Attachment 6

Ecological Assessment

Proposed Accommodations for Lot 1 on A3024

Ecological Assessment

4 elements

Proposed Accommodations on Lot 1 on A3024
Ecological Assessment

Revision History

Version	Purpose	Issued by	Date	Reviewer	Date
1	Draft Report	Jade Coase	14-04-2025	Ryan Hughes	14-04-2025
2	Alignment Update	Jade Coase	29-05-2025	Tayla Horton	04-06-2025

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Contents

Appendices

1.0 Introduction

1.1 Background

4 Elements Consulting has been commissioned by Gilvear Planning on behalf of Trailfinders Australia to undertake an ecological assessment for Manager and staff accommodations on Land at Dabu Road, Bloomfield QLD 4895, Lot 1 on A3024 (see **Figure 1**). The ecological assessment (EA) focused on ground verification of mapped regional ecosystems (REDD v13.1) identifying flora, fauna and ecological values/ecosystems within the project site. The survey effort for this report focused on identifying potential ecological impacts that may occur as a result of vegetation clearing in these areas and assesses the impact based on the clearance footprint required for works. A protected plant survey was also undertaken during the same field survey (4 Elements 2025) with data collected contributing to this EA.

This report provides a detailed inventory of the flora and fauna species present, and the likelihood of matters of national significance and state species (MNES, MSES) that were recorded during the field assessment and are considered a potential to be present. The likelihood assessment takes into consideration vegetation communities and fauna habitat types present within the proposed project site.

For the purpose of this report:

Lot 1 on A3024 is referred to as the project site (see **Figure 1)**. All land within 10 km of the project site is referred to as the locality. The Wet Tropics Bioregion is referred to as "the region".

1.2 Project Site Description

The location of the project site is on Lot 1 on A3021 directly south of the township of Ayton, located approximately halfway between Cape Tribulation and Cooktown on the Bloomfield river (see **Figure 1**). The elevational range of the project site is approximately ~2m to 12m above sea level (asl). The entire project site clearing footprint occurs on a single landform consisting of quaternary flood-plain alluvium consisting of clay, silt, sand and gravel This geology aligns with land zone 3 under the REDD v 13.1. No watercourses are mapped within the project site though the lots are immediately adjacent to the Bloomfield River and the associated tidal and estuarine environments of this system.

Both remnant (Category B) and non-remnant vegetation (Category X) are present within Lot 1A3024 (see **Figure 2**). As lot 1A3024 is less than 5 ha and the project is conditioned to a development approval, Cook Shire Council will be the assessment manager and therefore vegetation clearing will not be assessed under the Vegetation Management Act 1999. The vegetation communities onsite are generally consistent with the state mapping, with evidence of disturbance due to recent flood events and historical clearing.

1.3 Study Objectives

The objectives of this assessment were to:

- Classify vegetation into regional ecosystems as per REDD v13.1.
- Review and identify species of flora and fauna occurring or considered likely to occur on/or within the project site and project site.
- Assess the likelihood of the proposed project to have a significant impact on any threatened vegetation community, or individual flora and fauna species or populations listed under Queensland's *Nature Conservation Act 1992* (NC Act 1992) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).
- Assess the extent of marine plants present at the site and address State Code 11 if required.
- Undertake a Protected Plant Survey (PPS) to identify presence and/or distribution of threatened plants within the site.
- Assess the proposals impact on the Cook Shire Biodiversity Overlay.
- Provide recommendations to reduce impacts to environmental values, sensitive environments, and populations of threatened flora and fauna within potential vegetation clearing areas; and
- Identify the necessary approvals and any additional works required to meet ecological statutory requirements.

Figure 1 Proposed Development on 1A3024

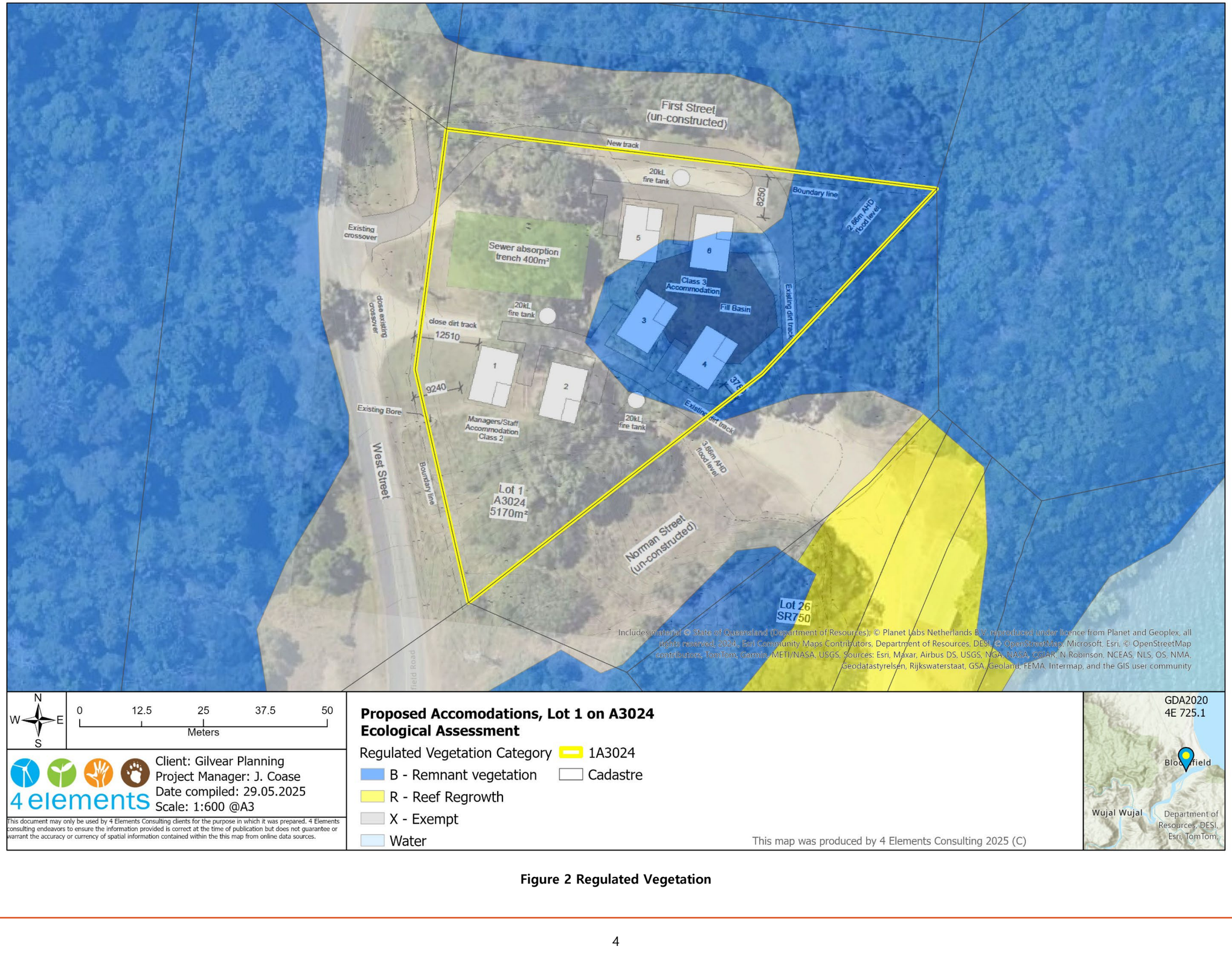


Figure 2 Regulated Vegetation

1.4 Legislative Context

The following legislation, provided in **Table 1**, are relevant to identifying ecological values, providing guidance for the assessment of potential project impacts and identifying environmental constraints to project activities. These legislation and guidance documents have been considered in this report and the appendices provided.

Table 1 Statutory Legislation Applied to the Project Site

Legislative Act	Brief Description
Commonwealth Legislation	
Environment Protection and Biodiversity Conservation Act 1999	The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a mechanism for assessing the environmental impact of activities and development where "Matters of National Environmental Significance" (NES) may be significantly impacted. The Act identifies nine matters of NES, which require consideration and analysis, namely: Ramsar wetland of international importance; World Heritage properties; National Heritage places; Commonwealth Marine areas; Great Barrier Reef Marine Park; Nationally listed threatened species and ecological communities; Nationally listed migratory species; Nuclear actions (including uranium mining); and Water resources in relation to coal seam gas and large coal mining development. Where a project or action is believed to potentially cause a significant impact on a matter of NES, it is to be referred to the Australian Government Department of Climate Change, Energy, Environment and Water (DCCEEW) for assessment as to whether the action is a 'controlled action' requiring Commonwealth approval for the proposed action. The EPBC Act processes also allow voluntary referral of a project to seek confirmation that a Project will not have significant impacts on matters of NES. Where an action requires Commonwealth approval, a formal assessment process is undertaken in accordance with provisions of relevant legislation.
State Legislation	
Vegetation Management Act 1999	The *Vegetation Management Act 1999* (VMA) is the planning initiative underlying regional management of vegetation in Queensland, including clearing of vegetation types, termed Regional Ecosystems (REs). The RE classification is a hierarchical system formed by a three-part code with the primary subdivision being bioregion, followed by land zone, and then vegetation. The biogeographic region or bioregion is the primary level of classification for biodiversity values in Queensland describing where the RE is found on a state-wide basis. Land Zones are geological and geomorphic categories that describe the major geologies and landforms of Queensland.

Legislative Act	Brief Description
	The system is based primarily on geology, with geologic age considered an important determinant. The status of REs is based on their pre-clearing and remnant extent and is gazetted under the act and listed in the RE Description Database (REDD) maintained by the Queensland Department of Environment, Science and Innovation (DES). The VMA aims to conserve remnant endangered and of concern REs, prevent land degradation and further loss of biodiversity, manage the environmental impacts of clearing vegetation and reduce of greenhouse emissions. The VMA status of a RE is described in line with the following: Endangered. A RE that is prescribed under the regulation and has either of the following attributes: ❖ Less than 10% of its pre-clearing extent remaining; or ❖ From 10% to 30% of its pre-clearing extent remaining and the remnant vegetation remaining is less than 10,000 ha. Of concern. A RE that is prescribed under the regulation and has either of the following attributes: ❖ From 10% to 30% of its pre-clearing extent remaining; or ❖ More than 30% of its pre-clearing extent remaining and the remnant vegetation remaining is less than 10,000 ha; or Least concern. A RE that is prescribed under the regulation and has more than 30% of its pre-clearing extent remaining and the remnant vegetation remaining is more than 10,000 ha; or The biodiversity status of a RE is classified by DES based on the condition of remnant vegetation. A RE will have a vegetation management status and/or a biodiversity status of endangered, of concern or least concern; or Essential Habitat. The VMA also has provision for the regulation of essential habitat for species of state significance. Essential habitat (mapped by DESI) is vegetation in which a listed species has been known to occur. Clearing or disturbance to areas of essential habitat will require compensatory habitat measures to be developed. For the project development area, core habitat has been used to describe the combination of critical or essential habitat for both national or state listed significant species.
Planning Act 2016	The Planning Act (2016) (Qld) establishes the framework for Queensland planning system. The purpose of the legislation is to establish an efficient and accountable system of land-use planning and development assessment that will lead to ecological sustainability. The Planning Act defines ecological sustainability as a balance between: The protection of ecological processes and natural systems at local, regional, state and national levels; Economic development; and The cultural, economic, physical and social wellbeing of Queenslanders. The Planning Regulation (2017) and the State Planning Policy (2017) are to guide local and state government in land use planning and development by defining the Queensland Government policies relating to matters of State interest.

Legislative Act	Brief Description
Nature Conservation Act 1999	The ***Nature Conservation Act 1992*** **(NC Act)** aims to conserve nature through strategies such as dedicating and declaring protected areas for those parts of Queensland with outstanding biological diversity, natural features and wilderness values. The NC Act provides for the protection of special least concern, near threatened, vulnerable and endangered animals and plants. **Nature Conservation (Animals) Regulation 2020** has replaced the Nature Conservation Wildlife Regulation (2006) and introduces a new wildlife licensing framework but incorporates and streamlines existing provisions from the regulations that it replaces. In general, an animal authority under the Animals Regulation must not be granted where activities are likely to adversely affect conservation or ecological sustainability of native wildlife. The demerit points system for offences against the Act has been retained. There is now one overarching offence provision for breaching the conditions of an authority, with a higher offence for failure to comply with a record-keeping or return of operations condition. **Nature Conservation (Plants) Regulation 2020** transfers all existing plant provisions into a single stand-alone regulation that were contained in the previous Nature Conservation Wildlife Regulation (2006). The new Plants Regulation retains and streamlines many of the existing provisions in the Administration, Wildlife and Wildlife Management regulations. The allowances for taking protected plants, including under a conservation plan, an authority (such as a clearing permit) or an exemption are retained in the plants regulation and there are no significant amendments to these provisions.
Queensland Fisheries Act 1994	The *Fisheries Act 1994* (Fisheries Act) provides for the use, conservation and enhancement of the community's fisheries resources and fish habitat by providing for, amongst other things, the protection of fish habitats. The *Fisheries Act* has been integrated into the *Planning Act 2016* so that development permits under the Planning Act are required for certain operational works that are assessable development under the Planning Act. Operation works that are assessable development under the Planning Act include waterway barrier works and works in a declared fish habitat.
Biosecurity Act (2014)	The Queensland Government's *Biosecurity Act 2014* is administered by the Department of Agriculture and Fisheries (DAF). The Act provides management measures to protect agricultural and tourism industries and the environment from pests, diseases and contaminants. Under the Act, invasive plants and animals are categorised as either a 'Prohibited Matter' or a 'Restricted Matter' and replace the 'Declared' status under the Land Protection (Pest and Stock Route Management) Act 2002 which has been superseded.

Legislative Act	Brief Description
Environmental Protection Act 1994	The *Environmental Protection Act 1994* (EP Act) provides the key legislative framework for environmental management and protection in Queensland. The EP Act utilises a number of mechanisms to achieve its objectives. Relevant to this project is the requirement for the establishment of a general environmental duty, under Section 319 of the EP Act. Section 319 of the EP Act places a general environmental duty on the proponent to ensure that 'it does not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm'. By undertaking the preparation of this detailed ecological investigation, the proponent demonstrates that it is cognisant of the responsibilities for environmental protection and management in Queensland.
Water Act 2000	The purpose of the *Water Act 2000* is to provide for the sustainable management of water and other resources. Under Section 266 of the *Water Act 2000*, a riverine protection permit is generally required from the DNRW to: Destroy vegetation in a watercourse; Excavate in a watercourse; and Place fill in a watercourse. Additionally, water supply for construction purposes (e.g., access track construction/ compaction, dust suppression etc) may be required. Where this water supply is proposed to be sourced from nearby watercourses, a permit in accordance with Section 237 of the *Water Act 2000* will be required from DNRM prior to any water being extracted from the watercourse.

1.5 Weed Management Legislation

Invasive plant species can interrupt natural landscape function and may lead to significant economic impacts. Weeds are managed by being declared under one or all three relevant legislation and/or local laws outlined below.

1.5.1 Weeds of National Significance

The Australian state and territory governments have compiled a list of invasive plant species based on an assessment process that prioritised these weeds based on their invasiveness, potential for spread and environmental, social and economic impacts. Consideration was also given to their ability to be successfully managed. A list of 20 Weeds of National Significance (WoNS) was endorsed in 1999 and a further 12 were added in 2012.

1.5.2 Biosecurity Act 2014 (Queensland)

1.5.2.1 Prohibited Invasive Plant

Prohibited matter includes a range of invasive plants and invasive animals and other types of pests and diseases listed in the Act. These plants have the potential to have significant impacts and are currently not present or known to be present in Queensland. It is an offence to deal with prohibited matter or fail to report its presence.

1.5.2.2 Restricted Invasive Plants

These species are established in Queensland and seriously threaten Queensland's primary industries, natural environment, livestock, human health and people's livelihoods.

Under the *Biosecurity Act 2014*, there are 7 categories of restricted matter (i.e., restricted matter may include matter such as plants, animal diseases, noxious fish, insects, pest animals and weeds).

Restricted invasive plants may fall into 1, a combination or all of categories 1 to 5 (listed below). Under each category the restricted invasive plant has listed restrictions. The specific restriction requirements also apply to a person when dealing with restricted invasive plants unless they have a restricted matter permit.

Restricted invasive plant categories and restrictions:

Category 1: not relevant as it does **NOT** relate to plant materials.
Category 2: the invasive plant must be reported within 24 hours Biosecurity Queensland on 13 25 23.
Category 3: the invasive plant must not be distributed either by sale or gift or released into the environment.
Category 4: the invasive plant must not be moved.
Category 5: the invasive plant must not be kept.

All landowners have a general biosecurity obligation (GBO) under the *Biosecurity Act 2014 to* take reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control *regardless of its category status.* Weeds that are not listed under the *Biosecurity Act 2014* may still be declared at the local government level.

1.5.3 Cook Shire Council Biosecurity Plan 2022-26

The Cook Shire Council Biosecurity Plan has been developed to provide a framework for management of declared and non-declared pest plants and animals in the local government area.

The plan also outlines areas of responsibilities for individuals, agencies and organisations involved in pest and weed management. It provides landholders with strategic direction and some simple tools to enable them to set priorities for pest management on their own property.

Under the plan, weed species are allocated a category ranking based on a hierarchal approach to effective management. This score is based on the listing under national and state legislation, the current distributional

extent and potential economic, social and environmental impacts as well as the likelihood of a beneficial control outcome. The category rankings are listed below:

Prevention Zone: An invasive species is known to be present in an adjoining catchment or area and measures are available to minimise the potential for the species to translocate

Eradication Zone: An invasive species is present in an area that is both well-defined and limited and is potentially eradicable with existing resources.

Containment Zone: The distribution of an invasive species is beyond eradication however is well-defined and the pathways of spread can be readily managed to prevent the species moving beyond its existing range.

Natural Asset Protection: The distribution of an invasive species is widespread to the extent that containment is not possible with the feasible option to identify assets and implement control methods to protect them.

2.0 Methodology

2.1 Desktop Review

4 Elements Consulting completed a review of relevant mapping, databases, legislation and associated plans and policies to identify potential matters of ecological significance, including species and communities, and other ecological features, that may occur on or within proximity planned expansion areas. This review included an assessment of the following:

- Protected Matters database of MNES (**Appendix B**). This database applies a range of bio-models to predict the presence of species of flora and fauna and other MNES within a given radius of the site (a search parameter was prescribed limiting the search area to a 10 km radius) as cited under the Commonwealth's EPBC Act.
- Wildlife Online database of flora and fauna (**Appendix C**). This database holds records of plants and animals that have either been sighted or collected within a given radius of the site (a search parameter was prescribed limiting the search area to a 10 km radius around the project site). The records held in this database are maintained by Department of Environment, Science and Innovation.
- Australian Virtual Herbarium (for voucher notes and other details in relation to flora collections).
- Review of relevant legislation and associated plans and policies, including but not limited to the QLD NC Act, VM Act, EPBC Act, and the Water Act.
- Cook Shire Council Biodiversity Overlay Code to identify and protect matters of environmental significance, which include Matters of State Environmental Significance (MSES) as defined under the State Planning Policy 2017 (SPP).
- Aerial Photograph Interpretation (API) to determine the broad categorisation of vegetation within and surrounding the site and to review the extent of historical clearing and land use, and any other significant environmental features such as watercourses and wetlands.
- Literature review. A range of scientific papers, recovery and conservation plans, and other literature were reviewed for a number of related matters (such as targeted threatened species).
- Digital geological mapping on GeoResGlobe which details surface geology; and
- Australian Virtual Herbarium (for voucher notes and distribution and habitat records of threatened flora species).

2.2 Field Survey Methodology

2.2.1 Flora

Field surveys were undertaken by Senior Ecologist Jade Coase on the 3rd and 4th of March 2025. This survey aimed at recording the ecological character of the project site, and to search for conservation significant species of flora. This included the following objectives:

- Establishing the accuracy of the regional ecosystem (RE) mapping of 'remnant' vegetation communities, the associated description of these communities, and their landscape context, particularly in relation to the proposed alignment of the project site (expansion areas).
- The identification of novel and important vegetation communities that could have the potential to be important wildlife refuges such as fire-proof niches, wetlands, and unique vegetation types.
- The compilation of a floristic checklist of vascular plants found within the project area, with specific emphasis placed on the floristic composition of representative vegetation communities affected by the predicted disturbance area.
- The ground-truthing of vegetation patterns depicted on aerial imagery, to inform the compilation of site-scale vegetation mapping.
- Record opportunistic observations of weeds while traversing the project site, targeting priority listed weeds under relevant legislation.
- Prepare vouchered flora specimens for any endangered, vulnerable, or near-threatened species for submission to the Queensland Herbarium.

2.2.1.1 Regional Ecosystem Verification

Delineation of regional ecosystem distributions across the project site was achieved using quaternary level assessments, or rapid plots, as per the QBEIS methodology v7.0 (Neldner et al. 2023). These assessments are designed to capture vegetation community information quickly by targeting soils, landforms and key species within each vegetation structural layer. This information is generally sufficient to determine the identity of a regional ecosystem. This then allows the confirmation or alteration of regional ecosystem polygon boundaries when mapping vegetation communities across the project site. A quaternary level assessment was undertaken within the project site (**Figure 3**).

2.2.2 Protected Plant Surveys

Desktop analysis determined the potential occurrences of threatened flora, listed under the Federal *Environmental Protection and Biodiversity Conservation Act 1999* and the Qld *Nature Conservation Act 1992*, within the project site. A Timed meander search as per the Flora Survey Guidelines – Protected Plants (DES 2020) was undertaken. This methodology states requires that during timed meanders, the time is recorded approximately every 5 minutes while conducting a search for threatened or near threatened plants. If no threatened or near threatened species are recorded the search continues for 30 min or when the entire area is

surveyed, whichever happens sooner. If threatened or near threatened species are recorded the search continues for at least 30 min after the last plants is recorded or when the entire area is surveyed, whichever happens sooner (**Figure 3**). Permission to access adjacent private land was not granted and therefore freehold land within the 100 m buffer was not assessed. The swamp/mangrove areas that can be tidally inundated to the north and east of the site were not traversed due to safety concerns related to known resident Estuarine Crocodiles being present.

2.2.3 Weed Assessment

Weeds were identified during the field survey. All records were GPS located and notes on infestation size and ecological impacts noted. The purpose of detail weed incursion is to describe the ecological condition of the project site which assists in determining the potential occurrence of additional threatened flora species recorded in the project site locality

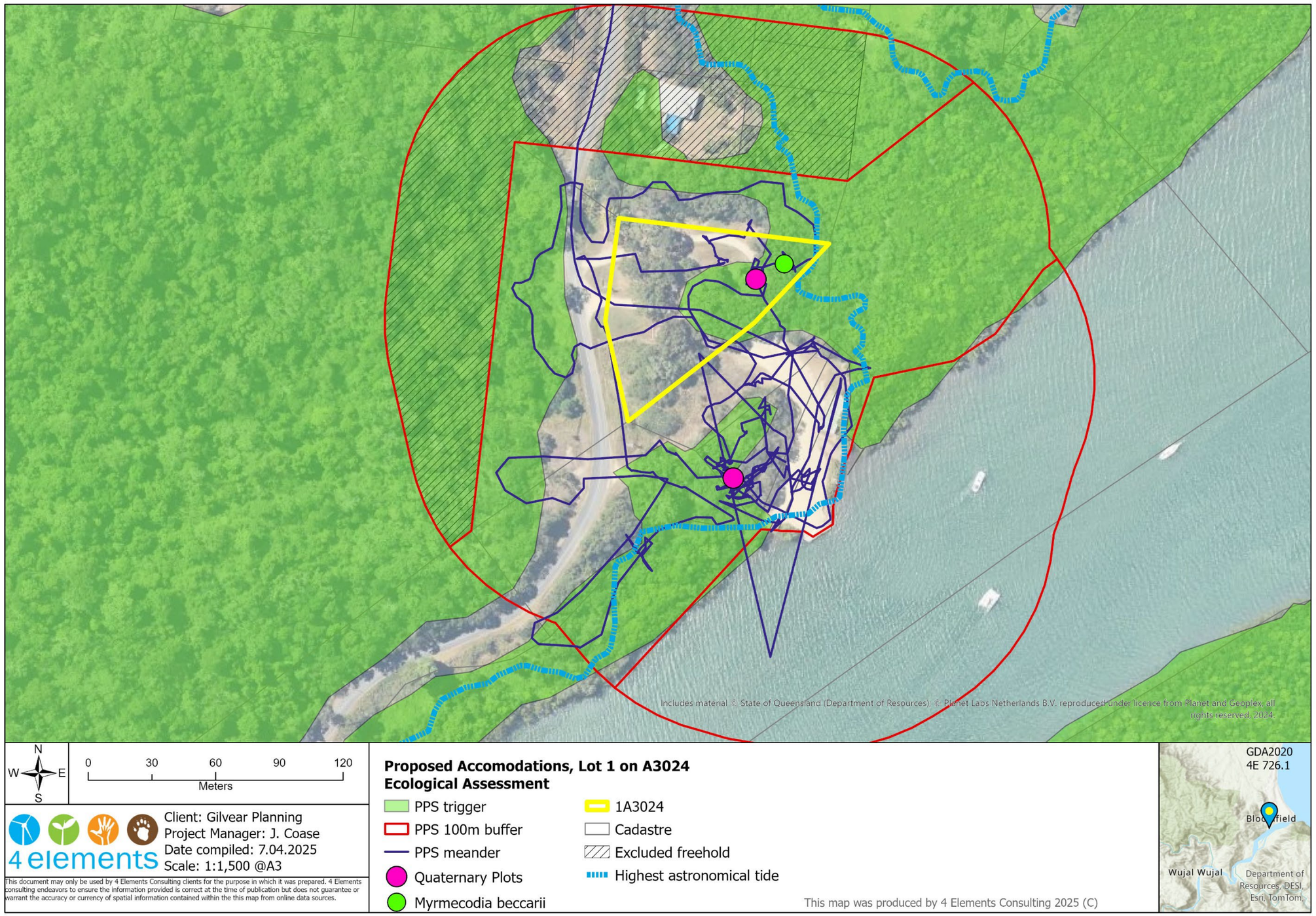


Figure 3 Quaternary Surveys and Protected Plant Survey Meander Within the Project Site

2.3 General Fauna Habitat Searches

Throughout the entire project site notes on general fauna habitat condition were recorded as below:

- Presence/absence of suitable habitat for EVNT species.
- Condition and disturbance history of habitat.
- Location of site within known distribution of the species.
- Connectivity with habitat where species is known to occur.
- Structural and floristic characteristics of the vegetation.
- Soil type and structure (visual only).
- Presence of water in any form e.g., rivers, dams, creeks, drainage lines, soaks.
- Size and abundance of hollows and coarse woody debris (CWD).
- Presence of sandbanks, shallow wading areas, rock walls, saltmarsh, roost areas, etc.
- Presence of mistletoe, nectar, gum, seed, sap sources, browse trees.

Results of the field survey are provided in **Section 5.0** for fauna.

3.0 Desktop Analysis Results

3.1 Matters of National and State Environmental Significance

Desktop searches for potentially occurring threatened species and habitats were conducted under both the *Environment Protection and Biodiversity Act 1999* (EPBC Act) and the *Nature Conservation Act 1992* (NC Act). Results from both databases (Protected Matters Search Tool and Wildlife Online Database) are detailed in **Appendix A**.

3.2 NC Act Wildlife Online

The Wildlife Online database search returned 19 NCA listed species. All marine turtles, cetaceans, shark species and pelagic sea birds were discounted due to a distinct lack of suitable habitat within the terrestrial environment of the project site. This refined list comprised a single amphibian, six (6) bird species, one (1) mammal, one (1) reptile and 10 land plants. See **Appendix C** for the complete search results of conservation significant species.

3.3 EPBC Act Protected Matters Search Tool (Species)

Database searches under the Protected Matters Search Tool (PMST) returned a result of 72 listed threatened species. A comprehensive fauna survey was not completed during the field survey, rather an assessment of habitat suitability for threatened fauna was conducted and any opportunistic sightings recorded. No EPBC-listed fauna species were observed during the survey. All marine turtles, cetaceans, shark species and pelagic sea birds were discounted due to a distinct lack of suitable habitat within the terrestrial environment of the project site. The refined list for the potential occurrence assessment included a total of 72 species. This included 32 flora species, 20 birds and 12 mammals. **Appendix B** provides the complete search results for the PMST search tool.

An assessment for the potential occurrence of these species on the project site, for both the EPBC and NC threatened species, is provided in **Appendix A**. **Table 2** below provides a summary list for these species and their relevant state and federal legislative listing.

Table 2 List of Potentially Occurring Threatened Species

Common Name	Scientific Name	Status EPBC Act	Status NC Act
Birds			
Asian dowitcher	*Limnodromus semipalmatus*	V	V
Australian painted snipe	*Rostratula australis*	E	E
Beach stone-curlew	*Esacus magnirostris*	-	V
Blue-faced parrot-finch	*Erythrura trichroa*	-	NT
Common greenshank	*Tringa nebularia*	E	E

Common Name	Scientific Name	Status EPBC Act	Status NC Act
Curlew sandpiper	*Calidris ferruginea*	CE	CE
Eastern curlew	*Numenius madagascariensis*	CE	CE
Greater sand plover	*Charadrius leschenaultii*	V	V
Grey falcon	*Falco hypoleucos*	V	V
Latham's snipe	*Gallinago hardwickii*	V	V
Little tern	*Stemula albifrons*	V	SL
Macleay's fig-parrot	*Cyclopsitta diophthalma macleayana*	-	V
Masked owl (northern)	*Tyto novaehollandiae kimberli*	V	V
Nunivak bar-tailed godwit	*Limosa lapponica baueri*	E	E
Red goshawk	*Erythrotriorchis radiatus*	E	E
Red knot	*Calidris canutus*	V	V
Sharp-tailed sandpiper	*Calidris acuminata*	V	V
Southern Cassowary	*Casuarius casuarius*	E	E
White-bellied Storm-Petrel	*Fregetta grallaria grallaria*	V	LC
White-throated needletail	*Hirundapus caudacutus*	V	V
Mammals			
Bare-rumped sheath-tailed bat	*Saccolaimus saccolaimus nudicluniatus*	V	E
Bennett's tree-kangaroo	*Dendrolagus bennettianus*		NT
Black-footed tree-rat (north Qld)	*Mesembriomys gouldii rattoides*	V	V
Ghost bat	*Macroderma gigas*	V	E
Greater Glider (northern), Greater Glider (north-eastern Queensland)	*Petauroides minor*	V	V
Koala	*Phascolarctos cinereus*	E	E
Large-eared Horseshoe Bat	*Rhinolophus robertsi*	V	E
Northern quoll	*Dasyurus hallucatus*	E	LC
Semon's Leaf-nosed Bat	*Hipposideros semoni*	V	E
Spectacled Flying-fox	*Pteropus conspicillatus*	E	E
Spotted-tailed Quoll	*Dasyurus maculatus gracilis*	E	LC
Water mouse	*Xeromys myoides*	V	V
Reptiles			
White headed snapping turtle	*Elseya irwini*	V	LC
Mertens' Water Monitor	*Varanus mertensi*	E	E
Yakka skink	*Egernia rugosa*	V	V
Amphibians			
Australian Lace-lid	*Litoria dayi*	V	V
Mountain mist frog	*Litoria nyakalensis*	CE	CE
Tapping green eyed tree frog	*Litoria serrata*	-	V
Aquatic Freshwater species			
Opal Cling Goby	*Stiphodon semoni*	CE	CE
Robert's Spiny Crayfish	*Euastacus robertsi*	E	E

Common Name	Scientific Name	Status EPBC Act	Status NC Act
Threatened Flora			
-	*Aphyllorchis anomala*	-	NT
-	*Backhousia hughesii*	-	CR
-	*Buckinghamia ferruginiflora*	-	V
-	*Chingia australis*	E	E
-	*Cyclophyllum costatum*	V	V
-	*Dendrobium carronii (Cepobaculum carronii)*	V	V
-	*Dendrobium nindii*	E	E
-	*Dissiliaria tuckeri*	-	E
-	*Drosera prolifera*	V	V
-	*Heliodendron xanthoxylon*	-	NT
-	*Leichhardtia araujacea synonymous with Marsdenia araujacea*	CE	CE
-	*Meiogyne hirsuta*	-	NT
-	*Oreogrammitis reinwardtii (Grammitis reinwardtii)*	V	V
-	*Phaius pictus*	V	V
-	*Polyscias bellendenkerensis*	V	V
-	*Rhodamnia sessiliflora*	-	E
-	*Rhodamnia spongiosa*	-	CR
-	*Rhodomyrtus effusa*	-	E
-	*Xanthostemon verticillatus*	-	V
Ant Plant	*Myrmecodia beccarii*	V	V
Blue Tassel-fern	*Phlegmariurus dalhousieanus*	E	CE
Chocolate Tea Tree Orchid	*Dendrobium johannis*	V	V
Cooktown Orchid	*Vappodes phalaenopsis*	V	-
Dark-stemmed Antler Orchid	*Dendrobium mirbelianum*	E	E
Haines's Orange Mangrove	*Bruguiera x hainesii*	CE	CE
Hairy-joint Grass	*Arthraxon hispidus*	V	V
Lesser Swamp-orchid	*Phaius australis*	E	E
Middle Filmy Fern	*Polyphlebium endlicherianum*	E	V
Pale Chandelier Orchid	*Acriopsis emarginata syn. Acriopsis javanica*	V	V
Rock Tassel-fern	*Phlegmariurus squarrosus*	CE	CE
Square tassel fern	*Phlegmariurus tetrastichoides*	V	V
Thin Feather Orchid	*Dendrobium callitrophilum*	V	V
Key: Ex: Extinct, CE/CR: Critically Endangered; E: Endangered; V: Vulnerable; NT: Near Threatened			

3.4 EPBC Act and MNES Search Tool (Places of Environmental Significance)

Matters of National Environmental Significance (MNES) are matters pursuant to the *EPBC Act 1999*. The results of the MNES search, which provides details on environmentally significant areas and habitat types, is provided in **Table 3** below. To conduct this search tool, a 10-kilometre radius buffer was added around a central point in the project site. This provides results for all possible MNES matters that may occur on the property.

Table 3 PMST results (Significant Places)

Category	Result
Matters of National Environmental Significance	
World Heritage Properties	2
National Heritage Places	3
Wetlands of International Importance	None
Great Barrier Reef Marine Park	5
Commonwealth Marine Area	1
Listed Threatened Ecological Communities	3
Listed Threatened Species	72
Listed Migratory Species	45
Other Matters Protected by the EPBC Act	
Commonwealth Land	None
Commonwealth Heritage Places	None
Listed Marine Species	99
Whales and other cetaceans	12
Critical Habitats (Marine Turtles)	None
Commonwealth Reserves Terrestrial	None
Commonwealth Reserves Marine	None
Nationally Important Wetlands	1

3.5 Migratory and Marine Species

A total of 23 migratory and/or marine species (adjusted for the exclusion of species solely dependent on aquatic marine habitats) listed under the *EPBC Act 1999* were identified in the Protected Matters Search Tool (PMST) search report. A summarised list of these species is provided in **Table 4** below. **Appendix B** provides the potential occurrence assessment results for each species listed under the PMST search tool.

Table 4. Migratory Species

Common name	Scientific name	EPBC Act Status
Asian Dowitcher	*Limnodromus semipalmatus*	V, Mi, Ma
Barn Swallow	*Hirundo rustica*	Mi, Ma
Bar-tailed Godwit	*Limosa lapponica*	Mi, Ma
Common Greenshank, Greenshank	*Tringa nebularia*	E, Mi, Ma
Common Noddy	*Anous stolidus*	Mi, Ma
Common Sandpiper	*Actitis hypoleucos*	Mi, Ma
Curlew Sandpiper	*Calidris ferruginea*	CE, Mi, Ma
Eastern Curlew, Far Eastern Curlew	*Numenius madagascariensis*	CE, Mi, Ma
Fork-tailed Swift	*Apus pacificus*	Mi, Ma
Great Frigatebird, Greater Frigatebird	*Fregata minor*	Mi, Ma
Greater Sand Plover, Large Sand Plover	*Charadrius leschenaultii*	V, Mi, Ma
Latham's Snipe, Japanese Snipe	*Gallinago hardwickii*	V, Mi, Ma
Lesser Frigatebird, Least Frigatebird	*Fregata ariel*	Mi, Ma
Little Tern	*Sternula albifrons*	V, Mi, Ma
Oriental Cuckoo, Horsfield's Cuckoo	*Cuculus optatus*	Mi, Ma
Osprey	*Pandion haliaetus*	Mi, Ma
Pectoral Sandpiper	*Calidris melanotos*	Mi, Ma
Red Knot, Knot	*Calidris canutus*	V, Mi, Ma
Red-rumped Swallow	*Cecropis daurica*	Mi, Ma
Sharp-tailed Sandpiper	*Calidris acuminata*	V, Mi, Ma
White-tailed Tropicbird	*Phaethon lepturus*	Mi, Ma
White-throated Needletail	*Hirundapus caudacutus*	V, Mi, Ma
Salt-water Crocodile, Estuarine Crocodile	*Crocodylus porosus*	Mi, Ma

3.6 Essential Habitat

Regulated vegetation (essential habitat) is mapped within the remnant vegetation of the project site (**Figure 4**). This essential habitat polygon is mapped for the Estuarine Crocodile (*Crocodylus porosus*) which is based on a record from the estuarine community RE 7.1.1 present adjacent and to the east of the site but not within 1A3024. The record has created a 1km buffer around this record within remnant vegetation. The remaining vegetation present on the project site mapped as RE 7.3.40 (REDD v13.1) is Melaleuca Open Forest and is not reasonably considered suitable habitat. The remnant 7.1.1 that is known to be suitable habitat for the Estuarine Crocodile is not found within the lot boundary.

