



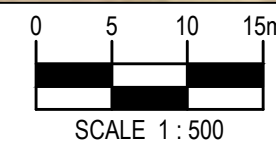
- AREA NO. LEGEND
- 1 – HV PARKING BAYS
 - 2 – PEDESTRIAN WALKWAY
 - 3 – SECURITY GATE
 - 4 – SITE VEHICLE PARK
 - 5 – SECURITY HUT
 - 6 – TURNSTILES
 - 7 – TEMPORARY OFFICES
 - 8 – TEMPORARY CRIB CLUSTERS

PLANS AND DOCUMENTS referred to in the SDA APPROVAL

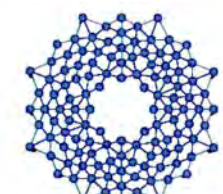
SDA approval: AP2025/002



MEDQ SITE TEMPORARY LAYDOWN FACILITY



PRELIMINARY



Alpha HPA

Prudentia
ENGINEERING
OPTIMAL PRACTICAL SOLUTIONS

SCALE	AS SHOWN	
DRAWN	SG	25.03.25
CHECKED	-	-
ENGINEER	-	-
APPROVED	-	-
CLIENT		

ALPHA HPA - HPA FIRST PROJECT

MEDQ SITE TEMPORARY LAYDOWN FACILITY

DRG. No.
MC23050-XXXXX

REV
P1

NUMBER	REFERENCE DRAWINGS	REV	REVISION DESCRIPTION	DRN	CHK	ENG	APP	DATE
		P1	PRELIMINARY FOR DISCUSSION	SG	-	-	-	20.03.25

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RPEQ: _____ SIGNATURE: _____

A1



Technical Memorandum

Revision	Date	Prepared by	Reviewed by	Client Reviewer
Rev 0	03/03/2025	Rebbekah Hearn	Patrice Brown	Rob Williamson (Alpha HPA)
Rev 1	04/03/2025	Rebbekah Hearn	Patrice Brown	NA
Rev 2	27/03/2025	Rebbekah Hearn	Patrice Brown	
To:		Mark Cornwell (Alpha HPA)		
From:		Rebbekah Hearn (CQG Consulting)		
CQG Project No.:		20118		
Client Reference:		MEDQ Land Usage		
CQG Project Manager:		Rebbekah Hearn		
Name of Document:		Laydown Area Ecology Investigation		

1 Summary of Results

The results of an ecological investigation undertaken by CQG Consulting ecologists on 13 February 2025 within a proposed temporary laydown area on adjacent land owned by MDEQ as part of the Alpha HPA First Project are summarised in this technical memorandum, and include:

- No species listed as critically endangered, endangered, vulnerable or near threatened under the *Nature Conservation Act 1992* (Qld) (NCA) or *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) were recorded;
- No significant impact to matters listed under the EPBC Act is expected negating the need to submit a referral under the EPBC Act for the proposed activities on the laydown area;
- Habitat features including arboreal termite mounds, potential arboreal hollows, leaf litter, log piles and exfoliating bark were recorded. An experienced fauna spotter catcher (FSC) holding an appropriate rehabilitation permit must be present during all clearing works;
- Vegetation was consistent with remnant regional ecosystem (RE) 12.11.6 (*Corymbia citriodora* subsp. *variegata*, *Eucalyptus crebra* woodland on metamorphics +/- interbedded volcanics) (least concern under the *Vegetation Management Act 1999* (Qld) (VMA)). Confirmation of clearing requirements under the Gladstone State Development Area (GSDA) Development Scheme is required from the Office of the Coordinator-General;
- Regional ecosystems (RE 12.3.12 and RE 12.3.3) known to correspond with an endangered threatened ecological community (TEC) are mapped along the boundary of the proposed laydown area however these areas will be avoided through micro-sighting by an ecologist prior to clearing;
- Grass trees (listed as special least concern under the NCA) were recorded, and will need to remain intact along with a 100 m buffer area or be translocated within the Lot; and

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PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: AP2025/002



- The proposed laydown area is intersected by a medium risk waterway barrier works (WWBW) drainage feature (in accordance with the *Water Act 2000* (Qld)). The design should avoid barriers to fish passage and works should be undertaken in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (Department of Agriculture and Fisheries 2018).

2 Introduction

Alpha HPA engaged CQG Consulting (CQG) to undertake an ecological site assessment for an area covering approximately 4.73 hectares (ha) of land (the Study Area, refer to **Attachment A, Figure A.1**) on Reid Road, Yarwun, Queensland. The Study Area is adjacent to Alpha HPA's existing high purity alumina operation and is currently owned and managed by Economic Development Queensland (EDQ) within the Gladstone State Development Area (GSDA).

Alpha HPA is proposing to use the area as a temporary laydown as part of Stage 2 of the Alpha HPA First Project. As the area is within the GSDA it will be subject to the associated Development Scheme under the *State Development and Public Works Organisation Act 1971* (Qld) (SDWPO Act), in addition to any clearing approval requirements under the *Vegetation Management Act 1999* (Qld) (VMA), *Nature Conservation Act 1992* (Qld) (NCA) and *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) where relevant.

In order to inform an assessment of potential impacts to matters of environmental significance listed under State legislation and matters of national significance (MNES) listed under the EPBC Act, an ecological investigation was conducted by a principal ecologist and senior ecologist from CQG on 13 February 2025.

The aim of the ecological investigation was to identify ecological values within the Study Area through the following objectives:

- Verify regulated vegetation and regional ecosystems mapped under the VMA;
- Record the presence of invasive species;
- Identify and record habitat features and potential breeding places within the Study Area; and
- Determine if permits will be required under the various legislation.

This technical memorandum summarises the results of the ecological investigation.

2.1 Study Area Location and Description

The Study Area consists of 4.73 ha of land located on Lot 1SP338512 on Reid Rd, Yarwun approximately 8 kilometres (km) north-east of Gladstone in Central Queensland (refer to **Attachment A, Figure A.1**). The Site was accessed via Alpha HPA's existing construction haul road within its production facility (Lot 12SP239343) on Reid Road.

The proposed temporary laydown area would consist of a light vehicle (LV) carpark, heavy vehicle turnaround and staging area, temporary offices and an access road (refer to **Attachment A, Figure A.2**).

3 Methodology

3.1 Desktop Assessment

A desktop search of publicly available databases was undertaken prior to conducting the ecological investigation to inform the survey methodology.

Searches of the following databases and spatial portals were undertaken:

- Protected Matters Search Tool (PMST) (Department of Climate Change, Energy, the Environment and Water (DCCEEW));
- Wildlife Online (Department of Tourism, Environment, Science and Innovation (DETSI));
- Regulated vegetation management (REV) mapping (Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (DNRMMRRD));

- Regional ecosystem (RE) mapping (DNRMMRRD);
- Essential Habitat Mapping (DNRMMRRD);
- Protected plant flora survey trigger mapping (DETSI);
- Biomaps spatial portal (DETSI);
- Qld Globe spatial portal (Queensland Government); and
- Atlas of Living Australia spatial portal (Australian Government's National Collaborative Research Infrastructure Strategy (NCRIS), hosted by CSIRO).

Full desktop search results are provided in **Attachment B**.

3.2 Field Survey

An ecological investigation of the Study Area was conducted by a CQG principal ecologist and senior ecologist on Thursday 13 February 2025 to verify regulated vegetation and regional ecosystem mapping, record the presence of invasive species, identify habitat values and potential breeding places within the Study Area.

The survey focused on the footprint of the proposed laydown area. Two random meander style field traverses covering approximately 300 metres (m) x 50 m each were undertaken throughout the Study Area. The following data was collected during the survey:

- Quaternary vegetation surveys along traverses to verify RE and identify changes between communities as per *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Version 7.1* (Neldner et al 2023);
- Flora species (native and invasive) present utilising available keys and reference material; and
- Incidental observations of fauna, suitable habitat, potential breeding places and signs of fauna presence (scats, tracks and traces).

3.2.1 Survey Limitations

The ecology survey was undertaken in late summer (February). Weather conditions at the time of the survey were dry with high temperatures (32-34 degrees Celsius (°C)). Rainfall records at the Gladstone Airport indicate that approximately 70 millimetres (mm) of rain had been received in January and February leading up to the survey. Ecology surveys have a range of inherent limitations associated with seasonal timing and climate conditions.

Certain plant species can be difficult to accurately identify without flowers present e.g., Acacias, Melaleucas and grasses. It can also be difficult to identify smaller plants obscured by long and/or thick grass.

4 Results

4.1 Regulated Vegetation and Regional Ecosystems

Regulated vegetation mapping (RMV) and RE mapping under the VMA were reviewed for the Study Area (refer to **Attachment A, Figure A.3** and **Figure A.4**). These maps were used to identify vegetation communities and potential threatened species likely to be present.

Current RVM mapping shows the Study Area consists of approximately 4.507 ha of Category B (remnant), 0.222 ha of Category X (non-remnant) and 0.001 ha of Category R (reef regrowth) vegetation. Mapped vegetation consists of REs shown in **Table 3.1**.

Table 3.1: REs mapped under the VMA within the Study Area

RE	Description	VMA Class	Structure Category	Area (m ²)	Area (ha)
11.3.29	<i>Eucalyptus crebra</i> , <i>E. exserta</i> , <i>Melaleuca</i> spp. woodland on alluvial plains.	Least concern (remnant)	Sparse	25,470	2.547
11.3.29 / 12.3.12	<i>Eucalyptus crebra</i> , <i>E. exserta</i> , <i>Melaleuca</i> spp. woodland on alluvial plains / <i>Eucalyptus latisinensis</i> or <i>E. exserta</i> , <i>Melaleuca viridiflora</i> var. <i>viridiflora</i> woodland on alluvial plains.	Least concern (remnant and high value regrowth)	Sparse	250	0.025
12.11.6	<i>Corymbia citriodora</i> subsp. <i>variegata</i> , <i>Eucalyptus crebra</i> woodland on metamorphics +/- interbedded volcanics.	Least concern (remnant)	Sparse	19,360	1.936
11.3.29 / 12.3.3	<i>Eucalyptus crebra</i> , <i>E. exserta</i> , <i>Melaleuca</i> spp. woodland on alluvial plains / <i>E. tereticornis</i> woodland on Quaternary alluvium.	Endangered (high value regrowth)	sparse	0.217	>0.001

The vegetation within the Study Area was found to be consistent with remnant RE12.11.6 (*Corymbia citriodora* subsp. *variegata*, *Eucalyptus crebra* woodland on metamorphics +/- interbedded volcanics).

Refer to **Attachment A, Figure A.6** for a map of the verified RE, **Attachment C** for a full description of the groundtruthed regional ecosystems, and **Attachment D** for the photograph log. For a full species list refer to **Attachment E**.

4.2 Threatened Ecological Communities

The mapped RE 12.3.12 and RE 12.3.3 (refer to **Table 3.1** and **Attachment A, Figure A.5**) are known to correspond to the Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions threatened ecological community (TEC) (listed as endangered under the EPBC Act). Although these REs were not verified as present during the ecology investigation, very small / narrow slivers of these RE (as a mixed heterogeneous polygon with RE11.3.29) are mapped within the Study Area (refer to **Table 3.1**).

CQG recommends that Alpha HPA adjust the design to avoid the mapped vegetation. This will result in a very small reduction to the laydown area, approximately 0.247 ha, resulting in a total area of 4.483 ha. Under the assumption that the design will be adjusted, impacts to TEC are not considered in any further detail in this technical memorandum.

4.3 Protected Plants

No areas mapped under the NCA as flora survey high risk trigger areas were identified within the Study Area or immediate adjoining areas.

No conservation significant plants have previously been recorded within 1 km of the Study Area (refer to the WildNet search results in **Attachment B**). The PMST search results identified five species of listed threatened flora under the EPBC Act as likely or known to occur within 5 km of the Study Area (refer to **Attachment B**).

No plants listed as critically endangered, endangered, vulnerable or near threatened were recorded during the ecology investigation however a number of Grass trees (*Xanthorrhoea johnsonii*) were recorded (listed as special least concern under the NCA) (refer to **Attachment A, Figure A.7**). This species is also known to be of cultural

significance to the native title holders (First Nations Bailai, Gurang, Gooreng Gooreng & Taribelang Bunda - FNBGGGTB Peoples) of the land on which Alpha HPA operates, and adjacent areas.

Where possible these grass trees should be protected, along with a 100 m buffer area or with involvement of the FNBGGGTB People, be translocated onto the same lot.

4.4 Threatened Fauna and Habitat

Fourteen conservation significant fauna species listed under the NCA were identified in the WildNet search as having been previously recorded within 1 km of the Study Area (refer to **Attachment B**). The PMST search results identified 21 threatened bird species, five threatened mammals and 23 listed migratory species listed under the EPBC Act as likely or known to occur within 5 km of the Study Area (refer to **Attachment B**).

Essential habitat is mapped under the VMA within the Study Area for Water mouse, Koala, Wallum froglet, Powerful owl, Lessor sand plover and Central greater glider.

No conservation significant fauna was recorded during CQG's ecology investigation, however potential suitable habitat in the form of foraging and breeding features was found to be present for species shown in **Table 3.2**. Water mouse, Wallum froglet and Lessor sand plover are considered unlikely to inhabit the Study Area based on records and habitat preferences.

It is important to note that neither the endangered Koala and Greater glider have been recorded within or immediately adjacent to the Study Area and no evidence (scats, tracks or scratches) of these species was recorded during the CQG ecological investigation. Potential hollows identified are relatively small in size and unlikely to be suitable for Greater glider denning.

Table 3.2: Species likelihood based on habitat availability

Common Name	Scientific Name	NCA Status ¹	EPBC Act Status ²	Likelihood
Grey-headed flying-fox	<i>Pteropus poliocephalus</i>	LC	V	Possible
Short-beaked echidna	<i>Tachyglossus aculeatus</i>	SL	-	Likely
Squatter pigeon (southern subspecies)	<i>Geophaps scripta scripta</i>	V	V	Likely
Central greater glider	<i>Petauroides volans volans</i>	E	E	Possible
Yellow-bellied Glider	<i>Petaurus australis australis</i>	V	V	Possible
Powerful owl	<i>Ninox strenua</i>	V	-	Possible
Koala	<i>Phascolarctos cinereus</i>	E	E	Possible

General habitat features recorded during the survey included:

- Arboreal termite mounds (these were common and widespread, with some evidence of use for nesting);
- Hollow fallen logs and stick piles;
- Earthen burrows and banks formed by fallen or burn out trees;
- Potential arboreal hollows (viewed from the ground, not confirmed);
- Stags;
- Exfoliating bark;
- Leaf litter; and
- Ephemeral drainage lines.

¹ NCA Status: LC = least concern; SL = special least concern; V = vulnerable; and E = endangered.

² EPBC Act Status: V = vulnerable; and E = endangered.

Recorded habitat features are shown in **Attachment A, Figure A.8** and photos are included in **Attachment D**. It is important to note that this list is not intended to be exhaustive, and represents features encountered during the transects undertaken within the Study Area during the ecology investigation were recorded.

No active breeding places were observed during the ecology investigation.

4.5 Waterways

An unnamed drainage feature is mapped as running parallel to the adjacent Reid Road, along the eastern boundary of the Study Area (refer to **Attachment A, Figure A.9**).

The unnamed drainage feature is also mapped as an amber waterway (moderate risk) under the waterways for waterway barrier works (WWBW) framework. Waterway barrier works may inhibit the free movement of fish along waterways and onto floodplains. Fish passage is an essential requirement for the survival and productivity of many species of fish which need to move into different habitats for breeding or rearing of young, or to access critical habitats for food and protection. We understand Alpha HPA does not intend to construct a waterway barrier within this drain.

A watercourse or drainage feature was also observed within the Study Area during the ecological investigation consisting of sections of more defined streams and areas of less defined intersecting roughly from south to north path consisting of depressions of varying depths. No ponded or flowing water was present at the time of the investigation. The watercourse was not mapped in detail however an approximate path was identified based on ground observations and aerial mapping (to be confirmed during surveying of the proposed laydown area) (refer to **Attachment A, Figure A.9**).

Although the WWBW mapping did not align with any obvious feature on the ground, this mapping is known to have some inaccuracies. Based on advice from the Office of the Coordinator-General (OCG), historical earthworks may have occurred upstream of the unmapped drainage feature observed within the study area, which may be contributing to diverted flow of water via the unmapped drainage feature running parallel to Reid Road. It is understood that Department of Primary Industries (DPI) may be referred to for technical advice in this regard during the assessment of any subsequent Material Change of Use (MCU) application to confirm the accuracy of mapping, and further considerations for waterway barrier works if required.

5 Conclusion – Ecological Investigation

The vegetation found within the Study Area was consistent with the mapped REs and potential habitat for conservation significant species was recorded within the Study Area, however no species listed as critically endangered, endangered, vulnerable or near threatened were sighted during the ecology investigation. Grass trees were recorded within the Study Area, these will need to remain intact along with a 100 m buffer area or be translocated within the Lot with involvement of the FNBGGGTB People.

A medium risk WWBW drainage feature runs parallel the Study Area. Consideration needs to be given in the design to avoid disturbing this watercourse. If a barrier is proposed within the watercourse, culvert etc, Alpha HPA would need to apply for a WWBW permit from the Queensland government. DPI may be referred to for technical advice in this regard during the assessment of any subsequent MCU application to confirm the accuracy of mapping, and further considerations for waterway barrier works if required.

5.1 Potential approvals requirements

Based on the findings of the ecological investigation, the approvals listed in **Table 4.1** may be triggered. It is noted that the Study Area is within the GSDA, owned by the Coordinator-General and Minister for Economic Development Queensland (EDQ), and managed by EDQ.

The Gladstone State Development Area Development Scheme (Department of State Development, Infrastructure, Local Government and Planning, 2022) controls planning and development within the GSDA. The development scheme contains a development assessment framework for making, assessing and deciding applications and requests relating to development within the GSDA.

The SDA Development Scheme outlines development which is SDA assessable and SDA self-assessable. All other forms of development subsequent to SDA approval continue to be regulated by other authorities, which may include Gladstone Regional Council, Gladstone Ports Corporation Limited or the State Assessment and Referral Agency. All other potential approval requirements will be determined during the pre-lodgement stage with the OCG.

Table 4.1: Potential approval requirements (ecological)

Matter	Trigger	Actions / Recommendations
Matters of State Environmental Significance		
Vegetation & Essential Habitat	Clearing of native vegetation	Determine applicability of SDA self-assessable development for operational works for the clearing of native vegetation where identified in an SDA application for a material change of use or reconfiguring a lot – if so conduct clearing in compliance with the requirements in the GSDA Development Scheme. The design of the laydown area should be adjusted to avoid areas mapped as RE 12.3.12 and RE 12.3.3 (refer to Section 3.2).
Protected Plants	Clearing of plants listed as special least concern under the NCA	Study Area does not contain any mapped high-risk protected plant areas. No plants listed as critically endangered, endangered, vulnerable and near threatened were recorded during the ecological investigation. Several Grass trees listed as special least concern under the NCA were recorded. Special least concern status is principally used when dealing with matters involving plant trade. Where the grass trees cannot be avoided (i.e. no clearing within 100 m of the plants), they should be translocated and used for rehabilitation or revegetation at the site. No permit is required if translocated onto the same Lot. If Alpha HPA becomes aware of any threatened or near threatened plants during construction, clearing within 100 m of the plants cannot occur without a protected plant clearing permit.
Threatened fauna	Clearing impacting threatened species under the NCA or EPBC	An ecologist is to conduct a pre-clearance survey within one week of clearing commencing. An experienced fauna spotter catcher (FSC) holding an appropriate rehabilitation permit must be present during all clearing works. Methodology of fauna management must ensure appropriate management of potential hollows (checking for active use prior to disturbance).
Waterways	Barriers to fish passage under the <i>Fisheries Act 1994</i> (Qld)	A surveyor should accurately map the extent and path of the waterway. The design should avoid barriers to fish passage. Works should be undertaken in accordance with the Accepted development requirements for operational work that is constructing or raising waterway barrier works (Department of Agriculture and Fisheries 2018). If the proposed work does not comply with the accepted development requirements, it will be considered assessable development and will require a development approval via the OCG who will coordinate relevant steps in the referral stage to SARA or direct to DPI as required.

Matter	Trigger	Actions / Recommendations
	Excavating, placing fill or destroying vegetation in any watercourse under the Water Act 2000 (Qld)	It is likely Alpha HPA will need to obtain a watercourse determination to confirm the drainage feature running through the centre of the Study Area prior to carrying out any filling activities. A watercourse determination may take up to 120 business days. Filling activities should be described in the supporting documentation of a watercourse determination and submitted to the Department of Local Government, Water and Volunteers to confirm any additional considerations or permits that may be required.
Matters of National Environmental Significance		
Threatened Ecological Communities	Likelihood of significant impact to a TEC under the EPBC Act.	Although no vegetation consistent with a TEC was found to occur within the Study Area during the ecological investigation, CQG recommends that Alpha HPA adjust the design to avoid areas mapped as containing RE 12.3.12 and RE 12.3.3 (refer to Attachment A, Figure A.4). This will result in a very small reduction to the laydown area, approximately 0.247 ha, resulting in a total area of 4.483 ha.
Threatened Species	Likelihood of significant impact to threatened species under the EPBC Act	Due to the relatively small size of the Study Area, the nature of the proposed development, the condition of the habitat present, the lack of records within the Study Area and immediately adjacent areas, it is considered unlikely that the proposed project would result in a significant impact to a threatened species, critical habitat or important population.

Yours sincerely,



Rebekah Hearn
Principal Ecologist
CQG Consulting

Attachments:

Attachment A: Maps

Attachment B: Database Search Results

Attachment C: Regional Ecosystems Verification

Attachment D: Photograph Log

Attachment E: Species Lists

Limitations

This report has been prepared for the use of the client, Alpha HPA, for the purpose of this commission only.

CQG³ takes no responsibility and disclaims all liability for any loss or damage that any party may suffer as a result of using or relying on any such information or recommendations contained in this report.

To the maximum extent permitted by law CQG expressly disclaims responsibility for or liability arising from:

- Any error in, or omission in connection with assumptions, or
- Reliance on the report by a third party, or use of the report other than for the purpose stated.

The report relates only to the project described herein and must be reviewed by a competent expert before being used for any other purpose. CQG accepts no responsibility for other use of the data.

This report does not provide a complete assessment of the environmental status of the site but is limited to the scope defined herein.

Should further information become available regarding the conditions of the Study Area, CQG reserves the right to review the report in the context of the additional information.

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This report is based on information issued and supplied to CQG by others as well as publicly available information.

³ CQ Environmental Pty Ltd (ABN 61 107 574 514) trading as CQG Consulting (CQG)

Attachment A:

Maps



Legend

Study Area

Cadastral Boundaries

N

Scale 1:1,750 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.1

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Study Area

CQG Consulting

180 Quay Street, Rockhampton Q 4700
PO Box 8384, Allenstown 4700
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Project No: 20118
Map No: 20118-19-01
Revision: Rev 0
20 February 2025



Legend

- Study
- Cadastral Boundaries
- Proposed Layout**
- Access Road
- HV Turnaround and Staging Area
- LV Carpark
- Temporary Offices

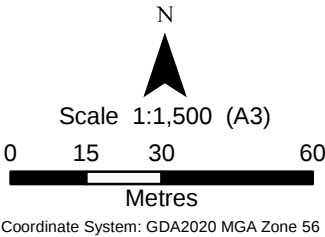


Figure A.2

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Proposed Layout



180 Quay Street, Rockhampton Q 4700
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Project No: 20118
Map No: 20118-19-02
Revision: Rev 0
20 February 2025



Legend

- Study Area
- Cadastral Boundaries

Regulated Vegetation

- Category B area
- Category R area
- Category X area

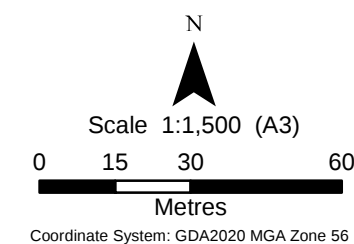


Figure A.3

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Regulated Vegetation Mapping



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Project No: 20118
Map No: 20118-19-03
Revision: Rev 0
20 February 2025



Legend

- Study Area
- Cadastral Boundaries
- Regional Ecosystem Mapping**
 - Non-remnant / regrowth
 - Endangered - Sub-dominant
 - Not Of Concern

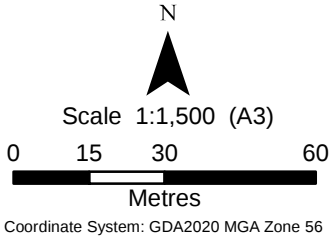
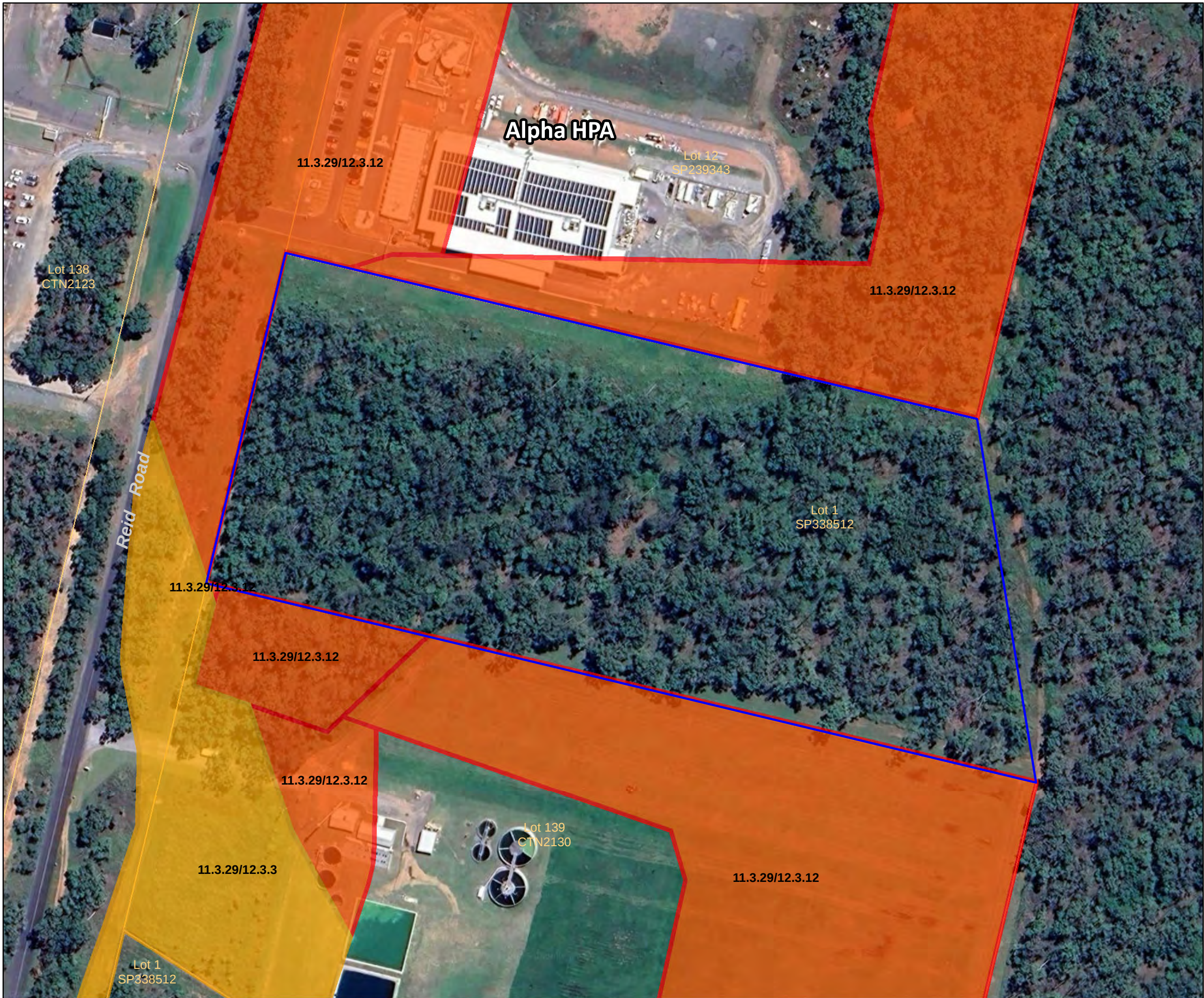


Figure A.4
Alpha HPA
MEDQ Temporary Laydown Area
Approvals Support
Ecological Investigation
13 February 2025
Regional Ecosystem Mapping



180 Quay Street, Rockhampton Q 4700
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Project No: 20118
Map No: 20118-19-04
Revision: Rev 0
20 February 2025



Legend

- Study Area
- Cadastral Boundaries
- RE Areas to be avoided**
- Endangered - Sub-Dominant (11.3.29/12.3.3)
- Not of Concern (11.3.29/12.3.12)

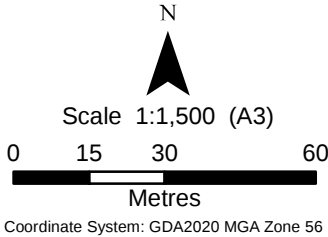


Figure A.5

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

RE Areas to be avoided



180 Quay Street, Rockhampton Q 4700
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Project No: 20118
Map No: 20118-19-05
Revision: Rev 0
3 March 2025



Legend

-  Study Area
-  Cadastral Boundaries
- Verified Regional Ecosystem**
-  12.11.6

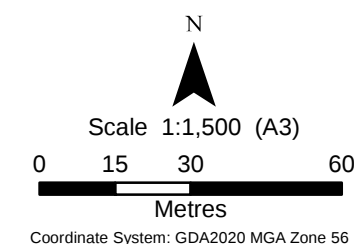


Figure A.6

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Verified Regional Ecosystem



180 Quay Street, Rockhampton Q 4700
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Project No: 20118
Map No: 20118-19-06
Revision: Rev 0
3 March 2025



Legend

-  Study Area
-  Grass Trees
-  Cadastral Boundaries

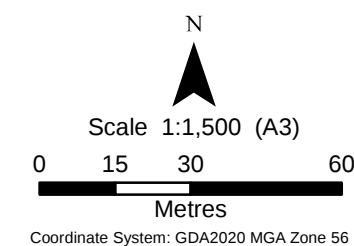


Figure A.7

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Grass Trees



180 Quay Street, Rockhampton Q 4700
PO Box 8384, Allenstown 4700
Ph: +61 7 4922 9252 Fax: +61 7 49220195

Project No: 20118
Map No: 20118-19-07
Revision: Rev 0
3 March 2025



Legend

- Study Area
- Cadastral Boundaries

Habitat Features

- Arboreal Termite Mound
- Earthen Bank
- Exfoliating Bark
- Hollow Log
- Leaf Litter
- Macropod Scat
- Potential Arboreal Hollow
- Potential Burrow
- Stag
- Termite Mound
- Timber Pile

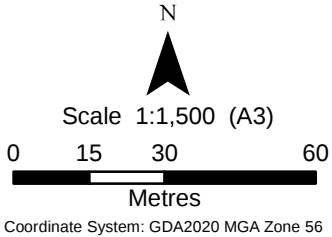


Figure A.8

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Habitat features and
Potential Breeding Places



180 Quay Street, Rockhampton Q 4700
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Project No: 20118
Map No: 20118-19-08
Revision: Rev 0
3 March 2025



Legend

-  Study Area
-  Cadastral Boundaries
-  Approximate location of watercourse

Waterway Barrier Works

Risk of Impact

-  2 - Moderate

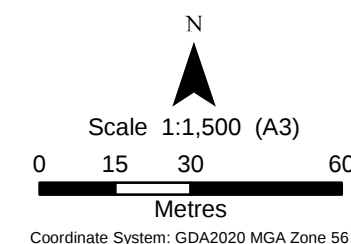


Figure A.9

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Waterway Mapping

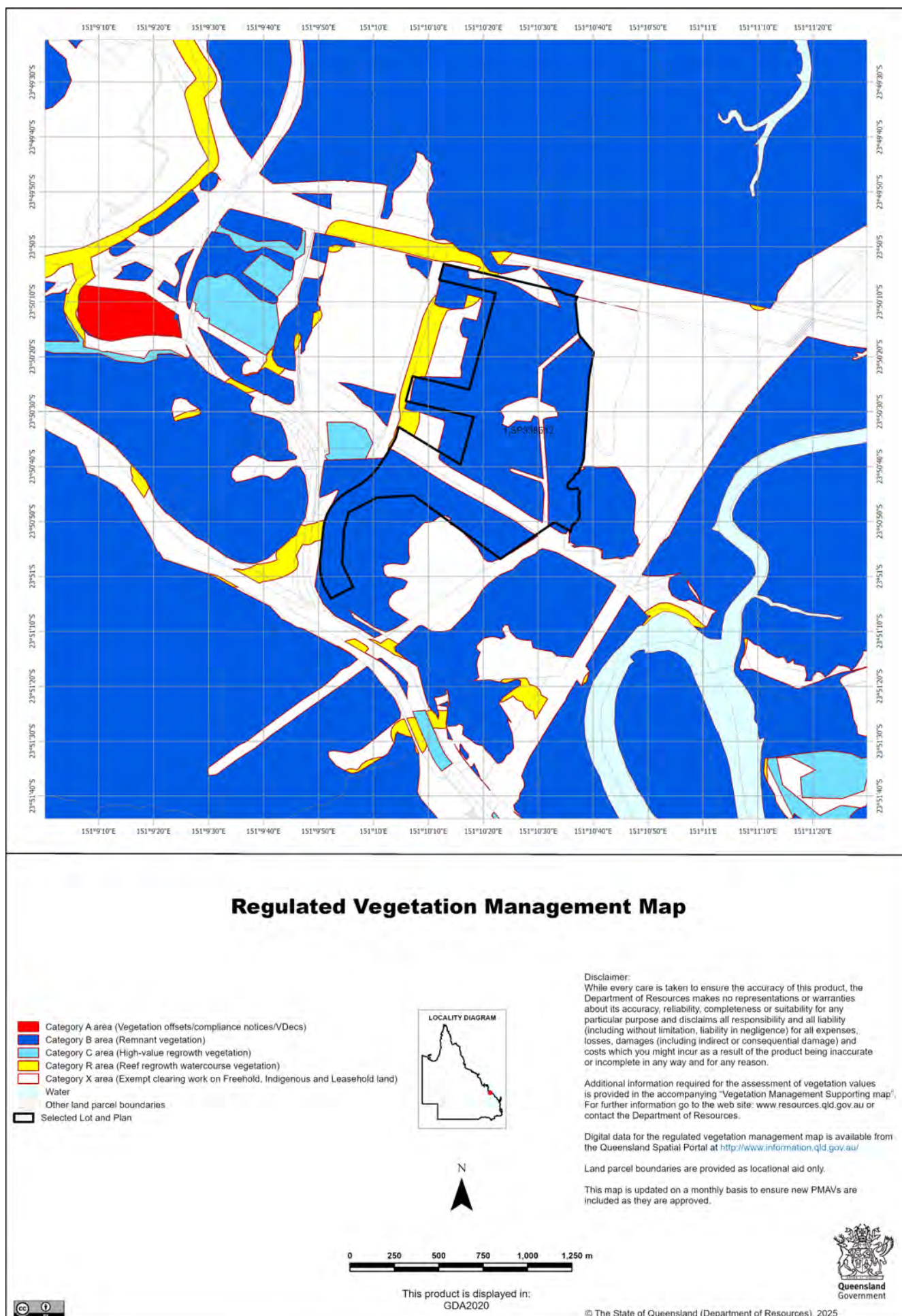


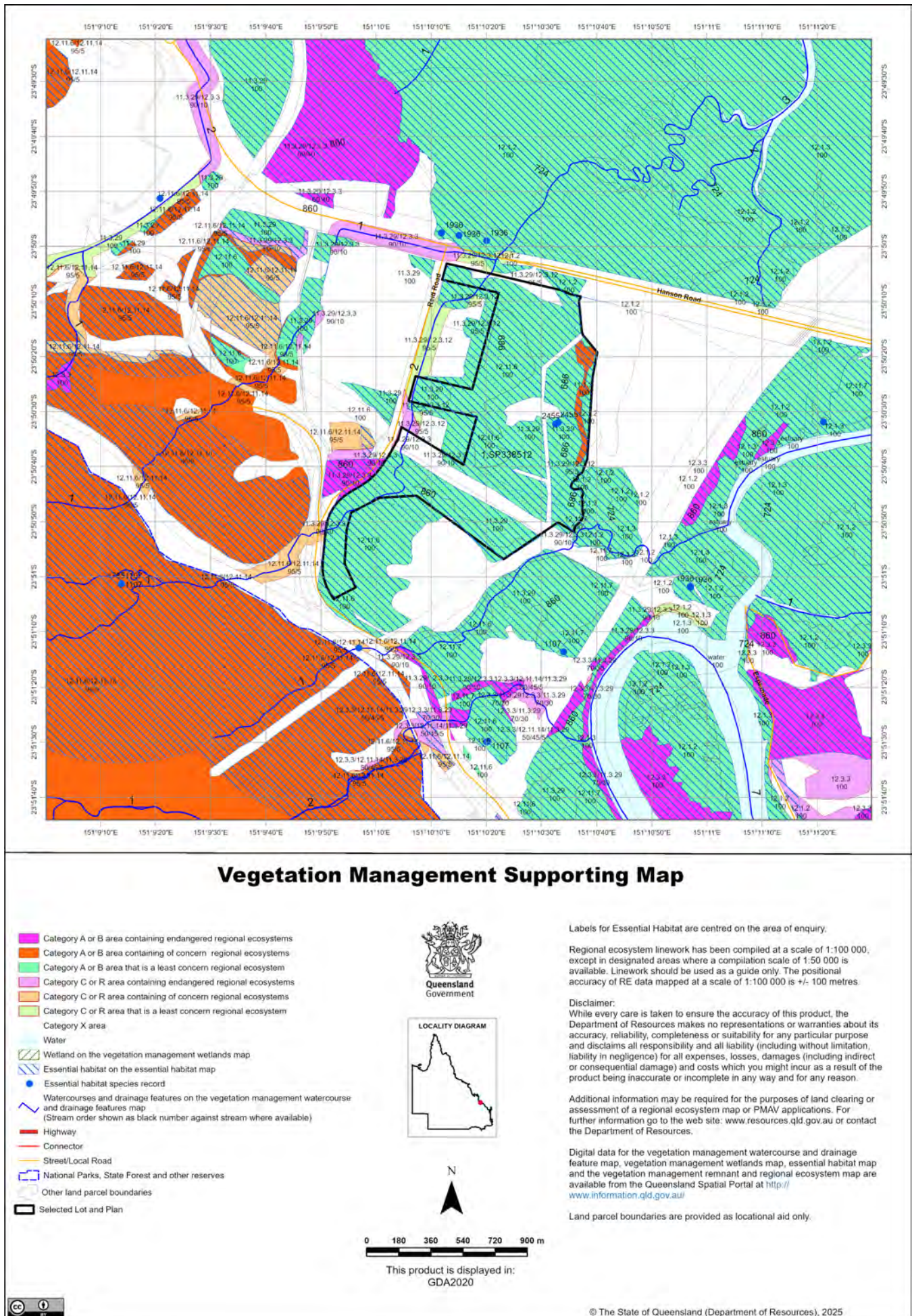
180 Quay Street, Rockhampton Q 4700
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Project No: 20118
Map No: 20118-19-09
Revision: Rev 0
3 March 2025

Attachment B:

Database Search Results





Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Resources website <http://www.resources.qld.gov.au> has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1. that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
2. in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
724	<i>Xeromys myoides</i>	water mouse	V	Sedgeland (<i>Juncus</i> , <i>Baumea</i> , <i>Lepironia</i> , <i>Cyperus</i> , <i>Eleocharis</i>), salt meadow/saline grassland (<i>Sporobolus virginicus</i>), wet heathland (<i>Banksia robur</i> , <i>Gahnia</i> spp.) and saltmarsh-chenopod grassland behind mangroves; and in open-closed mangrove scrub-forest (e.g. <i>Avicennia marinus</i> subsp. <i>australasica</i> in SEQ, <i>Ceriops tagal</i> & <i>Bruguiera</i> spp. but forage in adjacent <i>Avicennia</i> and saltpan areas in CQC), <i>Melaleuca quinquenervia</i> swamp forest or fresh-water mangrove, and supralittoral banks with <i>Callitris</i> and <i>Casuarina</i> .	Sea level to 100m.		Coastal areas near mangroves/swamps.
860	<i>Phascolarctos cinereus</i>	koala	E	Open forests and woodlands containing <i>Eucalyptus</i> , <i>Corymbia</i> , <i>Lophostemon</i> or <i>Melaleuca</i> trees having a trunk of a diameter of more than 10cm at 1.3m above the ground. Tree species used for food and habitat varies across the state and can include: <i>Corymbia citriodora</i> , <i>Corymbia henryi</i> , <i>Corymbia intermedia</i> , <i>Eucalyptus acmenoides</i> , <i>Eucalyptus bancroftii</i> , <i>Eucalyptus biturbinata</i> , <i>Eucalyptus blakelyi</i> , <i>Eucalyptus brownii</i> , <i>Eucalyptus camaldulensis</i> , <i>Eucalyptus carnea</i> , <i>Eucalyptus chloroclada</i> , <i>Eucalyptus coolabah</i> , <i>Eucalyptus crebra</i> , <i>Eucalyptus dealbata</i> , <i>Eucalyptus drepanophylla</i> , <i>Eucalyptus dunnii</i> , <i>Eucalyptus eugenioides</i> , <i>Eucalyptus exserta</i> , <i>Eucalyptus fibrosa</i> , <i>Eucalyptus grandis</i> , <i>Eucalyptus helidonica</i> , <i>Eucalyptus latissinensis</i> , <i>Eucalyptus longirostrata</i> , <i>Eucalyptus major</i> , <i>Eucalyptus melanophloia</i> , <i>Eucalyptus melliodora</i> , <i>Eucalyptus microcarpa</i> , <i>Eucalyptus microcorys</i> , <i>Eucalyptus microtheca</i> , <i>Eucalyptus moluccana</i> , <i>Eucalyptus montivaga</i> , <i>Eucalyptus orgadophila</i> , <i>Eucalyptus papuana</i> , <i>Eucalyptus pilularis</i> , <i>Eucalyptus platyphylla</i> , <i>Eucalyptus populnea</i> , <i>Eucalyptus portuensis</i> , <i>Eucalyptus propinqua</i> , <i>Eucalyptus racemosa</i> , <i>Eucalyptus resinifera</i> , <i>Eucalyptus robusta</i> , <i>Eucalyptus saligna</i> , <i>Eucalyptus seeana</i> , <i>Eucalyptus siderophloia</i> , <i>Eucalyptus sideroxylon</i> , <i>Eucalyptus tereticornis</i> , <i>Eucalyptus thozetiana</i> , <i>Eucalyptus tindaliae</i> , <i>Eucalyptus umbra</i> , <i>Lophostemon confertus</i> , <i>Melaleuca leucadendra</i> , <i>Melaleuca quinquenervia</i> .	Sea level to 1000m.		Riparian areas, plains and hill/escarpment slopes.
686	<i>Crinia tinnula</i>	wallum froglet	V	Vegetation community is a mandatory essential habitat factor for this species. Permanent to ephemeral acidic (pH 4.3 - 5.2), soft freshwater in <i>Melaleuca</i> (e.g. <i>M. quinquenervia</i>) swamps, sedgeland, wet and dry heathland (e.g. <i>Banksia robur</i> , <i>Xanthorrhoea</i>) and wallum (<i>Banksia aemula</i> shrubland/woodland) areas coastal lowlands on sand or sandstone, occasionally in adjacent open forest/woodland (e.g. <i>Eucalyptus racemosa</i> , <i>Corymbia citriodora</i>) with heathy understorey; known to persist in small remnants (<10ha); may be found well away from water.	Sea level to 150m.	Sandy and sandy-alluvial substrates.	
1107	<i>Ninox strenua</i>	powerful owl	V	Wet and dry tall open eucalypt forest (<i>Eucalyptus pilularis</i> , <i>E. acmenoides</i> , <i>E. tereticornis</i> , <i>E. camaldulensis</i> , <i>E. crebra</i> , <i>E. melliodora</i> , <i>Corymbia citriodora</i> & <i>C. intermedia</i>), including mountain forest gullies/gorges; forests aged 60+ years (large & old) on fertile soils with suitable hollows; roosting in dense foliage of closed forest (occasionally caves) and foraging in open forest and woodland including areas adjacent to urban/rural development. Nest in large hollows (45-75cm diameter, 50-180cm deep) 6-45m above ground, in large (>100cm dbh) old eucalypts on the side or at the head of heavily wooded gully.	Sea level to 1000m.		Gully.
1936	<i>Charadrius mongolus</i>	lesser sand plover	E	Foraging on sandy beach, intertidal mudflat/sandflat and mangrove mudflat of coastal bays and estuaries. Also inland at lakes and soaks. Roost on beach, banks, sand/shell spits, rocky spits and exposed reef.	Sea level to 100m.	Sand and mud substrates.	Associated with coastlines and coastal and inland wetlands.
2455	<i>Petauroides armillatus</i>	central greater glider	E	Tall mature open wet and dry eucalypt forest (<i>Eucalyptus</i> &/or <i>Corymbia</i> spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	

Label	Regional Ecosystem (mandatory unless otherwise specified)
724	7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.5, 8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.1.5, 11.1.1, 11.1.2, 11.1.3, 11.1.4, 11.2.4, 11.2.5, 11.3.27, 12.1.1, 12.1.2, 12.1.3, 12.2.5, 12.2.7, 12.2.11, 12.2.12, 12.2.15, 12.3.4, 12.3.5, 12.3.6, 12.3.8, 12.3.12, 12.3.13, 12.3.20
860	4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 9.5.17, 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12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.15, 12.12.23, 12.12.24, 12.12.25, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10
686	12.2.5, 12.2.7, 12.2.9, 12.2.10, 12.2.12, 12.2.15, 12.3.4, 12.3.5, 12.3.6, 12.3.12, 12.3.14, 12.3.20, 12.5.2, 12.5.10. These regional ecosystems are not a mandatory essential habitat factor for this species.
1107	8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.13, 8.2.14, 8.3.1, 8.3.3, 8.3.6, 8.3.8, 8.3.9, 8.3.10, 8.3.11, 8.5.1, 8.8.1, 8.10.1, 8.11.2, 8.11.3, 8.11.5, 8.12.1, 8.12.2, 8.12.3, 8.12.4, 8.12.5, 8.12.7, 8.12.8, 8.12.11, 8.12.12, 8.12.14, 8.12.16, 8.12.17, 8.12.18, 8.12.19, 8.12.26, 8.12.27, 8.12.28, 8.12.29, 8.12.30, 8.12.31, 8.12.32, 11.2.2, 11.2.3, 11.3.1, 11.3.11, 11.3.12, 11.3.25, 11.3.26, 11.3.40, 11.4.1, 11.4.3, 11.4.7, 11.4.9, 11.5.7, 11.5.16, 11.8.1, 11.8.13, 11.9.1, 11.9.4, 11.9.5, 11.9.6, 11.9.10, 11.9.13, 11.10.1, 11.10.2, 11.10.5, 11.10.8, 11.10.9, 11.10.13, 11.11.3, 11.11.5, 11.11.13, 11.11.14, 11.11.18, 11.12.4, 11.12.13, 11.12.19, 11.12.21, 12.2.1, 12.2.2, 12.2.3, 12.2.4, 12.2.5, 12.2.7, 12.2.8, 12.3.1, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.15, 12.3.16, 12.3.17, 12.3.18, 12.3.19, 12.3.20, 12.3.21, 12.5.1, 12.5.3, 12.5.6, 12.5.7, 12.5.13, 12.8.1, 12.8.2, 12.8.3, 12.8.4, 12.8.5, 12.8.6, 12.8.7, 12.8.8, 12.8.9, 12.8.10, 12.8.11, 12.8.12, 12.8.13, 12.8.14, 12.8.18, 12.8.21, 12.8.22, 12.8.23, 12.8.24, 12.8.25, 12.8.26, 12.9.10.1, 12.9.10.2, 12.9.10.3, 12.9.10.4, 12.9.10.5, 12.9.10.6, 12.9.10.14, 12.9.10.16, 12.9.10.17, 12.9.10.18, 12.9.10.19, 12.9.10.20, 12.9.10.21, 12.9.10.23, 12.9.10.24, 12.9.10.25, 12.9.10.26, 12.9.10.29, 12.11.1, 12.11.2, 12.11.3, 12.11.4, 12.11.5, 12.11.6, 12.11.9, 12.11.10, 12.11.11, 12.11.12, 12.11.13, 12.11.16, 12.11.17, 12.11.18, 12.11.19, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.1, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.11, 12.12.12, 12.12.13, 12.12.15, 12.12.16, 12.12.17, 12.12.18, 12.12.20, 12.12.26, 12.12.28, 13.3.2, 13.3.3, 13.3.5, 13.9.2, 13.11.2, 13.11.5, 13.11.6, 13.11.7, 13.12.1, 13.12.4, 13.12.11
1936	2.1.1, 2.1.2, 2.1.3, 2.1.5, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 7.1.1, 7.1.3, 8.1.2, 11.1.2, 11.1.4, 12.1.3.
2455	2.10.2, 2.10.3, 2.5.24, 7.3.19, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.5.2, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.35, 7.12.21, 7.12.22, 7.12.24, 7.12.27, 7.12.29, 7.12.30, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.61, 7.12.63, 8.3.2, 8.3.5, 8.3.6, 8.3.8, 8.11.3, 8.11.8, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.20, 8.12.23, 8.12.31, 8.12.32, 9.3.1, 9.3.3, 9.3.8, 9.3.15, 9.3.16, 9.5.5, 9.7.3, 9.8.1, 9.8.4, 9.8.9, 9.11.2, 9.11.4, 9.11.10, 9.11.14, 9.11.16, 9.12.1, 9.12.2, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.22, 9.12.23, 9.12.26, 10.3.13, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.14, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.29, 11.3.35, 11.3.36, 11.3.38, 11.3.39, 11.4.8, 11.4.13, 11.5.1, 11.5.2, 11.5.8, 11.5.8, 11.5.9, 11.5.12, 11.5.20, 11.5.21, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.9.2, 11.9.9, 11.9.13, 11.10.1, 11.10.2, 11.10.4, 11.10.5, 11.10.7, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.7, 11.11.10, 11.11.15, 11.12.1, 11.12.2, 11.12.3, 11.12.6, 11.12.13, 12.3.2, 12.3.3, 12.3.6, 12.3.7, 12.3.9, 12.3.11, 12.3.14, 12.3.15, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.6, 12.5.7, 12.5.11, 12.5.12, 12.8.1, 12.8.8, 12.8.10, 12.8.11, 12.8.14, 12.8.16, 12.8.20, 12.8.24, 12.8.25, 12.9.10.1, 12.9.10.2, 12.9.10.3, 12.9.10.4, 12.9.10.5, 12.9.10.7, 12.9.10.11, 12.9.10.12, 12.9.10.14, 12.9.10.17, 12.9.10.18, 12.9.10.19, 12.9.10.20, 12.9.10.21, 12.9.10.23, 12.9.10.24, 12.9.10.26, 12.9.10.27, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.19, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.11, 12.12.12, 12.12.13, 12.12.15, 12.12.20, 12.12.22, 12.12.23, 12.12.24, 12.12.25, 12.12.27, 12.12.28, 13.11.3, 13.11.5, 13.11.6, 13.11.8, 13.12.1, 13.12.2



Department of the Environment, Tourism, Science and Innovation

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest

Lot: 1 Plan: SP338512

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the input coordinates.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the Queensland Herbarium & Biodiversity Science's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium & Biodiversity Science's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Resources website <https://www.resources.qld.gov.au/>

Please direct queries about these reports to: Queensland.Herbarium@qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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Summary Information

The following table provides an overview of the AOI with respect to selected topographic and environmental themes. Refer to **Map 1** for locality information.

Table 1: Details for area of interest:
Lot: 1 Plan: SP338512, with area 109.94 ha

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Gladstone Regional	Calliope	Southeast Queensland	Burnett - Curtis Hills and Ranges

The table below summarizes the extent of remnant vegetation classed as "Endangered", "Of concern" and "No concern at present" regional ecosystems classified by Biodiversity Status within the area of interest (AOI).

Table 2: Summary table, biodiversity status of regional ecosystems within the AOI

Biodiversity Status	Area (Ha)	% of AOI
Endangered	1.97	1.79
Of concern	0.00	0.00
No concern at present	87.74	79.81
Total remnant vegetation	89.71	81.60

Refer to **Map 2** for further information.

Regional Ecosystems

1. Introduction

Regional ecosystems are vegetation communities in a bioregion that are consistently associated with particular combinations of geology, landform and soil (Sattler and Williams 1999). Descriptions of Queensland's Regional ecosystems are available online from the Regional Ecosystem Description Database (REDD). Descriptions are compiled from a broad range of information sources including vegetation, land system and geology survey and mapping and detailed vegetation site data. The regional ecosystem classification and descriptions are reviewed as new information becomes available. A number of vegetation communities may form a single regional ecosystem and may be distinguished by differences in structure or sub-dominant species in the ecologically dominant layer. Vegetation communities with different dominant species in the ecologically dominant layer may be amalgamated into a regional ecosystem if they are not mappable and predictable in the landscape at 1:100 000 scale. Vegetation communities may be mappable at a scale larger than 1:100 000. Vegetation communities within a regional ecosystem are denoted by a letter following the regional ecosystem code (e.g. a, b, c). Vegetation communities and regional ecosystems are amalgamated into a higher level classification of broad vegetation groups (BVGs).

A published methodology for survey and mapping of regional ecosystems across Queensland (Neldner et al 2023) provides further details on regional ecosystem concepts and terminology.

This report provides information on the type, status, and extent of vegetation communities, regional ecosystems and broad vegetation groups present within a user specified area of interest. Please note, for the purpose of this report, the Biodiversity Status is used. This report has not been developed for application of the *Vegetation Management Act 1999* (VMA). Additionally, information generated in this report has been derived from the Queensland Herbarium & Biodiversity Science's Regional Ecosystem Mapping, and not the regulated mapping certified for the purposes of the VMA. If your interest/matter relates to regional ecosystems and the VMA, users should refer to the Department of Resources website <https://www.resources.qld.gov.au/>.

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

- remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares, or
- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss*, or
- 10-30 percent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare** regional ecosystem subject to a threatening process.***

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.****

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 percent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

**Severe degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example, by loss of A horizon, surface expression of salinity; surface compaction, loss of organic matter or sheet erosion.*

***Rare regional ecosystem: pre-clearing extent (<1000 ha); or patch size (<100 ha and of limited total extent across its range).*

****Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

*****Moderate degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded.*

2. Remnant Regional Ecosystems

The following table identifies the remnant regional ecosystems and vegetation communities mapped within the AOI and provides their short descriptions, Biodiversity Status, and remnant extent within the selected AOI. Please note, where heterogeneous vegetated patches (mixed patches of remnant vegetation mapped as containing multiple regional ecosystems) occur within the AOI, they have been split and listed as individual regional ecosystems (or vegetation communities where present) for the purposes of the table below. In such instances, associated area figures have been generated based upon the estimated proportion of each regional ecosystem (or vegetation community) predicted to be present within the larger mixed patch.

Table 3: Remnant regional ecosystems, description and status within the AOI

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
11.3.29	Eucalyptus crebra, E. exserta, Melaleuca spp. woodland on alluvial plains	No concern at present	80.17	72.92
12.1.2	Saltpan vegetation including grassland, herbland and sedgeland on marine clay plains	No concern at present	0.12	0.11
12.11.6	Corymbia citriodora subsp. variegata, Eucalyptus crebra woodland on metamorphics +/- interbedded volcanics	No concern at present	4.39	4.00
12.3.12	Eucalyptus latisinensis or E. exserta, Melaleuca viridiflora var. viridiflora woodland on alluvial plains	No concern at present	3.05	2.78
12.3.3	Eucalyptus tereticornis woodland on Quaternary alluvium	Endangered	1.97	1.79
non-remnant	None	None	20.23	18.40

Refer to **Map 2** for further information. **Map 3** also provides a visual estimate of the distribution of regional ecosystems present before clearing.

Table 4 provides further information in regards to the remnant regional ecosystems present within the AOI. Specifically, the extent of remnant vegetation remaining within the bioregion, the 1:1,000,000 broad vegetation group (BVG) classification, whether the regional ecosystem is identified as a wetland, and extent of representation in Queensland's Protected Area Estate. For a description of the vegetation communities within the AOI and classified according to the 1:1,000,000 BVG, refer to **Table 6**.

Table 4: Remnant regional ecosystems within the AOI, additional information

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.3.29	Pre-clearing 81000 ha; Remnant 2021 29000 ha	18b	Not a Wetland	Low
12.1.2	Pre-clearing 33000 ha; Remnant 2021 26000 ha	35b	Intertidal	High

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
12.11.6	Pre-clearing 368000 ha; Remnant 2021 234000 ha	10b	Not a Wetland	High
12.3.12	Pre-clearing 18000 ha; Remnant 2021 13000 ha	21a	Contains Palustrine	High
12.3.3	Pre-clearing 437000 ha; Remnant 2021 38000 ha	16c	Not a Wetland	Low
non-remnant	None	None	None	None

Representation in Protected Area Estate: High greater than 10% of pre-clearing extent is represented; Medium 4 - 10% is represented; Low less than 4% is represented, No representation.

The distribution of mapped wetland systems within the area of interest is displayed in **Map 6**.

The following table lists known special values associated with a regional ecosystem type.

Table 5: Remnant regional ecosystems within the AOI, special values

Regional Ecosystem	Special Values
11.3.29	None
12.1.2	12.1.2: Habitat for threatened fauna species including the false water-rat <i>Xeromys myoides</i> in the southern part of the bioregion particularly in areas immediately adjacent to mangroves, 12.1.3. (Van Dyck and Gynther, 1996, 2003).
12.11.6	12.11.6: Habitat for threatened flora species including <i>Cycas megacarpa</i> and <i>Macrozamia parcifolia</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
12.3.12	12.3.12: Habitat for threatened plant species including <i>Germainia capitata</i> .
12.3.3	12.3.3: Habitat for threatened plant species including <i>Rhaponticum australe</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>). 12.3.3a: Habitat for threatened plant species including occasional <i>Rhaponticum australe</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>). 12.3.3b: Habitat for threatened flora species including <i>Melaleuca irbyana</i> . 12.3.3c: Habitat for threatened flora species including <i>Melaleuca irbyana</i> and <i>Marsdenia coronata</i> . 12.3.3d: Habitat for threatened plant species including <i>Rhaponticum australe</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
non-remnant	None

3. Remnant Regional Ecosystems by Broad Vegetation Group

BVGs are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid climatic zones. BVGs provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states. There are three levels of BVGs which reflect the approximate scale at which they are designed to be used: the 1:5,000,000 (national), 1:2,000,000 (state) and 1:1,000,000 (regional) scales.

A comprehensive description of BVGs is available at: <https://publications.qld.gov.au/dataset/redd/resource/>

The following table provides a description of the 1:1,000,000 BVGs present and their associated extent within the AOI.

