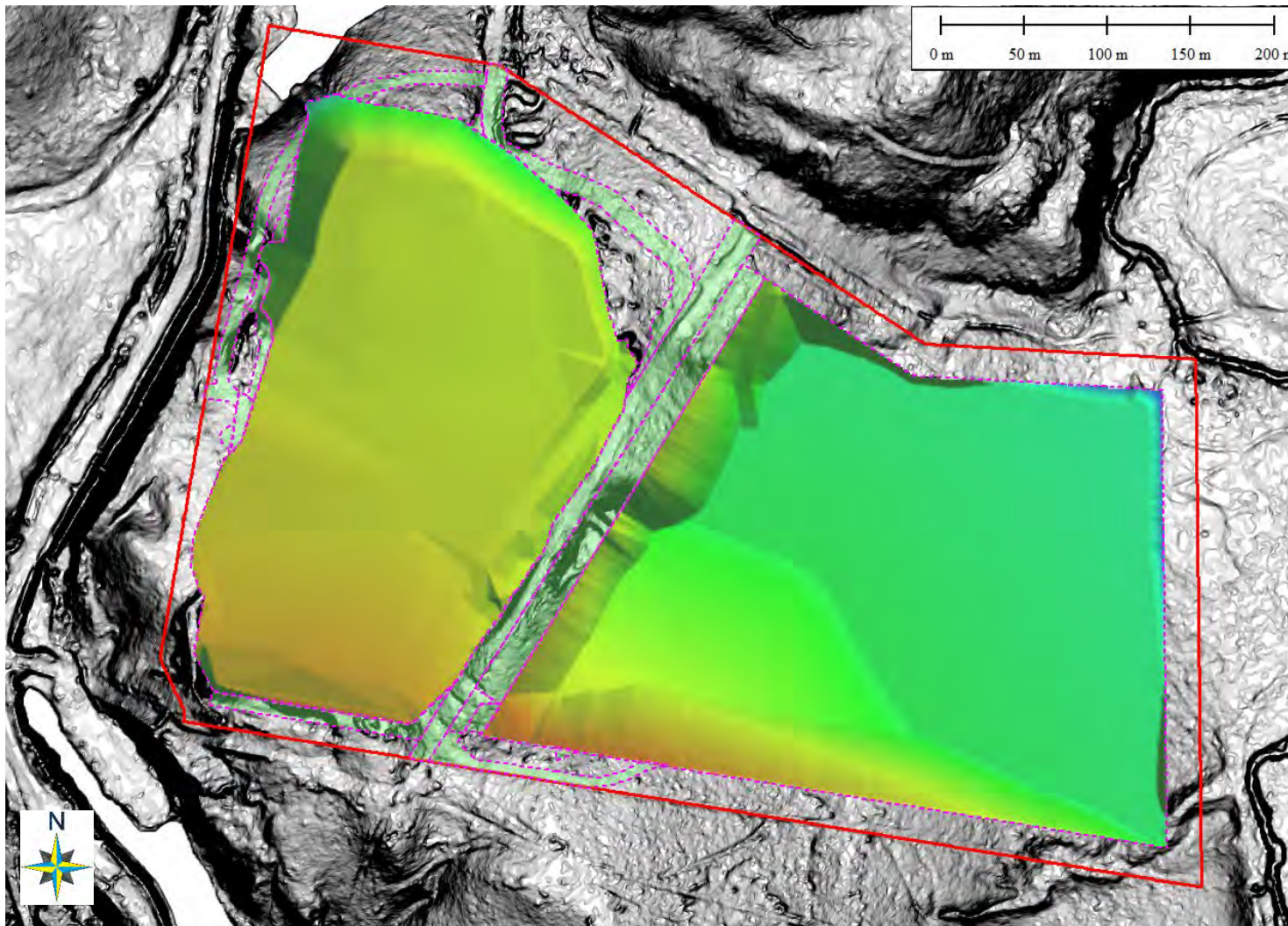
Figure 15 – Progressive Rehabilitation Design – Stage 3



Progressive Rehabilitation Design – Stage 4

The **Final Landform Design** is achieved in Stage 4 of the Progressive Rehabilitation Design (**Figure 16**). All pit batters are reduced to a 1 in 3 slope and the floor is backfilled to RL25 with a gentle slope (2%) towards the north to ensure a geotechnically stable and free draining final landform. This stage also includes the Western Pad reprofiling works. The western pad is designed to be free-draining to the north-east at ~1% grade, with a 1:3 (18.4 degrees) batter slope around the western, northern and eastern sides. It also incorporates a 1:10 gradient ramp on the eastern side to facilitate access to the pad from the northern access. Roads and other areas are also rehabilitated as shown.