Although essential habitat is mapped within the project site, there is no reasonable likelihood that the Estuarine Crocodile would utilise the mapped 7.3.40 remnant vegetation to be disturbed on the project site for breeding or foraging.

For the essential habitat mapping output see **Appendix D**.

3.7 Wildlife Habitat

As per Essential Habitat (see **Section 3.6**).

3.8 Protected Plant Trigger Area

Remnant vegetation within the project site is mapped within a high risk protected plant trigger area. A protected plant survey as per the Flora Survey Guidelines - Protected Plants has been undertaken for the site (**Figure 3**).

For the Protected Plant Trigger mapping output see **Appendix D**.

3.9 Ground Water Dependent Ecosystems

Riverine groundwater dependent ecosystems are riverine wetlands which require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements to maintain their communities of plants and animals, ecological processes and ecosystem services.

No groundwater dependent ecosystems, streams or springs are mapped within the project site.

4.0 Field Survey Results

4.1 Regional Ecosystems

The vegetation assessments focused on ground truthing RE mapping within the project site and correcting mapping where necessary from REDD version 13.1 (see **Table 5** & **Figure 4** below). The purpose of ground truthing the vegetation communities within the project site is not to override the regulated vegetation mapping. Ground truthing will however identify potential threatened species habitat listed under the EPBC act 1999 or the NC act 1992 critical to assessing the impact assessment section of the proposal (see **Section 6.0**).

Lot 1A3024 is <5 ha and hence clearing under a development approval for a material change of use is exempt clearing works under the Vegetation Management Framework with the Cook Shire Council being the assessor.

The project site was mapped as containing a single discrete vegetation community (REDD v 13.1) mapped as Endangered RE 7.3.40. Field verification determined that vegetation mapped as 7.3.40 was more consistent with RE 7.3.25b (**Table 6**). Approximately 0.11 ha of REDD v 13.1 mapped RE 7.3.40 is proposed to be impacted as a result of the proposal as mapped.

A Property Map of Assessable Vegetation (PMAV) is not advised for this project to formally correct the ground verified mapping as the remnant category B vegetation that is present is exempt from under the vegetation management due to the lot size being less than 5 ha and the ground truthed regional ecosystem present is mapped as of concern.

No regional ecosystem mapping changes were required in this assessment.

Table 5 Project Impact Site Ground Verification of Remnant Regional Ecosystems

	Biodiversity Status			Vegetation Management Status			Total No. RE Units
	Endangered	**Of Concern**	**No Concern at Present**	**Endangered**	**Of Concern**	**Least Concern**	**All Categories**
Regulated Vegetation Mapping	0.11 ha	0.00 ha	0.00 ha	0.11 ha	0 ha	0.00 ha	1 Regional Ecosystem
REDD v 13.1 State Mapping	0.11 ha	0.00 ha	0.00 ha	0.11 ha	0 ha	0.00 ha	1 Regional Ecosystem (7.3.40)
Ground Verified 4 Elements Consulting	0.00 ha	0.11 ha	0.00 ha	0.00ha	0. ha	0.00 ha	1 Regional Ecosystem (7.3.25)

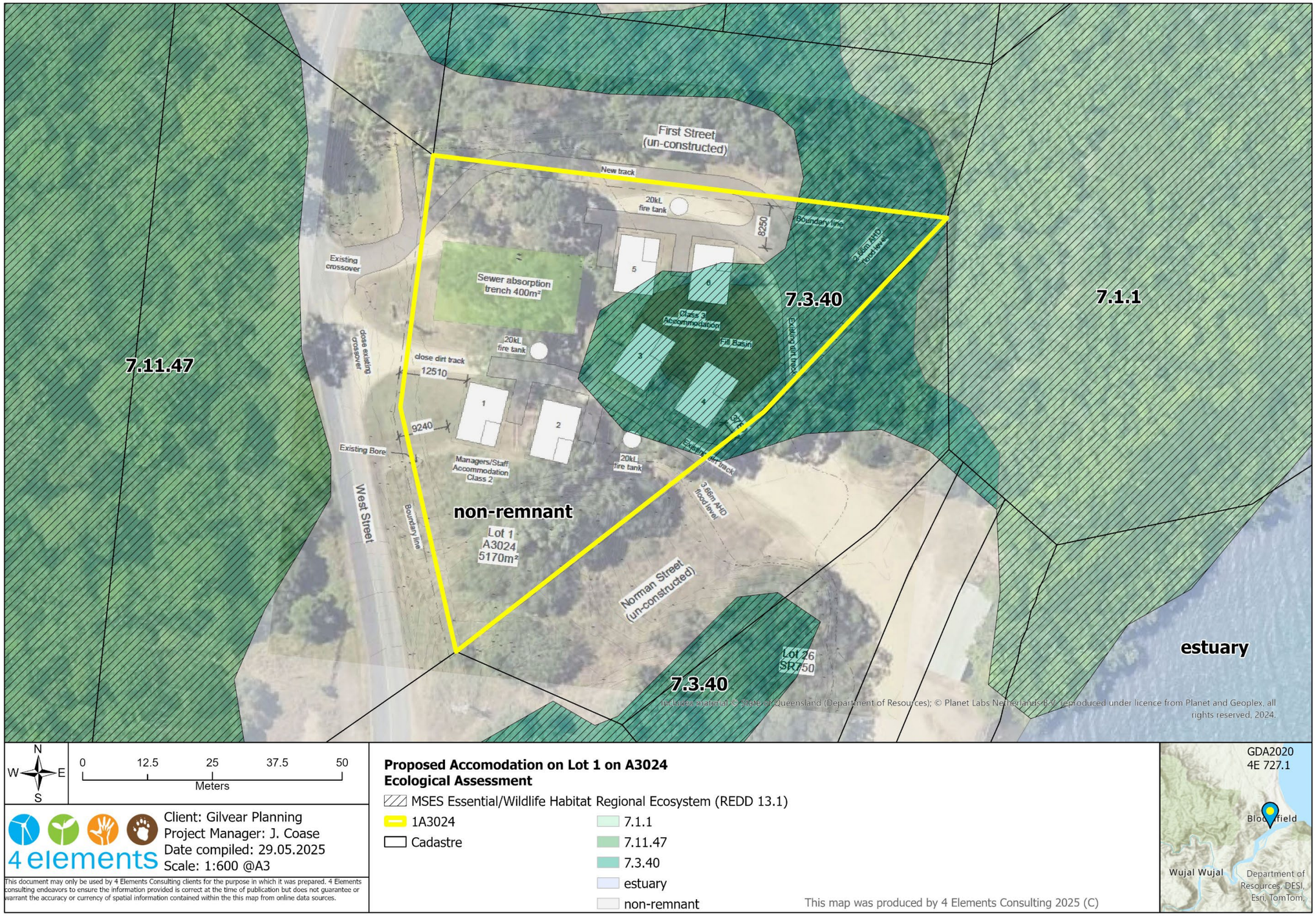
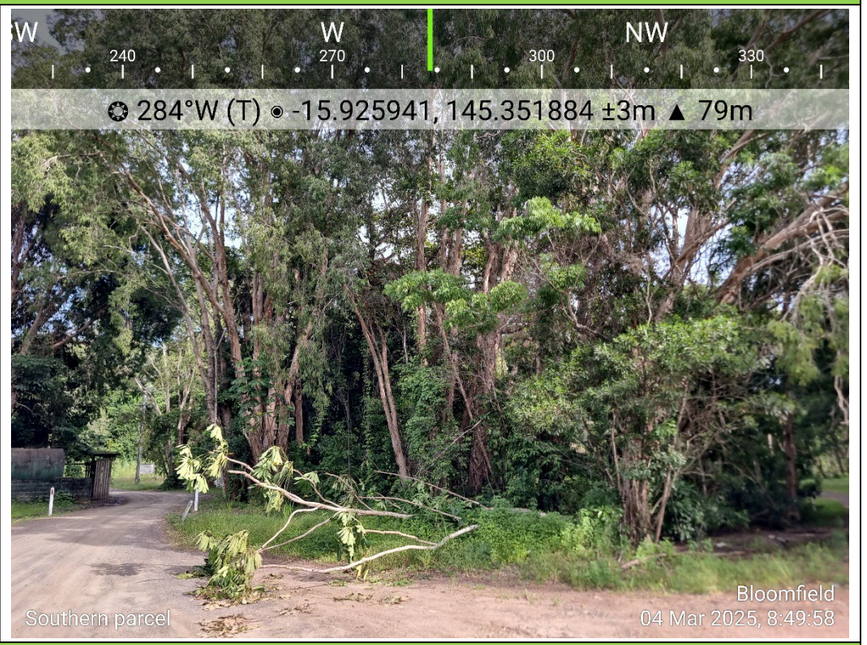


Figure 4 Regional Ecosystems and MSES Wildlife habitat Map

Table 6 Project Site Ground Truthed Regional Ecosystems and Proposed Individual RE Clearance Areas

RE & Biodiversity Status [1]	Ground Truth Clearance Area m^2	Description (REDD v 13) [3]	Structural Density	Canopy Height	Location in Project Site	Project Site Value[4]	Project Site Photo
Wet Tropics Bioregion – Land Zone 3 – Alluvial river and creek flats							
RE 7.3.25b Of Concern	0.11 ha	*Melaleuca leucadendra* and *Eucalyptus tereticornis*, layered open forest, and closed forest with a vine forest understorey. Stream levees and prior streams on well-drained sandy clay loam alluvial soils. Riverine. (BVG1M: 22c).	Open Forest	15-18 m	This vegetation community comprises all remnant vegetation to be disturbed by the project footprint.	7.3.25: Important wildlife corridors in cleared landscapes. Pre-clear extent =8,000 ha; 2021 extent = 5,000 ha	

[1] VMA status/Biodiversity status: E=endangered, OC=of concern, LC=least concern (VMA only), NC=not of concern at present (biodiversity only). REs with a letter postfix are a sub-unit of the main RE e.g. 3.2.5a is sub-unit 'a' of RE 3.2.5 and has the same VMA and Biodiversity status as the main RE.

[2] Area proposed to be cleared. This is represented in hectares and is post RE ground truthing and remapping (4 Elements, 2025).

[3] Regional Ecosystem Description Database version 13. (Department of Environment, Science and Innovation, 2024).

[4] Pre-clear and 2021 RE extents are from Regional Ecosystem Description Database version 13.1 (Department of Environment, Science and Innovation, 2024).

4.2 Project Site Vegetation Survey

4.2.1 Non-Remnant Vegetation

Lot 1 A3024 was characterised by predominantly non-remnant areas consisting of landscaped and maintained *Chrysopogon aciculatus* lawns, interspersed with landscaped vegetation including *Terminalia muelleri, Cocos nucifera* and *Mangifera indica* (see **Plate 1** and **Plate 2** below).

Plate 1 Existing cleared non-remnant areas of 1A3024

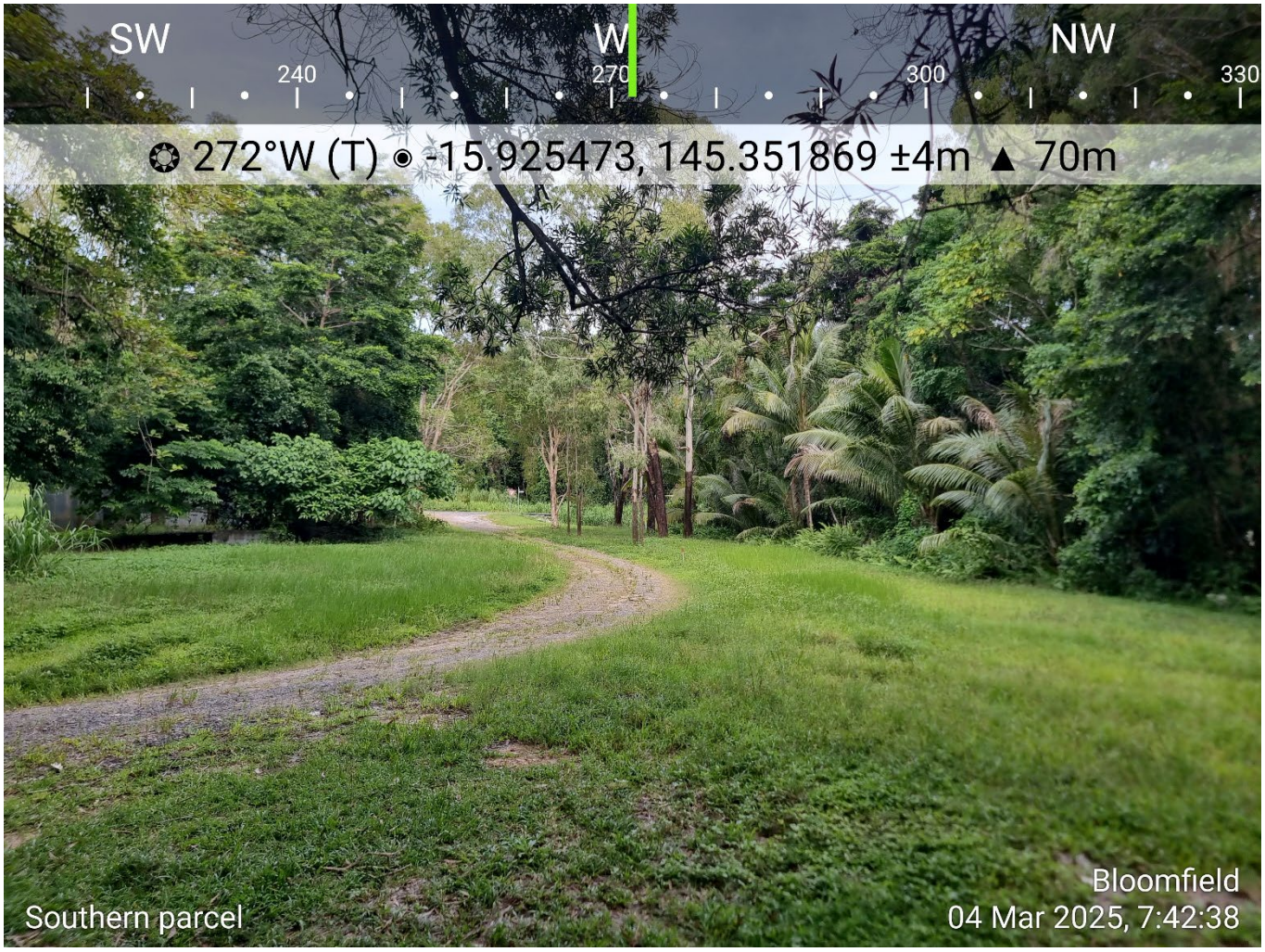
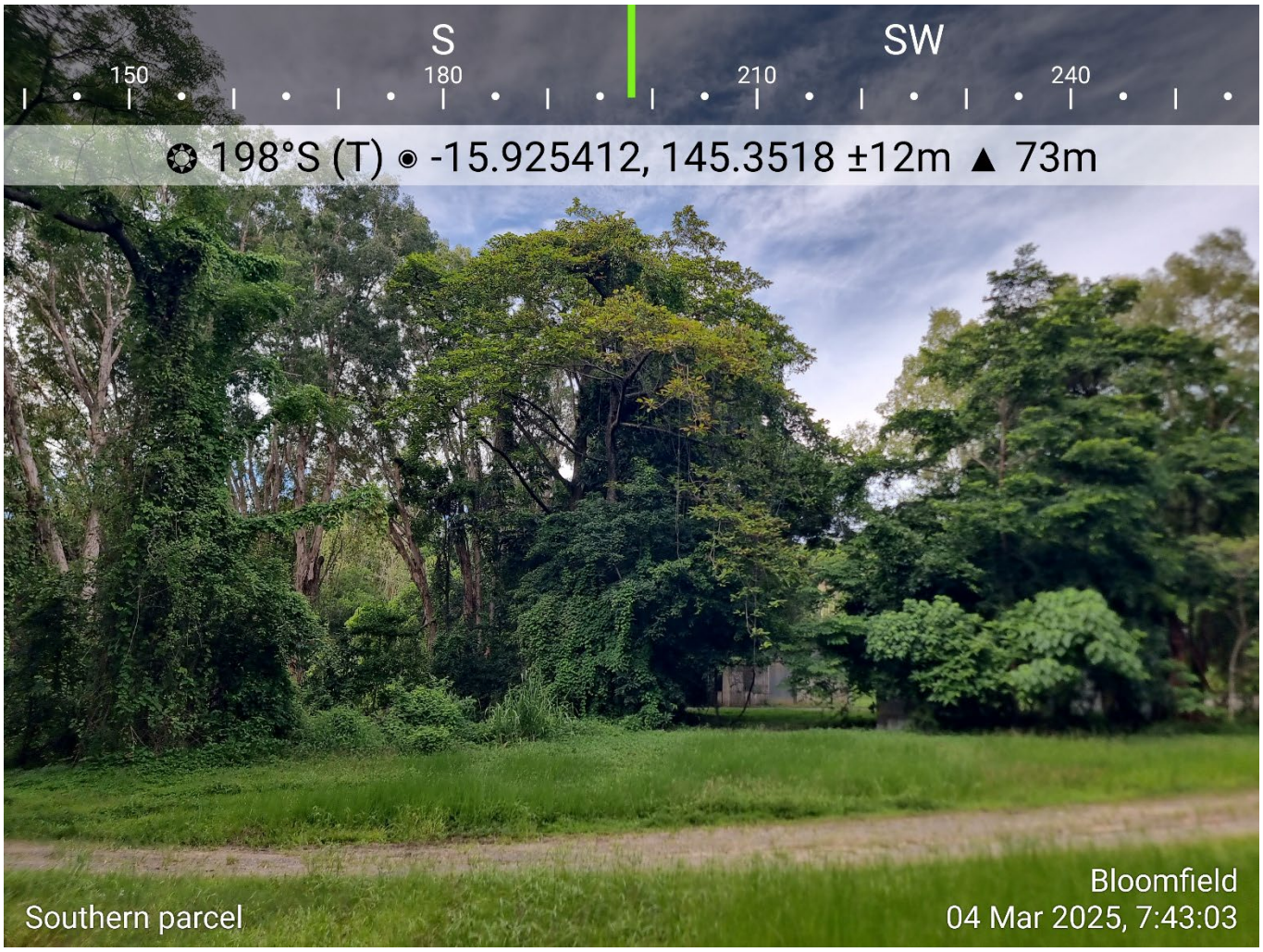


Plate 2 Existing Non-remnant Vegetation within the Norman St road parcel.



4.2.2 Remnant Vegetation

A single open forest remnant vegetation community was present onsite and is within the impact footprint of the project.

4.2.2.1 RE 7.3.25b (Mapped as 7.3.40)

Remnant vegetation with lot 1A3024 was present along the eastern edge of the block. This vegetation community was mapped as 7.3.40 in the REDD v 13.1 mapping but the vegetation composition and context was most similar to RE 7.3.25b with *Melaleuca leucadendra* forming an open forest with a canopy of 15-18m and an understory of *Acacia auriculiformis* and rainforest pioneer and vine forest species shrub layer including *Heptapleurum actinophyllum*, and *Jagera pseudorhus* and *Mangifera indica* to 8-12m (see **Plate 3** below). Rainforest and vine encroachment was heavy within this community on Lot 1 A3024 with encroachment of some species such as *Terminalia muelleri, Nauclea orientalis* and *Melia azedarach* into the canopy along the fringe of the community.

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Plate 3 RE 7.3.25 Remnant Vegetation within Direct Clearing Alignment

4.3 Native Flora

The vegetation assessment within the project site recorded a total of 71 flora species represented by 39 families. Of these species, 24 were exotics. A full list of flora species recorded within the project site is provided within **Appendix E** below.

4.4 Threatened Flora

A single threatened flora species, *Myrmecodia beccarii* (Ant plant) was detected during the protected plant survey within lot 1A3024 (**Figure 3**). The record is approximately 10m from the edge of the existing dirt road and the project footprint. A protected plant survey report has been completed with a supporting impact management plan to avoid and mitigate potential risk to the species.

The likelihood of occurrence of all other potential threatened flora species are assessed individually within **Appendix A**.

4.5 Weeds

For the purpose of this report, weeds are defined as all species categorised as invasive under the *Qld Biosecurity Act 2014* and the Qld Herbarium (Brown & Bostock 2019). A list of all exotic species recorded within the project site is included in **Appendix E**.

A single Weed of National Significance (WoNS) was recorded within the project site.

- *Lantana camara*

No prohibited invasive species, *Biosecurity Act 2014*, were recorded within the project site.

Three (3) category 3 restricted invasive species listed under the *Biosecurity Act 2014*, was recorded within the project site:

- *Lantana camara*
- *Senna obtusifolia*
- *Sphagneticola trilobata*

Four (4) of the weed species recorded during the field survey are listed as priority invasive plants under the Cook Shire Biosecurity Plan 2022-2026., the management objective for all four species at the project site is asset protection with the circumstance applied that '*the distribution of an invasive species is widespread to the extent that containment is not possible with the feasible option to identify assets and implement control methods to protect them*'. Priority species identified were:

- *Cyperus aromaticus*
- *Lantana camara*
- *Senna obtusifolia*
- *Themeda quadrivalvis*

5.0 Fauna Survey Results

5.1 Project Site Habitat Attributes

The below **Table 7** identifies habitat attributes for threatened fauna and if present the assessment determines the site-specific value of these features to threatened fauna.

Table 7 Habitat Attributes Present on the Project Site

Habitat Attribute	Project Site Condition	Potential Value for Threatened Species
Connectivity	The project site is located directly adjacent to existing residential infrastructure and the township of Ayton. The Rossville Bloomfield Rd runs parallel to the site and heavy weed incursions are present on the edge of the small remnant vegetation patches within the site. The roadway is a barrier for dispersal back into larger tracts of remnant vegetation and the world heritage areas beyond.	The proposed vegetation clearance of 0.11 ha of remnant vegetation provides **no specific connectivity value** to any threatened fauna species potentially occurring within the project site.
Vegetative Ground Cover	The majority of the project site is covered by lawn dominated by *Chrysopogon aciculatus* that appears to be mowed and maintained frequently.	**Feature provides no specific value.**
Leaf Litter	Moderate leaf litter accumulation was present to depths of approximately 20mm through much of the remnant 7.3.25b.	**Feature provides no specific value.**
Coarse Woody Debris	Minimal coarse woody debris within the direct clearing alignment was present within RE 7.3.25b. Collection of fallen debris for fires on the adjacent wharf may be a contributing factor to the scarcity of this resource.	**Feature provides no specific value.**
Tree Hollows	Tree hollows were not recorded during the field survey within non-remnant vegetation given the immature structure. Likewise, the remnant vegetation lacked hollows with the main canopy species consisting of Melaleucas and Acacias which are seldom hollow bearing.	**No specific threatened species value.**
Shrub layer containing nectar sources Melaleuca, Acacia, Banksia, Xanthorrhoea species	A sclerophyllous shrub layer was mostly absent within the proposed clearing alignment due to the high projective cover of weed and rainforest species incursion.	**No specific threatened species value.**

Habitat Attribute	Project Site Condition	Potential Value for Threatened Species
Primary Nectar Sources	*Acacia* spp. canopy species present produce abundant food source for common nectivorous species when in flower.	**Generic feeding resource** for common nectivorous birds and mammals.
Fleshy fruiting Species including *Ficus spp*.	Presence of fleshy fruiting species included *Ficus* species.	These trees were present at the shrub and canopy layers within both remnant and non-remnant vegetation. They present a generic food resource for the - Southern Cassowary, - Black-footed tree-rat - Spectacled Flying Fox**.**
Rock Outcrops	No rock outcrops were present within the site	No specific threatened species value.
Water bodies	No waterbodies area within the proposed footprint area, The Bloomfield river is directly adjacent to the site but is not representative of the impact area.	No specific threatened species value.

5.2 Threatened Fauna

No threatened fauna species were confirmed to be present within the project site during the field investigation. However, based on a detailed site assessment of the potential impact areas a list of potentially occurring threatened fauna species based on habitat availability was developed for the project site.

Within the project site, a total of eight (8) threatened fauna species listed under the EPBC Act 1999 and or the NC Act 1992 are considered at least a moderate potential to occur within the project site. Usage of the direct clearing alignment for all three of the below listed species will be restricted to generic foraging and dispersal habitat only and the limited size of the area to be disturbed is not large enough to support an individual. No potential breeding habitat is present within the proposed alignment (see **Appendix A**).

- Blue-faced parrot-finch *(Erythrura trichroa) Near Threatened NC Act*
- Macleay's fig-parrot (*Cyclopsitta diophthalma macleayana) Vulnerable NC Act*
- Southern Cassowary (*Casuarius casuarius) Endangered EPBC Act and Endangered NC Act*
- Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudicclunia*tus) *Vulnerable EPBC Act and Endangered NC Act*
- Bennett's tree-kangaroo (*Dendrolagus bennettianus) Near Threatened NC Act*
- Diadem leaf-nosed bat (*Hipposideros diadema reginae) Near threatened NC Act*
- Large-eared Horseshoe Bat (*Rhinolophus robertsi) Vulnerable EPBC Act Endangered NC Act*
- Semon's Leaf-nosed Bat (*Hipposideros semoni) Vulnerable EPBC Act Endangered NC Act*

5.3 Migratory Marine Species

No EPBC Act 1999 migratory listed fauna was confirmed to be present within the project site. Based on the field survey which considered availability of suitable habitat within the expansion area, a total of four (4) migratory species are considered at least a moderate potential to occur within the proposed clearing alignment.

- Barn Swallow *(Hirundo rustica)*
- Fork-tailed Swift *(Apus pacificus)*
- Osprey *(Pandion haliaetus)*
- Oriental cuckoo *(Cuculus optatus)*

6.0 Significant Impact Assessment

6.1 Matters of National Environmental Significance (MNES) continued

The following table details the guidelines to which a certain application may have a significant impact on a sensitive environmental matter pursuant under the *EPBC Act 1999*. **Table 8** below details the impact the proposed project site may have for places of national environmental significance.

Table 8 Matters of National Environmental Significance (MNES)

Matters of National Environmental Significance	Triggers
Listed Threatened Ecological Communities	
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will: ▸ reduce the extent of an ecological community. fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines. ▸ adversely affect habitat critical to the survival of an ecological community ▸ modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns. ▸ cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting. ▸ cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: ❖ assisting invasive species, that are harmful to the listed ecological community, to become established, or ❖ causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or ❖ interfere with the recovery of an ecological community.	Three TEC's are listed as potentially occurring within 10km of the project site. These include; ▸ Littoral Rainforest and coastal Vine Thickets of Eastern Australia ▸ Lowland tropical rainforest of the Wet Tropics ▸ Broad-leaf Tea Tree Woodlands in High rainfall coastal north Queensland. No vegetation communities present within the direct clearing alignment conform to either of the above listed TEC's. **No significant impact**

Matters of National Environmental Significance	Triggers
World Heritage Property/National Heritage Places	
An action is likely to have a significant impact on natural heritage values of a World Heritage property if there is a real chance or possibility that the action will: <u>Values associated with geology or landscape</u> ▸ damage, modify, alter or obscure important geological formations in a World Heritage property ▸ damage, modify, alter or obscure landforms or landscape features, for example, by excavation or infilling of the land surface in a World Heritage property ▸ modify, alter or inhibit landscape processes, for example, by accelerating or increasing susceptibility to erosion, or stabilising mobile landforms, such as sand dunes, in a World Heritage property ▸ divert, impound or channelise a river, wetland or other water body in a World Heritage property, and ▸ substantially increase concentrations of suspended sediment, nutrients, heavy metals, hydrocarbons, or other pollutants or substances in a river, wetland or water body in a World Heritage property. <u>Biological and ecological values</u> ▸ reduce the diversity or modify the composition of plant and animal species in all or part of a World Heritage property ▸ fragment, isolate or substantially damage habitat important for the conservation of biological diversity in a World Heritage property ▸ cause a long-term reduction in rare, endemic or unique plant or animal populations or species in a World Heritage property, and ▸ fragment, isolate or substantially damage habitat for rare, endemic or unique animal populations or species in a World Heritage property.	**Great Barrier Reef – World and national heritage values** **Wet Tropics of Queensland – World, National and Indigenous heritage values** The project site does intersect the Great Barrier Reef and Wet Tropics world heritage areas. ▸ For addressing the potential impacts geology and landscape values the final design and management of erosion and sediment control will be critical factors. ▸ It is considered in this ecological assessment that the location of the proposal is appropriate and avoids impacts to mapped waterways and wetlands. ▸ For addressing ecological impacts of the proposal, it is determined that there will be no significant impact to any threatened species or ecological community as a result of the proposal.
National Heritage Places	
An action is likely to have a significant impact on the National Heritage values of a National Heritage place if there is a real chance or possibility that it will cause: ▸ one or more of the National Heritage values to be lost. ▸ one or more of the National Heritage values to be degraded or damaged, or ▸ one or more of the National Heritage values to be notably altered, modified, obscured or diminished.	**Great Barrier Reef – World and national heritage values** **Wet Tropics of Queensland – World, National and indigenous heritage values**

Matters of National Environmental Significance	Triggers
	The project site does not intersects the Great Barrier Reef and Wet Tropics world heritage areas. • For addressing the potential impacts geology and landscape values the final design and management of erosion and sediment control will be critical factors. • It is considered in this ecological assessment that the location of the proposal is appropriate and avoids impacts to mapped waterways and wetlands. • For addressing ecological impacts of the proposal, it is determined that there will be no significant impact to any threatened species or ecological community as a result of the proposal.

6.2 Significant Impact Assessment for MNES

No EPBC listed threatened fauna species were confirmed present during the field investigation. It was determined that eight (8) threatened fauna species listed under the *EPBC Act 1999* are considered a moderate potential to occur within the project site.

No EPBC listed threatened fauna species were confirmed present during the field investigation. One EPBC listed threatened flora species was located within the 100m buffer of the clearance area. It is considered that no other threatened flora species listed under the *EPBC Act 1999* are likely to occur within the project site.

6.2.1 Threatened Flora Species

One listed threatened flora species, the Ant Plant, *Myrmecodia beccarii* (Vulnerable EPBC Act and NC Act), was recorded within a single *Melaleuca leucadendra* canopy tree in the 100m site buffer (see **Plate 4** below). This plant is a member of the Rubiaceae family. It has a narrow distribution within the Wet Tropics Bioregion being restricted to the coastal freshwater wetlands and mangrove communities between Ingham and Cooktown (AVH 2023).

Myrmecodia beccarii is a tuberous epiphyte which can reach a diameter up to 30 cm (DCCEEW 2008). The outside of the tuber is pale brown to grey with small spines borne on mounds. On mature plants, internal chambers form inside the tuber with smooth entrances where the Golden Ant (*Iridiomyrmex cordatus*) and the Apollo Jewel Butterfly (*Hypochrysops apollo apollo*) enter the plant forming a mutually beneficial relationship with the host plant. Stems emerge unbranched from the tuber of the plant where succulent elliptic to oblanceolate leaves to 9cm in length are oppositely arranged. Small white flowers (1cm in length) are pollinated to produce white fleshy fruits containing numerous seeds that are dispersed by birds and readily germinate when deposited on the branches of rough barked trees such as *Melaleuca* spp.

The record location within mapped remnant vegetation, approximately 10m from the existing road alignment with the road acting as a buffer from the proposed development. A Protected Plant Survey report and impact management plan have been completed and a Protected Plant Clearing permit is deemed necessary to undertake clearing works at such close proximity to the vulnerable species. No significant residual impacts as defined by the MNES guidelines are expected (**Table 9**) .

Plate 4 *Myrmecodia beccarii record within* **Melaleuca leucadendra**

Table 9 *Myrmecodia beccarii (Vulnerable species) – MNES Significant impact guidelines*

Significant Impact Criteria: An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	**Project Outcome**
▸ lead to a long-term decrease in the size of an important population of a species	The direct clearing alignment for the project is suitable habitat for *Myrmecodia beccarii,* however no plants were identified within the direct clearing alignment and so direct removal of plants or

	decrease in a population will not occur. **No significant Impact**
▸ reduce the area of occupancy of an important population	The direct clearing alignment for the project does not support a *Myrmecodia beccarii* population and will not reduce current occupancy area for the species. The mixed canopy structure within the impact area makes it unlikely that it will support one in the future as they are likely to be shaded out through the progression of rainforest incursion. The vegetation which supports populations of Ant Plants is reducing through fire exclusion in the landscape. The suitable habitat present for the Ant Plant will be pushed toward the mangrove forest and ecotonal buffer where regular tidal inundation prevents establishment of rainforest in the understory providing stable conditions for the Ant Plant population to persist. No vegetation subject to tidal inundation will be impacted as a result of the proposal. Area of occupancy will not be reduced. **No significant Impact**
▸ fragment an existing important population into two or more populations	The direct clearing alignment for the project does is on the periphery of the suitable habitat for the species and provides no connectivity to other populations. The clearing on 0.11 ha will not result in population fragmentation or isolation. **No significant Impact**
▸ adversely affect habitat critical to the survival of a species	The direct clearing alignment for the project is 0.11 ha on the periphery of a population and is not deemed critical for the survival of the species. The vegetation which supports populations of Ant Plants is reducing through fire exclusion in the landscape. The suitable habitat present for the Ant Plant will be pushed toward the mangrove forest

	and ecotonal buffer where regular tidal inundation prevents establishment of rainforest in the understory providing stable conditions for the Ant Plant population to persist. No vegetation subject to tidal inundation will be impacted as a result of the proposal. **No significant Impact**
▸ disrupt the breeding cycle of an important population	The direct clearing alignment for the project is 0.11 ha on the periphery of a population and will not disrupt the breeding cycle of this flora species. **No significant Impact**
▸ modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The direct clearing alignment for the project is 0.11 ha on the periphery of a population. While the area to be cleared is suitable habitat for the species, the limited nature of the clearing will not result in species decline. The vegetation which supports populations of Ant Plants is reducing through fire exclusion in the landscape. The suitable habitat present for the Ant Plant will be pushed toward the mangrove forest and ecotonal buffer where regular tidal inundation prevents establishment of rainforest in the understory providing stable conditions for the Ant Plant population to persist. No vegetation subject to tidal inundation will be impacted as a result of the proposal. **No significant Impact**
▸ result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The site and its surrounds area already heavily invaded by weed species and public access is granted at present for use of the wharf and boat ramp. The proposed developments will not exacerbate the current conditions. The vegetation which supports populations of Ant Plants is reducing through fire exclusion in the landscape. The suitable habitat present for the Ant Plant will be pushed toward the mangrove forest and ecotonal buffer where regular tidal inundation prevents establishment of rainforest in the

	understory providing stable conditions for the Ant Plant population to persist. No vegetation subject to tidal inundation will be impacted as a result of the proposal. **No significant Impact**
▸ introduce disease that may cause the species to decline, or	The site and its surrounds area already heavily invaded by weed species and public access is granted at present for use of the wharf and boat ramp. The proposed developments will not exacerbate the current conditions, and it will be in the developments best interest to manage weeds for visual amenity for the proposed usage as a accommodations. The proposal is not a biosecurity risk to the species. **No significant Impact**
▸ interfere substantially with the recovery of the species.	The direct clearing alignment for the project requires the removal of 0.11 ha suitable habitat with no records of the species within the direct clearing alignment. The impact will not interfere with any recovery of the species. **No significant Impact**

It was determined that no other threatened fauna species listed under the *EPBC Act 1999* are considered likely to occur within the project site.

Given the scale and type of vegetation clearance proposed, and the significant impact criteria addressed above **a referral to the Department of Climate Change, Energy, Environment and Water for assessment is not required.**

6.2.2 Threatened Fauna Species

The Department of Climate Change Energy Environment and Water (DCCEEW) notes an action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- Lead to a long-term decrease in the size of an important population.
- Reduce the area of occupancy of an important population.
- Fragment an existing population into two or more populations.
- Adversely affect habitat critical to the survival of a species.
- Disrupt the breeding cycle of an important population; and/or

- Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
- Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.
- Introduce disease that may cause the species to decline, or
- Interfere substantially with the recovery of the species.

Four (4) EPBC Act 1999 and/or NC Act 1992 listed species are considered at least a moderate potential to occur within the project site. A potential occurrence assessment was completed in (**Appendix A**).

- Southern Cassowary (*Casuarius casuarius*) Endangered EPBC Act
- Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudicclunia tus*) Vulnerable EPBC Act
- Large-eared Horseshoe Bat (*Rhinolophus robertsi*) Vulnerable EPBC Act
- Semon's Leaf-nosed Bat (*Hipposideros semoni*) Vulnerable EPBC Act Given the scale and type of vegetation clearance proposed, no species are considered at risk of a significant impact as a result of the proposal. Therefore, **a referral to the Department of Climate Change, Energy, Environment and Water for assessment is not required.**

6.2.3 Migratory Species

DCCEEW notes an action is likely to have a significant impact on a migratory species if there is a possibility it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.
- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

The species considered moderate and highly likely to occur on site are:

- Barn Swallow (*Hirundo rustica)*
- Osprey (*Pandion haliaetus)*
- Oriental cuckoo (Oriental cuckoo)

None of the above listed species accumulate in significant numbers within Australia to lead to the impact of large numbers of individuals. It is considered highly unlikely that a total vegetation clearance required for the proposal will impact on ecologically significant habitat to these species such that it interferes with the breeding,

foraging or roosting of migratory species. External to the project site, there are large tracts of available vegetation for these species to utilise. The results of this assessment determined that there is no reasonable likelihood of a significant impact on threatened or migratory species as a result of establishing the proposal.