Table 6: Broad vegetation groups (1 million) within the AOI

BVG (1 Million)	Description	Area (Ha)	% of AOI
None	None	20.23	18.40
10b	Moist open forests to woodlands dominated by <i>Corymbia citriodora</i> (spotted gum).	4.39	4.00
16c	Woodlands and open woodlands dominated by <i>Eucalyptus coolabah</i> (coolabah) or <i>E. microtheca</i> (coolabah) or <i>E. largiflorens</i> (black box) or <i>E. tereticornis</i> (blue gum) or <i>E. chlorophylla</i> on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded.	1.97	1.79
18b	Woodlands dominated <i>Eucalyptus crebra</i> (sens. lat.) (narrow-leaved red ironbark) frequently with <i>Corymbia</i> spp. or <i>Callitris</i> spp. on flat to undulating plains.	80.17	72.92
21a	Low woodlands and low open woodlands dominated by <i>Melaleuca viridiflora</i> (coarse-leaved paperbark) on depositional plains.	3.05	2.78
35b	Bare salt pans ± areas of <i>Tecticornia</i> spp. (samphire) sparse forbland and/or <i>Xerochloa imberbis</i> or <i>Sporobolus virginicus</i> (sand couch) tussock grassland.	0.12	0.11

Refer to **Map 4** for further information. **Map 5** also provides a representation of the distribution of vegetation communities as per the 1:5,000,000 BVG believed to be present prior to European settlement.

4. Technical and BioCondition Benchmark Descriptions

Technical descriptions provide a detailed description of the full range in structure and floristic composition of regional ecosystems (e.g. 11.3.1) and their component vegetation communities (e.g. 11.3.1a, 11.3.1b). See: <http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/>

The descriptions are compiled using site survey data from the Queensland Herbarium & Biodiversity Science's QBEIS database. Distribution maps, representative images (if available) and the pre-clearing and remnant extent (hectares) of each vegetation community derived from the regional ecosystem mapping data are included. The technical descriptions should be used in conjunction with the fields from the regional ecosystem description database (REDD) for a full description of the regional ecosystem.

Technical descriptions include data on canopy height, canopy cover and native plant species composition of the predominant layer, which are attributes relevant to assessment of the remnant status of vegetation under the *Vegetation Management Act 1999*. However, as technical descriptions reflect the full range in structure and floristic composition across the climatic, natural disturbance and geographic range of the regional ecosystem, local reference sites should be used for remnant assessment where possible (Neldner et al. 2023 (PDF)* section 3.3 of: https://www.qld.gov.au/_data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

The technical descriptions are subject to review and are updated as additional data becomes available.

When conducting a BioCondition assessment, these technical descriptions should be used in conjunction with BioCondition benchmarks for the specific regional ecosystem, or component vegetation community. <http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/>

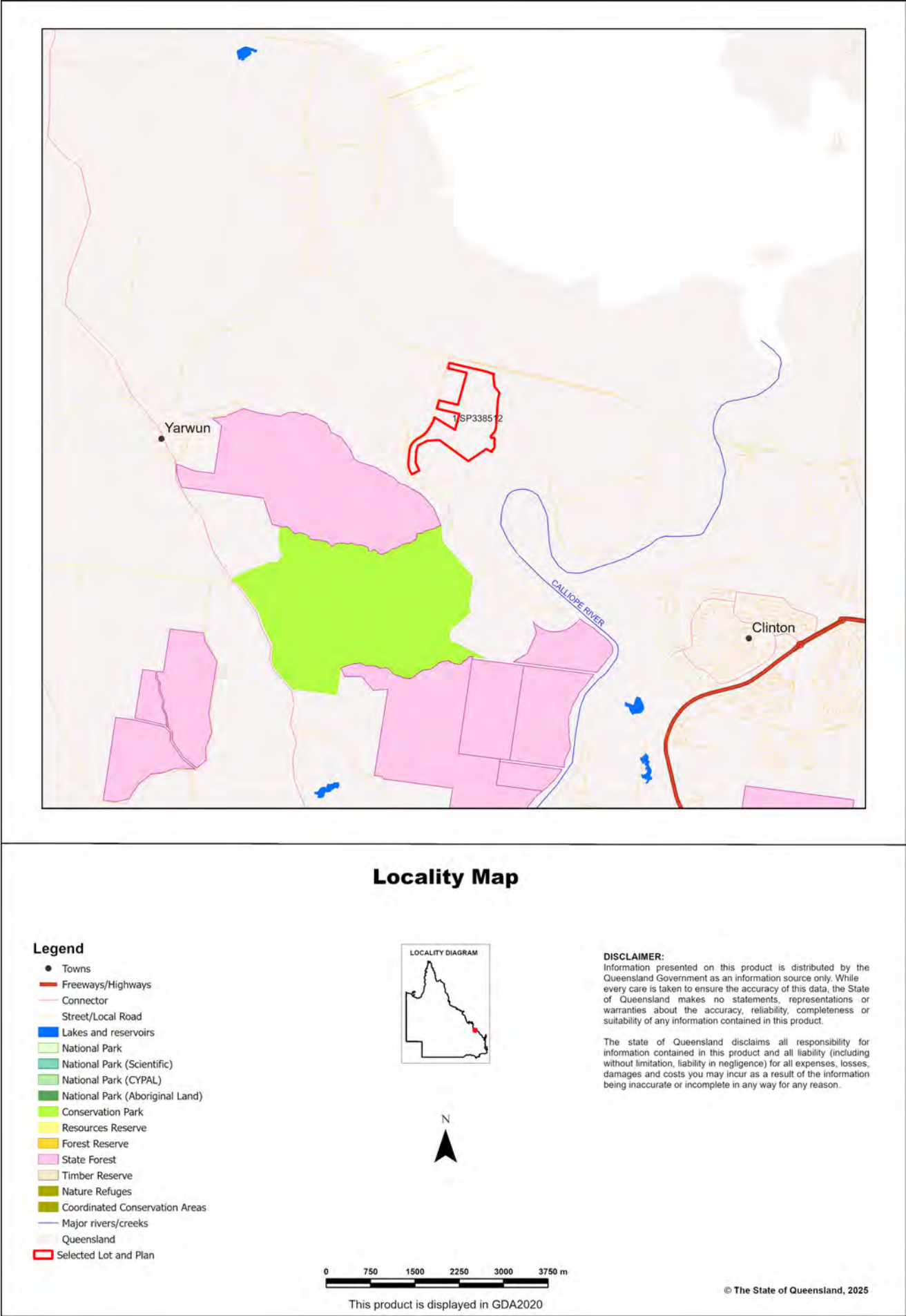
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance regimes has been considered throughout the geographic extent of the regional ecosystem. Local reference sites should be used for this spatial and temporal (seasonal and annual) variability.

Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available

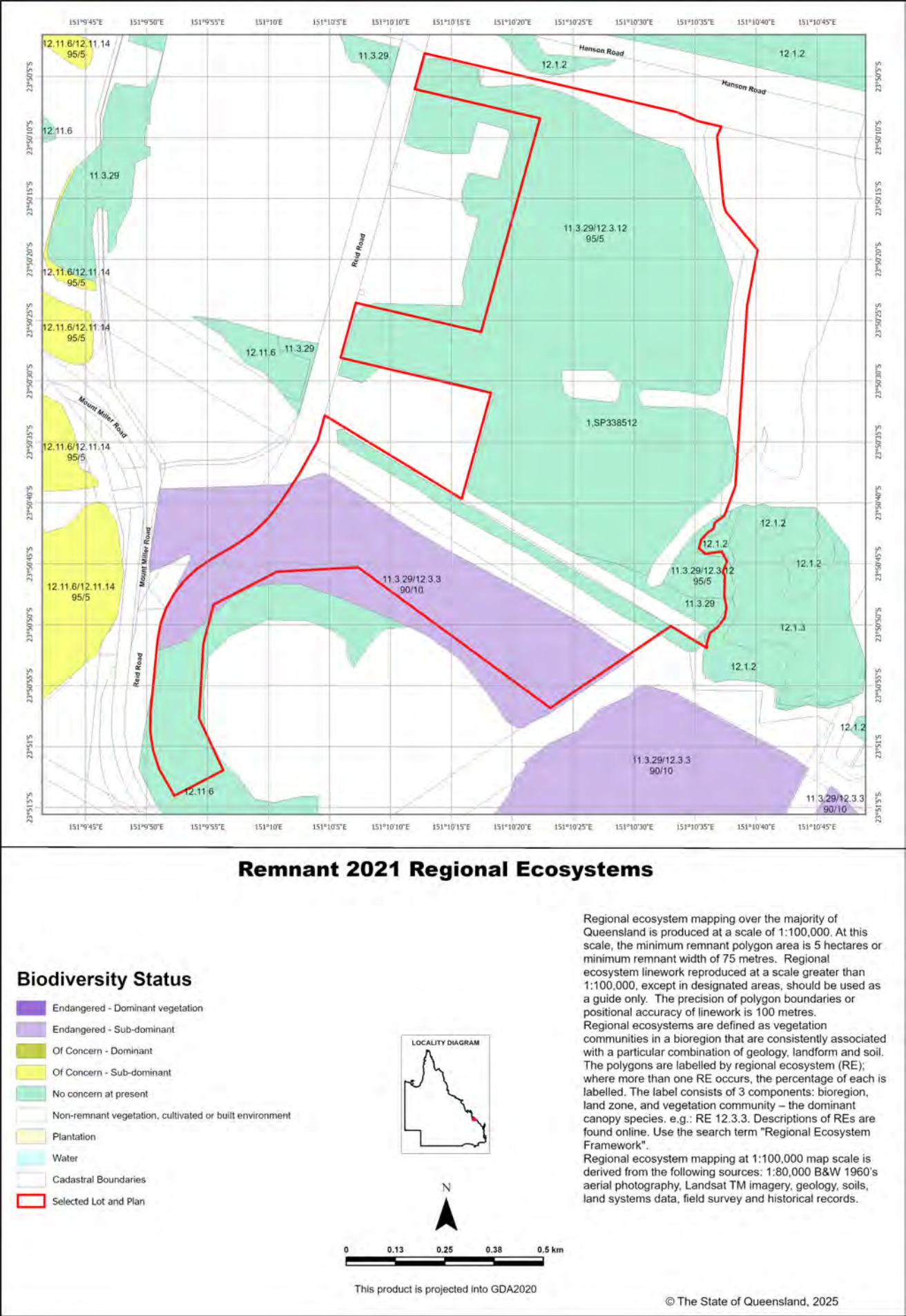
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
11.3.29	Not currently available	Not currently available
12.1.2	Not currently available	Available
12.11.6	Not currently available	Available
12.3.12	Available	Available
12.3.3	Available	Available
non-remnant	Not currently available	Not currently available

Maps

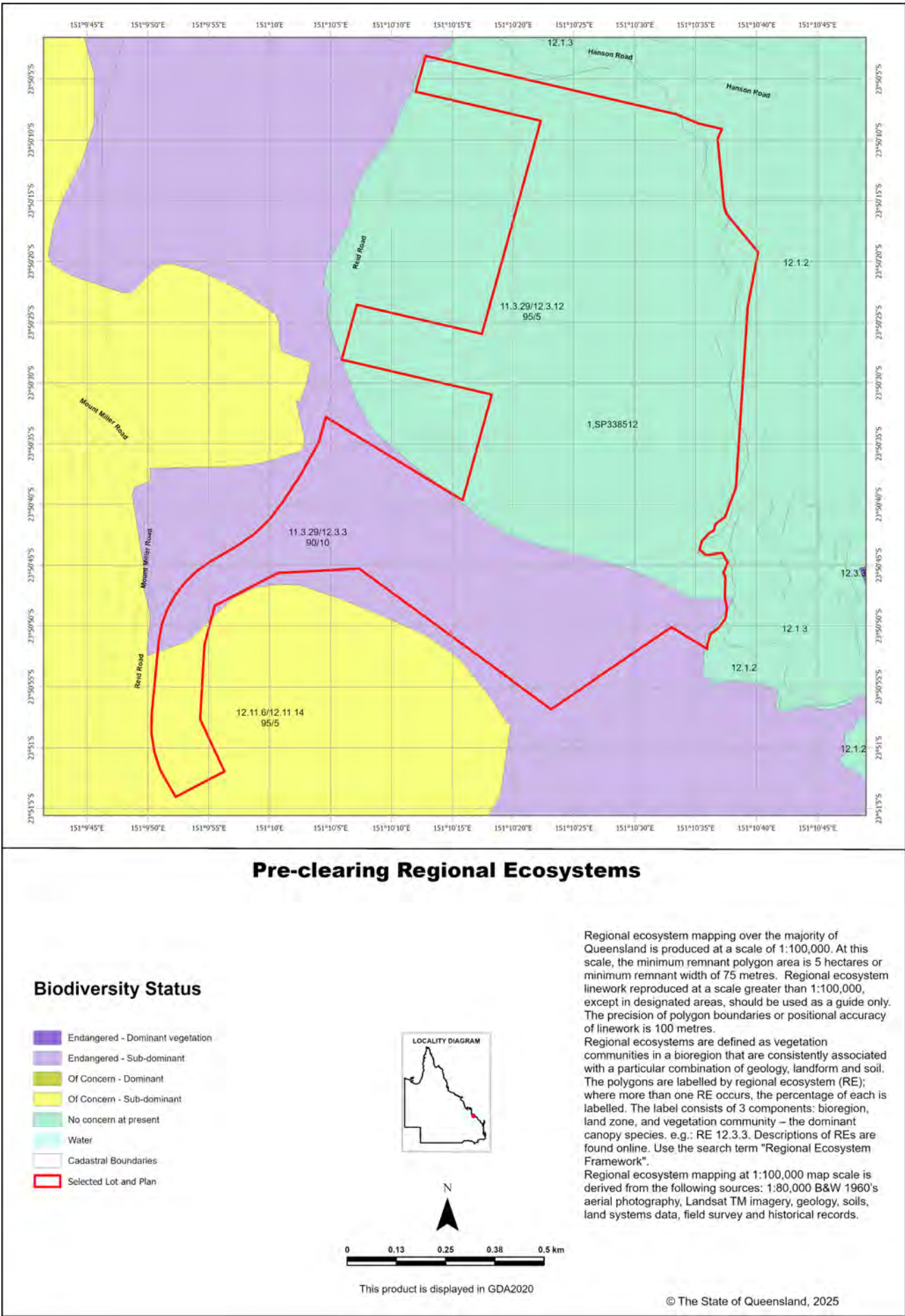
Map 1 - Location



Map 2 - Remnant 2021 regional ecosystems



Map 3 - Pre-clearing regional ecosystems



Map 4 - Remnant 2021 regional ecosystems by BVG (5M)



Remnant 2021 Regional Ecosystems coloured by Broad Vegetation Groups

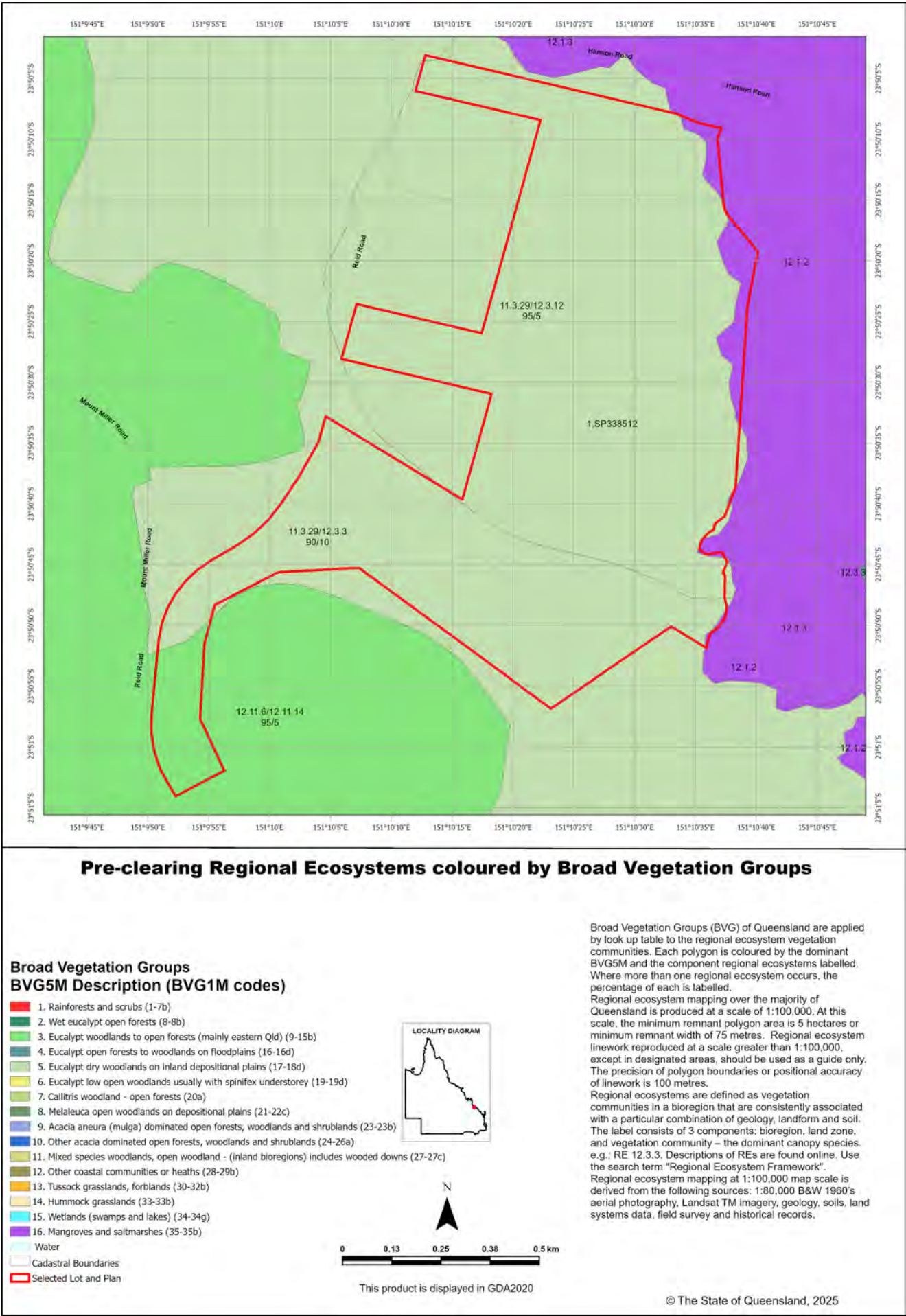
Broad Vegetation Groups

BVG5M Description (BVG1M codes)	BVG5M Code
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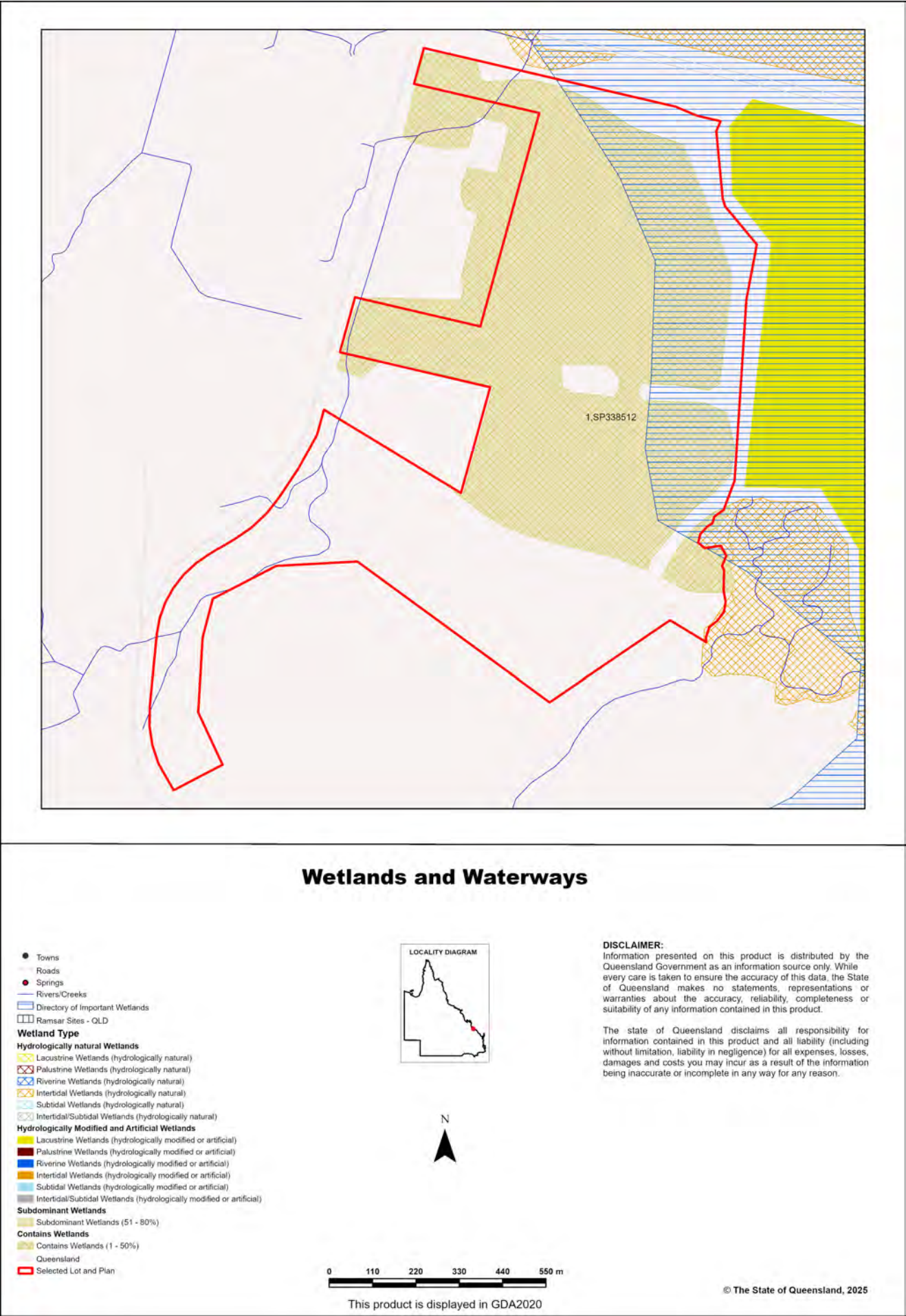
-
1. Rainforests and scrubs (1-7b)
 2. Wet eucalypt open forests (8-8b)
 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
 4. Eucalypt open forests to woodlands on floodplains (16-16d)
 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
 7. Calitris woodland - open forests (20a)
 8. Melaleuca open woodlands on depositional plains (21-22c)
 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
 11. Mixed species woodlands, open woodland - (inland bioregions) Includes wooded downs (27-27c)
 12. Other coastal communities or heaths (28-29b)
 13. Tussock grasslands, forblands (30-32b)
 14. Hummock grasslands (33-33b)
 15. Wetlands (swamps and lakes) (34-34g)
 16. Mangroves and saltmarshes (35-35b)
- Non-remnant vegetation, cultivated or built environment
 Water
- 0 0.13 0.25
- LOCALITY
- Qld
- 0 0.13 0.25
1. Rainforests and scrubs (1-7b)
 2. Wet eucalypt open forests (8-8b)
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 16. Mangroves and saltmarshes (35-35b)
- Non-remnant vegetation, cultivated or built environment
 Water
- 0 0.13 0.25
- LOCALITY
- Qld
- 0 0.13 0.25

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVGSM and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled. Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres. Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species, e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework". Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records. Remnant woody vegetation is defined as vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >70% of the height and >50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy. Non-remnant vegetation includes regrowth and disturbed native vegetation.

Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Map 6 - Wetlands and waterways



Links and Other Information Sources

The Department of the Environment, Tourism, Science and Innovation's Website -

<http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/> provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from:

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

The methodology for mapping regional ecosystems can be downloaded from:

https://www.qld.gov.au/_data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

Technical descriptions for regional ecosystems can be obtained from:

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

Benchmarks can be obtained from: <http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/>

For further information associated with the remnant regional ecosystem dataset used by this report, refer to the metadata associated with the Biodiversity status of pre-clearing and Remnant Regional Ecosystems of Queensland dataset (version listed in **Appendix 1**) which is available through the Queensland Spatial Catalogue, [Queensland Spatial Catalogue : Queensland Government \(information.qld.gov.au\)](http://www.qld.gov.au/spatial-catalogue)

The Queensland Globe is a mapping and data application. As an interactive online tool, Queensland Globe allows you to view and explore Queensland maps, imagery (including up-to-date satellite images) and other spatial data, including regional ecosystem mapping. To further view and explore regional ecosystems over an area of interest, access the Biota Globe (a component of the Queensland Globe). The Queensland Globe can be accessed via the following link:

<https://qldglobe.information.qld.gov.au/>

References

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2023). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 6.0. Queensland Herbarium, Department of Environment and Science.

<https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086>

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F., Richter, D., Addicott, E.P. and Appelman, C.N. (2023) Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 7.0. Updated December 2023. Queensland Herbarium, Queensland Department of Environment, Science and Innovation, Brisbane.

https://www.qld.gov.au/_data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendices

Appendix 1 - Source Data

The dataset listed below is available for download from:

<http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/>

- Regional Ecosystem Description Database

The datasets listed below are available for download from:

[Queensland Spatial Catalogue : Queensland Government \(information.qld.gov.au\)](http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/)

- Biodiversity status of pre-clearing and 2021 remnant regional ecosystems of Queensland
- Pre-clearing Vegetation Communities and Regional Ecosystems of Queensland
- Queensland Wetland Data Version - Wetland lines
- Queensland Wetland Data Version - Wetland points
- Queensland Wetland Data Version - Wetland areas
- Pre-clearing broad vegetation groups of Queensland
- Remnant 2021 broad vegetation groups of Queensland

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
GIS	- Geographic Information System
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
VMA	- <i>Vegetation Management Act 1999</i>



Vegetation management report

For Lot: 1 Plan: SP338512

2/10/2025



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Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of Environment, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

Overview

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

Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Resources who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of Environment, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of Environment, Science and Innovation who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:

- the vegetation management framework, which may include:

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

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 1 Plan: SP338512 are listed in Table 1.

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

Lot	Plan	Tenure	Property title area (sq metres)
A	SP165453	Easement	0
A	SP252881	Easement	747
B	SP285149	Easement	858
B	SP293584	Easement	29,770
1	SP338512	Freehold	1,099,000

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

Does the property Lot: 1 Plan: SP338512 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 1 Plan: SP338512, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Gladstone Regional	Calliope	Southeast Queensland	Burnett - Curtis Hills and Ranges

2. Vegetation management framework (administered by the Department of Resources)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

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

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

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Resources or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Resources before commencing clearing to ensure that the proposed activity is exempt clearing work.

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

<https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/>.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Resources prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

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

<https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/>

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

You can complete the online form at

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

2.3 Area management plans

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

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

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

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Resources and then follow the conditions and requirements listed in the AMP.

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

2.4 Development approvals

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

<https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development>

2.5. Contact information for the Department of Resources

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit <https://www.resources.qld.gov.au/?contact=vegetation> to submit an online enquiry.

3. Vegetation management framework for Lot: 1 Plan: SP338512

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property

Vegetation category	Area (ha)
Category B	93.28
Category R	less than 0.01
Category X	16.66

Table 4: Description of vegetation categories

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

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property.

Reference number:

2019/002867

2009/000089

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at

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

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.1.3	Of concern	B	2.76	Sedgeland on marine clay plains	Other
11.3.29	Least concern	B	56.86	Eucalyptus crebra, E. exserta, Melaleuca spp. woodland on alluvial plains	Sparse
11.3.29	Least concern	R	less than 0.01	Eucalyptus crebra, E. exserta, Melaleuca spp. woodland on alluvial plains	Sparse
12.1.2	Least concern	B	1.61	Saltpan vegetation including grassland, herbland and sedgeland on marine clay plains	Woody grassland
12.1.3	Least concern	B	0.08	Mangrove shrubland to low closed forest on marine clay plains and estuaries	Dense
12.11.6	Least concern	B	31.78	Corymbia citriodora subsp. variegata, Eucalyptus crebra woodland on metamorphics +/- interbedded volcanics	Sparse
12.11.7	Least concern	B	0.18	Eucalyptus crebra woodland on metamorphics +/- interbedded volcanics	Sparse
12.3.12	Least concern	B	less than 0.01	Eucalyptus latisinensis or E. exserta, Melaleuca viridiflora var. viridiflora woodland on alluvial plains	Sparse
12.3.12	Least concern	R	less than 0.01	Eucalyptus latisinensis or E. exserta, Melaleuca viridiflora var. viridiflora woodland on alluvial plains	Sparse
12.3.3	Endangered	B	less than 0.01	Eucalyptus tereticornis woodland on Quaternary alluvium	Sparse
12.3.3	Endangered	R	less than 0.01	Eucalyptus tereticornis woodland on Quaternary alluvium	Sparse
non-rem	None	X	16.66	None	None

Please note:

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

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

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

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

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

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

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

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

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

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

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

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
724	<i>Xeromys myoides</i>	water mouse	V	Sedgeland (<i>Juncus</i> , <i>Baumea</i> , <i>Lepironia</i> , <i>Cyperus</i> , <i>Eleocharis</i>), salt meadow/saline grassland (<i>Sporobolus virginicus</i>), wet heathland (<i>Banksia robur</i> , <i>Gahnia</i> spp.) and saltmarsh-chenopod grassland behind mangroves; and in open-closed mangrove scrub-forest (e.g. <i>Avicennia marinus</i> subsp. <i>australasica</i> in SEQ, <i>Ceriops tagal</i> & <i>Bruguiera</i> spp. but forage in adjacent <i>Avicennia</i> and saltpan areas in CQC), <i>Melaleuca quinquenervia</i> swamp forest or fresh-water mangrove, and supralittoral banks with <i>Callitris</i> and <i>Casuarina</i> .	Sea level to 100m.		Coastal areas near mangroves/swamps.
860	<i>Phascogale cinereus</i>	koala	E	Open forests and woodlands containing <i>Eucalyptus</i> , <i>Corymbia</i> , <i>Lophostemon</i> or <i>Melaleuca</i> trees having a trunk of a diameter of more than 10cm at 1.3m above the ground. Tree species used for food and habitat varies across the state and can include: <i>Corymbia citriodora</i> , <i>Corymbia henryi</i> , <i>Corymbia intermedia</i> , <i>Eucalyptus acmenoides</i> , <i>Eucalyptus bancroftii</i> , <i>Eucalyptus biturbinata</i> , <i>Eucalyptus blakelyi</i> , <i>Eucalyptus brownii</i> , <i>Eucalyptus camaldulensis</i> , <i>Eucalyptus carnea</i> , <i>Eucalyptus chloroclada</i> , <i>Eucalyptus coolabah</i> , <i>Eucalyptus crebra</i> , <i>Eucalyptus dealbata</i> , <i>Eucalyptus drepanophylla</i> , <i>Eucalyptus dunnii</i> , <i>Eucalyptus eugenioides</i> , <i>Eucalyptus exserta</i> , <i>Eucalyptus fibrosa</i> , <i>Eucalyptus grandis</i> , <i>Eucalyptus helidonica</i> , <i>Eucalyptus latisinensis</i> , <i>Eucalyptus longirostrata</i> , <i>Eucalyptus major</i> , <i>Eucalyptus melanophloia</i> , <i>Eucalyptus melliodora</i> , <i>Eucalyptus microcarpa</i> , <i>Eucalyptus microcorys</i> , <i>Eucalyptus microtheca</i> , <i>Eucalyptus moluccana</i> , <i>Eucalyptus montivaga</i> , <i>Eucalyptus orgadophila</i> , <i>Eucalyptus papuana</i> , <i>Eucalyptus pilularis</i> , <i>Eucalyptus platyphylla</i> , <i>Eucalyptus populnea</i> , <i>Eucalyptus portuensis</i> , <i>Eucalyptus propinqua</i> , <i>Eucalyptus racemosa</i> , <i>Eucalyptus resinifera</i> , <i>Eucalyptus robusta</i> , <i>Eucalyptus saligna</i> , <i>Eucalyptus seeana</i> , <i>Eucalyptus siderophloia</i> , <i>Eucalyptus sideroxylon</i> , <i>Eucalyptus tereticornis</i> , <i>Eucalyptus thozetiana</i> , <i>Eucalyptus tindaliae</i> , <i>Eucalyptus umbra</i> , <i>Lophostemon confertus</i> , <i>Melaleuca leucadendra</i> , <i>Melaleuca quinquenervia</i> .	Sea level to 1000m.		Riparian areas, plains and hill/escarpment slopes.
686	<i>Crinia tinnula</i>	wallum froglet	V	Vegetation community is a mandatory essential habitat factor for this species. Permanent to ephemeral acidic (pH 4.3 - 5.2), soft freshwater in <i>Melaleuca</i> (e.g. <i>M. quinquenervia</i>) swamps, sedgeland, wet and dry heathland (e.g. <i>Banksia robur</i> , <i>Xanthorrhoea</i>) and wallum (<i>Banksia aemula</i> shrubland/woodland) areas coastal lowlands on sand or sandstone, occasionally in adjacent open forest/woodland (e.g. <i>Eucalyptus racemosa</i> , <i>Corymbia citriodora</i>) with heathy understorey; known to persist in small remnants (<10ha); may be found well away from water.	Sea level to 150m.	Sandy and sandy-alluvial substrates.	
1107	<i>Ninox strenua</i>	powerful owl	V	Wet and dry tall open eucalypt forest (<i>Eucalyptus pilularis</i> , <i>E. acmenoides</i> , <i>E. tereticornis</i> , <i>E. camaldulensis</i> , <i>E. crebra</i> , <i>E. melliodora</i> , <i>Corymbia citriodora</i> & <i>C. intermedia</i>), including mountain forest gullies/gorges; forests aged 60+ years (large & old) on fertile soils with suitable hollows; roosting in dense foliage of closed forest (occasionally caves) and foraging in open forest and woodland including areas adjacent to urban/rural development. Nest in large hollows (45-75cm diameter, 50-180cm deep) 6-45m above ground, in large (>100cm dbh) old eucalypts on the side or at the head of heavily wooded gully.	Sea level to 1000m.		Gully.
1936	<i>Charadrius mongolus</i>	lesser sand plover	E	Foraging on sandy beach, intertidal mudflat/sandflat and mangrove mudflat of coastal bays and estuaries. Also inland at lakes and soaks. Roost on beach, banks, sand/shell spits, rocky spits and exposed reef.	Sea level to 100m.	Sand and mud substrates.	Associated with coastlines and coastal and inland wetlands.
2455	<i>Petauroides armillatus</i>	central greater glider	E	Tall mature open wet and dry eucalypt forest (<i>Eucalyptus</i> &/or <i>Corymbia</i> spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	

Label	Regional Ecosystem (mandatory unless otherwise specified)
724	7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.5, 8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.1.5, 11.1.1, 11.1.2, 11.1.3, 11.1.4, 11.2.4, 11.2.5, 11.3.27, 12.1.1, 12.1.2, 12.1.3, 12.2.5, 12.2.7, 12.2.11, 12.2.12, 12.2.15, 12.3.4, 12.3.5, 12.3.6, 12.3.8, 12.3.12, 12.3.13, 12.3.20
860	4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.34, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.40, 9.12.41, 9.12.42, 9.12.43, 9.12.44, 9.12.45, 9.12.46, 9.12.47, 9.12.48, 9.12.49, 9.12.50, 9.12.51, 9.12.52, 9.12.53, 9.12.54, 9.12.55, 9.12.56, 9.12.57, 9.12.58, 9.12.59, 9.13.1, 9.13.2, 9.13.3, 9.13.4, 9.13.5, 9.13.6, 9.13.7, 9.13.8, 9.13.9, 9.13.10, 9.13.11, 9.13.12, 9.13.13, 9.13.14, 9.13.15, 9.13.16, 9.13.17, 9.13.18, 9.13.19, 9.13.21, 9.13.23, 9.13.25, 9.13.26, 9.13.27, 9.13.28, 9.13.29, 9.13.30, 9.13.31, 9.13.32, 9.13.33, 9.13.34, 9.13.35, 9.13.36, 9.13.37, 9.13.38, 9.13.39, 9.13.40, 9.13.41, 9.13.42, 9.13.43, 9.13.44, 9.13.45, 9.13.46, 9.13.47, 9.13.48, 9.13.49, 9.13.50, 9.13.51, 9.13.52, 9.13.53, 9.13.54, 9.13.55, 9.13.56, 9.13.57, 9.13.58, 9.13.59, 9.13.60, 9.13.61, 9.13.62, 9.13.63, 9.13.64, 9.13.65, 9.13.66, 9.13.67, 9.13.68, 9.13.69, 9.13.70, 9.13.71, 9.13.72, 9.13.73, 9.13.74, 9.13.75, 9.13.76, 9.13.77, 9.13.78, 9.13.79, 9.13.80, 9.13.81, 9.13.82, 9.13.83, 9.13.84, 9.13.85, 9.13.86, 9.13.87, 9.13.88, 9.13.89, 9.13.90, 9.13.91, 9.13.92, 9.13.93, 9.13.94, 9.13.95, 9.13.96, 9.13.97, 9.13.98, 9.13.99, 9.14.1, 9.14.2, 9.14.3, 9.14.4, 9.14

Nil

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Coastal

*See also Map 4.3

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 1 Plan: SP338512.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
<https://www.resources.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form>

Regulated vegetation management map

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

Vegetation management supporting map

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

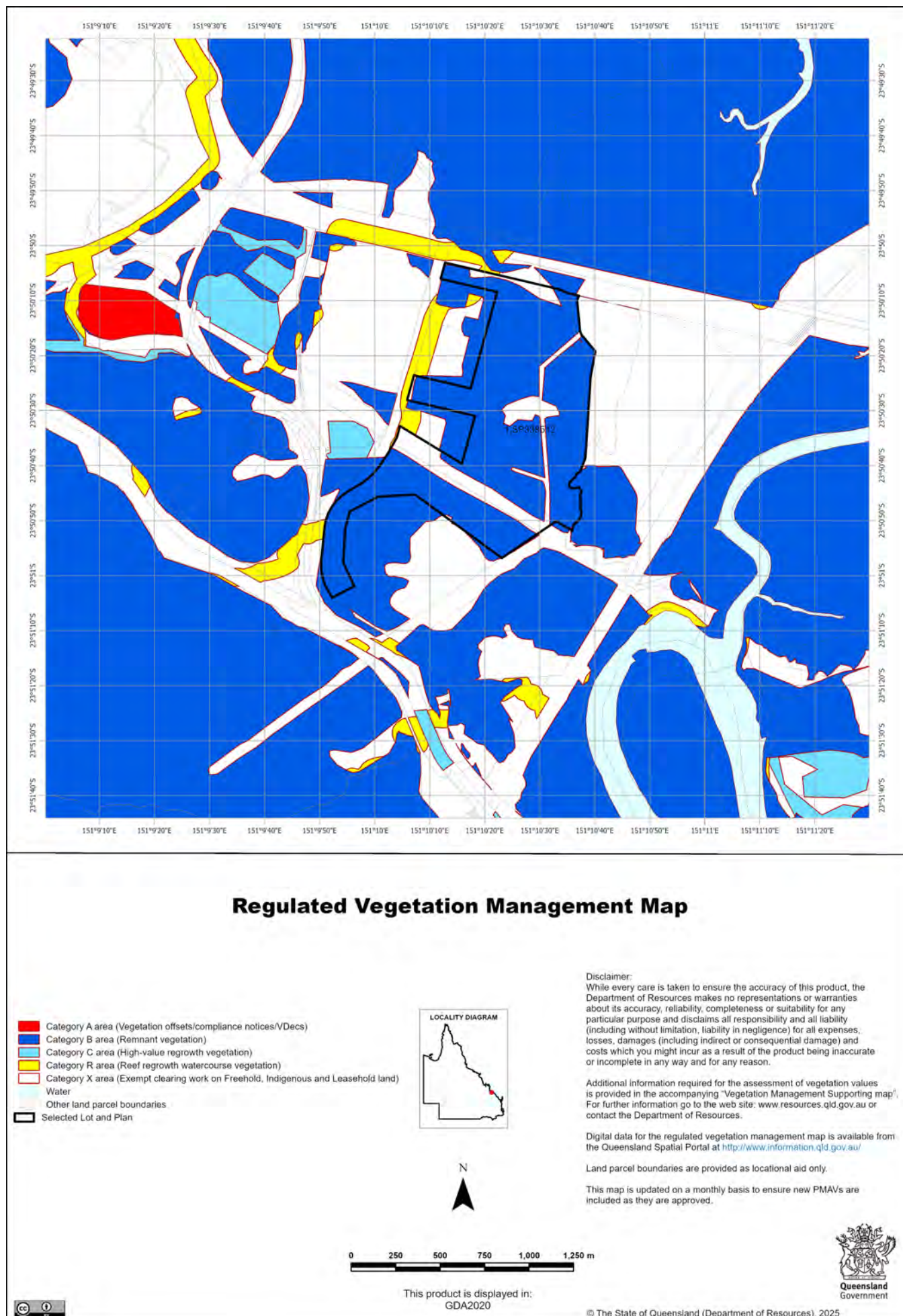
Coastal/non-coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

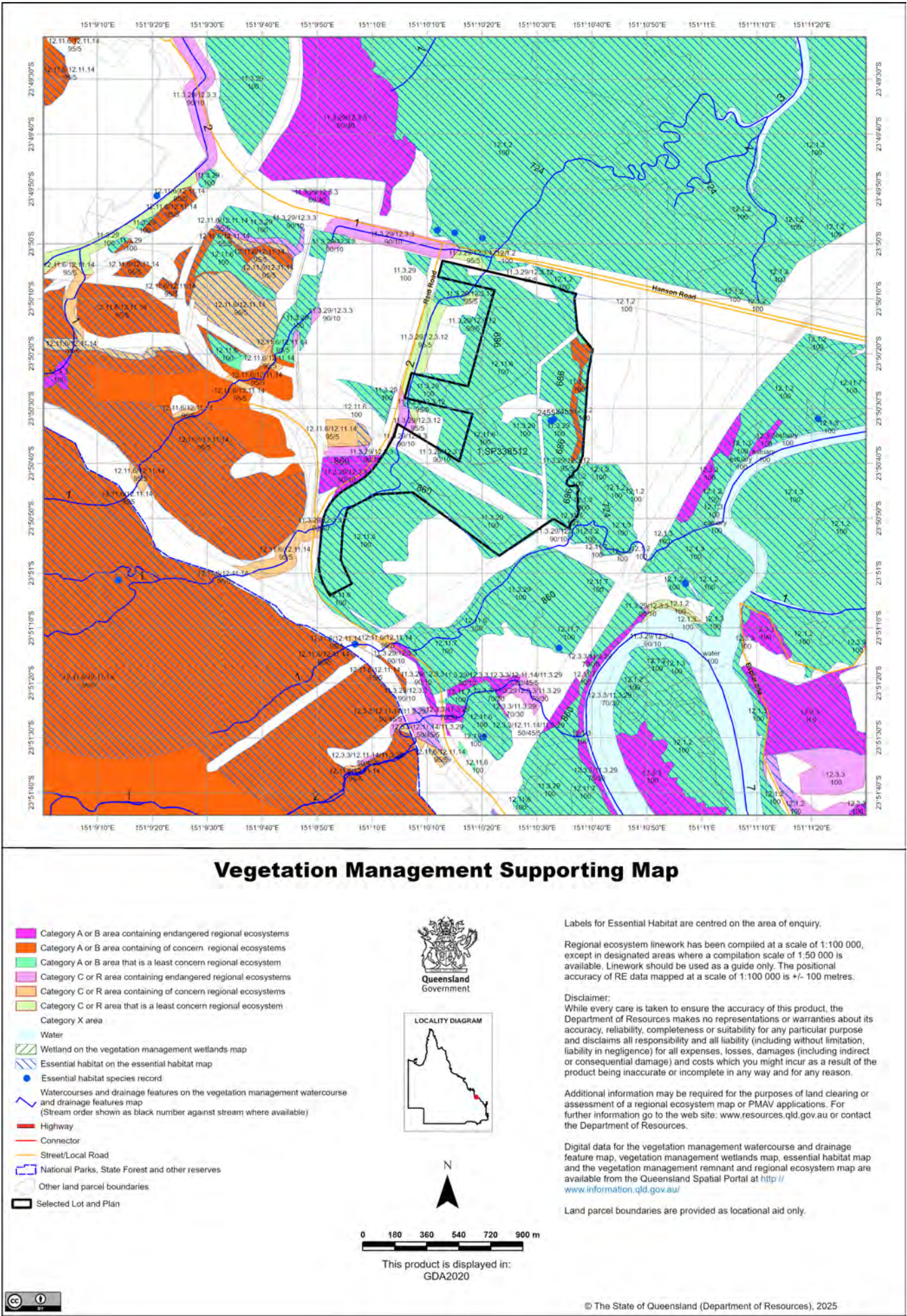
Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

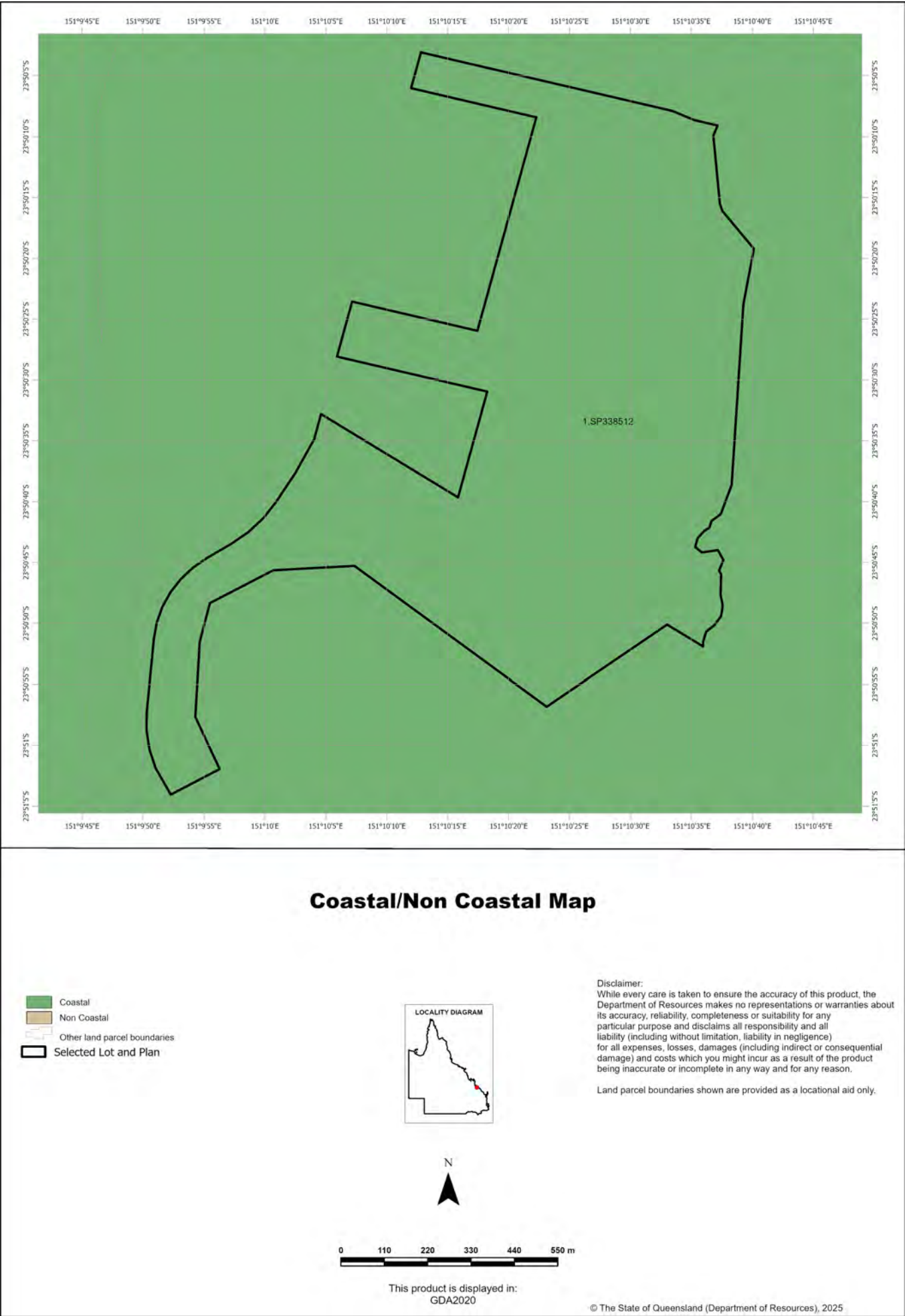
4.1 Regulated vegetation management map



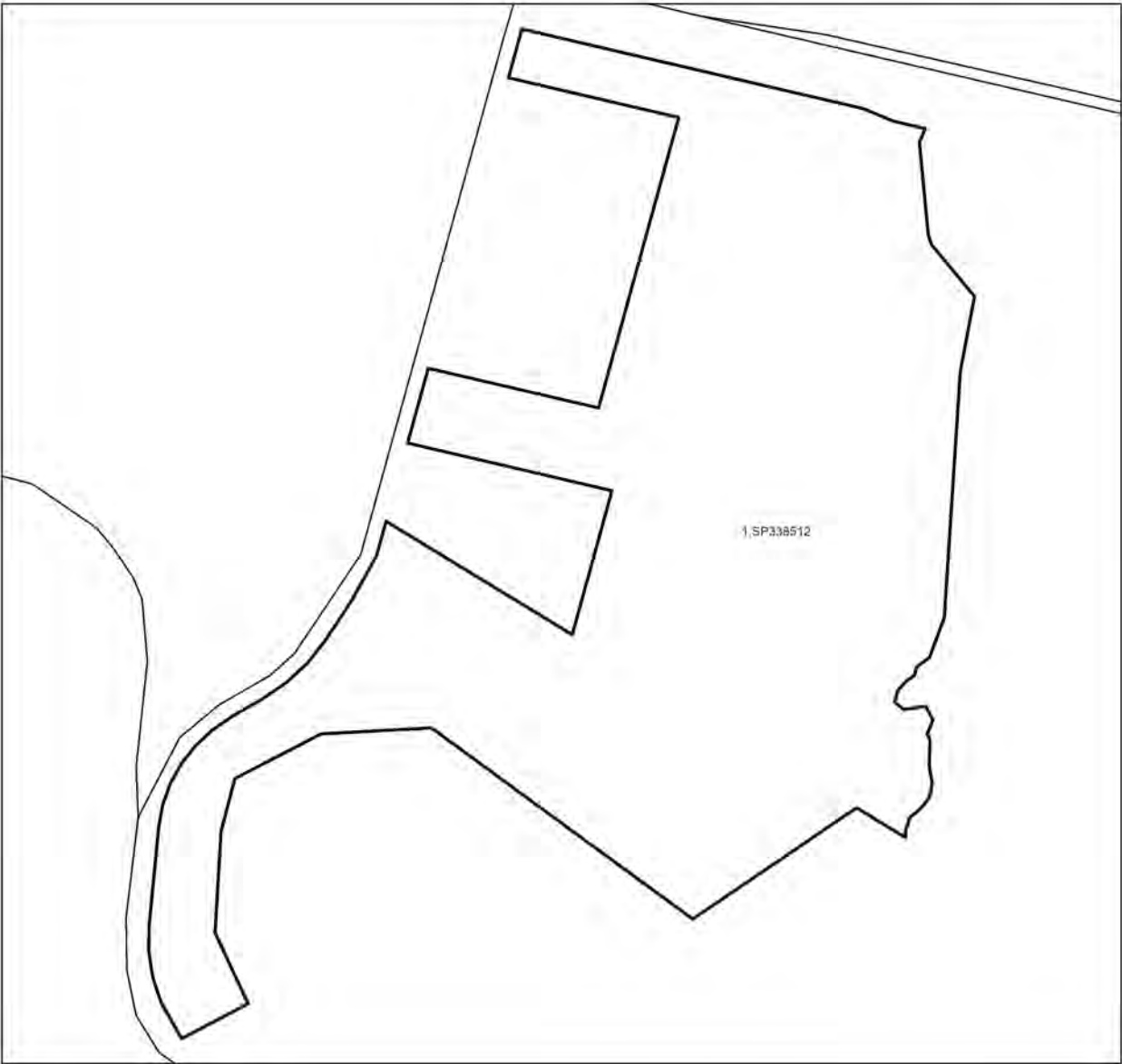
4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



**Agricultural Land Class A or B
as per State Planning Policy: State Interest for Agriculture**

- Towns
- Rivers and creeks
- Freeways / motorways; Highways
- Secondary roads; Streets
- Agricultural land class A or B
 - A
 - B
 - Not class A or B
- Selected Lot and Plan



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5. Protected plants framework (administered by the Department of Environment, Science and Innovation (DESI))

In Queensland, all plants that are native to Australia are protected plants under the [Nature Conservation Act 1992](#) (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see [Operational policy: When a protected plant in Queensland is considered to be 'in the wild'](#)) that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the [Flora survey guidelines](#). The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

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

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

5.2 Clearing outside high risk areas on the flora survey trigger map

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

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DESI

For further information on the protected plants framework:

Phone 1300 130 372 (and select option four)

Email palm@des.qld.gov.au

Visit <https://www.qld.gov.au/environment/plants-animals/plants/protected-plants>

5.5 Protected plants flora survey trigger map

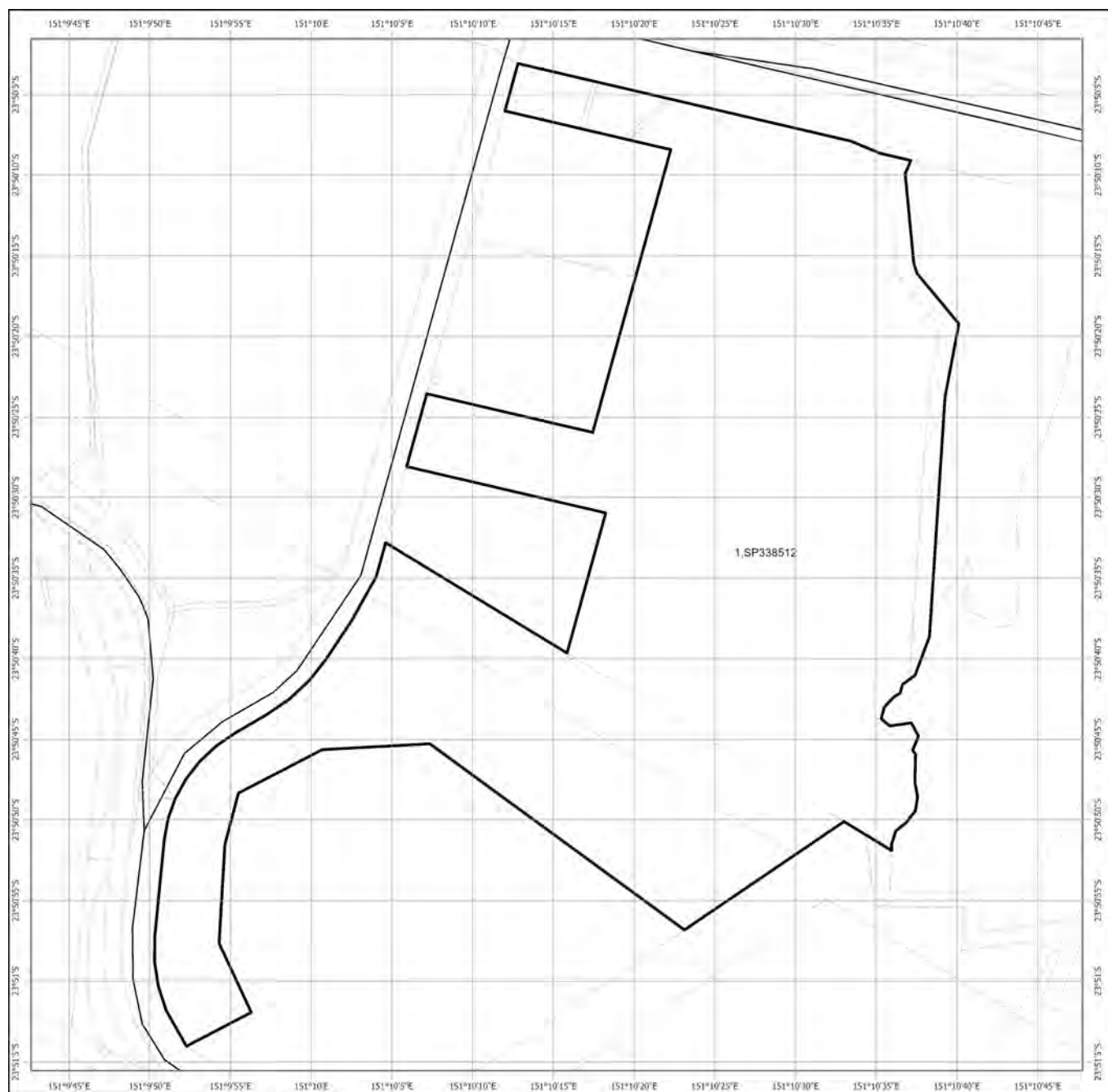
This map included may also be requested individually at: <https://apps.des.qld.gov.au/map-request/flora-survey-trigger/>.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the [Queensland Spatial Catalogue](#), the Department of Environment, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment, Science and Innovation webpage on the [clearing of protected plants](#) for more information.



Protected Plants Flora Survey Trigger Map

- High risk area
- Other land parcel boundaries
- Freeways / motorways / highways
- Secondary roads / streets
- Selected Lot and Plan



0 77 154 231 308 385 m

This product is displayed in:
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This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@des.qld.gov.au

Disclaimer: While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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6. Koala protection framework (administered by the Department of Environment, Science and Innovation (DESI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the *Nature Conservation (Animals) Regulation 2020*, the *Nature Conservation (Koala) Conservation Plan 2017*, the *Planning Act 2016* and the *Planning Regulation 2017*.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the *Planning Regulation 2017* for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document [Spatial modelling in South East Queensland](#).

Section 7.2 shows any koala habitat area that exists on your property.

Under the *Nature Conservation (Koala) Conservation Plan 2017*, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document [Guideline - Requests to make, amend or revoke a koala habitat area determination](#).