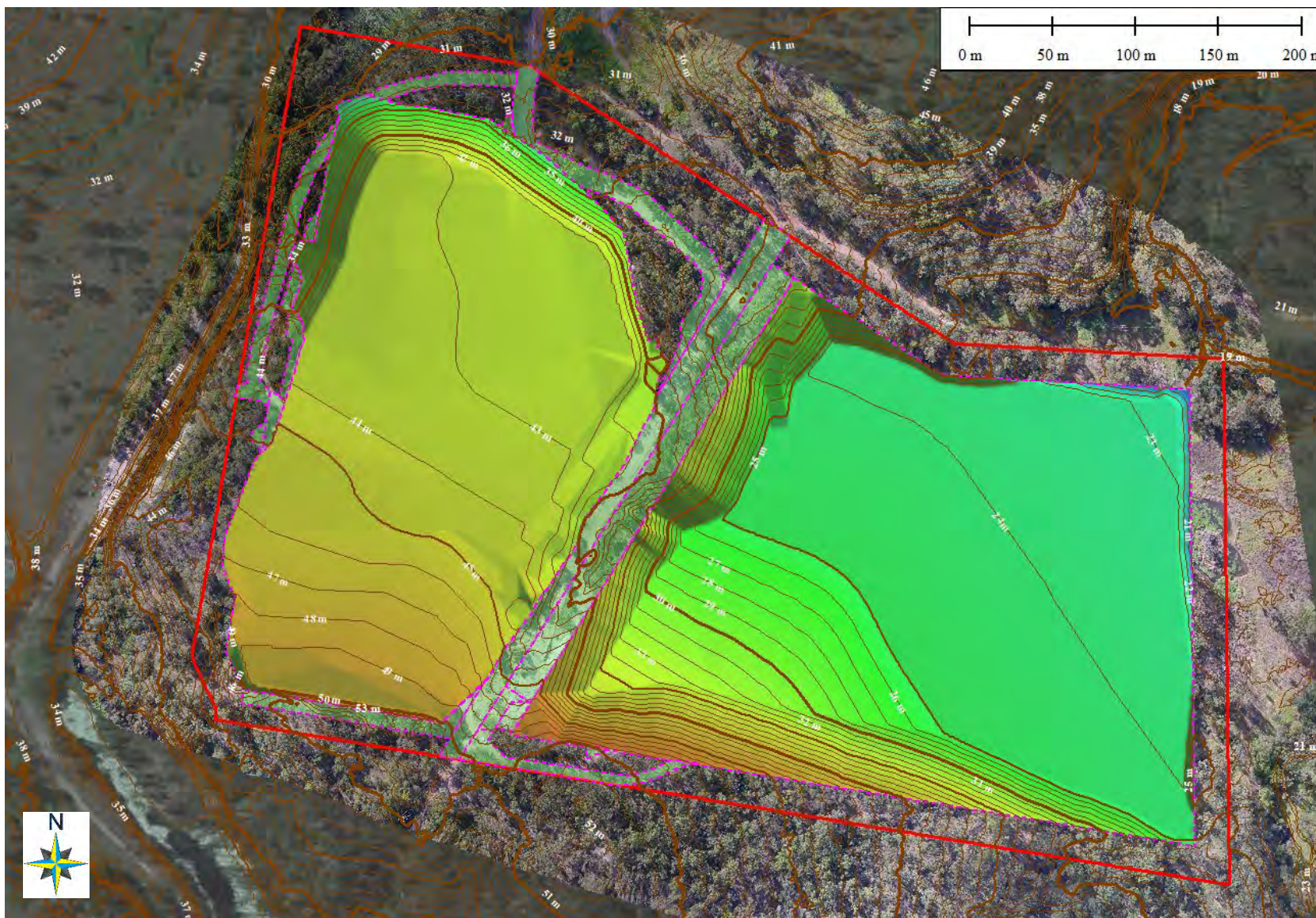
Figure 16 – Progressive Rehabilitation Design – Stage 4



Final Landform Design

The Final Landform Design incorporates the Stage 4 Pit rehabilitation along with the Western Pad reprofiling works. **Figure 17** shows the final landform with 1m contours.