6.3 Matters of State Environmental Significance (MSES)

The following table (**Table 10**) details the guidelines to which a certain application may have a significant impact on a sensitive environmental matter pursuant to the *Nature Conservation Act 1992.* This assessment is based on the project site clearing area where vegetation clearing may occur.

Table 10 Matters of State Environmental Significance

Matters of State Environmental Significance	Triggers
Regulated Vegetation (VMA)	
The prescribed regional ecosystems that are Endangered regional ecosystems comprise a matter of State Environmental Significance. The prescribed regional ecosystems that are of concern regional ecosystems comprise a matter of State environmental significance. A prescribed regional ecosystem is a matter of State environmental significance if it is— (a) a regional ecosystem that intersects with an area shown as a wetland on the vegetation management wetlands map (to the extent of the intersection); or (b) 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. A prescribed regional ecosystem is a matter of State environmental significance to the extent the ecosystem is located within a defined distance from the defining banks of a relevant watercourse.	One Endangered regional ecosystems is present within the project site and will be directly impacted by the clearing alignment with 0.11 ha to be removed/impacted. Lot 1A3024 is <5 ha and thus exempt under the Vegetation Management Act 1999 with the Cook Shire Council being the assessor of the project for the clearing within the lot. Regulated vegetation (essential habitat) is mapped within the 0.11 ha of remnant vegetation to be impacted. This essential habitat polygon is mapped for the Estuarine Crocodile (*Crocodylus porosus*) which is based on a record from the estuarine community RE 7.1.1 present externally to the site. The record has created a 1km buffer around this record within remnant vegetation. The remaining vegetation present on the project site ,RE 7.3.25 is disturbed Melaleuca Open Forest and is not reasonably considered suitable habitat. The remnant RE 7.1.1 that is known suitable habitat for the Estuarine Crocodile is not within the project development footprint. Although essential habitat is mapped within disturbance footprint, there is no reasonable likelihood that the Estuarine Crocodile would utilise the mapped 7.3.140 remnant vegetation to be disturbed on the project site for breeding or foraging.

Matters of State Environmental Significance	Triggers
Connectivity Areas	
(1) This section applies to a prescribed regional ecosystem— (a) to the extent the ecosystem contains remnant vegetation; and (b) if the ecosystem contains an area of land that is required for ecosystem functioning (a connectivity area). The prescribed regional ecosystem is a matter of State environmental significance if the administering agency is satisfied, having had regard to criteria in the environmental offsets policy about connectivity areas, that— (c) the connectivity area is of sufficient size or configured in a way that maintains ecosystem functioning; and (d) the prescribed regional ecosystem will remain despite a threatening process within the meaning of *the Nature Conservation Act 1992*.	No areas within the project site are mapped as a state connectivity area. Restricting the clearance of vegetation clearing to the edge of the vegetation community within a previously disturbed vegetation area will reduce impacts to connectivity at the local scale. Connectivity of remnant vegetation is likely to be sufficiently maintained throughout the project site with clearing along the edge of already cleared and or disturbance areas. Clearing of a portion remnant and non-remnant vegetation (RE 7.3.25b) will not have a significant impact on the core ecosystem at the local scale, the clearing will not significantly impact on connectivity areas and there will not be a significant loss or reduction of core remnant areas at the site scale.
Wetlands and Watercourses	
(2) Each of the following matters is a matter of State environmental significance— (a) a wetland; i. in a wetland protection area; or ii. of high ecological significance shown on the Map of referable wetlands; (b) a wetland or watercourse in high ecological value waters.	The project site is not within: (a) a wetland; i. in a wetland protection area; or ii. of high ecological significance shown on the Map of referable wetlands; (b) a wetland or watercourse in high ecological value waters.
Designated Precinct in a Strategic Environmental Area	
(1) A designated precinct in a strategic environmental area is a matter of State environmental significance.	No strategic environmental areas are mapped within the project site.
Protected Wildlife Habitat	
(1) An area that is shown as a high-risk area on the flora survey trigger map and that contains plants that are endangered wildlife, or vulnerable wildlife is a matter of State environmental significance. 2) An area that is not shown as a high-risk area on the flora survey trigger map, to the extent the area contains	1) Remnant vegetation on Lot 1A3024 is within a flora survey trigger area. 2) A field survey and Protected Plant Survey was undertaken within the project site. A single threatened flora species was recorded within the 100 protect plant survey buffer area of the project site.

Matters of State Environmental Significance	Triggers
plants that are endangered wildlife or vulnerable wildlife, is a matter of State environmental significance. 3) A non-juvenile koala habitat tree located in an area shown as bushland habitat, high value rehabilitation habitat or medium value rehabilitation habitat on the map called 'Map of Assessable Development Area Koala Habitat Values' that applies under the Southeast Queensland Koala Conservation State Planning Regulatory Provisions is a matter of State environmental significance. 4) A habitat for an animal that is endangered wildlife or vulnerable wildlife, or a special least concern animal is a matter of State environmental significance.	**A protected plant clearing permit is required to be obtained through DETSI for this matter.** It was determined that there is no reasonable likelihood that any threatened flora species will be impacted within the direct clearing alignment. 3) A portion of the project site is located in an area shown as bushland habitat. 4) The project site is mapped as wildlife habitat for the Estuarine Crocodile, however the area of remnant vegetation to be cleared is deemed unsuitable for this species and has been included only because of the 1km buffer applied to the mapping. Within the project site, a field survey determined that a total of eight (8) threatened fauna species are considered at least a moderate potential to occur within the project site. Usage of the direct clearing alignment for all eight of the below listed species will be restricted to generic foraging and dispersal habitat only. No potential breeding habitat is present within the proposed alignment or subject lot. - Blue-faced parrot-finch (*Erythrura trichroa*) Near Threatened NC Act - Macleay's fig-parrot (*Cyclopsitta diophthalma* macleayana) Vulnerable NC Act - Southern Cassowary (*Casuarius casuarius*) Endangered NC Act - Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudiccluniatus*) Endangered NC Act - Bennett's tree-kangaroo (*Dendrolagus bennettianus*) Near Threatened NC Act - Diadem leaf-nosed bat (*Hipposideros diadema reginae*) Near threatened NC Act - Large-eared Horseshoe Bat (*Rhinolophus robertsi*) Endangered NC Act Semon's Leaf-nosed Bat (*Hipposideros semoni*) Endangered NC Act
Protected Areas	

Matters of State Environmental Significance	Triggers
A protected area is a matter of State environmental significance.	No protected area is located within the project site clearance footprint.
Highly Protected Zones of State Marine Parks	
A highly protected area of a relevant Queensland marine park is a matter of State environmental significance.	No highly protected zones of State marine parks are located within the project site clearance footprint.
Fish Habitat Areas	
An area declared under the *Fisheries Act 1994* to be a fish habitat area is a Matter of State Environmental Significance.	No fish habitat areas area located within the proposed project site declared under *Fisheries Act 1994.*
Waterway Providing for Fish Passage	
1) Any part of a waterway providing for passage of fish is a matter of State environmental significance only if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.	The project site contains no potential to directly impact waterways the act as fish passages.
Marine Plants	
A marine plant within the meaning of the *Fisheries Act 1994* is a matter of State environmental significance.	The project site does not contain marine plants.
Legally Secured Offset Areas	
A legally secured offset area is a matter of State environmental significance.	No legally secured offsets are located within the project site.

6.4 Significant Residual Impact Assessment

An environmental offset condition may be imposed under various State assessment frameworks (such as the *Nature Conservation Act 1992* and the *Planning Act 2016* for an activity prescribed under the *Environmental Offsets Act 2014* (EO Act), if the activity will, or is likely to, have a significant residual impact (SRI) on a prescribed environmental matter that is a matter of state environmental significance (MSES) (DES 2023).

Of particular importance is Section 3.5 Protected Wildlife Habitat which states that:

> ANIMALS - Protected wildlife habitat (habitat for an animal that is 'endangered' or 'vulnerable' wildlife or a special least concern animal)
>
> > An action is LIKELY to have an SRI on habitat for an animal that is 'endangered' or 'vulnerable' wildlife if the action will:

(a) lead to a long-term decrease in the size of a local population;

(b) reduce the extent of occurrence of the species;

(c) fragment an existing population;

(d) avoid genetically distinct populations forming as a result of habitat isolation;

(e) result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat;

(f) introduce disease that may cause the population to decline,

(g) interfere with the recovery of the species; OR

(h) cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.

Eight (8) NC Act 1992 listed species are considered at least a moderate potential to occur within the project site. A potential occurrence assessment was completed in (**Appendix A**).

- Blue-faced parrot-finch (*Erythrura trichroa*) Near Threatened NC Act
- Macleay's fig-parrot (*Cyclopsitta diophthalma macleayana*) Vulnerable NC Act
- Southern Cassowary (*Casuarius casuarius*) Endangered NC Act
- Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudicclunatus*) Endangered NC Act
- Bennett's tree-kangaroo (*Dendrolagus bennettianus*) Near Threatened NC Act
- Diadem leaf-nosed bat (*Hipposideros diadema reginae*) Near threatened NC Act
- Large-eared Horseshoe Bat (*Rhinolophus robertsi*) Endangered NC Act
    - Semon's Leaf-nosed Bat (*Hipposideros semoni*) Endangered NC Act

Given the scale and type of vegetation clearance proposed, no species are considered at risk of a significant impact as a result of the proposal. Therefore, **a referral to the Department of Environment, Science and Innovation is not required.**

6.5 Cook Shire Biodiversity Overlay Code

The purpose of the Biodiversity overlay code is to protect biodiversity through:

- (a) avoiding development within biodiversity areas;
- (b) minimising the adverse impacts of development on biodiversity;
- (c) management of pest and invasive species;

- (d) strategic rehabilitation occurs through restoration of terrestrial and aquatic

ecosystems;

- (e) encourage expansion of habitat connectivity;
- (f) minimise downstream impacts on biodiversity including fish habitats and the Great

Barrier Reef.

The purpose of the code will be achieved through the following overall outcomes:

- (a) Conservation, consolidation, connection and restoration of the network of lands with environmental significance.
- (b) Protection and enhancement of waterways, wetlands and coastal environments

with environmental significance and their hydrological value and water-cleaning

functions.

- (c) Avoidance of impacts to areas of environmental significance through the

appropriate design and location of development

Performance Outcome	Acceptable Outcome
Accepted subject to requirements and assessable development	
PO1 Development avoids areas of environmental significance.	**AO1.1** Vegetation clearing from the project is limited to 0.11 ha of remnant vegetation mapped as endangered. 0.11 ha of an endangered RE (7.3.40, REDD 13.1 mapping) will be cleared within lot 1A3024 and is council assessable. The vegetation is also mapped as essential and wildlife habitat but is deemed unsuitable for the Estuarine Crocodile which has triggered this mapping (see sections **3.6** and **3.7**). Clearing is set back more than 20m from the Bloomfield River.
Assessable development	
PO2 Development is sited in a State environmental area only where there is no reasonable opportunity to avoid the area and where the extent of development in the State environmental area has been minimised.	**AO2.1** Due to the size of the lot and the surrounding land use, there is no reasonable opportunity to avoid clearing.
PO3 Development minimises or mitigates adverse impacts on areas of environmental significance where such impacts are unavoidable.	**AO3.2** The vegetation clearing required has been surveyed by 4 Elements Consulting and recommendations within this report will ensure that environmental values and ecosystem processes will not be significantly impacted by the proposed development.
PO4 Development is designed to avoid and minimise edge effects and other impacts to Protected Areas, Marine Parks	**AO4.2** The proposal is within 100m of a marine park (Bloomfield River). No marine turtles or other light/noise

and Declared Fish Habitat Areas identified on OM1 – Biodiversity Overlay.	sensitive species are reasonably likely to occur within the estuarine environment however design will be required to address the following: (a) directing light away from the nominated areas or using light shields; (b) establishing 20m dense native vegetation buffers between development and the nominated areas; (c) locating artificial noisegenerating activities away from the nominated areas.
PO5 An adequate buffer to wetlands identified on OM1 – Biodiversity Overlay Map is provided and maintained.	**AO5.1** The proposal does not interfere with any wetlands identified on Cook Shire Biodiversity Overlay map.

7.0 Recommendations

7.1.1 Threatened Species

All eight (8) potentially occurring threatened species within the project site are unlikely to be impacted as a result of the proposal. No clearing of denning or roosting habitat (arboreal tree hollows) will occur as a result of the proposal. As a result, no denning or roosting habitat is present for species within the proposed clearing alignment. The potential usage of the project site will be exclusively for generic foraging and or dispersal throughout the wider landscape. No further targeted surveys are recommended to determine utilisation of either of these species within the project site.

7.1.2 Clearing to the Minimum Required

All vegetation falling outside the minimum area required to establish the proposal are to remain undisturbed. All approved clearing areas must be visually delineated by a registered surveyor prior to the commencement of vegetation clearing. This will be critical in areas near to retained vegetation.

Clearing and earthworks is to avoid damage to the root zones of any retained trees. Therefore, no parking of vehicles or storage of construction material is permitted under any retained trees as this may compact soil and reduce viability of retained vegetation. A vehicle parking and laydown area should be provided outside of vegetation areas and clearly communicated to contractors prior to the commencement of works.

To manage potential impacts to fauna potentially occurring within the clearing area, a management plan should be prepared that advises optimal clearing times to avoid clearing during peak breeding times and identify key nesting resources to be retained to reduce impacts on these species.

7.1.3 Disposal of Cleared Vegetation

Cleared vegetation should be mulched on site by the clearing contractors and either taken to a licenced landfill or put aside and re-spread over the disturbed soils post works. The latter is recommended as it will assist in prevention of erosion and the establishment of weeds within rehabilitation areas.

7.1.4 Weed Control

Disturbance of the project site soil has the potential to encourage weed invasion. Currently, the weed incursion present within the edge of the existing clearing area is restricted along the roadsides. All light and heavy vehicles should arrive clean to the site prior to commencement of works. The delineation of the project footprint will prevent machinery from entering retained vegetation and reduce weed spread.

7.1.5 Erosion and Sediment Control

An erosion and sediment and control plan will be required during construction to mitigate downstream impacts. This includes the use of silt fences and sediment traps during the construction phase to ensure downstream aquatic habitats are not impacted.

7.1.6 Fauna Spotter/Catcher During Clearing Operations

During vegetation clearing works it is a requirement under the *Nature Conservation Act 1992* that a fauna spotter catcher working under a rehabilitation permit be present on site to capture and relocate any fauna that may occur within the clearing alignments. This will be critical in managing the direct impacts of clearing mortality on all fauna that may be present within the project site.

8.0 Conclusion

The following section addresses all relevant legislation considerations based on the proposed works outlined in the above. Each legislative instrument relevant to the project site is listed below with the requirements for meeting and gaining approval under each section.

8.1 EPBC Act 1999

A total of four (4) threatened fauna, and one (1) threatened flora listed under the *EPBC Act 1999* and/or NC Act are considered at least a moderate potential to occur within the property. Given the scale of the proposal and the lack of important foraging, denning or breeding habitat to be impacted **it is considered unlikely that a referral to the DCCEEW will be required**.

A total of four (4) migratory species are considered at least a moderate potential to occur within the property. Based on the current site survey and the potential scale of the proposals impact, it is considered unlikely that a significant impact would occur on these migrant species. **A referral to the DCCEEW is unlikely to be required for this MNES.**

8.2 Nature Conservation Act 1999 (NCA)

8.2.1 Protected Plants

A protected plant is any plant species listed as *Critically Endangered, Endangered, Vulnerable* or *Near Threatened* under the *NC Act 1992.*

The current proposal requires the clearing of vegetation within a Protected Plant Trigger Areas Defined under the *NC Act 1992.* A single threatened flora record was obtained during a protected plant survey. A protected plant survey report has been completed with an accompanying impact management plan. A Protected Plant Clearing Permit will be required.

8.2.2 Threatened Fauna

A total of eight (8) threatened fauna species listed under the *NC Act 1992* are currently considered at least a moderate potential to occur within the project site. Given the scale of the proposal and lack of important foraging, denning or breeding habitat **it is considered unlikely that a significant impact will occur on any potentially occurring *NC Act 1992* listed threatened species**.

8.3 Vegetation Management Act 1999 (VMA)

A total of 0.11 ha of remnant vegetation will require clearance as a result of the proposal. This comprises a single Endangered regional ecosystem Mapped as 7.3.40 under REDD v13.1. However, as the lot is subject to a development approval and is <5 ha, it is exempt from the Vegetation Management Act 1991 and the Cook Shire Council will be the assessor.

Essential habitat and Wildlife habitat is mapped as present for the Estuarine Crocodile, this is believed to be due to the proximity to suitable estuarine habitat, but the clearing impact is not deemed to be Estuarine Crocodile habitat, and no significant impact is expected.

8.4 Marine Plants (Fisheries Act 1994)

The subject lot 1A3024 contains no marine plants within the clearing or disturbance footprint.

8.5 Waterways (Fisheries Act 1994 and Water Act 2000)

No watercourse listed under the Water Act 2000 are present within the project site.

No waterway barrier works listed watercourses under the Fisheries Act 1994 are present within the project site.

9.0 References

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Appendix A Potential Occurrence

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Threatened Fauna					
Birds					
Asian dowitcher	*Limnodromus semipalmatus*	V, Mi, M	V	The Asian dowitcher is a non-breeding migrant to Australia, typically found in sheltered coastal environments such as embayments, coastal lagoons, estuaries, and tidal creeks. They feed in intertidal mudflats, frequenting shallow water and exposed mudflats or sandflats. In Australia, crucial habitat is provided by the Port Hedland Saltworks, where the species is commonly found in round ponds, channels of saltworks, sewage farms, and near-coastal swamps and lakes.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Australian painted snipe	*Rostratula australis*	E, M	E	The Australian painted snipe is found in wetlands across all states of Australia, with a higher concentration in eastern Australia, including parts of Qld, NSW, VIC, and south-eastern SA. They typically inhabit shallow terrestrial freshwater wetlands, which can be temporary or permanent lakes, swamps, claypans, or occasionally brackish wetlands. Their preferred sites have rank emergent tussocks of grass, sedges, rushes, or reeds, sometimes with scattered clumps of lignum, cane grass, or tea-tree. The Australian painted snipe's breeding habitat necessitates shallow wetlands with bare mud areas and nearby canopy cover.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Beach stone-curlew	*Esacus magnirostris*	Ma	V	he beach stone-curlew is a resident of undisturbed open beaches, exposed reefs, mangroves, and tidal sand or mudflats over a large range, including	**Unlikely**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				coastal eastern Australia as far south as far eastern Victoria, the northern Australian coast and nearby islands, New Guinea, New Caledonia, Indonesia, Malaysia, and the Philippines. It is uncommon over most of its range, and rare south of Cairns.	The species has been recorded within a 10 km radius; **however**, There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site.
Blue-faced parrot-finch	*Erythrura trichroa*		NT	The range of preferred habitat of this species is imperfectly understood. The blue-faced parrotfinches prefer rainforest edges and dense grasslands that have woody plants, and they prefer to roost in rainforests. They are widely distributed and found at various altitudes, ranging from sea-level on hot tropical islands to 800–3000 m in New Guinea. It is reported that the blue-faced parrotfinches engage in seasonal and nomadic movements, partly due to their cold-sensitiveness. In the winter, they migrate to the lowlands where there is excessive rainforest clearance.	**Moderate** The species has been recorded within a 10 km radius; suitable habitat is present within the project site.
Common greenshank	*Tringa nebularia*	E, Mi, M	E	The common greenshank is a non-breeding migrant to Australia, boasting the most extensive distribution among shorebirds in the country. Its habitat preferences span coastal and inland wetlands, encompassing mudflats, saltmarshes, mangroves, and seagrass beds along the coast. In inland regions, it frequents various wetland categories such as swamps, lakes, dams, rivers, and floodplains, often utilising artificial wetlands such as sewage farms and saltworks. Characteristic of its favoured habitats are muddy or clay-edged expanses, occasionally sandy, adorned with vegetation such as sedges, rushes, mangroves, and trees. Although	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				documented in pasture alongside Black-winged stilts, it typically eschews dry grassland environments.	
Curlew sandpiper	*Calidris ferruginea*	CE, Mi, M	CE	Curlew sandpipers primarily inhabit intertidal mudflats in sheltered coastal regions like estuaries, bays, inlets, and lagoons. They can also be found around non-tidal swamps, lakes, and coastal ponds, including those in saltworks and sewage farms. While less common, they are occasionally observed inland around ephemeral and permanent lakes, dams, waterholes, and bore drains, typically in areas with exposed mud or sand edges. They are adaptable to both fresh and brackish waters and are sporadically recorded around floodwaters. In Qld, the Curlew sandpiper is widespread along the coast south of Cairns, with only sparsely scattered records inland.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Eastern curlew	*Numenius madagascariensis*	CE, Mi, M	CE	The eastern curlew predominantly inhabits coastal areas across all Australian states, particularly on sheltered coasts, estuaries, bays, harbours, and coastal lagoons featuring intertidal mudflats or sandflats. During the non-breeding season, the birds can be found on ocean beaches, coral reefs, and rocky islets, as well as in saltmarsh areas, mudflats fringed by mangroves, and coastal saltworks. Foraging occurs on soft intertidal sandflats or mudflats, avoiding grassy areas and near-coastal lakes. Roosting during high tide takes place on sandy spits, sandbars, islets, and among coastal vegetation, including low saltmarsh or mangroves, with occasional roosting on reef-flats and in the shallow water of lagoons and other near-coastal wetlands.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Greater sand plover	*Charadrius leschenaultii*	V, Mi, M	V	The greater sand plover is a non-breeding migrant to Australia with a more westerly migratory route compared to other shorebirds. The species forages in sheltered coastal areas, including sandy, shelly, and muddy regions, as well as intertidal mudflats, sandbanks, estuaries, saltmarshes, coral reefs, rocky islands, and dunes. They feed on wet ground away from the water's edge, often in mixed flocks with other shorebirds. Their diet primarily consists of marine invertebrates such as molluscs, worms, and crustaceans. Roosting occurs on sand-spits, banks, and beaches, occasionally in saltmarshes or claypans, often above the high-tide mark. During hot weather, they seek cooler sites with damp substrates. Breeding takes place in dry, open, treeless areas up to 3,000m, including saltpans and rocky plains in deserts or semi-deserts.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities. .
Grey falcon	*Falco hypoleucos*	V	V	The grey falcon is primarily found in arid and semi-arid regions of Australia, including the Murray-Darling Basin, Eyre Basin, central Australia, and WA. It prefers regions with annual rainfall below 500mm, predominantly inhabiting arid and semi-arid zones. Its distribution may marginally expand during wet years followed by drought, but it generally remains restricted to these arid and semi-arid environments. The species is notably absent from Cape York Peninsula and areas east of the Great Dividing Range in Qld. It frequents timbered lowland plains, particularly acacia shrublands with tree-lined water courses, and has been observed hunting in treeless areas, tussock grassland, and open woodland, especially in winter. Nesting preferences include the tallest trees along watercourses, with a particular affinity for *Eucalyptus camaldulensis* and *E. coolabah*.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Latham's snipe	*Gallinago hardwickii*	V, Mi, M	V	In Australia, the Latham's snipe is known to inhabit a wide range of permanent and ephemeral wetlands, typically favouring open freshwater wetlands with nearby shelter, often in the form of low and dense vegetation. Their habitats include flooded meadows, seasonal or semi-permanent swamps, open waters, and various other freshwater settings like bogs, billabongs, lagoons, lakes, creek or river margins, river pools, and floodplains.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Little tern	*Stemula albifrons*	V, Mi, M	SL	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 occur on exposed ocean beaches. Little terns usually roost or loaf on sand-spits, banks and bars within sheltered estuarine or coastal environments, or on the sandy shores of lakes and ocean beaches.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Macleay's fig-parrot	*Cyclopsitta diophthalma macleayana*		V	Rainforests, adjacent eucalypt woodlands and coastal scrubs, timber on watercourses and paperbark woodlands from 0-800m above sea level in the Wet Tropics.	**Moderate** The species has been recorded numerous times within a 10 km radius; and suitable habitat is present within the project site.
Masked owl (northern)	*Tyto novaehollandiae kimberli*	V	V	The distribution of the northern masked owl is poorly understood, with historical records in the Normanton region and Pascoe, Archer, Chester,	**Unlikely**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				and Watson Rivers on Cape York Peninsula in Qld. This owl exhibits habitat preferences for sclerophyll forests and woodlands, often near ecotones with open areas like fields and grasslands, although it has been observed in various habitats across northern Australia, including riparian forests, rainforests, open forests, swamps, mangrove edges, and near sugar cane fields. Roosting sites include tree hollows, caves, or dense foliage.	The is a general paucity of records for this species but the site is within their known distribution, however vegetation is too dense to facilitate foraging within the project site.
Nunivak bar-tailed godwit	*Limosa lapponica baueri*	E	E	In Australia, the Nunivak bar-tailed godwit is primarily found along the north and east coasts. They typically feed near water's edge or in shallow tidal estuaries and harbours, mainly on sandy or soft mud substrates. Roosting often takes place on large intertidal sandflats, spits, and banks, occasionally within mudflats, estuaries, coastal lagoons, and bays, typically near seagrass beds or saltmarshes. In areas with limited natural habitat, they may also inhabit anthropogenic wetlands such as aquaculture ponds, saltworks, and industrial sites like ports, power facilities, and wastewater treatment areas.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Red goshawk	*Erythrotriorchis radiatus*	E	E	The red goshawk occurs in coastal and subcoastal areas in wooded and forested lands of tropical and warm-temperate Australia. It nests in large trees, frequently the tallest and most massive in a tall stand, and nest trees are within 2.5km of permanent water. Habitat must be open enough for fast attack and manoeuvring in flight but provide cover for ambushing of prey. Therefore, forests of intermediate density are favoured, or ecotones between habitats of differing densities, such as between rainforest and	**Unlikely** A single record from 1987 is present within 10km and generic foraging habitat is present. However, no stick nests were

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				eucalypt forest, between gallery forest and woodland, or on edges of woodland and forest where they meet grassland, cleared land, roads, or watercourses.	observed, and huge home ranges of this species suggests it is unlikely to be present, This species may occur as a rare flyover.
Red knot	*Calidris canutus*	V, Mi, M	V	The red knot inhabits the Australian coast with notable concentrations in north-west Australia. It primarily inhabits intertidal mudflats, sandflats, and sandy beaches along sheltered coasts, including estuaries, bays, inlets, lagoons, and harbours. Occasional sightings include sandy ocean beaches, exposed wave-cut rock platforms, or coral reefs. The species is sporadically observed in terrestrial saline wetlands near the coast, such as lakes, lagoons, pools, and pans, as well as on sewage ponds and saltworks. However, freshwater swamps and inland lakes are rarely utilised. Foraging typically takes place in soft substrate near the water's edge on intertidal mudflats or sandflats exposed during low tide. During high tide, they may feed at nearby lakes, sewage ponds, and floodwaters. Roosting sites include sandy beaches, spits, islets, and mudflats, along with shallow saline ponds in saltworks. The red knot prefers open roosting areas, far from potential cover for predators but close to feeding grounds.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Sharp-tailed sandpiper	*Calidris acuminata*	V, Mi, M	V	During non-breeding season, the sharp-tailed sandpiper predominantly inhabits south-east Australia, and is widespread in both inland and coastal locations, favouring freshwater and saline habitats. In Qld, they are found across most regions, with a significant presence along the coast and	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				scattered sightings inland, often during migration. Their preferred habitats include muddy edges of shallow wetlands with emergent vegetation such as sedges, grass, or saltmarsh, encompassing lagoons, swamps, lakes, and coastal pools, as well as dams, waterholes, bore drains, and inland salt pans and lakes. They are also found in saltworks, sewage farms, and flooded paddocks, but migrate when these ephemeral wetlands dry up. The species forage at the water's edge on bare mud or sand, in shallow water, or among inundated vegetation, including saltmarsh and sedges. They are adaptable feeders, also frequenting sewage ponds and hypersaline environments, and may venture into paddocks of short grass after rain. Roosting typically occurs at wetland edges, in shallow water, or among sparse vegetation like grass or saltmarsh.	within the project site. May utilise adjacent mangrove communities.
Southern Cassowary	*Casuarius casuarius*	E	E	Cassowaries in the Wet Tropics were historically distributed between Cooktown in the north, south to Townsville and west to the extent of rainforest including the entire rainforested portion of the Atherton Tableland. Present distribution remains similar but greatly reduced and fragmented by forest clearance. Areas in which cassowaries are thought to be extinct include large parts of the Atherton Tablelands, the lower Goldsborough Valley, the floor of the Whyanbeel valley, the Clohesy River region and the Cassowary Range. The species has seldom been reported from around Cooktown, and near Townsville it only occurs in low abundances in higher altitude areas of Bluewater and Mt Spec. Core habitat remains in the rainforest and associated habitats of the coastal lowlands between Ingham and Mossman, and the upland areas	**Moderate** The species has been recorded within a 10 km radius; marginal foraging and dispersal habitat is present within the project site.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				incorporating Seaview and Kirrama Range, the southern Atherton and Evelyn Tablelands, the Lamb Range and the Carbine, Finnegan and Thornton uplands.	
White-bellied Storm-Petrel	*Fregetta grallaria grallaria*	V	LC	The White-bellied Storm-Petrel occurs across sub-tropical and tropical waters in the Tasman Sea, Coral Sea and, possibly, the central Pacific Ocean. In the non-breeding season, it reaches and forages over near-shore waters along the continental shelf of mainland Australia. It breeds, in Australian territory, on offshore islets and rocks in the Lord Howe Island group. It nests in crevices between large volcanic rocks, and in burrows excavated in banks.	**Unlikely** There is a distinct lack of suitable within the project site.
White-throated needletail	*Hirundapus caudacutus*	V, Mi, M	V	The white-throated needletail is widespread in eastern and south-eastern Australia during the summer months. In eastern Australia, it is observed in all coastal regions of Qld and NSW, extending inland to the western slopes of the Great Divide and occasionally onto adjacent inland plains. This species is predominantly aerial, ranging from heights of less than 1m to over 1,000m above the ground, rendering conventional habitat descriptions inapplicable. Nevertheless, certain preferences are exhibited, with a higher occurrence above wooded areas, including open forest, rainforest, and heathland. They may also fly between trees or in clearings below the canopy, though less commonly above woodlands, or treeless areas such as grassland or swamps. Foraging often takes place in areas with updraughts, such as ridges, cliffs, sand dunes, or along the edges of low-pressure systems. The white-throated needletail has been recorded	**Unlikely** This species may seasonally occur overhead during aerial foraging above all vegetation communities present within the project site. The proposed project site represents a very minor portion of a much larger foraging area.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				roosting in trees within forests and woodlands, either among dense foliage in the canopy or in hollows.	
Mammals					
Bare-rumped sheath-tailed bat	*Saccolaimus saccolaimus nudicluniatus*	V	E	The type locality for the Bare-rumped sheat-tailed bat is Babinda Creek near Cardwell, N Qld, with syntypes collected from Gowrie Creek near Cardwell. This bat predominantly occurs in lowland areas, favouring a variety of woodland, forest, and open environments. Roost habitats in N Qld range from Eucalyptus platyphylla woodland in the Jerona Fauna Sanctuary to E. tetrodonta woodland with Corymbia clarksoniana and Carbeen at Iron Range. Adjacent areas may include woodlands dominated by E. tessellaris and E. papuana, a narrow strip of gallery forest along a seasonally dry watercourse, or large patches of rainforest associated with river floodplains. The Bare-rumped sheath-tailed bat has been suggested to forage over habitat edges, such as rainforest edges and forest clearings. Confirmed roosts in Australia have all been in tree hollows, distinct from subspecies in other regions that often roost in caves, overhangs, or man-made structures.	**Likely** A record within 1 km of the project site exists and generic habitat is available.
Bennett's tree-kangaroo	*Dendrolagus bennettianus*		NT	This very elusive (or "cryptic") tree-kangaroo is found in both mountain and lowland tropical rain forests south of Cooktown, Queensland to just north of the Daintree River; an area of only about 70 km by 50 km (44 miles by 31 miles). It is also occasionally found in sclerophyll woodlands. It lives almost completely on the leaves of a wide range of rainforest trees, notably *Heptapleurum actinophyllum* (the umbrella tree), vines, ferns and various wild fruits.	**Likely** Suitable habitat and proximal records present.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Black-footed tree-rat (north Qld)	*Mesembriomys gouldii rattoides*	V	V	The distribution of the Black-footed tree-rat (north Qld) is poorly known, with most records from around Mareeba. Sparse records exist across Cape York Peninsula, including recent sightings in Mungkan Kandju National Park and the Australian Wildlife Conservancy's Piccaninny Plains and Brooklyn wildlife sanctuaries. In North Qld, the species is predominantly found in eucalypt forests and woodlands, particularly where hollows are abundant. An individual record notes denning in a hollow within a large rainforest tree near the boundary between rainforest and eucalypt forest at Iron Range.	**Unlikely** No proximal records and only marginal habitat present.
Ghost bat	*Macroderma gigas*	V	E	The ghost bat is found in Qld, spanning from Cape York to Rockhampton, and exhibits a diverse foraging habitat that includes arid woodlands in the Pilbara as well as tropical woodlands and rainforests. Essential to its ecology is the availability of suitable roosting habitat, which typically consists of deep cave structures and rock crevices, and there are reports of the species utilising abandoned mining excavations. During winter, colonies of ghost bats may disperse over distances exceeding 150 km, moving from colonial roost sites into smaller groups dispersed across the landscape.	**Unlikely** No proximal records and only marginal habitat present.
Greater Glider (northern), Greater Glider (north-eastern Queensland)	*Petauroides minor*	V	V	The greater glider (northern) is an arboreal nocturnal marsupial, predominantly solitary and largely restricted to eucalypt forests and woodlands of north-eastern Australia. It is typically found in highest abundance on high elevation, wetter sites in open woodland to open forests, containing relatively old trees and abundant hollows. It is likely that only a proportion of forest in potential habitat areas is suitable for the	**Unlikely** No proximal records and outside of preferred altitudinal range.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				species, as the structural attributes of the forest overstorey and forage quality it relies on vary considerably across the landscape.	
Koala	*Phascolarctos cinereus*	E	E	Koalas are distributed across various bioregions in Qld, ranging from the southeast to as far north as the Einasleigh Uplands and Wet Tropics bioregions, and extending westward to the Mitchell Grass Downs and Mulga Lands. Within Qld, koalas can be found in diverse habitats, including moist coastal forests, southern and central western subhumid woodlands, and certain eucalypt woodlands near waterbodies in the semi-arid western regions of the state. In north-western Qld, koalas have a patchy distribution and are often associated with creek-lines. They tend to be more abundant in areas with higher tree species richness, and their population size is influenced by leaf-moisture content.	**Unlikely** No proximal records and outside of known range.
Large-eared Horseshoe Bat	*Rhinolophus robertsi*	V	E	The Large-eared horseshoe bat is confined to northern Qld, ranging from the Iron Range southwards to Townsville and west to the karst regions of Chillagoe and Mitchell-Palmer. While the southern limit is not precisely defined, recent occurrences within 50km of Townsville have been recorded. The species is found in lowland rainforest, along gallery forest-lined creeks within open eucalypt forests, Melaleuca forests with rainforest understorey, open savannah woodland, and tall riparian woodlands of Melaleuca, Eucalyptus tereticornis, and E. tesselaris. Daytime roosting locations include caves, underground mines in rainforest, open eucalypt forests, and woodlands, with additional observations in road culverts. It is suspected that basal hollows of large trees, dense vegetation, rockpiles, and areas beneath creek banks may also serve as roosting sites. During the night,	**Moderate** No proximal records and outside of preferred altitudinal range.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				foraging primarily occurs in open forest and wattle-dominated ridges in rainforest. In open forest and woodland, the species tends to forage among thicker vegetation in gullies and along creeks, though sightings have also been noted at the edge of grassy clearings in rainforest and along road edges.	
Northern quoll	*Dasyurus hallucatus*	E	LC	The northern quoll is distributed across five regional populations in Qld, the NT, and WA, including both mainland and offshore islands. In Qld, its range extends from Gracemere and Mt Morgan south of Rockhampton to Weipa in the north and the vicinity of Carnarvon Range National Park in the west. This species occupies diverse habitats such as rocky areas, eucalypt forests and woodlands, rainforests, sandy lowlands, and beaches, shrublands, grasslands, and deserts. They are also found in non-rocky lowland habitats like beach scrub communities in central Qld. Generally, northern quoll habitat includes rocky areas for denning, with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are often rugged and dissected, including tor fields or caves in low-lying areas. Eucalypt forest or woodland habitats feature high structural diversity with large trees, termite mounds, or hollow logs for denning. Dens are constructed in rock crevices, tree holes, or occasionally termite mounds. The species appears most abundant within 150km of the coast, with recent surveys suggesting a preference for high relief areas with shallower soils, greater boulder cover, less fire impact, and proximity to permanent water.	**Unlikely** Habitat is considered sub-optimal; no hollows or rocky areas present.
Semon's Leaf-nosed Bat	*Hipposideros semoni*	V	E	Semon's leaf-nosed bat is primarily found in north-eastern Australia, particularly along the eastern Cape York Peninsula to Townsville, with a	**Moderate**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				concentration of records near Iron Range, Kulla, Oyala Thumotang, and Cape Melville National Parks, as well as near Cooktown. Its habitat includes tropical rainforests, monsoon forests, wet sclerophyll forests, and open savannah woodlands. Unlike some bats, it does not obligatorily require cave roosts. Daytime roost sites consist of tree hollows, deserted buildings in rainforests, road culverts, and shallow caves among granite boulders or in fissures. Semon's leaf-nosed bat shows a preference for rainforests and is more likely to dwell in trees than in caves. During foraging, they stay within the undergrowth, flying relatively slow and manoeuvrable within 1 to 2m of the ground. Their feeding behaviour involves gleaning prey from surfaces such as tree trunks, rock surfaces, and the ground, and they also fly low along forest gaps.	No proximal records but site is within known range and suitable habitat is present within the project site.
Spectacled Flying-fox	*Pteropus conspicillatus*	E	E	The Spectacled flying-fox is found in the vicinity of tropical forests in the Iron Range and Wet Tropics regions of Australia. While initially believed to primarily feed on rainforest species, these bats regularly consume a diverse range of non-rainforest species, including eucalypts in tall open forests, tropical woodlands, and savannas adjacent to rainforest communities. The foraging range of the species is not fully understood, and ongoing research aims to provide a better understanding of its distribution. Telemetry and resource use studies in the Wet Tropics reveal that foraging individuals cover extensive areas across the bioregion, reaching into drier forests west of the Wet Tropics Region. The species roosts in large aggregations, called camps or colonies, on exposed branches of canopy trees. Spectacled flying-foxes exhibit high mobility with complex and irregular movement patterns, primarily influenced by seasonal nectar flows.	**Unlikely** A single roost (Bloomfield School (651)) is in the locality of the project site but has only had spectacled flying-foxes present during 2 of 7 surveys. In addition, the site holds only marginal seasonal foraging habitat of extremely limited extent. May also occur as infrequent fly-over.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				While most colonial camps occur in or near rainforests, individuals are capable of flying up to 50km in a single night to feed, with longer-distance movements predicted.	
Spotted-tailed Quoll	*Dasyurus maculatus gracilis*	E	-	The Spot-tailed quoll inhabits south-east Qld, ranging along the coast from Bundaberg to the border, inland to Monto and Stanthorpe. This species is found in five main geographic areas, encompassing coastal ranges, the Great Dividing Range, and the eastern Darling Downs-Inglewood Sandstone provinces. It exhibits a preference for mature wet forest habitats, particularly those with an annual rainfall of around 600mm. Unlogged or less disturbed forests are favoured, providing suitable den sites like hollow logs, tree hollows, rock outcrops, or caves. Adequate food sources, including birds and small mammals, are crucial, and large areas of relatively intact vegetation are required for foraging. Its habitat range includes temperate and subtropical rainforests in mountain areas, wet sclerophyll forests, lowland forests, open and closed eucalypt woodlands, inland riparian and River Red Gum (Eucalyptus camaldulensis) forests, dry 'rainshadow' woodlands, sub-alpine woodlands, coastal heathlands, and occasional sightings from open country, grazing lands, rocky outcrops, and other treeless areas.	**Unlikely** Habitat is considered sub-optimal; no hollows or rocky areas present and outside of preferred altitudinal range.
Water mouse	*Xeromys myoides*	V	V	The water mouse has been documented in three coastal regions of Australia: the NT, central south Qld, and south-east Qld. Their overall	**Unlikely**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				habitat preference includes aquatic environments, encompassing coastal saltmarsh, samphire shrublands, saline reed-beds, saline grasslands, mangroves, coastal freshwater wetlands, and wet heathlands. The main difference in habitat between regions lies in the littoral, supralittoral, and terrestrial vegetation, which influences nesting behaviour. Areas with potential to be habitat include areas with one, some, or all known habitat attributes listed above, with more detailed information in the approved Conservation Advice.	No proximal records but site is within known range and suitable habitat is present within the 250m2 of RE 7.1.1 Due to the small area available it is considered unlikely the species would be onsite at any given time and is unlikely to occur within the impact area.
Reptiles					
White headed snapping turtle	*Elseya irwini*	V	LC	The habitat critical to the survival of Irwin's turtle occurs in the North and South Johnstone Rivers, the rivers and tributaries of the Burdekin catchment, and the Daintree River and associated tributaries. This habitat is described in detail above, and is characterised by: ❖ Alternating rapids, riffles and deep pools which provide clear, well-oxygenated water. ❖ Clay and sandy-loam banks adjacent to and accessible from the water, which provide suitable nesting habitat.	**Unlikely** No freshwater habitat available onsite and outside known distribution.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Mertens' Water Monitor	*Varanus mertensi*	E	E	Mertens' water monitor is patchily distributed across tropical northern Australia, from the Kimberley region in WA, through the Top End of the NT, to the wet tropics in far north Qld, bounded by the northern coastline and nearby islands. It is a highly aquatic lizard, typically staying within 5–10m of water bodies, including perennial and semi-permanent pools, springs, seeps, swamps, creeks, gorges, the margins of permanent streams, rivers, lakes, floodplain billabongs, lagoons, swamps, soaks, perennial waterholes in woodlands, and man-made irrigation channels and dam margins.	**Unlikely** No proximal records or freshwater habitats present.
Yakka skink	*Egernia rugosa*	V	V	The Yakka skink is one of four skink species listed as a 'Brigalow Belt Reptile' under the EPBC Act with suitable habitat listed as open forests to low-woodlands and shrubs. This habitat is often mapped as land zones 3, 4, 5, 7, 8, 9, 10 and 12 (DSEWPC 2011). The Yakka skink prefers open dry sclerophyll forests or open woodland and is commonly associated with various vegetation types, including Brigalow, Mulga, Bendee, Lancewood, Belah, Poplar box, Ironbark, and White cypress pine. It frequently seeks refuge in large hollow logs and may occasionally dig deep burrow systems, often beneath dense ground vegetation (Cogger 2014).	**Unlikely** No proximal records or preferred suitable habitat.
Amphibian					
Australian Lace-lid	*Litoria dayi*	V	V	The Australian lace-lid frog is endemic to the Wet Tropics Bioregion in northern Qld, once ranging from Paluma to Cooktown at altitudes between sea level and 1200m. Stable populations of the Australian lace-lid frog persist at lower altitudes, where temperatures are higher and less conducive to the amphibian	**Unlikely** No freshwater streams or rainforest communities present within project site.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				chytrid fungus. As a rainforest specialist, it favours montane areas with fast-flowing rocky streams, though they also inhabit slower watercourses with ample vegetation. At low elevations, they prefer rock soaks, narrow ephemeral streams, and rock outcrops in larger watercourses. The species is dependent on rainforest vegetation, inhabiting complex, densely vegetated habitats. Adult Lace-lid frogs are moderately associated with streams, reliably found within stream banks during an extended season. They move towards rainforest streams for breeding exclusively during the warmer wet season/early dry season.	
Mountain mist frog	*Litoria nyakalensis*	CE	CE	The Mountain mist frog is a rainforest specialist, endemic to the Wet Tropics Bioregion. It is found in upland rainforest and wet sclerophyll forest along fast-flowing streams where there is white water from riffles and cascades. It is usually found perched on rocks or overhanging vegetation adjacent to the water. The tadpoles are restricted to fast-flowing waters where they cling to rocks in riffles and torrents and in highly oxygenated pools below waterfalls. Tadpoles also burrow into loose sand under rocks which may help them withstand the violent floods that often occur in rainforest streams.	**Unlikely** No freshwater streams or rainforest communities present within project site.
Tapping green eyed tree frog	*Litoria serrata*		V		**Unlikely** Records within 10km but no freshwater streams or