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps>. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the *Planning Regulation 2017* (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the [Planning Regulation 2017](#). More information on exempted development can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

- the local government planning scheme makes the development assessable;
- the premises includes an area that is both a koala priority area and a koala habitat area; and
- the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The [Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks](#) outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the [Nature Conservation \(Koala\) Conservation Plan 2017](#) prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DESI

For further information on the koala protection framework:

Phone 13 QGOV (13 74 68)

Email koala.assessment@des.qld.gov.au

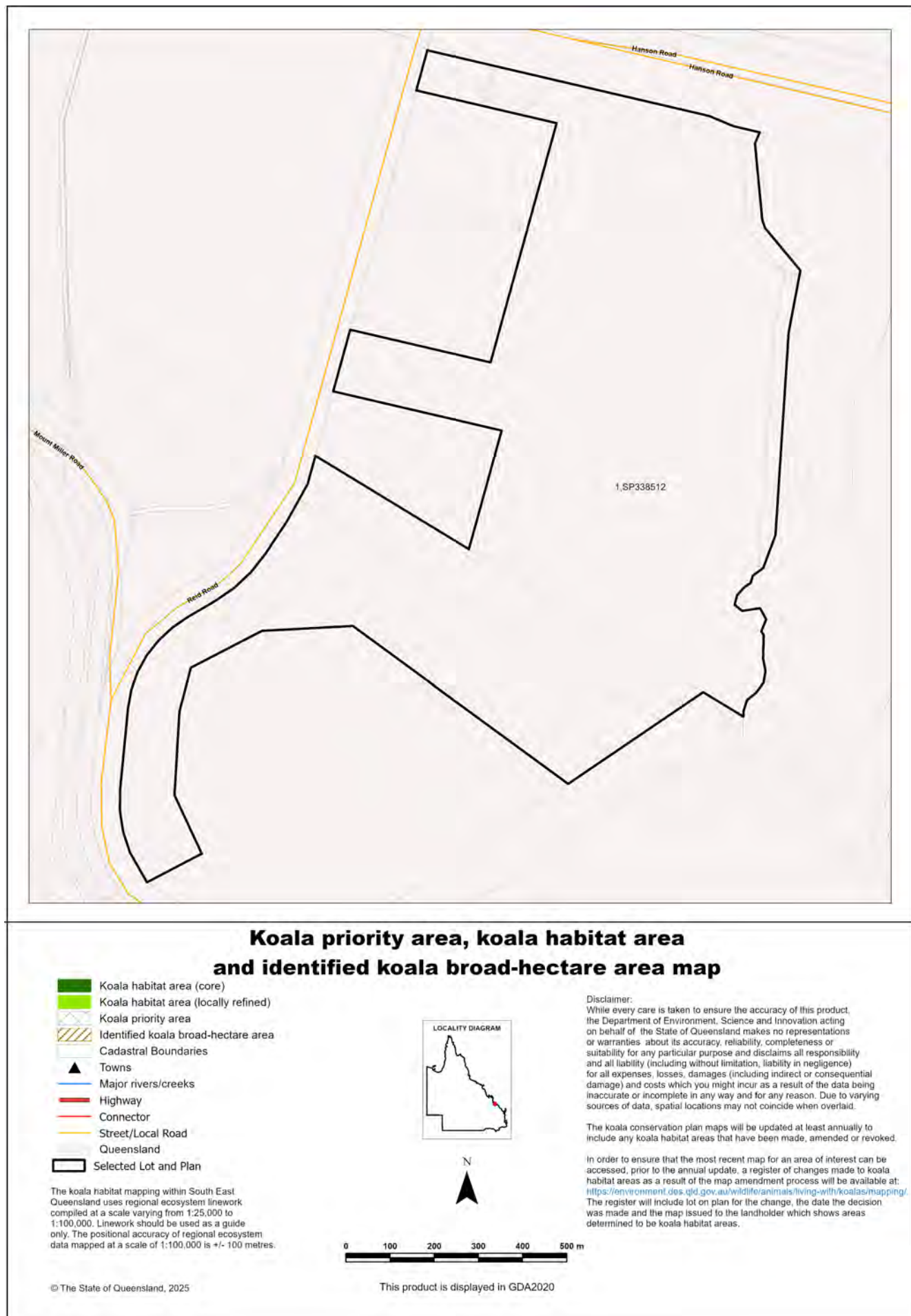
Visit <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping>

7. Koala protection framework details for Lot: 1 Plan: SP338512

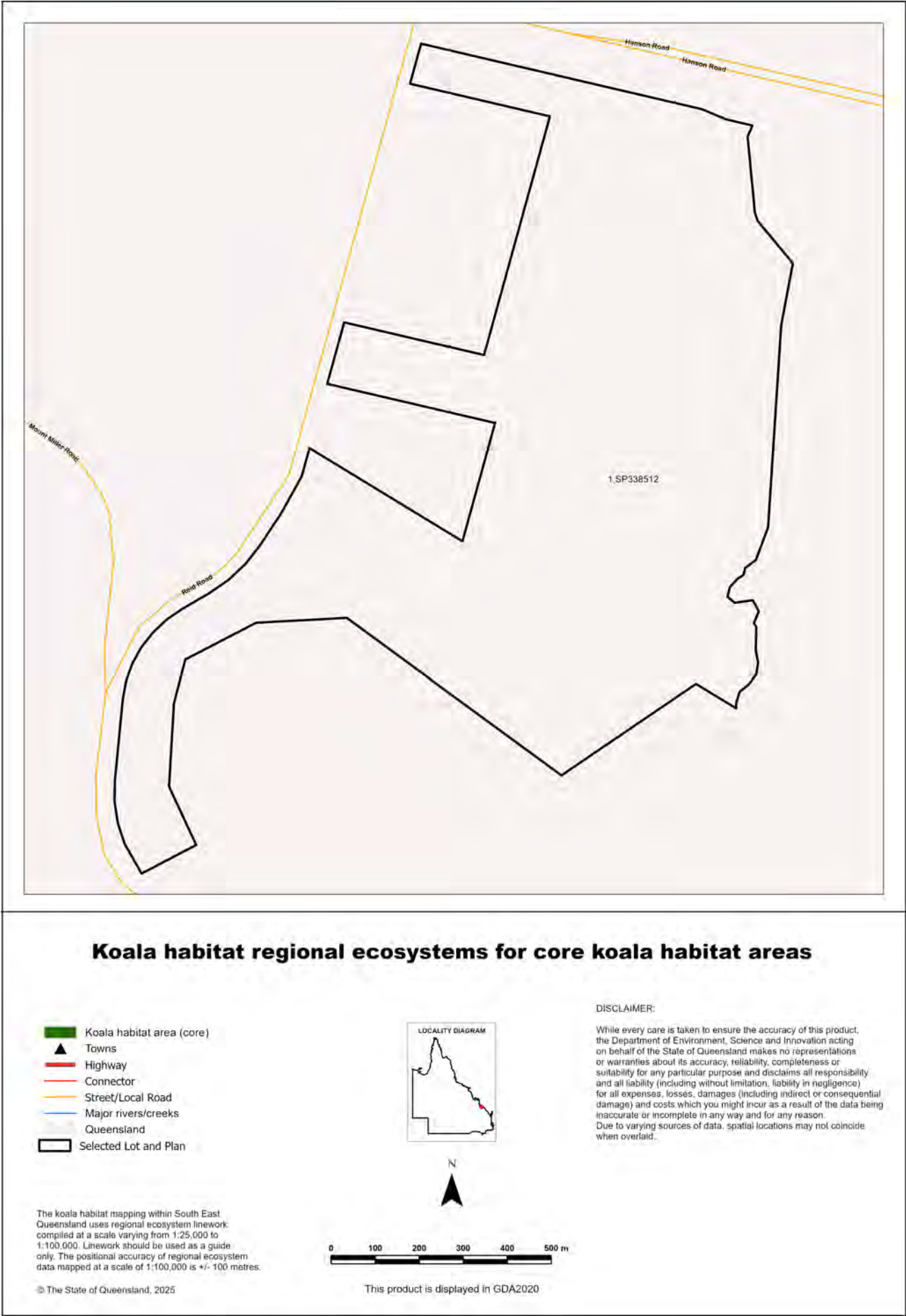
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow	<i>Water Act 2000</i>	Queensland Department of Regional Development, Manufacturing and Water	Ph: 13 QGOV (13 74 68) www.rdmw.qld.gov.au
Earthworks, significant disturbance	<i>Soil Conservation Act 1986</i>	Queensland Department of Resources	Ph: 13 QGOV (13 74 68) www.resources.qld.gov.au
Fire Permits	<i>Fire and Emergency Services Act 1990</i>	Queensland Fire Department	Ph: 13 QGOV (13 74 68) www.fire.qld.gov.au
Indigenous Cultural Heritage	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Queensland Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts	Ph: 13 QGOV (13 74 68) www.dsdsatsip.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues	<i>Environmental Protection Act 1994</i> <i>Coastal Protection and Management Act 1995</i> <i>Queensland Heritage Act 1992</i>	Queensland Department of Environment, Science and Innovation	Ph: 13 QGOV (13 74 68) www.desi.qld.gov.au
Protected plants and protected areas	<i>Nature Conservation Act 1992</i> <i>Planning Act 2016</i>	Queensland Department of Environment, Science and Innovation	Ph: 1300 130 372 (option 4) palm@des.qld.gov.au www.desi.qld.gov.au
Koala mapping and regulations	<i>Nature Conservation Act 1992</i>	Queensland Department of Environment, Science and Innovation	Ph: 13 QGOV (13 74 68) Koala.assessment@des.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities	<i>Fisheries Act 1994</i> <i>Forestry Act 1959</i>	Queensland Department of Agriculture and Fisheries	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of Climate Change, Energy, the Environment and Water (Australian Government)	Ph: 1800 803 772 www.dcceew.gov.au
Development and planning processes	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Queensland Department of Housing, Local Government, Planning and Public Works	Ph: 13 QGOV (13 74 68) www.planning.qld.gov.au
Coordinated projects	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Office of the Coordinator-General	Ph: 13 QGOV (13 74 68) www.statedevelopment.qld.gov.au/coordinator-general
Wet Tropics World Heritage Area	<i>Wet Tropics World Heritage Protection and Management Act 1993</i>	Queensland Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au
Requirements on State controlled road	<i>Transport Infrastructure Act 1994</i>	Queensland Department of Transport and Main Roads	Ph: 13 QGOV (13 74 68) https://www.tmr.qld.gov.au
Local government requirements	<i>Local Government Act 2009</i> <i>Planning Act 2016</i>	Your relevant local government office	



WildNet Records

Conservation Significant Species List

For the selected area of interest Lot: 1 Plan: SP338512
Current as at 10/02/2025 WildNetCSSpeciesList

Summary Information

The following table provides an overview of the area of interest: Lot: 1 Plan: SP338512

Table 1. Area of interest details

Size (ha)	
109.94	
Local Government(s)	
Gladstone Regional	
Catchment(s)	
Calliope	
Bioregion(s)	Subregion(s)
Southeast Queensland	Burnett - Curtis Hills and Ranges

Protected Area(s)

No estates or reserves are located within the area of interest.

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Introduction

This WildNet report is derived from a spatial layer that is generated from the [WildNet database](#), managed by the Department of the Environment, Tourism, Science and Innovation. The layer, which is generated weekly, contains a subset of WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero. It does not include aspatial data such as some baseline species lists created for some protected areas.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a conservation significant species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest.

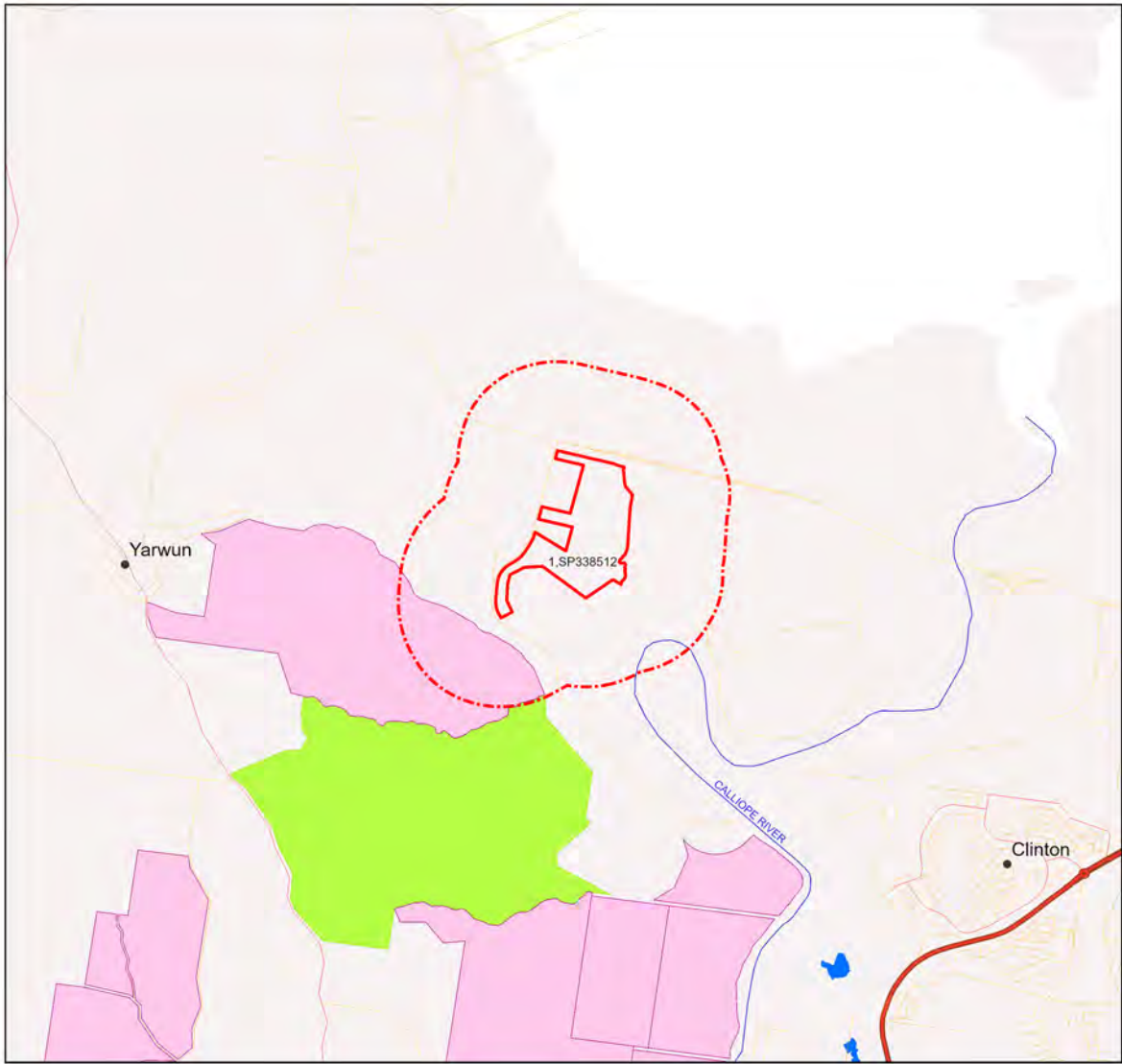
The [Species List Application](#) may provide additional information on species occurrence within your area of interest.

Conservation significant species are species listed:

- as [threatened](#) or near threatened under the Nature Conservation Act 1992;
- as threatened under the [Environment Protection and Biodiversity Conservation Act 1999](#) or
- [migratory species](#) protected under the following international agreements:
 - Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
 - China-Australia Migratory Bird Agreement
 - Japan-Australia Migratory Bird Agreement
 - Republic of Korea-Australia Migratory Bird Agreement

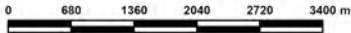
Table 2 lists the species recorded within the area of interest and its one kilometre buffer.

Map 1. Locality Map



Locality Map

- Legend**
- Towns
 - Freeways/Highways
 - Connector
 - Street/Local Road
 - Lakes and reservoirs
 - National Park
 - National Park (Scientific)
 - National Park (CYPAL)
 - National Park (Aboriginal Land)
 - Conservation Park
 - Resources Reserve
 - Forest Reserve
 - State Forest
 - Timber Reserve
 - Nature Refuges
 - Coordinated Conservation Areas
 - Major rivers/creeks
 - Queensland
 - Selected Lot and Plan
 - 1 kilometre buffer



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Table 2. Conservation significant species recorded within the area of interest and its one kilometre buffer

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1971	Animalia	Aves	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail	V	V	0	2	10/16/2019
1936	Animalia	Aves	Charadriidae	<i>Charadrius mongolus</i>	lesser sand plover	E	E	0	1	2/4/2010
1931	Animalia	Aves	Charadriidae	<i>Pluvialis squatarola</i>	grey plover	V	V	0	1	3/30/2006
1702	Animalia	Aves	Pandionidae	<i>Pandion haliaetus cristatus</i>	eastern osprey	SL		0	3	3/30/2006
1885	Animalia	Aves	Scolopacidae	<i>Actitis hypoleucos</i>	common sandpiper	SL		0	1	3/30/2006
1875	Animalia	Aves	Scolopacidae	<i>Calidris alba</i>	sanderling	SL		0	1	3/30/2006
1878	Animalia	Aves	Scolopacidae	<i>Calidris ferruginea</i>	curlew sandpiper	CR	CE	0	1	3/30/2006
1880	Animalia	Aves	Scolopacidae	<i>Calidris ruficollis</i>	red-necked stint	SL		0	1	3/30/2006
1867	Animalia	Aves	Scolopacidae	<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit	E	E	0	1	3/30/2006
1843	Animalia	Aves	Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew	CR	CE	0	1	3/30/2006
1845	Animalia	Aves	Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	SL		0	1	3/30/2006
724	Animalia	Mammalia	Muridae	<i>Xeromys myoides</i>	water mouse	V	V	0	3	12/9/2011
962	Animalia	Mammalia	Pteropodidae	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V	0	1	1/31/2003
838	Animalia	Mammalia	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL		0	2	5/19/2023

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).

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

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of most recent record of the taxon.

Links and Support

Other sites that deliver species information from the [WildNet database](#) include:

- [Species profile search](#) - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- [Species lists](#) - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- [Biomaps](#) - view biodiversity information, including WildNet records approved for publication, and generate reports
- [Queensland Globe](#) - view spatial information, including WildNet records approved for publication
- [Qld wildlife data API](#) - access WildNet species information approved for publication such as notes, images and records etc.
- [Wetland Maps](#) - view species records, survey locations etc. approved for publication
- [Wetland Summary](#) - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- [WildNet wildlife records - published - Queensland](#) - spatial layer of WildNet records approved for publication generated weekly
- [Generalised distribution and densities of Queensland wildlife](#) - Queensland species distributions and densities generalised to a 10 km grid resolution
- [Conservation status of Queensland wildlife](#) - access current lists of priority species for Queensland including nomenclature and status information
- [Queensland Confidential Species](#) - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team WildNet@des.qld.gov.au.

Other useful sites for accessing Queensland biodiversity data include:

- [Useful wildlife resources](#)
- [Queensland Government Data](#)
- [Atlas of Living Australia \(ALA\)](#)
- [Online Zoological Collections of Australian Museums \(OZCAM\)](#)
- [Australia's Virtual Herbarium \(AVH\)](#)
- [Protected Matters Search Tool](#)

Disclaimer

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Department of the Environment, Tourism, Science and Innovation

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest

Lot: 1 Plan: SP338512

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and a field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

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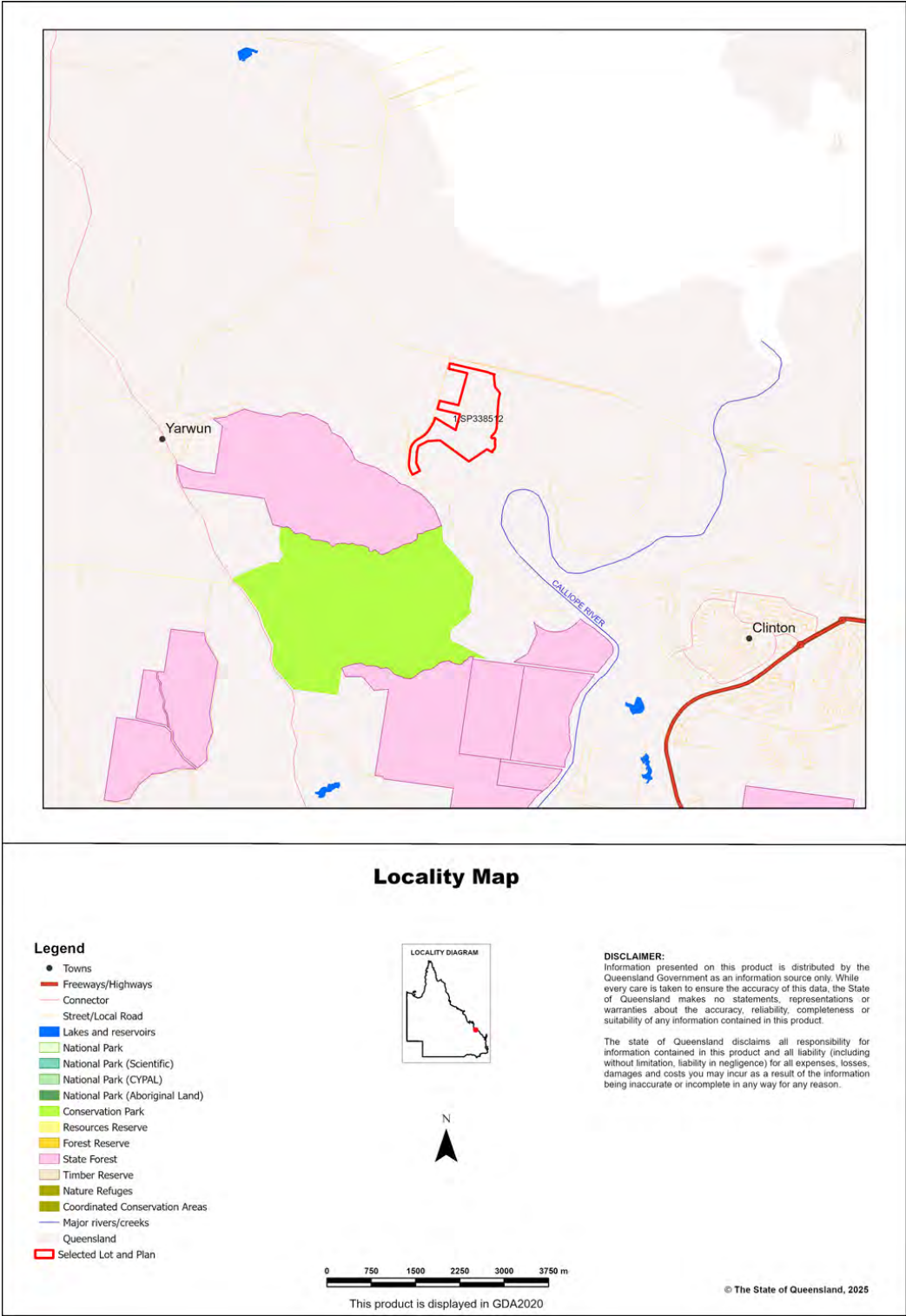
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Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI: Lot: 1 Plan: SP338512, with area 109.94 ha

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Gladstone Regional	Calliope	Southeast Queensland	Burnett - Curtis Hills and Ranges



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992*;
- *Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the Marine Parks Act 2004 ;*
- *Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;*
- *Threatened wildlife under the Nature Conservation Act 1992 and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;*
- Regulated vegetation under the *Vegetation Management Act 1999* that is:
 - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;
 - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;
 - Category R areas on the regulated vegetation management map;
 - Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;
 - Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;
- Strategic Environmental Areas under the *Regional Planning Interests Act 2014 ;*
- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;
- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;
- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0 ha	0.0%
1b Protected Areas- nature refuges	0 ha	0.0%
1c Protected Areas- special wildlife reserves	0 ha	0.0%
2 State Marine Parks- highly protected zones	0 ha	0.0%
3 Fish habitat areas (A and B areas)	0 ha	0.0%
4 Strategic Environmental Areas (SEA)	0 ha	0.0%
5 High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values	0 ha	0.0%
6a High Ecological Value (HEV) wetlands	0 ha	0.0%
6b High Ecological Value (HEV) waterways	0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	89.71 ha	81.6%
7b Special least concern animals	89.71 ha	81.6%
7c i Koala habitat area - core (SEQ)	0 ha	0.0%
7c ii Koala habitat area - locally refined (SEQ)	0 ha	0.0%
7d Sea turtle nesting areas	0 km	Not applicable
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	2.76 ha	2.5%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0 ha	0.0%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0 ha	0.0%
8d Regulated Vegetation - Essential habitat	93.11 ha	84.7%
8e Regulated Vegetation - intersecting a watercourse	1.1 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	0 ha	0.0%
9a Legally secured offset areas- offset register areas	0 ha	0.0%
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0 ha	0.0%

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(No results)

1b. Protected Areas - nature refuges

(No results)

1c. Protected Areas - special wildlife reserves

(No results)

2. State Marine Parks - highly protected zones

(No results)

3. Fish habitat areas (A and B areas)

(No results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways**4. Strategic Environmental Areas (SEA)**

(No results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

(no results)

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species**7a. Threatened (endangered or vulnerable) wildlife**

Values are present

7b. Special least concern animals

Values are present

7c i. Koala habitat area - core (SEQ)

Not applicable

7c ii. Koala habitat area - locally refined (SEQ)

Not applicable

7d. Wildlife habitat (sea turtle nesting areas)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
<i>Boronia keysii</i>	Keys boronia	V	None
<i>Calyptrorhynchus lathamii</i>	Glossy black cockatoo	V	None
<i>Casuarius casuarius johnsonii</i>	Sthn population cassowary	E	None
<i>Crinia tinnula</i>	Wallum froglet	V	Core
<i>Denisonia maculata</i>	Ornamental snake	V	None
<i>Euastacus bindal</i>	Mount Elliot crayfish	CR	None
<i>Euastacus binzayedii</i>		CR	None
<i>Euastacus eungella</i>		E	None
<i>Euastacus hystricosus</i>		E	None
<i>Euastacus jagara</i>	Jagara hairy crayfish	CR	None
<i>Euastacus maidae</i>		CR	None
<i>Euastacus monteithorum</i>		E	None
<i>Euastacus robertsi</i>		E	None
<i>Taudactylus pleione</i>	Kroombit tinkerfrog	E	None
<i>Litoria freycineti</i>	Wallum rocketfrog	V	None
<i>Litoria olongburensis</i>	Wallum sedgefrog	V	None
<i>Macadamia integrifolia</i>		V	None
<i>Melaleuca irbyana</i>	swamp tea-tree	E	None
<i>Macadamia ternifolia</i>		V	None
<i>Macadamia tetraphylla</i>	bopple nut	V	None
<i>Petrogale penicillata</i>	brush-tailed rock-wallaby	V	None
<i>Petrogale coenensis</i>	Cape York rock-wallaby	E	None
<i>Petrogale purpureicollis</i>	purple-necked rock-wallaby	V	None
<i>Petrogale sharmani</i>	Sharmans rock-wallaby	V	None
<i>Petrogale xanthopus celeris</i>	yellow-footed rock-wallaby (Qld subspecies)	V	None
<i>Petaurus gracilis</i>	Mahogany Glider	E	None
<i>Petrogale persephone</i>	Proserpine rock-wallaby	E	None
<i>Phascolarctos cinereus</i>	Koala - outside SEQ*	E	Core
<i>Pezoporus wallicus wallicus</i>	Eastern ground parrot	V	None
<i>Xeromys myoides</i>	Water Mouse	V	Core

*For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit	V	V	M-C/J/R/B/E
<i>Calidris ferruginea</i>	curlew sandpiper	CR	CE	M-C/J/R/B/E
<i>Numenius madagascariensis</i>	eastern curlew	E	CE	M-C/J/R/B/E
<i>Charadrius mongolus</i>	lesser sand plover	E	E	M-C/J/R/B/E
<i>Petauroides armillatus</i>	central greater glider	E	E	None
<i>Ninox strenua</i>	powerful owl	V	None	None

Special least concern animal species records

Scientific name	Common name	Migratory status
<i>Tachyglossus aculeatus</i>	short-beaked echidna	None
<i>Actitis hypoleucos</i>	common sandpiper	M-C/J/R/B/E
<i>Calidris ruficollis</i>	red-necked stint	M-C/J/R/B/E
<i>Pluvialis squatarola</i>	grey plover	M-C/J/R/B/E
<i>Calidris alba</i>	sanderling	M-C/J/R/B/E
<i>Numenius phaeopus</i>	whimbrel	M-C/J/R/B/E
<i>Pandion haliaetus cristatus</i>	eastern osprey	M-B/E

Shorebird habitat (critically endangered/endangered/vulnerable)

Not applicable

Shorebird habitat (special least concern)

Not applicable

*Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

<https://www.qld.gov.au/environment/plants-animals/species-list/>

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** and **Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

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

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

<https://environment.ehp.qld.gov.au/regional-ecosystems/>

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.1.3	O-dom	rem_oc
11.3.29/12.3.3	E-subdom	rem_end

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Not applicable

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number
R	9150

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Not applicable

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

(No results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(No results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

Map 1 - MSES - State Conservation Areas

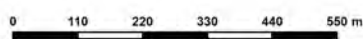
**MSES - State Conservation Areas**

- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)
- Selected Lot and Plan



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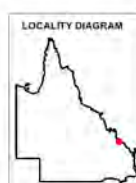
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Map 2 - MSES - Wetlands and Waterways

**MSES - Wetlands and Waterways**

- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands
- Selected Lot and Plan

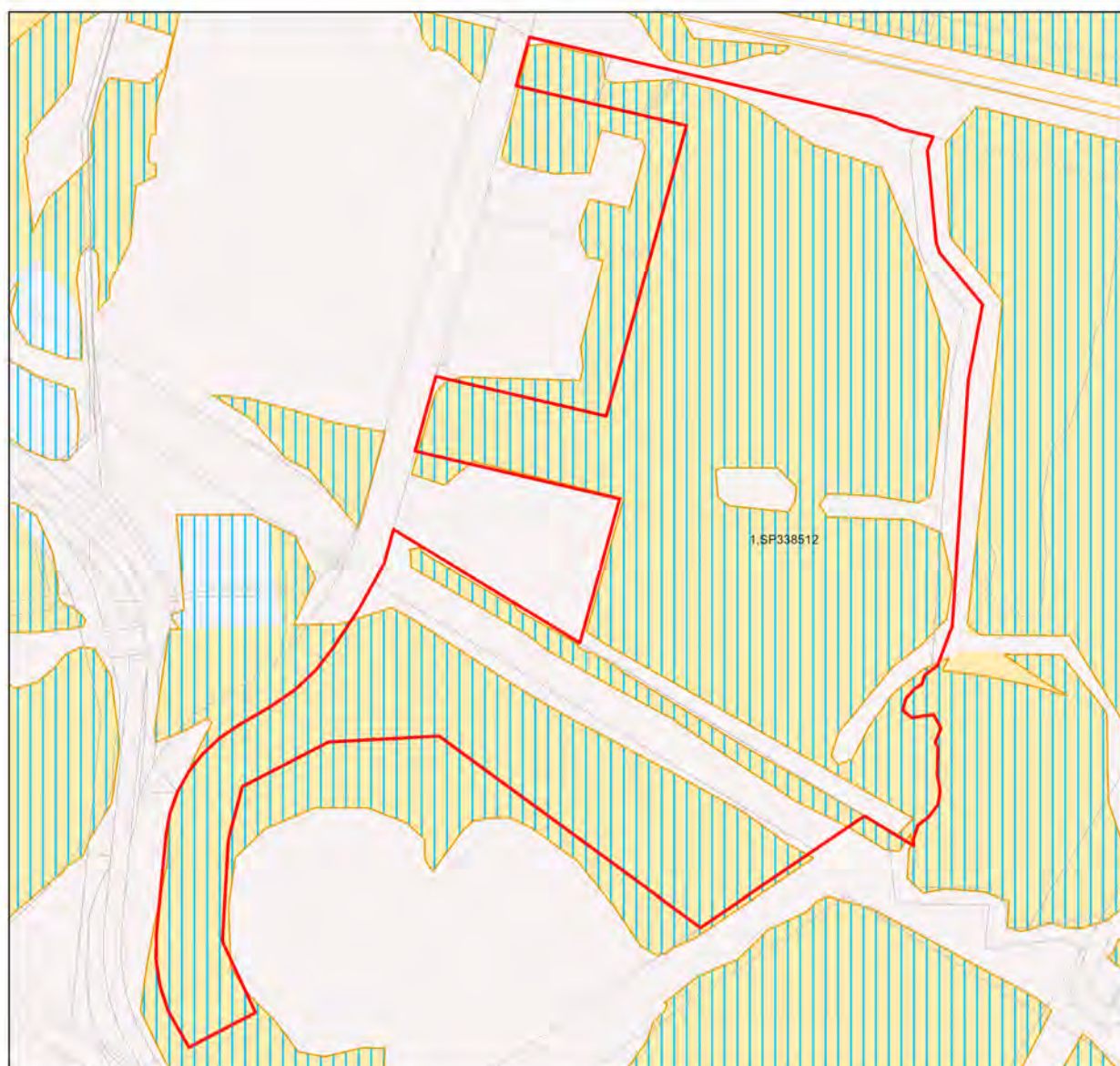


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Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



MSES - Species

Threatened (endangered or vulnerable) wildlife and special least concern animals

- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- ▨ Wildlife habitat (special least concern)
- ▨ Wildlife habitat (endangered or vulnerable)
- ▭ Selected Lot and Plan



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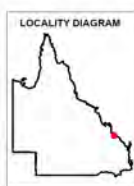
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Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species Koala habitat area (SEQ)

- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)
- Selected Lot and Plan



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area-locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See <https://environment.des.qld.gov.au/wildlife/animals/living-with-koalas/mapping>

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.



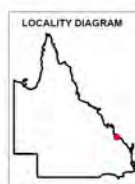
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Map 3c - MSES - Species - Wildlife habitat (sea turtle nesting areas)

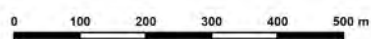
**MSES - Wildlife habitat (sea turtle nesting areas)**

- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (sea turtle nesting areas)
- ▭ Selected Lot and Plan

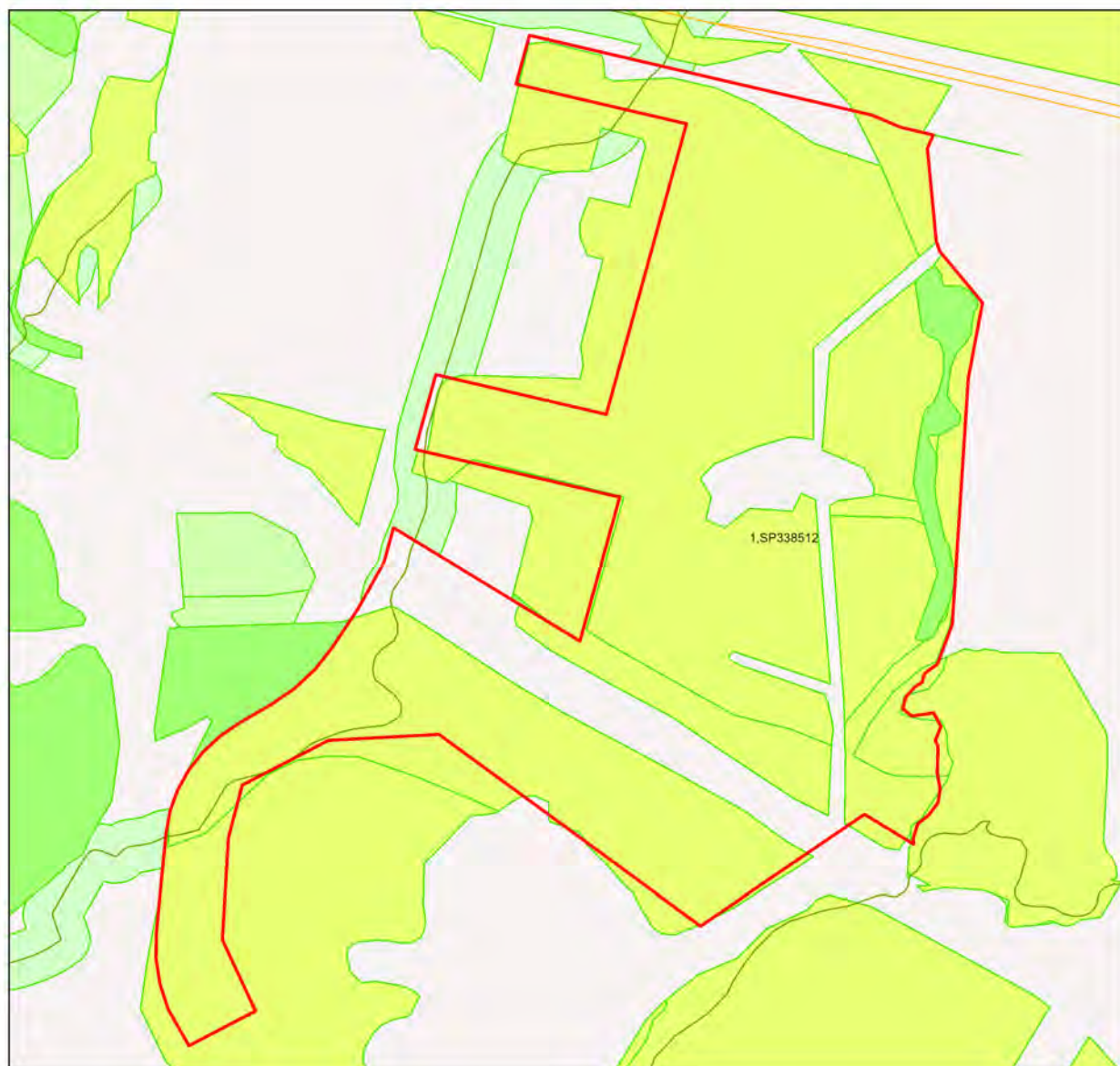


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MSES mapping of sea turtle nesting areas identifies beaches where the recorded number of turtle nests are over 1% of the turtle species or genetic stock. The linework is also deliberately extended along nearby rocky coastlines and headlands to recognise that significant numbers of nesting adults and hatchlings can become disoriented by light pollution from development on rocky coastlines and headlands while navigating offshore from nesting beaches.



Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

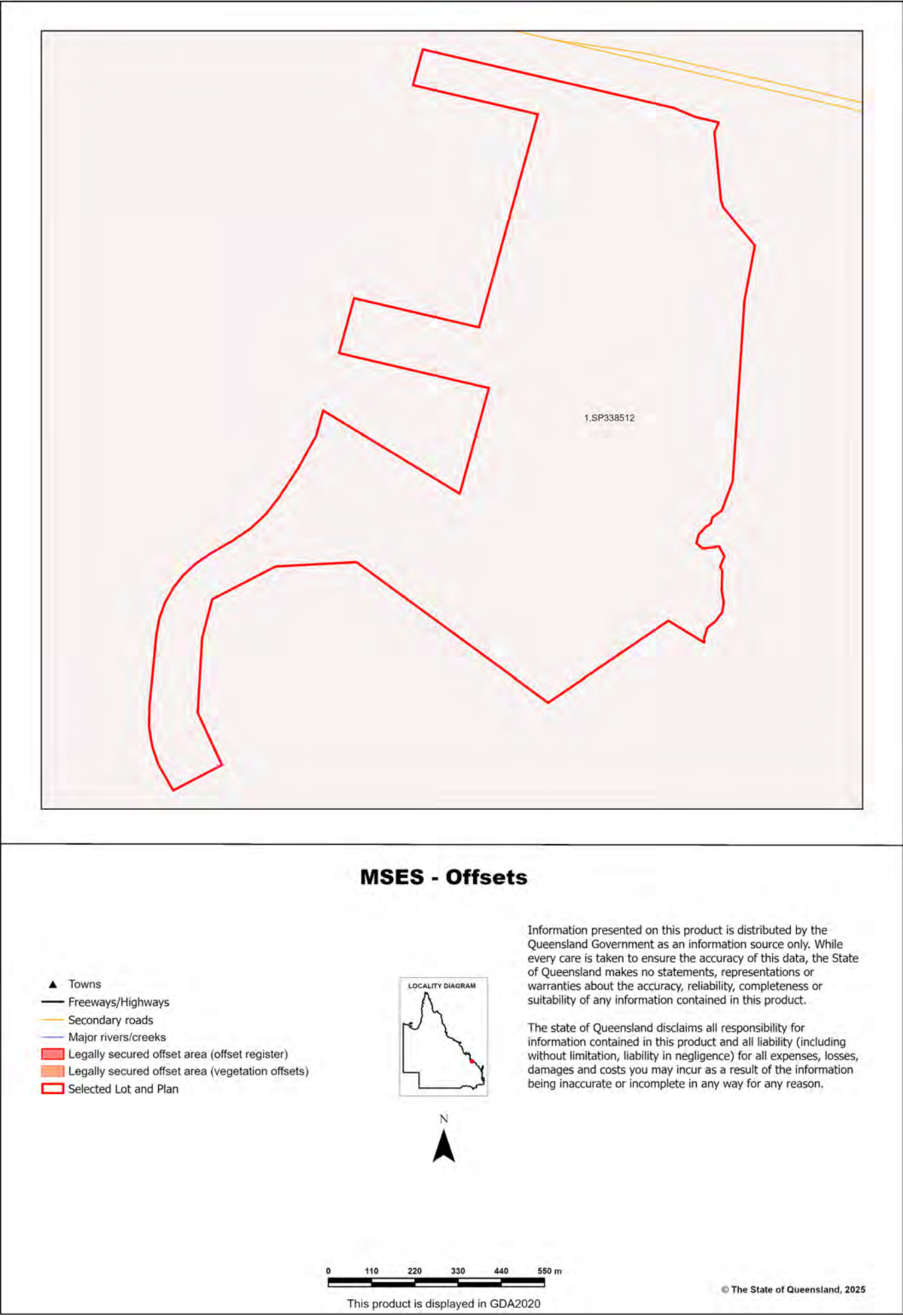
- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)
- Selected Lot and Plan



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Map 5 - MSES - Offset Areas



Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). Its primary purpose is to support implementation of the SPP biodiversity policy.

MSES mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

MSES mapping does not determine whether state or local development assessment is required. For state assessment triggers refer to the Development Assessment Mapping System (DAMS). For local assessment triggers, refer to the relevant local planning scheme.

The Queensland Government's "Method for mapping - matters of state environmental significance can be downloaded from:

<http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html> .

Appendix 2 - Source Data

The datasets listed below are available on request from:

<http://qldspatial.information.qld.gov.au/catalogue/custom/index.page>

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	current QSpatial data (http://qspatial.information.qld.gov.au)
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DETSI
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DETSI	- Department of the Environment, Tourism, Science and Innovation
EP Act	- Environmental Protection Act 1994
EPP	- Environmental Protection Policy
GDA2020	- Geocentric Datum of Australia 2020
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- Nature Conservation Act 1992
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- Vegetation Management Act 1999



Department of the Environment, Tourism, Science and Innovation

Environmental Reports

Biodiversity and Conservation Values

Biodiversity Planning Assessments and Aquatic Conservation Assessments

For the selected area of interest

Lot: 1 Plan: SP338512

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or Area of Interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "Central co-ordinates" option, the resulting assessment area encompasses an area extending from 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: biodiversity.planning@des.qld.gov.au

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Summary Information

Tables 1 to 8 provide an overview of the AOI with respect to selected topographic and environmental values.

Table 1: Details for area of interest: Lot: 1 Plan: SP338512, with area 109.94 ha

Local Government(s)	
Gladstone Regional	
Bioregion(s)	Subregion(s)
Southeast Queensland	Burnett - Curtis Hills and Ranges
Catchment(s)	
Calliope	

The following table identifies available Biodiversity Planning Assessments (BPAs) and Aquatic Conservation Assessments (ACAs) with respect to the AOI.

Table 2: Available Biodiversity Planning and Aquatic Conservation Assessments

Biodiversity Planning Assessment(s)	Aquatic Conservation Assessment(s) (riverine)	Aquatic Conservation Assessment(s) (non-riverine)
Southeast Queensland v4.1	Great Barrier Reef Catchments v1.1	Great Barrier Reef Catchments v.1.3

Table 3: Remnant regional ecosystems within the AOI as per the Qld Herbarium's 'biodiversity status'

Biodiversity Status	Area (Ha)	% of AOI
Endangered	1.97	1.79
Of concern	0.00	0.00
No concern at present	87.74	79.81

The following table identifies the extent and proportion of the user specified area of interest (AOI) which is mapped as being of "State", "Regional" or "Local" significance via application of the Queensland Department of the Environment, Tourism, Science and Innovation's *Biodiversity Assessment and Mapping Methodology* (BAMM).

Table 4: Summary table, biodiversity significance

Biodiversity Status	Area (Ha)	% of AOI
State Habitat for EVNT taxa	91.42	83.15
State	0.07	0.07

Table 5: Non-riverine wetlands intersecting the AOI

(No Records)

NB. The figures presented in the table above are derived from the relevant non-riverine Aquatic Conservation Assessment(s). Later releases of wetland mapping produced via the Queensland Wetland Mapping Program may provide more recent information in regards to wetland extent.

Table 6: Named waterways intersecting the AOI

(No Records)

Refer to **Map 1** for general locality information.

The following two tables identify the extent and proportion of the user specified AOI which is mapped as being of "Very High", "High", "Medium", "Low", or "Very Low" aquatic conservation value for riverine and non-riverine wetlands via application of the Queensland Department of the Environment, Tourism, Science and Innovation's *Aquatic Biodiversity Assessment and Mapping Method* (AquaBAMM).

Table 7: Summary table, aquatic conservation significance (riverine)

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Medium	109.94	100.00

Table 8: Summary table, aquatic conservation significance (non-riverine)

(No Records)

Biodiversity Planning Assessments

Introduction

The Department of the Environment, Tourism, Science and Innovation (DETSI) attributes biodiversity significance on a bioregional scale through a Biodiversity Planning Assessment (BPA). A BPA involves the integration of ecological criteria using the *Biodiversity assessment and Mapping Methodology* (BAMM) and is developed in two stages: 1) **diagnostic criteria**, and 2) **expert panel criteria**. The diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion, while the expert panel criteria allows for the refinement of the mapped information from the diagnostic output by incorporating local knowledge and expert opinion.

The BAMM methodology has application for identifying areas with various levels of significance solely for biodiversity reasons. These include threatened ecosystems or taxa, large tracts of habitat in good condition, ecosystem diversity, landscape context and connection, and buffers to wetlands or other types of habitat important for the maintenance of biodiversity or ecological processes. While natural resource values such as dryland salinity, soil erosion potential or land capability are not dealt with explicitly, they are included to some extent within the biodiversity status of regional ecosystems recognised by the DETSI. Biodiversity Planning Assessments (BPAs) assign three levels of overall biodiversity significance.

- **State significance** - areas assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed by other studies/processes as being significant at national or international scales. In addition, areas flagged as being of State significance due to the presence of endangered, vulnerable and/or near threatened taxa, are identified as "State Habitat for EVNT taxa".
- **Regional significance** - areas assessed as being significant for biodiversity at the subregional scale. These areas have lower significance for biodiversity than areas assessed as being of State significance.
- **Local significance and/or other values** - areas assessed as not being significant for biodiversity at state or regional scales. Local values are of significance at the local government scale.

For further information on released BPAs and a copy of the underlying methodology, go to:

<http://www.qld.gov.au/environment/plants-animals/biodiversity/planning/>

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

<https://qldspatial.information.qld.gov.au/catalogue/custom/index.page>

The following table identifies the extent and proportion of the user specified AOI which is mapped as being of "State", "Regional" or "Local" significance via application of the BAMM.

Table 9: Summary table, biodiversity significance

Biodiversity Status	Area (Ha)	% of AOI
State Habitat for EVNT taxa	91.42	83.15
State	0.07	0.07

Refer to **Map 2** for further information.

Diagnostic Criteria

Diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion. These criteria are diagnostic in that they are used to filter the available data and provide a "first-cut" or initial determination of biodiversity significance. This initial assessment is then combined through a second group of other essential criteria.

A description of the individual diagnostic criteria is provided in the following sections.

Criteria A. Habitat for EVNT taxa: Classifies areas according to their significance based on the presence of endangered, vulnerable and/or rare (EVNT) taxa. EVNT taxa are those scheduled under the *Nature Conservation Act 1992* and/or the *Environment Protection and Biodiversity Conservation Act 1999*. It excludes highly mobile fauna taxa which are instead considered in Criterion H and brings together information on EVNT taxa using buffering of recorded sites or habitat suitability models (HSM) where available.

Criteria B. Ecosystem value: Classifies on the basis of biodiversity status of regional ecosystems, their extent in

protected areas (presence of poorly conserved regional ecosystems), the presence of significant wetlands; and areas of national importance such as the presence of Threatened Ecological Communities, World Heritage areas and Ramsar sites. Ecosystem value is applied at a bioregional (**B1**) and regional (**B2**) scale.

Criteria C. Tract size: Measures the relative size of tracts of vegetation in the landscape. The size of any tract is a major indicator of ecological significance, and is also strongly correlated with the long-term viability of biodiversity values. Larger tracts are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller tracts.

Criteria D. Relative size of regional ecosystems: Classifies the relative size of each regional ecosystem unit within its bioregion (**D1**) and its subregion (**D2**). Remnant units are compared with all other occurrences with the same regional ecosystem. Large examples of a regional ecosystem are more significant than smaller examples of the same regional ecosystem because they are more representative of the biodiversity values particular to the regional ecosystem, are more resilient to the effects of disturbance, and constitute a significant proportion of the total area of the regional ecosystem.

Criteria F. Ecosystem diversity: Is an indicator of the number of regional ecosystems occurring within an area. An area with high ecosystem diversity will have many regional ecosystems and ecotones relative to other areas within the bioregion.

Criteria G. Context and connection: Represents the extent to which a remnant unit incorporates, borders or buffers areas such as significant wetlands, endangered ecosystems; and the degree to which it is connected to other vegetation.

A summary of the biodiversity status based upon the diagnostic criteria is provided in the following table.

Table 10: Summary of biodiversity significance based upon diagnostic criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Significant Wetland (B1)	0.07	0.07
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A) & Nat. Threatened Ecol. Community (B1)	0.07	0.06
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A)	91.35	83.09

Assessment of diagnostic criteria with respect to the AOI

The following table reflects an assessment of the individual diagnostic criteria noted above in regards to the AOI.

Table 11: Assessment of individual diagnostic criteria with respect to the AOI

Diagnostic Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
A: Habitat for EVNT Taxa	91.42	83.15	0.00	0.00	0.00	0.00	0.00	0.00
B1: Ecosystem Value (Bioregion)	0.18	0.17	0.00	0.00	86.91	79.05	4.40	4.00
B2: Ecosystem Value (Subregion)	0.00	0.00	0.00	0.00	86.96	79.09	4.46	4.06
C: Tract Size	0.00	0.00	4.51	4.10	0.00	0.00	86.91	79.05
D1: Relative RE Size (Bioregion)	0.00	0.00	0.00	0.00	0.00	0.00	91.42	83.15

Diagnostic Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
D2: Relative RE Size (Subregion)	60.36	54.90	0.00	0.00	21.32	19.39	9.74	8.86
F: Ecosystem Diversity	0.00	0.00	6.10	5.55	85.32	77.60	0.00	0.00
G: Context and Connection	0.04	0.04	1.66	1.51	89.71	81.60	0.00	0.00

Other Essential Criteria

Other essential criteria (also known as expert panel criteria) are based on non-uniform information sources and which may rely more upon expert opinion than on quantitative data. These criteria are used to provide a "second-cut" determination of biodiversity significance, which is then combined with the diagnostic criteria for an overall assessment of relative biodiversity significance. A summary of the biodiversity status based upon the other essential criteria is provided in the following table.

Table 12: Summary of biodiversity significance based upon other essential criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant forms part of a bioregional corridor (J)	4.51	4.10
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant forms part of a bioregional corridor (J)	21.91	19.93
Regional	Remnant contains Core Habitat for Priority Taxa (H)	65.00	59.13

A description of each of the other essential criteria and associated assessment in regards to the AOI is provided in the following sections.

Criteria H. Essential and general habitat for priority taxa: Priority taxa are those which are at risk or of management concern, taxa of scientific interest as relictual (ancient or primitive), endemic taxa or locally significant populations (such as a flying fox camp or heronry), highly specialised taxa whose habitat requirements are complex and distributions are not well correlated with any particular regional ecosystem, taxa important for maintaining genetic diversity (such as complex spatial patterns of genetic variation, geographic range limits, highly disjunct populations), taxa critical for management or monitoring of biodiversity (functionally important or ecological indicators), or economic and culturally important taxa.

Criteria I. Special biodiversity values: areas with special biodiversity values are important because they contain multiple taxa in a unique ecological and often highly biodiverse environment. Areas with special biodiversity values can include the following:

- Ia - centres of endemism - areas where concentrations of taxa are endemic to a bioregion or subregion are found.
- Ib - wildlife refugia (Morton *et al.* 1995), for example, islands, mound springs, caves, wetlands, gorges, mountain ranges and topographic isolates, ecological refuges, refuges from exotic animals, and refuges from clearing. The latter may include large areas that are not suitable for clearing because of land suitability/capability.
- Ic - areas with concentrations of disjunct populations.
- Id - areas with concentrations of taxa at the limits of their geographic ranges.
- Ie - areas with high species richness.
- If - areas with concentrations of relictual populations (ancient and primitive taxa).
- Ig - areas containing REs with distinct variation in species composition associated with geomorphology and other environmental variables.
- Ih - an artificial waterbody or managed/manipulated wetland considered by the panel/s to be of ecological significance.
- Ii - areas with a high density of hollow-bearing trees that provide habitat for animals.
- Ij - breeding or roosting sites used by a significant number of individuals.
- Ik - climate change refuge.

The following table identifies the value and extent area of the Other Essential Criteria H and I within the AOI.

Table 13: Relative importance of expert panel criteria (H and I) used to assess overall biodiversity significance

with respect to the AOI

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
H: Core Habitat Priority Taxa	0.00	0.00	86.91	79.05	0.11	0.10	4.39	4.00
Ia: Centres of Endemism	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ib: Wildlife Refugia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ic: Disjunct Populations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id: Limits of Geographic Ranges	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ie: High Species Richness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
If: Relictual Populations	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ig: Variation in Species Composition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ih: Artificial Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ii: Hollow Bearing Trees	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ij: Breeding or Roosting Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ik: Climate Refugia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NB. Whilst biodiversity values associated with Criteria I may be present within the site (refer to tables 12 and 15), for the New England Tableland and Central Queensland Coast BPAs, area and % area figures associated with Criteria Ia through to Ij cannot be listed in the table above (due to slight variations in data formats between BPAs).

Criteria J. Corridors: areas identified under this criterion qualify either because they are existing vegetated corridors important for contiguity, or cleared areas that could serve this purpose if revegetated. Some examples of corridors include riparian habitats, transport corridors and "stepping stones".

Bioregional and subregional conservation corridors have been identified in the more developed bioregions of Queensland through the BPAs, using an intensive process involving expert panels. Map 3 displays the location of corridors as identified under the Statewide Corridor network. The Statewide Corridor network incorporates BPA derived corridors and for bioregions where no BPA has been assessed yet, corridors derived under other planning processes.

Note: as a result of updating and developing a statewide network, the alignment of corridors may differ slightly in some instances when compared to those used in individual BPAs.

The functions of these corridors are:

- **Terrestrial** Bioregional corridors, in conjunction with large tracts of remnant vegetation, maintain ecological and evolutionary processes at a landscape scale, by:

- Maintaining long term evolutionary/genetic processes that allow the natural change in distributions of species and connectivity between populations of species over long periods of time;
- Maintaining landscape/ecosystems processes associated with geological, altitudinal and climatic gradients, to allow for ecological responses to climate change;
- Maintaining large scale seasonal/migratory species processes and movement of fauna;

- Maximising connectivity between large tracts/patches of remnant vegetation;
- Identifying key areas for rehabilitation and offsets; and

- **Riparian** Bioregional Corridors also maintain and encourage connectivity of riparian and associated ecosystems.

The location of the corridors is determined by the following principles:

- Terrestrial

- Complement riparian landscape corridors (i.e. minimise overlap and maximise connectivity);
- Follow major watershed/catchment and/or coastal boundaries;
- Incorporate major altitudinal/geological/climatic gradients;
- Include and maximise connectivity between large tracts/patches of remnant vegetation;
- Include and maximise connectivity between remnant vegetation in good condition; and

- Riparian

- Located on the major river or creek systems within the bioregion in question.

The total extent of remnant vegetation triggered as being of "State", "Regional" or "Local" significance due to the presence of an overlying BPA derived terrestrial or riparian corridor within the AOI, is provided in the following table. For further information on how remnant vegetation is triggered due to the presence of an overlying BPA derived corridor, refer to the relevant landscape BPA expert panel report(s).

Table 14: Extent of triggered remnant vegetation due to the presence of BPA derived corridors with respect to the AOI

Biodiversity Significance	Area (Ha)	% of AOI
State	26.41	24.03

NB: area figures associated with the extent of corridor triggered remnant vegetation are only available for those bioregions where a BPA has been undertaken.

Refer to **Map 3** for further information.

Threatening process/condition (Criteria K) - areas identified by experts under this criterion may be used to amend (upgrade or downgrade) biodiversity significance arising from the "first-cut" analysis. The condition of remnant vegetation is affected by threatening processes such as weeds, ferals, grazing and burning regime, selective timber harvesting/removal, salinity, soil erosion, and climate change.

Assessment of Criteria K with respect to the AOI is not currently included in the "Biodiversity and Conservation Values" report, as it has not been applied to the majority of Queensland due to data/information limitations and availability.

Special Area Decisions

Expert panel derived "Special Area Decisions" are used to assign values to Other Essential Criteria. The specific decisions which relate to the AOI in question are listed in the table below.

Table 15: Expert panel decisions for assigning levels of biodiversity significance with respect to the AOI

Decision Number	Description	Panel Recommended Significance	Criteria Values
brbs_I_17a	Terrestrial Bioregional Corridors	State	J (terrestrial corridor): STATE
seqn_I_01	Terrestrial bioregional corridors	State or Regional	Criterion J
seqn_I_13	Riparian bioregional corridors	State	Criterion J

Expert panel decision descriptions:

Decision Number	Description
brbs_l_17a	Maintaining connectivity across a landscape, either through "continuous linkages" or via "stepping-stones" of remnant vegetation, is important for the long-term conservation of biodiversity. The panel agreed that corridor triggered remnant vegetation in version 2.1 of the Brigalow Belt BPA would focus upon identifying key connections between remaining core tracts/nodes (as identified under the special area decisions brbs_l_16 and brbn_l_83) within the bioregion. For further information regarding the broad principles and intent, as well as more specific information relating to the Brigalow Belt terrestrial corridor network, refer to Section 3.3.2.1 (pg 169) and Table 14 in this report. Refer to brbn_l_17 for the northern BRB implementation of this decision.
seqn_l_01	The expert panel reviewed the existing bioregional corridors for northern SEQ. Corridors were assigned as being of State or Regional significance. For further information, refer to sections 2.3.2 and 3.2 of this report.
seqn_l_13	The riparian bioregional corridors provide connectivity through lowland areas of SEQ. See Table 4 for list of waterways considered riparian corridors. For further information, refer to sections 2.3.2 and 3.2 of this report.

Aquatic Conservation Assessments

Introduction

The Aquatic Biodiversity Assessment and Mapping Method or AquaBAMM (Clayton *et al.* 2006), was developed to assess conservation values of wetlands in Queensland, and may also have application in broader geographical contexts. It is a comprehensive method that uses available data, including data resulting from expert opinion, to identify relative wetland conservation/ecological values within a specified study area (usually a catchment). The product of applying this method is an Aquatic Conservation Assessment (ACA) for the study area.

An ACA using AquaBAMM is non-social, non-economic and identifies the conservation/ecological values of wetlands at a user-defined scale. It provides a robust and objective conservation assessment using criteria, indicators and measures that are founded upon a large body of national and international literature. The criteria, each of which may have variable numbers of indicators and measures, are naturalness (aquatic), naturalness (catchment), diversity and richness, threatened species and ecosystems, priority species and ecosystems, special features, connectivity and representativeness. An ACA using AquaBAMM is a powerful decision support tool that is easily updated and simply interrogated through a geographic information system (GIS).

Where they have been conducted, ACAs can provide a source of baseline wetland conservation/ecological information to support natural resource management and planning processes. They are useful as an independent product or as an important foundation upon which a variety of additional environmental and socio-economic elements can be added and considered (i.e. an early input to broader 'triple-bottom-line' decision-making processes). An ACA can have application in:

- determining priorities for protection, regulation or rehabilitation of wetlands and other aquatic ecosystems
- on-ground investment in wetlands and other aquatic ecosystems
- contributing to impact assessment of large-scale development (e.g. dams)
- water resource and strategic regional planning processes

For a detailed explanation of the methodology please refer to the summary and expert panel reports relevant to the ACA utilised in this assessment. These reports can be accessed at Wetland Info:

<http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca>

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

<https://qldspatial.information.qld.gov.au/catalogue/custom/index.page>

Explanation of Criteria

Under the AquaBAMM, eight criteria are assessed to derive an overall conservation value. Similar to the Biodiversity Assessment and Mapping Methodology, the criteria may be primarily diagnostic (quantitative) or primarily expert opinion (qualitative) in nature. The following sections provide a brief description of each of the 8 criteria.