Figure 17 – Final Landform Design – Pit & Western Pad



Figures 18-20 detail a series of cross sections through the final landform design. The pit shell has also been included for reference.

Figure 18 – Final Landform Design East-West Cross Section (Looking North)

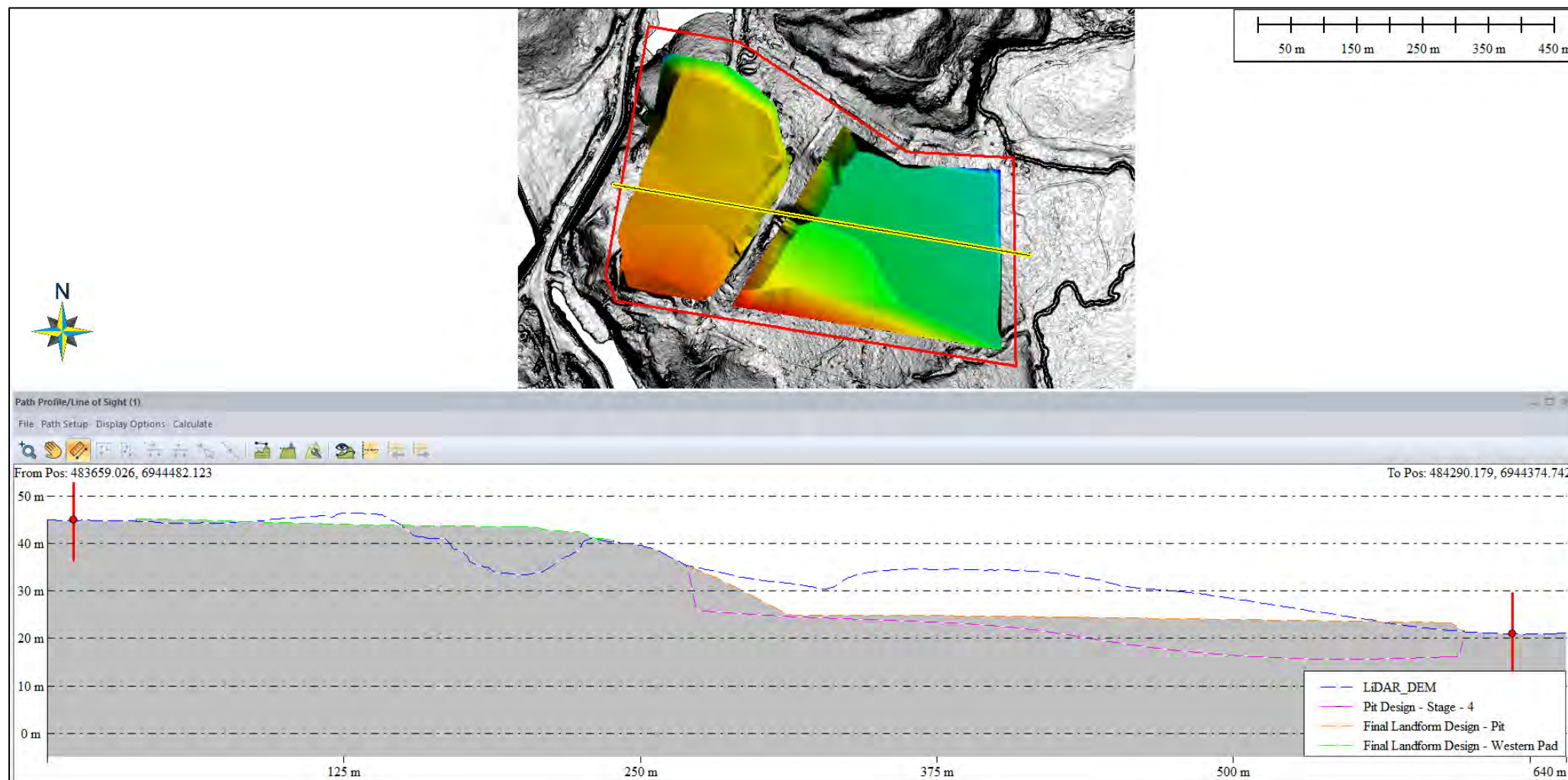


Figure 19 – Final Landform Design South-North Cross Section_Western Pad (Looking West)