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
					rainforest communities present within project site.
Fish and Crustaceans					
Opal Cling Goby	*Stiphodon semoni*	CE	CE	In Australia, adult Opal Cling Gobies are found in pristine rainforest streams that have significant flow and direct access to marine habitats. The Opal Cling Goby is confined to a limited number of rainforest streams in far north-east Queensland. Locations where the species has been found include Cooper Creek north of the Daintree River, Pauls Pocket Creek north of the Mulgrave and Russell Rivers, and Harvey Creek that drains into the Mulgrave River and Russell River estuary.	**Unlikely** No freshwater habitats present.
Robert's Spiny Crayfish	*Euastacus robertsi*	E	E	E. robertsi is the species at the northernmost extent of the genera's Australian distribution, and is restricted to upland tropical rainforest (above 650 m ASL, usually nearer 850 m up to ~1100 m) on a few mountains in northern Queensland, south of Cooktown. It is known from Mt. Finnigan (including the type location of Horan's Creek), Mt. Pieter Bott (~30 kms to the southeast of Mt. Finnigan) and Thornton Peak (~10 km to the southwest of Mt. Pieter Bott).	**Unlikely** No freshwater habitats present.
Threatened Flora					

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
	Aphyllorchis anomala		NT	*The simple pauper orchid grows near sea level in moist, shady rainforest mainly between Rossville and the Atherton Tableland and near Airlie Beach.*	**Unlikely** No freshwater habitats present.
	Backhousia hughesii		CR	*Endemic to NEQ, restricted to the area between Rossville and Innisfail. Altitudinal range from sea level to 1100 m. Grows in well-developed rain forest on a variety of sites and is often associated with Kauri Pine (Agathis robusta).*	**Unlikely** No well-developed rainforest habitat present within project site.
	Buckinghamia ferruginiflora		V	*Endemic to NEQ, restricted to the area between Bloomfield and the Daintree River. Altitudinal range from sea level to 350 m. Grows in well-developed lowland and upland rain forest.*	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Chingia australis*	E	E	*Chingia australis* occurs in rainforest on steep creek banks and slopes of ridges. This species is reliant upon exposure of mineral soil (that lacks organic matter) and is an early pioneer of canopy gaps and substrate disturbance. The species may be somewhat shade intolerant, often inhabiting naturally well-lit sites such as swampy ground in lowland forest or creek banks. However, its presence in such locations may be attributed to its high moisture requirements: like all ferns, *C. australis* has a two stage life cycle involving a stage that is entirely dependent on the presence of water. Some populations are riparian (growing in or very close to water courses); all are dependent on surrounding rainforest habitat and the moist microclimate it provides. Populations are ephemeral (short-lived), responding to the kinds of disturbance processes that typically remove topsoil, such as landslips, flood scouring, tree-falls and road cuttings.	**Unlikely** No well-developed rainforest habitat present within project site.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
-	*Cyclophyllum costatum*	V	V	*Cyclophyllum costatum* is known from the Daintree River, Little Falls Creek northwest of Mossman, and Mt Windsor in northeast Queensland. This species grows in rainforest and complex notophyll vineforest along creeks and rivers on stony clay soil with shallow surface of loam from altitudes of 960–1095m.	**Unlikely** No well-developed rainforest habitat present within project site and outside altitudinal range.
-	*Dendrobium carronii* (*Cepobaculum carronii)*	V	V	This species grows in well-lit areas from sea level to 600 m altitude, in humid areas of gallery forest, hillside scrub and low-lying areas subject to periodic inundation. It often grows on the papery bark of the Paperbark Teatree (*Melaleuca viridiflora*). The species has also been recorded on Swamp Box (*Lophostemon suaveolens*) and other paperbarks (*Melaleuca spp.*) Plants usually form small clumps. Flowering occurs from August to October.	**Unlikley** **Targeted searches for this species did not record any individuals.**
-	*Dendrobium nindii*	E	E	*Dendrobium nindii* is known from the McIlwraith Range on Cape York Peninsula, south to Innisfail, Queensland and is also known to occur in New Guinea. Localities include Gap Creek in the Bloomfield area, the Daintree River, Port Douglas, and the Johnstone River. This species occurs within the Cape York and Wet Tropics (Queensland) Natural Resource Management Regions. *Dendrobium nindii* occurs up to 400 m above sea level, growing on trees (including mangroves and palms) in near-coastal swamps, coastal rainforest, mangroves, and low altitude gorges and streams. It has been recorded in rainforest on conglomerate and granite. It grows with its leaves and inflorescences exposed to strong light or even direct sunlight and its roots shaded.	**Unlikley** **Targeted searches for this species did not record any individuals.**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
	Dissiliaria tuckeri		E	*Endemic to Queensland. Occurs in NEQ. Known from a few populations between Cooktown and Mossman. Altitudinal range from near sea level to about 760 m. Grows along watercourses in well-developed rain forest on rocky alluvia derived from granite.*	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Drosera prolifera*	V	V	*Drosera prolifera* is endemic to north Queensland and occurs at Mount Pieter Botte Creek, Thornton Peak, Noah Creek and the Roaring Meg Falls areas. The species is also known from Monkhouse Timber Reserve and two sites in the Daintree National Park. *Drosera prolifera* grows on the banks of streams, sometimes forming large mats. The species also occurs on rocks in rainforest areas in the altitudinal range of 220—1200 m above sea level. The species often occurs in steep terrain that is densely forested and difficult to access.	**Unlikely** No well-developed rainforest habitat present within project site and outside altitudinal range.
	Heliodendron xanthoxylon		NT	*Endemic to NEQ, restricted to the area between Rossville and Mt Molloy. Altitudinal range from sea level to 500 m. Grows in well-developed lowland and upland rain forest.*	**Unlikely** No well-developed rainforest habitat present within project.
-	*Leichhardtia araujacea* synonymous with *Marsdenia araujacea*	CE	CE	*Marsdenia araujacea* is endemic to the northeast Queensland Wet Tropics, occurring between approximately Hope Vale and Townsville. Collection sites span 600 km from Biniirr National Park in the north to the Stone River, west of Ingham, in the south. Habitat: Lowland *Blepharocarya involucrigera* gallery rainforest invariably associated with permanent water, often by tapping underground springs or aquifers. Blepharocarya dominated communities are widespread and strongly associated with	**Unlikely** Lack of *Blepharocarya involucrigera* gallery rainforest habitat present within project site and outside altitudinal range.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				water. They may be located immediately around a water source or are linear following water courses (Forster 1995).	
	Meiogyne hirsuta		NT	*Endemic to NEQ, known only from Cedar Bay, Mossman River and the North Johnstone River. Altitudinal range from near sea level to 300 m. Grows as an understory shrub in well-developed lowland and foothill rain forests.*	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Oreogrammitis reinwardtii* (Grammitis reinwardtii)	V	V	*Grammitis reinwardtii* is known from north-east Queensland, where it has been found on Mt Finnegan, Mt Lewis and Mt Spurgeon. In Australia, this species was last seen in 1994. It is also found in South-East Asia, Malesia and Melanesia. This species grows in tropical rainforest and is found both as an epiphyte on trees and as a lithophytic fern growing on granite boulders.	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Phaius pictus*	V	V	*Phaius pictus* occurs in north-east Queensland, sporadically from the McIlwraith Range, Bloomfield River to Kirrama Range. It is highly localised, restricted to rainforests from 0–600 m altitude, and usually occurs in sheltered humid sites close to streams and among forest litter on boulders. Population numbers are unknown. Known locations appear to all be within protected areas. This species occurs within the Wet Tropics and Cape York (Queensland) Natural Resource Management Regions. The distribution of this species is not known to overlap with any EPBC Act-listed threatened ecological community.	**Unlikely** No well-developed rainforest habitat present within project site.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
-	*Polyscias bellendenkerensis*	V	V	*Polyscias bellendenkerensis* is known from north-east Queensland, occurring in mountain rainforest. The Queensland Herbarium has 14 specimens of the species, collected between 1904 and 1997 from Mount Bartle Frere, Mount Bellenden Ker, Mossman Bluff and the upper reaches of Saltwater Creek, north-west of Mossman, at altitudes of 1100 to 1600 m. The species has been recorded as growing in microphyll vine/fern thickets, notophyll vine forest and stunted shrublands on granite substrates.	**Unlikely** No well-developed rainforest habitat present within project site and outside altitudinal range.
	Rhodamnia sessiliflora		E	Endemic to NEQ, widespread throughout the area. Altitudinal range from near sea level to 1000 m. Grows in lowland and upland rain forest on a variety of sites, also found in drier rain forest often associated with Kauri Pine (Agathis robusta).	**Unlikley** **This species is present on the edges of well-developed vine forest communities which were not recorded within the project site.**
	Rhodamnia spongiosa		CR	Occurs in CYP, NEQ, CEQ and southwards in southern central Queensland. Altitudinal range from near sea level to 1150 m. Grows as an understory tree in well-developed rain forest on a variety of sites but more frequently encountered in drier rain forest often associated with Kauri Pine (Agathis robusta). Also occurs in New Guinea.	**Unlikely** No well-developed rainforest habitat present within project site.
	Rhodomyrtus effusa		E	Endemic to NEQ. Altitudinal range from near sea level to 200 m. Grows in disturbed or previously disturbed areas of lowland rain forest.	**Unlikley** **This species is present on the edges of well-developed vine forest**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
					communities which were not recorded within the project site.
	Xanthostemon verticillatus		V	Endemic to NEQ, restricted to the Daintree River and Bloomfield River watersheds. Altitudinal range probably quite small, from near sea level to 100 m. Grows as a rheophyte along creeks and rivers.	**Unlikely** Lack of suitable freshwater riparian habitat.
Ant Plant	*Myrmecodia beccarii*	V	V	*Myrmecodia beccarii* is known from the coastal woodlands between Cooktown and Ingham in Queensland. This species occurs in open woodland dominated by Melaleuca viridiflora or mangroves. The species is conserved within the Girringun National Park (NP), Daintree NP and Edmund Kennedy NP. This species has a minimum area of occupancy of 7000 km2 , a minimum range of 350 km and is known from 10 locations. This species occurs within the Wet Tropics and Cape York (Queensland) Natural Resource Management Regions.	**Confirmed** Species present in 100m buffer area of project site,
Blue Tassel-fern	*Phlegmariurus dalhousieanus*	E	CE	The Blue Tassel-fern is known from only two collections in Queensland, both of which are in lowland swamp forest near Cairns, one of which has been lost to urban development. It is an epiphyte on trees or rocks and has been recorded growing in clumps of Platycerium (staghorn), and anecdotal information suggests the species still occurs in coastal swamps between Daintree River and Cooktown, and in the McIlwraith Range. It also occurs in Indonesia and New Guinea. This species occurs within the Wet Tropics (Queensland) Natural Resource Management region.	**Unlikely** No proximal records and no known populations in region.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Chocolate Tea Tree Orchid	*Dendrobium johannis*	V	V	*Dendrobium johannis* grows in open humid habitats, on slopes in open woodland, close to swamps and in pockets of monsoon forests. It has been recorded growing on Broad-leaved Tea-tree (*Melaleuca viridiflora*) in a melaleuca woodland in the Cowal Creek floodplain; and in a semi-evergreen vine thicket on an old stabilised sand dune where Thryptomene was dominant in the canopy. *Dendrobium johannis* occurs from the tip of Cape York Peninsula, south to the McIlwraith Range and in north Queensland. It also occurs in the Torres Strait islands, possibly New Guinea and occurs on islands on the Great Barrier Reef.	**Unlikley** Outside of known distribution,
Cooktown Orchid	*Vappodes phalaenopsis*	V	-	*Dendrobium phalaenopsis* is locally common within its restricted range. It rapidly recolonises disturbed sites. This species occurs within the Cape York (Queensland) Natural Resource Management Region. *Dendrobium phalaenopsis* grows on trees and rocks in coastal scrub, littoral rainforest, riverine vegetation, monsoon thickets, swamps and gullies in open forests at altitudes of up to 400 m above sea level. It also grows in vegetation near beaches, in areas with a hot climate and extremely seasonal rainfall.	**Unlikely** **Targeted searches for this species did not detection any individuals. This species restricted to coastal vine thickets in the region.**
Dark-stemmed Antler Orchid	*Dendrobium mirbelianum*	E	E	*Dendrobium mirbelianum* is known from the Daintree area to Innisfail and Moa Island, north of Cape York Peninsula, north Queensland. It is also known to occur in New Guinea and the Solomon Islands. This species occurs within the Cape York, Wet Tropics and Torres Strait (Queensland) Natural Resource Management Regions. *Dendrobium mirbelianum* is locally common within its restricted range. It grows mainly on trees in	**Unlikely** **Targeted searches for this species did not detection any individuals. Die back of RE 7.1.1 adjacent further reduces quality of**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				mangroves and coastal swamps in humid locations and has also been recorded growing on rocks, grows at altitudes of 2–150 m above sea level.	**habitat within the project site.**
Haines's Orange Mangrove	*Bruguiera x hainesii*	CE	CE	In Australia, Haines's Orange Mangrove is known from one population adjacent to Trinity Inlet in the Cairns region. Haines's Orange Mangrove occurs in the landward mangrove zone where it is inundated by only very high tides. It co-occurs with *Aegiceras corniculatum, B. cylindrica, B. gymnorhiza and Xylocarpus granatum*. Globally, the species is found in the intermediate estuarine zone in the high intertidal region (i.e. back mangrove areas).	**Unlikely** Outside known distribution
Hairy-joint Grass	*Arthraxon hispidus*	V	V	In Queensland it occurs north to Port Douglas, and west to disjunct occurrences around mound springs in Carnavon National Park (NP); however, most occurrences are from Noosa southwards. Hairy-joint Grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps as well as woodland.	**Unlikely** Outside of known distribution.
Lesser Swamp-orchid	*Phaius australis*	E	E	This species is associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark (*Melaleuca leucadendra*) or Swamp Mahogany (*Eucalyptus robusta*) are found. Less commonly, the species has been found in drier forest near the coast.	**Unlikley** Proximal records present and suitable habitat present. **Targeted searches for this species did not detection any individuals.**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Middle Filmy Fern	*Polyphlebium endlicherianum*	E	V	The middle filmy fern grows on damp rocks and tree trunks in tropical rainforest, often near streams or beside waterfalls, in moist and shaded sites. In Qld, herbarium collections have been made on a deeply shaded rock wall, on a damp rock in a dried stream bed, and in closed forest on granite sands. In Qld, the species has been recorded in the Atherton Tablelands at Kauri Creek (about 500 m due south-west of Mt Haig), Tinaroo Hills (7.5 km up Forestry Road B), and in Maalan State Forest.	**Unlikely** No well-developed rainforest habitat present within project site and outside altitudinal range.
Native Moth Orchid	*Phalaenopsis rosenstromii*	E	E	The Native Moth Orchid is found in humid rainforest areas, close to waterfalls or streams, in deep gorges, sheltered slopes or gullies in notophyll vine thickets, deciduous vine thickets and in open forest. The Native Moth Orchid grows in shaded or partially shaded positions, on trees and less commonly on rocks. The species is found at altitudes from 200–500 m above sea level (though is less common below 500 m). The distribution of the Native Moth Orchid overlaps with the *Mabi Forest (Complex Notophyll Vine Forest 5b)*, which is listed under the EPBC Act as a Critically Endangered Ecological Community.	**Unlikely** No well-developed vine forest habitat present within project site and outside altitudinal range.
Pale Chandelier Orchid	*Acriopsis emarginata syn. Acriopsis javanica*	V	V	*Acriopsis javanica* is endemic to north Queensland, from the tip of Cape York Peninsula to the Daintree River. This species has been recorded from Daintree River valley, Leo Creek (Timber Reserve 14), McIlwraith Range, Mount Bulbin South, Tozers Gap, and Mount Norkwa. *Acriopsis javanica* is considered widespread and common within its range. This species occurs within the Wet Tropics and Cape York (Queensland) Natural Resource	**Unlikely** **Targeted searches for this species did not detection any individuals. Die back of RE 7.1.1 adjacent further**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				Management Regions. *Acriopsis javanica* grows on trees in hot, humid, lowland rainforest, rainforest margins, and in swamps. This species is found in near-coastal swamps in the most southerly parts of its range where it can be found growing on paperbarks, palms, and Pandanus spp. It has been found growing up to 380 m above sea level. Specimens from the Leo Creek area were recorded from a complex mesophyll vine forest along a watercourse on metamorphic soils.	**reduces quality of habitat within the project site.** Proximal records present
Rock Tassel-fern	*Phlegmariurus squarrosus*	CE	CE	*Phlegmariurus squarrosus* is restricted to north-east Queensland, where it has been recorded from McIlwraith Range, Cape Tribulation region, the Mossman region, around Mt Bellenden Ker and 'near Cairns'. *Phlegmariurus squarrosus* occurs on rocks, particularly around waterfalls, or on tree trunks in lowland swamps and low to mid-altitude rainforest.	**Unlikely** No well-developed rainforest habitat present or freshwater riparian areas.
Square tassel fern	*Phlegmariurus tetrastichoides*	V	V	*Phlegmariurus tetrastichoides* is an epiphyte found on rainforest trees in north-eastern Qld, ranging from the Daintree and Hinchinbrook Island south to Mackay, and from sea level to 1100m in altitude. All known populations are in areas of remnant vegetation, protected from broad-scale clearing under the *Vegetation Management Act 1999*. This species occurs within the Wet Tropics, Cape York, and Mackay Whitsunday Natural Resource Management regions. Its distribution overlaps with the "Mabi Forest (Complex Notophyll Vine Forest 5b)" EPBC Act-listed threatened ecological community.	**Unlikely** No well-developed rainforest habitat present within project site
Thin Feather Orchid	*Dendrobium callitrophilum*	V	V	*Dendrobium callitrophilum* is endemic to north-east Queensland where it occurs on the Evelyn, Mt Windsor, Atherton and Carbine Tablelands and some of the higher mountains between the Daintree and Bloomfield Rivers	**Unlikely** No well-developed rainforest habitat present

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				. *Dendrobium callitrophilum* grows at altitudes of 760–1500 m above sea level, in or close to rainforest. It favours Stringybark Cypress Pine (*Callitris macleayana*) but also grows on various shrubby myrtles such as Austromyrtus.	within project site and outside of altitudinal range.
Migratory Species					
Asian Dowitcher	*Limnodromus semipalmatus*	V, MI, M	V	The Asian dowitcher is a non-breeding migrant to Australia, typically found in sheltered coastal environments such as embayments, coastal lagoons, estuaries, and tidal creeks. They feed in intertidal mudflats, frequenting shallow water and exposed mudflats or sandflats. In Australia, crucial habitat is provided by the Port Hedland Saltworks, where the species is commonly found in round ponds, channels of saltworks, sewage farms, and near-coastal swamps and lakes.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Barn Swallow	*Hirundo rustica*	Mi, M	SL	The Barn swallow is typically found in northern Australia, including Cocos-Keeling Island, Christmas Island, Ashmore Reef, and intermittently along the north coast of the mainland from the Pilbara region in Western Australia to Fraser Island in Qld. In Australia, it inhabits open country in coastal lowlands, often near water bodies, towns, and cities. Barn swallows are frequently observed perched on overhead wires and can also be seen in or over freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets, and tussock grassland.	**Moderate** Generic foraging available, may occur as infrequent flyover.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Bar-tailed Godwit	*Limosa lapponica*	Mi, M	SL	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Common Greenshank	*Tringa nebularia*	V, MI, M	V	The common greenshank is a non-breeding migrant to Australia, boasting the most extensive distribution among shorebirds in the country. Its habitat preferences span coastal and inland wetlands, encompassing mudflats, saltmarshes, mangroves, and seagrass beds along the coast. In inland regions, it frequents various wetland categories such as swamps, lakes, dams, rivers, and floodplains, often utilising artificial wetlands such as sewage farms and saltworks. Characteristic of its favoured habitats are muddy or clay-edged expanses, occasionally sandy, adorned with vegetation such as sedges, rushes, mangroves, and trees. Although documented in pasture alongside Black-winged stilts, it typically eschews dry grassland environments.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Common Noddy	*Anous stolidus*	Mi, M	SL	In Australia, the Common noddy is primarily found in the ocean off the Qld coast. During breeding season, they inhabit islands, rocky islets, coral or sand shoals, and cays, often nesting in bushes, saltbush, Pigface, grass, bare rock, or on top of rocks, shingle	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				beaches, coral rubble, or sand close to grassy areas. They may also nest in tall trees, coconut palms, dead timber, tree stumps, or cliff ledges on islands like Lord Howe, Kermadec, and Christmas Islands.	within the project site. May utilise adjacent mangrove communities.
Common Sandpiper	*Actitis hypoleucos*	Mi, M	SL	The common sandpiper is a migratory species to Australia and inhabits coastal and inland wetlands with varying salinity levels, typically favouring muddy or rocky shores. It can be found in estuaries, deltas, lakes, pools, billabongs, and occasionally near piers and jetties. This species often associates with mangroves and frequents areas with rocky or snag-filled mud. It primarily forages in shallow water and soft mud along wetland edges, occasionally venturing into nearby grassy areas.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Curlew Sandpiper	*Calidris ferruginea*	CE, MI, M	CE	Curlew sandpipers primarily inhabit intertidal mudflats in sheltered coastal regions like estuaries, bays, inlets, and lagoons. They can also be found around non-tidal swamps, lakes, and coastal ponds, including those in saltworks and sewage farms. While less common, they are occasionally observed inland around ephemeral and permanent lakes, dams, waterholes, and bore drains, typically in areas with exposed mud or sand edges. They are adaptable to both fresh and brackish waters and are sporadically recorded around floodwaters. In Qld, the Curlew sandpiper is widespread along the coast south of Cairns, with only sparsely scattered records inland.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Eastern Curlew	*Numenius madagascariensis*	CE, MI, M	CE	The eastern curlew predominantly inhabits coastal areas across all Australian states, particularly on sheltered coasts, estuaries, bays, harbours, and coastal lagoons featuring intertidal mudflats or sandflats. During the non-breeding season, the birds can be found on ocean beaches, coral reefs, and rocky islets, as well as in saltmarsh areas, mudflats fringed by mangroves, and coastal saltworks. Foraging occurs on soft intertidal sandflats or mudflats, avoiding grassy areas and near-coastal lakes. Roosting during high tide takes place on sandy spits, sandbars, islets, and among coastal vegetation, including low saltmarsh or mangroves, with occasional roosting on reef-flats and in the shallow water of lagoons and other near-coastal wetlands.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Fork-tailed Swift	*Apus pacificus*	Mi, M	SL	The fork-tailed Swift is a non-breeding visitor to all Australian states and territories, with scattered records in the Gulf Country and Cape York Peninsula, and frequent sightings east of the Great Divide from Cooktown to Townsville. They are commonly found west of the Great Divide, between Chinchilla and Hughenden, extending to locations like Richmond, Winton, Longreach, Gowan Range, Maraila National Park, and Dirranbandi, with occasional sightings further west to Windorah and Thargomindah. They are predominantly aerial and can be found over a variety of habitats, including inland plains, cliffs, beaches, islands, urban areas, dry landscapes, and even above rainforests and pine plantations.	**Moderate** Generic foraging available, may occur as infrequent flyover.
Great Frigate Bird	*Fregata minor*	Mi, M	SL	The Great Frigatebird breeds on small, remote tropical and sub-tropical islands, primarily nesting in mangroves or bushes, occasionally on bare ground. Major breeding populations are concentrated in tropical waters of	**Unlikely** There is a distinct lack of suitable wetland habitat

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				the Pacific and Indian Oceans. For foraging, they primarily inhabit pelagic waters within 80km of their breeding colony or roosting areas. The only known significant seabird breeding colonies, which support Frigate birds among other species, are confined to Pulu Keeling National Park, however, it has been suggested that the frigatebird roost at Weipa, Queensland should be recognised as nationally or internationally significant for one or both species of frigatebirds.	or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Greater Sand Plover	*Charadrius leschenaultii*	V, MI, M	V	The greater sand plover is a non-breeding migrant to Australia with a more westerly migratory route compared to other shorebirds. The species forages in sheltered coastal areas, including sandy, shelly, and muddy regions, as well as intertidal mudflats, sandbanks, estuaries, saltmarshes, coral reefs, rocky islands, and dunes. They feed on wet ground away from the water's edge, often in mixed flocks with other shorebirds. Their diet primarily consists of marine invertebrates such as molluscs, worms, and crustaceans. Roosting occurs on sand-spits, banks, and beaches, occasionally in saltmarshes or claypans, often above the high-tide mark. During hot weather, they seek cooler sites with damp substrates. Breeding takes place in dry, open, treeless areas up to 3,000m, including saltpans and rocky plains in deserts or semi-deserts.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Latham's Snipe	*Gallinago hardwickii*	V, MI, M	V	In Australia, the Latham's snipe is known to inhabit a wide range of permanent and ephemeral wetlands, typically favouring open freshwater wetlands with nearby shelter, often in the form of low and dense	**Unlikely** There is a distinct lack of suitable wetland habitat

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				vegetation. Their habitats include flooded meadows, seasonal or semi-permanent swamps, open waters, and various other freshwater settings like bogs, billabongs, lagoons, lakes, creek or river margins, river pools, and floodplains.	or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Lesser Frigate Bird	*Fregata ariel*	MI, M	SL		**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Little Tern	*Sternula albifrons*	MI, M	SL	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.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Oriental cuckoo	*Cuculus optatus*	Mi	SL	The oriental cuckoo is a regular migrant to Australia, where it spends the non-breeding season (Sept-May) in coastal regions across northern and eastern Australia as well as offshore islands. The species uses a range of	**Moderate**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				vegetated habitats such as monsoon rainforest, wet sclerophyll forest, open woodlands and appears quite often along edges of forests, or ecotones between forest types (Menkhorts et al. 2021).	Generic foraging available, may occur as infrequent flyover.
Osprey	*Pandion haliaetus*	Mi, M	SL	Ospreys inhabit littoral and coastal environments as well as terrestrial wetlands in both tropical and temperate regions of Australia, including offshore islands. Their primary presence is along coastal areas, with occasional ventures inland along major rivers, particularly in northern Australia. These birds necessitate expansive areas of open fresh, brackish, or saline water for foraging. Their foraging habitats encompass various wetland environments, such as inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs, and large lakes and waterholes. Although they display a preference for coastal cliffs and elevated islands in certain regions, they may also be found on low sandy, muddy, or rocky shores and over coral cays. Eastern ospreys can occasionally be observed over atypical habitats like heath, woodland, or forest when traveling to and from their foraging sites.	**Moderate** Generic foraging available, may occur as infrequent flyover.
Pectoral sandpiper	*Calidris melanotos*	Mi, M	SL	In Australasia, the pectoral sandpiper typically inhabits shallow wetlands, ranging from fresh to saline. They are commonly found in coastal areas, including lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains, and artificial wetlands. While their preference is coastal or near-coastal habitat, they are occasionally spotted further inland. They favour wetlands with open mudflats and low vegetation, such as grass or samphire, and have been recorded in swampy	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				areas overgrown with lignum. Their foraging occurs in shallow water or soft mud at wetland edges.	
Red Knot	*Calidris canutus*	V, Mi, M	V	The red knot inhabits the Australian coast with notable concentrations in north-west Australia. It primarily inhabits intertidal mudflats, sandflats, and sandy beaches along sheltered coasts, including estuaries, bays, inlets, lagoons, and harbours. Occasional sightings include sandy ocean beaches, exposed wave-cut rock platforms, or coral reefs. The species is sporadically observed in terrestrial saline wetlands near the coast, such as lakes, lagoons, pools, and pans, as well as on sewage ponds and saltworks. However, freshwater swamps and inland lakes are rarely utilised. Foraging typically takes place in soft substrate near the water's edge on intertidal mudflats or sandflats exposed during low tide. During high tide, they may feed at nearby lakes, sewage ponds, and floodwaters. Roosting sites include sandy beaches, spits, islets, and mudflats, along with shallow saline ponds in saltworks. The red knot prefers open roosting areas, far from potential cover for predators but close to feeding grounds.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
Red Rumped Swallow	*Cecropis daurica*	Mi, M	SL	The Red-rumped swallow is infrequently recorded in Australia, serving as a non-breeding migrant to the northern regions of the country, particularly northeastern Qld. Despite limited information about the species in Australia, its habits align with those of other aerial insectivores. The species is commonly observed over grassland, where it engages in hawking.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Sharp-tailed Sandpiper	*Calidris acuminata*	V, Mi, M	V	During non-breeding season, the sharp-tailed sandpiper predominantly inhabits south-east Australia, and is widespread in both inland and coastal locations, favouring freshwater and saline habitats. In Qld, they are found across most regions, with a significant presence along the coast and scattered sightings inland, often during migration. Their preferred habitats include muddy edges of shallow wetlands with emergent vegetation such as sedges, grass, or saltmarsh, encompassing lagoons, swamps, lakes, and coastal pools, as well as dams, waterholes, bore drains, and inland salt pans and lakes. They are also found in saltworks, sewage farms, and flooded paddocks, but migrate when these ephemeral wetlands dry up. The species forage at the water's edge on bare mud or sand, in shallow water, or among inundated vegetation, including saltmarsh and sedges. They are adaptable feeders, also frequenting sewage ponds and hypersaline environments, and may venture into paddocks of short grass after rain. Roosting typically occurs at wetland edges, in shallow water, or among sparse vegetation like grass or saltmarsh.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.
White-tailed Tropicbird	*Phaethon lepturus*	Mi, M	LC	The White-tailed tropicbird is a common inhabitant of northwest Australia and occasional visitor to the Coral sea and east coast. A mostly oceanic species, it is rarely observed inshore, except when breeding. Nests are located on islands and atolls in rainforests, on bare sandy ground and on rocky terrain.	**Unlikely** There is a distinct lack of suitable wetland habitat or exposed flats/sandbars within the project site. May utilise adjacent mangrove communities.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
White-throated Needletail	*Hirundapus caudacutus*	V, Mi, M	LC	The white-throated needletail is widespread in eastern and south-eastern Australia during the summer months. In eastern Australia, it is observed in all coastal regions of Qld and NSW, extending inland to the western slopes of the Great Divide and occasionally onto adjacent inland plains. This species is predominantly aerial, ranging from heights of less than 1m to over 1,000m above the ground, rendering conventional habitat descriptions inapplicable. Nevertheless, certain preferences are exhibited, with a higher occurrence above wooded areas, including open forest, rainforest, and heathland. They may also fly between trees or in clearings below the canopy, though less commonly above woodlands, or treeless areas such as grassland or swamps. Foraging often takes place in areas with updraughts, such as ridges, cliffs, sand dunes, or along the edges of low-pressure systems. The white-throated needletail has been recorded roosting in trees within forests and woodlands, either among dense foliage in the canopy or in hollows.	**Unlikely** Generic foraging available, but due to the size of the site species presence is considered unlikely. May occur as an infrequent flyover.
Estuarine Crocodile	*Crocodylus porosus*	Mi, M	V	In Queensland the Salt-water Crocodile inhabits reef, coastal and inland waterways from Gladstone on the east coast, throughout the	**Unlikely** There is a distinct lack of suitable estuarine habitat or exposed flats/sandbars within the project site.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				Cape York Peninsula and west to the Queensland-Northern Territory border.	Species is confirmed within the bloomfield river adjacent to site.