Criteria 1. Naturalness - Aquatic: This attribute reflects the extent to which a wetland's (riverine, non-riverine, estuarine) aquatic state of naturalness is affected through relevant influencing indicators which include: presence of exotic flora and fauna; presence of aquatic communities; degree of habitat modification and degree of hydrological modification.

Criteria 2. Naturalness - Catchment: The naturalness of the terrestrial systems of a catchment can have an influence on many wetland characteristics including: natural ecological processes e.g. nutrient cycling, riparian vegetation, water chemistry, and flow. The indicators utilised to assess this criterion include: presence of exotic flora and/or fauna; riparian, catchment and flow modification.

Criteria 3. Naturalness - Diversity and Richness: This criterion is common to many ecological assessment methods and can include both physical and biological features. It includes such indicators as species richness, riparian ecosystem richness and geomorphological diversity.

Criteria 4. Threatened Species and Ecosystems: This criterion evaluates ecological rarity characteristics of a wetland. This includes both species rarity and rarity of communities / assemblages. The communities and assemblages are best represented by regional ecosystems. Species rarity is determined by NCA and EPBC status with Endangered, Vulnerable or Near-threatened species being included in the evaluation. Ecosystem rarity is determined by regional ecosystem biodiversity status i.e. Endangered, Of Concern, or Not of Concern.

Criteria 5. Priority Species and Ecosystems: Priority flora and fauna species lists are expert panel derived. These are aquatic, semi-aquatic and riparian species which exhibit at least 1 particular trait in order to be eligible for consideration. For flora species the traits included:

- It forms significant macrophyte beds (in shallow or deep water).
- It is an important food source.
- It is important/critical habitat.
- It is implicated in spawning or reproduction for other fauna and/or flora species.
- It is at its distributional limit or is a disjunct population.
- It provides stream bank or bed stabilisation or has soil binding properties.
- It is a small population and subject to threatening processes.

Fauna species are included if they meet at least one of the following traits:

- It is endemic to the study area (>75 per cent of its distribution is in the study area/catchment).
- It has experienced, or is suspected of experiencing, a serious population decline.
- It has experienced a significant reduction in its distribution and has a naturally restricted distribution in the study area/catchment.
- It is currently a small population and threatened by loss of habitat.
- It is a significant disjunct population.
- It is a migratory species (other than birds).
- A significant proportion of the breeding population (>one per cent for waterbirds, >75 per cent other species) occurs in the waterbody (see Ramsar criterion 6 for waterbirds).
- Limit of species range.

See the individual expert panel reports for the priority species traits specific to an ACA.

Criteria 6. Special Features: Special features are areas identified by flora, fauna and ecology expert panels which exhibit characteristics beyond those identified in other criteria and which the expert panels consider to be of the highest ecological importance. Special feature traits can relate to, but are not solely restricted to geomorphic features, unique ecological processes, presence of unique or distinct habitat, presence of unique or special hydrological regimes e.g. spring-fed streams. Special features are rated on a 1 - 4 scale (4 being the highest).

Criteria 7. Connectivity: This criterion is based on the concept that appropriately connected aquatic ecosystems are healthy and resilient, with maximum potential biodiversity and delivery of ecosystem services.

Criteria 8. Representativeness: This criterion applies primarily to non-riverine assessments, evaluates the rarity and uniqueness of a wetland type in relation to specific geographic areas. Rarity is determined by the degree of wetland protection within "protected Areas" estate or within an area subject to the *Fisheries Act 1994*, *Coastal Protection and Management Act 1995*, or *Marine Parks Act 2004*. Wetland uniqueness evaluates the relative abundance and size of a wetland or wetland management group within geographic areas such as catchment and subcatchment.

Riverine Wetlands

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water. AquaBAMM, when applied to riverine wetlands uses a discrete spatial unit termed subsections. A subsection can be considered as an area which encompasses discrete homogeneous stream sections in terms of their natural attributes (i.e. physical, chemical, biological and utilitarian values) and natural resources. Thus in an ACA, an aquatic conservation significance score is calculated for each subsection and applies to all streams within a subsection, rather than individual streams as such.

Please note, the area figures provided in Tables 16 and 17, are derived using the extent of riverine subsections within the AOI. Refer to **Map 5** for further information. A summary of the conservation significance of riverine wetlands within the AOI is provided in the following table.

Table 16: Overall level/s of riverine aquatic conservation significance

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Medium	109.94	100.00

The individual aquatic conservation criteria ratings for riverine wetlands within the AOI are listed below.

Table 17: Level/s of riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic	0.00	0.00	0.00	0.00	109.94	100.00	0.00	0.00
2. Naturalness catchment	109.94	100.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Diversity and richness	0.00	0.00	109.94	100.00	0.00	0.00	0.00	0.00
4. Threatened species and ecosystems	0.00	0.00	0.00	0.00	109.94	100.00	0.00	0.00
5. Priority species and ecosystems	109.94	100.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Special features	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7. Connectivity	109.94	100.00	0.00	0.00	0.00	0.00	0.00	0.00
8. Representativeness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to riverine wetlands within the AOI.

Table 18: Expert panel decisions for assigning overall levels of riverine aquatic conservation significance

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
(No Records)				

4 is the highest rating/value

Expert panel decision descriptions:

Decision Number	Description
(No Records)	

Non-riverine Wetlands

Non-riverine wetlands include both lacustrine and palustrine wetlands, however, do not currently incorporate estuarine, marine or subterranean wetland types. A summary of the conservation significance of non-riverine wetlands within the AOI is provided in the following table. Refer to **Map 6** for further information.

Table 19: Overall level/s of non-riverine aquatic conservation significance

(No Records)

The following table provides an assessment of non-riverine wetlands within the AOI and associated aquatic conservation criteria values.

Table 20: Level/s of non-riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Naturalness catchment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Diversity and richness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Threatened species and ecosystems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Priority species and ecosystems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Special features	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7. Connectivity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8. Representativeness	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to non-riverine wetlands within the AOI.

Table 21: Expert panel decisions for assigning overall levels of non-riverine aquatic conservation significance.

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
(No Records)				

4 is the highest rating/value

Expert panel decision descriptions:

Decision Number	Description
(No Records)	

Threatened and Priority Species

Introduction

This chapter contains a list of threatened and priority flora and/or fauna species that have been recorded on, or within 4km of the Assessment Area.

The information presented in this chapter with respect to species presence is derived from compiled databases developed primarily for the purpose of BPAs and ACAs. Data is collated from a number of sources and is updated periodically.

It is important to note that the list of species provided in this report, may differ when compared to other reports generated from other sources such as the State government's WildNet, HerbreCs or the federal government's EPBC database for a number of reasons.

Records for threatened and priority species are filtered and checked based on a number of rules including:

- Taxonomic nomenclature - current scientific names and status,
- Location - cross-check co-ordinates with location description,
- Taxon by location - requires good knowledge of the taxon and history of the record,
- Duplicate records - identify and remove,
- Expert panels - check records and provide new records,
- Flora cultivated records excluded,
- Use precise records less than or equal to 2000m,
- Use recent records greater than or equal to 1975 animals, greater than or equal to 1950 plants.

Threatened Species

Threatened species are those species classified as "Endangered" or "Vulnerable" under the *Environment Protection and Biodiversity Conservation Act 1999* or "Endangered", "Vulnerable" or "Near threatened" under the *Nature Conservation Act 1992*.

The following threatened species have been recorded on, or within approximately 4km of the AOI.

Table 22: Threatened species recorded on, or within 4km of the AOI

Species	Common name	NCA status	EPBC status	Migratory species*	Wetland species**	Identified flora/fauna
<i>Calidris ferruginea</i>	curlew sandpiper	CR	CE	Y	I	FA
<i>Charadrius mongolus</i>	lesser sand plover	E	E	Y	I	FA
<i>Crocodylus porosus</i>	estuarine crocodile	V		Y	I	FA
<i>Dugong dugon</i>	dugong	V		Y	I	FA
<i>Gallinago hardwickii</i>	Latham's snipe	SL	V	Y	I	FA
<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)	V	V			FA
<i>Limnodromus semipalmatus</i>	Asian dowitcher	SL	V	Y	I	FA
<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit	V	E	Y	I	FA
<i>Ninox strenua</i>	powerful owl	V				FA

Species	Common name	NCA status	EPBC status	Migratory species*	Wetland species**	Identified flora/fauna
<i>Numenius madagascariensis</i>	eastern curlew	E	CE	Y	I	FA
<i>Petauroides volans volans</i>	southern greater glider	E	E			FA
<i>Phascolarctos cinereus</i>	koala	E	E			FA
<i>Pluvialis squatarola</i>	grey plover	SL	V	Y	I	FA
<i>Pteropus poliocephalus</i>	grey-headed flying-fox	C	V			FA
<i>Tringa nebularia</i>	common greenshank	SL	E	Y	I	FA
<i>Xenus cinereus</i>	terek sandpiper	SL	V	Y	I	FA
<i>Xeromys myoides</i>	water mouse	V	V		I	FA

NB. Please note that the threatened species listed in this section are based upon the most recently compiled DETSI internal state-wide threatened species dataset. This dataset may contain additional records that were not originally available for inclusion in the relevant individual BPAs and ACAs.

*JAMBA - Japan-Australia Migratory Bird Agreement; CAMBA - China-Australia Migratory Bird Agreement; ROKAMBA - Republic of Korea-Australia Migratory Bird Agreement; CMS - Convention on the Conservation of Migratory Species.

**I - wetland indicator species; D - wetland dependent species.

BPA Priority Species

A list of BPA priority species that have been recorded on, or within approximately 4km of the AOI is contained in the following table.

Table 23: Priority species recorded on, or within 4km of the AOI

Species	Common name	Identified flora/fauna
<i>Chlamydosaurus kingii</i>	frilled lizard	FA
<i>Climacteris picumnus</i>	brown treecreeper	FA
<i>Figuladra incei curtisiana</i>	Port Curtis Dark Snail	FA
<i>Lampropholis adonis</i>	diamond-shielded sunskink	FA
<i>Melaleuca nervosa</i>		FL
<i>Melaleuca viridiflora</i>		FL
<i>Mogurnda adspersa</i>	southern purplespotted gudgeon	FA
<i>Mugil cephalus</i>	sea mullet	FA
<i>Ninox connivens</i>	barking owl	FA
<i>Notamacropus agilis</i>	agile wallaby	FA
<i>Petrogale herberti</i>	Herbert's rock-wallaby	FA
<i>Pomatostomus temporalis</i>	grey-crowned babbler	FA

Species	Common name	Identified flora/fauna
<i>Pteropus alecto</i>	black flying-fox	FA
<i>Scoteanax rueppellii</i>	greater broad-nosed bat	FA
<i>Varanus semiremex</i>	rusty monitor	FA
<i>Varanus varius</i>	lace monitor	FA

NB. Please note that the list of priority species is based on those species identified in the BPAs, however records for these species may be more recent than the originals used. furthermore, the BPA priority species databases are updated from time to time. At each update, the taxonomic details for all species are amended as necessary to reflect current taxonomic name and/or status changes.

ACA Priority Species

A list of ACA priority species used in riverine and non-riverine ACAs that have been recorded on, or within approximately 4km of the AOI are contained in the following tables.

Table 24: Priority species recorded on, or within 4 km of the AOI - riverine

Species	Common name	Identified flora/fauna
<i>Ardea alba modesta</i>	Eastern Great Egret	FA
<i>Casuarina cunninghamiana</i>		FL
<i>Eucalyptus tereticornis</i>		FL
<i>Lates calcarifer</i>	Barramundi	FA
<i>Lomandra longifolia</i>		FL
<i>Megalops cyprinoides</i>	Oxeye Herring/Tarpon	FA
<i>Melaleuca leucadendra</i>	broad-leaved tea-tree	FL
<i>Melaleuca viminalis</i>		FL
<i>Mugil cephalus</i>	Sea Mullet	FA
<i>Nymphoides indica</i>	water snowflake	FL

Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine

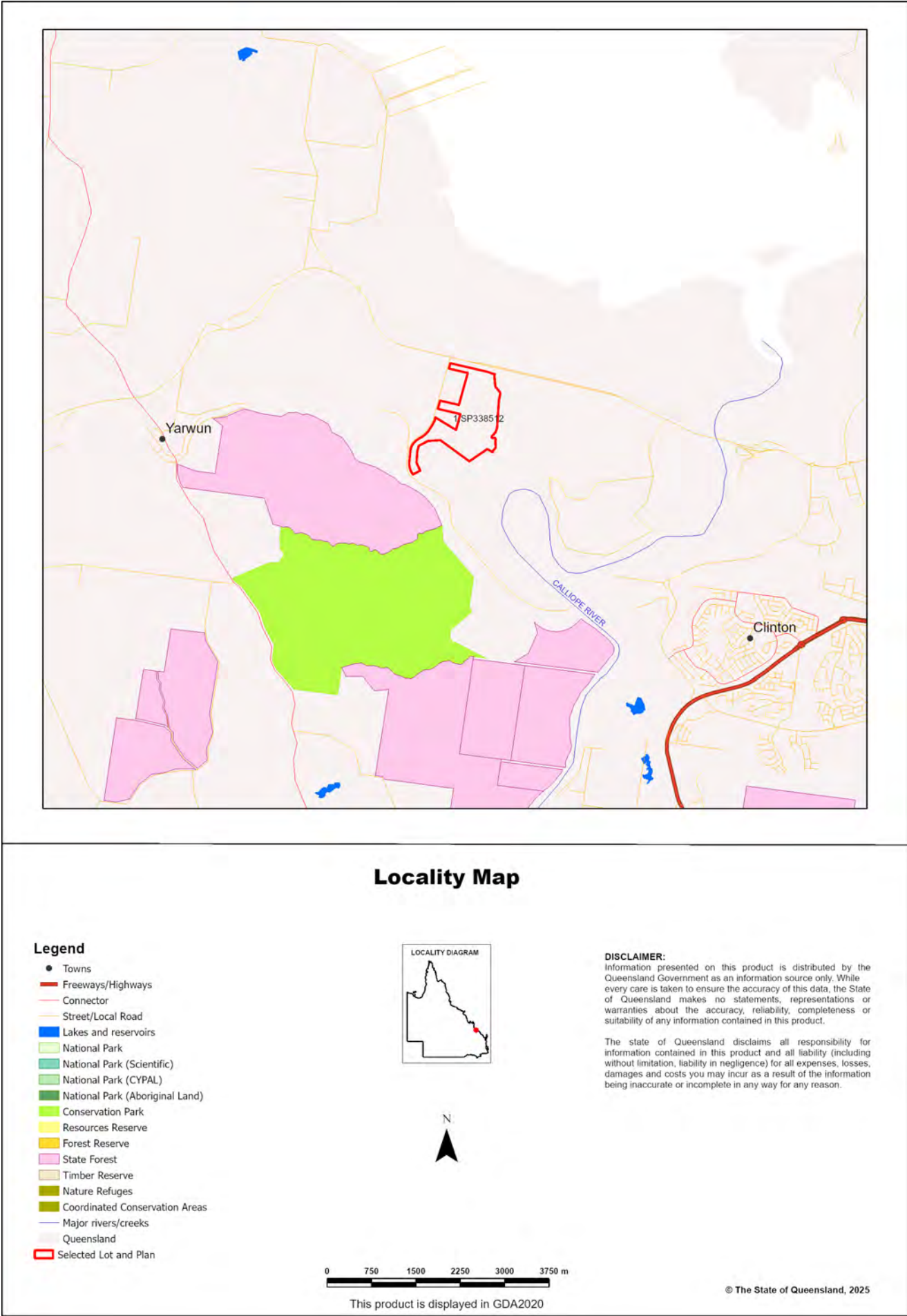
Species	Common name	Identified flora/fauna
<i>Ardea alba modesta</i>	Eastern Great Egret	FA
<i>Cyperus exaltatus</i>	tall flatsedge	FL
<i>Eucalyptus tereticornis</i>		FL
<i>Lates calcarifer</i>	Barramundi	FA
<i>Machaerina articulata</i>	jointed twigrush	FL
<i>Megalops cyprinoides</i>	Oxeye Herring/Tarpon	FA
<i>Melaleuca leucadendra</i>	broad-leaved tea-tree	FL
<i>Melaleuca viminalis</i>		FL
<i>Mugil cephalus</i>	Sea Mullet	FA

Species	Common name	Identified flora/fauna
<i>Nymphoides indica</i>	water snowflake	FL

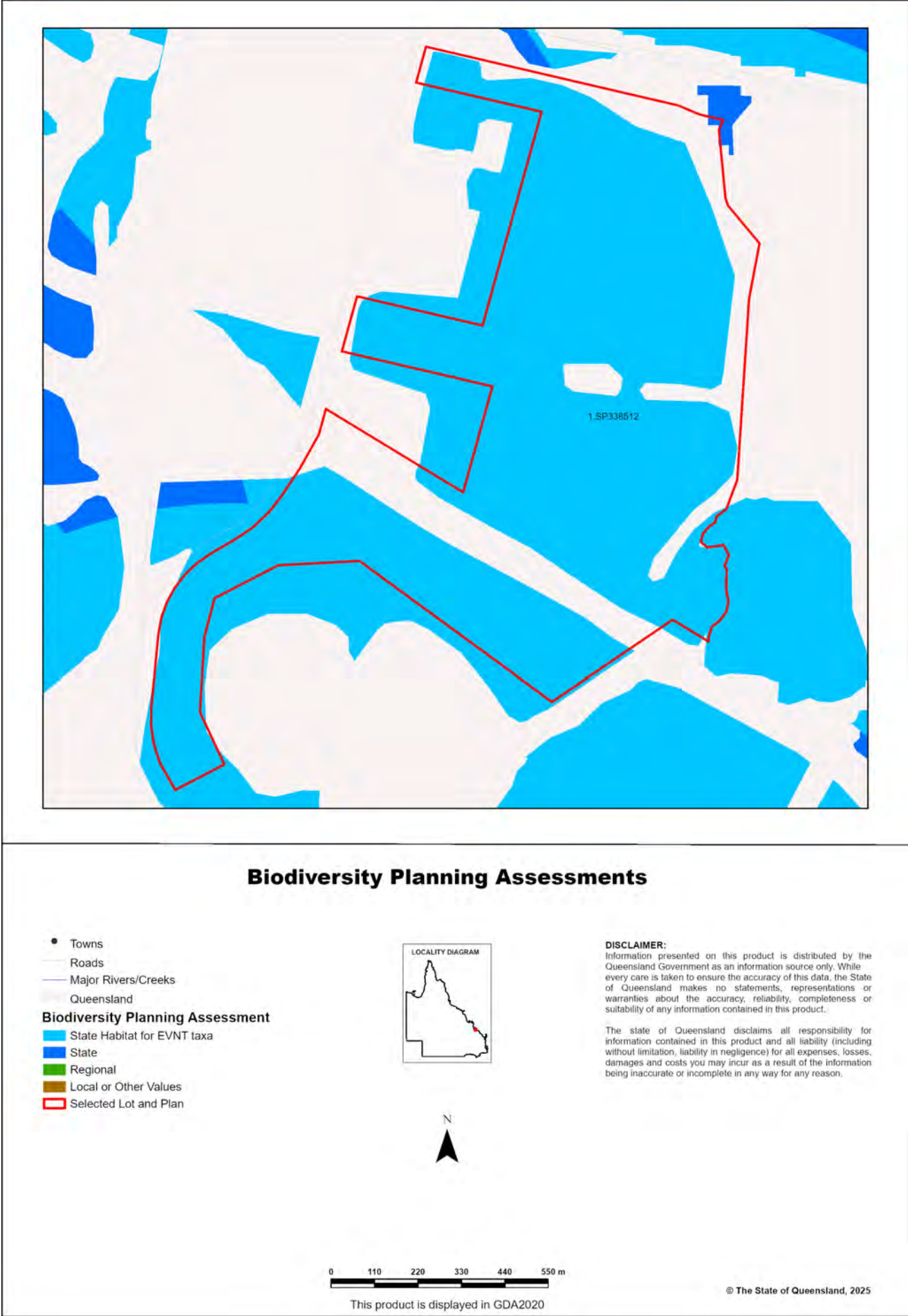
NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details for all ACAs records are amended as necessary to reflect current taxonomic name and/or status changes.

Maps

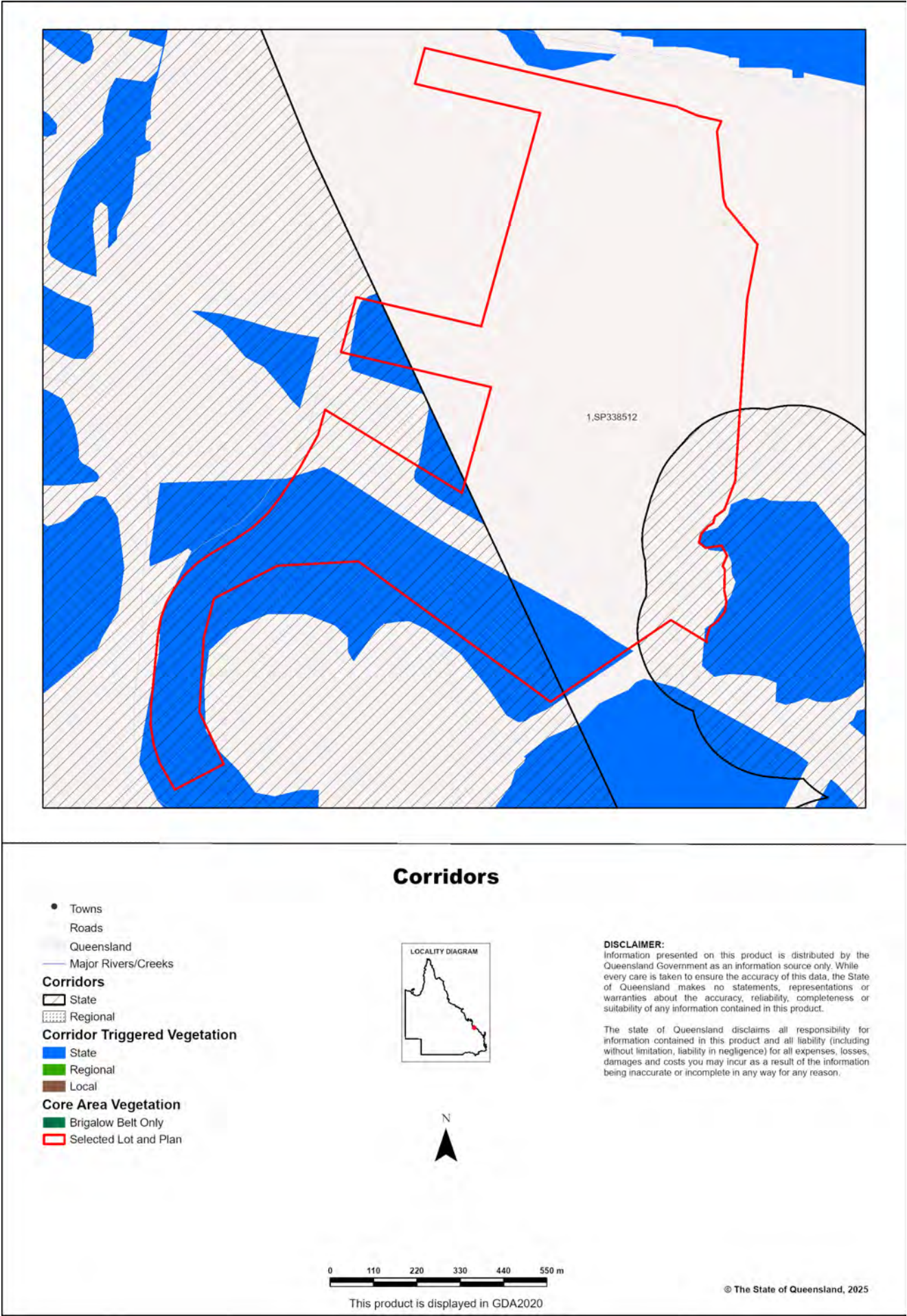
Map 1 - Locality Map



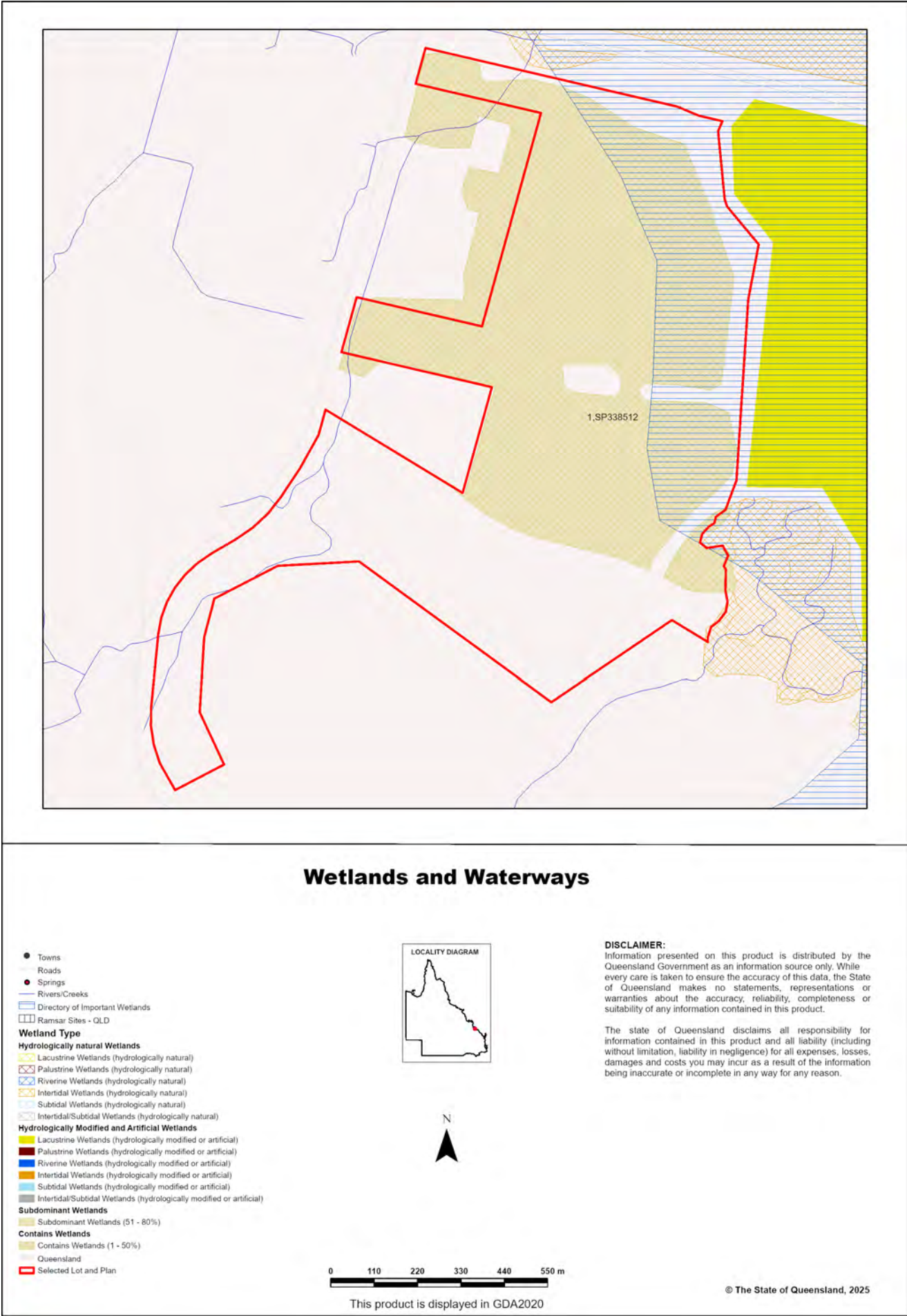
Map 2 - Biodiversity Planning Assessment (BPA)



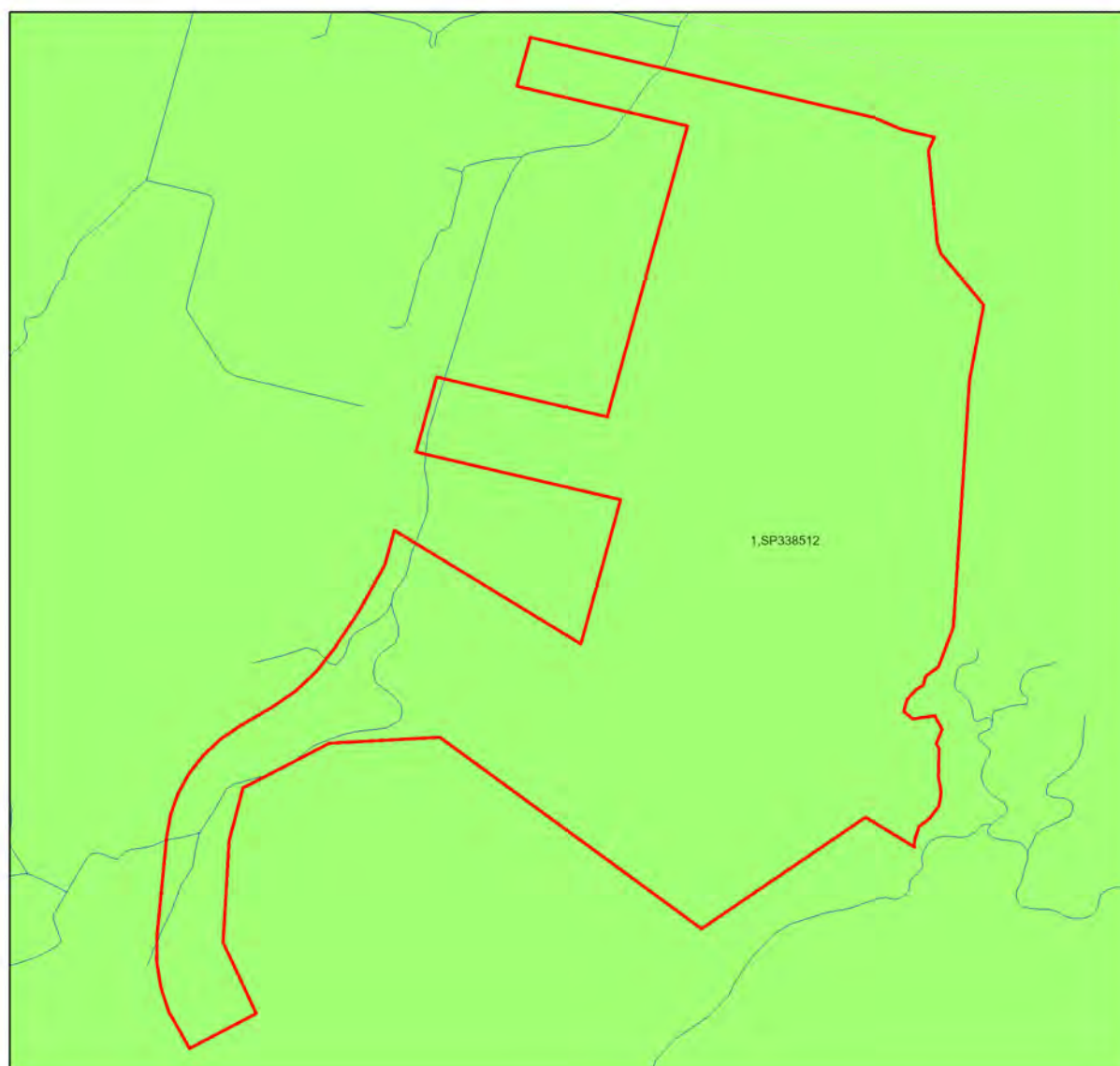
Map 3 - Corridors



Map 4 - Wetlands and waterways



Map 5 - Aquatic Conservation Assessment (ACA) - riverine

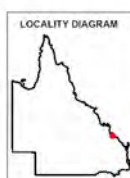


Aquatic Conservation Assessment (ACA) - riverine

- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Riverine - Subcatchment Significance

- Very High
- High
- Medium
- Low
- Very Low
- Selected Lot and Plan



This product is displayed in GDA2020

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Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine



Aquatic Conservation Assessment (ACA) - nonriverine

- Towns
 - Roads
 - Rivers/Creeks
 - Queensland
- ACA Non-riverine**
- Very High
 - High
 - Medium
 - Low
 - Very Low
 - Selected Lot and Plan



This product is displayed in GDA2020

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References

Clayton, P.D., Fielder, D.F., Howell, S. and Hill, C.J. (2006) *Aquatic biodiversity assessment and mapping method (AquaBAMM): a conservation values assessment tool for wetlands with trial application in the Burnett River catchment*. Published by the Environmental Protection Agency, Brisbane. ISBN 1-90928-07-3. Available at

<http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/>

Environment and Heritage Protection 2014, *Biodiversity Assessment and Mapping Methodology*. Version 2.2. Department of Environment and Heritage Protection, Brisbane.

Morton, S. R., Short, J. and Barker, R. D. with an Appendix by G.F. Griffin and G. Pearce (1995). *Refugia for Biological Diversity in Arid and Semi-arid Australia*. Biodiversity Series, Paper No. 4, Biodiversity Unit, Environment Australia.

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendices

Appendix 1 - Source Data

Theme	Datasets
Aquatic Conservation Assessments Non-riverine*	Combination of the following datasets: Cape York Peninsula Non-riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Non-riverine v1.3 Lake Eyre and Bulloo Basins v1.1 QMDBB Non-riverine ACA v2.1 Southeast Queensland ACA v1.1 WBB Non-riverine ACA v1.1 Southern Gulf Catchments Non-riverine ACA v1.1 WBBGBRCC Non-riverine ACA v2.1
Aquatic Conservation Assessments Riverine*	Combination of the following datasets: Cape York Peninsula Riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Riverine v1.1 Lake Eyre and Bulloo Basins v1.1 QMDBB Riverine ACA v2.1 Southeast Queensland ACA v1.1 WBB Riverine ACA v1.1 Southern Gulf Catchments Riverine ACA v1.1 WBBGBRCC Riverine ACA v2.1
Biodiversity Planning Assessments*	Combination of the following datasets: Brigalow Belt BPA v2.1 Cape York Peninsula BPA v1.1 Central Queensland Coast BPA v1.3 Channel Country BPA v1.1 Desert Uplands BPA v1.3 Einasleigh Uplands BPA v1.1 Gulf Plains BPA v1.1 Mitchell Grass Downs BPA v1.1 Mulga Lands BPA v1.4 New England Tableland v3.1 Northwest Highlands v1.1 Southeast Queensland v4.1 Wet Tropics v1.1
Statewide BPA Corridors*	Statewide corridors v1.7
Threatened Species	An internal DETSI database compiled from Wildnet, Herbrecks, Corveg, the QLD Museum, as well as other incidental sources.
BPA Priority Species	An internal DETSI database compiled from Wildnet, Herbrecks, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DETSI database compiled from Wildnet, Herbrecks, Corveg, the QLD Museum, as well as other incidental sources.

These datasets are available at:

<http://dds.information.qld.gov.au/DDS>

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
ACA	- Aquatic Conservation Assessment
AQUABAMM	- Aquatic Biodiversity Assessment and Mapping Methodology
BAMM	- Biodiversity Assessment and Mapping Methodology
BoT	- Back on Track
BPA	- Biodiversity Planning Assessment
CAMBA	- China-Australia Migratory Bird Agreement
DETSI	- Department of the Environment, Tourism, Science and Innovation
EPBC	- <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVNT	- Endangered, Vulnerable, Near Threatened
GDA2020	- Geocentric Datum of Australia 2020
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement

AREA REPORT

Area: 0.05 sq km	Species: 0	Occurrences: 0
Endemic species: 0	All threatened species: 0	Migratory species: 0
All invasive species: 0	Iconic species: 0	JournalMap Articles: 0
Animals: 0	Plants: 0	Birds: 0

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My Polygon

Area: 0.05 sq km

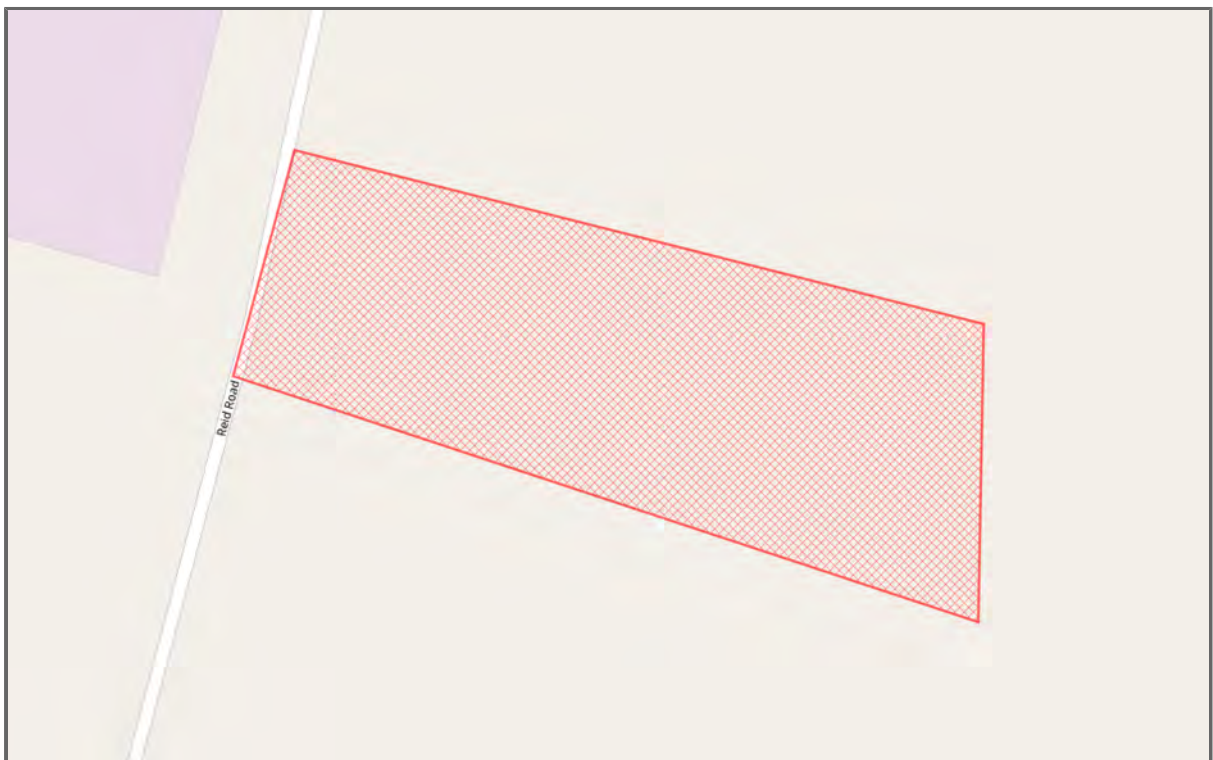
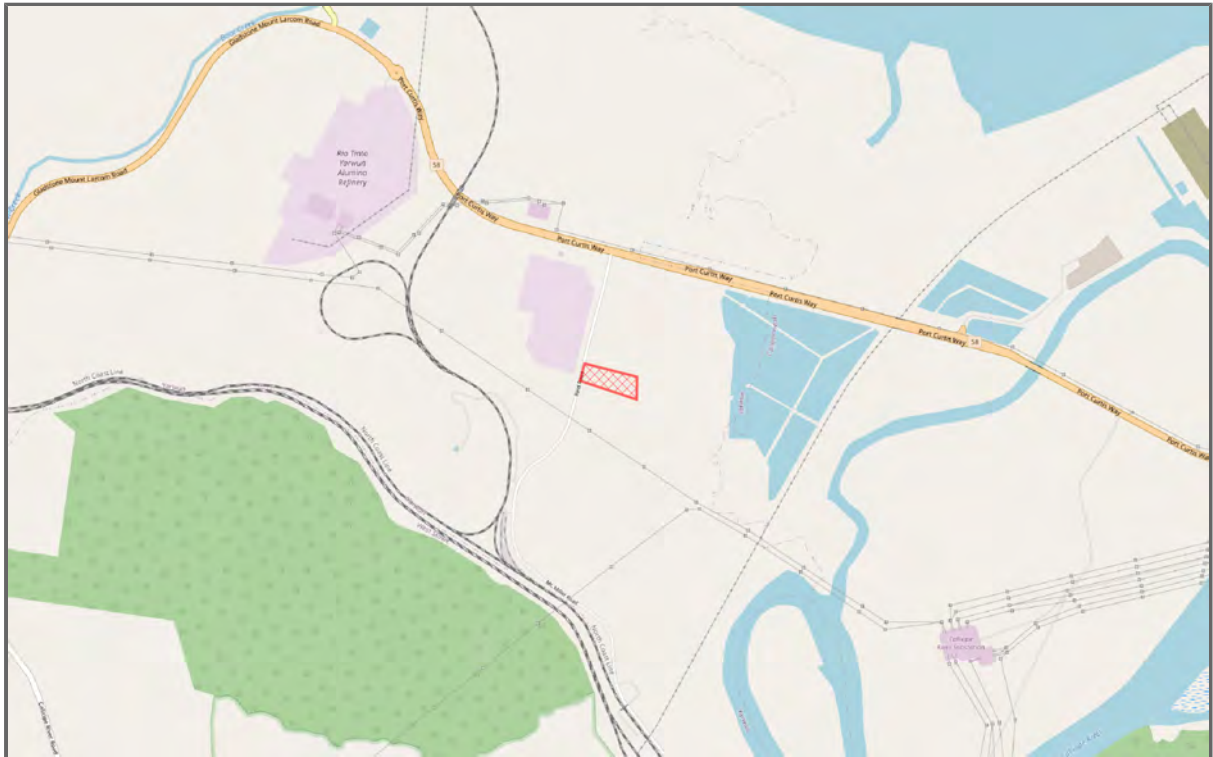


Figure 1 : Map of My Polygon

National Dynamic Land Cover

The Dynamic Land Cover Dataset is the first nationally consistent and thematically comprehensive land cover reference for Australia. It provides a base-line for reporting on change and trends in vegetation cover and extent. Information about land cover dynamics is essential to understanding and addressing a range of national challenges such as drought, salinity, water availability and ecosystem health. The data is a synopsis of land cover information for every 250m by 250m area of the country from April 2000 to April 2008. The classification scheme used to describe land cover categories in the Dataset conforms to the 2007 International Standards Organisation (ISO) land cover standard (19144-2). The Dataset shows Australian land covers clustered into 34 ISO classes. These reflect the structural character of vegetation, ranging from cultivated and managed land covers (crops and pastures) to natural land covers such as closed forest and open grasslands. [Ref1]

Australia's Dynamic Land Cover: <http://www.ga.gov.au/earth-observation/landcover.html>

National Dynamic Land Cover layer: Classification: Vegetation; Type: Contextual (polygonal); Metadata contact organisation: Geoscience Australia (GA). <https://spatial.ala.org.au/ws/layers/view/more/dlcmv1>

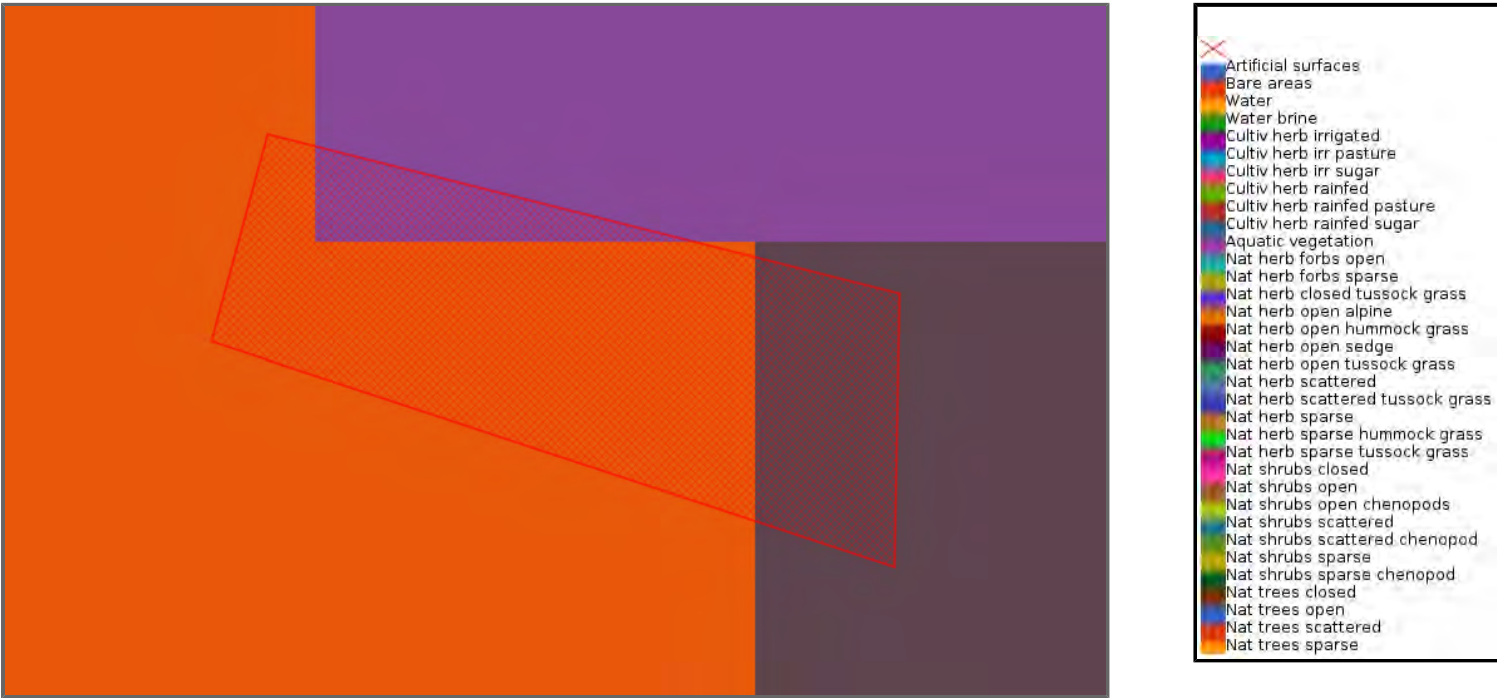


Figure 2 : Map of National Dynamic Land Cover

Table 1: National Dynamic Land Cover

Class/Region	Area (sq km)	% of total area
--------------	--------------	-----------------

Global Context Ecoregions

Terrestrial Ecoregions of the World (TEOW)

Terrestrial Ecoregions of the World (TEOW) is a biogeographic regionalisation of the Earth's terrestrial biodiversity. Our biogeographic units are ecoregions, which are defined as relatively large units of land or water containing a distinct assemblage of natural communities sharing a large majority of species, dynamics, and environmental conditions. There are 867 terrestrial ecoregions, classified into 14 different biomes such as forests, grasslands, or deserts. Ecoregions represent the original distribution of distinct assemblages of species and communities. [Ref2]

TEOW: <https://worldwildlife.org/biome-categories/terrestrial-ecoregions>

Terrestrial Ecoregional Boundaries layer: Classification: Biodiversity - Region; Type: Contextual (polygonal); Metadata contact organisation: The Nature Conservancy (TNC). <https://spatial.ala.org.au/ws/layers/view/more/1053>

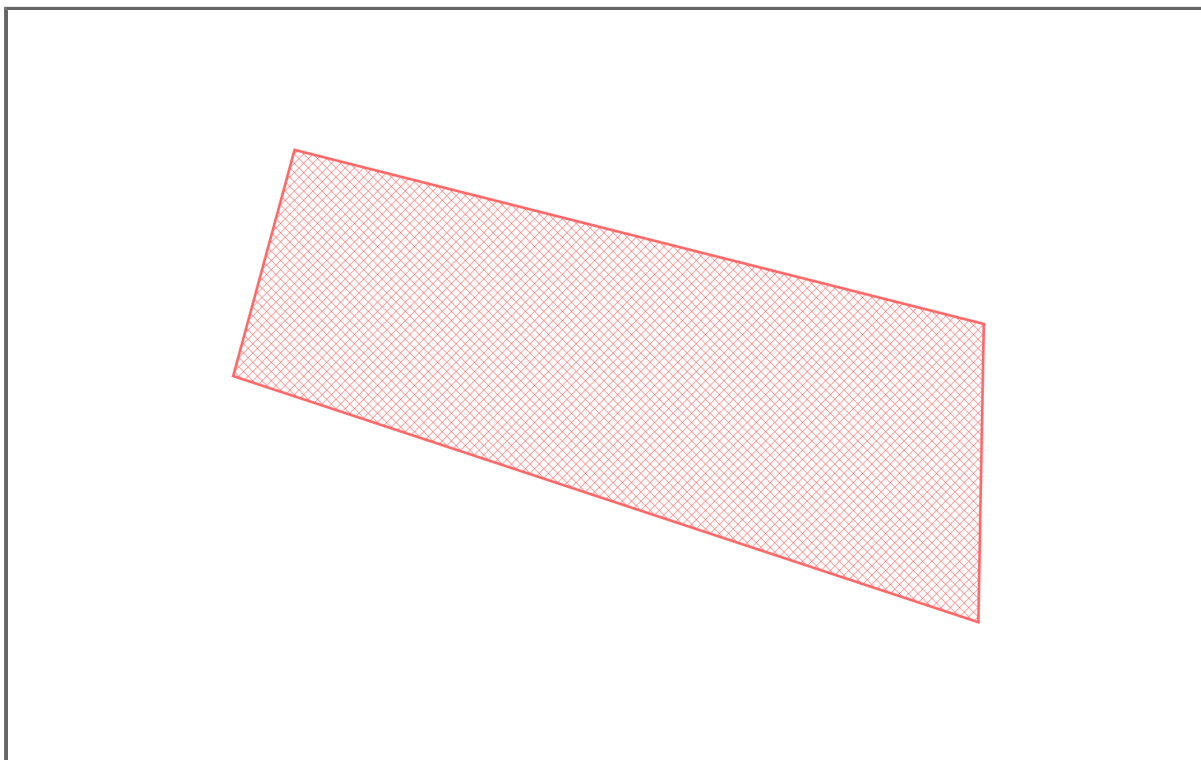


Figure 3 : Map of Global Context Ecoregions

Freshwater Ecoregions of the World (FEOW)

Freshwater Ecoregions of the World (FEOW) is a collaborative project providing the first global biogeographic regionalization of the Earth's freshwater biodiversity, and synthesizing biodiversity and threat data for the resulting ecoregions. We define a freshwater ecoregion as a large area encompassing one or more freshwater systems that contains a distinct assemblage of natural freshwater communities and species. The freshwater species, dynamics, and environmental conditions within a given ecoregion are more similar to each other than to those of surrounding ecoregions and together form a conservation unit. [Ref5]

FEOW: <https://worldwildlife.org/biome-categories/freshwater-ecoregions>

Freshwater Ecoregions of the World layer: Classification: Biodiversity - Region; Type: Contextual (polygonal); Metadata contact organisation: TNC.
<https://spatial.ala.org.au/ws/layers/view/more/1052>

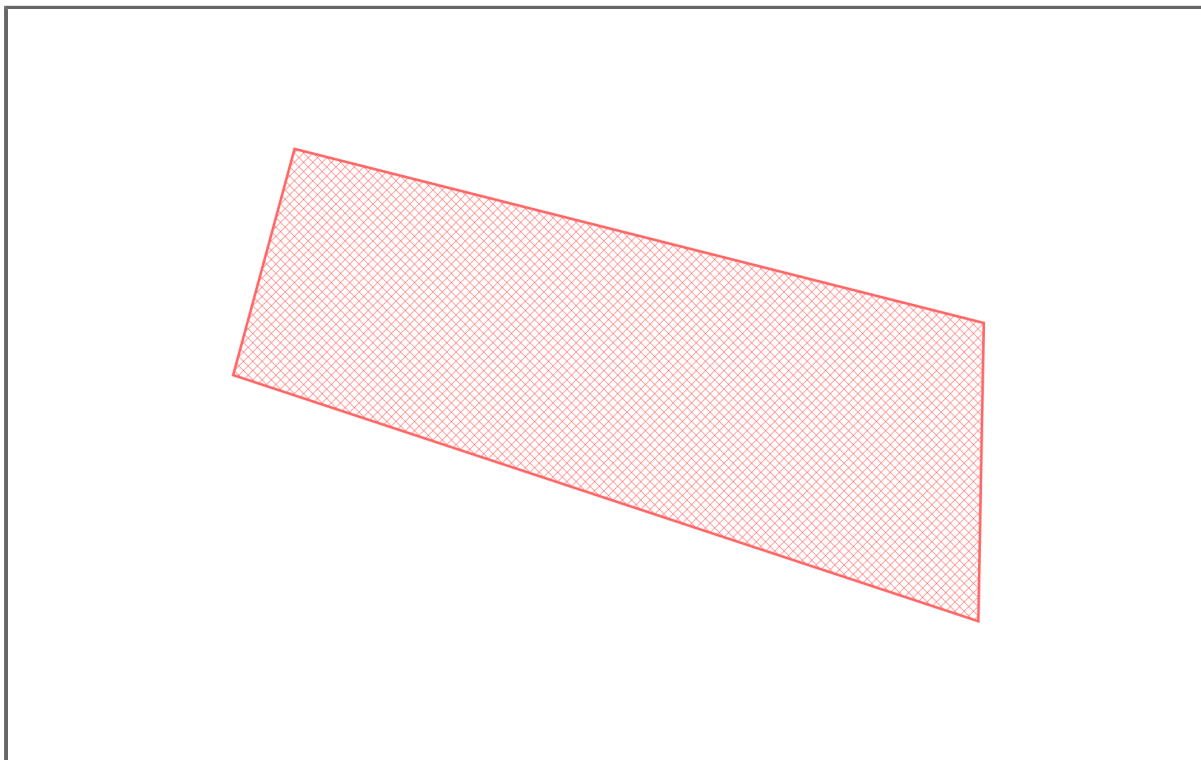


Figure 4 : Map of Freshwater Ecoregions of the World (FEOW)

Occurrences

Occurrences: **0**

Spatially valid records are considered those that do not have any type of flag questioning their location, for example a terrestrial species being recorded in the ocean. [Ref6]

Number of occurrences (spatially valid only): **0**

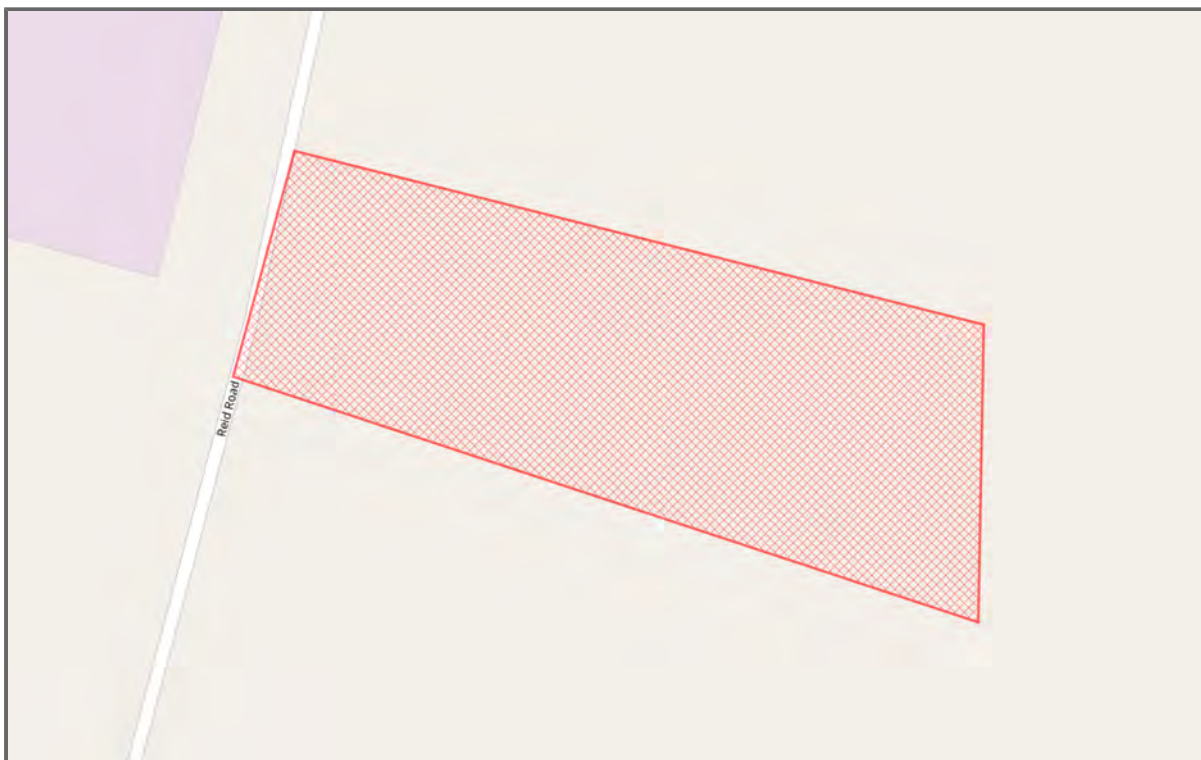


Figure 5 : Map of Occurrences

Endemic Species

Endemic Species: 0

Spatially valid records are considered those that do not have any type of flag questioning their location, for example a terrestrial species being recorded in the ocean. [Ref6]

Number of endemic species (spatially valid only): 0

Table 4: Endemic Species

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

All invasive species

Number of invasive species: 0

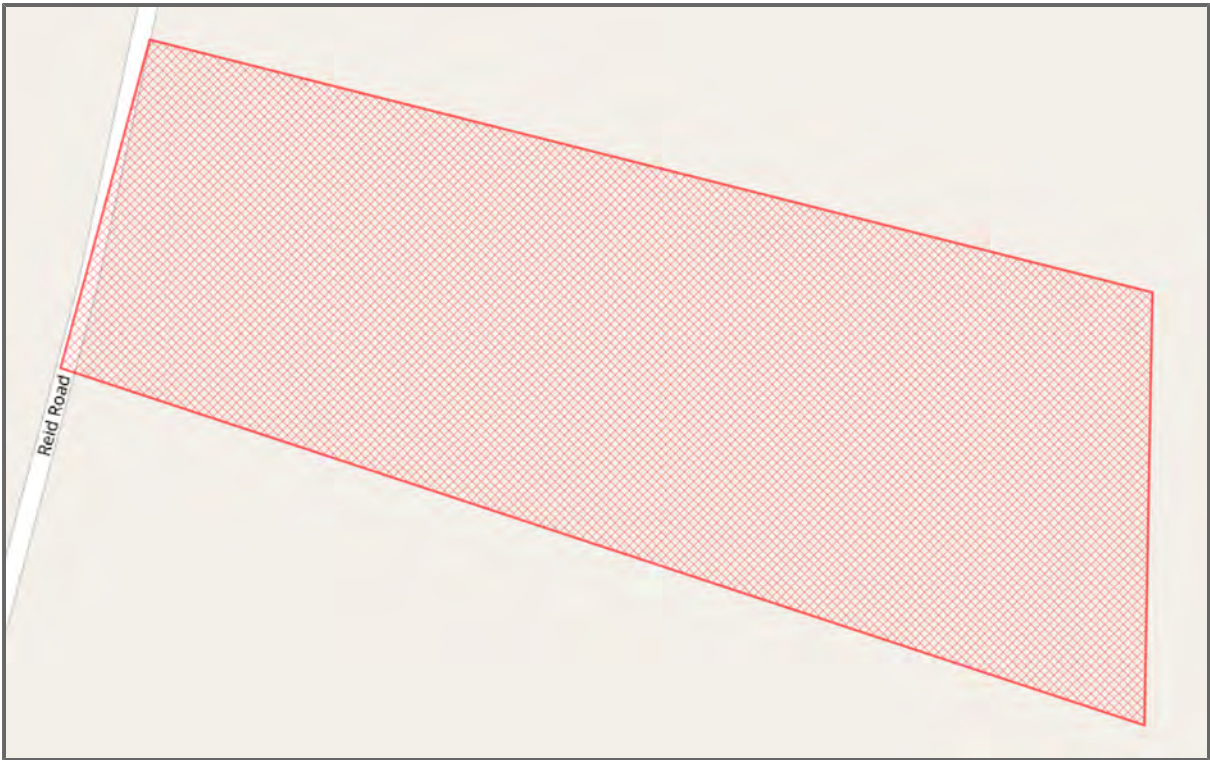


Figure 6 : Map of All invasive species

Table 5: All invasive species [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Iconic species