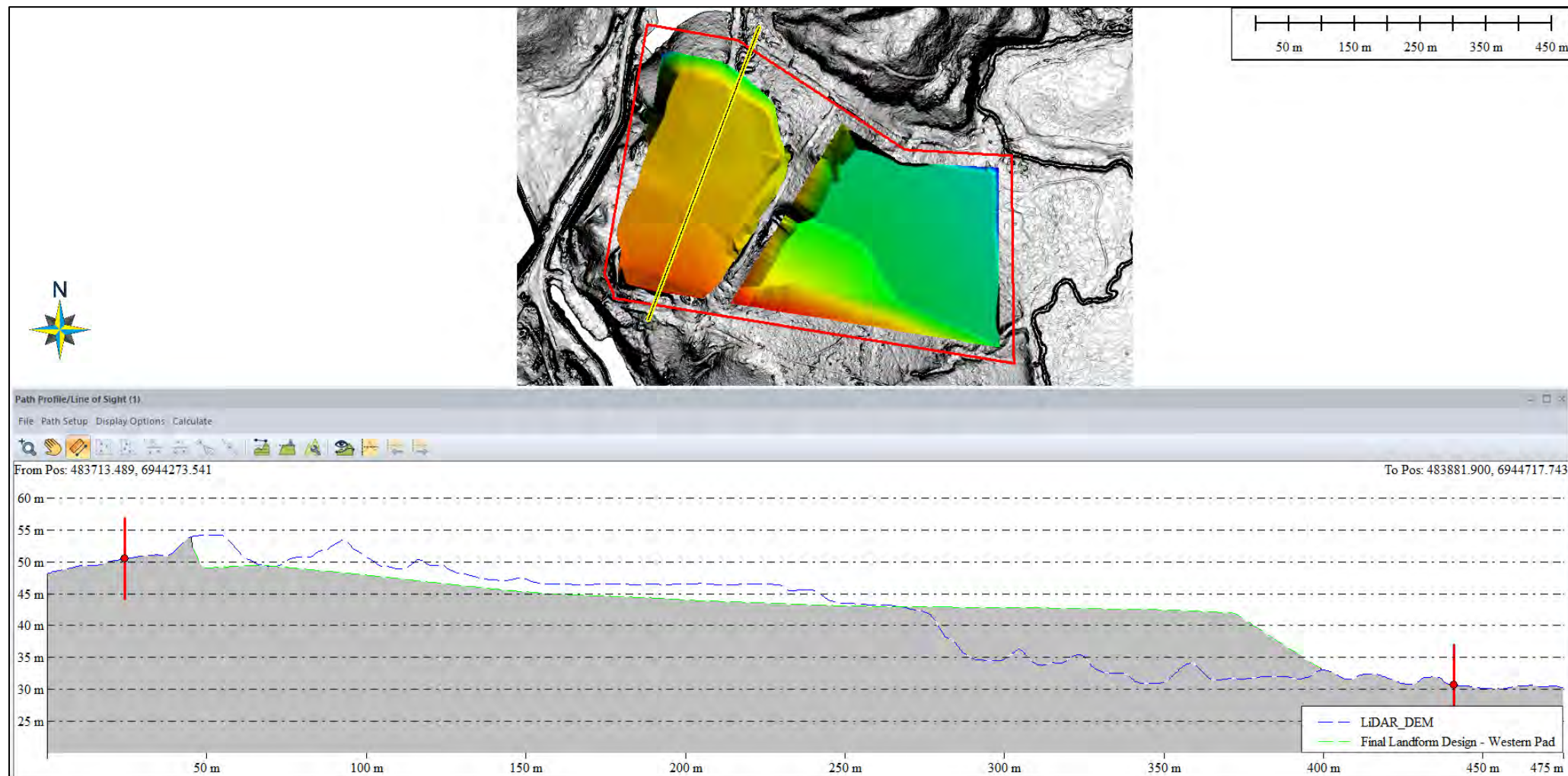
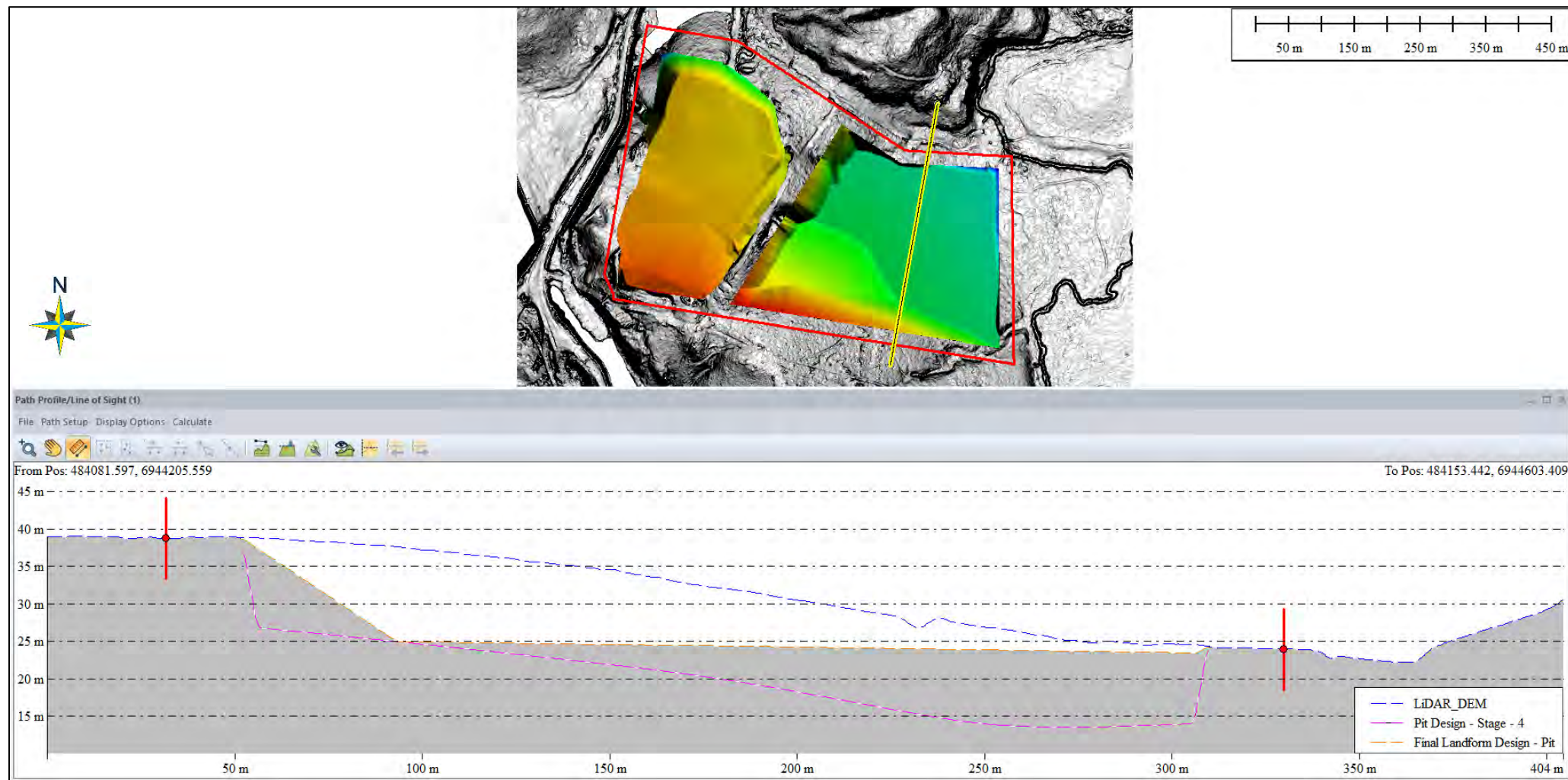


Figure 20 – Final Landform Design South-North Cross Section_Pit Design (Looking West)



Watershed Analyses – Final Landform Design

The **Final Landform Design** is a free draining final landform (**Figure 20**). The floor is backfilled to RL25 with a gentle slope (2%) towards the north to ensure a geotechnically stable and free draining final landform.

Figure 20 – Watershed Analyses – Final Landform Design