[1] **EPBC Act** Conservation Status: CE=Critically Endangered, E=Endangered, V=Vulnerable, Mi=Migratory, M=Marine.

[2] **NC Act** Conservation Status: CE=Critically Endangered, E=Endangered, V=Vulnerable, NT=Near Threatened, LC=Least Concern, SL=Special Least Concern

[3] **Habitat Preference** information is gathered from the SPRAT-profile of each species (DE 2025), along with the corresponding Conservation Advice if available, unless explicitly mentioned otherwise.

[4] All records of occurrences are sourced from the Atlas of Living Australia (ALA 2025) for fauna and the Australian Virtual Herbarium (AVH 2025) for flora, unless explicitly mentioned otherwise.

[5] **Known** to occur: species were recorded during field surveys. **Likely** to occur: suitable habitat for the species is present within or near the project site, and the species has been recorded within the extent of the desktop search. **Possible** occurrence: the project site is within the species known distribution, and suitable habitat is available; however, the species has not been recorded within the extent of the desktop search; and/or suitable habitat may be degraded or limited in extent, reducing the likelihood of species occurrence. **Unlikely** to occur: the project site does not provide suitable habitat for the species or is outside the species known distribution.

Appendix B Protected Matters Database Search

Appendix C Wildlife Online (NC Act 1992)

Appendix D Vegetation Management Report

Appendix E Project Site Flora List

Family	Scientific name	Common name	NC Act	EPBC Act
Acanthaceae	*Barleria strigosa**	Barleria	I	-
Acanthaceae	*Pseuderanthemum variabile*	Pastel flower	LC	-
Amaranthaceae	*Alternanthera brasiliana**	Brazilian joy weed	I	-
Anacardiaceae	*Blepharocarya involucrigera*	Rose butternut	LC	
Anacardiaceae	*Buchanania arborescens*	Jam jam	LC	-
Anacardiaceae	*Mangifera indica**	Mango	LC	-
Araliaceae	*Heptapleurum actinophylumm*	Umbrella tree	LC	-
Araliaceae	*Polyscias elegans*	Celary wood	LC	-
Arecaceae	*Cocos nucifera*	Coconut	LC	-
Asteraceae	*Ageratum conyzoides**	Billy goat weed	I	-
Asteraceae	*Praxelis clematidea**	Praxelis	I	-
Asteraceae	*Sphagneticolia trilobata***	Singapore daisy	I	-
Asteraceae	*Synedrella nodiflora**	Cinderella weed	I	-
Burseraceae	*Canarium muelleri*	Scrub turpentine	LC	-
Cannabaceae	*Trema tomentosa*	Poison peach	LC	-
Combretaceae	*Terminalia microcarpa*	Damson plum	LC	-
Combretaceae	*Terminalia muelleri*	Beach almond	LC	-
Combretaceae	*Terminalia sericocarpa*	Damson plum	LC	-
Commelinaceae	*Commelina ensifolia*	Scurvy grass	LC	-
Convolvulaceae	*Ipomoea indica**	Blue morning glory	I	-
Crassulaceae	*Kalanchoe pinnata (Bryophyllum pinnatum)**	Resurrection plant	I	-
Cyperaceae	*Cyperus aromaticus**	Navua sedge	I	-
Cyperaceae	*Garnia aspera*	Saw-sedge	LC	-
Dioscoreaceae	*Dioscorea bulbifera var. bulbifera*	Native yam	LC	-
Euphorbiaceae	*Excoecaria agallocha*	Milky mangrove	LC	-
Euphorbiaceae	*Macaranga tanarius*	Blush macaranga	LC	-
Euphorbiaceae	Mallotus philippensis	Red Kamala	LC	-
Fabaceae	*Senna obtusifolia***	Sicklepod	I	-
Fabaceae	*Stylosanthes scabra**	Stylo	I	-
Flagellariaceae	*Flagellaria indica*	Supplejack	LC	-
Hemerocallidaceae	*Dianella bambusifolia*	Flax lily	LC	-
Hernandiaceae	*Hernandia nymphaeifolia*	Lantern tree	LC	-
Lauraceae	*Neolitsea brassii*	Grey bolly gum	LC	-
Laxmanniaceae	*Eustrephus latifolius*	Wombat berry	LC	-
Leguminosae (Caesalpinioideae)	*Acacia auriculiformis*	Northern black wattle	LC	-
Leguminosae (Caesalpinioideae)	*Acacia crassicarpa*	Northern wattle	LC	-
Leguminosae (Caesalpinioideae)	*Mimosa pudica**	Sensitive weed	I	-
Leguminosae (Papilionoideae)	*Calopogonium mucunoides**	Calopo	I	-
Leguminosae (Papilionoideae)	*Macroptilium atropurpureum**	Siratro	I	-
Malvaceae	*Sida rhombifolia**	Sida	I	-

Malvaceae	*Urena lobata**	Urena burr	I	-
Meliaceae	*Melia azedarach*	White cedar	LC	-
Moraceae	*Ficus benjamina*	Weeping fig	LC	-
Moraceae	*Ficus opposita*	Sandpaper fig	LC	-
Myrtaceae	*Corymbia tessellaris*	Moreton bay ash	LC	-
Myrtaceae	*Eugenia reinwardtiana*	Cedar bay cherry	LC	-
Myrtaceae	*Lophostemon suaveolens*	Swamp box	LC	-
Myrtaceae	*Melaleuca leucadendra*	Narrow leaf paperbark	LC	-
Oleaceae	*Chionanthus ramiflorus*	Native olive	LC	-
Oleaceae	*Jasminum didymum*	Native jasmine	LC	-
Phyllanthaceae	*Breynia cernua*	Coffee bush	LC	-
Piperaceae	*Piper caninum*	Native pepper	LC	-
Poaceae	*Chloris gayana**	Rhodes grass	I	-
Poaceae	Chrysopogon aciculatus	Mackie's pest	I	-
Poaceae	*Eleusine indica**	Crows foot	I	-
Poaceae	*Megathyrsus maximus**	Guinea grass	I	-
Poaceae	*Melinis repens**	Red natal	I	-
Poaceae	*Oplismenus compositus*	Running mountain grass	LC	-
Poaceae	*Themeda quadrivalvis**	Grader grass	I	-
Polypodiaceae	*Drynaria quercifolia*	Oakleaf fern	LC	-
Rhamnaceae	*Alphitonia excelsa*	Soap tree	LC	-
Rhizophoraceae	*Bruguiera gymnorhiza*	Orange mangrove	LC	-
Rubiaceae	*Myrmecodia beccarii*	Ant plant	V	V
Rubiaceae	*Nauclea orientalis*	Leichhardt tree	LC	-
Rubiaceae	*Psydrax odorata*	Alahe'e	LC	-
Sapindaceae	*Cupaniopsis foveolata*	Narrow-leaf tuckeroo	LC	-
Sapindaceae	Jagera pseudorhus	Pink Foambark	LC	-
Smilacaceae	*Smilax australis*	Smilax	LC	-
Verbenaceae	*Lantana camara***	Lantana	I	-
Verbenaceae	*Stachytarpheta jamaicensis**	Snake weed	I	-
Vitaceae	*Leea novaguineensis*	Bandicoot berry	LC	-

EPBC Act Conservation Status: CE=Critically Endangered, E=Endangered, V=Vulnerable

NC Act Conservation Status: CE=Critically Endangered, E=Endangered, V=Vulnerable, NT=Near Threatened, LC=Least Concern, SL=Special Least Concern, I=Introduced (exotic)

Protected Plant Survey & Impact Management Plan

MCU development application for

Lot 26 SR750 and 1 A3024, Bloomfield

March 2025

Protected Plant Survey & Impact Management Plan

MCU development application for

Lot 26 SR750 and 1 A3024, Bloomfield

March 2025

Revision History

Version	Purpose	Issued by	Date	Reviewer	Date
1.0	Draft	Jade Coase	10-04-2025	Ryan Hughes	11-04-2025
2.0	Alignment Update	Jade Coase	29-05-2025	Tayla Horton	04-06-2025

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Contents

Appendices

1.0 Introduction

Four Elements Consulting was commissioned by Gilvear Planning Pty Ltd to undertake a Protected Plant Survey (PPS) for a proposal which seeks approval or a Development Permit for Material Change of Use for lots 26 SR750 and 1A3024 in the locality of Bloomfield QLD 4895. All remnant vegetation within the lots including the clearing alignments are located within the protected plant high risk trigger area. This has triggered the requirement for a protect plant survey and impact management plan which is provided in the below report body.

A Protected Plant Survey was conducted as per the Flora Survey Guidelines – Protected Plants (DES 2020) by 4 Elements botanist Jade Coase on the 4th of March 2025. Protected plants and/or threatened plants as defined under the NC Act 1992 and EPBC Act 1999 were recorded in this survey and therefore an Impact Management Plan is also provided for submission to the Department of Environment, Science and Innovation for assessment of the proposal.

1.1 Project Site Description

The location of the project sites are Lot 26 on SR750 and Lot 1 on A3024 directly south of the township of Ayton, located approximately halfway between Cape Tribulation and Cooktown on the Bloomfield river (**Figure 1**) within The Cook Shire Council local government area. The elevational range of the project site is approximately ~0m to 14m above sea level (asl). The entire project site clearing footprint occurs on a single landform consisting of quaternary flood-plain alluvium consisting of clay, silt, sand and gravel This geology aligns with land zone 3 under the REDD v 13.1. No watercourses are mapped within the project site though the lots are immediately adjacent to the Bloomfield River and the associated tidal and estuarine environments of the system.

Lot 26SR750 and 1A3024 both contain remnant (Category B), and non-remnant vegetation (Category X) as do the adjacent road parcels (see Figure 2). The projects seeks to build a food and beverage outlet on 26SR750 and associated accommodations and staff housing on A13024. Approximately 0.24 ha of mapped remnant vegetation under REDD 13.1 is slated for clearing (0.13 ha for 26SR750 and 0.11 ha for 1A3024). The vegetation communities onsite are generally consistent with the state mapping, with evidence of disturbance due to recent flood events and historical clearing.

The protected plant high risk trigger mapping is located within all mapped remnant vegetation across both lots and surrounding areas.

For the purposes of this report,

- The proposed alignment is the direct clearing area for the development across both lots.
- Clearance Impact Area (CIA) is the area of vegetation within 100 m of the proposed clearing alignment.
- The locality is within ~10 km of the project site and;
- The region is the Wet Tropics Bioregion.

1.2 Scope of Works

The objectives of this assessment were to:

- Review and identify species of protected/ threatened flora occurring or considered likely to occur on/or within the proposed clearing impact area;
- Identify all flora species within the clearing impact area where access is permitted/ required under the Protected Plants Assessment Guidelines (2006);
- Identify likelihood of occurrence and subsequent impact for any EVNT flora species listed under the Environmental Protection and Biodiversity Act 1999 (EPBC Act) or the Nature Conservation Act 1992 (NCA Act) as a result of the field survey (PPS);
- Ground truth all regional ecosystems mapped under the Regional Ecosystem Description Database (REDD v 13.1).

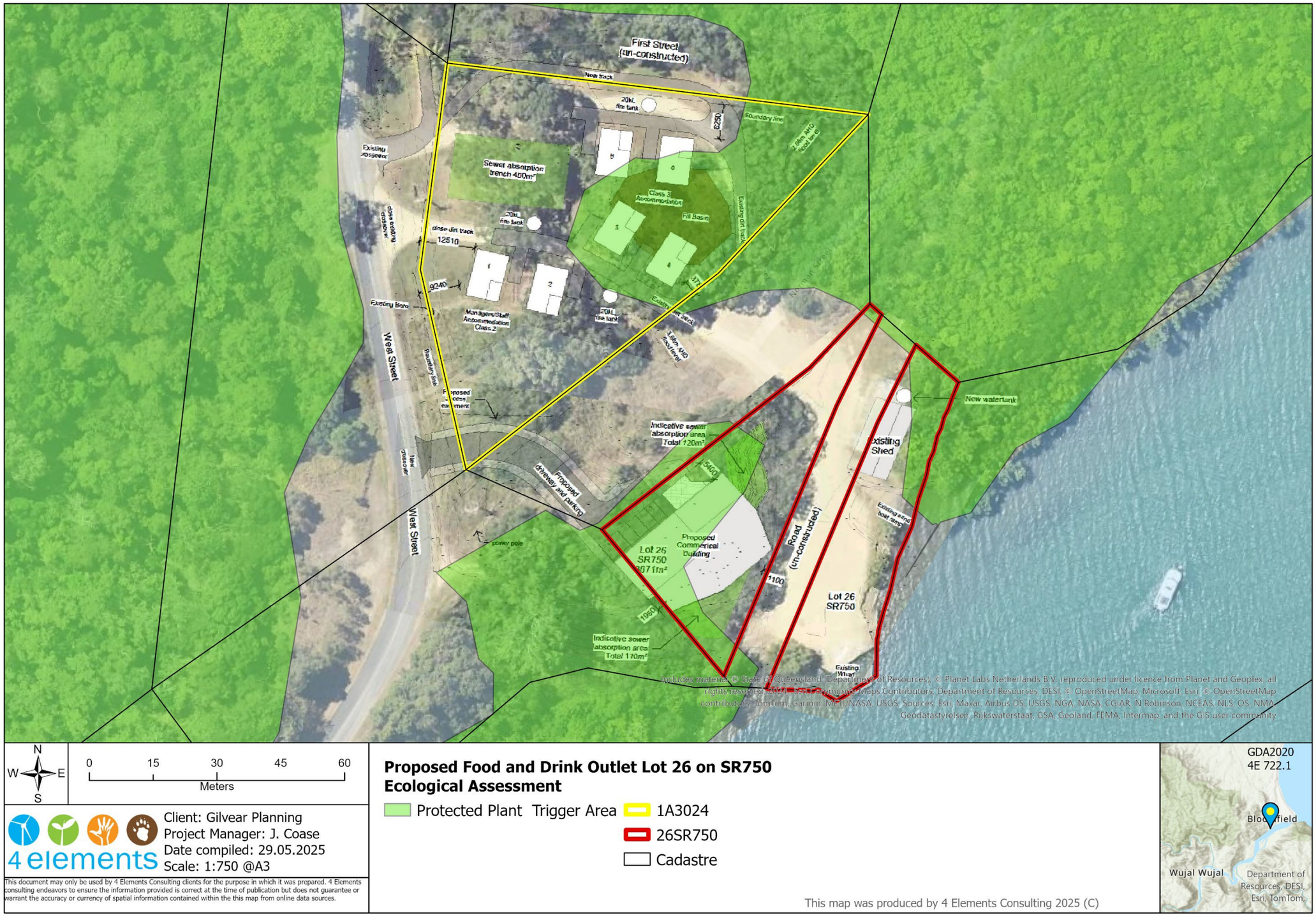

Figure 1. Proposed building and infrastructure footprints and protected plant trigger areas

1.3 Survey Limitations

The survey was undertaken on the 4th March 2024, which is considered to be the mid to late wet season for the region. With the prevailing wet conditions, the survey timing was considered appropriate for this vegetation community. The component layers of the vegetation communities present including epiphytic species were readily detectable. All trees and shrubs had leaves present though not many species were in fruit. All potentially occurring species were adequately assessed for the purpose of this report.

1.4 Site Access

The entirety of the proposed clearance alignment was accessible to be traversed during the PPS. All efforts were made to search as much of the 100 m buffer as was practical though standing water and mud prevented safe access to some vegetation to the east of the site below the highest astronomical tide. Permission to access adjacent private land was not granted and therefore freehold land within the 100 m buffer was not assessed. Timed meander tracks are provided in (**Figure 2**).

2.0 Methodology

2.1 Desktop review

4 Elements Consulting completed a review of relevant mapping, databases, legislation and associated plans and policies to identify potential matters of ecological significance. These include listed threatened species and vegetation communities, and other ecological features that may occur on or within proximity of the development. This review included an assessment of the following:

- Wildlife Online database of flora and fauna (DESI 2024a). This database holds records of plants and animals that have either been sighted or collected within a given radius of the property (a search parameter was prescribed limiting the search area to a 10 km radius around the property. The records held in this database are maintained by DESI.
- Protected Matters database of MNES (DCCEEW 2024). This database applies a range of bio-models to predict the presence of species of flora and fauna and other MNES within a given radius of the property (a search parameter was prescribed limiting the search area to a 10 km radius) as cited under the Commonwealth's EPBC Act.
- Protected Matters database of MSES (DES 2024b). This database applies a range of bio-models to predict the presence of species of vegetation and other MSES within a given property.
- Review of relevant legislation and associated plans and policies, including but not limited to the QLD NC Act, VM Act, EPBC Act, and the Water Act.
- Literature review. A range of scientific papers, recovery and conservation plans, and other ecological assessment and literature were reviewed for a number of related matters (such as targeted threatened species).
- Digital mapping on Queensland Globe to determine vegetation communities within and surrounding the property, and to review the extent of historical clearing and land use, and any other significant environmental features such as watercourses and wetlands.
- Australian Virtual Herbarium (for voucher notes and distribution records of threatened flora species).

2.2 Field Survey Methodology

The field survey was undertaken over a single day on Wednesday 4th of March 2025. The primary aims of this investigation are explained below.

2.2.1 Timed Meander Survey

One (1) timed meander (~2 hours) was conducted across the entire clearing impact area by suitably qualified persons Jade Coase (see **Section 5.0**). A 100 m radius of the planned vegetation clearance area was searched (see **Figure 2**). The survey effort undertaken exceeded the methodology required under the Flora Survey Guidelines – Protected Plants (DES 2020). This methodology states requires that during timed meanders, the

time is recorded approximately every 5 minutes while conducting a search for threatened or near threatened plants. If no threatened or near threatened species are recorded the search continues for 30 min or when the entire area is surveyed, whichever happens sooner. If threatened or near threatened species are recorded the search must continue for at least 30 min after the last plants is recorded or when the entire area is surveyed, whichever happens sooner.

All vascular plant species observed in this meander survey were recorded to compile a list of all species detected (see **Table 1** below). For species that could not be identified confidently in the field, a voucher specimen was collected and used for later identification. No specimens were required to be sent to the Queensland Herbarium for verification in this survey.

2.2.1.1 Regional Ecosystem Verification

Delineation of regional ecosystem distributions across the project was achieved using quaternary level assessments, or rapid plots, as per the QBEIS methodology v7.0 (Neldner *et al* 2023). These assessments are designed to capture information quickly targeting soil and landform and key species within each vegetation structural layer. This information is generally sufficient to determine the identity of a regional ecosystem. A total of two (2) quaternary surveys were undertaken throughout the project sites.

2.2.1.2 Weed Assessment

Weeds were identified during the field survey. All records were GPS located and notes on infestation size and ecological impacts noted. The purpose of detail weed incursion is to describe the ecological condition of the project site which assists in determining the potential occurrence of additional threatened flora species recorded in the project site locality.

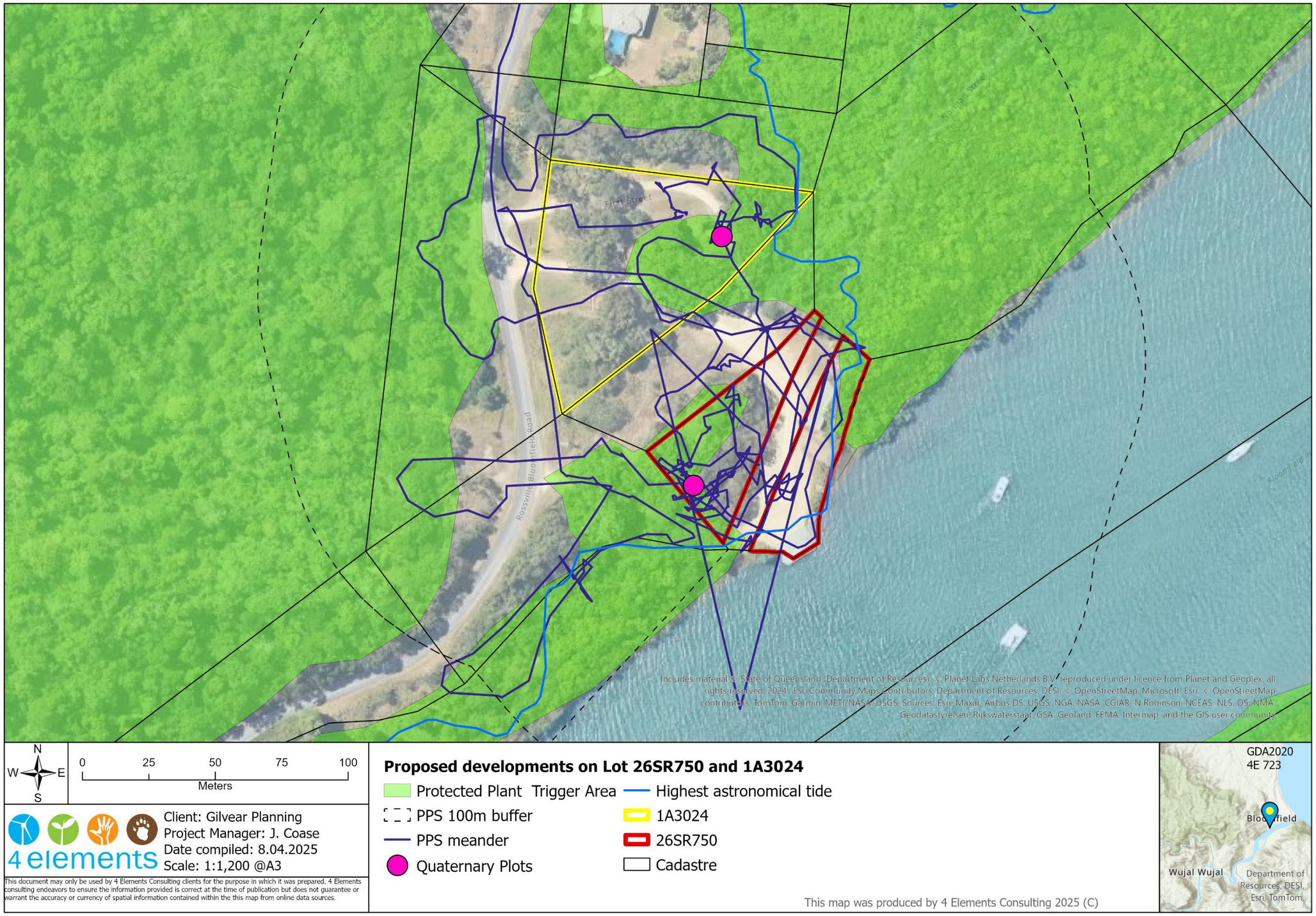

Figure 2 Quaternary Plot Survey Locations and Flora Survey Meander

3.0 Results

3.1 Desktop Analysis Results

3.1.1 EPBC and NCA Database Search

Desktop searches were made of the:

Environment Protection and Biodiversity Act 1999 (EPBC Act) Protected Matters database (**Appendix A**).

Nature Conservation Act 1992 (NCA Act) Environmental Reports online:

- Protected Matters Search Tool (**Appendix A**)
- Wildlife Online (**Appendix B**)
- Potential Occurrence Assessment (**Appendix C**)

3.1.2 EPBC Act Protected Matters Search Tool

A 10 km radius from a central point (145.3517°E 15.9262°S) within the project site was applied in the search tool to identify the locality. Searches of the EPBC Act Protected Matters Search Tool returned records of and 23 threatened flora potentially occurring within the locality. The complete online EPBC protected matters search tool output results are provided in **Appendix A**.

3.1.3 NC Act Wildlife Online

The *Nature Conservation Act 1992* (NC Act) Wildlife Online database search was based on a 10 km radius from a central point within the project site 145.3519°E 15.9264°S). The search returned a total of records of 10 plants. The complete online search results are provided in **Appendix B**.

3.1.4 Combined Potential Occurrence

Condensed results *which summarise the results of all search outputs* are combined in (**Table 1**) and identify that 33 flora which are endangered, vulnerable or near threatened (EVNT) species which have potential to occur within 10 km of the project site.

Appendix C assesses the risk of EVNT species known to occur within the locality and their potential of occurring on the project site. This risk was considered after the property assessment was completed.

Table 1: Potentially occurring threatened species (EPBC Act and NC Act)

Scientific Name	Common Name	EBPC Act	NC Act
Threatened Flora			
Acriopsis emarginata syn. Acriopsis javanica	Pale Chandelier Orchid	V	V
Aphyllorchis anomala	-	-	NT
Arthraxon hispidus	Hairy-joint Grass	V	V
Backhousia hughesii	-	-	CR
Bruguiera x hainesii	Haines's Orange Mangrove	CE	CE
Buckinghamia ferruginiflora	-	-	V
Chingia australis	-	E	E
Cyclophyllum costatum	-	V	V
Dendrobium callitrophilum	Thin Feather Orchid	V	V
Dendrobium carronii (*Cepobaculum carronii)*	-	V	V
Dendrobium johannis	Chocolate Tea Tree Orchid	V	V
Dendrobium mirbelianum	Dark-stemmed Antler Orchid	E	E
Dendrobium nindii	-	E	E
Dissiliaria tuckeri	-	-	E
Drosera prolifera	-	V	V
Heliodendron xanthoxylon	-	-	NT
Leichhardtia araujacea synonymous with *Marsdenia araujacea*	-	CE	CE
Meiogyne hirsuta	-	-	NT
Myrmecodia beccarii	Ant Plant	V	V
Oreogrammitis reinwardtii (Grammitis reinwardtii)	-	V	V
Phaius australis	Lesser Swamp-orchid	E	E
Phaius pictus	-	V	V
Phalaenopsis rosenstromii	Native Moth Orchid	E	E
Phlegmariurus dalhousieanus	Blue Tassel-fern	E	CE
Phlegmariurus squarrosus	Rock Tassel-fern	CE	CE
Phlegmariurus tetrastichoides	Square tassel fern	V	V
Polyphlebium endlicherianum	Middle Filmy Fern	E	V
Polyscias bellendenkerensis	-	V	V
Rhodamnia sessiliflora	-	-	E
Rhodamnia spongiosa	-	-	CR

Scientific Name	Common Name	EBPC Act	NC Act
Rhodomyrtus effusa	-	-	E
Vappodes phalaenopsis	Cooktown Orchid	V	-
Xanthostemon verticillatus	-	-	V
Key: Ex: extinct, CE: Critically Endangered; E: Endangered; V: Vulnerable; NT: Near Threatened			

3.2 Field Survey Results

The vegetation assessments focused on ground truthing RE mapping within the project site and correcting mapping where necessary from REDD version 13.1. This process resulted in identification of the remnant vegetation within lot 26SR750 being more consistent with RE 7.3.12b than the mapped 7.3.40 and vegetation within lot 1A3024 core consistent with RE 7.3.25b (see **Table 2** below). All other vegetation within the project site footprint is listed as Category X non-remnant vegetation under the Vegetation Management Act 1999. Estuarine habitat representative of RE 7.1.1 was present on the periphery of lot 26SR750 but is not part of the clearance area.

Table 2. Project Site Mapped Pre-Clearance Regional Ecosystem Descriptions

Regional Ecosystem	VMA Status	Clearing Alignment	Short Description	Project Site Value
REDD 13.1 - Land Zone 3 – Alluvials				
RE 7.3.40	Endangered	0.24 ha	*Eucalyptus tereticornis (forest red gum) open forest. Well-drained alluvial plains of lowlands. Not a Wetland. (BVG1M: 9e).*	7.3.40: Considered potential habitat for NCA listed species: *Dendrobium bigibbum, Habenaria rumphii, Peristylus banfieldii.*
Ground verified - Land Zone 3 – Alluvials				
RE 7.3.12b	Endangered	0.13 ha	*Eucalyptus tereticornis, Corymbia tessellaris, E. pellita, C. intermedia, Melaleuca dealbata and Lophostemon suaveolens woodland to open forest, often with a secondary tree layer of Acacia mangium and A. crassicarpa, and with a very well-developed vine forest understorey. Alluvial plains of lowlands. Not a Wetland. (BVG1M: 9e).*	7.3.12: Considered potential habitat for NCA listed species: Phlegmariurus phlegmarioides. Disturbed condition with heavy edge effects and weed incursion. *Acacia* spp. form dominant canopy layer with *E. tereticornis* and *C. tessellaris* to 20cm diameter at breast height (DBH) present on edge of small remnant patches

				within the clearing alignment.
RE 7.3.25b	Of Concern	0.11 ha	*Melaleuca leucadendra and Eucalyptus tereticornis, layered open forest, and closed forest with a vine forest understorey. Stream levees and prior streams on well-drained sandy clay loam alluvial soils. Riverine. (BVG1M: 22c).*	7.3.25: Important wildlife corridors in cleared landscapes. Known habitat for *Myrmecodia beccarii* (Ant Plant) listed Vulnerable under the EPBC Act 1999 and the NC Act 1992.

3.3 Vegetation Community Descriptions

The vegetation within the project site has a history of disturbance and is impacted strongly by edge effects and weed ingress into mapped remnant vegetation. The majority of the non-remnant areas are characterised by gravel roads and hardstands on 26 SR750 and maintained lawns of *Chrysopogon aciculatus* in lot 1A3024.

To the south and west of Lot 26 SR750 , a disturbed forest community with a pioneering vine forest understory was present (see **Plate 1** below). The canopy consisted of *Eucalyptus tereticornis* and *C. tessellaris* to 20m with a dense sub-canopy of *Acacia crassicarpa* and *Acacia auriculiformis* to 10-14m, with *Corymbia tessellaris* and *Melaleuca leucadendra* on the fringes/disturbed edges to 10m. The shaded understorey was being invaded by vine forest species and consisted of *Chionanthus ramiflorus*, Buchanania arborescens, *Psydrax odorata, Terminalia macrocarpa and* canopy associates (4-8 m). A sparse shrub layer comprised *Ficus opposita, Leea novoguineensis, and canopy associates* (1-2 m). A very sparse ground layer consisted of *Oplismenus compositus, and litter.* Evidence of disturbance was present within the mapped remnant community with the ground having been historically benched and old footing present. The narrow strip of remnant vegetation was also heavily impacted by edge affects with pioneer species such as *Macaranga tanarius*, *Trema tomentosa* and a variety of herbaceous weeds. Leaf litter accumulations were a dominant component of the ground layer. Soils were skeletal and poorly formed which limited grass cover.

Lot 1 A3024 was characterised by predominantly non-remnant areas consisting of landscaped and maintained *Chrysopogon aciculatus* lawns, interspersed with landscaped vegetation including *Terminalia muelleri, Cocos nucifera* and *Mangifera indica* (see **Plate 2** below). Remnant vegetation was present along the eastern edge of the block. This vegetation community was mapped as 7.3.40 in the REDD v 13.1 mapping but the vegetation composition and context was most similar to RE 7.3.25b with *Melaleuca leucadendra* forming an open forest with a canopy of 15-18m and an understory of *Acacia auriculiformis* and rainforest pioneer and vine forest species shrub layer including *Heptapleurum actinophyllum*, and *Jagera pseudorhus* and *Mangifera indica* to 8-12m (see Plate 3 below). Rainforest and vine encroachment was heavy within this community on Lot 1 A3024 with encroachment of some species such as *Terminalia muelleri, Nauclea orientalis* and *Melia azedarach* into the canopy along the fringe of the community.

RE 7.1.1 was present within the 100m buffer zone but not within the project lots or the project clearing footprints. This community was not surveyed due to water inundation and safety concerns over Estuarine Crocodiles. This community has suffered major dieback due to the flooding event associated with ex tropical cyclone Jasper.

Plate 1 Vegetation Condition Within the Clearing Impact Area on 26SR750 representative of RE 7.3.12b

Plate 2 Non-remnant areas of 1A3024

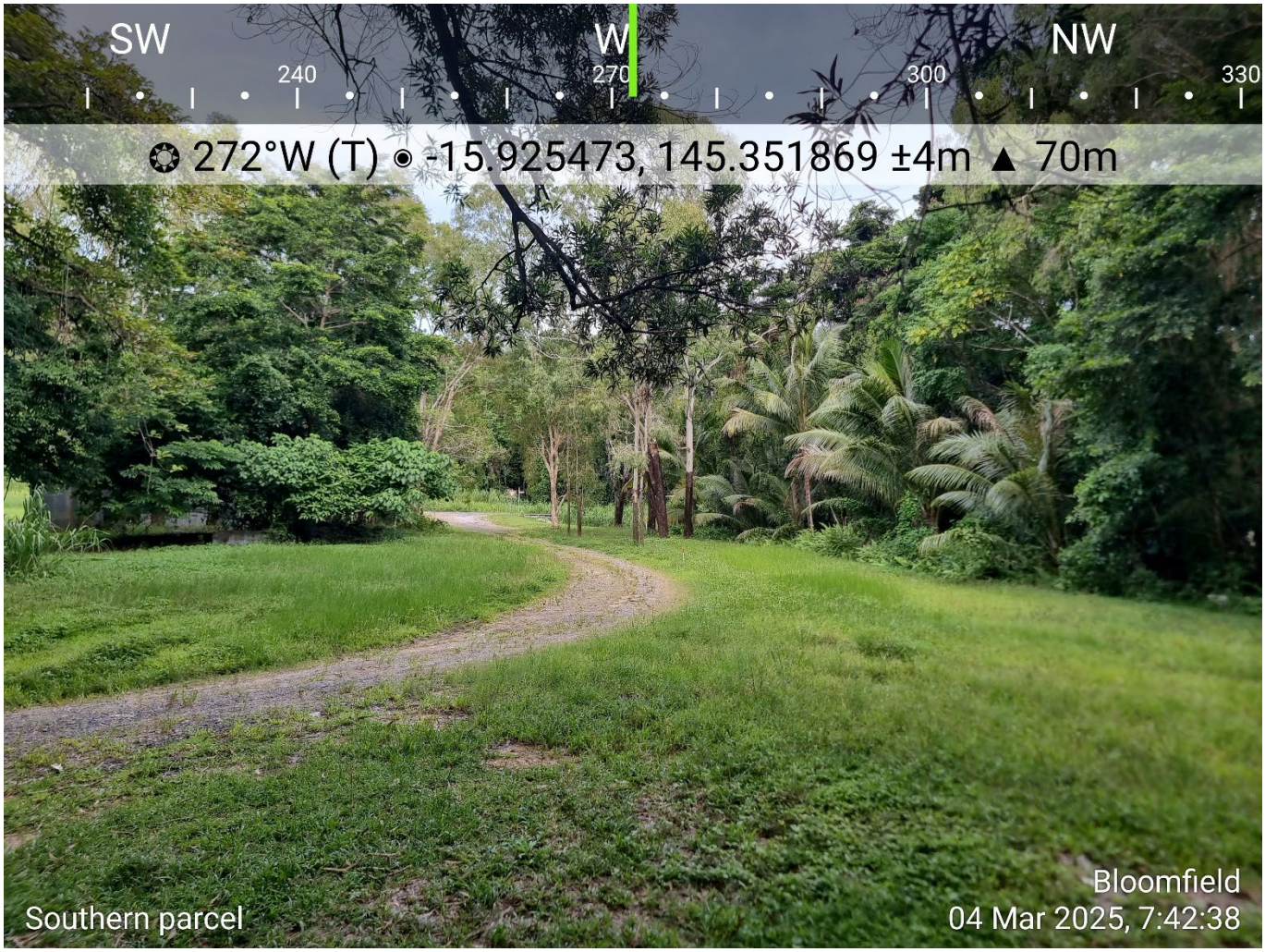

Plate 3 Vegetation on 1A3024 representative of disturbed RE 7.3.25b

3.4 General Flora

A total of 71 flora species were recorded within the clearing impact area (see **Table 3** below), with non-native weeds representing 34% (24) of this number. Given the disturbance of the project site, strong edge affects and land use on the sites, weed cover was fairly consistent throughout and most dominant in the ground layer and shrub layers in non-remnant areas and edges of remnant vegetation.