Number of iconic species: 0

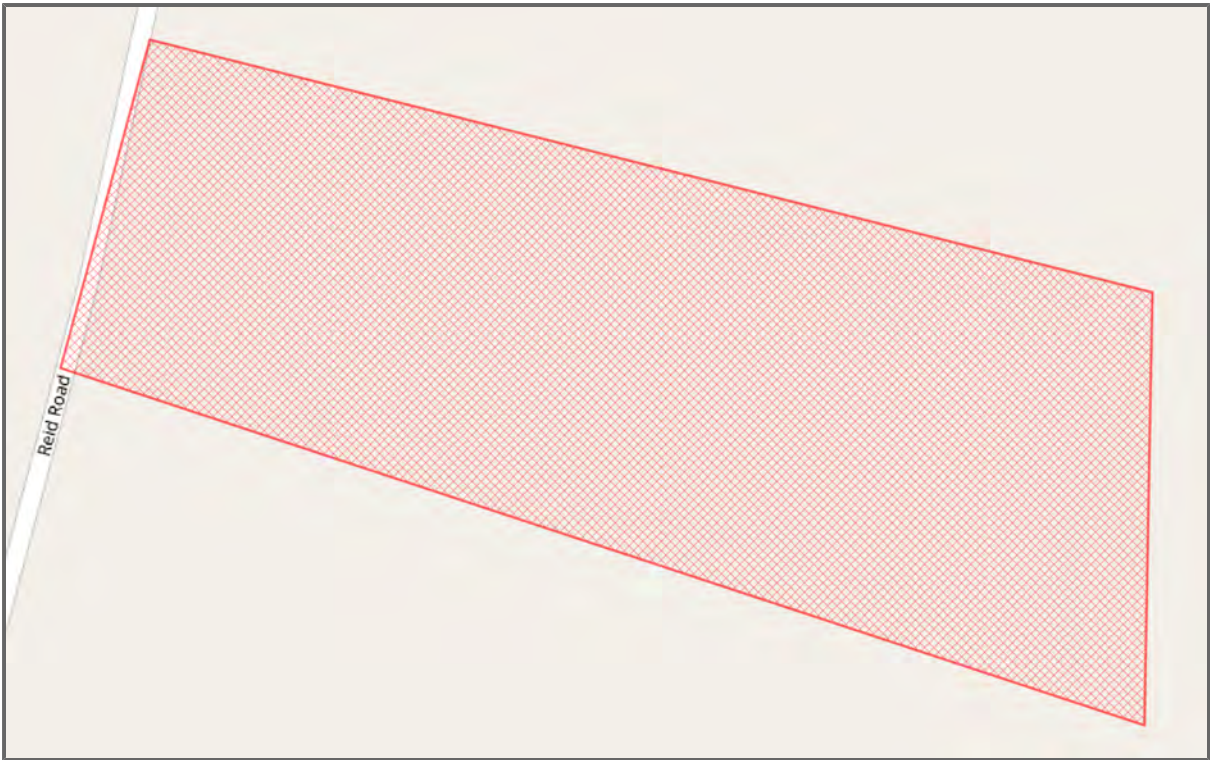


Figure 7 : Map of Iconic species

Table 6: Iconic species [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Migratory species

Number of migratory species: 0

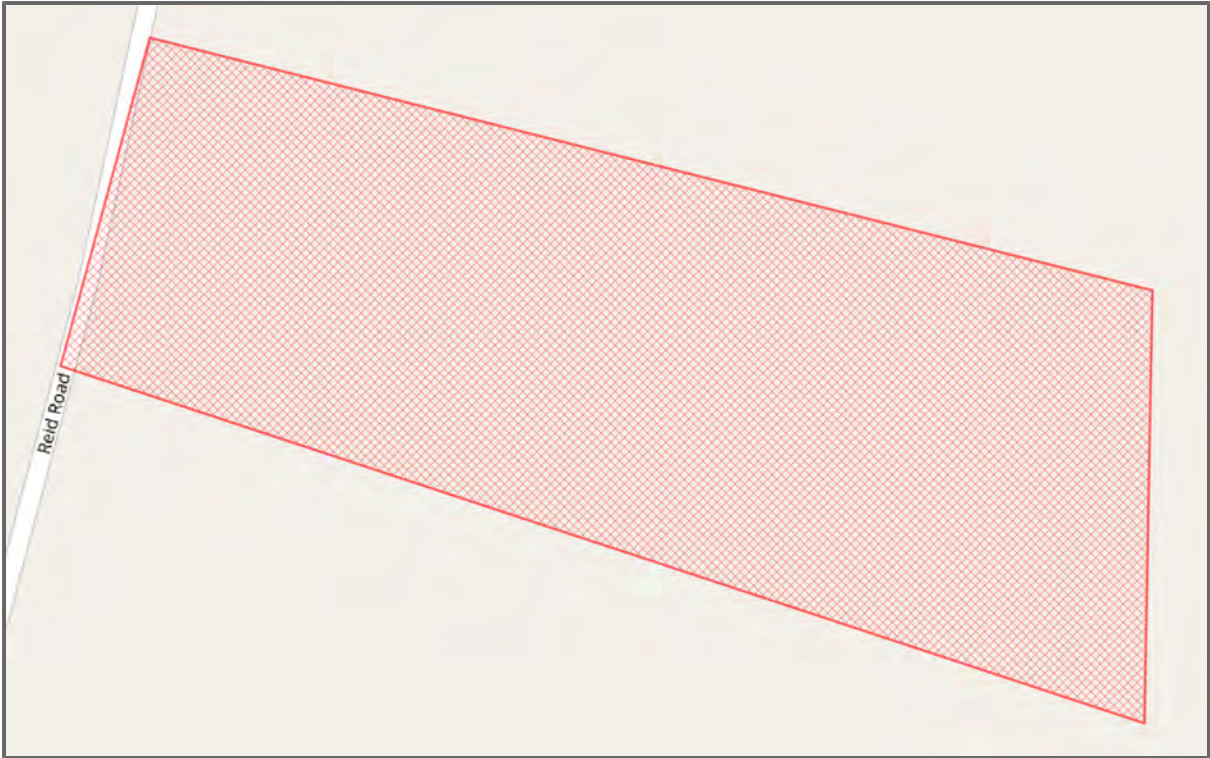


Figure 8 : Map of Migratory species

Table 7: Migratory species ([Link to full list](#))

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Algae

Number of Algae 0

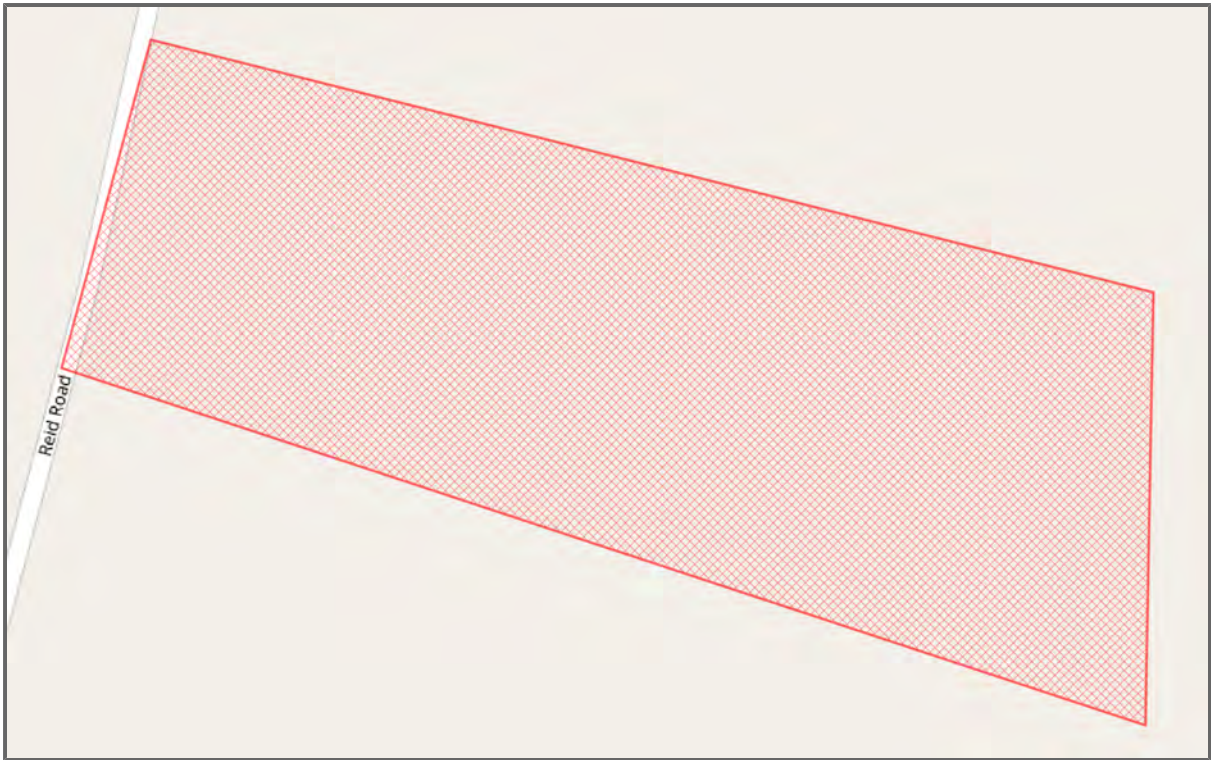


Figure 9 : Map of Lifeform - Algae

Table 8: Lifeform - Algae [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Amphibians

Number of Amphibians 0

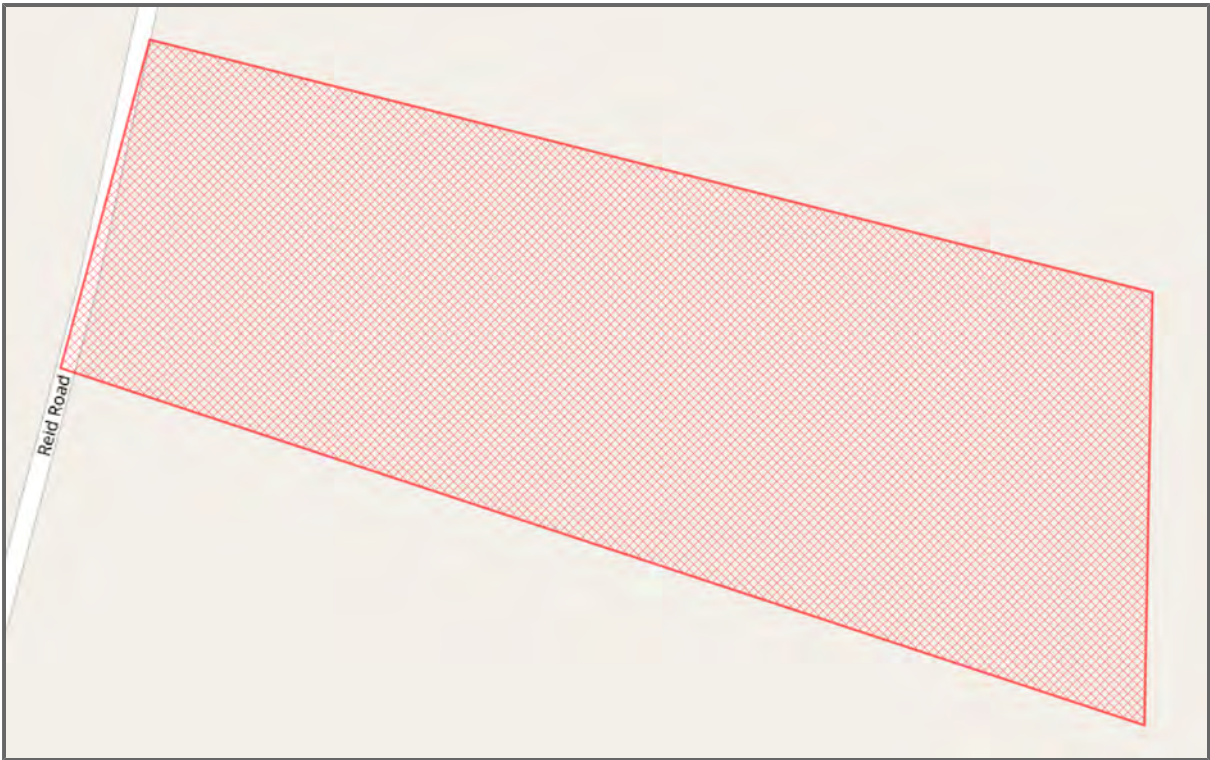


Figure 10 : Map of Lifeform - Amphibians

Table 9: Lifeform - Amphibians [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Angiosperms

Number of Angiosperms 0

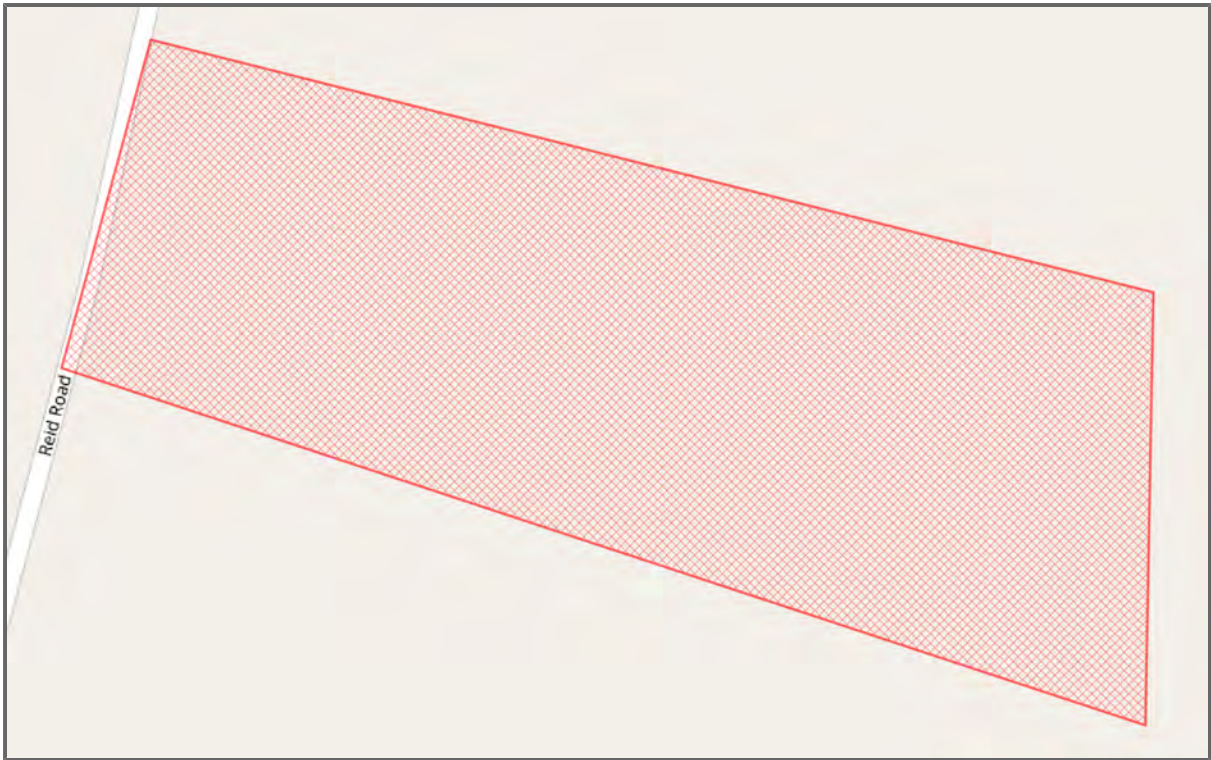


Figure 11 : Map of Lifeform - Angiosperms

Table 10: Lifeform - Angiosperms [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Animals

Number of Animals 0

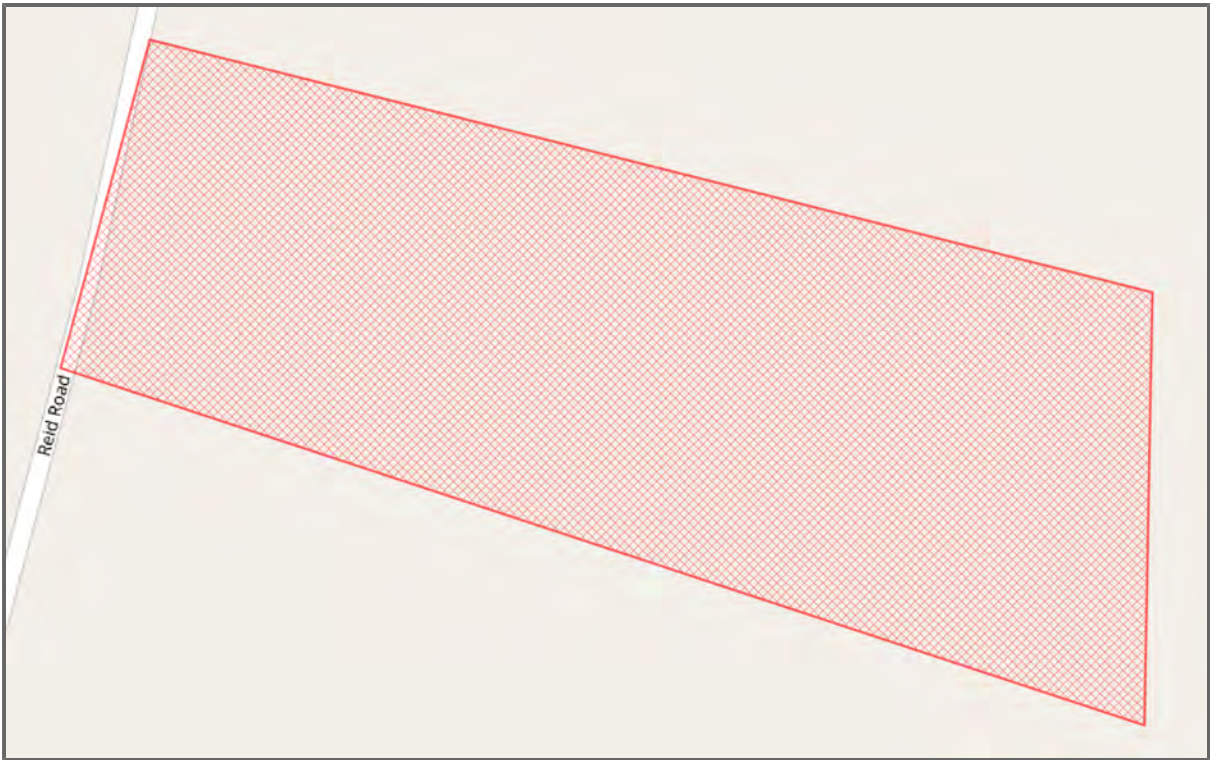


Figure 12 : Map of Lifeform - Animals

Table 11: Lifeform - Animals [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Arthropods

Number of Arthropods 0

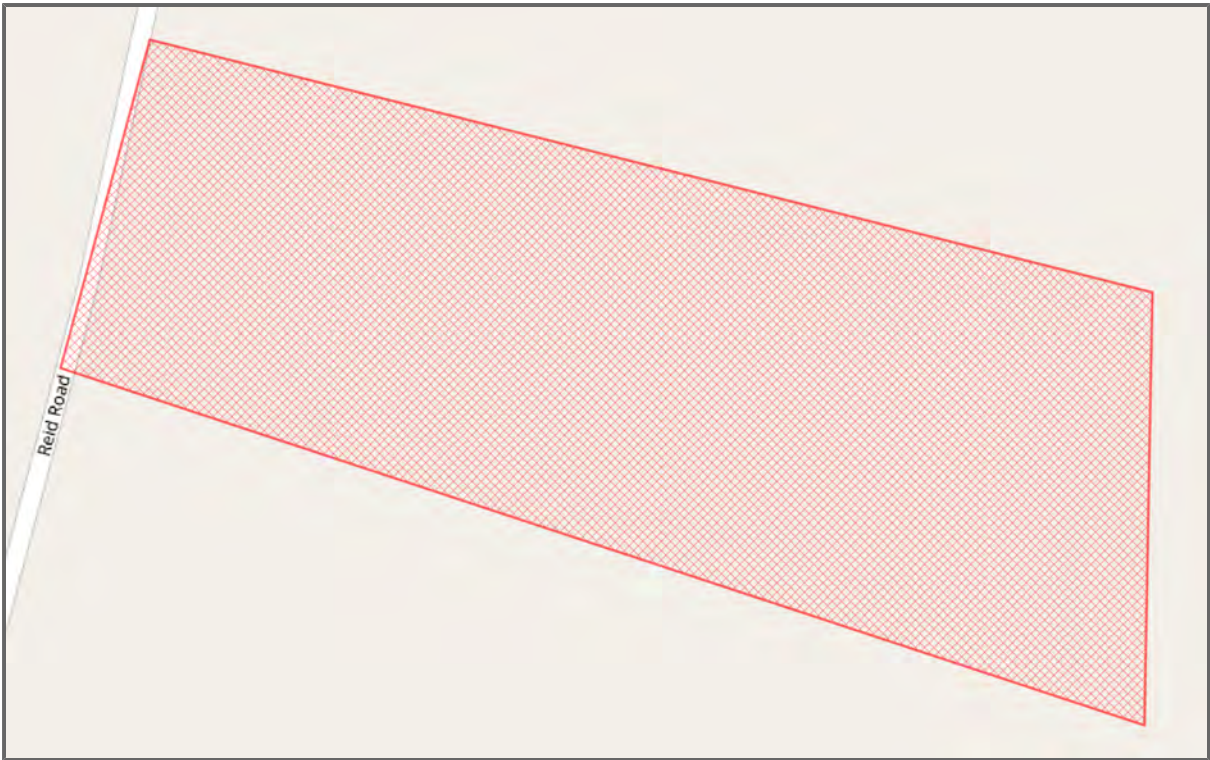


Figure 13 : Map of Lifeform - Arthropods

Table 12: Lifeform - Arthropods [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Bacteria

Number of Bacteria 0

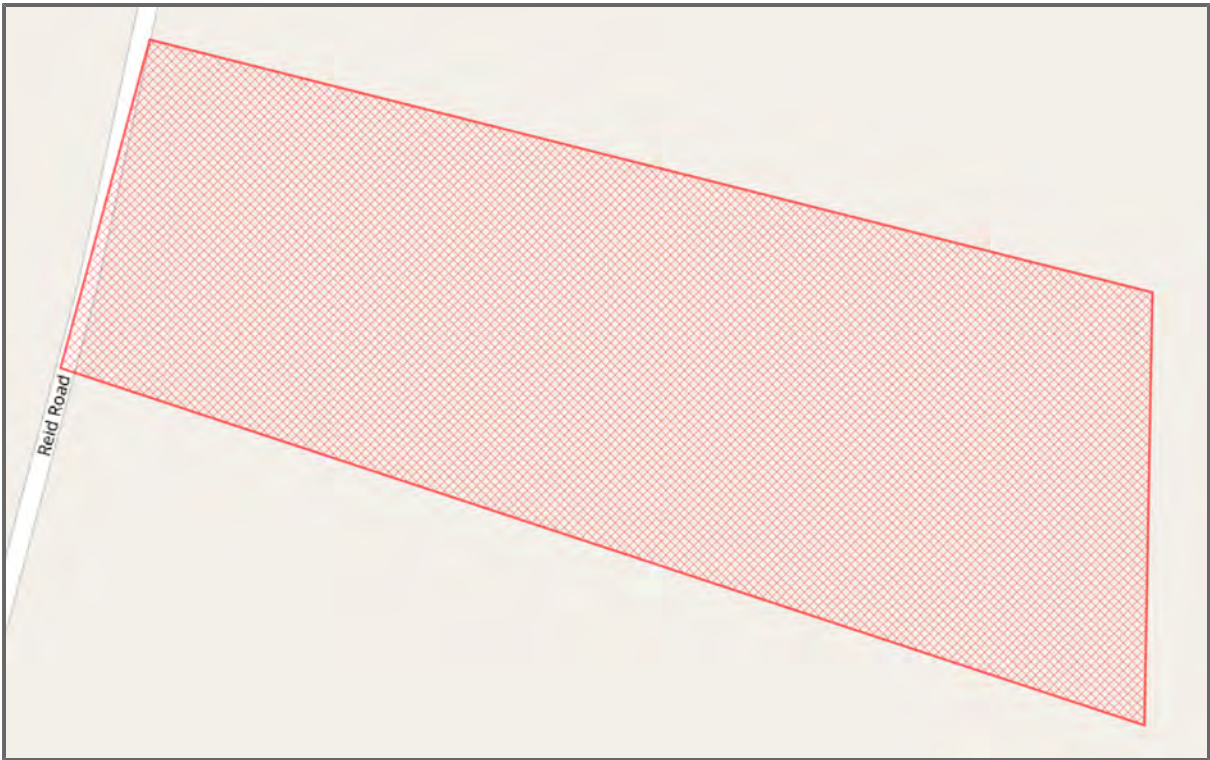


Figure 14 : Map of Lifeform - Bacteria

Table 13: Lifeform - Bacteria [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Birds

Number of Birds 0

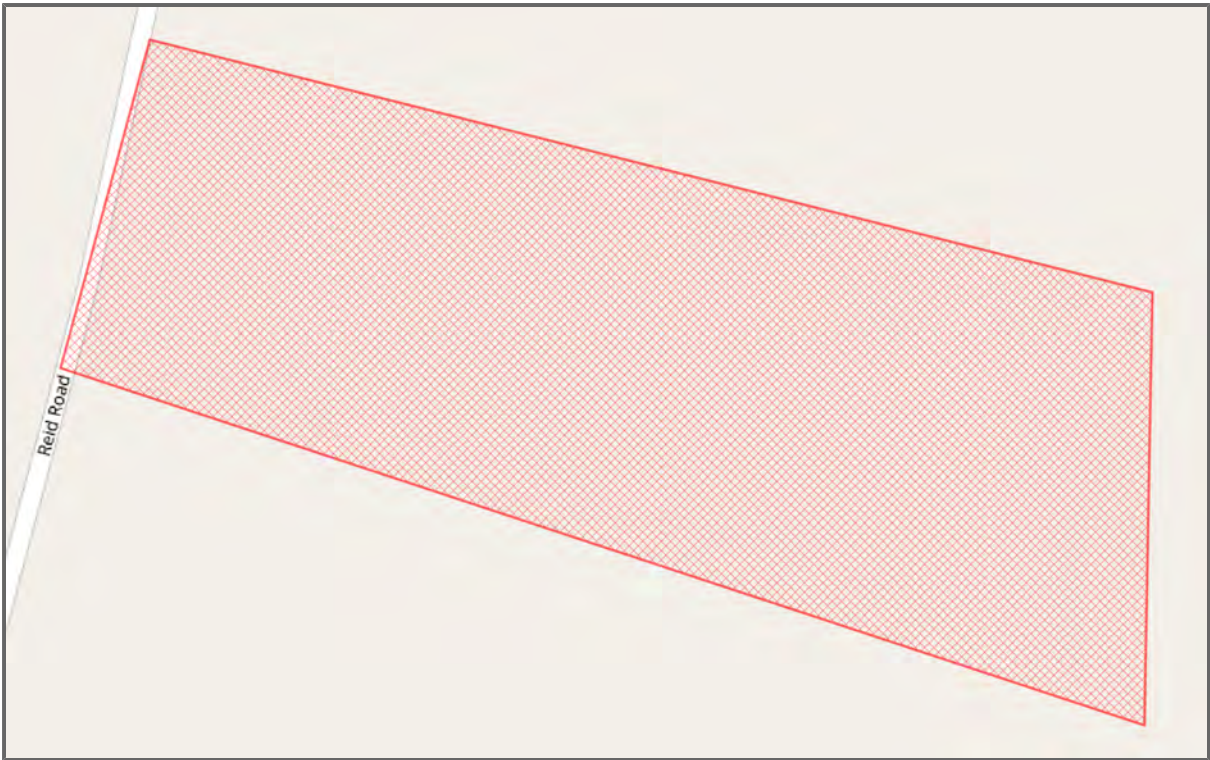


Figure 15 : Map of Lifeform - Birds

Table 14: Lifeform - Birds [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Bryophytes

Number of Bryophytes 0

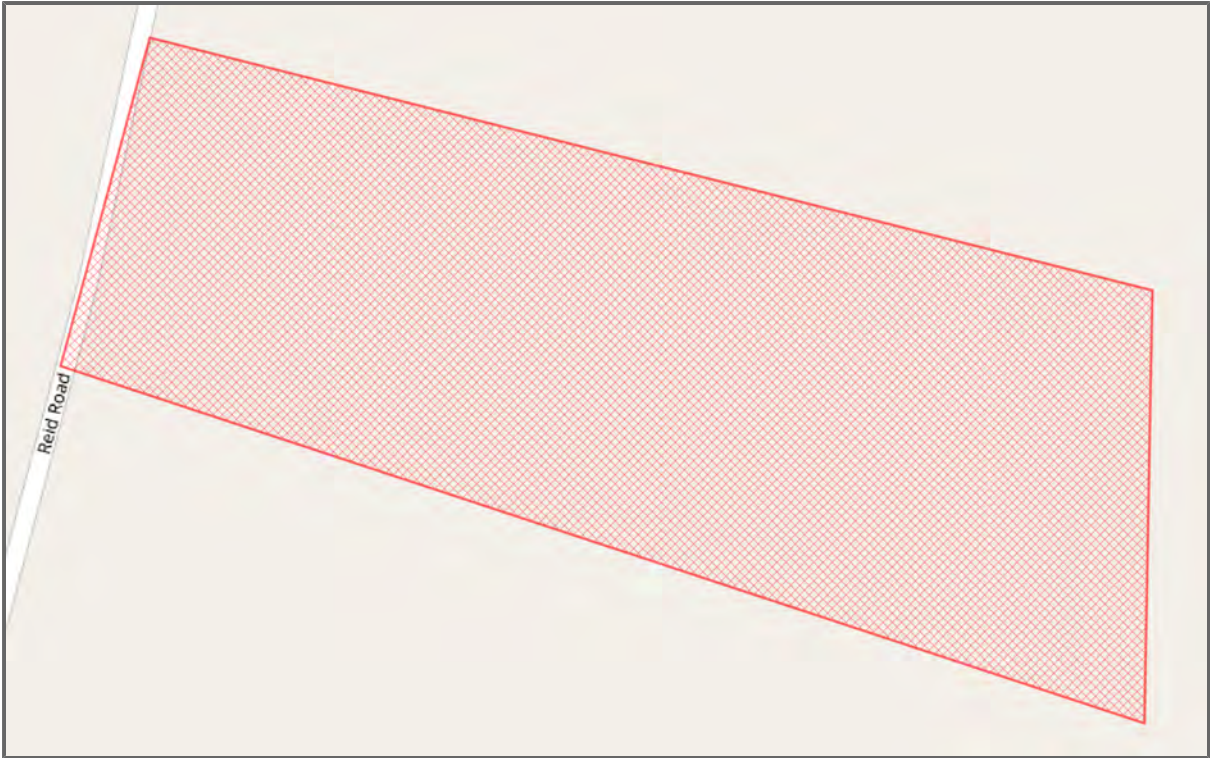


Figure 16 : Map of Lifeform - Bryophytes

Table 15: Lifeform - Bryophytes [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Chromista

Number of Chromista 0

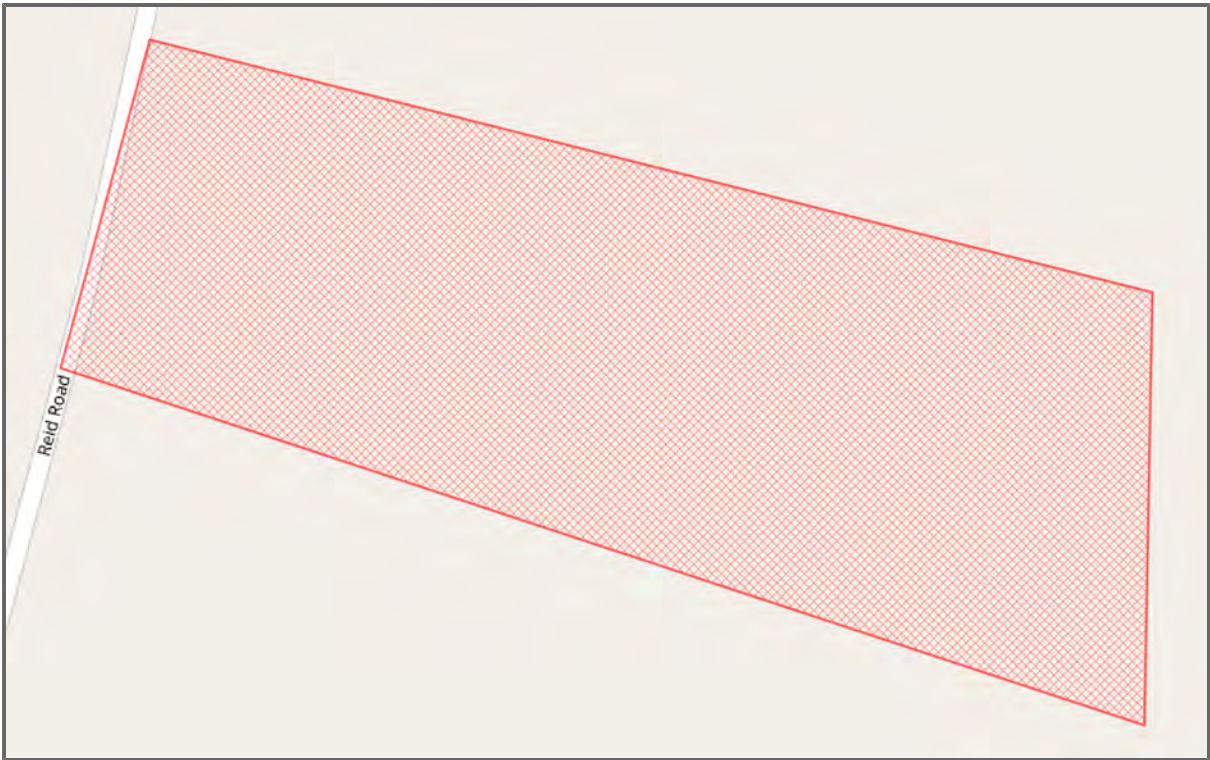


Figure 17 : Map of Lifeform - Chromista

Table 16: Lifeform - Chromista [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Crustaceans

Number of Crustaceans 0

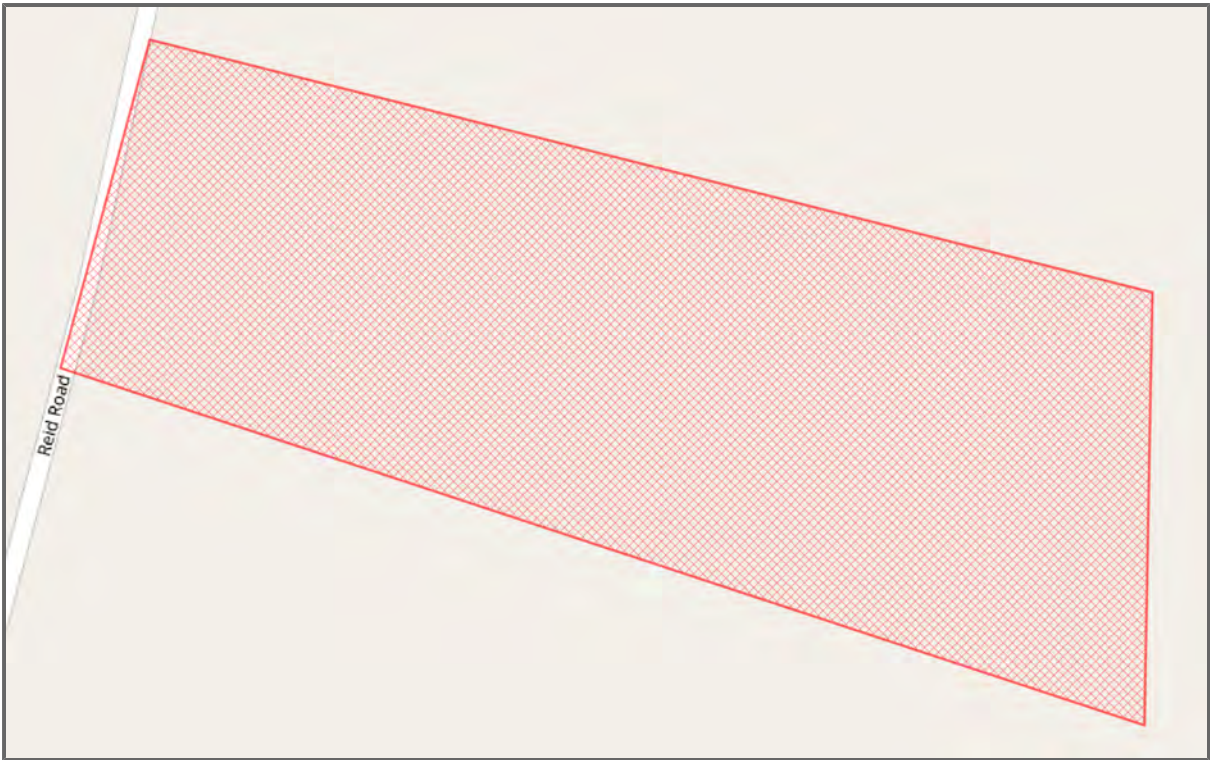


Figure 18 : Map of Lifeform - Crustaceans

Table 17: Lifeform - Crustaceans [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Dicots

Number of Dicots 0

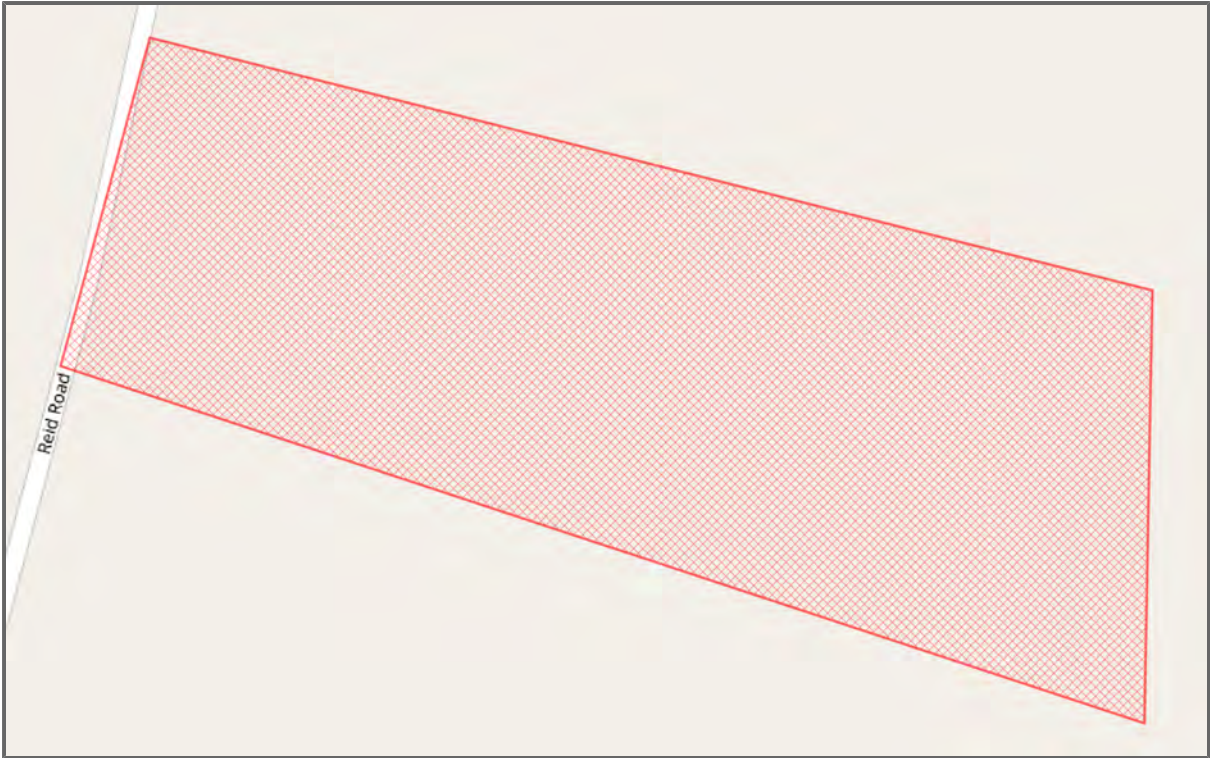


Figure 19 : Map of Lifeform - Dicots

Table 18: Lifeform - Dicots ([Link to full list](#))

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - FernsAndAllies

Number of FernsAndAllies 0

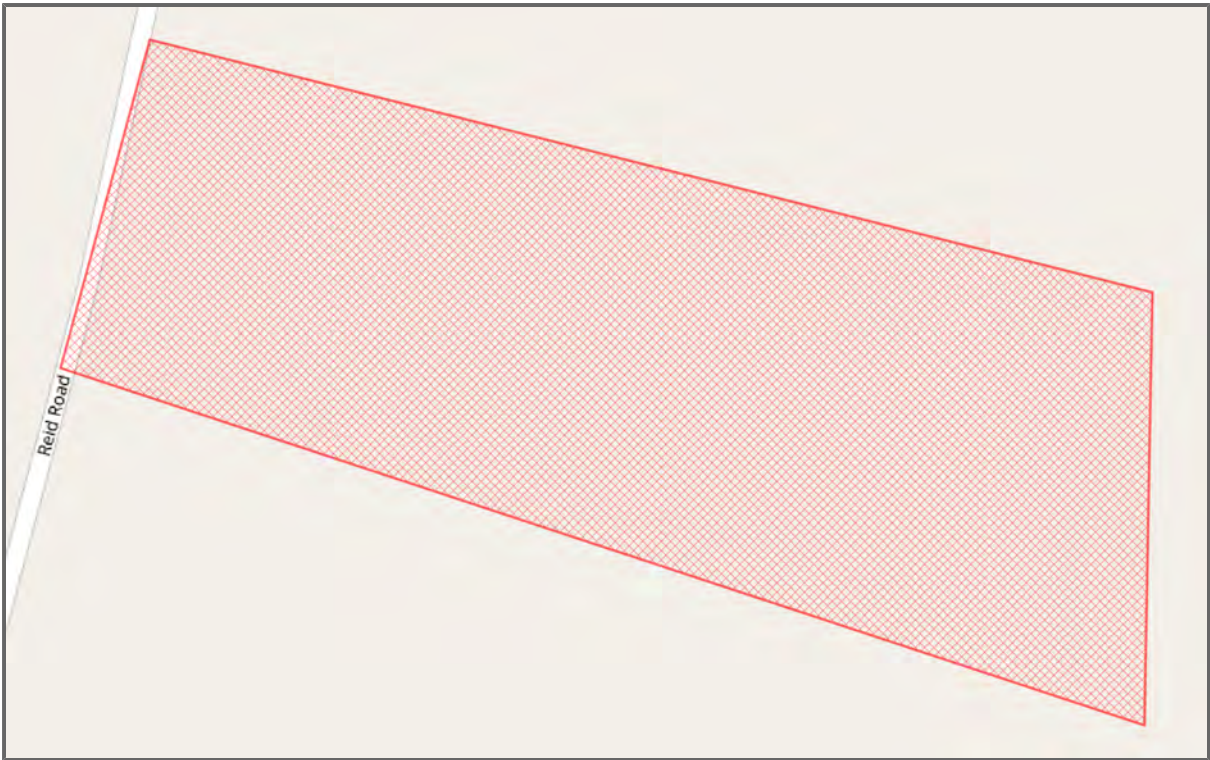


Figure 20 : Map of Lifeform - FernsAndAllies

Table 19: Lifeform - FernsAndAllies [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Fishes

Number of Fishes 0

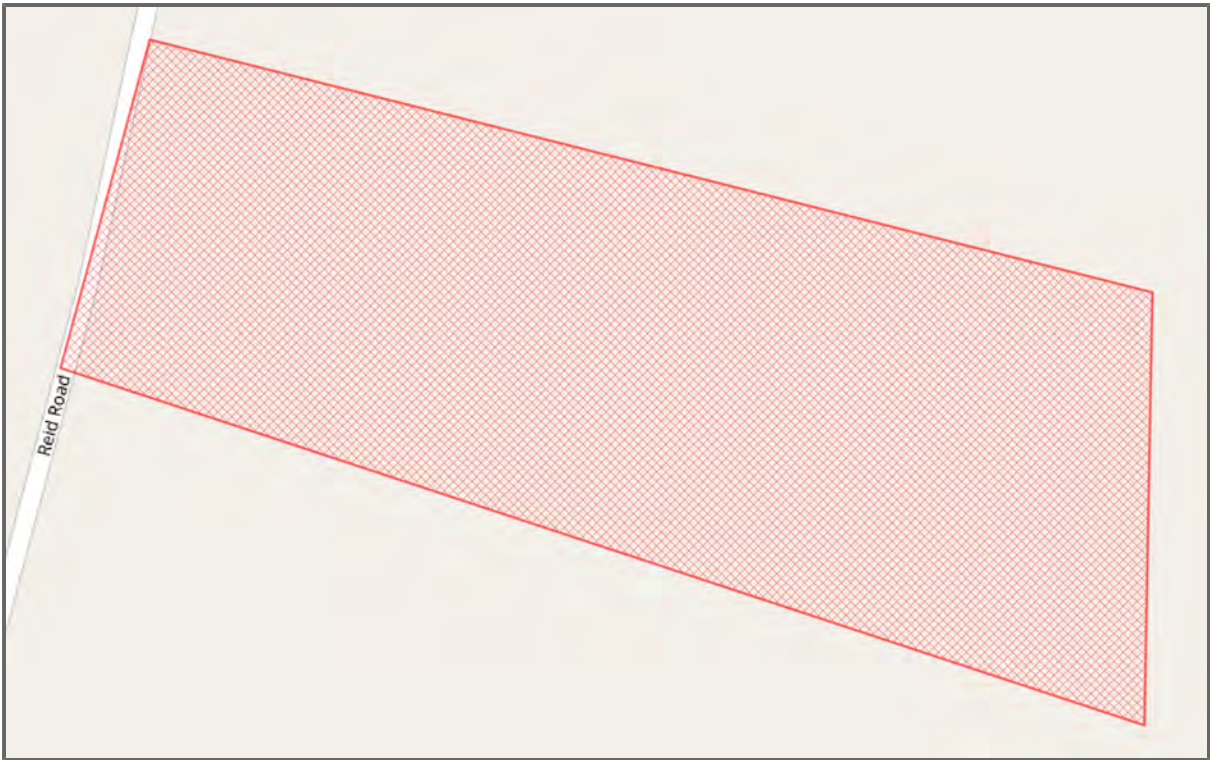


Figure 21 : Map of Lifeform - Fishes

Table 20: Lifeform - Fishes [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Fungi

Number of Fungi 0

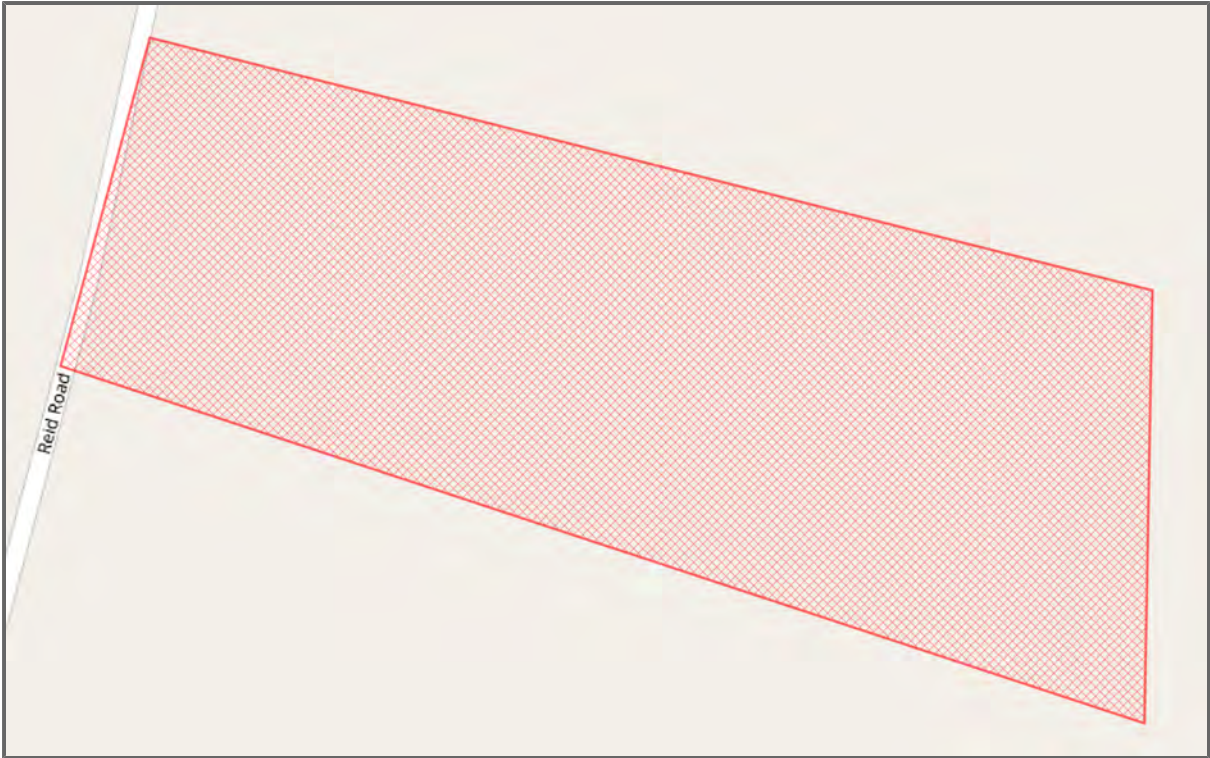


Figure 22 : Map of Lifeform - Fungi

Table 21: Lifeform - Fungi [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Gymnosperms

Number of Gymnosperms 0

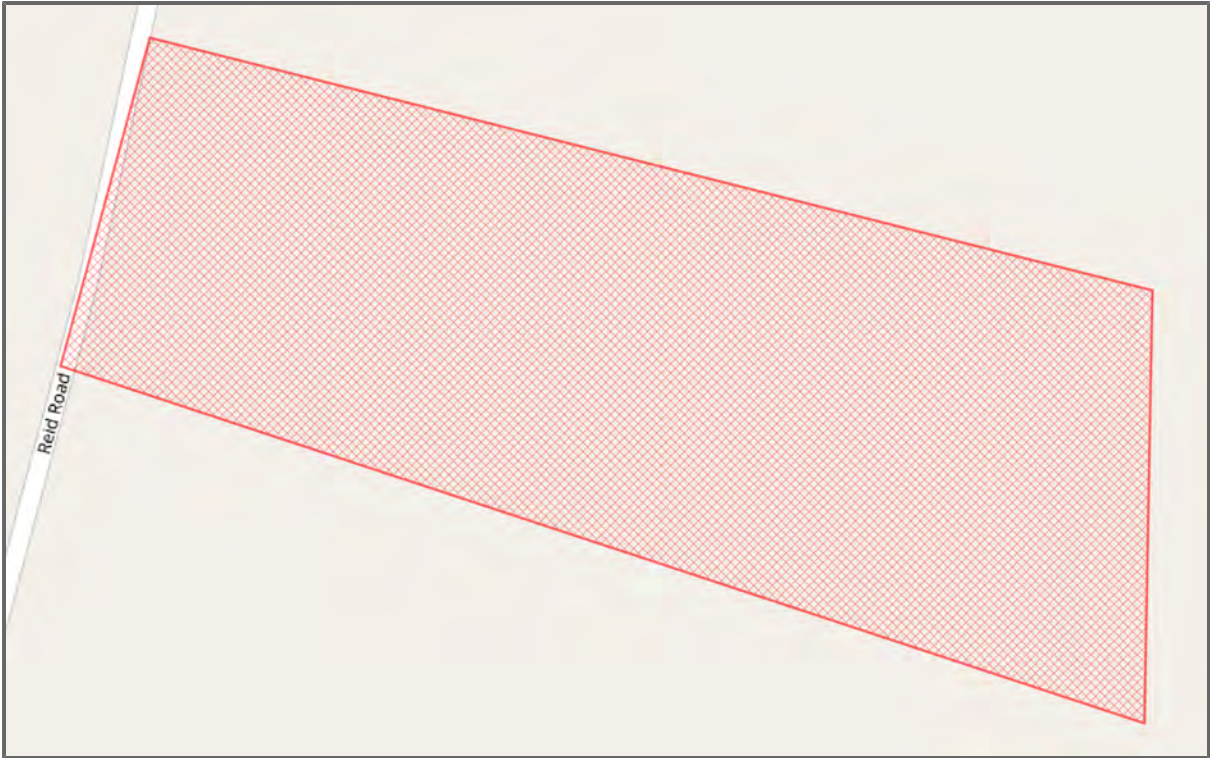


Figure 23 : Map of Lifeform - Gymnosperms

Table 22: Lifeform - Gymnosperms [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Insects

Number of Insects 0

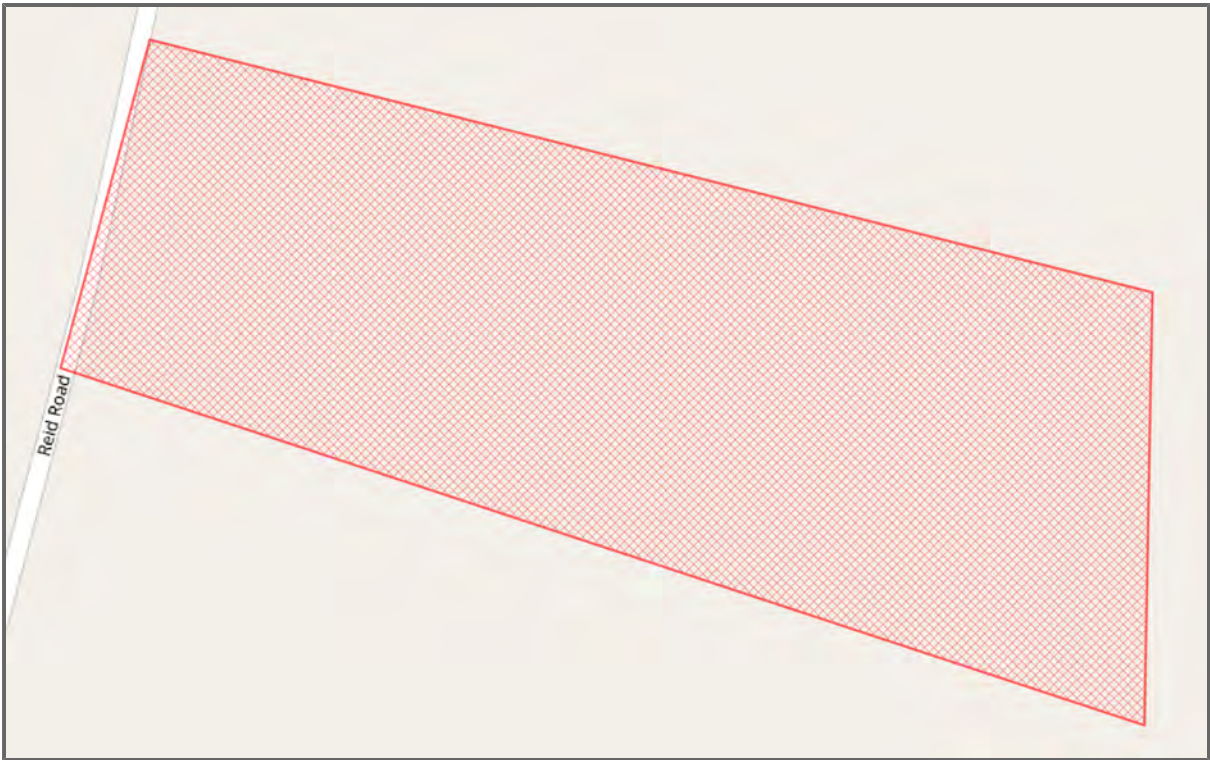


Figure 24 : Map of Lifeform - Insects

Table 23: Lifeform - Insects [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Mammals

Number of Mammals 0

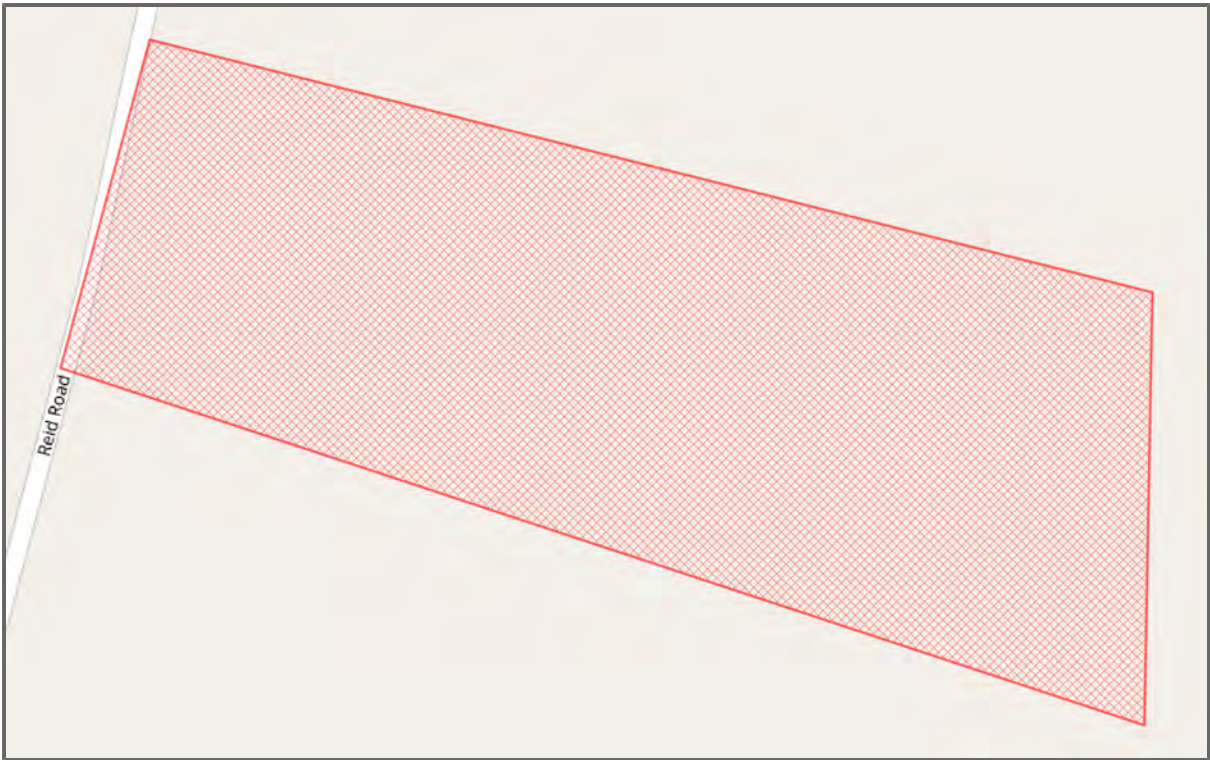


Figure 25 : Map of Lifeform - Mammals

Table 24: Lifeform - Mammals [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Molluscs

Number of Molluscs 0

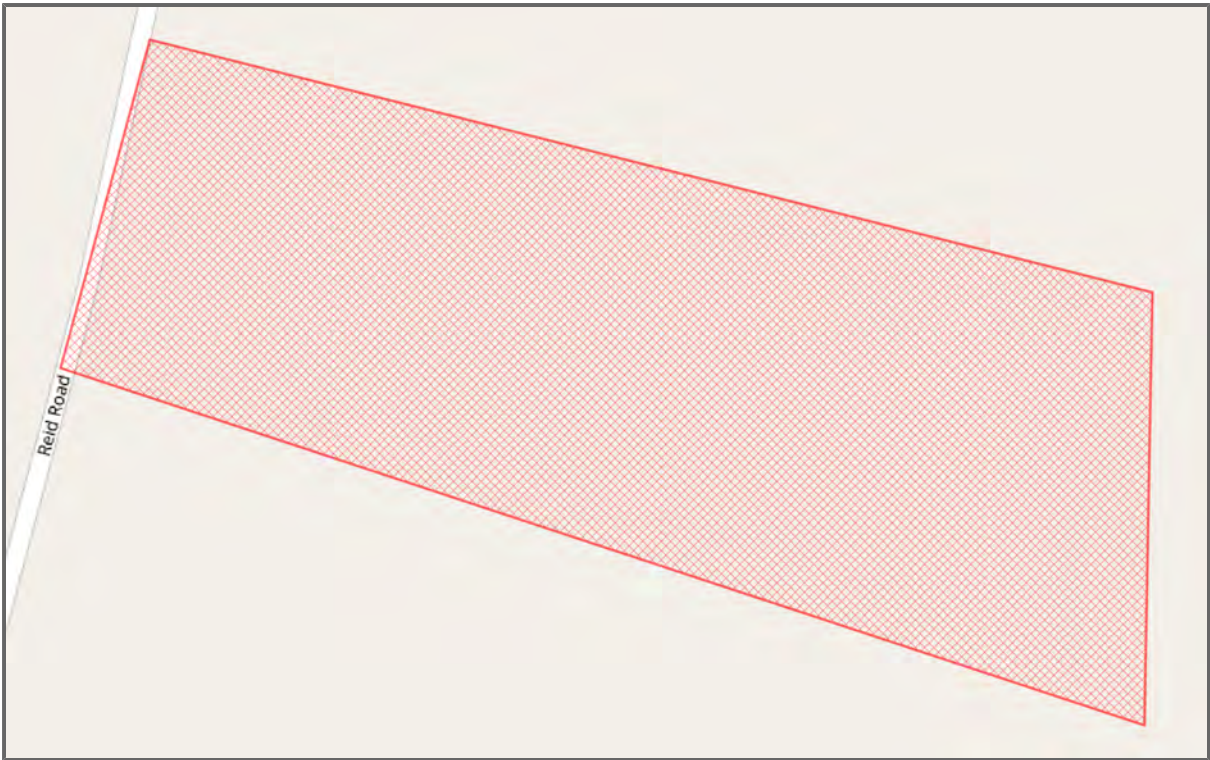


Figure 26 : Map of Lifeform - Molluscs

Table 25: Lifeform - Molluscs [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Monocots

Number of Monocots 0

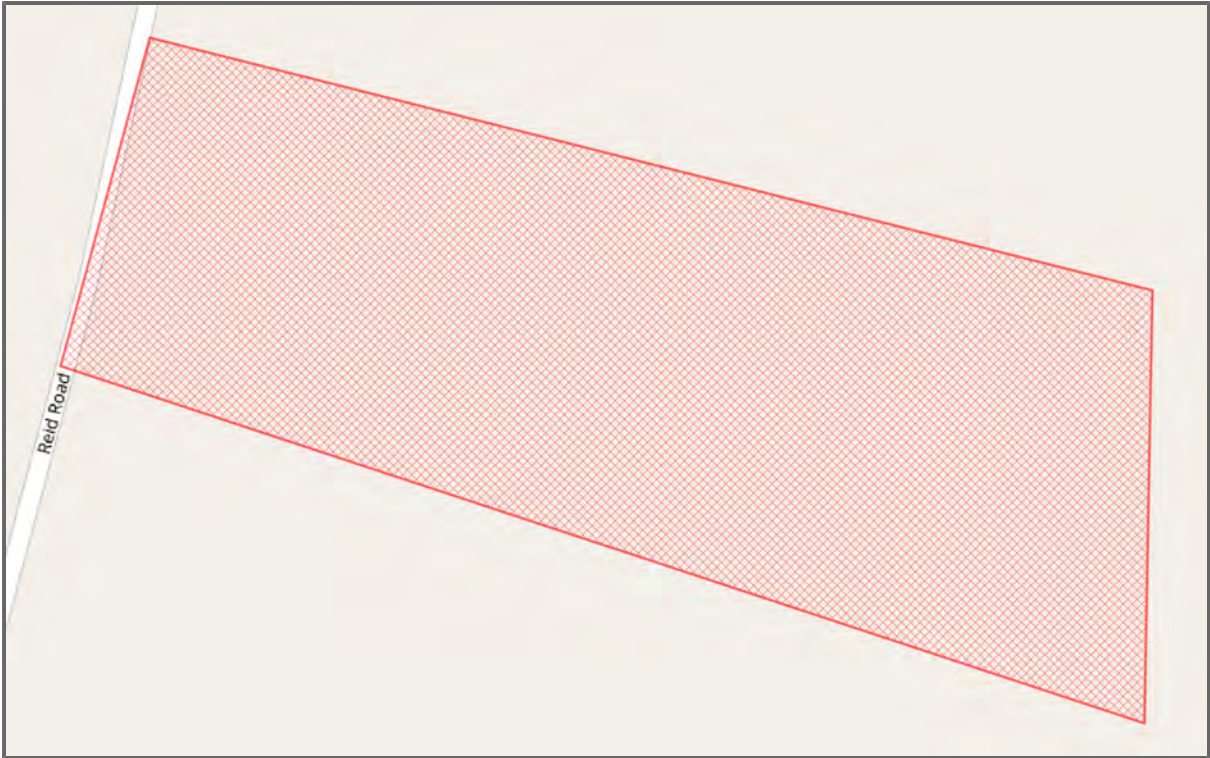


Figure 27 : Map of Lifeform - Monocots

Table 26: Lifeform - Monocots [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Plants

Number of Plants 0

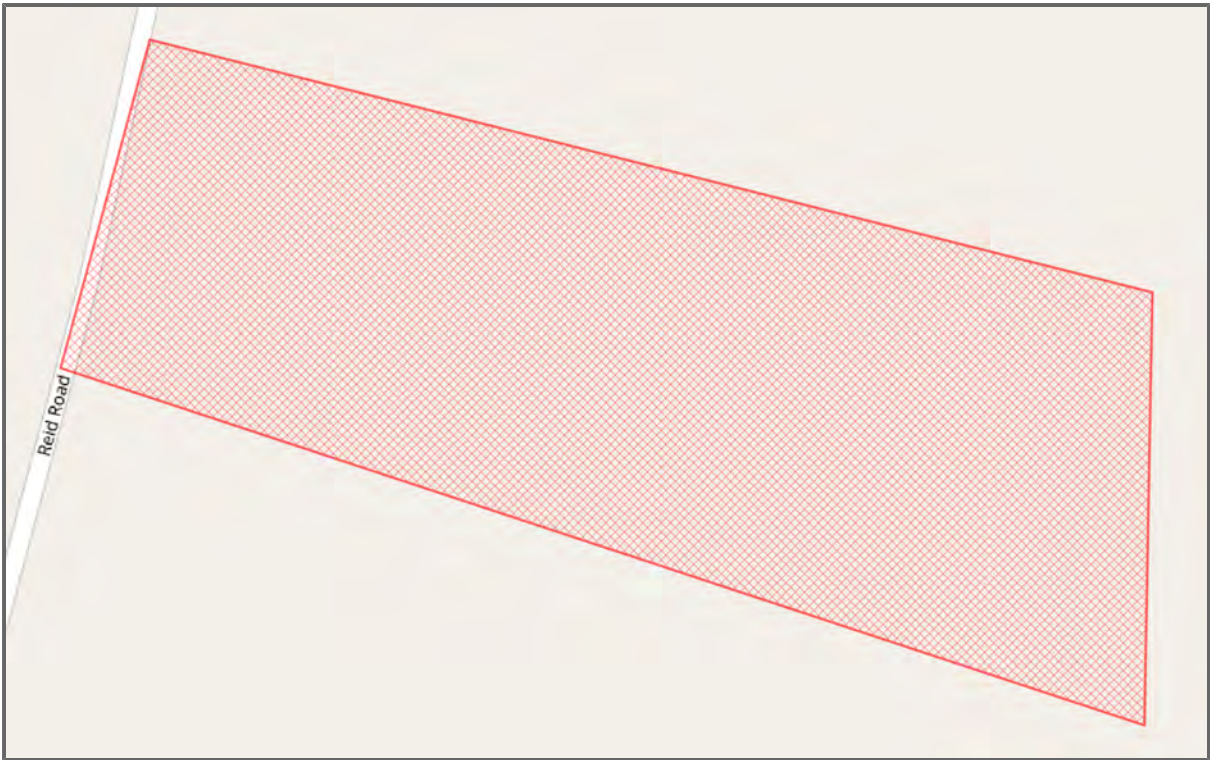


Figure 28 : Map of Lifeform - Plants

Table 27: Lifeform - Plants [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Protozoa

Number of Protozoa 0

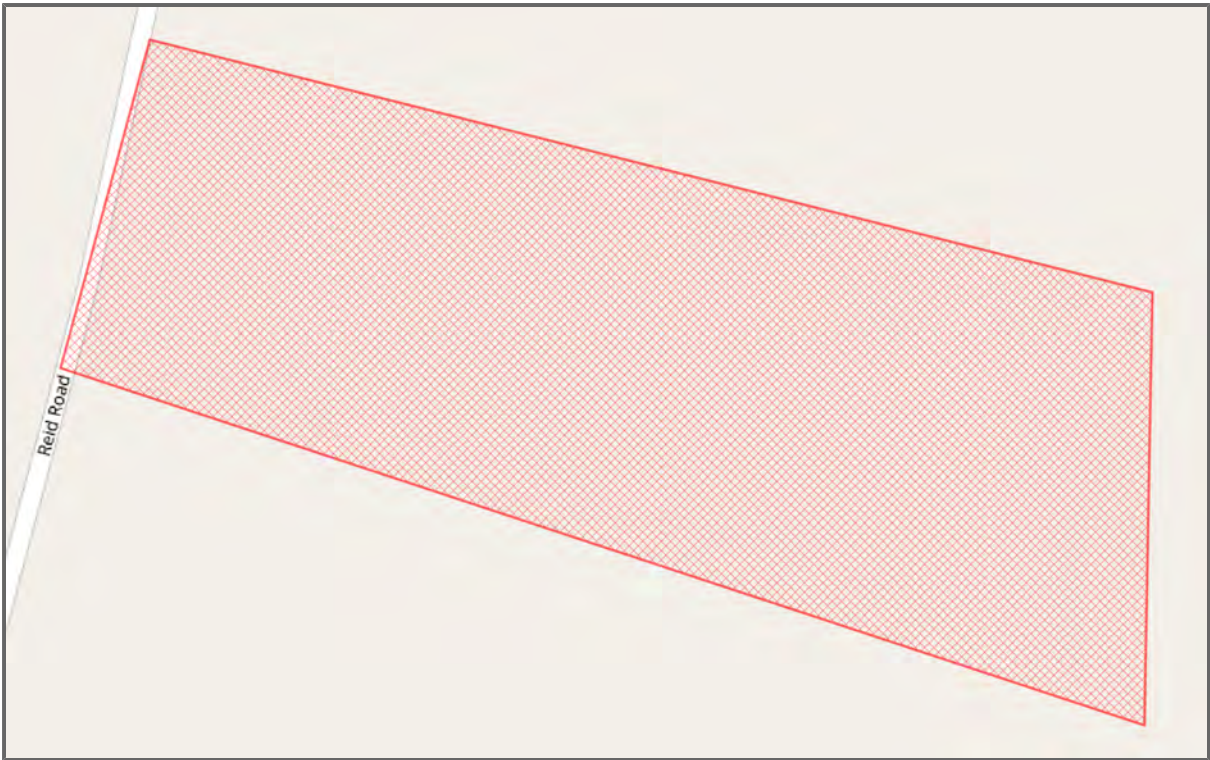


Figure 29 : Map of Lifeform - Protozoa

Table 28: Lifeform - Protozoa [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Lifeform - Reptiles

Number of Reptiles 0

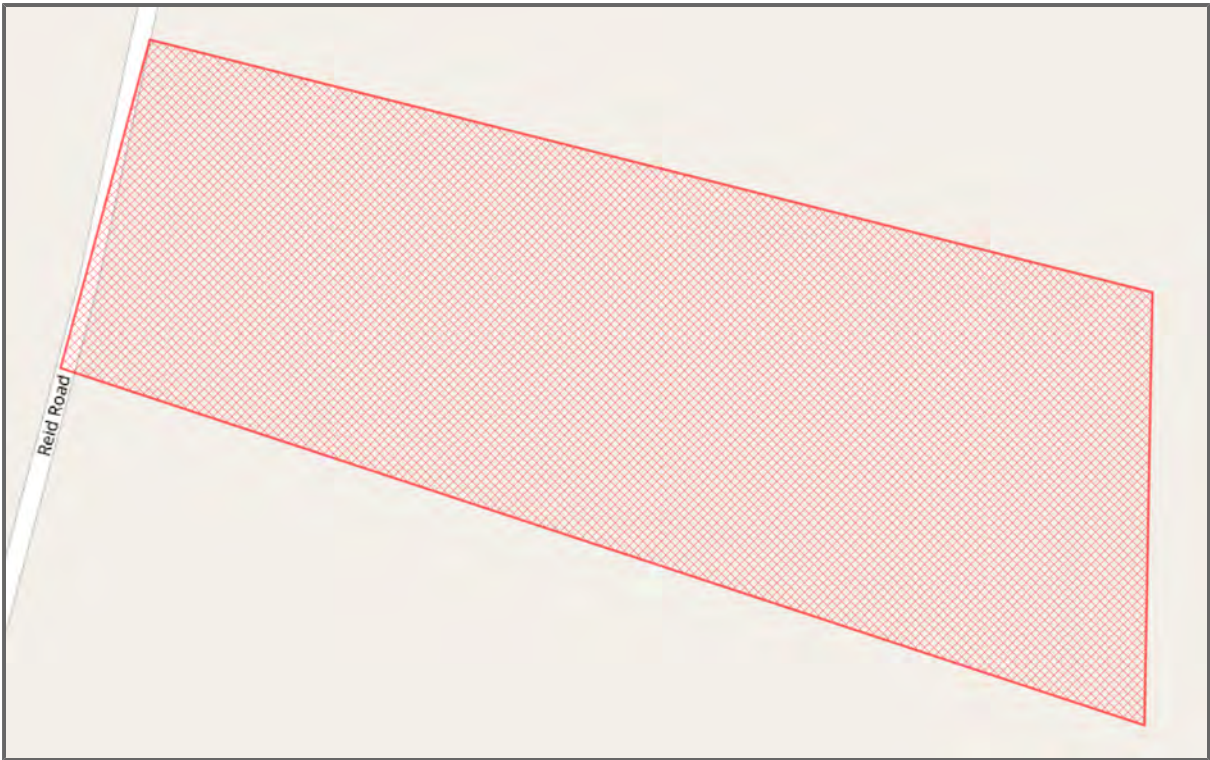


Figure 30 : Map of Lifeform - Reptiles

Table 29: Lifeform - Reptiles [\(Link to full list\)](#)

Family	Scientific Name	Common Name	No. Occurrences
--------	-----------------	-------------	-----------------

Expert Distributions

Number of expert distributions: **372**

Table 30: Expert Distributions

Family	Scientific Name	Common Name	Min Depth	Max Depth	Area Name	Area sq km
Simaroubaceae	Samadera bidwillii				Expert distribution (likely) Samadera bidwillii	25206.09
Turnicidae	Turnix melanogaster	Black-breasted Button-quail			Expert distribution (likely) Turnix melanogaster	90597.92
CISTICOLIDAE	Cisticola (Cisticola) juncidis	Zitting Cisticola			Expert distribution Cisticola juncidis	18105486.89
LARIDAE	Chlidonias (Pelodes) hybrida	Whiskered Tern			Expert distribution Chlidonias hybrida	31766691.37
RALLIDAE	Fulica atra	Eurasian Coot			Expert distribution Fulica atra	40213555.69
SCOLOPACIDAE	Xenus cinereus	Terek Sandpiper			Expert distribution Xenus cinereus	14255785.46
	Mesophoyx intermedia				Expert distribution Mesophoyx intermedia	28849005.88
	Phalacrocorax melanoleucos				Expert distribution Phalacrocorax melanoleucos	5881748.39
	Esacus giganteus				Expert distribution Esacus giganteus	2220382.16
CUCULIDAE	Chrysococcyx lucidus	Shining Bronze Cuckoo			Expert distribution Chrysococcyx lucidus	3617321.76
Cheloniidae	Eretmochelys imbricata	Hawksbill Turtle			Expert distribution (likely) Eretmochelys imbricata	4042610.15
Balaenopteridae	Balaenoptera edeni	Bryde's Whale			Expert distribution (maybe) Balaenoptera edeni	8943204.54
Cheloniidae	Chelonia mydas	Green Turtle			Expert distribution (likely) Chelonia mydas	5522768.79
ANATIDAE	Malacorhynchus membranaceus	Pink-eared Duck			Expert distribution Malacorhynchus membranaceus	7027203.52
Mobulidae	Manta birostris	Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray			Expert distribution (maybe) Manta birostris	5002091.45
Rostratulidae	Rostratula benghalensis (sensu lato)	Painted Snipe			Expert distribution (likely) Rostratula benghalensis (sensu lato)	596728.15
ACANTHIZIDAE	Acanthiza (Subacanthiza) lineata	Striated Thornbill			Expert distribution Acanthiza lineata	1046877.65
ACANTHIZIDAE	Acanthiza (Acanthiza) pusilla	Brown Thornbill			Expert distribution Acanthiza pusilla	1135125.79
ACANTHIZIDAE	Acanthiza (Geobasileus) chrysorrhoa	Yellow-rumped Thornbill			Expert distribution Acanthiza chrysorrhoa	4621303.32
FALCONIDAE	Falco (Hierofalco) hypoleucos	Grey Falcon			Expert distribution Falco hypoleucos	5390602.21
CASUARIIDAE	Dromaius novaehollandiae	Emu			Expert distribution Dromaius novaehollandiae	6759542.46
RECURVIROSTRIDAE	Recurvirostra novaehollandiae	Red-necked Avocet			Expert distribution Recurvirostra novaehollandiae	3550921.74
COLUMBIDAE	Ptilinopus (Megaloprepia) magnificus	Wompoo Fruit-dove			Expert distribution Ptilinopus magnificus	985504.12
CUCULIDAE	Chrysococcyx minutillus	Little Bronze Cuckoo			Expert distribution Chrysococcyx minutillus	2285983.48
CISTICOLIDAE	Cisticola (Cisticola) exilis	Golden-headed Cisticola			Expert distribution Cisticola exilis	7215046.55
CAMPEPHAGIDAE	Coracina (Coracina) novaehollandiae	Black-faced Cuckoo-shrike			Expert distribution Coracina novaehollandiae	8275248.68

CAMPEPHAGIDAE	Coracina (Coracina) papuensis	White-bellied Cuckoo-shrike	Expert distribution Coracina papuensis	4476090.08
NEOSITTIDAE	Daphoenositta (Neositta) chrysoptera	Varied Sittella	Expert distribution Daphoenositta chrysoptera	4916038.89
Dermochelyidae	Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth	Expert distribution (likely) Dermochelys coriacea	6176689.17
ANATIDAE	Dendrocygna (Dendrocygna) arcuata	Wandering Whistling-duck	Expert distribution Dendrocygna arcuata	4946709.72
ACANTHIZIDAE	Gerygone mouki	Brown Gerygone	Expert distribution Gerygone mouki	369417.56
COLUMBIDAE	Leucosarcia melanoleuca	Wonga Pigeon	Expert distribution Leucosarcia melanoleuca	504859.85
COLUMBIDAE	Lopholaimus antarcticus	Topknot Pigeon	Expert distribution Lopholaimus antarcticus	318375.02
MELIPHAGIDAE	Meliphaga (Meliphaga) lewinii	Lewin's Honeyeater	Expert distribution Meliphaga lewinii	645576.48
ARDEIDAE	Ardea (Ardea) pacifica	White-necked Heron	Expert distribution Ardea pacifica	7532467.66
CACATUIDAE	Cacatua (Cacatua) galerita	Sulphur-crested Cockatoo	Expert distribution Cacatua galerita	3951643.10
CACATUIDAE	Cacatua (Licmetis) sanguinea	Little Corella	Expert distribution Cacatua sanguinea	5339700.99
CUCULIDAE	Cacomantis (Vidgenia) flabelliformis	Fan-tailed Cuckoo	Expert distribution Cacomantis flabelliformis	2447973.99
CAPRIMULGIDAE	Caprimulgus macrurus	Large-tailed Nightjar	Expert distribution Caprimulgus macrurus	6039818.55
CENTROPODIDAE	Centropus (Polophilus) phasianinus	Pheasant Coucal	Expert distribution Centropus phasianinus	2679814.22
ALCEDINIDAE	Ceyx azureus azureus	Azure Kingfisher	Expert distribution Alcedo azurea	3414781.74
COLUMBIDAE	Chalcophaps indica	Emerald Dove	Expert distribution Chalcophaps indica	5374630.89
CORACIIDAE	Eurystomus orientalis	Dollarbird	Expert distribution Eurystomus orientalis	13954544.70
ACCIPITRIDAE	Haliastur indus	Brahminy Kite	Expert distribution Haliastur indus	8689654.72
ARDEIDAE	Ixobrychus flavicollis	Black Bittern	Expert distribution Ixobrychus flavicollis	9646142.05
SCOLOPACIDAE	Numenius (Numenius) madagascariensis	Eastern Curlew	Expert distribution Numenius madagascariensis	3601101.26
ARDEIDAE	Nycticorax caledonicus	Nankeen Night-heron	Expert distribution Nycticorax caledonicus	7827831.87
PACHYCEPHALIDAE	Pachycephala (Pachycephala) pectoralis	Golden Whistler	Expert distribution Pachycephala pectoralis	2142705.71
Apodidae	Apus pacificus	Fork-tailed Swift	Expert distribution (likely) Apus pacificus	6850159.42
COLUMBIDAE	Columba (Janthoenas) leucomela	White-headed Pigeon	Expert distribution Columba leucomela	275996.44
ANATIDAE	Anas (Nettion) gracilis	Grey Teal	Expert distribution Anas gracilis	8854807.76
PHASIANIDAE	Coturnix (Synoicus) ypsilophora	Brown Quail	Expert distribution Coturnix ypsilophora	5867626.03
Cycadaceae	Cycas ophiolitica		Expert distribution (likely) Cycas ophiolitica	76700.14
CACATUIDAE	Calyptorhynchus (Calyptorhynchus) lathami	Glossy Black-cockatoo	Expert distribution Calyptorhynchus lathami	772096.28
	Chthonicola sagittatus		Expert distribution Chthonicola sagittatus	1273248.95
ALCEDINIDAE	Todiramphus (Todiramphus) sanctus	Sacred Kingfisher	Expert distribution Todiramphus sanctus	8251815.38
ANATIDAE	Anas (Anas) superciliosa	Pacific Black Duck	Expert distribution Anas superciliosa	8885221.53

Expert distribution (likely) Bosistoa

Rutaceae	Bosistoa selwynii	Heart-leaved Bosistoa	selwynii	51364.21
Cycadaceae	Cycas megacarpa		Expert distribution (likely) Cycas megacarpa	45822.32
Pygopodidae	Delma torquata	Collared Delma	Expert distribution (maybe) Delma torquata	326512.55
Elapidae	Furina dunmali	Dunmall's Snake	Expert distribution (maybe) Furina dunmali	356695.41
Orchidaceae	Phaius australis	Lesser Swamp-orchid	Expert distribution (likely) Phaius australis	43296.11
ACANTHIZIDAE	Acanthiza (Geobasileus) reguloides	Buff-rumped Thornbill	Expert distribution Acanthiza reguloides	1849773.47
ACCIPITRIDAE	Accipiter (Paraspizias) cirrocephalus	Collared Sparrowhawk	Expert distribution Accipiter cirrocephalus	5512908.79
AEGOTHELIDAE	Aegotheles (Aegotheles) cristatus	Australian Owlet-nightjar	Expert distribution Aegotheles cristatus	7734887.23
MEGAPODIIDAE	Alectura lathamii	Australian Brush-turkey	Expert distribution Alectura lathamii	645820.16
ANSERANATIDAE	Anseranas semipalmata	Magpie Goose	Expert distribution Anseranas semipalmata	1315483.62
MONARCHIDAE	Myiagra (Myiagra) cyanoleuca	Satin Flycatcher	Expert distribution Myiagra cyanoleuca	1380675.96
MONARCHIDAE	Myiagra (Myiagra) rubecula	Leaden Flycatcher	Expert distribution Myiagra rubecula	2278989.74
MELIPHAGIDAE	Myzomela (Cosmeteira) obscura	Dusky Honeyeater	Expert distribution Myzomela obscura	798240.71
Vespertilionidae	Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	Expert distribution (maybe) Chalinolobus dwyeri	205459.82
PSITTACIDAE	Psephotus (Psephotellus) pulcherrimus	Paradise Parrot	Expert distribution Psephotus pulcherrimus	560212.51
Procellariidae	Pterodroma neglecta neglecta	Kermadec Petrel (western)	Expert distribution (maybe) Pterodroma neglecta neglecta	2253322.62
LARIDAE	Chroicocephalus novaehollandiae novaehollandiae	Silver Gull	Expert distribution Larus novaehollandiae	7828185.18
ACCIPITRIDAE	Circus assimilis	Spotted Harrier	Expert distribution Circus assimilis	7850851.09
PACHYCEPHALIDAE	Colluricincla (Colluricincla) harmonica	Grey Shrike-thrush	Expert distribution Colluricincla harmonica	6948277.29
CAMPEPHAGIDAE	Coracina (Paragraucus) lineata	Barred Cuckoo-shrike	Expert distribution Coracina lineata	640007.94
PHALACROCORACIDAE	Phalacrocorax (Phalacrocorax) sulcirostris	Little Black Cormorant	Expert distribution Phalacrocorax sulcirostris	4531811.78
THRESKIORNITHIDAE	Platalea (Platalea) regia	Royal Spoonbill	Expert distribution Platalea regia	6253990.16
PODARGIDAE	Podargus strigoides	Tawny Frogmouth	Expert distribution Podargus strigoides	7706572.49
CHARADRIIDAE	Charadrius (Eupoda) veredus	Oriental Plover	Expert distribution Charadrius veredus	5299746.77
PACHYCEPHALIDAE	Colluricincla (Myiolestes) megarhyncha	Little Shrike-thrush	Expert distribution Colluricincla megarhyncha	1211167.64
CORVIDAE	Corvus orru	Torresian Crow	Expert distribution Corvus orru	5479698.82
MELIPHAGIDAE	Philemon buceroides novaeguineae		Expert distribution Philemon novaeguineae	667850.48
Orchidaceae	Bulbophyllum globuliforme	Miniature Moss-orchid, Hoop Pine Orchid	Expert distribution (likely) Bulbophyllum globuliforme	22549.89
MALURIDAE	Malurus (Malurus) cyaneus	Superb Fairy-wren	Expert distribution Malurus cyaneus	1243356.34
ANATIDAE	Oxyura australis	Blue-billed Duck	Expert distribution Oxyura australis	2220865.40
Phascolarctidae	Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Expert distribution (likely) Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	624916.13

ARDEIDAE	Ardea (Bubulcus) ibis	Cattle Egret	Expert distribution Bubulcus ibis	63736830.48
ARDEIDAE	Ardea alba	Great White Egret	Expert distribution Casmerodius albus	75783095.10
SCOLOPACIDAE	Arenaria interpres	Ruddy Turnstone	Expert distribution Arenaria interpres	13110297.20
SCOLOPACIDAE	Calidris (Calidris) canutus	Red Knot	Expert distribution Calidris canutus	6909656.74
SCOLOPACIDAE	Calidris (Calidris) tenuirostris	Great Knot	Expert distribution Calidris tenuirostris	3582115.30
SCOLOPACIDAE	Calidris (Crocethia) alba	Sanderling	Expert distribution Calidris alba	12943524.46
SCOLOPACIDAE	Calidris (Ereunetes) ruficollis	Red-necked Stint	Expert distribution Calidris ruficollis	9890575.48
SCOLOPACIDAE	Calidris (Erolia) acuminata	Sharp-tailed Sandpiper	Expert distribution Calidris acuminata	12325741.41
CHARADRIIDAE	Charadrius (Charadrius) mongolus	Lesser Sand Plover	Expert distribution Charadrius mongolus	7799309.27
COLUMBIDAE	Columba (Columba) livia	Rock Dove	Expert distribution Columba livia	40132736.33
ARDEIDAE	Egretta garzetta	Little Egret	Expert distribution Egretta garzetta	40036024.12
ARDEIDAE	Egretta sacra	Eastern Reef Egret	Expert distribution Egretta sacra	4120498.08
LARIDAE	Gelochelidon nilotica	Gull-billed Tern	Expert distribution Sterna nilotica	17427456.75
LARIDAE	Hydroprogne caspia	Caspian Tern	Expert distribution Sterna caspia	13971242.26
SCOLOPACIDAE	Limosa lapponica	Bar-tailed Godwit	Expert distribution Limosa lapponica	9217521.21
ESTRILDIDAE	Lonchura (Lonchura) punctulata	Nutmeg Mannikin	Expert distribution Lonchura punctulata	7710656.30
PHALACROCORACIDAE	Phalacrocorax (Phalacrocorax) carbo	Great Cormorant	Expert distribution Phalacrocorax carbo	29810439.37
THRESKIORNITHIDAE	Plegadis falcinellus	Glossy Ibis	Expert distribution Plegadis falcinellus	28613832.12
CHARADRIIDAE	Pluvialis fulva	Pacific Golden Plover	Expert distribution Pluvialis fulva	7571696.64
CHARADRIIDAE	Pluvialis squatarola	Grey Plover	Expert distribution Pluvialis squatarola	15219550.69
RALLIDAE	Porphyrio (Porphyrio) porphyrio	Purple Swamphen	Expert distribution Porphyrio porphyrio	18612466.94
SCOLOPACIDAE	Steganopus tricolor	Wilson's Phalarope	Expert distribution Steganopus tricolor	43981867.07
LARIDAE	Sterna (Gygisterna) sumatrana	Black-naped Tern	Expert distribution Sterna sumatrana	39120950.07
LARIDAE	Sterna (Sterna) dougallii	Roseate Tern	Expert distribution Sterna dougallii	35272496.90
ALCEDINIDAE	Todiramphus (Todiramphus) chloris	Collared Kingfisher	Expert distribution Todiramphus chloris	3902967.52
MOTACILLIDAE	Motacilla flava	Western Yellow Wagtail	Expert distribution Motacilla flava	53460898.81
	Butorides striata		Expert distribution Butorides striata	46400881.73
	Heteroscelus brevipes	Grey-tailed Tattler	Expert distribution Heteroscelus brevipes	4921697.20
ANATIDAE	Anas (Anas) platyrhynchos	Northern Mallard	Expert distribution Anas platyrhynchos	49456016.35
RALLIDAE	Gallirallus (Hypotaenidia) philippensis	Buff-banded Rail	Expert distribution Gallirallus philippensis	2526398.57
SCOLOPACIDAE	Limicola falcinellus	Broad-billed Sandpiper	Expert distribution Limicola falcinellus	3033885.92
TYTONIDAE	Tyto alba	Barn Owl	Expert distribution Tyto alba	63421904.27
	Stigmatopelia chinensis		Expert distribution Stigmatopelia chinensis	11412223.27
ALCEDINIDAE	Dacelo (Dacelo) novaeguineae	Laughing Kookaburra	Expert distribution Dacelo novaeguineae	2777117.73
ARTAMIDAE	Artamus (Campbellornis) superciliosus	White-browed Woodswallow	Expert distribution Artamus superciliosus	7195470.64
			Expert distribution (likely)	

Lamnidae	Carcharodon carcharias	Great White Shark	Carcharodon carcharias	5210447.28
MONARCHIDAE	Carterornis leucotis	White-eared Monarch	Expert distribution Monarcha leucotis	314066.64
ORIOLIDAE	Oriolus (Mimeta) sagittatus	Olive-backed Oriole	Expert distribution Oriolus sagittatus	3426210.81
PITTIDAE	Pitta (Pitta) versicolor	Noisy Pitta	Expert distribution Pitta versicolor	567565.73
PSITTACIDAE	Platycercus (Violania) adscitus	Pale-headed Rosella	Expert distribution Platycercus adscitus	1472456.77
CORVIDAE	Corvus coronoides	Australian Raven	Expert distribution Corvus coronoides	4821723.12
ARTAMIDAE	Cracticus nigrogularis	Pied Butcherbird	Expert distribution Cracticus nigrogularis	6375272.64
CUCULIDAE	Cuculus pallidus	Palid Cuckoo	Expert distribution Cuculus pallidus	7788647.90
NECTARINIIDAE	Dicaeum (Dicaeum) hirundinaceum	Mistletoebird	Expert distribution Dicaeum hirundinaceum	6504923.75
PELECANIDAE	Pelecanus conspicillatus	Australian Pelican	Expert distribution Pelecanus conspicillatus	6627953.98
POMATOSTOMIDAE	Pomatostomus (Pomatostomus) temporalis	Grey-crowned Babbler	Expert distribution Pomatostomus temporalis	3791994.92
MELIPHAGIDAE	Lichenostomus (Gavicalis) fasciolaris	Mangrove Honeyeater	Expert distribution Lichenostomus fasciolaris	43453.64
BURHINIDAE	Burhinus (Burhinus) grallarius	Bush Stone-curlew	Expert distribution Burhinus grallarius	2584849.12
PARDALOTIDAE	Pardalotus (Pardalotus) punctatus	Spotted Pardalote	Expert distribution Pardalotus punctatus	2177370.82
PTILONORHYNCHIDAE	Ailuroedus crassirostris	Green Catbird	Expert distribution Ailuroedus crassirostris	209568.92
Psittacidae	Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	Expert distribution (maybe) Cyclopsitta diophthalma coxeni	58050.42
Sapindaceae	Cupaniopsis shirleyana	Wedge-leaf Tuckeroo	Expert distribution (likely) Cupaniopsis shirleyana	26061.45
ACANTHIZIDAE	Acanthiza (Subacanthiza) nana	Yellow Thornbill	Expert distribution Acanthiza nana	2028243.52
MELIPHAGIDAE	Myzomela (Myzomela) sanguinolenta	Scarlet Honeyeater	Expert distribution Myzomela sanguinolenta	916620.91
CLIMACTERIDAE	Climacteris (Climacteris) picumnus	Brown Treecreeper	Expert distribution Climacteris picumnus	2277553.59
CAMPEPHAGIDAE	Coracina (Pteropodocys) maxima	Ground Cuckoo-shrike	Expert distribution Coracina maxima	6417009.57
PHASIANIDAE	Coturnix (Coturnix) pectoralis	Stubble Quail	Expert distribution Coturnix pectoralis	6348551.61
ARTAMIDAE	Cracticus torquatus	Grey Butcherbird	Expert distribution Cracticus torquatus	6428212.34
THRESKIORNITHIDAE	Platalea (Platibis) flavipes	Yellow-billed Spoonbill	Expert distribution Platalea flavipes	4717240.77
Dicruridae	Monarcha trivirgatus	Spectacled Monarch	Expert distribution (likely) Monarcha trivirgatus	231632.67
CUCULIDAE	Chalcites (Chalcites) minutillus russatus	Gould's Bronze-cuckoo	Expert distribution Chrysococcyx russatus	2185570.92
CHARADRIIDAE	Charadrius (Charadrius) ruficapillus	Red-capped Plover	Expert distribution Charadrius ruficapillus	4830132.20
STRIGIDAE	Ninox (Hieracoglaux) connivens	Barking Owl	Expert distribution Ninox connivens	2486340.95
ESTRILDIDAE	Neochmia (Aidemosyne) modesta	Plum-headed Finch	Expert distribution Neochmia modesta	1601385.99
Delphinidae	Sousa chinensis	Indo-Pacific Humpback Dolphin	Expert distribution (likely) Sousa chinensis	368780.29
			Expert distribution Megalurus	

MEGALURIDAE	Megalurus timoriensis	Tawny Grassbird	timoriensis	2490619.94
ACCIPITRIDAE	Accipiter (Leucospiza) fasciatus	Brown Goshawk	Expert distribution Accipiter fasciatus	8215601.74
PSITTACIDAE	Aprosmictus erythropterus	Red-winged Parrot	Expert distribution Aprosmictus erythropterus	2581641.22
ACCIPITRIDAE	Aquila (Uroaetus) audax	Wedge-tailed Eagle	Expert distribution Aquila audax	7711600.67
Ardeidae	Ardea alba	Great Egret, White Egret	Expert distribution (likely) Ardea alba	7998335.02
OTIDIDAE	Ardeotis australis	Australian Bustard	Expert distribution Ardeotis australis	6747155.01
ARTAMIDAE	Artamus (Angroyan) cinereus	Black-faced Woodswallow	Expert distribution Artamus cinereus	7455889.31
ARTAMIDAE	Artamus (Angroyan) minor	Little Woodswallow	Expert distribution Artamus minor	6541794.28
ARTAMIDAE	Artamus (Campbellornis) personatus	Masked Woodswallow	Expert distribution Artamus personatus	7602300.12
DICRURIDAE	Dicrurus bracteatus	Spangled Drongo	Expert distribution Dicrurus bracteatus	2116143.99
NECTARINIIDAE	Nectarinia (Cyrtostomus) jugularis	Olive-backed Sunbird	Expert distribution Nectarinia jugularis	5234046.89
Scolopacidae	Numenius minutus	Little Curlew, Little Whimbrel	Expert distribution (likely) Numenius minutus	69699.06
ARTAMIDAE	Artamus (Artamus) leucorhynchus	White-breasted Woodswallow	Expert distribution Artamus leucorhynchus	7668178.65
CACATUIDAE	Calyptorhynchus (Calyptorhynchus) banksii	Red-tailed Black-cockatoo	Expert distribution Calyptorhynchus banksii	2812291.69
ANATIDAE	Chenonetta jubata	Australian Wood Duck	Expert distribution Chenonetta jubata	6020637.70
CAMPEPHAGIDAE	Coracina (Edolisoma) tenuirostris	Cicadabird	Expert distribution Coracina tenuirostris	2311134.51
GRUIDAE	Grus (Mathewsia) rubicunda	Brolga	Expert distribution Grus rubicunda	3576758.72
ANATIDAE	Nettapus (Cheniscus) coromandelianus	Cotton Pygmy-geese	Expert distribution Nettapus coromandelianus	9275135.80
HIRUNDINIDAE	Petrochelidon (Hylochelidon) nigricans	Australian Tree Martin	Expert distribution Hirundo nigricans	8367826.45
ANATIDAE	Cygnus (Chenopsis) atratus	Black Swan	Expert distribution Cygnus atratus	7281302.88
ARDEIDAE	Egretta novaehollandiae	White-faced Heron	Expert distribution Egretta novaehollandiae	7554193.63
Passeridae	Poephila cincta cincta	Black-throated Finch (southern)	Expert distribution (likely) Poephila cincta cincta	116726.34
Rutaceae	Bosistoa transversa	Three-leaved Bosistoa, Yellow Satinheart	Expert distribution (likely) Bosistoa transversa	51364.21
MELIPHAGIDAE	Entomyzon cyanotis	Blue-faced Honeyeater	Expert distribution Entomyzon cyanotis	2770131.17
CACATUIDAE	Eolophus roseicapillus roseicapillus	Galah	Expert distribution Cacatua roseicapilla	7705836.89
FALCONIDAE	Falco (Hierofalco) subniger	Black Falcon	Expert distribution Falco subniger	5935857.83
COLUMBIDAE	Phaps (Phaps) chalcoptera	Common Bronzewing	Expert distribution Phaps chalcoptera	5913133.12
Scolopacidae	Limosa lapponica	Bar-tailed Godwit	Expert distribution (likely) Limosa lapponica	91689.55
Dicruridae	Myiagra cyanoleuca	Satin Flycatcher	Expert distribution (likely) Myiagra cyanoleuca	924638.98
Scolopacidae	Numenius madagascariensis	Eastern Curlew	Expert distribution (likely) Numenius madagascariensis	102432.37
Charadriidae	Pluvialis squatarola	Grey Plover	Expert distribution (likely) Pluvialis squatarola	104846.72
Rostratulidae	Rostratula australis	Australian Painted Snipe	Expert distribution (likely) Rostratula australis	596728.15

Scolopacidae	Xenus cinereus	Terek Sandpiper	Expert distribution (likely) Xenus cinereus	101444.35
Ardeidae	Ardea ibis	Cattle Egret	Expert distribution (maybe) Ardea ibis	6474803.97
Scolopacidae	Calidris ruficollis	Red-necked Stint	Expert distribution (likely) Calidris ruficollis	122895.47
Scolopacidae	Calidris tenuirostris	Great Knot	Expert distribution (likely) Calidris tenuirostris	117165.66
Dasyuridae	Dasyurus hallucatus	Northern Quoll	Expert distribution (maybe) Dasyurus hallucatus	693660.25
Charadriidae	Charadrius mongolus	Lesser Sand Plover, Mongolian Plover	Expert distribution (likely) Charadrius mongolus	118881.46
ANATIDAE	Anas (Nettion) castanea	Chestnut Teal	Expert distribution Anas castanea	3142293.12
ANATIDAE	Dendrocygna (Leptotarsis) eytoni	Plumed Whistling-duck	Expert distribution Dendrocygna eytoni	4799859.70
ANATIDAE	Anas (Spatula) rhynchotis	Australasian Shoveler	Expert distribution Anas rhynchotis	4469444.80
MEGALURIDAE	Cincloramphus (Cincloramphus) cruralis	Brown Songlark	Expert distribution Cincloramphus cruralis	6413759.53
Pteropodidae	Pteropus poliocephalus	Grey-headed Flying-fox	Expert distribution (maybe) Pteropus poliocephalus	188409.44
Diomedidae	Thalassarche carteri	Indian Yellow-nosed Albatross	Expert distribution (maybe) Thalassarche carteri	3699956.72
Diomedidae	Thalassarche melanophris impavida	Campbell Albatross	Expert distribution (maybe) Thalassarche melanophris impavida	5369022.49
Muridae	Xeromys myoides	Water Mouse, False Water Rat, Yirrkoo	Expert distribution (likely) Xeromys myoides	154067.77
MELIPHAGIDAE	Manorina (Myzantha) melanocephala	Noisy Miner	Expert distribution Manorina melanocephala	2072642.79
MONARCHIDAE	Myiagra (Piezorhynchus) alecto	Shining Flycatcher	Expert distribution Myiagra alecto	1373494.44
ACROCEPHALIDAE	Acrocephalus (Acrocephalus) australis	Australian Reed-warbler	Expert distribution Acrocephalus australis	3900510.52
ANHINGIDAE	Anhinga novaehollandiae	Australasian Darter	Expert distribution Anhinga novaehollandiae	7220532.85
ACCIPITRIDAE	Aviceda (Aviceda) subcristata	Pacific Baza	Expert distribution Aviceda subcristata	1727251.75
CUCULIDAE	Cacomantis (Cacomantis) variolosus	Brush Cuckoo	Expert distribution Cacomantis variolosus	2378096.36
CACATUIDAE	Calyptorhynchus (Zanda) funereus	Yellow-tailed Black-cockatoo	Expert distribution Calyptorhynchus funereus	1049093.58
ESTRILDIDAE	Neochmia (Neochmia) ruficauda	Star Finch	Expert distribution Neochmia ruficauda	1502021.83
CACATUIDAE	Nymphicus hollandicus	Cockatiel	Expert distribution Nymphicus hollandicus	6490031.09
ANATIDAE	Aythya (Nyroca) australis	Hardhead	Expert distribution Aythya australis	8179872.96
Hydrobatidae	Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	Expert distribution (likely) Fregetta grallaria grallaria	3380480.93
Moraceae	Streblus pendulinus	Siah's Backbone, Sia's Backbone, Isaac Wood	Expert distribution (likely) Streblus pendulinus	298490.91
PSITTACIDAE	Alisterus scapularis	Australian King-parrot	Expert distribution Alisterus scapularis	814270.55
ARTAMIDAE	Artamus (Angroyan) cyanopterus	Dusky Woodswallow	Expert distribution Artamus cyanopterus	3910611.37
CORCORACIDAE	Corcorax melanorhamphos	White-winged Chough	Expert distribution Corcorax melanorhamphos	1985830.63
PETROICIDAE	Eopsaltria (Eopsaltria) australis	Eastern Yellow Robin	Expert distribution Eopsaltria australis	1178303.63

COLUMBIDAE	Geophaps (Geophaps) scripta	Squatter Pigeon	Expert distribution Geophaps scripta	958181.48
PSITTACIDAE	Glossopsitta pusilla	Little Lorikeet	Expert distribution Glossopsitta pusilla	789996.65
PSITTACIDAE	Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	Expert distribution Trichoglossus chlorolepidotus	1157774.90
Scolopacidae	Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Expert distribution (maybe) Gallinago hardwickii	2661585.22
Procellariidae	Macronectes giganteus	Southern Giant-Petrel	Expert distribution (maybe) Macronectes giganteus	5074155.78
CUCULIDAE	Chrysococcyx basalis	Horsfield's Bronze Cuckoo	Expert distribution Chrysococcyx basalis	7963191.79
CHARADRIIDAE	Erythrogonys cinctus	Red-kneed Dotterel	Expert distribution Erythrogonys cinctus	5131877.29
HIRUNDINIDAE	Hirundo ariel	Fairy Martin	Expert distribution Hirundo ariel	5393670.79
ACCIPITRIDAE	Lophoictinia isura	Square-tailed Kite	Expert distribution Lophoictinia isura	5787193.90
MELIPHAGIDAE	Melithreptus (Melithreptus) lunatus	White-naped Honeyeater	Expert distribution Melithreptus lunatus	1464130.07
MEROPIIDAE	Merops (Merops) ornatus	Rainbow Bee-eater	Expert distribution Merops ornatus	7656493.44
MONARCHIDAE	Monarcha (Monarcha) melanopsis	Black-faced Monarch	Expert distribution Monarcha melanopsis	573675.85
Charadriidae	Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	Expert distribution (likely) Charadrius leschenaultii	84490.79
Crocodylidae	Crocodylus porosus	Salt-water Crocodile, Estuarine Crocodile	Expert distribution (likely) Crocodylus porosus	1639508.81
ANATIDAE	Nettapus (Cheniscus) pulchellus	Green Pygmy-goose	Expert distribution Nettapus pulchellus	2083441.80
MALURIDAE	Malurus (Musciparus) melanocephalus	Red-backed Fairy-wren	Expert distribution Malurus melanocephalus	2036299.41
MEGALURIDAE	Megalurus gramineus	Little Grassbird	Expert distribution Megalurus gramineus	3287342.46
ANATIDAE	Tadorna (Radjah) radjah	Radjah Shelduck	Expert distribution Tadorna radjah	2174664.16
PETROICIDAE	Petroica (Erythrodryas) rosea	Rose Robin	Expert distribution Petroica rosea	696683.03
Columbidae	Geophaps scripta scripta	Squatter Pigeon (southern)	Expert distribution (likely) Geophaps scripta scripta	307453.82
Lamnidae	Lamna nasus	Porbeagle, Mackerel Shark	Expert distribution (maybe) Lamna nasus	3341600.56
Ploceidae	Neochmia ruficauda ruficauda	Star Finch (eastern), Star Finch (southern)	Expert distribution (likely) Neochmia ruficauda ruficauda	547583.76
CUCULIDAE	Cuculus (Cuculus) optatus	Oriental Cuckoo	Expert distribution Cuculus optatus	16851779.48
GLAREOLIDAE	Stiltia isabella	Australian Pratincole	Expert distribution Stiltia isabella	5241998.56
PODICIPEDIDAE	Tachybaptus novaehollandiae	Australasian Grebe	Expert distribution Tachybaptus novaehollandiae	8158001.38
ALCEDINIDAE	Todiramphus (Lazulena) macleayii	Forest Kingfisher	Expert distribution Todiramphus macleayii	1323448.11
Scolopacidae	Heteroscelus brevipes	Grey-tailed Tattler	Expert distribution (likely) Heteroscelus brevipes	126830.61
Meropidae	Merops ornatus	Rainbow Bee-eater	Expert distribution (maybe) Merops ornatus	7784899.62
Dicruridae	Monarcha melanopsis	Black-faced Monarch	Expert distribution (likely) Monarcha melanopsis	772088.26
Cheloniidae	Natator depressus	Flatback Turtle	Expert distribution (likely) Natator depressus	4457761.25
Scolopacidae	Numenius phaeopus	Whimbrel	Expert distribution (likely) Numenius phaeopus	156438.76
Delphinidae	Orcaella brevirostris	Irrawaddy Dolphin	Expert distribution (likely) Orcaella brevirostris	176956.59

Charadriidae	Pluvialis fulva	Pacific Golden Plover	Expert distribution (likely) Pluvialis fulva	119874.36
MONARCHIDAE	Grallina cyanoleuca	Magpie-lark	Expert distribution Grallina cyanoleuca	6774362.21
Hirundinidae	Hirundo rustica	Barn Swallow	Expert distribution (maybe) Hirundo rustica	956452.68
Dicruridae	Rhipidura rufifrons	Rufous Fantail	Expert distribution (likely) Rhipidura rufifrons	704280.91
Sapindaceae	Atalaya collina	Yarwun Whitewood	Expert distribution (likely) Atalaya collina	451.14
Apocynaceae	Parsonsia larcomensis	Mt Larcom Silk Pod	Expert distribution (likely) Parsonsia larcomensis	3629.49
ACCIPITRIDAE	Erythrotriorchis radiatus	Red Goshawk	Expert distribution Erythrotriorchis radiatus	1080679.74
Accipitridae	Haliaeetus leucogaster	White-bellied Sea-Eagle	Expert distribution (likely) Haliaeetus leucogaster	1987188.30
MELIPHAGIDAE	Melithreptus (Eidopsarus) brevirostris	Brown-headed Honeyeater	Expert distribution Melithreptus brevirostris	2009064.71
ESTRILDIDAE	Stagonopleura (Stagonopleura) guttata	Diamond Firetail	Expert distribution Stagonopleura guttata	1457084.07
Diomedeidae	Thalassarche impavida	Campbell Albatross	Expert distribution (maybe) Thalassarche impavida	5369022.49
FALCONIDAE	Falco (Falco) longipennis	Australian Hobby	Expert distribution Falco longipennis	8298592.48
RALLIDAE	Gallinula (Gallinula) tenebrosa	Dusky Moorhen	Expert distribution Gallinula tenebrosa	3818628.75
ACANTHIZIDAE	Gerygone olivacea	White-throated Gerygone	Expert distribution Gerygone olivacea	2368961.46
HAEMATOPODIDAE	Haematopus longirostris	Australian Pied Oystercatcher	Expert distribution Haematopus longirostris	871291.53
ACCIPITRIDAE	Haliastur sphenurus	Whistling Kite	Expert distribution Haliastur sphenurus	5610016.45
ACCIPITRIDAE	Hieraaetus (Hieraaetus) morphnoides	Little Eagle	Expert distribution Hieraaetus morphnoides	7295760.24
RHIPIDURIDAE	Rhipidura (Sauloprocta) leucophrys	Willie Wagtail	Expert distribution Rhipidura leucophrys	8437314.02
THRESKIORNITHIDAE	Threskiornis molucca	Australian White Ibis	Expert distribution Threskiornis molucca	5606446.57
TYTONIDAE	Tyto (Megastrix) novaehollandiae	Masked Owl	Expert distribution Tyto novaehollandiae	5149773.71
TYTONIDAE	Tyto (Megastrix) tenebricosa	Sooty Owl	Expert distribution Tyto tenebricosa	1199963.60
TURDIDAE	Zoothera (Zoothera) heinei	Russet-tailed Thrush	Expert distribution Zoothera heinei	471608.20
PODICIPEDIDAE	Podiceps cristatus	Great Crested Grebe	Expert distribution Podiceps cristatus	30644062.36
SCOLOPACIDAE	Actitis hypoleucos	Common Sandpiper	Expert distribution Actitis hypoleucos	61323916.68
ACCIPITRIDAE	Milvus migrans	Black Kite	Expert distribution Milvus migrans	64724141.77
SCOLOPACIDAE	Calidris (Erolia) ferruginea	Curlew Sandpiper	Expert distribution Calidris ferruginea	17993095.28
ARDEIDAE	Ixobrychus minutus	Little Bittern	Expert distribution Ixobrychus minutus	29699169.81
CUCULIDAE	Scythrops novaehollandiae	Channel-billed Cuckoo	Expert distribution Scythrops novaehollandiae	2987078.83
THRESKIORNITHIDAE	Threskiornis spinicollis	Straw-necked Ibis	Expert distribution Threskiornis spinicollis	6591872.02
Scolopacidae	Tringa stagnatilis	Marsh Sandpiper, Little Greenshank	Expert distribution (likely) Tringa stagnatilis	97388.66
			Expert distribution (maybe)	

Balaenopteridae	Balaenoptera musculus	Blue Whale	Balaenoptera musculus	4296119.31
Scolopacidae	Calidris canutus	Red Knot, Knot	Expert distribution (likely) Calidris canutus	94493.03
Scolopacidae	Calidris ferruginea	Curlew Sandpiper	Expert distribution (likely) Calidris ferruginea	115894.60
MELIPHAGIDAE	Lichenostomus (Nesoptilotis) leucotis	White-eared Honeyeater	Expert distribution Lichenostomus leucotis	1981130.16
CICONIIDAE	Ephippiorhynchus (Ephippiorhynchus) asiaticus	Black-necked Stork	Expert distribution Ephippiorhynchus asiaticus	6421393.66
FALCONIDAE	Falco (Ieracidea) berigora	Brown Falcon	Expert distribution Falco berigora	8309376.46
FALCONIDAE	Falco (Tinnunculus) cenchroides	Nankeen Kestrel	Expert distribution Falco cenchroides	8092779.67
ACCIPITRIDAE	Haliaeetus (Pontoaetus) leucogaster	White-bellied Sea-eagle	Expert distribution Haliaeetus leucogaster	5153916.36
RECURVIROSTRIDAE	Himantopus himantopus leucocephalus	Banded Stilt	Expert distribution Himantopus leucocephalus	8909101.48
APODIDAE	Hirundapus caudacutus	White-throated Needletail	Expert distribution Hirundapus caudacutus	8589434.60
JACANIDAE	Irediparra gallinacea	Comb-crested Jacana	Expert distribution Irediparra gallinacea	2193803.05
CAMPEPHAGIDAE	Lalage (Karua) leucomela	Varied Triller	Expert distribution Lalage leucomela	1265631.41
CAMPEPHAGIDAE	Lalage tricolor	Australian White-winged Triller	Expert distribution Lalage tricolor	7665912.79
RALLIDAE	Lewinia pectoralis	Lewin's Rail	Expert distribution Lewinia pectoralis	1006182.01
MELIPHAGIDAE	Lichmera (Lichmera) indistincta	Brown Honeyeater	Expert distribution Lichmera indistincta	5289757.25
COLUMBIDAE	Macropygia (Macropygia) amboinensis	Brown Cuckoo-dove	Expert distribution Macropygia amboinensis	1651529.14
MELIPHAGIDAE	Melithreptus (Melithreptus) albogularis	White-throated Honeyeater	Expert distribution Melithreptus albogularis	1481491.18
PETROICIDAE	Microeca (Microeca) fascinans	Jacky Winter	Expert distribution Microeca fascinans	5323897.16
ALAUDIDAE	Mirafrja (Mirafrja) javanica	Horsfield's Bushlark	Expert distribution Mirafrja javanica	6688389.55
MELIPHAGIDAE	Lichenostomus (Caligavis) chrysops	Yellow-faced Honeyeater	Expert distribution Lichenostomus chrysops	1462297.86
MELIPHAGIDAE	Melithreptus (Eidopsarus) gularis	Black-chinned Honeyeater	Expert distribution Melithreptus gularis	3081342.36
RHIPIDURIDAE	Rhipidura (Howeavis) rufifrons	Rufous Fantail	Expert distribution Rhipidura rufifrons	1314337.02
TYTONIDAE	Tyto (Tyto) longimembris	Eastern Grass Owl	Expert distribution Tyto longimembris	4303461.80
MELIPHAGIDAE	Conopophila (Conopophila) rufogularis	Rufous-throated Honeyeater	Expert distribution Conopophila rufogularis	1964731.98
CLIMACTERIDAE	Cormobates leucophaea	White-throated Treecreeper	Expert distribution Cormobates leucophaea	972074.56
MELIPHAGIDAE	Philemon (Microphilemon) citreogularis	Little Friarbird	Expert distribution Philemon citreogularis	3175797.20
MELIPHAGIDAE	Philemon (Tropidorhynchus) corniculatus	Noisy Friarbird	Expert distribution Philemon corniculatus	1764937.39
ROSTRATULIDAE	Rostratula australis	Australian Painted Snipe	Expert distribution Rostratula australis	1395471.65
ACANTHIZIDAE	Sericornis (Arfakornis) magnirostra	Large-billed Scrubwren	Expert distribution Sericornis magnirostra	271666.55
ORIOIDAE	Sphecotheres vieilloti	Australasian Figbird	Expert distribution Sphecotheres vieilloti	1012512.81
ACCIPITRIDAE	Circus approximans	Swamp Harrier	Expert distribution Circus approximans	5155720.31