Table 3. All Flora Species Recorded During the Protected Plant Survey

Family	Scientific name	Common name
Acanthaceae	*Barleria strigosa**	Barleria
Acanthaceae	*Pseuderanthemum variabile*	Pastel flower
Amaranthaceae	*Alternanthera brasiliana**	Brazilian joy weed
Anacardiaceae	*Blepharocarya involucrigera*	Rose butternut
Anacardiaceae	*Buchanania arborescens*	Jam jam
Anacardiaceae	*Mangifera indica**	Mango
Araliaceae	*Heptapleurum actinophylumm*	Umbrella tree
Araliaceae	*Polyscias elegans*	Celary wood
Arecaceae	*Cocos nucifera*	Coconut
Asteraceae	*Ageratum conyzoides**	Billy goat weed
Asteraceae	*Praxelis clematidea**	Praxelis
Asteraceae	*Sphagneticolia trilobata***	Singapore daisy
Asteraceae	*Synedrella nodiflora**	Cinderella weed
Burseraceae	*Canarium muelleri*	Scrub turpentine
Cannabaceae	*Trema tomentosa*	Poison peach
Combretaceae	*Terminalia microcarpa*	Damson plum
Combretaceae	*Terminalia muelleri*	Beach almond
Combretaceae	*Terminalia sericocarpa*	Damson plum
Commelinaceae	*Commelina ensifolia*	Scurvy grass
Convolvulaceae	*Ipomoea indica**	Blue morning glory
Crassulaceae	*Kalanchoe pinnata (Bryophyllum pinnatum)**	Resurrection plant
Cyperaceae	*Cyperus aromaticus**	Navua sedge
Cyperaceae	*Garnia aspera*	Saw-sedge
Dioscoreaceae	*Dioscorea bulbifera var. bulbifera*	Native yam
Euphorbiaceae	*Excoecaria agallocha*	Milky mangrove
Euphorbiaceae	*Macaranga tanarius*	Blush macaranga
Euphorbiaceae	Mallotus philippensis	Red Kamala
Fabaceae	*Senna obtusifolia***	Sicklepod
Fabaceae	*Stylosanthes scabra**	Stylo
Flagellariaceae	*Flagellaria indica*	Supplejack
Hemerocallidaceae	*Dianella bambusifolia*	Flax lily
Hernandiaceae	*Hernandia nymphaeifolia*	Lantern tree
Lauraceae	*Neolitsea brassii*	Grey bolly gum
Laxmanniaceae	*Eustrephus latifolius*	Wombat berry
Leguminosae (Caesalpinioideae)	*Acacia auriculiformis*	Northern black wattle

Leguminosae (Caesalpinioideae)	*Acacia crassicarpa*	Northern wattle
Leguminosae (Caesalpinioideae)	*Mimosa pudica**	Sensitive weed
Leguminosae (Papilionoideae)	*Calopogonium mucunoides**	Calopo
Leguminosae (Papilionoideae)	*Macroptilium atropurpureum**	Siratro
Malvaceae	*Sida rhombifolia**	Sida
Malvaceae	*Urena lobata**	Urena burr
Meliaceae	*Melia azedarach*	White cedar
Moraceae	*Ficus benjamina*	Weeping fig
Moraceae	*Ficus opposita*	Sandpaper fig
Myrtaceae	*Corymbia tessellaris*	Moreton bay ash
Myrtaceae	*Eugenia reinwardtiana*	Cedar bay cherry
Myrtaceae	*Lophostemon suaveolens*	Swamp box
Myrtaceae	*Melaleuca leucadendra*	Narrow leaf paperbark
Oleaceae	*Chionanthus ramiflorus*	Native olive
Oleaceae	*Jasminum didymum*	Native jasmine
Phyllanthaceae	*Breynia cernua*	Coffee bush
Piperaceae	*Piper caninum*	Native pepper
Poaceae	*Chloris gayana**	Rhodes grass
Poaceae	Chrysopogon aciculatus	Mackie's pest
Poaceae	*Eleusine indica**	Crows foot
Poaceae	*Megathyrsus maximus**	Guinea grass
Poaceae	*Melinis repens**	Red natal
Poaceae	*Oplismenus compositus*	Running mountain grass
Poaceae	*Themeda quadrivalvis**	Grader grass
Polypodiaceae	*Drynaria quercifolia*	Oakleaf fern
Rhamnaceae	*Alphitonia excelsa*	Soap tree
Rhizophoraceae	*Bruguiera gymnorhiza*	Orange mangrove
Rubiaceae	*Myrmecodia beccarii*	Ant plant
Rubiaceae	*Nauclea orientalis*	Leichhardt tree
Rubiaceae	*Psydrax odorata*	Alahe'e
Sapindaceae	*Cupaniopsis foveolata*	Narrow-leaf tuckeroo
Sapindaceae	Jagera pseudorhus	Pink Foambark
Smilacaceae	*Smilax australis*	Smilax
Verbenaceae	*Lantana camara***	Lantana
Verbenaceae	*Stachytarpheta jamaicensis**	Snake weed
Vitaceae	*Leea novaguineensis*	Bandicoot berry

3.5 Threatened Flora

Searches for potentially occurring threatened flora species targeted the canopy, shrub and ground layer within a 100m buffer of the proposed subdivision alignment. A single *Myrmecodia beccarii* listed as Vulnerable under the EPBC Act 1999 and NC Act 1992 were recorded within a *Melaleuca leucadendra* canopy tree located on the edge of an existing road frontage on the eastern side of 1A3024 (see **Figure 3** & **Plate 2**). The plant is growing

within a natural *Melaleuca* swamp vegetation community and as a result are deemed to be "in the wild" under the Nature Conservation Act 1992. All suitable habitat that is proposed to be impacted for *Myrmecodia beccarii* was restricted to lot *1A3024.*

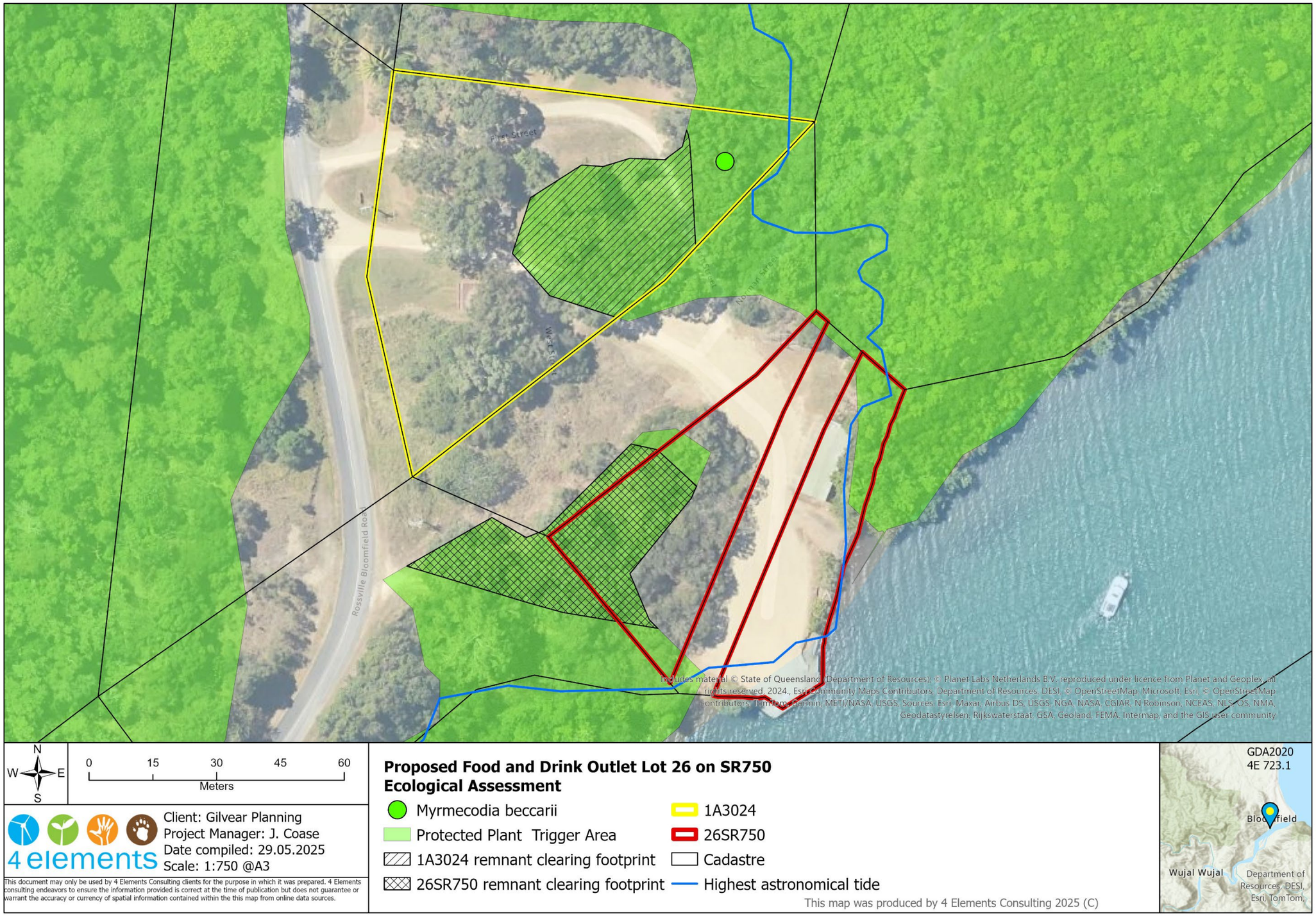

Figure 3. Location of Ant Plant Within 100m clearing buffer of impact areas.

3.5.1 Ant Plant – *Myrmecodia beccarii* (Vulnerable EPBC 1999 and NC act 1992)

The Ant Plant, *Myrmecodia beccarii*, was recorded within a single *Melaleuca leucadendra* canopy tree within RE 7.3.25b in the 100m clearance buffer area (see **Plate 2** below). This plant is a member of the Rubiaceae family. It has a narrow distribution within the Wet Tropics Bioregion being restricted to the coastal freshwater wetlands and mangrove communities between Ingham and Cooktown (AVH 2023).

Myrmecodia beccarii is a tuberous epiphyte which can reach a diameter up to 30 cm (DCCEEW 2008). The outside of the tuber is pale brown to grey with small spines borne on mounds. On mature plants, internal chambers form inside the tuber with smooth entrances where the Golden Ant (*Iridiomyrmex cordatus*) and the Apollo Jewel Butterfly (*Hypochrysops apollo apollo*) enter the plant forming a mutually beneficial relationship with the host plant. Stems emerge unbranched from the tuber of the plant where succulent elliptic to oblanceolate leaves to 9cm in length are oppositely arranged. Small white flowers (1cm in length) are pollinated to produce white fleshy fruits containing numerous seeds that are dispersed by birds and readily germinate when deposited on the branches of rough barked trees such as *Melaleuca* spp.

Myrmecodia beccarii was recorded at a single location within a *Melaleuca leucadendra* canopy tree 145.3519534°E 15.9255836°S). One (1) individual plant was recorded. This species was located on the tree where the canopy layer had an open structure. This allowed for a higher light level on the stable lower branches and trunks of the host tree which receive high sun exposure and on limbs which do not move readily in the wind.

Plate 4 Ant Plant Within Project Site Buffer Area

4.0 Impact Mitigation and Nature of Impact

After the completion of the population assessment for *Myrmecodia beccarii* the location of the single record was located outside of the development clearing alignment (see **Figure 3** above) and buffered from disturbance footprint by an existing gravel access road. The record was located within remnant vegetation consistent with RE 7.3.25b (*Melaleuca leucadendra* open forest), (Mapped as RE 7.3.40 – Endangered under REDD 13.1) and within an existing High Risk Trigger area for protected plants. The Ant Plant recorded was on the edge of the HAT with less vine forest/understory incursion with access to high light penetration to support flowering and fruiting. The lack of Ant Plants within the same RE within the disturbance footprint is highly likely to be due to the lack of light penetration due to dense understory shading through incursion of rainforest and pioneer species.

It is therefore considered by the consultant that the most effective mitigation would be to establish a tree protection zone around the host tree within the retained vegetation to ensure the host tree does not suffer root ball damage or other indirect impacts from the proposed works within 1A3024.'

No impact is expected from the development on 26SR750. This is due to the vegetation community to be impacted (7.3.12) being in a disturbed state with the acacia sub-canopy cover exceeding 70% and shading out any potential *Myrmecodia beccarii* habitat. The record is also buffered from the clearing proposed for 26SR750 by more than 60m with no continuous suitable habitat between the record and the impact area. Of the 60m buffer area to the record, 25m is an established gravel hardstand. With no suitable habitat within the clearing alignment on 26SR750, a sizable buffer distance to the *Myrmecodia beccarii* record and habitat area no significant direct or indirect impacts are considered likely.

No direct impacts are considered to threaten the *Myrmecodia beccarii* record, Indirect impacts to *Myrmecodia beccarii* as a result of the construction of the planned works on Lot 1A3024 are outlined in **Table 4** and **Table 5** respectively.

Table 4. Direct impacts to Ant Plant *Myrmecodia beccarii*

Threat	Potential Impact	Study Site Mitigation
Direct Removal of Plants	nil	No *Myrmecodia beccarii* records were identified within the project impact footprint.
Loss of habitat	A total of 0.11 ha of potential mapped habitat will be cleared as a result of the development.	The clearing of 0.11 ha of disturbed and edge impacted RE 7.3.25b will primarily remove Melaleuca leucadendra with a rainforest understory for the development of 1A3024. Remnant vegetation outside of the clearing footprint will be retained and have continuous connectivity through to the mangrove and tidally inundated communities present along the Bloomfield river which is also suitable habitat for *Myrmecodia beccarii.*

		While a small loss of habitat is proposed, there will be no impacts to connectivity through to the larger remnant tracts of suitable habitat for the species.

Table 5. Indirect impacts to Ant Plants *Myrmecodia beccarii*

Threat	Potential Impact	Study Site Mitigation
Weed Invasion	Disturbance of soil provides the opportunity for weed invasion. Weeds may also be transported to the site from vehicle, people (e.g. on clothing) and potentially via introduced fill material for civil works.	Existing weed incursion is relatively high given the high disturbance levels present, and continued access of the public to the site. It is not considered likely that the development of accommodation units will worsen the existing weed extents.
Edge Affects and Fragmentation	The fragmentation and/or isolation of currently intact vegetation via partial/mosaic clearing and establishment of building envelopes and roads can lead to edge effects. Ingress of weeds into areas not previously found. Alterations to microclimate i.e. drying, altered humidity levels, increases light penetration. Increased exposure to wind.	The establishment of the proposal will essentially remove 0.11 ha of edge habitat. No increase to fragmentation is expected. Connectivity of Ant Plant habitat locally will be retained, and no habitat will be isolated as a result of the development.
Pollution	Pollution or contamination through spillage of or inappropriate usage of petrochemicals, fertilisers and herbicides poses some risk. These chemicals generally reach adjacent habitats via contaminated runoff, groundwater, sedimentation and erosion. Erosion and sedimentation and eutrophication impacts may occur at both the construction and establishment phases of the proposed development.	Risk of pollution in the study area is reduced if care is taken when refuelling machinery associated with the works and appropriate housekeeping of the site is maintained. Refuelling must not occur in proximity to water ways or drainage areas.
Altered Hydrological Regimes	Alterations to topography, vegetative cover can increase water shedding rates, concentrate runoff, and affect flood peaks. Soil compaction and construction of hard surfaces can also influence these factors, plus reduce infiltration, which can adversely affect plant growth, aquifer recharge and wetland regimes.	No changes in hydrology are expected from the proposed development. The site is relatively flat and even with existing roads and old concrete slabs present throughout. The establishment of the proposed accommodations are not likely to negatively impact current hydrological regimes significantly to the extent that retained

		Myrmecodia beccarii habitat will be negatively impacted.
Erosion and Sedimentation	Sedimentation and erosion impacts can occur both during the construction and establishment phases. Erosion and sedimentation may occur via fill material and disturbed soils, scouring of exposed soil, earthen banks and habitats adjacent to the development area via stormwater flow.	The site is predominantly flat with no major earthworks required for the establishment of the accommodation building proposed. The building contractor will be required to implement an erosion and sediment control plan prior to commencement of works. Cook Shire Council is the assessment authority for assessing compliance of ECSP on the site and will assess the potential for impacts as a result of the proposal.

5.0 Management of Impacts

The primary aim of impact management is to ensure "no net loss" of threatened plants, as defined under the Nature Conservation (Wildlife Management) Regulation 2006 Protected Plants Assessment Guidelines. Proposed clearing and development footprints do not result in any direct loss of the Ant Plant (*Myrmecodia beccarii*) population and no significant residual or indirect impacts are expected.

The proposed impact management measure will ensure that the *Myrmecodia beccarii* record, its host tree and the retained suitable habitat on the project site are not adversely impacted:

- A tree protection zone (TPZ) to be established around the host tree of the *Myrmecodia beccarii* record to be retained, the TPZ will be a minimum of 7.2 m (based on a DBH of 0.60m multiplied by 12 as per AS4970-2009) and no encroachment or machinery or vehicles will be permitted to the eastern shoulder of the existing road adjacent to the record; and
- All clearing areas will be visually demarcated prior to the commencement of works and personnel made aware of the presence of *Myrmecodia beccarii* onsite. The TPZ will be fenced off prior to the commencement of site works.

6.0 Justification of Impacts

It is expected that with the mitigation measures detailed in the above sections of this report that there is a high likelihood that the population of Ant Plant *Myrmecodia beccarii* will not be impacted locally or regionally as a result of the proposal. There will be no isolation of individuals or populations and connectivity which support Ant Plant habitat will be retained.

Limitations to the existing impact management measures include a reliance on maintaining a minimum clearance area so as not to impact the identified host tree within retained vegetation.

7.0 Conclusions

A Protected Plant Survey was undertaken on 4th of March 2025. A single EVNT species listed under the Nature Conservation Act 1992 were recorded within 100m buffer of the proposed clearing alignment (see **Figure 3** above). Under REDD 13.1, 0.11 ha of remnant vegetation mapped as 7.3.40 will be cleared, ground verification identified the RE as conforming to RE 7.3.25b and habitat for *Myrmecodia beccarii.*

- *Myrmecodia beccarii* (Vulnerable) NC Act 1992 and EPBC Act 1999

A single (1) individual was recorded and is outside of the direct impact footprint in remnant vegetation that is to be retained. With the simple management measures identified above in place, no net loss to a population of a protected flora species is expected.

7.1 General Requirements

This report is required to be submitted to the Qld Department of Environment, Science and Innovation for assessment of the impact management plan provided. The report will be reviewed by the department and advice may be sought from the Qld Herbarium on the efficacy of the proposal. If the plan is approved, then a protected plant clearing permit will be issued for the proposed clearing alignment. This may be subject to additional conditions which will at a minimum be the demarcation of the clearing area and establishment of an 7.2 m TPZ around the host tree. Clearing is generally required to be completed within two (2) years of an approval date of this impact management plan. This will be confirmed upon receiving potential approval.

8.0 Suitably Qualified Person

Jade Coase is recognised as a suitably qualified person by the Qld Department of Environment, Science and Innovation. He has regularly performed Protected Plant Surveys in the last five (5) years. Jade obtained a Bachelor of Science - Conservation Biology (Hons) from James Cook University Queensland in 2011 and has worked as a Field Ecologist and Botanist since 2017. He has been working as a full time Ecological Consultant for the past 8 years. He has formal training in plant taxonomy and ecology from both his tertiary qualifications and completion of the James Cook University Rainforest Plant Identification Course. He is an experienced project manager, specialising in ecological assessment and compliance, flora and fauna monitoring, flora surveys, vegetation mapping and site rehabilitation. He has been involved in threatened flora surveys across the Wet Tropics, Einasleigh Uplands and Cape York Peninsular Bioregions.

The ability to identify protected flora in a range of habitats, understand their ecology and how this may be impacted (directly and indirectly) by an activity or development proposal is a core part of Ryan's profession and expertise. He has detected a range of threatened species including *Acacia purpureopetala, Phlegmariurus phlegmarioides, Rhodamnia sessiliflora, Melaleuca uxoram, Blakella leptoloma, Dendrobium fellowsii* and others during site investigations and routinely assesses sites for the presence of threatened species in Far North Queensland.

Jade has the necessary skills and experience to undertake a wide array of ecological surveys including vegetation community mapping, identification and condition assessments, baseline monitoring surveys, bio-condition assessments, threatened species/ community identification and management.

An assessment of Jade Coase's skills and experience against the self-assessment criteria provided in the guideline is presented in **Table 6** below. To be determined a suitably qualified person a minimum total of 100 points is required.

Table 6. Details of Suitably Qualified Person

Component 1- Qualification Knowledge and Ability	Conditions	Points Allocated
A relevant qualification from a recognised institution that results in a thorough knowledge of plant identification and flora surveys	Bachelor of Science – Conservation Biology James Cook University Townsville Queensland Focused	50 points
Component 2: Field Experience	**Conditions**	**Points Allocated**
Experience within the last two years and a total of at least 5 years leading flora surveys in a field-based environment at a rate of no less than 5 comprehensive botanical surveys that focus on locating and identifying threatened plant or near threatened plant.	Qld based field flora surveys. Jade Coase has been undertaking flora surveys for a period of 7 years. Surveys includes Protected Plant Surveys, Regional Ecosystem Verification and Mapping Analysis, bio-condition surveys, Weed Surveys and habitat quality assessments.	60 points
Total points	**Must be greater than 100 points**	**110 points**

9.0 References

DCCEEW. (2024) Department of Climate Change, Environment, Energy and Water, Canberra. Available from: https://www.environment.gov.au/sprat.

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Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Addicott, E.P. and Appelman, C.N. (2020) Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 5.1. Updated March 2020. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

Appendix A Protected Matters Report (EPBC)

Appendix B Wildlife Online (NCA)

Appendix C Potential Occurrence Assessment

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
Threatened Flora					
	Aphyllorchis anomala		NT	*The simple pauper orchid grows near sea level in moist, shady rainforest mainly between Rossville and the Atherton Tableland and near Airlie Beach.*	**Unlikely** Lack of suitable well developed moist rainforest habitat onsite.
	Backhousia hughesii		CR	*Endemic to NEQ, restricted to the area between Rossville and Innisfail. Altitudinal range from sea level to 1100 m. Grows in well-developed rain forest on a variety of sites and is often associated with Kauri Pine (Agathis robusta).*	**Unlikely** No well-developed rainforest habitat present within project site.
	Buckinghamia ferruginiflora		V	*Endemic to NEQ, restricted to the area between Bloomfield and the Daintree River. Altitudinal range from sea level to 350 m. Grows in well-developed lowland and upland rain forest.*	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Chingia australis*	E	E	*Chingia australis* occurs in rainforest on steep creek banks and slopes of ridges. This species is reliant upon exposure of mineral soil (that lacks organic matter) and is an early pioneer of canopy gaps and substrate disturbance. The species may be somewhat shade intolerant, often inhabiting naturally well-lit sites such as swampy ground in lowland forest or creek banks. However, its presence in such locations may be attributed to its high moisture requirements: like all ferns, *C. australis* has a two stage life cycle involving a stage that is entirely dependent on the presence of water. Some populations are riparian (growing in or very close to water courses); all are dependent on surrounding rainforest habitat and the moist microclimate it provides. Populations are ephemeral (short-lived), responding to the kinds of disturbance processes that typically remove topsoil, such as landslips, flood scouring, tree-falls and road cuttings.	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Cyclophyllum costatum*	V	V	*Cyclophyllum costatum* is known from the Daintree River, Little Falls Creek northwest of Mossman, and Mt Windsor in northeast Queensland. This species grows in rainforest and complex notophyll vine forest along creeks and rivers on stony clay soil with shallow surface of loam from altitudes of 960–1095m.	**Unlikely** No well-developed rainforest habitat present within project site and outside altitudinal range.
-	*Dendrobium carronii* (*Cepobaculum carronii)*	V	V	This species grows in well-lit areas from sea level to 600 m altitude, in humid areas of gallery forest, hillside scrub and low-lying areas subject to periodic inundation. It often grows on the papery bark of the Paperbark Teatree (*Melaleuca viridiflora*). The species has also been recorded on Swamp Box (*Lophostemon suaveolens*) and other paperbarks (*Melaleuca spp.*) Plants usually form small clumps. Flowering occurs from August to October.	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.
-	*Dendrobium nindii*	E	E	*Dendrobium nindii* is known from the McIlwraith Range on Cape York Peninsula, south to Innisfail, Queensland and is also known to occur in New Guinea. Localities include Gap Creek in the Bloomfield area, the Daintree River, Port Douglas, and the Johnstone River. This species occurs within the Cape York and Wet Tropics (Queensland) Natural Resource Management Regions. *Dendrobium nindii* occurs up to 400 m above sea level, growing on trees (including mangroves and palms) in near-coastal swamps, coastal rainforest, mangroves, and low altitude gorges and streams. It has been recorded in rainforest on	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				conglomerate and granite. It grows with its leaves and inflorescences exposed to strong light or even direct sunlight and its roots shaded.	
	Dissiliaria tuckeri		E	*Endemic to Queensland. Occurs in NEQ. Known from a few populations between Cooktown and Mossman. Altitudinal range from near sea level to about 760 m. Grows along watercourses in well-developed rain forest on rocky alluvia derived from granite.*	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Drosera prolifera*	V	V	*Drosera prolifera* is endemic to north Queensland and occurs at Mount Pieter Botte Creek, Thornton Peak, Noah Creek and the Roaring Meg Falls areas. The species is also known from Monkhouse Timber Reserve and two sites in the Daintree National Park. *Drosera prolifera* grows on the banks of streams, sometimes forming large mats. The species also occurs on rocks in rainforest areas in the altitudinal range of 220—1200 m above sea level. The species often occurs in steep terrain that is densely forested and difficult to access.	**Unlikely** No well-developed rainforest habitat present within project site and outside altitudinal range.
	Heliodendron xanthoxylon		NT	*Endemic to NEQ, restricted to the area between Rossville and Mt Molloy. Altitudinal range from sea level to 500 m. Grows in well-developed lowland and upland rain forest.*	**Unlikely** No well-developed rainforest habitat present within project.
-	*Leichhardtia araujacea* synonymous with *Marsdenia araujacea*	CE	CE	*Marsdenia araujacea* is endemic to the northeast Queensland Wet Tropics, occurring between approximately Hope Vale and Townsville. Collection sites span 600 km from Biniirr National Park in the north to the Stone River, west of Ingham, in the south. Habitat: Lowland *Blepharocarya involucrigera* gallery rainforest invariably associated with permanent water, often by tapping underground springs or aquifers. Blepharocarya dominated communities are widespread and strongly associated with water. They may be located immediately around a water source or are linear following water courses (Forster 1995).	**Unlikely** Lack of *Blepharocarya involucrigera* gallery rainforest habitat present within project site and outside altitudinal range.
	Meiogyne hirsuta		NT	*Endemic to NEQ, known only from Cedar Bay, Mossman River and the North Johnstone River. Altitudinal range from near sea level to 300 m. Grows as an understory shrub in well-developed lowland and foothill rain forests.*	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Oreogrammitis reinwardtii* (Grammitis reinwardtii)	V	V	*Grammitis reinwardtii* is known from north-east Queensland, where it has been found on Mt Finnegan, Mt Lewis and Mt Spurgeon. In Australia, this species was last seen in 1994. It is also found in South-East Asia, Malesia and Melanesia. This species grows in tropical rainforest, and is found both as an epiphyte on trees and as a lithophytic fern growing on granite boulders.	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Phaius pictus*	V	V	*Phaius pictus* occurs in north-east Queensland, sporadically from the McIlwraith Range, Bloomfield River to Kirrama Range. It is highly localised, restricted to rainforests from 0–600 m altitude, and usually occurs in sheltered humid sites close to streams and among forest litter on boulders. Population numbers are unknown. Known locations appear to all be within protected areas. This species occurs within the Wet Tropics and Cape York (Queensland) Natural Resource Management Regions. The distribution of this species is not known to overlap with any EPBC Act-listed threatened ecological community.	**Unlikely** No well-developed rainforest habitat present within project site.
-	*Polyscias bellendenkerensis*	V	V	*Polyscias bellendenkerensis* is known from north-east Queensland, occurring in mountain rainforest. The Queensland Herbarium has 14 specimens of the species, collected between	**Unlikely**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				1904 and 1997 from Mount Bartle Frere, Mount Bellenden Ker, Mossman Bluff and the upper reaches of Saltwater Creek, north-west of Mossman, at altitudes of 1100 to 1600 m. The species has been recorded as growing in microphyll vine/fern thickets, notophyll vine forest and stunted shrublands on granite substrates.	No well-developed rainforest habitat present within project site and outside altitudinal range.
	Rhodamnia sessiliflora		E	Endemic to NEQ, widespread throughout the area. Altitudinal range from near sea level to 1000 m. Grows in lowland and upland rain forest on a variety of sites, also found in drier rain forest often associated with Kauri Pine (Agathis robusta).	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.
	Rhodamnia spongiosa		CR	Occurs in CYP, NEQ, CEQ and southwards in southern central Queensland. Altitudinal range from near sea level to 1150 m. Grows as an understory tree in well-developed rain forest on a variety of sites but more frequently encountered in drier rain forest often associated with Kauri Pine (Agathis robusta). Also occurs in New Guinea.	**Unlikely** No well-developed rainforest habitat present within project site.
	Rhodomyrtus effusa		E	Endemic to NEQ. Altitudinal range from near sea level to 200 m. Grows in disturbed or previously disturbed areas of lowland rain forest.	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.
	Xanthostemon verticillatus		V	Endemic to NEQ, restricted to the Daintree River and Bloomfield River watersheds. Altitudinal range probably quite small, from near sea level to 100 m. Grows as a rheophyte along creeks and rivers.	**Unlikely** Lack of suitable freshwater riparian habitat.
Ant Plant	*Myrmecodia beccarii*	V	V	*Myrmecodia beccarii* is known from the coastal woodlands between Cooktown and Ingham in Queensland. This species occurs in open woodland dominated by Melaleuca viridiflora or mangroves. The species is conserved within the Girringun National Park (NP), Daintree NP and Edmund Kennedy NP. This species has a minimum area of occupancy of 7000 km2 , a minimum range of 350 km and is known from 10 locations. This species occurs within the Wet Tropics and Cape York (Queensland) Natural Resource Management Regions.	**Confirmed** Species present from a single *Melaleuca leucadendra*, outside of the clearing impact area but within the 100m buffer search area.
Blue Tassel-fern	*Phlegmariurus dalhousieanus*	E	CE	The Blue Tassel-fern is known from only two collections in Queensland, both of which are in lowland swamp forest near Cairns, one of which has been lost to urban development. It is an epiphyte on trees or rocks and has been recorded growing in clumps of Platycerium (staghorn), and anecdotal information suggests the species still occurs in coastal swamps between Daintree River and Cooktown, and in the McIlwraith Range. It also occurs in Indonesia and New Guinea. This species occurs within the Wet Tropics (Queensland) Natural Resource Management region.	**Unlikely** No proximal records and no known populations in region.
Chocolate Tea Tree Orchid	*Dendrobium johannis*	V	V	*Dendrobium johannis* grows in open humid habitats, on slopes in open woodland, close to swamps and in pockets of monsoon forests. It has been recorded growing on Broad-leaved Tea-tree (*Melaleuca viridiflora*) in a melaleuca woodland in the Cowal Creek floodplain; and in a semi-evergreen vine thicket on an old stabilised sand dune where Thryptomene was dominant in the canopy. *Dendrobium johannis* occurs from the tip of Cape York Peninsula, south to the McIlwraith Range and in north Queensland. It also	**Unlikely** Outside of known distribution,

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				occurs in the Torres Strait islands, possibly New Guinea and occurs on islands on the Great Barrier Reef.	
Cooktown Orchid	*Vappodes phalaenopsis*	V	-	*Dendrobium phalaenopsis* is locally common within its restricted range. It rapidly recolonises disturbed sites. This species occurs within the Cape York (Queensland) Natural Resource Management Region. *Dendrobium phalaenopsis* grows on trees and rocks in coastal scrub, littoral rainforest, riverine vegetation, monsoon thickets, swamps and gullies in open forests at altitudes of up to 400 m above sea level. It also grows in vegetation near beaches, in areas with a hot climate and extremely seasonal rainfall.	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.
Dark-stemmed Antler Orchid	*Dendrobium mirbelianum*	E	E	*Dendrobium mirbelianum* is known from the Daintree area to Innisfail and Moa Island, north of Cape York Peninsula, north Queensland. It is also known to occur in New Guinea and the Solomon Islands. This species occurs within the Cape York, Wet Tropics and Torres Strait (Queensland) Natural Resource Management Regions. *Dendrobium mirbelianum* is locally common within its restricted range. It grows mainly on trees in mangroves and coastal swamps in humid locations and has also been recorded growing on rocks, grows at altitudes of 2–150 m above sea level.	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.
Haines's Orange Mangrove	*Bruguiera x hainesii*	CE	CE	In Australia, Haines's Orange Mangrove is known from one population adjacent to Trinity Inlet in the Cairns region. Haines's Orange Mangrove occurs in the landward mangrove zone where it is inundated by only very high tides. It co-occurs with *Aegiceras corniculatum, B. cylindrica, B. gymnorhiza and Xylocarpus granatum*. Globally, the species is found in the intermediate estuarine zone in the high intertidal region (i.e. back mangrove areas).	**Unlikely** Outside known distribution
Hairy-joint Grass	*Arthraxon hispidus*	V	V	In Queensland it occurs north to Port Douglas, and west to disjunct occurrences around mound springs in Carnavon National Park (NP); however, most occurrences are from Noosa southwards. Hairy-joint Grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps as well as woodland.	**Unlikely** Outside of known distribution.
Lesser Swamp-orchid	*Phaius australis*	E	E	This species is associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark (*Melaleuca leucadendra*) or Swamp Mahogany (*Eucalyptus robusta*) are found. Less commonly, the species has been found in drier forest near the coast.	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.
Middle Filmy Fern	*Polyphlebium endlicherianum*	E	V	The middle filmy fern grows on damp rocks and tree trunks in tropical rainforest, often near streams or beside waterfalls, in moist and shaded sites. In Qld, herbarium collections have been made on a deeply shaded rock wall, on a damp rock in a dried stream bed, and in closed forest on granite sands. In Qld, the species has been recorded in the Atherton Tablelands at Kauri Creek (about 500 m due south-west of Mt Haig), Tinaroo Hills (7.5 km up Forestry Road B), and in Maalan State Forest.	**Unlikely** No well-developed rainforest habitat present within project site and outside altitudinal range.
Native Moth Orchid	*Phalaenopsis rosenstromii*	E	E	The Native Moth Orchid is found in humid rainforest areas, close to waterfalls or streams, in deep gorges, sheltered slopes or gullies in notophyll vine thickets, deciduous vine thickets and in open forest. The Native Moth Orchid grows in shaded or partially	**Unlikely**

Common Name	Scientific Name	EPBC Act[1]	NC Act[2]	Habitat Preference[3]	Likelihood of Occurrence[4,5]
				shaded positions, on trees and less commonly on rocks. The species is found at altitudes from 200–500 m above sea level (though is less common below 500 m). The distribution of the Native Moth Orchid overlaps with the *Mabi Forest (Complex Notophyll Vine Forest 5b)*, which is listed under the EPBC Act as a Critically Endangered Ecological Community.	No well-developed vine forest habitat present within project site and outside altitudinal range.
Pale Chandelier Orchid	*Acriopsis emarginata syn. Acriopsis javanica*	V	V	*Acriopsis javanica* is endemic to north Queensland, from the tip of Cape York Peninsula to the Daintree River. This species has been recorded from Daintree River valley, Leo Creek (Timber Reserve 14), McIlwraith Range, Mount Bulbin South, Tozers Gap, and Mount Norkwa. *Acriopsis javanica* is considered widespread and common within its range. This species occurs within the Wet Tropics and Cape York (Queensland) Natural Resource Management Regions. *Acriopsis javanica* grows on trees in hot, humid, lowland rainforest, rainforest margins, and in swamps. This species is found in near-coastal swamps in the most southerly parts of its range where it can be found growing on paperbarks, palms, and Pandanus spp. It has been found growing up to 380 m above sea level. Specimens from the Leo Creek area were recorded from a complex mesophyll vine forest along a watercourse on metamorphic soils.	**Unlikely** Suitable habitat and proximate records are present for this species. Targeted searches for this species did not detect any records.
Rock Tassel-fern	*Phlegmariurus squarrosus*	CE	CE	*Phlegmariurus squarrosus* is restricted to north-east Queensland, where it has been recorded from McIlwraith Range, Cape Tribulation region, the Mossman region, around Mt Bellenden Ker and 'near Cairns'. *Phlegmariurus squarrosus* occurs on rocks, particularly around waterfalls, or on tree trunks in lowland swamps and low to mid-altitude rainforest.	**Unlikely** No well-developed rainforest habitat present or freshwater riparian areas.
Square tassel fern	*Phlegmariurus tetrastichoides*	V	V	*Phlegmariurus tetrastichoides* is an epiphyte found on rainforest trees in north-eastern Qld, ranging from the Daintree and Hinchinbrook Island south to Mackay, and from sea level to 1100m in altitude. All known populations are in areas of remnant vegetation, protected from broad-scale clearing under the *Vegetation Management Act 1999*. This species occurs within the Wet Tropics, Cape York, and Mackay Whitsunday Natural Resource Management regions. Its distribution overlaps with the "Mabi Forest (Complex Notophyll Vine Forest 5b)" EPBC Act-listed threatened ecological community.	**Unlikely** No well-developed rainforest habitat present within project site
Thin Feather Orchid	*Dendrobium callitrophilum*	V	V	*Dendrobium callitrophilum* is endemic to north-east Queensland where it occurs on the Evelyn, Mt Windsor, Atherton and Carbine Tablelands and some of the higher mountains between the Daintree and Bloomfield Rivers . *Dendrobium callitrophilum* grows at altitudes of 760–1500 m above sea level, in or close to rainforest. It favours Stringybark Cypress Pine (*Callitris macleayana*) but also grows on various shrubby myrtles such as Austromyrtus.	**Unlikely** No well-developed rainforest habitat present within project site and outside of altitudinal range.