MOTACILLIDAE	Anthus (Anthus) novaeseelandiae	Australasian Pipit	Expert distribution Anthus novaeseelandiae	6504213.91
CHARADRIIDAE	Charadrius (Charadrius) bicinctus	Double-banded Plover	Expert distribution Charadrius bicinctus	580716.62
ESTRILDIDAE	Lonchura (Munia) castaneothorax	Chestnut-breasted Mannikin	Expert distribution Lonchura castaneothorax	1873655.63
ESTRILDIDAE	Neochmia (Aegintha) temporalis	Red-browed Finch	Expert distribution Neochmia temporalis	1125930.56
STRIGIDAE	Ninox (Ninox) novaeseelandiae	Southern Boobook	Expert distribution Ninox novaeseelandiae	8080194.91
PETROICIDAE	Petroica (Petroica) goodenovii	Red-capped Robin	Expert distribution Petroica goodenovii	6577525.66
COLUMBIDAE	Ptilinopus (Ptilinopus) regina	Rose-crowned Fruit-dove	Expert distribution Ptilinopus regina	548595.17
ACANTHIZIDAE	Sericornis (Sericornis) frontalis	White-browed Scrubwren	Expert distribution Sericornis frontalis	1687669.44
ACANTHIZIDAE	Smicronis brevirostris	Weebill	Expert distribution Smicronis brevirostris	7261150.12
RALLIDAE	Tribonyx ventralis	Black-tailed Native-hen	Expert distribution Gallinula ventralis	4636120.02
TURNICIDAE	Turnix (Austroturnix) varius	Painted Button-quail	Expert distribution Turnix varius	2300628.94
CHARADRIIDAE	Vanellus (Lobipluvia) miles	Masked Lapwing	Expert distribution Vanellus miles	5298978.32
CHARADRIIDAE	Vanellus (Lobivanellus) tricolor	Banded Lapwing	Expert distribution Vanellus tricolor	5665395.23
Delphinidae	Orcinus orca	Killer Whale, Orca	Expert distribution (maybe) Orcinus orca	11843233.78
HAEMATOPODIDAE	Haematopus fuliginosus	Sooty Oystercatcher	Expert distribution Haematopus fuliginosus	814979.94
MELIPHAGIDAE	Lichenostomus (Gavicalis) virescens	Singing Honeyeater	Expert distribution Lichenostomus virescens	7337047.11
MELIPHAGIDAE	Lichenostomus (Ptilotula) fuscus	Fuscous Honeyeater	Expert distribution Lichenostomus fuscus	952256.36
Laridae	Sterna albifrons	Little Tern	Expert distribution (maybe) Sterna albifrons	221139.02
Scolopacidae	Actitis hypoleucos	Common Sandpiper	Expert distribution (likely) Actitis hypoleucos	104846.72
Scolopacidae	Arenaria interpres	Ruddy Turnstone	Expert distribution (likely) Arenaria interpres	150847.39
MELIPHAGIDAE	Epthianura (Aurepthianura) crocea	Yellow Chat	Expert distribution Epthianura crocea	2190499.15
Scincidae	Egernia rugosa	Yakka Skink	Expert distribution (maybe) Egernia rugosa	713172.77
ALCEDINIDAE	Alcedo pusilla	Little Kingfisher	Expert distribution Alcedo pusilla	915892.65
HIRUNDINIDAE	Hirundo (Hirundo) neoxena	Welcome Swallow	Expert distribution Hirundo neoxena	6051281.36
COLUMBIDAE	Ocyphaps lophotes	Crested Pigeon	Expert distribution Ocyphaps lophotes	7413153.51
PACHYCEPHALIDAE	Pachycephala (Alisterornis) rufiventris	Rufous Whistler	Expert distribution Pachycephala rufiventris	7241012.34
PARDALOTIDAE	Pardalotus (Pardalotinus) rubricatus	Red-browed Pardalote	Expert distribution Pardalotus rubricatus	5215172.69
PARDALOTIDAE	Pardalotus (Pardalotinus) striatus	Striated Pardalote	Expert distribution Pardalotus striatus	6172513.14
MELIPHAGIDAE	Phylidonyris (Meliornis) niger	White-cheeked Honeyeater	Expert distribution Phylidonyris niger	1050960.21
MELIPHAGIDAE	Plectorhyncha lanceolata	Striped Honeyeater	Expert distribution Plectorhyncha lanceolata	2027718.48
ESTRILDIDAE	Poephila (Poephila) cincta	Black-throated Finch	Expert distribution Poephila cincta	830809.11
			Expert distribution Poliocephalus	

PODICIPEDIDAE	Poliiocephalus poliocephalus	Hoary-headed Grebe	poliocephalus	7076105.52
MELIPHAGIDAE	Ramsayornis fasciatus	Bar-breasted Honeyeater	Expert distribution Ramsayornis fasciatus	936411.12
RHIPIDURIDAE	Rhipidura (Rhipidura) fuliginosa	New Zealand Fantail	Expert distribution Rhipidura fuliginosa	5840029.33
ARTAMIDAE	Strepera (Strepera) graculina	Pied Currawong	Expert distribution Strepera graculina	1586016.94
CORCORACIDAE	Struthidea cinerea	Apostlebird	Expert distribution Struthidea cinerea	2511273.32
ESTRILDIDAE	Taeniopygia bichenovii	Double-barred Finch	Expert distribution Taeniopygia bichenovii	3122485.25
ALCEDINIDAE	Todiramphus (Cyanalcyon) pyrrhopygius	Red-backed Kingfisher	Expert distribution Todiramphus pyrrhopygius	7466637.09
TURNICIDAE	Turnix (Alphaturnia) velox	Little Button-quail	Expert distribution Turnix velox	7007734.60
TURNICIDAE	Turnix (Unplaced) pyrrhothorax	Red-chested Button-quail	Expert distribution Turnix pyrrhothorax	4306240.09
TIMALIIDAE	Zosterops lateralis	Silvereeye	Expert distribution Zosterops lateralis	2710961.04
Accipitridae	Erythrotriorchis radiatus	Red Goshawk	Expert distribution (likely) Erythrotriorchis radiatus	1212786.58
Apodidae	Hirundapus caudacutus	White-throated Needletail	Expert distribution (likely) Hirundapus caudacutus	640661.78
ACCIPITRIDAE	Elanus axillaris	Black-shouldered Kite	Expert distribution Elanus axillaris	7680926.93
ACANTHIZIDAE	Gerygone fusca	Western Gerygone	Expert distribution Gerygone fusca	3763661.46
ALCEDINIDAE	Dacelo (Dacelo) leachii	Blue-winged Kookaburra	Expert distribution Dacelo leachii	2194998.13
COLUMBIDAE	Geopelia humeralis	Bar-shouldered Dove	Expert distribution Geopelia humeralis	2772010.47
COLUMBIDAE	Geopelia striata placida	Peaceful Dove	Expert distribution Geopelia placida	5604983.01
ACANTHIZIDAE	Gerygone palpebrosa	Fairy Gerygone	Expert distribution Gerygone palpebrosa	975018.21
MONARCHIDAE	Symposiachrus trivirgatus melanorrhous		Expert distribution Monarcha trivirgatus	625166.73
ESTRILDIDAE	Taeniopygia guttata	Zebra Finch	Expert distribution Taeniopygia guttata	6384312.10
ACCIPITRIDAE	Accipiter (Leucospiza) novaehollandiae	Grey Goshawk	Expert distribution Accipiter novaehollandiae	2587279.61
APODIDAE	Apus (Apus) pacificus	Fork-tailed Swift	Expert distribution Apus pacificus	25317218.87
ARTAMIDAE	Cracticus tibicen	Australian Magpie	Expert distribution Gymnorhina tibicen	6938575.86
CHARADRIIDAE	Eseyornis melanops	Black-fronted Dotterel	Expert distribution Eseyornis melanops	7384843.66
CUCULIDAE	Eudynamys orientalis	Eastern Koel	Expert distribution Eudynamys orientalis	2492075.68
SCOLOPACIDAE	Gallinago (Gallinago) hardwickii	Latham's Snipe	Expert distribution Gallinago hardwickii	1749425.01
PHALACROCORACIDAE	Phalacrocorax (Phalacrocorax) varius	Pied Cormorant	Expert distribution Phalacrocorax varius	4427211.02
PSITTACIDAE	Trichoglossus haematodus	Rainbow Lorikeet	Expert distribution Trichoglossus haematodus	3387784.21
Cheloniidae	Lepidochelys olivacea	Olive Ridley Turtle, Pacific Ridley Turtle	Expert distribution (likely) Lepidochelys olivacea	2469273.05
Rhincodontidae	Rhincodon typus	Whale Shark	Expert distribution (maybe) Rhincodon typus	3009959.26
Scolopacidae	Calidris acuminata	Sharp-tailed Sandpiper	Expert distribution (likely) Calidris acuminata	113588.43
Cheloniidae	Caretta caretta	Loggerhead Turtle	Expert distribution (likely) Caretta caretta	5378049.38
	Acanthorhynchus		Expert distribution	

Checklist Areas

Number of checklist areas: 0

Table 31: Checklist Areas

Family	Scientific Name	Common Name	Area Name	Area sq km
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JournalMap Articles

Number of JournalMap articles: 0

Table 32: JournalMap Articles

Author/s	Year	Title	Publication	DOI	URL
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Further Links

Geoscience Australia: <http://www.ga.gov.au/>

Global Biodiversity Information Facility: <https://www.gbif.org/>

Threatened Species & Ecological Communities: <https://www.environment.gov.au/topics/threatened-species-ecological-communities>

WWF Ecoregions: <https://worldwildlife.org/biomes>

Environmental Resources Information Network (ERIN): <https://www.environment.gov.au/topics/science-and-research/databases-and-maps/erin>

Australian National Fish Expert Distributions: <https://collections.ala.org.au/public/show/dr803>

Lists of Australian endemic species: <http://Intreasures.com/australia.html>

Federal

Department of the Environment: <https://www.environment.gov.au/>

State/Territory

Australian Capital Territory

Environment and Sustainable Development Directorate: <https://www.environment.act.gov.au/>

New South Wales

Office of Environment and Heritage: <http://www.environment.nsw.gov.au/>

Northern Territory

Department of Land Resource Management: <https://www.lrm.nt.gov.au/>

Queensland

Department of Environment and Heritage Protection: <https://www.ehp.qld.gov.au/>

South Australia

Department of Environment, Water and Natural Resources: <https://www.environment.sa.gov.au/Home>

Tasmania

Department of Primary Industries, Parks, Water and Environment: <http://www.dpiw.tas.gov.au/>

Western Australia

Department of Parks and Wildlife: <https://www.dpaw.wa.gov.au/>

Victoria

Department of Environment and Primary Industries: <http://www.depi.vic.gov.au/>

References

1. Lymburner, L., Tan, P., Mueller, N., Thackway, R., Lewis, A., Thankappan, M., Randall, L., Islam, A. and Senarath, U. (2010). 250 metre Dynamic Land Cover Dataset of Australia (1st Edition), Geoscience Australia, Canberra.
2. Olson, D. M., Dinerstein, E., Wikramanayake, E. D., Burgess, N. D., Powell, G. V. N., Underwood, E. C., D'Amico, J. A., Itoua, I., Strand, H. E., Morrison, J. C., Loucks, C. J., Allnutt, T. F., Ricketts, T. H., Kura, Y., Lamoreux, J. F., Wettengel, W. W., Hedao, P. and Kassem, K. R. (2001). Terrestrial ecoregions of the world: a new map of life on Earth. *Bioscience* 51(11):933-938.
3. Commonwealth of Australia (2006). A Guide to the Integrated Marine and Coastal Regionalisation of Australia Version 4.0. Department of the Environment and Heritage, Canberra, Australia.
4. Spalding, M.D., Fox, H.E., Allen, G.R., Davidson, N., Ferdaña, Z.A., Finlayson, M., Halpern, B.S., Jorge, M.A., Lombana, A., Lourie, S.A., Martin, K.D., McManus, E., Molnar, Jennifer, Recchia, C.A. and Robertson, J. (2007). Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas. *Bioscience* 57(7): 573–583.
<https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/colorado/scienceandstrategy/marine-ecoregions-of-the-world.pdf>
5. Abell, R., Thieme, M.L., Revenga, C., Bryer, M., Kottelat, M., Bogutskaya, N., Coad, B., Mandrak, N., Contreras Balderas, S., Bussing, W., Stiassny, M.L.J., Skelton, P., Allen, G.R., Unmack, P., Naseka, A., Ng, R., Sindorf, N., Robertson, J., Armijo, E., Higgins, J.V., Heibel, T.J., Wikramanayake, E., Olson, D., Lopez, H.L., Reis, R.E., Lundberg, J.G., Sabaj Pérez, M.H. and Petry, P. (2008). Freshwater Ecoregions of the World: A new map of biogeographic units for freshwater biodiversity conservation. *BioScience* 58(5): 403-414.
http://www.feow.org/download/Abell_et_al_08_BioScience.pdf
6. Crisp, M.D., Laffan, S. Linder, H.P. and Monro, A. (2001). Endemism in the Australian flora. *Journal of Biogeography* 28: 183-198.
7. Atlas of Living Australia (2013). Spatial Portal Help: Area Report. <https://www.ala.org.au/spatial-portal-help/area-report/>
8. Commonwealth of Australia (2013). Migratory Species in Australia. Department of the Environment, Canberra.
<https://www.environment.gov.au/topics/biodiversity/migratory-species>
9. Atlas of Living Australia (2013). FAQ: Data Sensitivity. <https://www.ala.org.au/faq/data-sensitivity/>
10. Commonwealth of Australia (2010). Gazetteer of Australia Place Name Search. Geoscience Australia, Canberra.
<http://www.ga.gov.au/place-names/>
11. NASA Earth Observatory (2000). Net Primary Productivity. https://earthobservatory.nasa.gov/GlobalMaps/view.php?d1=MOD17A2_M_PSN



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 10-Feb-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

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[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	9
Listed Threatened Species:	63
Listed Migratory Species:	58

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	102
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	1

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	42
Key Ecological Features (Marine):	None
Biologically Important Areas:	6
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties			[Resource Information]
Name	State	Legal Status	Buffer Status
Great Barrier Reef	QLD	Declared property	In buffer area only

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Natural			
Great Barrier Reef	QLD	Listed place	In buffer area only

Listed Threatened Ecological Communities			[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.			
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.			

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In buffer area only
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area	In feature area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In feature area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Weeping Myall Woodlands	Endangered	Community may occur	In feature area within area

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
 Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area	In feature area
Epthianura crocea macgregori Capricorn Yellow Chat, Yellow Chat (Dawson) [67090]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythroriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area	In feature area
PLANT			
Atalaya collina Yarwun Whitewood [55417]	Endangered	Species or species habitat known to occur within area	In buffer area only
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cossinia australiana Cossinia [3066]	Endangered	Species or species habitat may occur within area	In feature area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cycas megacarpa [55794]	Endangered	Species or species habitat may occur within area	In feature area
Cycas ophiolitica [55797]	Endangered	Species or species habitat may occur within area	In feature area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Parsonsia larcomensis Mt Larcom Silk Pod [64587]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
SHARK			
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			

Scientific Name	Threatened Category	Presence Text	Buffer Status	
Anous stolidus Common Noddy [825]		Species or species habitat known to occur within area	In feature area	
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area	
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only	
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In buffer area only	
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]		Endangered	Species or species habitat may occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only	
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only	
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]		Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species				
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]			Species or species habitat likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]	Species or species habitat may occur within area		In buffer area only	
Balaenoptera musculus Blue Whale [36]	Endangered		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharias taurus Grey Nurse Shark [64469]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Dugong dugon Dugong [28]		Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat likely to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sousa sahalensis as Sousa chinensis Australian Humpback Dolphin [87942]		Breeding known to occur within area	In buffer area only
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago megala Swinhoe's Snipe [864]	Vulnerable	Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat may occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pandion haliaetus Osprey [952]	Vulnerable	Breeding known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area	In feature area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat known to occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]		Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]	Vulnerable	Breeding known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area overfly marine area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area	In buffer area only
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area	In buffer area only
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In buffer area only
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area	In buffer area only
Corythoichthys haematopterus Reef-top Pipefish [66201]		Species or species habitat may occur within area	In buffer area only
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area	In buffer area only
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In buffer area only
Corythoichthys paxtoni Paxton's Pipefish [66204]		Species or species habitat may occur within area	In buffer area only
Corythoichthys schultzi Schultz's Pipefish [66205]		Species or species habitat may occur within area	In buffer area only
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area	In buffer area only
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area	In buffer area only
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In buffer area only
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area	In buffer area only
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area	In buffer area only
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In buffer area only
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus bargibanti Pygmy Seahorse [66721]		Species or species habitat may occur within area	In buffer area only
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In buffer area only
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus zebra Zebra Seahorse [66241]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In buffer area only
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In buffer area only
Nannocampus pictus Painted Pipefish, Reef Pipefish [66263]		Species or species habitat may occur within area	In buffer area only
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Mammal			
Dugong dugon Dugong [28]		Species or species habitat known to occur within area	In buffer area only
Reptile			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aipysurus duboisii Dubois' Sea Snake, Dubois' Seasnake, Reef Shallows Sea Snake [1116]		Species or species habitat may occur within area	In buffer area only
Aipysurus laevis Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area	In buffer area only
Aipysurus mosaicus as Aipysurus eydouxii Mosaic Sea Snake [87261]		Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydrophis hardwickii as Lapemis hardwickii Spine-bellied Sea Snake [93516]		Species or species habitat may occur within area	In buffer area only
Hydrophis kingii as Disteira kingii Spectacled Sea Snake [93511]		Species or species habitat may occur within area	In buffer area only
Hydrophis major as Disteira major Olive-headed Sea Snake [93512]		Species or species habitat may occur within area	In buffer area only
Hydrophis peronii as Acalyptophis peronii Horned Sea Snake [93509]		Species or species habitat may occur within area	In buffer area only
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In buffer area only
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area	In buffer area only
Laticauda colubrina Yellow-lipped Sea Krait [1092]		Species or species habitat may occur within area	In buffer area only
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera acutorostrata Minke Whale [33]	Endangered	Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]		Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat likely to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Sousa sahalensis Australian Humpback Dolphin [87942]		Breeding known to occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Tursiops truncatus s. str.			
Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Habitat Critical to the Survival of Marine Turtles			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Aug - Sep			
Natator depressus			
Flatback Turtle [59257]	Nesting	Known to occur	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Calliope	Conservation Park	QLD	In buffer area only
D?-ral-l? (Calliope River)	Fish Habitat Area (B)	QLD	In buffer area only
Port of Gladstone - Rodds Bay	Dugong Protection Area (B)	QLD	In buffer area only

Nationally Important Wetlands			[Resource Information]
Wetland Name		State	Buffer Status
Port Curtis		QLD	In feature area

EPBC Act Referrals					[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Calvale to Calliope River Transmission Line Reinforcement Project	2024/10044		Assessment	In feature area	
CQ-H2 Hydrogen Transport Facility (HTF) Project	2024/09901		Assessment	In buffer area only	
CQ-H2 Surplus Industrial Water Pipeline (SIWP) Project	2024/09935		Assessment	In feature area	
Gladstone - Fitzroy Pipeline	2007/3501		Post-Approval	In buffer area only	
Renewable Diesel and Sustainable Aviation Fuel Project	2022/09369		Completed	In buffer area only	

Controlled action				
Blackwater to Gladstone Gas Pipeline Project	2011/6034	Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Clinton Vessel Interaction Project - Clinton Widening, Qld	2017/7976	Controlled Action	Post-Approval	In buffer area only
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	Controlled Action	Post-Approval	In feature area
Construction of a Chlor-Alkali/Ethylene Di-Chlorid	2003/922	Controlled Action	Completed	In buffer area only
Construction of a Chlor-Alkali-Ethylene Di-Chloride (CA/EDC) Plant at the Gladst	2002/764	Controlled Action	Completed	In feature area
Construction of a high pressure buried gas pipeline, Kogan to Gladstone, QLD	2009/5029	Controlled Action	Post-Approval	In buffer area only
Development of the Yarwun Coal Terminal	2012/6348	Controlled Action	Completed	In feature area
Gas Pipeline with Alternative Pipeleine to Supply Natural Gas Liquefaction Park	2008/4096	Controlled Action	Post-Approval	In buffer area only
Gladstone New Fuels Development Project - stage 2A	2014/7241	Controlled Action	Completed	In buffer area only
H2-Hub??? Gladstone - Export-class Green Hydrogen and Ammonia Complex	2021/9049	Controlled Action	Referral Decision	In feature area
HPAL Nickel Plant	2005/2376	Controlled Action	Post-Approval	In feature area
install & operate gas pipeline	2005/2059	Controlled Action	Post-Approval	In feature area
LNG Plant and Ancillary onshore and marine facilities	2009/4977	Controlled Action	Post-Approval	In buffer area only
Nickel and cobalt laterite mine, High-pressure acid leach plant, slurry pipeline	2005/2257	Controlled Action	Completed	In feature area
Port of Gladstone Gatcombe & Golding Cutting Channel Duplication Project	2012/6558	Controlled Action	Post-Approval	In buffer area only
Queensland Curtis LNG Project - LNG Marine Facilities	2008/4401	Controlled Action	Post-Approval	In feature area
Queensland Curtis LNG Project - Pipeline Network	2008/4399	Controlled Action	Post-Approval	In buffer area only
Queensland Curtis LNG Project - Swing Basin and Channel Dredging	2008/4406	Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Talisman Saber 2005 Military Exercise	2004/1819	Controlled Action	Post-Approval	In buffer area only
The Arrow Gas Transmission Pipeline, Gladstone to Curtis Island	2009/5008	Controlled Action	Post-Approval	In feature area
The Arrow LNG Facility, Curtis Island, Gladstone	2009/5007	Controlled Action	Post-Approval	In buffer area only
Wiggins Island Coal Terminal	2005/2374	Controlled Action	Post-Approval	In feature area
Not controlled action				
Calcining Plant	2001/193	Not Controlled Action	Completed	In buffer area only
Construction of a portable water pipeline and a sewer pressure main	2010/5646	Not Controlled Action	Completed	In buffer area only
Construction of Calliope River 275kV and 132kV Bulk Supply Substation	2009/5229	Not Controlled Action	Completed	In buffer area only
Fisherman's Landing Port Facility	2000/124	Not Controlled Action	Completed	In buffer area only
Fishermans Landing site conversion for Lime Kiln	2002/740	Not Controlled Action	Completed	In buffer area only
Gladstone Energy and Ammonia Project, Qld	2018/8305	Not Controlled Action	Completed	In buffer area only
Gladstone State Development Area, Ammonia Production Facility	2006/2855	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Liquefied Natural Gas Export Terminal	2008/3954	Not Controlled Action	Completed	In buffer area only
Moura Link - Aldoga Rail Project	2007/3773	Not Controlled Action	Completed	In buffer area only
Project Sun Liquefied Natural Gas Plant and Pipeline	2008/3994	Not Controlled Action	Completed	In buffer area only
Replacement of Existing Processing Plant with a smaller Technology Demonstration Plant	2009/5064	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Powerlink Gladstone to Larcom Creek 275kV Transmission Line	2003/1229	Not Controlled Action (Particular	Post-Approval	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Manner)				
Referral decision				
Gas Transmission Pipeline to supply Natural Gas Liquefaction Park	2008/4061	Referral Decision	Completed	In buffer area only
Port of Gladstone Western Basin Strategic Dredging and Disposal Project	2009/4826	Referral Decision	Completed	In buffer area only
Biologically Important Areas [Resource Information]				
Scientific Name		Behaviour	Presence	Buffer Status
Dolphins				
Sousa chinensis				
Indo-Pacific Humpback Dolphin [50]		Breeding	Known to occur	In buffer area only
Tursiops aduncus				
Indo-Pacific/Spotted Bottlenose Dolphin [68418]		Breeding	Likely to occur	In buffer area only
Seabirds				
Ardenna tenuirostris				
Short-tailed Shearwater [82652]		Foraging	Likely to occur	In buffer area only
Sula sula				
Red-footed Booby [1023]		Foraging	Likely to occur	In buffer area only
Sharks				
Carcharias taurus				
Grey Nurse Shark [64469]		Foraging	Known to occur	In buffer area only
Whales				
Megaptera novaeangliae				
Humpback Whale [38]		Breeding and calving	Known to occur	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

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

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

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

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 10-Feb-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	44
Listed Migratory Species:	27

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	40
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	15
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[Resource Information]

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area

Listed Threatened Species

[Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area
Epthianura crocea macgregori Capricorn Yellow Chat, Yellow Chat (Dawson) [67090]	Critically Endangered	Species or species habitat may occur within area
Erythroriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area

MAMMAL

Scientific Name	Threatened Category	Presence Text
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area
PLANT		
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cossinia australiana Cossinia [3066]	Endangered	Species or species habitat may occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Cycas megacarpa [55794]	Endangered	Species or species habitat may occur within area
Cycas ophiolitica [55797]	Endangered	Species or species habitat may occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat may occur within area
REPTILE		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area
Listed Migratory Species		
[Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		

Scientific Name	Threatened Category	Presence Text
Anous stolidus Common Noddy [825]		Species or species habitat known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Marine Species		
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]	
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Reptile	
Crocodylus porosus	
Salt-water Crocodile, Estuarine Crocodile [1774]	Species or species habitat likely to occur within area

Extra Information

Nationally Important Wetlands	[Resource Information]
Wetland Name	State
Port Curtis	QLD

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Calvale to Calliope River Transmission Line Reinforcement Project	2024/10044		Assessment
CQ-H2 Surplus Industrial Water Pipeline (SIWP) Project	2024/09935		Assessment

Controlled action

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	Controlled Action	Post-Approval
Construction of a Chlor-Alkali-Ethylene Di-Chloride (CA/EDC) Plant at the Gladst	2002/764	Controlled Action	Completed
Development of the Yarwun Coal Terminal	2012/6348	Controlled Action	Completed
H2-Hub??? Gladstone - Export-class Green Hydrogen and Ammonia Complex	2021/9049	Controlled Action	Referral Decision
HPAL Nickel Plant	2005/2376	Controlled Action	Post-Approval
install & operate gas pipeline	2005/2059	Controlled Action	Post-Approval
Nickel and cobalt laterite mine, High-pressure acid leach plant, slurry pipeline	2005/2257	Controlled Action	Completed
Queensland Curtis LNG Project - LNG Marine Facilities	2008/4401	Controlled Action	Post-Approval
The Arrow Gas Transmission Pipeline, Gladstone to Curtis Island	2009/5008	Controlled Action	Post-Approval
Wiggins Island Coal Terminal	2005/2374	Controlled Action	Post-Approval
Not controlled action			
Gladstone State Development Area, Ammonia Production Facility	2006/2855	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Not controlled action (particular manner)			
Powerlink Gladstone to Larcom Creek 275kV Transmission Line	2003/1229	Not Controlled Action (Particular Manner)	Post-Approval

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

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

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

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

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Attachment C:

Regional Ecosystems Verification

Appendix C: RE Verification

Site	1	2
Location	-23.840802, 151.1715349	-23.8407771, 151.1714292
Mapped RE	12.11.6 - <i>Corymbia citriodora subsp. variegata</i> , <i>Eucalyptus crebra</i> woodland on metamorphics +/- interbedded volcanics.	11.3.29 - <i>Eucalyptus crebra</i> , <i>E. exserta</i> , <i>Melaleuca</i> spp. woodland on alluvial plains.
Vegetation Cover	Remnant	Remnant
Vegetation Structure	Open forest	Woodland
Vegetation Description	Remnant eucalypts with a weedy understory dominated by Lantana and Guinea grass. Generally flat with some historical undercutting erosion and man-made pits. Dry creek line following southern boundary of survey area. Trees with small hollows and terrestrial termite mounds with evidence of nesting observed.	Remnant eucalypts with a weedy understory dominated by Lantana and Guinea grass. Generally flat. Dry creek line following southern boundary of survey area. Trees with small hollows and terrestrial termite mounds with evidence of nesting observed.
Dominant vegetation species and strata	T1 <i>Corymbia citriodora subsp. variegata</i>	T1 <i>Corymbia citriodora subsp. variegata</i>
Dominant species height	15 m	15 m
EDL Cover	40%	30%
Land Zone	11 - Metamorphosed rocks, forming ranges, hills and lowlands	3 - alluvial river and creek flats, recent Quaternary alluvial systems
RE Verification	12.11.6 remnant 12 – Yes, on the boundary of bioregions 11 and 12 11 – Yes, on a flat, at base of hills to the south and west. 6 – Yes, dominated by <i>Corymbia citriodora subsp. variegata</i> with <i>Eucalyptus crebra</i> present.	12.11.6 remnant 12 – Yes, on the boundary of bioregions 11 and 12 11 – Yes, on a flat, at base of hills to the south and west. 6 – Yes, dominated by <i>Corymbia citriodora subsp. variegata</i> with <i>Eucalyptus crebra</i> present.
TEC key characteristics observed	No	No
Protected Plants or Threatened Species Observed	No	No
Habitat Observed	Arboreal termite mounds Earthen mounds Holes in ground Hollows Stags Stick piles Thick leaf litter Timber piles Exfoliating bark	Arboreal termite mounds Earthen mounds Holes in ground Hollows Hollow logs Stags Stick piles Timber piles
Koala Food Trees Present	<i>Blakella dallachiana</i> <i>Corymbia citriodora subsp. variegata</i>	<i>Blakella dallachiana</i> <i>Blakella tessellaris</i>

Appendix C: RE Verification

Site	1	2
	<i>Corymbia intermedia</i> <i>Eucalyptus crebra</i> <i>Eucalyptus exserta</i>	<i>Corymbia citriodora</i> subsp. <i>variegata</i> <i>Corymbia intermedia</i> <i>Eucalyptus crebra</i>
Restricted Invasive species / WoNS observed	<i>Cryptostegia grandiflora</i> <i>Lantana camara</i> <i>Solanum torvum</i>	<i>Cryptostegia grandiflora</i> <i>Lantana camara</i> <i>Lantana montevidensis</i>
Representative site photo		

Attachment D:

Photograph Log

Attachment D: Photograph Log

Quaternary Site Photographs

Site 1	Site 2
	

Grass trees

Location	Photos	Location	Photos
-23.840742, -151.171277		-23.840957, -151.168543	
-23.840841, -151.170557		-23.840746, -151.168633	

Habitat Features

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Stick pile	-23.840788, -151.171450		Earthen mound	-23.840746, -151.171449		Arboreal termite nest	-23.840700, -151.171484	
Leaf litter (widespread throughout)	-23.840752, -151.171324		Exfoliating bark	-23.840653, -151.171183		Arboreal termite nest	-23.840645, -151.171181	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Arboreal termite nest	-23.840630, -151.171178		Arboreal termite nest	-23.840617, -151.171183		Arboreal termite nest	-23.840638, -151.171194	
Stick pile	-23.840751, -151.171370		Hollow log	-23.840682, -151.171182		Bare area (scratched)	-23.840743, -151.171108	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Stag	-23.840737, -151.171091		Timber pile	-23.840639, -151.170868		Arboreal termite nest	-23.840637, -151.170877	
Arboreal termite nest	-23.840631, -151.170881		Arboreal termite nest	-23.840626, -151.170882		Potential arboreal hollow	-23.840723, -151.170833	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Exfoliating bark	-23.840685, -151.170860		Exfoliating bark	-23.840799, -151.170848		Potential arboreal hollow	-23.840761, -151.170638	
Arboreal termite nest	-23.840668, -151.170469		Deep burrow / hole	-23.840804, -151.170526		Arboreal termite nest	-23.840796, -151.170468	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Arboreal termite mound	-23.840633, -151.170119		Timber pile	-23.840621, -151.170118		Arboreal termite nest	-23.840533, -151.169950	
Macropod scats	-23.840525, -151.169847		Arboreal termite nest	-23.840525, -151.169802		Exfoliating bark (with potential scratches or rub marks)	-23.840512, -151.169621	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Arboreal termite nest	-23.840556, -151.169493		Hollow log	-23.840543, -151.169466		Arboreal termite nest	-23.840511, -151.169420	
Potential burrow / hole	-23.840507, -151.169331		Potential arboreal hollow	-23.840480, -151.169326		Arboreal termite nest	-23.840540, -151.169273	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Arboreal termite nest	-23.840494, -151.169129		Potential arboreal hollow	-23.840506, -151.169114		Potential burrow / hole	-23.840391, -151.168998	
Stick pile and Exfoliating bark	-23.840368, -151.168953		Arboreal termite nest	-23.840439, -151.168844		Stag	-23.840392, -151.168776	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Stag	-23.840829, -151.168606		Arboreal termite nest	-23.840801, -151.168845		Macropod scat	-23.840736, -151.168822	
Stag	-23.840786, -151.168848		Termite mound	-23.840806, -151.168966		Arboreal termite nest	-23.840821, -151.168977	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Arboreal termite nest	-23.841004, -151.169261		Ephemeral waterway	-23.841074, -151.169632		Earthen bank	-23.841170, -151.170144	
Macropod scat	-23.841137, -151.170406		Arboreal termite nest	-23.841206, -151.170509		Potential arboreal hollow	-23.841220, -151.170905	

Type	Location	Photos	Type	Location	Photos	Type	Location	Photos
Potential arboreal hollow	-23.841218, -151.170907		Hollow log	-23.840804, -151.171154		Arboreal termite nest	-23.841136, -151.171350	

Attachment E:

Species Lists

Appendix E: Species Lists

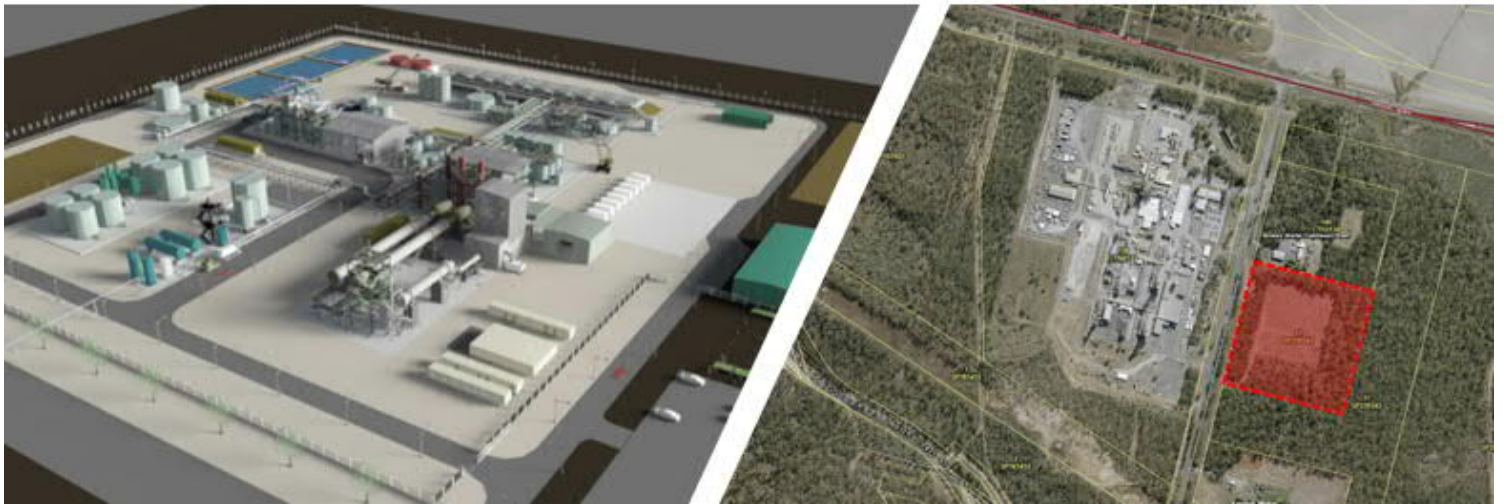
Flora Species List

Family	Scientific Name	Common Name	Site 1	Site 2
Leguminosae	<i>Acacia falciformis</i>	Broad-leaved hickory	✕	
Leguminosae	<i>Acacia leiocalyx</i>	Black wattle	✕	✕
Casuarinaceae	<i>Allocasuarina torulosa</i>	Forest she-oak		✕
Rhamnaceae	<i>Alphitonia excelsa</i>	Soap tree	✕	✕
Poaceae	<i>Aristida leptopoda</i>	White speargrass	✕	✕
Poaceae	<i>Arundinella nepalensis</i>	Reedgrass	✕	✕
Myrtaceae	<i>Blakella dallachiana</i>	Dallachy's gum		✕
Myrtaceae	<i>Blakella tessellaris</i>	Moreton Bay ash	✕	✕
Lauraceae	<i>Cassytha filiformis</i>	Dodder laurel	✕	✕
Rubiaceae	<i>Coelospermum reticulatum</i>	Medicine bush		✕
Boraginaceae	<i>Cordia dichotoma</i>	Snotty gobble	✕	
Myrtaceae	<i>Corymbia citriodora</i> subsp. <i>variegata</i>	Spotted gum	✕	✕
Myrtaceae	<i>Corymbia intermedia</i>	Pink bloodwood	✕	✕
Apocynaceae	<i>Cryptostegia grandiflora</i>	Rubber vine	✕	✕
Orchidaceae	<i>Cymbidium canaliculatum</i>	Black orchid	✕	✕
Poaceae	<i>Cymbopogon refractus</i>	Barbed-wire grass	✕	
Leguminosae	<i>Desmodium rhytidophyllum</i>	Desmodium	✕	✕
Leguminosae	<i>Erythrina vespertilio</i>	Bats wing coral		✕
Myrtaceae	<i>Eucalyptus crebra</i>	Narrow-leaved ironbark	✕	✕
Myrtaceae	<i>Eucalyptus exserta</i>	Queensland peppermint	✕	
Moraceae	<i>Ficus opposita</i>	Sandpaper fig	✕	✕
Cyperaceae	<i>Fimbristylis dichotoma</i>	Common fringerush	✕	✕
Leguminosae	<i>Flemingia parviflora</i>	Flemingia		✕
Hemerocallidaceae	<i>Geitonoplesium cymosum</i>	Scrambling lily	✕	
Sparrmanniaceae	<i>Grewia latifolia</i>	Dysentery plant	✕	✕
Malvaceae	<i>Hibiscus divaricatus</i>	Native hibiscus		
Poaceae	<i>Hyparrhenia rufa</i>	Thatch grass	✕	
Poaceae	<i>Imperata cylindrica</i>	Blady grass	✕	✕
Verbenaceae	<i>Lantana camara</i>	Lantana	✕	✕
Verbenaceae	<i>Lantana montevidensis</i>	Creeping lantana		✕
Lindsaeaceae	<i>Lindsaea brachypoda</i>		✕	
Arecaceae	<i>Livistona australis</i>	Cabbage palm		✕
Laxmanniaceae	<i>Lomandra hystrix</i>	Matrush	✕	
Laxmanniaceae	<i>Lomandra longifolia</i>	Longleaf matrush	✕	✕
Myrtaceae	<i>Lophostemon confertus</i>	Brushbox	✕	✕
Poaceae	<i>Megathyrsus maximus</i>	Guinea grass	✕	✕
Myrtaceae	<i>Melaleuca leucadendra</i>	Broad-leaved-tea-tree	✕	
Passifloraceae	<i>Passiflora suberosa</i>	Corky passion flower	✕	✕
Picrodendraceae	<i>Petalostigma pubescens</i>	Quinine tree	✕	
Lecythidaceae	<i>Planchonia careya</i>	Cockatoo apple	✕	✕
Asteraceae	<i>Praxelis clematidea</i>	Praxelis	✕	
Malvaceae	<i>Sida acuta</i>	Spinyhead sida	✕	
Malvaceae	<i>Sida hackettiana</i>	Queensland hemp	✕	✕
Solanaceae	<i>Solanum torvum</i>	Devil's fig	✕	
Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Jamacia snakeweed		✕
Menispermaceae	<i>Stephania japonica</i> var. <i>discolor</i>	Tape vine	✕	
Poaceae	<i>Urochloa panicoides</i>	Liverseed grass		✕
Xanthorrhoeaceae	<i>Xanthorrhoea johnsonii</i>	Grasstree	✕	✕

Appendix E: Species Lists		
Fauna Species List		
Family	Scientific Name	Common Name
Corvidae	<i>Corvus orru</i>	Torresian crow
Psittaculidae	<i>Aprosmictus erythropterus</i>	Red wing parrot
Psittaculidae	<i>Trichoglossus moluccanus</i>	Rainbow lorikeet
Rhipiduridae	<i>Rhipidura albiscapa</i>	Grey fantail
Alcedinidae	<i>Todiramphus macleayii</i>	Forest kingfisher



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PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: AP2025/002

Alpha HPA Project, Yarwun Traffic Impact Assessment October 2021

Prepared for Alpha HPA Limited



Quality Information

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C	19/10/2021	Final (Revised Site Plan)	Andrew Barrie Principal Traffic Engineer RPEQ 12801	

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Executive Summary

Access Traffic Consulting (ATC) was commissioned by Alpha HPA Limited to undertake a Traffic Impact Assessment (TIA) for the proposed Special Industry Development (High Purity Aluminium (HPA) Processing Plant) and Linear Infrastructure Facility, located in Yarwun to the west of the township of Gladstone, on the land parcel formally described as Lot 12 SP239343.

It is understood that that applicant proposes to develop the facility in two stages, the first of which will include the construction of a smaller precursor production facility (PPF), while the second will full development of the overall processing plant and linear infrastructure facility.

The Project site is located within the state controlled Gladstone State Development Area (GSDA), which is within the Gladstone Regional Council (GRC) Local Government Area and proposes direct access to the site be provided from the GRC controlled Reid Road, with Project traffic also expected to utilise the adjacent State-controlled Gladstone - Mount Larcom Road and the corresponding intersection of Gladstone - Mount Larcom Road and Reid Road.

As such a Traffic Impact Assessment (TIA) has been carried out to establish the traffic impacts of the Project on the operation of both the local Council and State-controlled road networks, considering the relevant State government guidelines and Council controls, including the Department of Transport and Main Roads' Guide to Traffic Impact Assessment (GTIA) December 2018 and the Gladstone Regional Planning Scheme (Ver 2) 2017.

As part of the assessment a review of the preliminary plan of development for both the Stage 1 and Stage 2 site areas for the Alpha HPA Project was undertaken. While it is noted that the provided site layouts are preliminary only, with further detailed design works expected to be completed as part of the subsequent Operational Works phase of the Project in response to the conditions of the development application, the following comments can be provided regarding the proposed site layout:

- The preliminary layouts for both the Stage 1 and Stage 2 site areas are considered clear and legible, with adequate vehicle circulation and set down areas located throughout the Project site areas.
- The proposed parking area for the Project, located in the south-western corner of the site, initially provides 40 parking spaces as part of Stage 1, and then 70 spaces as part of Stage 2. This proposed parking provision is expected to be adequate to accommodate the expected maximum staff numbers on site at any time for both Stage 1 (approx. 21 staff) and Stage 2 (approx. 58 staff), as well as a nominal provision for visitor parking.
- The two nominated site accesses, proposed to be located approximately 505m (Stage 1) and 740m (Stage 2 – existing access) south of Gladstone – Mount Larcom Road, and catering for the heavy vehicle and staff movements respectively, are considered appropriate.
- Based on a review of the forecast construction and operations phase Project traffic volumes at both access points, it has been determined that the use of the existing site access for Stage 1 and the provision of a new Type B2 (9m) access from Reid Road (in accordance with Standard Drawing CMDG-R-042A) as part of the Stage 2 of the Project, is expected to be adequate to cater for the expected volume and vehicle configuration of traffic associated with the construction and operations phase of each stage of the Project.

In addition to the review of the internal transport facilities completed, an assessment of the potential traffic and pavement impact of the proposed development on the external road network was also undertaken. This assessment identified:

- That based on the identified increases in daily traffic volumes from the various stages of the Project (Stage 1 construction, Stage 2 construction including Stage 1 operations & Stage 1 & 2 operations), the calculated daily "post development" link volumes under each identified traffic scenario were still well within the nominated capacities of both Gladstone – Mount Larcom Road (arterial road / highway - approx. 15,000 vpd) and Reid Road (local rural distributor road - 5,000 vpd).

As such the additional traffic from the proposed staged development of the Alpha HPA Facility is not anticipated to have a significant impact on the operation of the surrounding state or local government controlled road links.

- That based on the detailed intersection analysis completed the existing signalised configuration of the key Gladstone – Mount Larcom Road / Reid Road intersection was shown to operate satisfactorily under the required post development traffic conditions during the Stage 1 construction phase (2022), Stage 2 construction phase (2023) and at the year of opening of the overall facility (2024). As such it can be seen that the introduction of additional traffic from the Project will have a minimal impact on the operation of the intersection.
- Further to this, the calculated increase in intersection delay during the operations phase of the overall Alpha HPA Facility was approximately 0.28%, meaning that no works are required at the existing Gladstone – Mount Larcom Road / Reid Road intersection to mitigate the impacts of the Project.
- That the HV movements associated with the staged development of the Project are expected to lead to negligible increases in pavement loadings on all identified sections of the state-controlled road network, with most calculated increase values below the typical 5% increase trigger threshold.
- That the additional vehicle movements generated by the both the Stage 1 and Stage 2 construction phases will lead to increases in pavement loadings of >5% on the GRC controlled link of Reid Road. As a result, GRC may request a contribution from Alpha HPA for the increased road maintenance costs as a means to offset or mitigate the impact of the additional pavement loadings from the Stage 1 and Stage 2 construction phases of the Project on the existing sealed road pavement of Reid Road. Further to this it was recommended that the value of any contribution is to be based on the percentage increase in pavement loadings, with reference to GRC's current maintenance expenditure.
- It is also recommended that pre and post construction dilapidation inspections be undertaken for both the Stage 1 and Stage 2 construction phases to ensure that the relevant sections of Reid Road are left in a similar condition to that observed prior to the commencement of the construction works for each stage of the Project.
- That based on the relatively low volume of heavy vehicles (approx. 10vpd) generated by overall (Stage 1 and Stage 2) operations phase of the Project, and the existing heavy vehicle movements on the relevant sections of the state controlled road network and Reid Road (in particular those generated by the adjacent Orica Ammonium Nitrate facility), that the pavement impacts of the operation of the proposed Alpha HPA facility are expected to be minimal and no further pavement mitigation measures are considered necessary as part of the ongoing operations of the Project (post construction).

Based on the results of the assessments identified above, it was determined that conditional to the provision of a mitigation measure agreed with Council to offset the potential pavement impacts of the Stage 1 and Stage 2 construction works on Reid Road, that the proposed staged development of the Alpha HPA Project will have a minor impact on the surrounding road network and can therefore be recommended to be approved from a traffic engineering perspective.

1.0 Introduction and Summary

1.1 Project Background

The applicant proposes to establish a Special Industry (HPA Processing Plant and Linear Infrastructure Facility) on the land parcel formally described as Lot 12 SP239343, located to the east of Reid Road in Yarwun, Queensland.

It is understood that that applicant proposes to develop the facility in two stages, the first of which will include the construction of a smaller precursor production facility (PPF), while the second will full development of the overall processing plant and linear infrastructure facility.

1.2 Project Context

Access Traffic Consulting (ATC) was commissioned by Alpha HPA Limited to undertake a Traffic Impact Assessment (TIA) for the proposed Special Industry (HPA Processing Plant and Linear Infrastructure Facility - the Project).

The Project site is located within the Gladstone State Development Area, to the west of the regional centre of Gladstone, with access proposed to be provided via the GRC controlled Reid Road. In addition, the Project traffic is also expected to utilise the adjacent State-controlled network including Gladstone-Mount Larcom Road (locally known as Hanson Road) and the adjacent Gladstone-Mount Larcom Road / Reid Road intersection.

The Traffic Impact Assessment (TIA) was carried out to determine the level of potential impacts of the Project on the operation of both the local Council and State-controlled road networks, and as such the proposal has been assessed considering the relevant State government guidelines and Council controls, including the Department of Transport and Main Roads' Guide to Traffic Impact Assessment (GTIA) December 2018 and the Gladstone Regional Planning Scheme (Ver 2) 2017.

This Traffic Impact Assessment (TIA) was carried out to determine the level of potential impacts of both the construction and operational phases of the Project on the operation of the surrounding road network, with the outcomes of the TIA to be provided in support of the subsequent development application.

The assessment methodology adopted for this TIA is summarised in the key tasks listed below.

- Broadly identify the existing transport infrastructure which is of relevance to the Project.
- Estimate traffic generation associated with the construction and operational phases of the Project and the distribution of this development traffic on the identified road network, including the movement of materials, plant and equipment in addition to the construction and operational phase workforces.
- Assess the potential impact of the estimated Project traffic on the operation of the surrounding transport network during both the construction and operational phases of the Project.
- Establish potential mitigation and management strategies to be implemented during the construction and operational phases of the Project to offset any identified impacts (if required).

As outlined above, the adopted methodology centres on establishing a background or "pre development" traffic scenario for the identified transport routes and comparing this with a scenario including the Project-generated traffic, i.e. the "with development" scenario.

This process allows for the assessment of the traffic impacts of the Project in terms of road safety, access requirements, intersection operations, road link capacity, pavement and other transport infrastructure. Following this, if required, potential mitigation and/or management measures would be formulated to address the potential traffic impacts caused by the proposed Project.

1.2.1 Scope and Study Area and Scope

As identified above, the proposed HPA extraction facility is to be located on Lot 12 SP239343, opposite the existing Orica Ammonium Nitrate plant and adjacent to the Yarwun Water Treatment Plant. The site is located on the eastern side of Reid Road, as shown in **Figure 1** over page.



Figure 1 Study Area – Lot 12 SP239343 (Reid Road, Yarwun)

[Source: Qld Globe]

1.2.2 Previous Road Authority Advice

1.2.2.1 OCG Pre-lodgement Meeting

As part of the development application process a pre-lodgement meeting was held with representatives of the Office of Co-ordinator General (OCG), with no specific concerns regarding the traffic impact of the proposed development raised by the relevant authorities.

A traffic impact assessment was completed to identify the expected traffic impacts of the Project on the surrounding state and local government controlled road networks. The TIA seeks to demonstrate compliance with the applicable State Code requirements and applicable assessment criteria of the Gladstone State Development Area Development Scheme.

1.3 Data Sources

The following sources of data have been used for the purpose of this assessment:

- TMR AADT Road Segment Data (2019) for (181 - Gladstone-Mt Larcom Road) – refer **Appendix A**.
- Intersection turning movement count of the existing Gladstone-Mt Larcom Road / Reid Road intersection undertaken on Tuesday 14 July 2020 by Austraffic Pty Ltd. The raw traffic data from this intersection count is included for reference as **Appendix B**.
- Queensland Globe (<https://qldglobe.information.qld.gov.au>) - crash data in vicinity of the site.

2.0 Existing Conditions

2.1 Land Use and Zoning

The subject site of the proposed industrial HPA extraction facility (Lot 12 SP239343) is approximately 9.2 hectares in area and is located within the “Medium – High Impact and Port Related Industry Precinct” of the Gladstone State Development Area (GSDA), as shown in **Figure 2**.

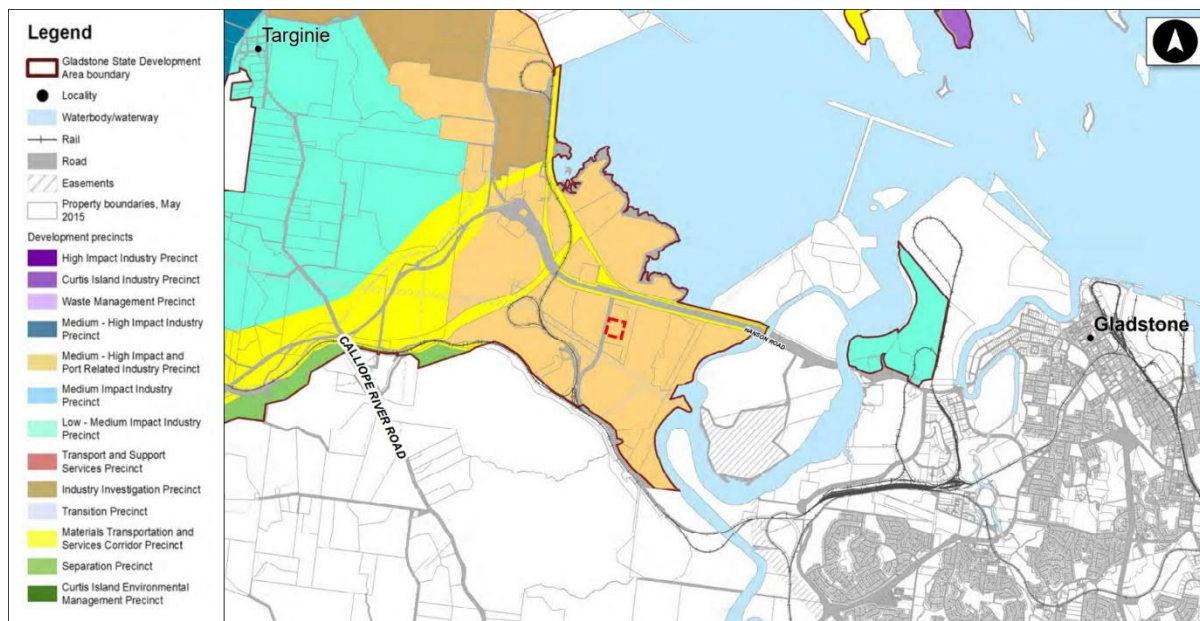


Figure 2 Land Use Zoning – Lot 12 SP239343

[Source: GSDA Planning Scheme]

2.2 Adjacent Land Use / Approvals

As shown in **Figure 2** above, the surrounding land is also located within the Medium – High Impact and Port Related Industry Zone Precinct of the GSDA. As previously identified, the Project site is located opposite the Orica Ammonium Nitrate facility (Lot 138 CTN2123) and adjacent to the Yarwun Water Treatment Plant (Lots 139-140 CTN2130).

Further to this, no current development approvals are understood to be currently held over adjacent lots that would be relevant to the proposed development. As such the impact of the use of the adjacent land use on the proposal is expected to be minimal.

2.3 Surrounding Road Network Details

2.3.1 Project Transport Routes

This section describes the road transport networks expected to be utilised by the Project, which were established from the following information regarding the expected construction and operations activities associated with the Project provided by Alpha HPA Ltd.

- In general the earthworks materials will be imported to site from local quarries, in particular the quarry site to the west of the Project site on Quarry Road and transported to the site via Truck & 4 Axle Dog configurations (assumed) via Gladstone-Mount Larcom Road and Reid Road.
- The remaining construction materials, equipment, componentry and plant for the proposed facility will be delivered to site via road transport from Gladstone, again utilising sections of Gladstone-Mount Larcom Road and Reid Road.
- Construction staff for the Project are expected to commute daily between Gladstone and the site, using private vehicles.
- Similarly, operations staff for the Project are expected to also commute daily between Gladstone and the site, utilising private vehicles.

- Finally, the expected heavy vehicle movements during the Project's operations phase including incoming material deliveries, product export waste removal and miscellaneous deliveries, are all expected to travel between Gladstone and the site.

Based on this information, the Project is anticipated to utilise the following transport routes, as shown diagrammatically in **Figure 3**:

State (TMR) Controlled Roads

- Gladstone – Mount Larcom Road (181) - Ch. 0.000 km to Ch. 19.030 km.

Local Government (GRC) Controlled Roads

- Reid Road – Ch. 0.000 km to Ch. 0.700 km.



Figure 3 Project Transport Routes

[Source: QLD Globe]

2.3.2 Road Links

Reference has been made to the existing road hierarchy identified in Council's Planning Scheme, with the classifications of the sections of the road network expected to be utilised by Project traffic shown in **Figure 4** below, with further details of the relevant road links provided in the following sections.

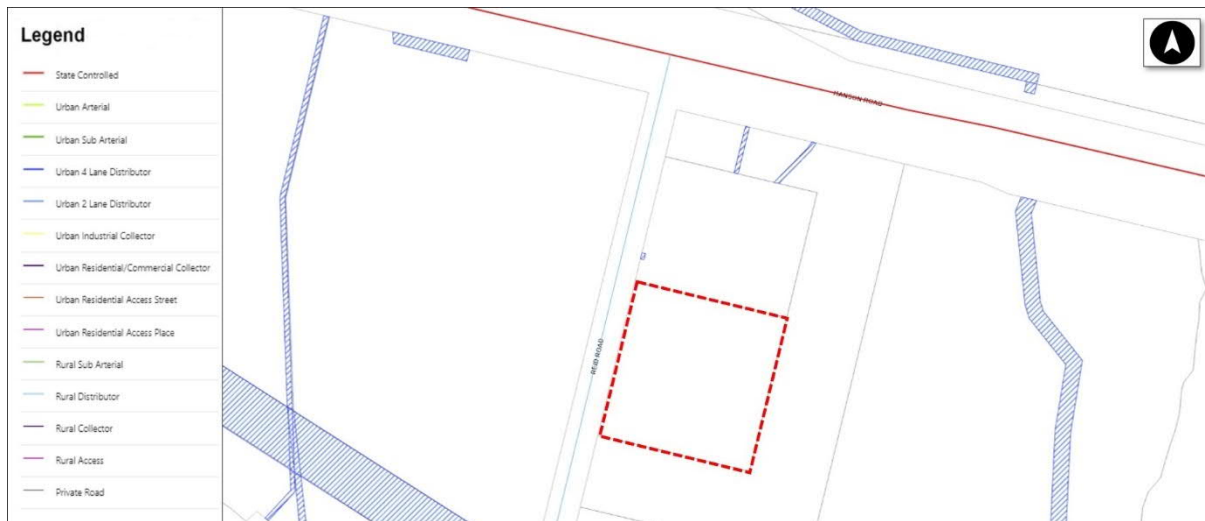


Figure 4 GRC Existing Road Hierarchy

[Source: GRC Online Mapping]

2.3.2.1 Gladstone - Mount Larcom Road (181)

The section of Gladstone – Mount Larcom Road expected to be relevant to the Project is the segment of the link between its intersections with the Dawson Highway (in Gladstone) to the east of the site and Quarry Road (TMR Ch. 19.030 km) to the west.

Gladstone – Mount Larcom Road is an approved B-Double route and contains both urban and rural road conditions, with the urban section within Gladstone operating as a two-way, four lane, median divided

carriageway with a posted speed limit of 60km/h before transitioning to a higher speed (100 km/h) rural connection with a standard two-way, two lane configuration. The section of the link adjacent to the Project site is currently configured as a two-way, two lane carriageway with a posted speed of 80km/h, with a four lane configuration provided approximately 500m to the east of the Reid Road intersection.

2.3.2.2 Reid Road

Reid Road is a local road under the jurisdiction of GRC and is designated as a “Rural Distributor” road under Council’s road hierarchy (refer **Figure 4**) that provides access to the Orica facility and water treatment plant in its northern section, as well as rail facilities in the south-east.

The main section of Reid Road relevant to the Project is the 740m length of the link spanning between Gladstone – Mount Larcom Road and the existing access into the subject site, which currently operates as a sealed two-way, two lane rural road with an 7m wide undivided cross-section (refer **Figure 5** and **Figure 6**), with a posted speed limit of 60km/hr.



Figure 5 Reid Road Configuration (Looking North)



Figure 6 Reid Road Configuration (Looking South)

It is also noted that the section of Reid Road between the current site access and the access to the Economic Development Queensland (EDQ) borrow site to the south (approx. Ch. 2.600km) will also be utilised by a small number of Project vehicles during the earthworks phase of the Stage 1 construction works, however no further use of this section of the link is proposed in the larger Stage 2 works.

2.3.3 Intersections

In addition to the road links discussed above, the state controlled intersection of Gladstone – Mount Larcom Road / Reid Road, located to the north of the Project site has been identified as relevant to the assessment. Further details of this intersection are provided below.

2.3.3.1 Gladstone-Mount Larcom Road / Reid Road

As shown in **Figure 7** below, the intersection of Gladstone – Mount Larcom Road / Reid Road currently operates as a three-way signalised intersection, with the state controlled Gladstone – Mount Larcom Road functioning as the major road and the southern Reid Road leg forming the minor side road approach.

The existing configuration of the intersection provides one through lane in each direction of travel on Gladstone – Mount Larcom Road, with a 105m channelised right turn lane on the western approach and a 115m long left turn lane on the eastern approach. A single entry and exit lane is provided on the minor Reid Road approach.

Based on site observations, the signals are also understood to run under standard 3 phase operation, with an indicative phasing shown in **Figure 8**.