[1] **EPBC Act** Conservation Status: CE=Critically Endangered, E=Endangered, V=Vulnerable, Mi=Migratory, M=Marine.

[2] **NC Act** Conservation Status: CE=Critically Endangered, E=Endangered, V=Vulnerable, NT=Near Threatened, LC=Least Concern, SL=Special Least Concern

[3] **Habitat Preference** information is gathered from the SPRAT-profile of each species (DE 2025), along with the corresponding Conservation Advice if available, unless explicitly mentioned otherwise.

[4] All records of occurrences are sourced from the Atlas of Living Australia (ALA 2025) for fauna and the Australian Virtual Herbarium (AVH 2025) for flora, unless explicitly mentioned otherwise.

[5] **Known** to occur: species were recorded during field surveys. **Likely** to occur: suitable habitat for the species is present within or near the project site, and the species has been recorded within the extent of the desktop search. **Possible** occurrence: the project site is within the species known distribution, and suitable habitat is available; however, the species has not been recorded within the extent of the desktop search; and/or suitable habitat may be degraded or limited in extent, reducing the likelihood of species occurrence. **Unlikely** to occur: the project site does not provide suitable habitat for the species or is outside the species known distribution.

Attachment 7

Hydraulic Services Infrastructure Report

GILBOY HYDRAULIC SOLUTIONS

GJ & TL GILBOY PTY LTD / ABN: 85 105 215 432 / ACN: 105 215 432

4/131 Scott Street, Bungalow.
PO Box 857N, North Cairns. 4870
Phone: (07) 4051 5116 Mobile: 0439 664623
Email: reception@gilboy.com.au

Gilvear Planning
63 Munro Street,
Babinda. 4861

Attention: Miss Kristy Gilvear.

Re:

PROPOSED HYDRAULIC SERVICES INFRASTRUCTURE
TRAILFINDERS DEVELOPMENT - LOT 1 ON A3024
PROPOSED ACCOMMODATION FACILITIES
FIRST STREET AND WEST STREET, BLOOMFIELD - AYTON

In accordance with our telephone directions received on 23rd January 2025 from Mr. Jon Nott of Jon Nott Building Services working as nominee for the owners, we are pleased to assist you with your Development Application to Cook Shire Council for the development on Lot 1 of Accommodation Facilities at Ayton on the Bloomfield River, North Queensland.

In accordance with Mr. Notts request, following are our preliminary comments on design concepts that will need to be adopted when addressing water supply, wastewater treatment and effluent disposal on these sites for information and/or comment by the relevant departments as required when considering their Development Conditions.

1.0 INTRODUCTION:

We advise that the site relative to this proposal is Lot 1 on A3024.

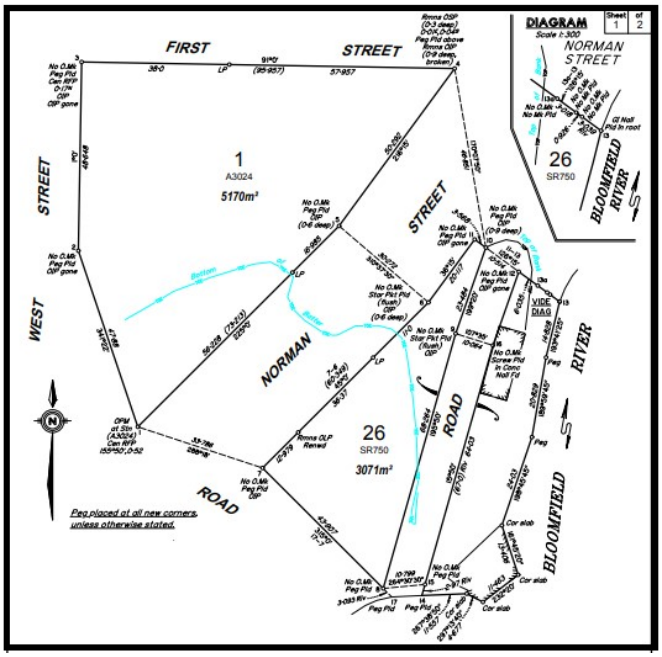


Image # 1 – Snippet from MD Land Surveys Identification Survey

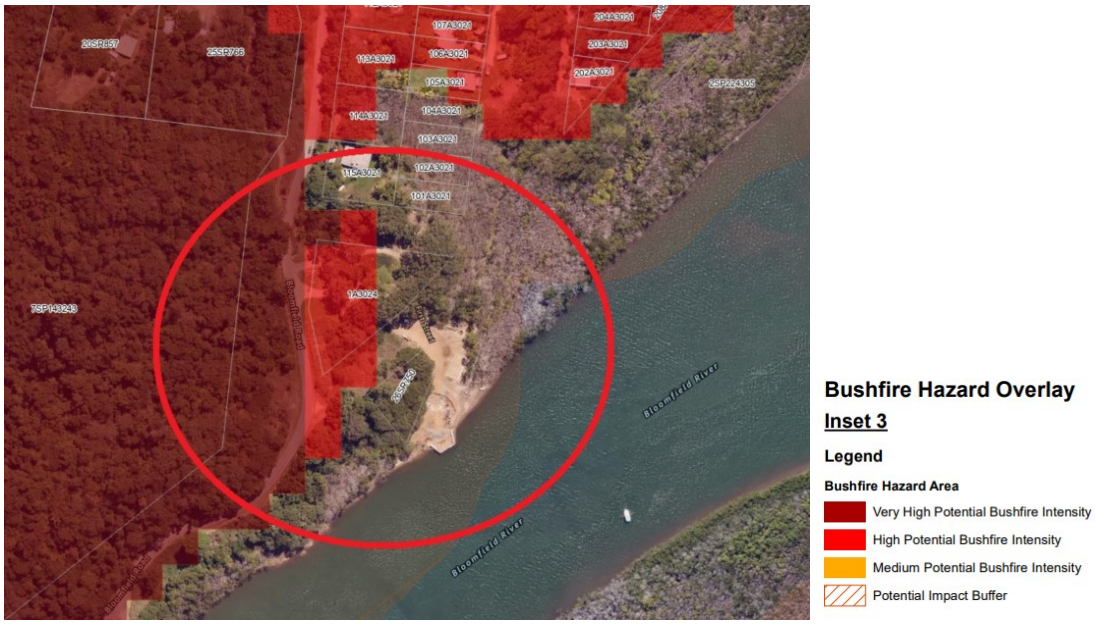


Image # 2 – Cook Shire Council, Bushfire Hazard Overlay Map

From our research to date, there appears to be no local authority services infrastructure available in the surrounding streetscapes, so water and sewerage systems will require onsite collection, storage, treatment, and disposal respectively.

Lot 1 on A3024

This 5170m2 property is bordered by West Street to the west, First Street to the North and Norman Street to the South-East.

It is envisaged that this site will be used for cabin accommodation cabins and have some minor communal facilities associated with it. We have been provided with preliminary architectural concepts that show 8x2 bedroom units and a communal kitchen area.

Currently we have assumed that the number of people being allocated to this site is as follows:

- 8x2 bedrooms x 2 people = 32 people

Given that the site caters for short-term tourist accommodation, on-site wastewater collection, treatment and disposal will be required.

All buildings currently shown on the concept plans are under 500m2 in floor area so there is no requirement for fire hydrant or fire hose reel coverage to be provided to the buildings under the provisions of the BCA.

However, parts of this site are located in a High Potential Bushfire Intensity Zone under the Cook Shire Council Bushfire Overlay Maps and will need consideration given to fire water storage tanks, material selections and locations of services to protect life and minimize the impact / loss in the event of a bushfire event.

The nature of the accommodation and associated facilities will suggest that water for domestic purposes will be required using either rainwater or bore water collection, storage and treatment.

2.0 LOT 1 ON A3024 – WATER SUPPLY

The location of the proposed accommodation facility is beyond the reticulated water main infrastructure network of the Cook Shire Council; therefore, this site will be required to provide its own means of collection, storage, treatment and distribution for domestic and bushfire protection purposes.

Given the spread-out nature of the buildings and the inefficiencies in collecting rainwater, it is recommended to seek water for this site from the existing bore and store it in above ground storage tanks centrally on the site.

Being used for ablutions, food preparation and human consumption, it is recommended that the bore water be passed through a water filtration and treatment system to meet ADWG aesthetic / potable parameters and plumbed accordingly to maintain potable supply in a dedicated treated water storage tank.

Potable water from the tank will be distributed to the relevant fixtures throughout the site via a multi-staged water pressure booster pump.

At this stage we have estimated that 3,200 litres of potable water and 5,000 litres of non-potable water is required each day at this facility and this is based on:

8x2 bedrooms x 2 people = 32 people x 100 litres/person/day = 3,200 litres
Daily washdown / watering etc = 5,000 litres
Total water volume = **8,200** litres/day

Noting that this is in a Bushfire Hazard Overlay Zone we envisage that a Bushfire Hazard Analysis Report will need to be undertaken which will outline subsequent wet fire protection methodology and ultimately any fire water tank sizing requirements.

Generally, the Cook Shire Planning Scheme would require that a 20,000 litre non-flammable fire water tank is provided within 10m of each building with a pumped hydrant system capable of delivering 10 litres/second @ 200 kpa to a hardstand area within 6m of the tank.

3.0 LOT 1 ON A3024 – WASTEWATER COLLECTION TREATMENT AND DISPOSAL

As previously highlighted this site will involve overnight accommodations, use facilities for bathing, washing and food preparation and will require sewerage collection, treatment and on-site disposal.

From the overnight accommodation numbers established in Section 1 above we have calculated below that 3,200 litres of sewerage effluent per day will be generated from the caravans and camp site areas when using the current 'EPA Queensland Planning Guideline to Determine Capacity of Sewerage Treatment Plants Base on Use Conditions'.

8x2 bedrooms x 2 people = 32 people x 100 litres/person/day = 3,200 litres
Total sewerage volume = **3,200** litres/day

The Environmental Protection Regulation Part 13 covers Water Treatment Services and states in Section 63 that an Environmentally Relevant Activity consists of operating 1 or more sewerage treatment works at a site that has a total daily peak design capacity of at least 21EP.
The regulation goes on to state that the Relevant Activity does not include:

(a) carrying out works, other than operating a sewage pumping station mentioned, involving infrastructure for the collection of sewage, including, pipes; or
(b) carrying out works involving either of the following:
    (i) operating or maintaining composting toilets.
    (ii) treating or recycling greywater; or
(c) operating no-release works.

Daily Peak Design Capacity, for Sewerage Treatment Works is calculated using either volumetric calculations or grams of phosphorus.

For our initial estimates, we have used the formulae EP = V/200, where V is the volume in litres of the average dry weather flow of sewage that can be treated at the works in a day.

Currently the campground calculated EP is 3,200 litres / 200 = **16 EP**

The calculations above reveal that the proposed development of this accommodation facility does not trigger the requirement for an application to the Queensland Governments Department of Environment, Tourism, Science and Innovation (DESI) Environmentally Relevant Activity for discharge to land at this point in time.

Sewerage generated from the accommodation cabins and communal kitchen will be required to be treated to at least advanced secondary level using 2 x FujiClean ACE3000's or similar before being discharged to an on-site sub-surface disposal system.

At this stage we estimate that the land application area required to dispose of 3,200 litres/day in a Class 4 soil type using Evapo-Transpiration Absorption will be approximately 400m2.

Based on our site visit we are intending to utilize the flatter middle area of the site for this effluent disposal and it is expected that some existing vegetation and structure clearing will be required to cater for the land application disposal area.

Detailed investigation, planning and co-ordination would be undertaken at design phase to rationalize a suitable outcome for sewerage disposal on this site.

Image # 3 – Lot 1 on A3024 with Proposed Effluent Disposal Area Shown Circled

4.0 DATE AND SIGNING:

This letter is dated 7th March 2025.

We trust the above information provides some clarification on the recommended hydraulic services approach proposed for this facility moving forward to the next phases of approval and project delivery.

For further information or clarification on the above, please do not hesitate to contact the undersigned on 4051 5116.

Yours faithfully,
GILBOY HYDRAULIC SOLUTIONS

……..
Gregory Gilboy

Attachment 8

Engineering Services Report

Lot 1 A3024 - West Street, Bloomfield

Engineering Services Report

022-2501-R-001| Revision B

13 June 2025

Trailfinders

Project Name	Lot 1 A3024 - West Street, Bloomfield
Project Address	West Street, Bloomfield (Lot 1 A3024), Ayton, Qld
Project No:	022-2501
Document Title:	Engineering Services Report
Document No.:	022-2501-R-001
Revision:	B
Date:	13/06/2025
Client Name:	Trailfinders

Report prepared by
Craig Caplick | Principal Engineer | RPEng RPEQ 25102 | +61 402 568 698 | Craig@ConsultNeon.com.au

Revision History

Rev	Date	Description
A	09/06/2025	Draft
B	13/06/2025	For Approval

Contents

1. Introduction

Neon Consulting has been engaged to prepare an Engineering Services Report to support a Development Application for a development at West Street, Bloomfield (Lot 1 A3024), Ayton, Qld.

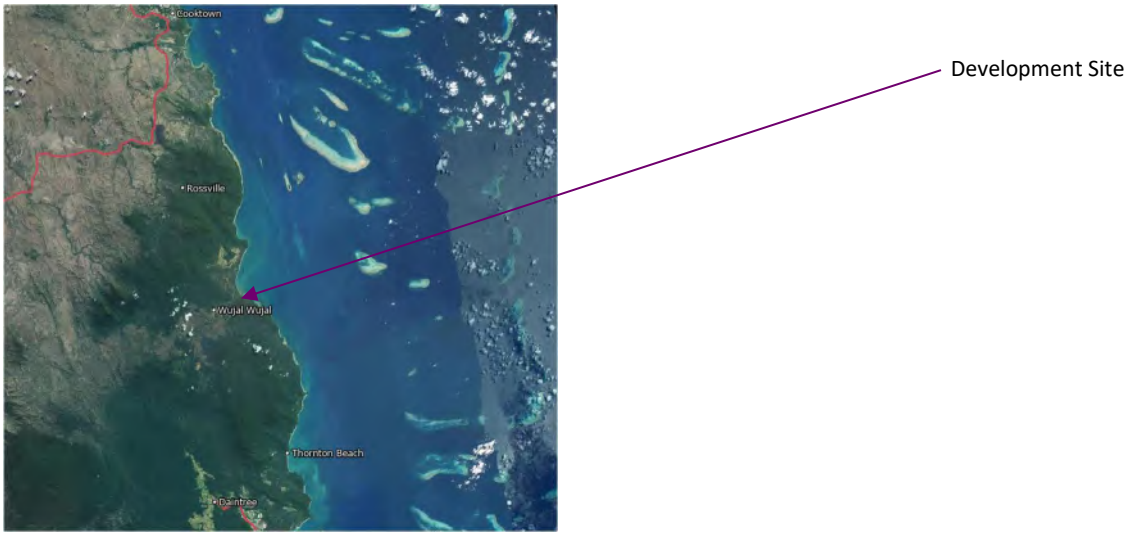


Figure 1 - Locality Aerial Image (image sourced from Qld Globe)

Figure 2 - Project Site Aerial Image (image sourced from Qld Globe)

The development proposal is for a proposed residential development. Appendix A contains the architectural plans of the preliminary development layout. The following report addresses the civil engineering elements of a development application to determine the development constraints, in particular:

- Traffic and Access
- Site Grading
- Stormwater and Flooding

Gilboy Hydraulic Solutions have prepared separate reporting to address Water Supply and Firefighting requirements as well as the proposed wastewater disposal solution.

2. Site Grading and Clearing

The development site is bounded by West Street to the west and the unconstructed Norman Street and First Streets to the east and north of the site. The developer is also preparing to develop the property south of Norman Street with a commercial development.

The site layout has been developed through preliminary design options to provide efficient stormwater and sewer outcomes. The development can provide building envelopes which can achieve a Finished Floor Level (FFL) above the Emergency Management Queensland minimum floor level of RL 3.66m AHD.

The earthwork philosophy is to achieve the project goals while also achieving the following;

- Compliance with the FNQROC Development Manual - Design Guideline D2
- Flood immunity
- Stormwater drainage compliant with FNQROC Development Manual - Design Guideline D4 and QUDM
- Efficient and economical design

Earthwork compaction testing will comply with AS3798 – Guidelines on Earthworks for Commercial and Residential Development and the Far North Queensland Regional Organisation of Councils (FNQROC) Design Guideline D2. Topsoil from the site will be stockpiled before earthworks and spread over the zones identified for grass and landscaping.

Figure 3 –Development Site with LiDAR Contours (Queensland Globe)

2.1 Potential Acid Sulfate Soils

The State Planning Policy ensures that developments in the region account for the potential presence of acid sulfate soils. The below figure is an extract of this policy. The state planning policy applies to the proposed development which is below RL 20m AHD but will have more than 100m^3 of cut and fill.

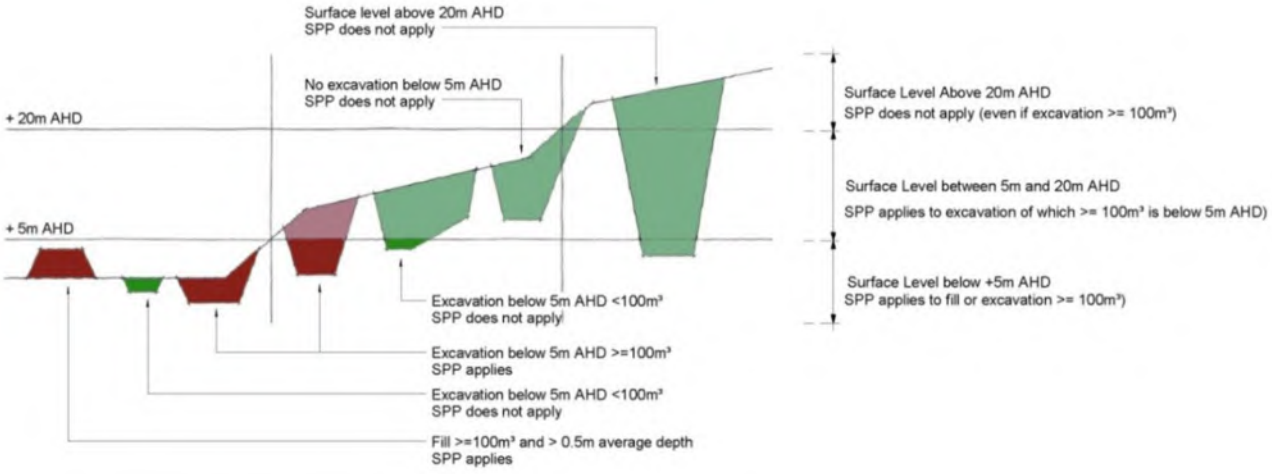


Figure 4 –Applicability of the State Planing Policy for Acid Sulfate Soils

A development condition such the following is appropriate.

In the event that acid sulfate soils are encountered, the applicant is to ensure the site is managed in accordance with requirements of the Queensland Acid Sulfate Technical Manual. In addition, an ASS/PASS Management Plan is to be submitted to Council within seven (7) days, should site investigations identify the presence of acid sulfate soils.

2.2 Erosion and Sediment Control

The development will be programmed so that the restoration of ground cover by paving or revegetation is complete within the shortest period of time and by avoiding the tropical wet season. Potential causes of erosion for this site by wind erosion or precipitation are:

- Stripping and removal of topsoil
- Removal of fill
- Other earthwork operations
- Heavy vehicle use on-site

A compliant erosion and sediment control strategy will be provided at the operational works stage to meet the requirements below. The contractor will revise these plans prior to commencing on-site. No clearing is required to be undertaken unless preceded or accompanied by the installation of adequate runoff and sediment control measures.

Following practical completion of the project, a minimum of 70% coverage of all soil with ground cover (i.e. topsoiling and seeding) shall be provided within 30 calendar days.

During the construction phases, water spraying will be used with care to act as a dust suppression method.

2.2.1 Monitoring and Maintenance Programs

Water discharge from the site will adhere to a total suspended solid content of less than 50 milligrams per litre and a pH range of between 6.5 and 8.5 at all times. If the pH of the flocculated water is not achieved, then pH adjustments will be required. This could possibly be done by a dosing of lime.

Site personnel will inspect all erosion and control measures at least at the following frequencies:

- Daily during construction works,
- Weekly when construction works are not happening,
- Within 24 hours of expected rain, and
- Within 18 hours of an impacting rainfall event.

All erosion and sediment control measures that have an order of efficiency below 75% will be corrected by the end of that working day

3. Stormwater and Flooding

The Bloomfield Ayrton Storm Tide Mapping (Emergency Management Queensland and Cook Shire) extract below correlates to the site contours and shows the various flood zones as the eastern portion of the site falls towards the Bloomfield River.

Flood studies are currently underway by the adjoining local authorities, but not yet available for reference. In the interim, it is understood that Emergency Management Queensland have defined a minimum floor level of RL 3.66m AHD in Bloomfield / Ayton. The proposed accommodation buildings will be constructed with the habitable floor level above this flood level.

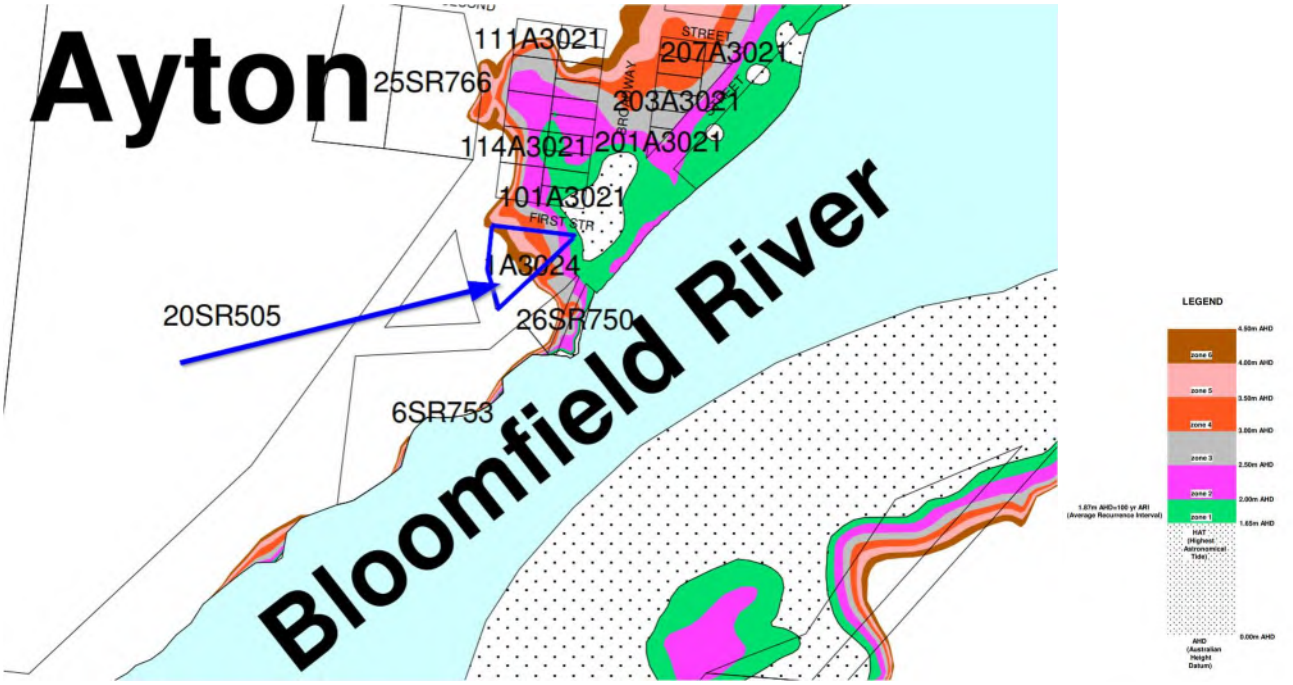


Figure 5 –Extract of Bloomfield Ayrton Storm Tide Mapping (Emergency Management Queensland and Cook Shire)

3.1 Stormwater Quality

For developments in Queensland, the State Planning Policy applies for stormwater quality management or new or expanded non-tidal artificial waterways if any of the following criteria are met;

Criteria	Applies to this development
Material change of use for urban purposes that involves a land area greater than 2,500m^2 that will result in an impervious area greater than 25% of the net developable area	No
Material change of use for urban purposes that involves a land area greater than 2,500m^2 that will result in six or more dwellings	Yes
Reconfiguring a lot for urban purposes that involves a land area greater than 2500m^2 and will result in six or more lots	No
Operational works for urban purposes that involve disturbing more than 2,500m^2 of land	No

Table 1 – State Planning Policy Assessment Criteria

This development triggers the criteria requiring an assessment of the stormwater quality from the site. This assessment should be provided with the final design to account and will likely not require hard engineering structures due to the minimal site coverage and the allowance for the natural swale and buffers for treatment.

4. Traffic and Access

4.1 Sight Distance and On-Site Access

Appendix C contains plans showing how the design vehicles can manoeuvre within the site and achieve safe access and egress from the site to West Street via the existing access.

4.2 Car Parking

The on-site car parking can comply with the requirements of AS2890.1 Off Street Parking.

4.3 Surrounding Road Network

The site has frontage to the council road network at West Street. Key attributes of the existing local road networks associated with the proposed access are summarised below.

Attribute	Draper Street
Posted Speed (km/h)	50km/h and 60 km/h (changes at the site frontage)
Predominant Land Use	Residential
Kerb and Channel	No
Median Divided	No
Dedicated On-Street Parking	No
Concrete Footpath	No
Principal Cycle Network	No
Pedestrian Network	No
Bus Route	No
Heavy Vehicle Access Route	No

Table 2 - Key Road Attributes

5. Recommendations

Based on the assessments and information collated in this report, it is concluded that this development can be serviced in accordance with the statutory requirements and appropriate engineering solutions. In summary;

- The development can achieve immunity to the Emergency Management Queensland have defined a minimum floor level of RL 3.66m AHD.
- The state planning policy for Acid Sulfate Soils applies due to the elevation and minor earthworks required on-site
- Stormwater quality improvement in accordance with the State Planning Policy will be is required for this development.
- On-site carparking can comply with the relevant standards
- Safe site distance for the site access is available for the proposed access

With respect to the Civil Engineering constraints assessed in this report, the development should be approved under standard, relevant, and reasonable conditions.

Appendix A. Development Layout

NORTH

Sheet Number	Sheet Name	Issue
A01	Site Plan	4
A02	Demolition Works	6
A03	Floor Plans	3
A04	Site Elevations	3
A05	Site Elevations	3

Bloomfield Development - Lot 1 Residential | A01 Site Plan | 24063

West Street, Bloomfield, Ayton, Qld | Trailfinders | 1 : 500 | 21/05/2025 | Issue 4

bau design architects
M 0403 975 557 L1 488 Mulgrave Rd, Cairns, Qld

Bloomfield Development - Lot 1 Residential | A02 Demolition Works | 24063

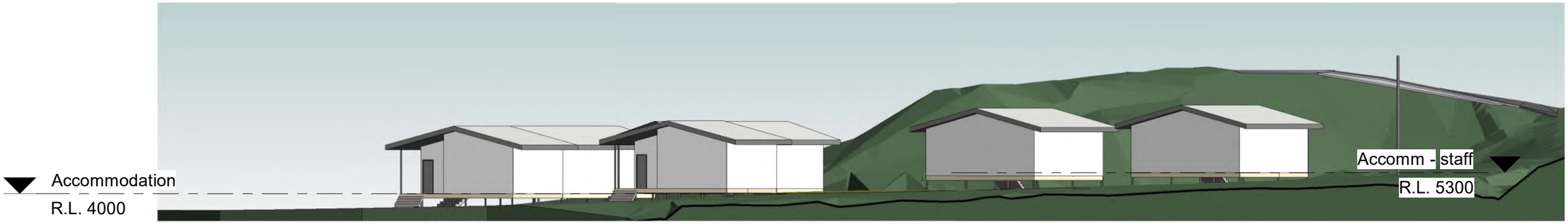
West Street, Bloomfield, Ayton, Qld | Trailfinders | 1 : 500 | 21/05/2025 | Issue 6

bau design
architects
M 0403 975 557 L1 488 Mulgrave Rd, Cairns, Qld

Bloomfield Development - Lot 1 Residential | A03 Floor Plans | 24063

West Street, Bloomfield, Ayton, Qld | Trailfinders | 1 : 100 | 21/05/2025 | Issue 3

bau design architects
M 0403 975 557 | L1 488 Mulgrave Rd, Cairns, Qld



North Elevation

1 : 250

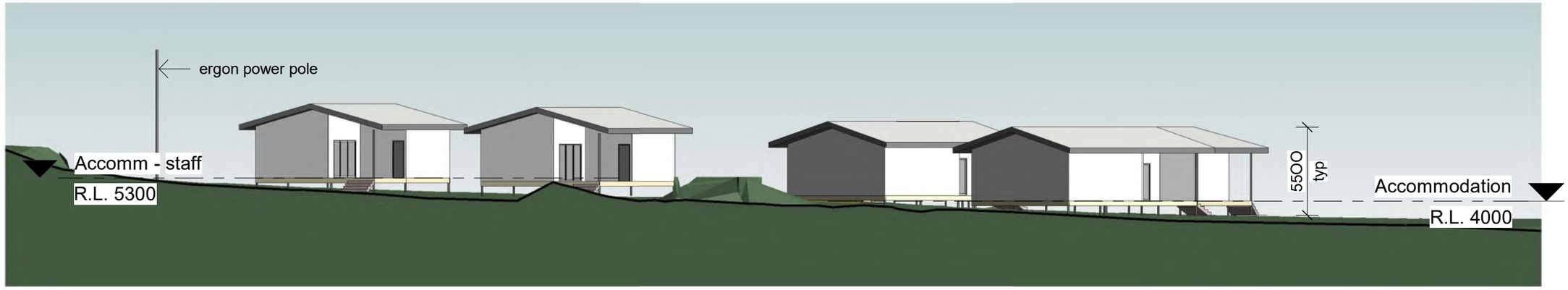
East Elevation

1 : 250

Bloomfield Development - Lot 1 Residential | A04 | Site Elevations | 24063

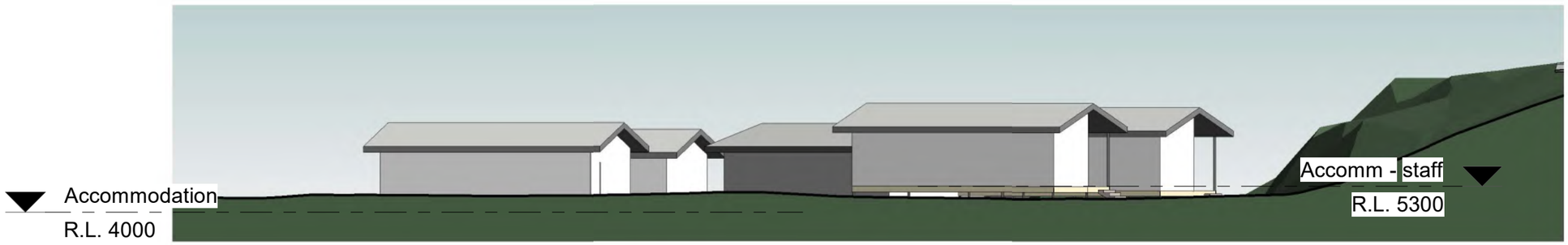
West Street, Bloomfield, Ayton, Qld | Trailfinders | 1 : 250 | 21/05/2025 | Issue 3

bau design architects
M 0403 975 557 L1 488 Mulgrave Rd, Cairns, Qld



South Elevation

1 : 250



West Elevation

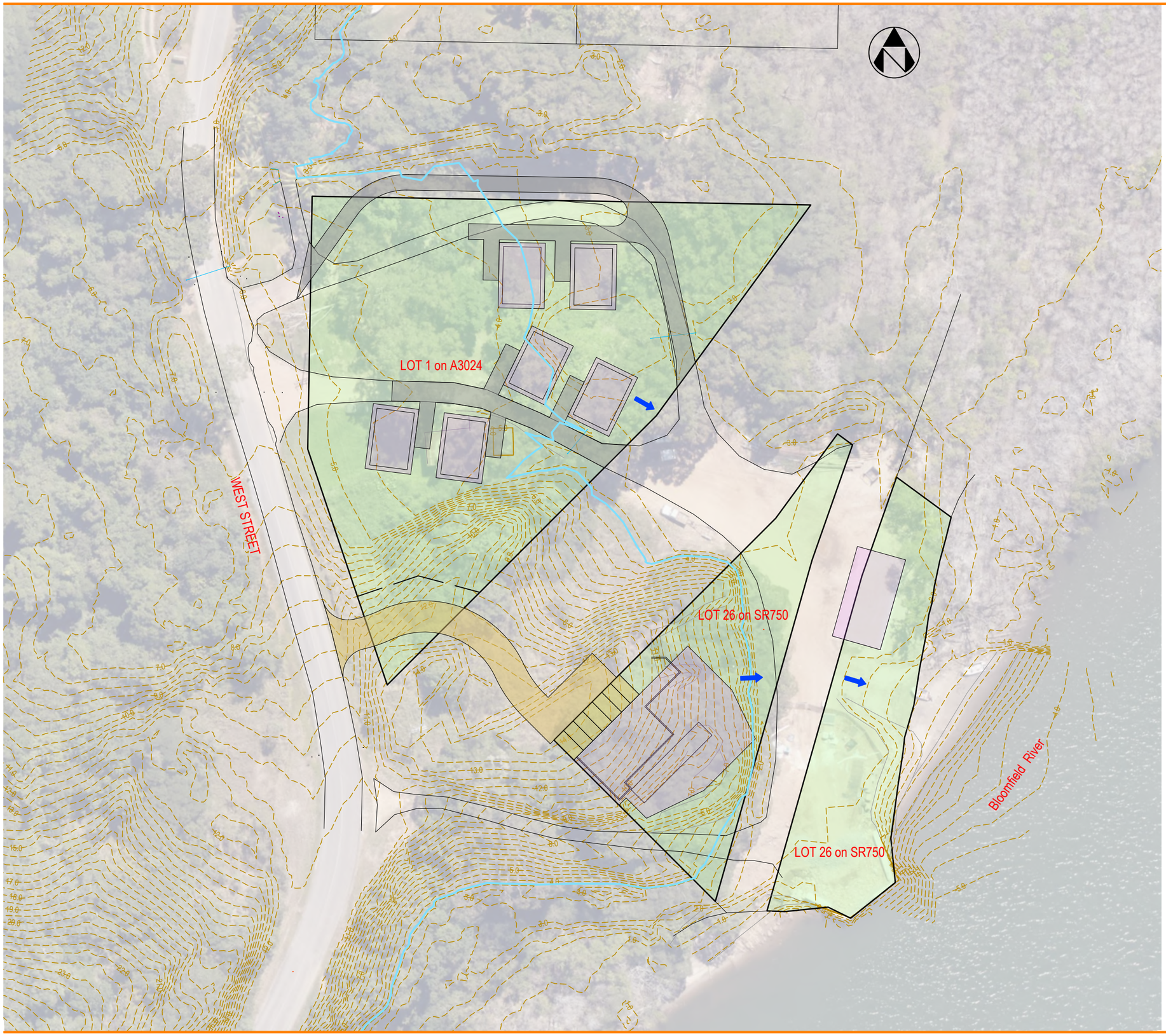
1 : 250

Bloomfield Development - Lot 1 Residential | A05 Site Elevations | 24063

West Street, Bloomfield, Ayton, Qld | Trailfinders | 1 : 250 | 21/05/2025 | Issue 3

bau design architects
M 0403 975 557 L1 488 Mulgrave Rd, Cairns, Qld

Appendix B. Stormwater



LEGEND

- SUBJECT LOTS
- RL 3.66m CONTOUR (MIN FLOOR LEVEL AS PER EMERGENCY MANAGEMENT QUEENSLAND)
- EXISTING SURFACE CONTOURS (0.5m INTERVAL)
- DIRECTION OF FALL
- EXISTING DRAINAGE PIPE

1:750 0 7.5 15 22.5 30

Rev	Date	Revision Notes
A	10.06.25	INITIAL ISSUE

NEON CONSULTING

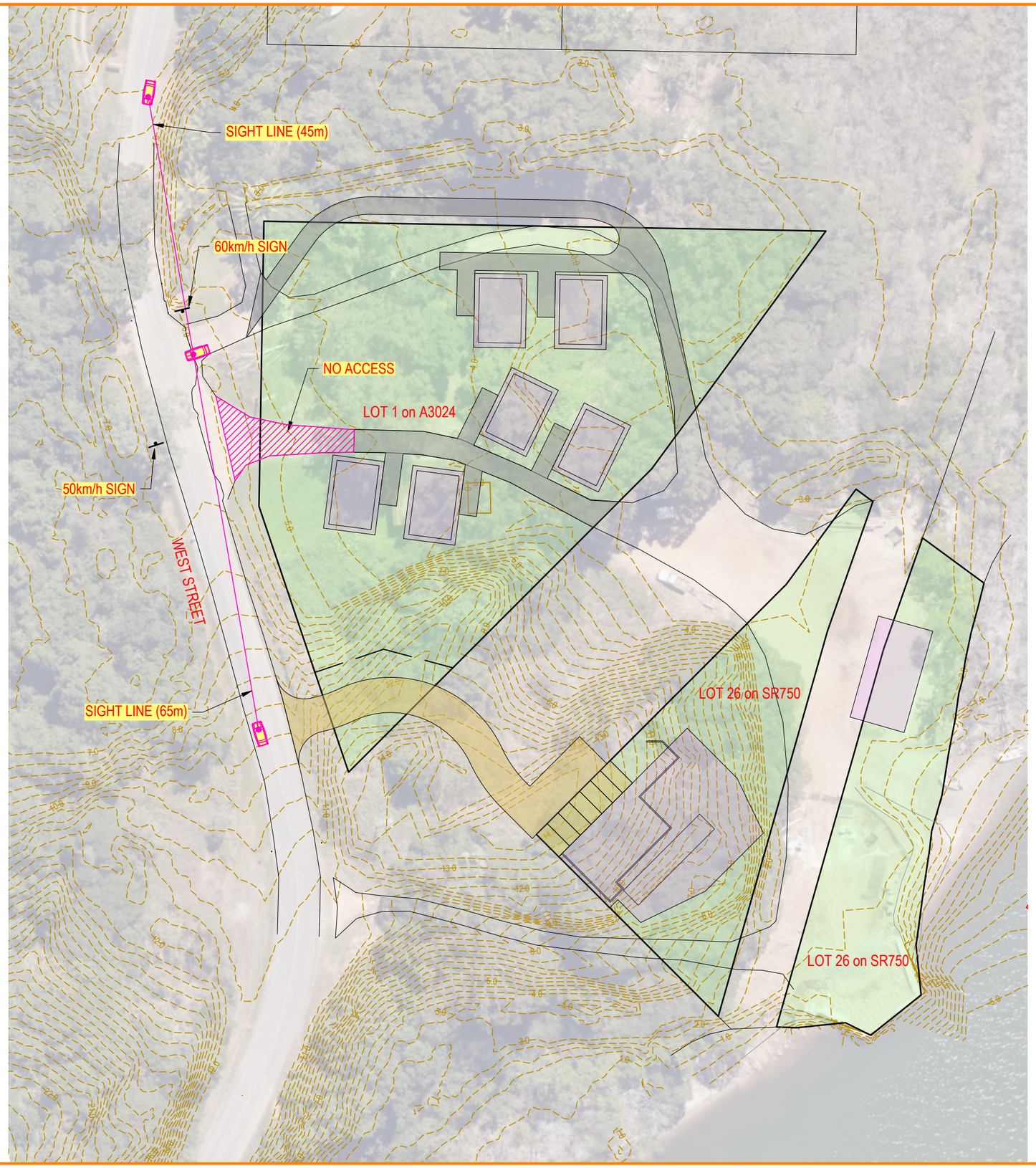
BLOOMFIELD DEVELOPMENT

MASTERPLANS
DRAINAGE AND FLOODING

Drawn	Design	Check'd	Apprv'd	A3 Full Size (Scale as shown)		
PAM	PAM	CJC	CJC	10.06.25	022-2501-00-SK-0003	A

13/06/2025 5:19:06 PM File: I:\022\022-2501\10 Drawings\00 Masterplanning\022-2501-00-SK-0003_FLOOD.dwg

Appendix C. Sight Distance



NOTES

- SIGHT DISTANCE REQUIREMENTS AT ACCESS DRIVEWAYS OBTAINED FROM AS/NZS 2890.1 SECTION 3.2.4.

- ROAD FRONT SPEED = 50km/h
- SIGHT DISTANCE REQUIRED = 45m (MINIMUM) 40m (DOMESTIC MINIMUM)

- ROAD FRONT SPEED = 60km/h
- SIGHT DISTANCE REQUIRED = 65m (MINIMUM) 55m (DOMESTIC)

FURTHER NOTES
- POSTED SPEED VARIES AS SHOWN (60km/h & 50km/h)
- VERTICAL GEOMETRY IS UNOBSTRUCTED BASED ON A CHECK OF DETAIL SURVEY AND LIDAR DATA

1:750 0 7.5 15 22.5 30

Rev	Date	Revision Notes
A	10.06.25	INITIAL ISSUE

NEON CONSULTING

BLOOMFIELD DEVELOPMENT

SIGHT ASSESSMENT
FOR LOT 1 ON A3024

Drawn	Design	Check'd	Apprv'd	A3 Full Size (Scale as shown)	
PAM	PAM	CJC	CJC	10.06.25	022-2501-00-SK-0002 A

13/06/2025 5:18:44 PM File: I:\022\022-2501\10 Drawings\00 Masterplanning\022-2501-00-SK-0001_SIGHT.dwg


NEON
CONSULTING

Attachment 9

Site Investigation and Classification Report

GILVEAR PLANNING

SITE INVESTIGATION AND CLASSIFICATION

RESIDENTIAL BUILDING
BLOOMFIELD DEVELOPMENT
WEST STREET

REPORT NO: GT25-093-002R REV 1

JUNE 2025

REVISION 1

ETS Geo Pty Ltd
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Email: admin@etsgeo.com.au

Distribution of Copies			
Revision	***Electronic***	***Paper***	***Issued to***
1	1	-	Kristy Gilvear – Gilvear Planning

Document Status							
Revision No.	***Author***	***Reviewer***	***Reason for Issue***	***Approved for Issue***			
				Name	***Signature***	***Date***	***RPEQ No***
1	M. Avera	C. Ryan	Final	M.Ganza	M. Ganza	4/6/25	4449

TABLE OF CONTENTS

1.0 INTRODUCTION

ETS Geo Pty Ltd (ETS) has conducted a geotechnical investigation at West Street, Bloomfield. The works were commissioned by the client, Gilvear Planning. The scope of the investigation allowed for a geotechnical assessment for the suitability of ground conditions for the proposed residential development. The assessment and testing were limited to the subject site and surrounding area appropriate to the scale and type of the proposed works.

Figure 1 presents a locality plant of the subject site.

Figure 1: Locality Plan

The objectives of the geotechnical investigation are summarised as follows:

- Characterise the subsurface ground conditions, including the presence of groundwater.
- Soil and rock strength and deformation parameters.
- Provision of foundation options and design parameters including:
  - Pad and strip footing ultimate bearing capacities.
  - Anticipated settlement values.
- Procedures and recommendations for site preparation and earthworks to be performed at site.
- Identify and comment on any other geotechnical or environmental factors that need to be addressed during the development.
- Advice on construction difficulties likely to be encountered.

2.0 STANDARDS & GUIDELINES

The soil classification descriptions, field and laboratory testing were carried out in general accordance with the following Australian Standards.

- AS1170.4-2007 Structural Design Actions, Part 4: Earthquake actions in Australia
- AS 1726-2017 Geotechnical Site Investigations
- AS 2870-2011 Residential Slabs & Footings
- AS 1289 Methods of Testing Soils for Engineering Purposes
- AS2159-2009 Piling - Design and installation

3.0 PROPOSED DEVELOPMENT

It is understood that the project area is to be developed for residential purposes. Figure 2 below shows the site development plan showing the location of the proposed buildings.

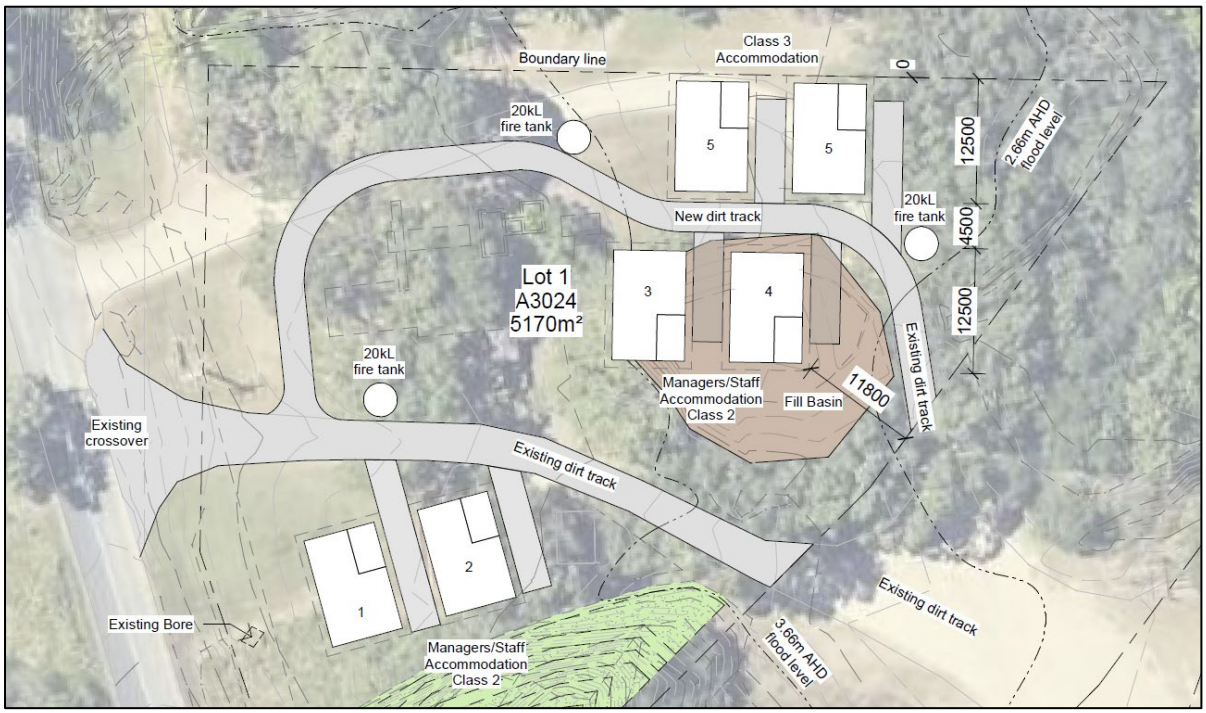


Figure 2: Proposed Site Development

4.0 SITE GEOLOGY

GeoResGlobe indicates that the site overlies mostly quaternary alluvium (Qa). Refer to Figure 3 below for the geological extents surrounding the subject site.

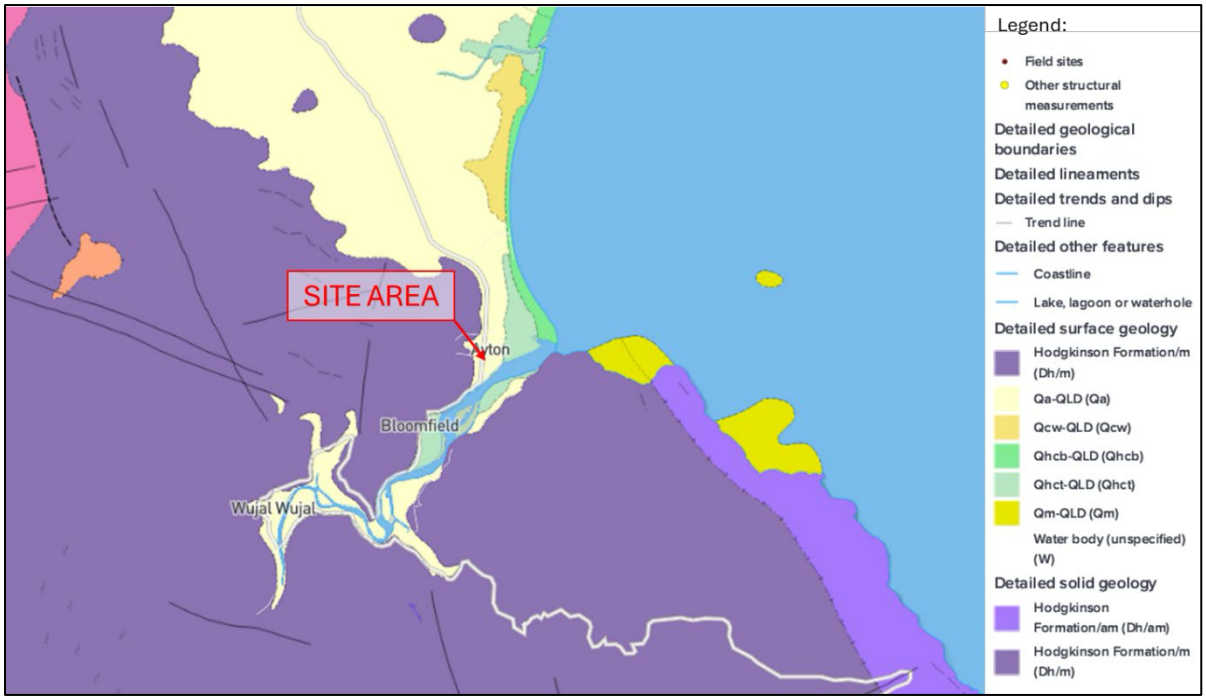


Figure 3: Site Geology

Table 1: Summary of Geology

AGE	SYMBOL	LITHOLOGICAL SUMMARY
QUATERNARY	Qa	Clay, silt, sand and gravel; flood-plain alluvium.

5.0 FIELD WORK

Field work was conducted by ETS on the 3rd of April 2025. It included a visual assessment of the site, site walkover and subsurface investigation. This investigation consisted of excavating three (3) test pits (TP3 to TP5)across the residential development. A mini excavator was used to excavate test pits to a maximum depth of 2.2m. Dynamic Cone Penetrometer (DCP) testing was completed alongside the three (3) test pits.

The results of the fieldwork (test pit logs and DCP results) are presented in Appendix B. The test locations are shown in Appendix A.

6.0 LABORATORY TESTING

The following laboratory testing was conducted in our NATA accredited laboratory on samples recovered during fieldwork in order to assist with the assessment of geotechnical design parameters to be used in the analysis:

- Atterberg Limits testing;
- Particle Size Distribution.

All testing was completed to Australian Standards and the results of the laboratory testing are presented in Appendix C. Table 2 below provides a summary of the laboratory testing.

Table 2: Summary of Laboratory Results

Location	Depth (m)	ATTERBERGS			PSD			Soil Description
		LL %	PI %	LS %	% Fines	% Sand	% Gravel	
TP3	0.6-0.8	29	12	8	60	32	8	Sandy CLAY (CL)
TP4	0.3-0.6	27	5	3.5	23	74	3	Silty SAND (SM)
TP5	0.8-1.0	41	20	10	86	13	1	CLAY (CL)

7.0 SUBSURFACE CONDITIONS

The test pit logs are displayed in Appendix B and have been summarised below.

At TP3, a 0.2m layer of TOPSOIL was encountered composed of Sandy CLAY (CL) of low plasticity with fine to medium grained sand. It overlies a FILL material composed of Sandy CLAY (CL) of low plasticity with fine to medium grained sand extending to 1.2m depth. The groundwater was encountered at 1.0m depth. The test pit was terminated at 1.2m depth due to the test pit wall collapsing because of groundwater.

At TP4, a 0.25m layer of TOPSOIL was encountered composed of fine to coarse grained Silty SAND (SM). It overlies a FILL material composed of Gravelly CLAY (CL-CI) of low to medium plasticity with fine to coarse grained sand extending to 0.6m depth. It overlies a CLAY (CL) of medium plasticity with fine to coarse grained sand until 2.2m depth. The groundwater was encountered at 2.0m depth. The test pit was terminated at 2.2m depth due to the test pit wall collapsing because of groundwater.

At TP5, a 0.1m layer of TOPSOIL was encountered composed of fine to coarse grained Clayey SAND (SC). It overlies a FILL material composed of Gravelly CLAY (CL) of low to medium plasticity with fine to coarse grained gravel extending to 0.8m depth. The groundwater was encountered at 0.73m depth. The test pit was terminated at 0.8m depth due to the test pit wall collapsing because of groundwater.

In the absence of evidence to confirm otherwise, it is assumed the fill material was not placed in accordance with AS3798 and is classified as ‘uncontrolled’.

8.0 ENGINEERING ASSESMENT & RECOMMENDATIONS

8.1 Site Classification

Due to the presence of fill soils to approximately 1.2m depth, the site is classified as **CLASS – P** in accordance with AS2870-2011[1] "Residential Slabs and Footings – Construction".

The Atterberg Limits tests indicate the soils and moderately reactive to changes in moisture content with a characteristic surface movement (y_s) within the **Class M** category (20mm to 40mm). This classification is also based on the site in its current state (i.e. no additional earthworks).

8.2 High Level Footings

Due to the presence of uncontrolled fill and soft soils extending beyond 1m depth, shallow footings are not considered suitable for the site in its current state. Therefore, short bored piers are recommended for all building structures designed in accordance with AS2870. Further information regarding short bored piers are shown in Section 8.3.

8.3 Short Bored Piers

For bored piers founded in stiff CLAY (CL) an ultimate end bearing capacity of 560kPa can be adopted for design. The minimum anticipated foundation depth is approximately 2.7m below the existing ground surface level. An ultimate skin friction value of 50kPa can be adopted for stiff clay.

It is highly recommended that a strength reduction factor of 0.42 is applied to the ultimate end bearing and skin friction. For bored piers founded in stiff clay, elastic settlements are estimated to less than 2% of the bored pier diameter.

From the subsoil conditions encountered during the borehole investigation, it is likely that bored piers will require the use of sacrificial steel casing and/or liners to reduce the potential for groundwater seepage and pier collapse. It is suggested that any seepage water be pumped from the hole immediately prior to concrete being placed or the concrete be placed under water using a "Tremie" pipe to avoid segregation.

It is recommended that drilling of any bored pile foundations should be observed by one of ETS Geotechnical Engineers (or experienced Geo-technician under the direction of a Geotechnical Engineer) to confirm that conditions encountered are consistent with the design assumptions.

---

[1] Australian Standard AS 2870-2011 "Residential Slabs and Footings – Construction", Standards Australia

In addition, it should be ensured that all loose material is removed from the base of piers prior to pouring of concrete. The use of a 'clean-out' bucket should be explicit in instructions to the drilling contractor. The practice of 'using water and spinning the augers' to remove loose material from the pier base is generally unacceptable. All footings are to be designed using engineering principles by an experienced and suitably qualified structural engineer.

8.4 Batter Angles

Temporary and permanent safe batter angles are presented in Table 3 that may be adopted at this site for the excavation of footings, services, etc., up to a depth of 1.5m. Due to the presence of groundwater, shoring and dewatering of excavations will likely be required. Short term angles apply during construction duration (i.e. day by day basis).

Table 3: Recommended Batter Angles

Material	Short Term	Long Term
Uncontrolled FILL: (Cohesive Materials)	1V:2H	Refer to Note 2
Controlled Fill (Cohesive Materials)	1.5V:1H	1V:1H
Controlled Fill (Non-Cohesive Materials)	1V:2H	1V:3H
CLAY (CL) – Soft	1V:2H	Note 3
CLAY (CL) – Firm	1V:1.5H	Note 3
CLAY (CL) – Stiff	1.5V:1H	1V:1H

NR: Not recommended

Note 1: All finished batter angles >1.5m in vertical height are subject to final inspection and approval by ETS.

Note 2: Long term batters proposed in uncontrolled fill shall be inspected and approved by ETS Geo to ensure stability.

Note 3: Not advisable without support.

8.5 Erosion Considerations

Given the project area's proximity to a riverbank, the following erosion hazards and mitigation measures must be carefully considered during planning and design:

- The site is susceptible to scour and bank erosion during high-flow events and seasonal flooding from the nearby river.
- Potential for undermining of foundations and loss of property along the river frontage. Requires a comprehensive stormwater management plan.
- Erosion can lead to significant loss of topsoil, impacting landscaping and site aesthetics.

A suitably qualified civil designer/engineer should be engaged to undertake the final design for site drainage and erosion protection.

8.6 Cut & Fill Earthworks

The following general procedures are suggested for any site preparation and earthworks to be performed at the site:

- Strip & remove topsoil, soil containing significant amounts of organic materials, 'uncontrolled' filling and also any deleterious soft, wet or highly compressible materials if encountered at footing or pavement formation levels;
- Undertake 'proof' rolling of the exposed surface levels across the site with a minimum 12 tonne static weight smooth drum roller or similar. Any soft or loose material that cannot be improved by compaction should be removed and replaced with approved select fill (loading around the crest should be not take place);
- Any exposed natural foundation soils should be compacted to a minimum dry density ratio of 98% using Standard compaction and moisture treated to a moisture range of -2%(dry) to +2%(wet) of optimum moisture content (OMC);
- Excavations should be kept free of water in order to maintain the stability of the surrounding soils and to provide suitable working conditions until the foundations are installed;
- Where the foundation levels are to be raised or subgrade materials are to be excavated (i.e. remove & replace), the foundation soils should be prepared as detailed below:

    - Approved filling should be undertaken by placing fill in uniform horizontal layers not exceeding 200mm loose thickness and compacted to achieve a dry density ratio of at least 98% using Standard compaction for cohesive soil or to at least 75% density index for sand. The moisture content of any cohesive soil fill materials should be maintained at -2% to +2% of OMC, during and after compaction;
    - Filling should be placed at least two (2) metres beyond the design profile and then trimmed to the design profile;
    - Where unsuitable materials are to be excavated it is recommended that all excavated in-situ soils are removed from the site and approved select fill is placed and compacted in the excavation. The excavation should be benched to "key in" the select fill material and optimise compaction. The benches should slope back at 1V:5H and be at least 0.5m wide, refer to Figure 4 below;

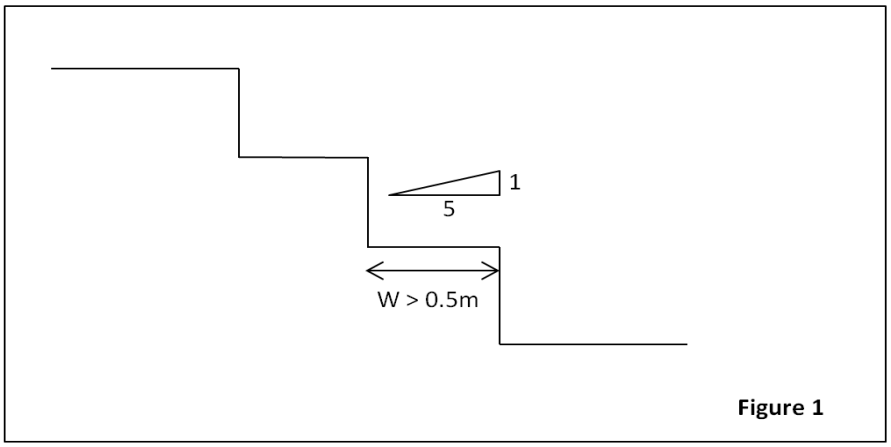


Figure 1

- Approved filling (general fill) should be a well graded material free from organic materials, have a Liquid Limit less than 35%, and should not contain any individual particles greater than 75mm in size;
- In order for filling to be considered 'controlled' any earthworks that are undertaken beneath any of the proposed structures or pavements are to be performed under full time 'Level 1' inspection and testing as described and in accordance with AS3798:2007.

It should be noted that there may be trafficability issues for rubber wheeled earthmoving equipment if construction activities are undertaken either during, or soon after, wet weather, due to the moistening and softening of the upper-level soils. In order to minimise these issues, the use of tracked equipment is suggested. In addition to this, achieving a satisfactory 'proof' roll under wet weather conditions may also be difficult. Should this situation arise, additional geotechnical advice should be sought from ETS.

The above procedures will necessitate geotechnical inspection and testing services to be utilised throughout the project lifecycle.

Any earthworks to be undertaken for any proposed structures required for the project are to be performed under full time 'Level 1' inspection and testing as described and in accordance with AS3798:2007.

Particular attention should be given to drainage and erosion control measures during site development. Areas where surface groundwater seepage currently exists or becomes apparent during or immediately after periods of heavy rainfall may require sub-soil drains.

8.7 In-Situ Material Suitability for Fill

The low plasticity clays at the site are considered suitable for re-use as general fill.

9.0 SITE MANAGEMENT RECOMMENDATIONS

It is important that the following site management methods be undertaken by the owner throughout the life of the proposed residences.

- Incorporate a perimeter drain at the pavement edges to prevent possible deterioration of the subgrade conditions under wet weather.
- It is important the site to be well drained. The ground around buildings should slope away at 1 in 20 metres and then fall to the stormwater system to prevent ponding of water adjacent to the buildings.
- Measures should be taken to divert surface water away from the crest of slopes to reduce the seepage of water into these slopes.
- Provision of kerbing and drainage structures on all driveways.
- Stormwater should be collected and discharged from the site via pipes into designated drainage paths and not allowed to flow on to the ground around the founding structures.
- Roof downpipes and other taps should not be allowed to saturate founding soils. The importance of avoiding leakage from underground services and drains near structures is stressed. Any leaking services or blocked drain should be remedied promptly. It is advisable to use flexible joints, allowing horizontal and vertical movement where services pipes pass through the foundation structure (floor and slab). The bases of services trenches should fall away from the building.
- Future shrubs and trees should be planted at a distance at least equivalent to their mature height away from the building to avoid shrinkage movement in expansive founding soils. Existing trees that may encroach this restriction should be removed. It is recommended that tress to be removed as early as possible prior to building construction to enable soil moisture to reach equilibrium.
- Lined surface and subsurface drains should be constructed, and water collected by these drainage systems, together with run-off from gutters, down-pipes, driveways and paved areas should be directed into the stormwater reticulation system.
- Particular attention should be given to drainage and erosion control measures. Areas where surface groundwater seepage currently exists or becomes apparent during or immediately after periods of heavy rainfall may require sub-soil drains.

10.0 SEASONAL INFLUENCES

Seasonal influences, i.e. “wet season” versus “dry season” may affect the foundation conditions on a site. At some sites softening of the cohesive soils (silt and clay) may be observed due to higher moisture content in the soil compared to the moisture content at the time of the investigation. As a consequence, the undrained shear strength of the soil may be higher during the dry season and lower during the wet season. Therefore, if moisture conditions encountered during construction are considered to be different to those that were encountered during the fieldwork, it is recommended that additional geotechnical advice be sought. Depending on the circumstances, it may be necessary to modify the design or implement some form of foundation improvement.

11.0 CONSTRUCTION INSPECTIONS

Footing excavations, slope stabilisation construction and earthworks activities shall be inspected by ETS Geo to confirm design assumptions. Instability / erosion may occur at the site during construction activities and result in destabilisation of the slope and localised slips. Any works on the site shall minimise disturbance of all surfaces outside of the immediate earthworks zone. No construction works shall be undertaken during prolonged or heavy periods of rainfall.

12.0 LIMITATIONS

We have prepared this report for the use of **GILVEAR PLANNING** for design purposes in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has not been prepared for use by parties other than **GILVEAR PLANNING** or their design consultants, i.e. Architect & Civil/Structural Engineers. It may not contain sufficient information for purposes of other parties or for other uses.

Your attention is drawn to the document - “Understand the Limitations of Your Geotechnical Report”, which is included in Appendix E of this report. This document has been prepared to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimise the risks associated with the ground works for this project. The document is not intended to reduce the level of responsibility accepted by ETS, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

APPENDIX A – TEST LOCATIONS

Legend

Test Pit / DCP Locations

ETS GEOTECHNICAL

PO Box 587
Redlynch QLD 4870

Telephone: (07) 4047 8600
Facsimile: (07) 4047 8699

E-mail: admin@etsgeo.com.au

TITLE:
Test Pit Locations
Test Pit / DCP Locations
Food and Drink Outlet, Bloomfield.

PROJECT NO.: GT25-093	**SCALE:** NTS	**DRAWN BY:** GD
DATE: 14/04/2025	**OFFICE:** CNS	**APPROVED BY:** RR

CLIENT: Gilvear Planning

DRAWING NO.: GT25-093-001 DWG

APPENDIX B – TEST PIT LOGS & DCP RESULTS

CLIENT:	Gilvear Planning	**SHEET:**	1 of 1
PROJECT:	Food and Drink Outlet	**PROJECT NO.:**	GT25-093
		DATE:	2025-04-03
TEST LOCATION:	TP3	**REVIEWER:**	RR
LOGGED BY:	GD	**ELEVATION:**	
EQUIPMENT:	Kubota KX 040-4	**LATITUDE:**	-15.92549
HOLE DIA.	450mm x 2000mm	**LONGITUDE:**	145.35175

ETS GEOTECHNICAL

Ground Surface at (m)

TOPSOIL: Sandy CLAY (CL)
low plasticity, dark brown, with fine to medium grained sand, with fine roots, moist.
0.2 m

FILL: Sandy CLAY (CL)
low plasticity, orange-brown, fine to medium grained sand, trace of fine grained gravel, moist.

1.2 m

TP3 terminated at 1.2m due to test pit wall collapse because of groundwater.

Groundwater was encountered at 1.0m.

Manual DCP: 2, 8, 6, 4, 4, 3, 2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 3, 2, 4, 4, 3, 4, 4, 5, 6, 6

RSLog / ETS BH Log Soil (DCP) - RR / ets-geo-pty-ltd / Engineer / April 08, 2025 11:24 AM

CLIENT:	Gilvear Planning	**SHEET:**	1 of 1
PROJECT:	Food and Drink Outlet	**PROJECT NO.:**	GT25-093
		DATE:	2025-04-03
TEST LOCATION:	TP4	**REVIEWER:**	RR
LOGGED BY:	GD	**ELEVATION:**	
EQUIPMENT:	Kubota KX 040-4	**LATITUDE:**	-15.92575
HOLE DIA.	450mm x 2000mm	**LONGITUDE:**	145.3516

Ground Surface at (m)

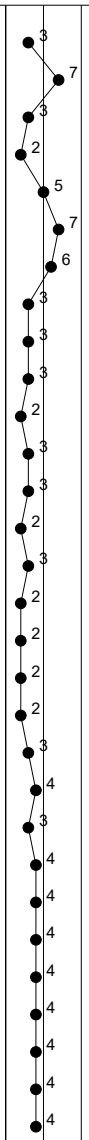
TOPSOIL: Silty SAND (SM)
fine to coarse grained, dark brown, low plasticity silt, trace of fine to medium grained gravel, with fine to medium roots, moist.
0.25 m

FILL: Gravelly CLAY (CL-CI)
low to medium plasticity, grey, fine to coarse grained gravel, with fine to coarse grained sand, moist.
0.6 m

CLAY (CI)
medium plasticity, orange-brown mottled grey, with fine to coarse grained sand, with fine to coarse grained gravel, moist.
2.2 m

TP4 terminated at 2.2m due to test pit wall collapse because of groundwater.

Groundwater was encountered at 2.0m.



RSLog / ETS BH Log Soil (DCP) - RR / ets-geo-pty-ltd / Engineer / April 08, 2025 11:24 AM

CLIENT:	Gilvear Planning	**SHEET:**	1 of 1
PROJECT:	Food and Drink Outlet	**PROJECT NO.:**	GT25-093
		DATE:	2025-04-03
TEST LOCATION:	TP5	**REVIEWER:**	RR
LOGGED BY:	GD	**ELEVATION:**	
EQUIPMENT:	Kubota KX 040-4	**LATITUDE:**	-15.92587
HOLE DIA.	450mm x 2000mm	**LONGITUDE:**	145.35131

GEOTECHNICAL

Ground Surface at (m)

TOPSOIL: Clayey SAND (SC)
fine to coarse grained, grey, low plasticity clay, trace of fine to coarse grained gravel, with fine roots, wet. 0.1 m

FILL: Gravelly CLAY (CI)
low to medium plasticity, grey, fine to coarse grained gravel, with fine to coarse grained sand, moist.

0.8 m

TP5 terminated at 0.8m due to test pit wall collapse because of groundwater.

Groundwater was encountered at 0.73m.

Manual DCP: 1, 4, 4, 5, 5, 3, 1, 2, 1, 1, 1, 1, 1, 2, 3, 8, 12, 14, 19, 20

APPENDIX C – LABORATORY TEST RESULTS

Material Test Report

Report Number:	**GT25-050-8**
Issue Number:	1
Date Issued:	15/05/2025
Client:	ETS Geotechnical Pty Ltd
	PO Box 587, Redlynch QLD 4870
Project Number:	GT25-050
Project Name:	Various Projects
Project Location:	Far North Queensland Region
Client Reference:	GT25-093
Work Request:	1705
Date Sampled:	03/04/2025
Dates Tested:	11/04/2025 - 15/05/2025
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Preparation Method:	In accordance with the test method
Site Selection:	Selected by Client
Location:	Lot 1 & 26 West Street, Bloomfield.
Material Source:	Insitu

ETS Geo Pty Ltd
Cairns Laboratory
130 Buchan Street Bungalow QLD 4870
Phone: 07 4047 8600
Email: admin@etsgeo.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Troy Bock
Laboratory Manager
NATA Accredited Laboratory Number: 20026

Sample Details							
Sample Number	S-1705A	S-1705B	S-1705C	S-1705D	S-1705E		
Date Sampled	03/04/2025	03/04/2025	03/04/2025	03/04/2025	03/04/2025		
Sample Location	TP1	TP2	TP3	TP4	TP4		
Sample Depth	0.4 - 0.5m	0.3 - 0.7m	0.6 - 0.8m	0.3 - 0.6m	0.8 - 1.0m		
Material	CLAY with sand and gravel - CI	Gravelly CLAY with sand - CI	Sandy CLAY with trace gravel - CI	Silty SAND with trace gravel - SM	CLAY with trace sand and gravel - CI		
Particle Size Distribution (AS1289 3.6.1)						**Min**	**Max**
Passing 75.0mm (%)	100	**	**	**	**		
Passing 37.5mm (%)	98	100	**	**	**		
Passing 19.0mm (%)	**	89	100	100	100		
Passing 9.5mm (%)	87	76	**	100	100		
Passing 4.75mm (%)	82	66	99	99	100		
Passing 2.36mm (%)	77	60	92	97	99		
Passing 0.425mm (%)	66	51	68	73	94		
Passing 0.075mm (%)	50	37	60	23	86		
Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)						**Min**	**Max**
Sample History	Oven Dried	Oven Dried	Oven Dried	Air Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve		
Liquid Limit (%)	49	32	29	27	41		
Plastic Limit (%)	15	13	17	22	21		
Plasticity Index (%)	34	19	12	5	20		
Linear Shrinkage (AS 1289 3.4.1)						**Min**	**Max**
Sample History	Oven Dried	Oven Dried	Oven Dried	Air Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2	AS 1289.3.1.2	AS 1289.3.1.2	AS 1289.3.1.2	AS 1289.3.1.2		
Linear Shrinkage (%)	11.5	13.0	8.0	3.5	10.0		
Cracking Crumbling Curling	Curling	Cracking & Curling	Cracking	None	Cracking & Curling		

APPENDIX D – PHOTOGRAPHS

PHOTOGRAPH 1: View of Test Pit 3

PHOTOGRAPH 2: View of soil profile of Test Pit 3

PHOTOGRAPH 3: View of Test Pit 4

PHOTOGRAPH 4: View of soil profile of Test Pit 4

PHOTOGRAPH 5: View of Test Pit 5

PHOTOGRAPH 6: View of soil profile of Test Pit 5

APPENDIX E – UNDERSTAND THE LIMITATIONS OF YOUR GEOTECHNICAL REPORT

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UNDERSTAND THE LIMITATIONS OF YOUR GEOTECHNICAL REPORT

This report is based on project details as provided to ETS Geo Pty Ltd at the time of commission. It therefore applies only to the site investigated, and to the specific set of project requirements as understood by ETS Geo Pty Ltd.

If there are changes to the project, you need to advise us in order that the effect of the changes on the report recommendations can be adequately assessed. ETS Geo Pty Ltd cannot take responsibility for problems that may occur due to project changes if we are not consulted.

It is important to remember that the subsurface conditions described in the report represent the state of the site at the time of investigation. Natural processes and the activities of man can result in changes to site conditions. For example, ground water levels can change, or fill can be placed on a site after the investigation is completed. If there is a possibility that conditions may have changed with time, ETS Geo Pty Ltd should be consulted to assess the impact on the recommendations of the report.

The site investigation only identifies the actual subsurface conditions at the location and time when the samples were taken. Geologists and engineers then extrapolate between the investigation points to provide an assumed three-dimensional picture of the site conditions. The report assumes that the site conditions as identified at the investigation locations are representative of the actual conditions throughout an area. This may not be the case and actual conditions may differ from those inferred to exist. This will not be known until construction has commenced. Your geotechnical report and the recommendations contained within it can therefore only be regarded as preliminary.

In the event that conditions encountered during construction differ from those described in the report, ETS Geo Pty Ltd should be consulted immediately. Although little can be done to change the actual site conditions which exist, steps can be taken to ameliorate the impact of unexpected conditions. For this reason, the services of ETS Geo Pty Ltd should be retained throughout the development stage of the project.

Problems can occur when other design professionals misinterpret a report. To help avoid this, ETS Geo Pty Ltd should be retained for liaison with other design professionals to explain the implications of the report.

This report should be retained as a complete document and should not be copied in part, divided, or altered in any way.

It is recommended that the services or ETS Geo Pty Ltd are retained during the construction phase to confirm that conditions encountered are consistent with design assumptions. For example, this may involve assessment of bearing capacity for footings, stability of natural slopes or excavations or advice on temporary construction conditions.

This document has been produced to help all parties involved recognise their individual responsibilities.