Figure 7 Existing Gladstone-Mount Larcom Road / Reid Road Intersection, Yarwun

[Source: Qld Globe]

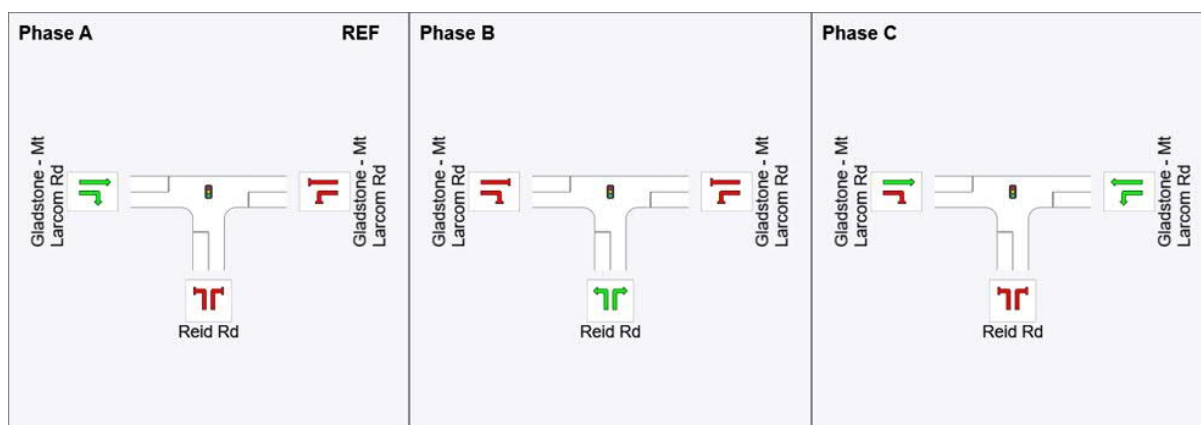


Figure 8 Gladstone-Mount Larcom Road / Reid Road Intersection – Indicative Signal Phasing

2.4 Existing Traffic Volumes

2.4.1 Road Link Volumes

The background traffic volumes for the relevant section of the state-controlled road network, Gladstone – Mount Larcom Road were established using the available 2019 AADT segment traffic count data provided by TMR (refer **Appendix A**).

Using the provided traffic volumes (2018) and identified 10-year growth rates (average growth rate, compounding annually) for the relevant road sections forecasts of the current (2020) traffic volumes on the road network were established. It is noted that for any segments where a historical 10-year growth rate was negative, which was the case for all sections of Gladstone-Mount Larcom Road, a conservative growth rate of 1.0% was also applied to the estimate volumes.

Further to this, as no traffic count data was available for the relevant sections of Reid Road, estimates of the daily traffic volumes on this link were established from the recorded peak hour inbound and outbound traffic volumes as identified in the intersection counts undertaken (refer **Appendix B**). The daily directional volumes were estimated by assuming the peak hour is approximately 15% of the overall daily (ADT) traffic volume. It is noted that the heavy vehicle percentages for each direction identified from the count volumes were also adopted as the daily heavy vehicle percentages, while a daily directional split of 50/50 has been assumed for the purpose of this assessment. In addition, the volumes on Reid Road were also assumed to reduce the further south from Gladstone-Mount Larcom Road travelled, to account for traffic exiting the link into the adjacent Orica Ammonium Nitrate facility via the existing accesses along the length of Reid Road.

To estimate the volumes the identified subsections of Reid Road the following assumptions were adopted:

- 10% of light vehicles and 50% of heavy vehicles will leave Reid Road at the first Orica access located 275m south of Gladstone-Mt Larcom Road.
- A further 80% of light vehicles will leave Reid Road at the second Orica access (to parking area) located 430m south of Gladstone-Mt Larcom Road.
- An additional 10% of light vehicles and 50% of heavy vehicles will leave Reid Road at the third Orica access located 710m south of Gladstone-Mt Larcom Road.

Based on the assumptions outlined above, the forecast background traffic volumes for each of the relevant road segments at the adopted design horizons were established, with a summary provided in **Table 1**.

Table 1 Existing (2020) AADT Traffic Volumes

Site ID	Road Segment		Base Data Year	Base Year AADT				10 Yr. GR %	Background AADT (2021)			
	Start (km)	End (km)		Gaz	% HV	A-Gaz	% HV		Gaz		A-Gaz	
									Total	HV	Total	HV
Gladstone-Mount Larcom Road (181)												
60071	0.000	1.409	2019	3,563	18.52%	3,085	15.24%	1.00%	3,635	673	3,147	480
60073	1.409	3.258	2018	3,025	16.07%	3,150	16.16%	1.00%	3,117	501	3,245	524
61052	3.258	4.625		4,706	11.52%	4,542	14.11%	1.00%	4,849	559	4,680	660
60074	4.625	9.833		3,206	13.54%	3,189	15.96%	1.00%	3,303	447	3,286	524
	9.833	12.292		3,206	13.54%	3,189	15.96%	1.00%	3,303	447	3,286	524
60076	12.292	19.030		1,480	21.89%	1,482	30.23%	1.00%	1,525	334	1,527	462
	19.030	32.140		1,480	21.89%	1,482	30.23%	1.00%	1,525	334	1,527	462
Reid Road **												
GRC	0.000	0.275	2020	351	6.84%	351	6.84%	1.00%	355	24	355	24
	0.275	0.430		306	3.92%	306	3.92%	1.00%	309	12	309	12
	0.430	0.505		45	26.85%	45	26.85%	1.00%	45	12	45	12
	0.505	0.710		45	26.85%	45	26.85%	1.00%	45	12	45	12
	0.710	0.740		16	10.00%	16	10.00%	1.00%	16	2	16	2
	0.740	2.600		16	10.00%	16	10.00%	1.00%	16	2	16	2

** Chainage and gazetted direction for Reid Road assumed to be south from Gladstone-Mount Larcom Road.

TMR Ch. 9.833km (181) – Gladstone-Mount Larcom Road / Reid Road intersection.

TMR Ch. 14.284km (832) – Gladstone-Mount Larcom Road / Quarry Road intersection.

Ch. 0.275km Reid Road – Existing Orica (1st) access.

Ch. 0.430km Reid Road – Existing Orica (2nd) access.

Ch. 0.505km Reid Road – Proposed Alpha HPA site access (Stage 2).

Ch. 0.710km Reid Road – Existing Orica (3rd) access.

Ch. 0.740km Reid Road – Proposed Alpha HPA site access (Stage 1).

Ch. 2.600km Reid Road – EDQ Borrow Pit access.

2.4.2 Intersection Volumes

Peak period traffic counts were undertaken at the Gladstone – Mount Larcom Road / Reid Road intersection by Austraffic Pty Ltd on Tuesday 14 July 2020. A copy of the raw data for this count is provided for reference in **Appendix B**, with the recorded data indicating that the traffic peak hours at the intersection occurred from 6am – 7am and between 4pm – 5pm, with a summary of the recorded turning movement volumes during these periods shown in **Figure 9** and **Figure 10**.

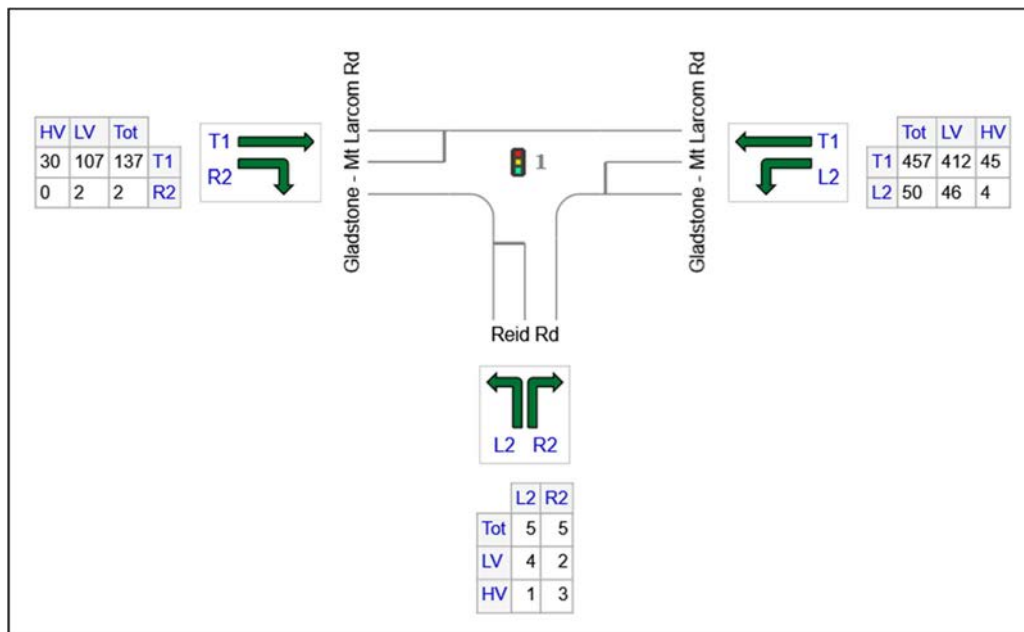


Figure 9 2021 AM Peak Hour Traffic Volumes – Gladstone-Mt Larcom Road / Reid Road Intersection

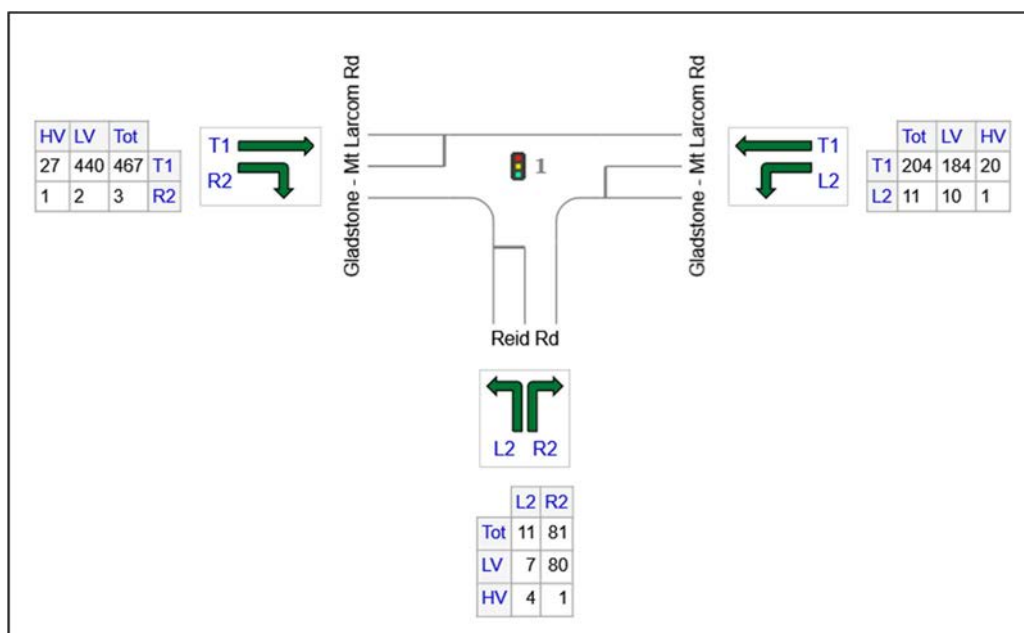


Figure 10 2021 AM Peak Hour Traffic Volumes – Gladstone-Mt Larcom Road / Reid Road Intersection

2.5 Site Access

The existing vehicular access to the site is provided via an existing sealed access located on the southern boundary of the site, approximately 740m south of the Gladstone-Mount Larcom Road / Reid Road intersection. Based on preliminary survey, the access provides approximately 9m of width across the midsection of the access and provides a width of approximately 6.0-6.7m within the subject site.

All inbound and outbound vehicle movements are currently supported by the existing access, and based on site measurements undertaken, suitable access site distances are available to/from both directions of travel on Reid Road. The current configuration of the existing site access is shown further in **Figure 11** below.



Figure 11 Existing Project Site Access Configuration

2.6 Intersection and Network Performance

2.6.1 Road Links

Based on the current (2021) background daily traffic volumes on the relevant sections of the Gladstone-Mount Larcom Road (6,589 vpd) and Reid Road (up to approx. 709 vpd), the links can be seen to be currently operating satisfactorily and well within the capacity of a rural arterial road / highway (approx. 15,000 vpd) and local rural distributor road (5,000 vpd) respectively.

2.6.2 Intersections

The existing traffic volumes at the Gladstone-Mount Larcom / Reid Road intersection identified in **Figure 9** and **Figure 10** above were utilised to undertake preliminary intersection analysis (using SIDRA software) to establish the operational performance of the intersection under current (2021) traffic conditions. A summary of the results is provided in **Table 2**, with further detailed results included in **Appendix C**.

Table 2 2020 (Existing) SIDRA Results – Gladstone-Mount Larcom Rd / Reid Rd intersection (Existing Configuration)

Analysis Scenario	Intersection Degree of Saturation	Intersection Level of Service	Intersection Average Delay (sec)	Maximum 95% Back of Queue Length (m)
Gladstone-Mount Larcom Road / Reid Road				
2021 AM Peak	0.708	LOS B	10.1	52.8
2021 PM Peak	0.647	LOS A	9.7	47.0

The results above indicate that the existing configuration of the Gladstone-Mt Larcom Road / Reid Road intersection operates adequately under current traffic conditions (2021), with all values for DOS, average delay and vehicle queueing being within acceptable limits of operation for a signalised intersection.

2.7 Road Safety

2.7.1 Road Crash History Review

A review of the road crash history in proximity to the proposed Project site was undertaken based on the available road crash data from the Queensland Globe database, which includes data from 2001-2019. The standard practice for road crash analysis is to review the data from the most recent 5-year period (i.e. 2015 – 2019 inclusive) and based on this it was noted that no recorded accidents have occurred in the vicinity of the site in the last 10 years.

In light of this, it is not considered that there is an existing safety issue on the network in the vicinity of the site which needs to be addressed as part of the proposed Project.

3.0 Proposed Development Details

As identified above, it is understood that the Project is proposed to be developed in two stages. The first stage is understood to include the construction of a smaller precursor production facility (PPF) on the south-eastern corner of the subject site, while the second stage of the Project will see the full development of the overall processing plant and linear infrastructure facility.

Further details of the identified stages of the Project are provided in the following sections.

3.1 Stage 1 (Precursor Production Facility – PPF)

3.1.1 Plan of Development (Stage 1)

The initial stage of the Project includes the construction of a precursor production facility which will focus on the manufacture and sale of 5N Ultra Aluminium Precursor salts including Ultra Aluminium Nitrate and Ultra Aluminium Sulfate and have a production capacity of approximately 10-20 MT per month.

Figure 12 below identifies the indicative layout of the PPF (Stage 1), including the proposed site access location, internal access road alignment and vehicle circulation arrangements and the approximate locations of the relevant plant, site facilities and vehicle parking area.

A copy of the relevant Stage 1 plan of development has also been included for reference as **Appendix D**.

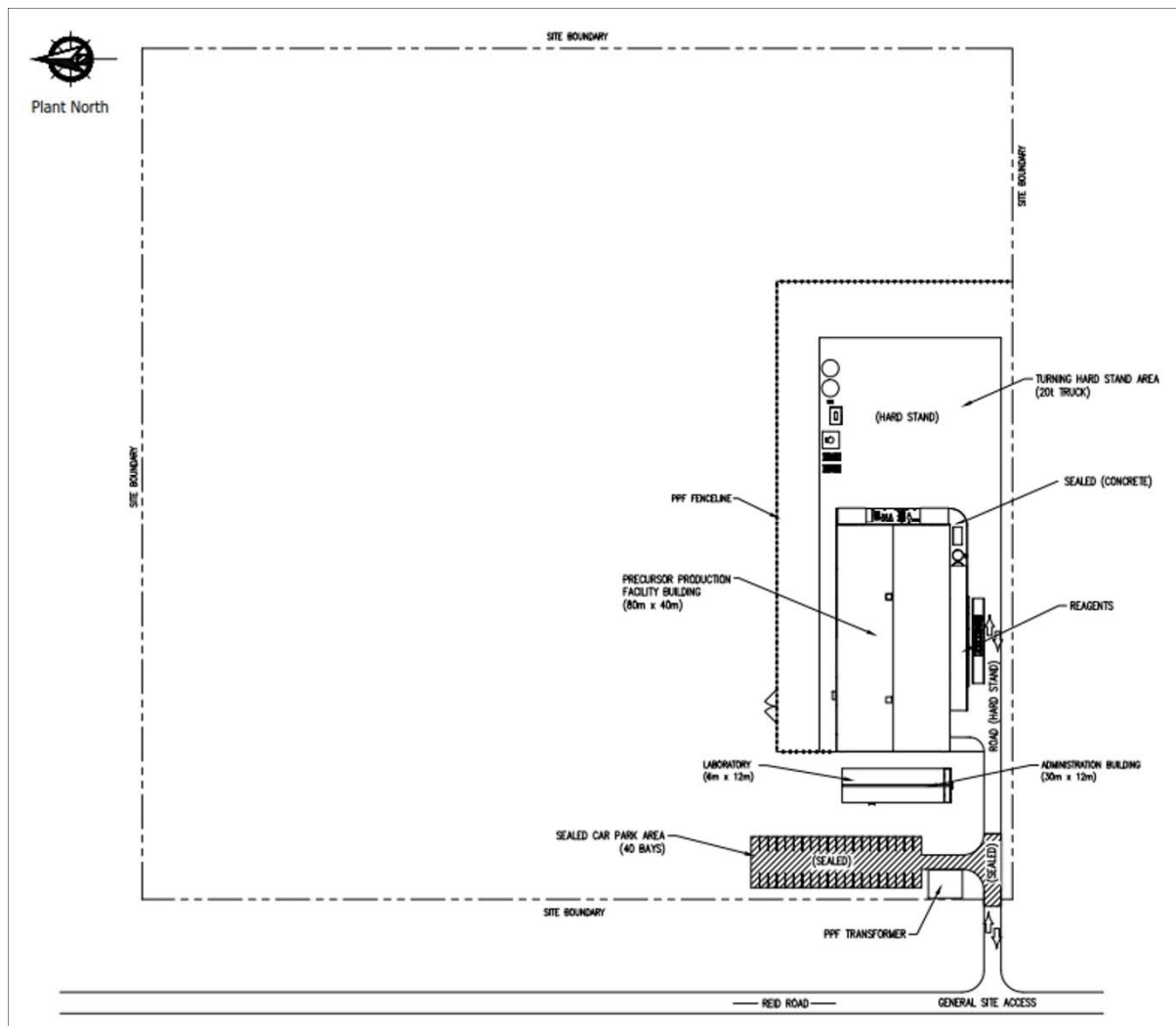


Figure 12 Stage 1 (PPF) Plan of Development – Alpha HPA Project

[Source: Dwg. MC1868-G-030_E]

3.1.2 Construction Phase Details (Stage 1)

Based on information provided by Alpha HPA it is understood that the construction of the PPF as part of the Stage 1 of the Project is anticipated to commence in November 2021 (pending approvals) with an expected construction timeframe of 10 months through to August 2022. Further to this, it is understood that the proposed construction works will be undertaken approximately 12 hours per day, 5 day per week.

The proposed Stage 1 construction works are anticipated to include periods for site earthworks, civil works, structural mechanical piping (SMP), electrical and instrumentation (E&I) and site commissioning, with an indicative schedule outlined in **Figure 13**.

ID	Task	Duration	Month									
			Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-24
			1	2	3	4	5	6	7	8	9	10
A	Earthworks	2 M										
B	Civil	3 M										
C	SMP	4 M										
D	E&I	5 M										
E	Commissioning	1 M										
F	EPCM	10 M										

Figure 13 Stage 1 (PPF) Alpha HPA Project – Indicative Project Schedule

3.1.3 Proposed Access and Parking

3.1.3.1 Site Access (Stage 1)

As identified in **Figure 12** above, it is proposed that access to the Stage 1 (PPF) Project site will be gained via the existing access point to Lot 12 SP239343 from Reid Road, located approximately 740m to the south of Gladstone – Mount Larcom Road. This access is proposed to be the sole access point to the Project site during Stage 1, catering for the staff (light) vehicle and limited heavy vehicle movements associated with the construction and operation of the precursor production facility.

As identified above, the existing access currently provides approximately 9m of width across the midsection of the access and provides a width of approximately 6.0-6.7m within the subject site, which is noted to be between the recommended dimensions of a B1 and B2 type commercial/industrial driveway as per CMDG standard drawing CMDG-R-042A (refer **Appendix E**).

Notwithstanding this, based on the rural nature of the road environment, the temporary nature of construction (10 months overall – 4 months peak traffic) and the relatively low volume of heavy vehicles during construction (18vpd peak – 1 month / average 2-6vpd) the existing site access is anticipated to be suitable to cater for the expected construction traffic associated with Stage 1 of the Project.

Further to this, the existing site access configuration is also expected to be suitable to cater for the ongoing traffic volumes at the access, due to the relatively low number of parking bays serviced (approx. 40 Stage 1 / 70 vpd Stage 2) and the limited volume of heavy vehicles proposed to utilise this access point (2 vpd – Stage 1 operations).

3.1.3.2 Internal Site Facilities (Stage 1)

The finalisation of the Stage 1 site layout is expected to be undertaken as part of the Operational Works stage of the Project, however the current layout as shown in **Figure 12** is considered clear and legible, with adequate vehicle circulation and set down areas provided within the precursor production facility. The proposed Stage 1 site layout (refer **Figure 12**) also identifies the provision of an on-site parking area on the south-eastern corner of the site. It is noted that the configuration of this parking area is currently preliminary only and will be confirmed as part of the subsequent detailed design works for the Project, in accordance with the requirements of all relevant standards, guidelines and policies including AS2890.1.

In addition, the number of car parking spaces proposed in the Stage 1 parking area (40 spaces) is expected to be adequate to accommodate the parking demand from the maximum staff numbers on site at any time (approx. 21 staff) and a nominal provision for visitor parking (3-5 spaces).

Finally, it is also noted that due to the abundance of suitable vacant land on site and the provided setback of the proposed PPF to Reid Road, it is anticipated that the Stage 1 construction phase parking demand will be adequately catered for on site. As such it is not expected that the either the construction or operations phase of the precursor production facility (PPF – Stage 1) will lead to any overspill of vehicles or parking onto the surrounding road network.

3.2 Stage 2 (Overall HPA Processing Plant and Linear Infrastructure Facility)

3.2.1 Plan of Development (Stage 2)

As noted above, Stage 2 is proposed to include the construction of the remainder of the overall HPA processing plant and linear infrastructure facility on the subject site, which when completed is proposed to produce approximately 10,000 tonnes of HPA equivalent per year.

An indicative layout of the overall facility, showing the integration of Stage 1 and Stage 2 on the subject site is shown in **Figure 14** below, with a copy of the relevant plan of development included for reference in **Appendix D**.

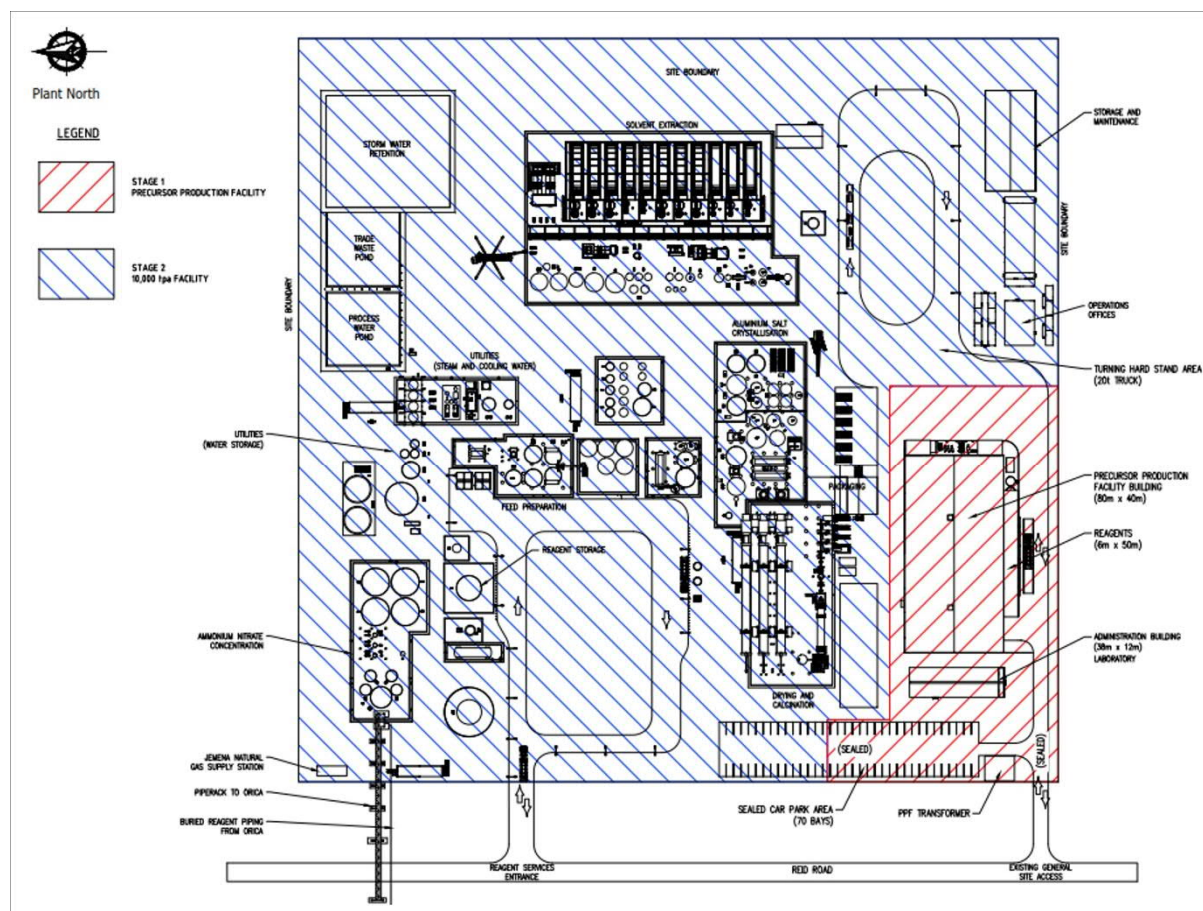


Figure 14 Stage 2 Plan of Development – Alpha HPA Project

[Source: Dwg. MC1868-G-031_D]

3.2.2 Construction Phase Details

Based on information provided by Alpha HPA it is understood that the Stage 2 construction works for the overall HPA processing plant and linear infrastructure facility is anticipated to commence in August 2022 (pending approvals) with an expected construction timeframe of 24 months, up to July 2024. As per the Stage 1 works, it is understood that the proposed Stage 2 construction works will be undertaken 12 hours per day, 5 day per week over this period.

The proposed Stage 2 construction works are also expected to include periods for site earthworks, civil works, structural mechanical piping (SMP), electrical and instrumentation (E&I) and site commissioning, with an indicative schedule outlined in **Figure 15** overpage.

ID	Task	Duration	Month																							
			Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	Earthworks	11 M																								
B	Civil	8 M																								
C	SMP	9 M																								
D	E&I	9 M																								
E	Commissioning	6 M																								
F	EPCM	24 M																								

Figure 15 Stage 2 Alpha HPA Project – Indicative Project Schedule

3.2.3 Proposed Access and Parking

3.2.3.1 Site Access

As identified in **Figure 13** above, it is proposed that access to the overall HPA processing facility will be provided via two access points from Reid Road, including the existing site access and a second sight access provided as part of the Stage 2 works, located approximately 505m to the south of Gladstone – Mount Larcom Road.

Again this second, northern site access provided as part of the Stage 2 works will be constructed to provide a Type B2 (9m) driveway in accordance with the Standard Drawing CMDG-R-042A of the Capricorn Municipal Design Guidelines (refer **Appendix E**).

3.2.3.2 Internal Site Facilities

The overall site layout at the completion of the Stage 2 works on site (refer **Figure 14** above) is considered clear and legible, with adequate vehicle circulation and set down areas throughout the Project site.

In addition, the construction of a further 30 parking spaces on the northern end of the Stage 1 parking area, bringing the overall on-site parking provision to 70 spaces, is expected to be adequate to accommodate the parking demand from the maximum staff numbers on site at any time (approx. 79 staff) and a nominal provision for visitor parking (3-5 spaces).

It is also noted that due to the abundance of suitable vacant land on site (outside of the Stage 1 area) and the provided setback of the proposed Alpha HPA Project to Reid Road, it is anticipated that the construction phase parking demand from the Stage 2 works will be able to be adequately catered for on site. As such it is not expected that either the construction or operations phase of the Project will lead to any overspill of vehicles or parking onto the surrounding road network.

4.0 Project Traffic

Based on the information provided by Alpha HPA Limited it is evident that there will be two distinct periods of traffic generation (construction phase and subsequent operations phase) for each stage of the Project. Further details regarding the expected Project traffic generation and distribution during both the construction and operations phases of Stage 1 and Stage 2 of the Project are provided in the following sections.

4.1 Stage 1 (Precursor Production Facility – PPF)

4.1.1 Stage 1 Construction Phase

As identified previously, the Stage 1 construction works are anticipated to commence in November 2021 (pending approvals), with the indicative construction schedule identifying that all construction activities across the Stage 1 site will be completed within 10 months i.e. by August 2022, with the peak period of construction expected to be between March and June 2022.

Based on the information provided by Alpha HPA, it has been identified that the construction works on site can be separated into five main works packages, being earthworks, civil works, structural mechanical piping (SMP) works, electrical and instrumentation (E&I) works and commissioning. The main traffic generating activities occurring within all of these identified construction phases include the transport of the various construction materials / equipment to site and the daily construction staff movements, as outlined below.

4.1.1.1 Materials and Equipment Delivery Movements

Alpha HPA Limited has provided information and assumptions regarding the expected traffic movements associated with the construction phase of the Project. This information is based on their experience in developing and managing the construction of similar projects, which has been used to calculate the expected material and equipment quantities and the associated vehicle movements for the delivery of these items.

As part of this provided information, the following general assumptions were also adopted in relation to the expected heavy vehicle movements as part of the Stage 1 construction works.

- Earthworks materials will be imported to site from local quarries and borrow pit locations, in particular the quarry site to the west of the Project site on Quarry Road and the Economic Development Queensland (EDQ) borrow pit site to the south of the subject site on Reid Road. From these source locations the material is proposed to be transported to the site via Truck & 4 Axle Dog configurations (assumed) via Quarry Road, Gladstone-Mount Larcom Road and Reid Road.
- The remaining construction materials, equipment, componentry, and plant for the proposed facility will be delivered to site via road transport from Gladstone, again utilising sections of Gladstone-Mount Larcom Road and Reid Road.

A breakdown of the estimated heavy vehicle traffic movements for each of the Stage 1 construction works packages is summarised in **Table 3** overpage, with further details of the calculations undertaken to establish the vehicle movement estimates included for reference in **Appendix F**. It is noted that the volumes below are estimates only and the daily Project traffic volumes may fluctuate slightly depending on the day's activities.

4.1.1.2 Construction Staff Movements

Alpha HPA Limited has also provided information regarding the anticipated construction staff movements as part of the Stage 1 works. As part of this information the following assumptions have been adopted:

- Maximum Stage 1 construction workforce will comprise approximately 37 staff.
- Construction staff are expected to commute daily to site from Gladstone.
- Construction staff are expected to commute using private vehicles (light vehicles and 4WDs), with an average vehicle capacity of 1.5 staff per vehicle.

Table 4 summarises the expected number of staff by construction task and by month, as well as providing an estimate of the expected staff vehicle movement volumes.

Table 3 Stage 1 – Construction Phase Heavy Vehicle Movements

ID	Task	Duration	Month										
			Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
			1	2	3	4	5	6	7	8	9	10	11
A	Earthworks	2 M	12	12									
B	Civil	3 M		6	6	6							
C	SMP	4 M					3	3	3	3			
D	E&I	5 M					1	1	1	1	1		
E	Commissioning	1 M										1	
F	EPCM	1 M	0	0	0	0	0	0	0	0	0	0	0
G	Operations Phase	1 M										1	2
Peak Daily HV Movements			12	18	6	6	4	4	4	4	2	2	2
Peak Hourly HV Movements (Assume 12hrs/day)			1	2	1	1	1	1	1	1	1	1	1

Table 4 Stage 1 - Construction Staff Numbers and Vehicle Movement Forecast

ID	Task	Duration	Month										
			Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
			1	2	3	4	5	6	7	8	9	10	11
A	Earthworks	2 M	17	17									
B	Civil	3 M		10	10	10							
C	SMP	4 M					25	25	25	25			
D	E&I	5 M					7	7	7	7	7		
E	Commissioning	1 M										13	
F	EPCM	24 M	2	2	2	2	4	4	4	4	4	3	
G	Operations Phase	-										5	10
FTE Staff Numbers			19	29	12	12	37	37	37	37	16	26	45
% Staff Travelling by Light Vehicle			100%										
Volume Staff Travelling by Light Vehicles			19	29	12	12	37	37	37	37	16	26	45
Average Staff per Light Vehicle			1.5										
Number of Staff Light Vehicles per day			13	19	8	8	24	24	24	24	11	18	30

4.1.2 Stage 1 Operations Phase

4.1.2.1 Operations Staff Movements

Based on information provided by Alpha HPA, it is understood that the precursor production facility (PPF) is proposed to operate 24 hours a day, 7 days per week. Further to this, it was advised that the operation of the facility is expected to require an overall workforce of 45 staff, with four separate shift teams of 8 people and a daytime workforce (including administration etc.) in the order of 13 staff. All staff for the Project are expected to be local and commute daily to the site from Gladstone.

It is understood that at any given time one of the shift teams will be present on site (typically starting 6am / 6pm), with the maximum staff numbers on site during the day (approx. 20-21 staff), when the additional daytime workforce (typical hours of 7:30-5:00pm) are also on site.

Based on these staff numbers and shift timings, it is anticipated that the largest staff movements to the site will be during the commuter movements of the daytime staff (13 staff), with up to 9 light vehicle movements to the site in the AM peak, and from the site in the PM peak.

4.1.2.2 Heavy Vehicle Movements

In addition to the staff movements above, it is understood that the operation of the Stage 1 PPF is expected to generate in the order of 2 heavy vehicle movements per day, catering for materials and miscellaneous deliveries to site and waste removal. These movements are expected to be local, with the heavy vehicles travelling between the Project site and Gladstone.

4.2 Stage 2 (Overall HPA Processing Plant and Linear Infrastructure Facility)

4.2.1 Stage 2 Construction Phase

As noted, the Stage 2 construction phase is anticipated to commence in August 2022 and run for approximately 24 months to July 2024. Based on the identified works schedule, it is anticipated that the peak period of construction for Stage 2 will occur between May and August 2023.

Again, as per the Stage 1 construction works detailed above, the main traffic generating activities during the Stage 2 construction phase include the transport of the various construction materials / equipment to site and the daily construction staff movements, estimates of which are provided in the following sections.

4.2.1.1 Materials and Equipment Delivery Movements

The heavy vehicle movements associated with the material and equipment delivery task of the Stage 2 construction works were again estimated based on information provided by Alpha HPA Limited, noting that for this stage all required earthworks materials were proposed to be sourced from the quarry operations to the west of the site on Quarry Road.

A summary of the expected heavy vehicle movements for the Stage 2 construction works is summarised in **Table 5** below, while the full Stage 2 project traffic calculations provided for reference in **Appendix F**. Again it is noted that the volumes below are estimates only and the daily Project traffic volumes may fluctuate slightly depending on the day's activities.

Table 5 Stage 2 – Construction Phase Heavy Vehicle Movements

ID	Task	Duration	Month																								
			Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
A	Earthworks	11 M	11	11	11	11	11	11	11	11	11	11															
B	Civil	8 M					11	11	11	11	11	11	11														
C	SMP	9 M									6	6	6	6	6	6	6	6	6								
D	E&I	9 M											1	1	1	1	1	1	1	1	1						
E	Commissioning	6 M																			1	1	1	1	1	1	
F	EPCM	24 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	Operations	-														5	5	5	5	5	5	5	5	5	5	8	8
Peak Daily HV Movements			11	11	11	11	22	22	22	22	28	28	29	18	12	12	12	12	12	6	7	6	6	6	6	9	8
Peak Hourly HV Movements (Assume 12hrs/day)			1	1	1	1	2	2	2	2	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1

4.2.1.2 Construction Staff Movements

Details of the Stage 2 construction phase workforce was also provided by Alpha HPA Limited, with the key details as follows:

- Maximum construction workforce will comprise approximately 298 staff.
- Construction staff are expected to commute daily from Gladstone.
- Construction staff are expected to commute using private vehicles (light vehicles and 4WDs), with an average capacity of 1.5 staff per vehicle.

Based on the information provided and the assumptions above, the construction staff numbers, and associated vehicle movements were identified, with a summary provided in **Table 6** overpage.

Table 6 Stage 2 - Construction Staff Numbers and Vehicle Movement Forecast

ID	Task	Duration	Month																																	
			Nov-21	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24									
			1	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34									
A	Earthworks	11 M	41	30	40	40	40	40	40	14	22	19	16																							
B	Civil	8 M							1	37	57	92	45	29	29	15																				
C	SMP	9 M												46	151	233	209	154	119	74	14	7														
D	E&I	9 M														5	19	55	72	90	83	37	9	6												
E	Commissioning	6 M																			21	21	28	26	30	12										
F	EPCM	24 M	5	5	5	5	5	10	10	10	10	10	15	15	15	15	15	15	15	15	15	5	5	5	5	0										
G	Operations	-														5	5	5	17	42	42	99	99	99	99	99	99	99	99	118						
FTE Staff Numbers			46	35	45	45	46	87	107	116	123	209	298	258	229	211	184	129	101	66	141	125	132	130	134	111	118									
% Staff Travelling by Light Vehicle			100%																																	
Volume Staff Travelling by Light Vehicles			46	35	45	45	46	87	107	116	123	209	298	258	229	211	184	129	101	66	141	125	132	130	134	111	118									
Average Staff per Light Vehicle			1.5																																	
Number of Staff Light Vehicles per day			31	23	30	30	31	58	72	77	82	139	199	172	153	141	123	86	67	44	94	83	88	87	89	74	79									

4.2.2 Stage 2 Operations Phase

4.2.2.1 Operations Staff Movements

It was also advised that upon the completion of the Stage 2 construction works the overall processing plant and linear infrastructure facility will operate 24hrs per day 7 days per week, with the majority of the overall facility operating continuously and being monitored and controlled from a central control room.

Based on information provided it is understood that the operations phase of the Stage 2 area is anticipated to require workforce of approximately 118 staff (over numerous shifts), with four separate shift teams of 20 people and a daytime workforce (including administration etc.) in the order of 38 staff. All staff for the Project are expected to be local and commute daily to the site from Gladstone.

It is understood that at any given time one of the shift teams will be present on site (typically starting 6am / 6pm), with the maximum staff numbers on site during the day (approx. 58 staff), when the additional daytime workforce (typical hours of 7:30-5:00pm) are also on site.

Based on these staff numbers and shift timings, it is anticipated that the largest staff movements to the site will be during the commuter movements of the 38 daytime staff, with up to 26 light vehicle movements to the site in the AM peak, and from the site in the PM peak.

4.2.2.2 Heavy Vehicle Movements

In addition to the staff movements above, it is understood that the operation of the facility is expected to generate in the order of 8 heavy vehicle movements per day, catering for materials and miscellaneous deliveries to site, export of the product (HPA) from the facility and waste removal. These movements are expected to be local, with the heavy vehicles travelling between the Project site and Gladstone.

A summary of the daily heavy vehicle movements and expected vehicle configurations are provided below:

- Feed (raw materials) delivery – 3 x 20t truck deliveries per day.
- Product export – 3 x 15t containers per day.
- Waste removal – 1 x refuse collection truck (heavy rigid vehicle - HRV) per day.
- Miscellaneous deliveries – 1 HRV per day.

4.3 Project Traffic Volumes on the Network

Based on the estimated Project traffic volumes and construction timeframes identified for Stage 1 and Stage 2 in the sections above, it was identified that there would be a period where the Stage 2 construction works would occur concurrently with the operations phase of the Stage 1 area.

As such, three separate traffic volume scenarios have been identified to be assessed for the Project, being the periods of peak Project traffic generation during the staged development of the overall Alpha HPA facility. These three traffic scenarios include the following Project traffic volumes:

- 1) Stage 1 peak construction.
- 2) Stage 2 peak construction & Stage 1 operations phase concurrently.
- 3) Stage 1 and Stage 2 operations phases concurrently.

The volumes of Project traffic forecast to be generated during these assessment scenarios have been distributed onto the public road network based upon Project operational information provided by Alpha HPA.

Further details of the expected Project traffic volumes on the adjacent road links and at the key Gladstone – Mount Larcom Road / Reid Road intersection during these assessment periods are provided below.

4.3.1 Road Links

Calculations were undertaken to establish the peak daily Project traffic volumes on the relevant sections of the road network, with a summary of the expected Project traffic volumes on the identified road links for each traffic scenario provided in **Table 7**.

Table 7 Forecast Road Link Project Traffic Volumes

AADT Segment		Stage 1 Construction			Stage 2 Construction & Stage 1 Operations			Stage 1 & Stage 2 Operations		
Start (km)	End (km)	Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Bi-Dir
Gladstone-Mount Larcom Road (181)										
0.000	1.409	28	28	57	260	260	520	119	119	237
1.409	3.258	28	28	57	260	260	520	119	119	237
3.258	4.625	28	28	57	260	260	520	119	119	237
4.625	9.833	28	28	57	260	260	520	119	119	237
9.833	12.292	2	2	4	11	11	22	0	0	0
12.292	19.030	2	2	4	11	11	22	0	0	0
19.030	32.140	0	0	0	0	0	0	0	0	0
Reid Road (GRC)										
0.000	0.275	28	28	57	260	260	520	119	119	237
0.275	0.430	28	28	57	260	260	520	119	119	237
0.430	0.505	28	28	57	260	260	520	119	119	237
0.505	0.710	28	28	57	260	260	520	119	119	237
0.710	0.740	28	28	57	260	260	520	119	119	237
0.740	2.600	10	10	20	0	0	0	0	0	0

** Chainage and gazettal direction for Reid Road assumed to be south from Gladstone-Mount Larcom Road.

TMR Ch. 9.833km (181) – Gladstone-Mount Larcom Road / Reid Road intersection.

TMR Ch. 14.284km (832) – Gladstone-Mount Larcom Road / Quarry Road intersection.

Ch. 0.275km Reid Road – Existing Orica (1st) access.

Ch. 0.430km Reid Road – Existing Orica (2nd) access.

Ch. 0.505km Reid Road – Proposed Alpha HPA site access (Stage 2).

Ch. 0.710km Reid Road – Existing Orica (3rd) access.

Ch. 0.740km Reid Road – Proposed Alpha HPA site access (Stage 1).

Ch. 2.600km Reid Road – EDQ Borrow Pit access.

4.3.2 Intersections

From the information regarding the proposed staff and heavy vehicle movement numbers relevant construction and operations phases of Stages 1 & 2 of the Project, estimates of the peak hour Project volumes at the critical Gladstone – Mount Larcom / Reid Road were established for each traffic scenario.

A summary of the calculated peak hour volumes at this intersection is shown in **Table 8** to **Table 10** below, with further details of the calculations undertaken to establish these peak hour volumes provided for reference in **Appendix G**.

Table 8 Stage 1 Construction Phase - Peak Hour Project Traffic Volumes

Design Scenario	Gladstone-Mt Larcom Rd (W)				Reid Road (S)				Gladstone-Mt Larcom Rd (E)			
	Through		Right		Left		Right		Left		Through	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Gladstone-Mt Larcom Road / Reid Road Intersection												
AM Peak Project Traffic	0	0	0	1	0	1	0	1	24	1	0	0
PM Peak Project Traffic	0	0	0	1	0	1	24	1	0	1	0	0

Table 9 Stage 2 Construction Phase & Stage 1 Operations Phase - Peak Hour Project Traffic Volumes

Design Scenario	Gladstone-Mt Larcom Rd (W)				Reid Road (S)				Gladstone-Mt Larcom Rd (E)			
	Through		Right		Left		Right		Left		Through	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Gladstone-Mt Larcom Road / Reid Road Intersection												
AM Peak Project Traffic	0	0	0	2	0	2	0	4	209	4	0	0
PM Peak Project Traffic	0	0	0	2	0	2	209	4	0	4	0	0

Table 10 Stage 1 & 2 Operations Phase - Peak Hour Traffic Volumes

Design Scenario	Gladstone-Mt Larcom Rd (W)				Reid Road (S)				Gladstone-Mt Larcom Rd (E)			
	Through		Right		Left		Right		Left		Through	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Gladstone-Mt Larcom Road / Reid Road Intersection												
AM Peak Project Traffic	0	0	0	0	0	0	0	1	34	1	0	0
PM Peak Project Traffic	0	0	0	0	0	0	34	1	0	1	0	0

The impact of these additional Project traffic volumes on the operation of the key sections of the surrounding road network has been assessed, with the results outlined in **Section 5.0** below.

5.0 Traffic Impact Assessment

Based on the information provided above, it was determined that the critical elements of the surrounding road network in terms of the potential impact of the traffic associated with Stage 1 and Stage 2 of the proposed Alpha HPA Project were the key Gladstone – Mount Larcom Road / Reid Road intersection and the adjacent sections of Gladstone – Mount Larcom Road and Reid Road, which are expected to be utilised as part of the material and equipment transport and staff travel routes to/from the site. Further details of the assessment of the impact of the development on road network is provided in the following sections.

5.1 With and Without Development Traffic Volumes

5.1.1 Road Link Volumes

As identified above, the assessment has identified three traffic scenarios which represent the peak traffic generation of the various stages of the proposed Alpha HPA Project. Based on the adoption of the identified distribution of the Project traffic volumes for each scenario as outlined in **Section 4.3** above, the expected pre and post development traffic volumes on the relevant sections of the road network during each phase of the Project were established, as shown in **Table 12** overpage.

5.1.2 Intersection Volumes

Based on the requirements of TMR's Guide to Traffic Impact Assessment as the intersection of the Gladstone – Mount Larcom Road / Reid Road is not the direct access to the site, the assessment of the impacts of the proposed development on its operation are only required for the expected year of opening for the Project. However, to enable an assessment of the impacts of critical traffic period for each of the proposed stages of the Alpha HPA Project, analysis of this key intersection has been undertaken during each of the critical traffic scenarios identified, including:

- Stage 1 peak construction (2022).
- Stage 2 peak construction & Stage 1 operations phase concurrently (2023).
- Stage 1 and Stage 2 operations phases concurrently (2024).

As such an estimate of the expected peak hour traffic volumes at the key Gladstone – Mount Larcom / Reid Road intersection at the relevant design horizons were established, noting that the relevant volumes were established by combining the forecast background traffic volumes with the calculated Project traffic volumes for each scenario as identified in **Section 4.3**. The resultant volumes are shown in **Figure 16** to **Figure 21** below, with further details of these calculations provided in **Appendix G**.

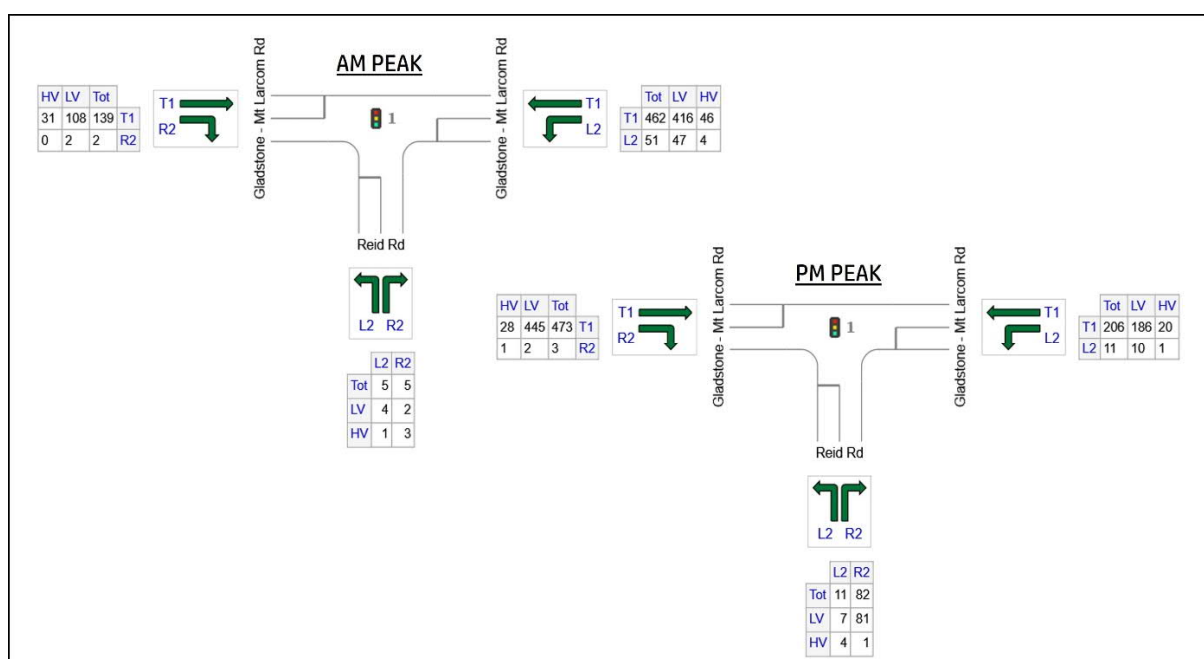


Figure 16 2022 AM & PM Peak Traffic Volumes (Pre Development)

Table 11 Forecast Pre and Post Development Traffic Volumes (Daily)

Site ID	Road Segment		Pre Development Daily Volumes						Stage 1 Peak Construction (Daily)		Stage 2 Peak Construction & Stage 1 Operations (Daily)		Stage 1 & 2 Operations (Daily)		Post Development Daily Volumes					
	Start (km)	End (km)	2022		2023		2024		Gaz	A-Gaz	Gaz	A-Gaz	Gaz	A-Gaz	2022		2023		2024	
Gaz			A-Gaz	Gaz	A-Gaz	Gaz	A-Gaz	Gaz							A-Gaz	Gaz	A-Gaz			
Gladstone-Mt Larcom Road (181)																				
60071	0.000	1.409	3,671	3,178	3,708	3,210	3,745	3,242	28	28	260	260	119	119	3,699	3,207	3,967	3,470	3,863	3,361
60073	1.409	3.258	3,148	3,278	3,179	3,311	3,211	3,344	28	28	260	260	119	119	3,176	3,306	3,439	3,570	3,330	3,462
61052	3.258	4.625	4,897	4,726	4,946	4,774	4,996	4,821	28	28	260	260	119	119	4,925	4,755	5,206	5,033	5,114	4,940
60074	4.625	9.833	3,336	3,318	3,370	3,352	3,403	3,385	28	28	260	260	119	119	3,365	3,347	3,629	3,611	3,522	3,504
	9.833	12.292	3,336	3,318	3,370	3,352	3,403	3,385	2	2	11	11	0	0	3,338	3,320	3,381	3,363	3,403	3,385
60076	12.292	19.030	1,540	1,542	1,555	1,558	1,571	1,573	2	2	11	11	0	0	1,542	1,544	1,566	1,569	1,571	1,573
	19.030	32.140	1,540	1,542	1,555	1,558	1,571	1,573	0	0	0	0	0	0	1,540	1,542	1,555	1,558	1,571	1,573
Reid Road (GRC)																				
GRC	0.000	0.275	358	358	362	362	365	365	28	28	260	260	119	119	386	386	621	621	484	484
	0.275	0.430	312	312	316	316	319	319	28	28	260	260	119	119	341	341	575	575	437	437
	0.430	0.505	46	46	46	46	47	47	28	28	260	260	119	119	74	74	306	306	165	165
	0.505	0.710	46	46	46	46	47	47	28	28	260	260	119	119	74	74	306	306	165	165
	0.710	0.740	16	16	16	16	17	17	28	28	260	260	119	119	45	45	276	276	135	135
	0.740	2.600	16	16	16	16	17	17	10	10	0	0	0	0	26	26	16	16	17	17

** Chainage and gazettal direction for Reid Road assumed to be south from Gladstone-Mount Larcom Road.

TMR Ch. 9.833km (181) – Gladstone-Mount Larcom Road / Reid Road intersection.

TMR Ch. 14.284km (832) – Gladstone-Mount Larcom Road / Quarry Road intersection.

Ch. 0.275km Reid Road – Existing Orica (1st) access.

Ch. 0.430km Reid Road – Existing Orica (2nd) access.

Ch. 0.505km Reid Road – Proposed Alpha HPA site access (Stage 2).

Ch. 0.710km Reid Road – Existing Orica (3rd) access.

Ch. 0.740km Reid Road – Proposed Alpha HPA site access (Stage 1).

Ch. 2.600km Reid Road – EDQ Borrow Pit access.

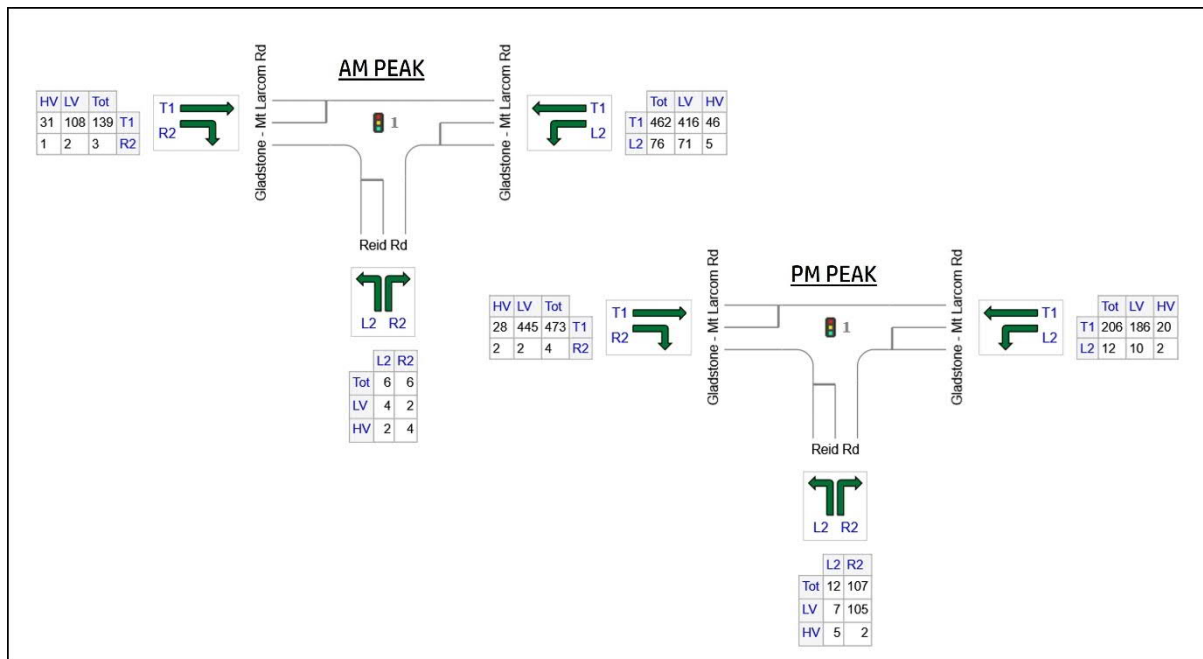


Figure 17 2022 AM & PM Peak Traffic Volumes (Stage 1 Peak Construction)

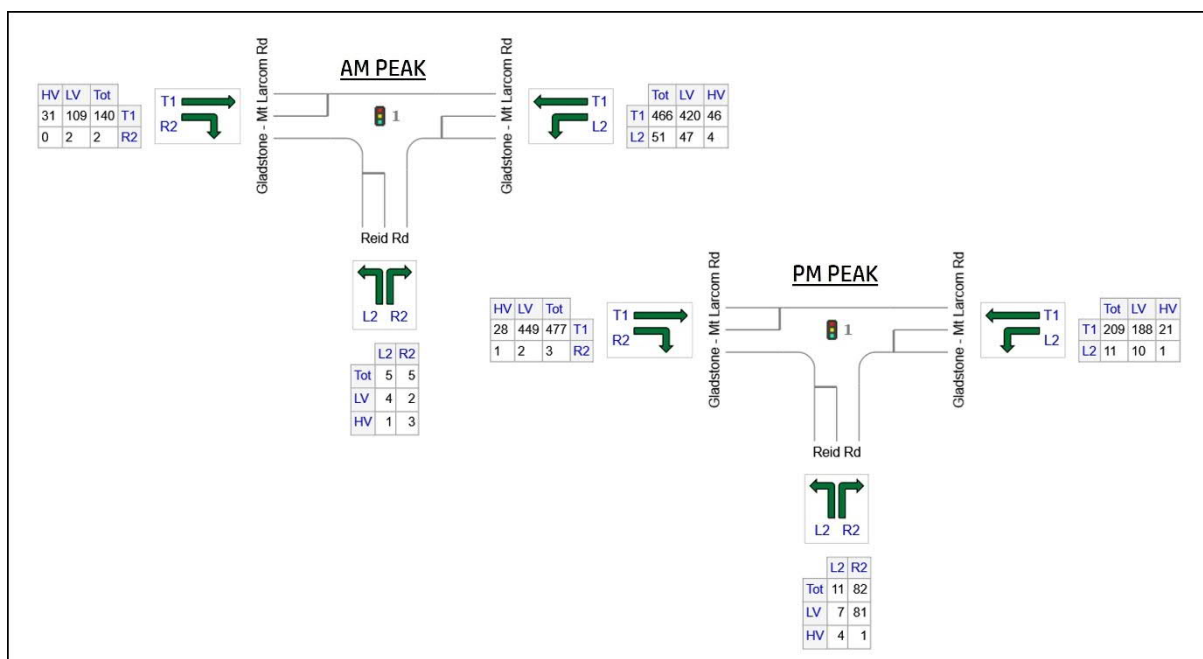


Figure 18 2023 AM & PM Peak Traffic Volumes (Pre Development)

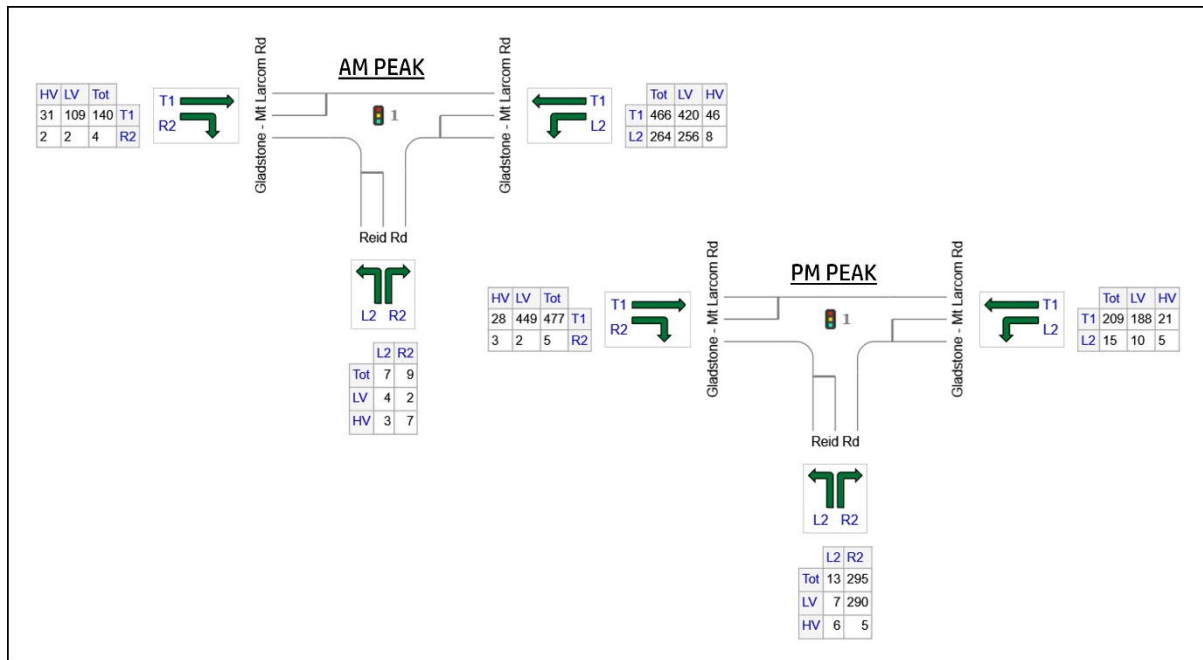


Figure 19 2023 AM & PM Peak Traffic Volumes (Stage 2 Peak Construction & Stage 1 Operations)

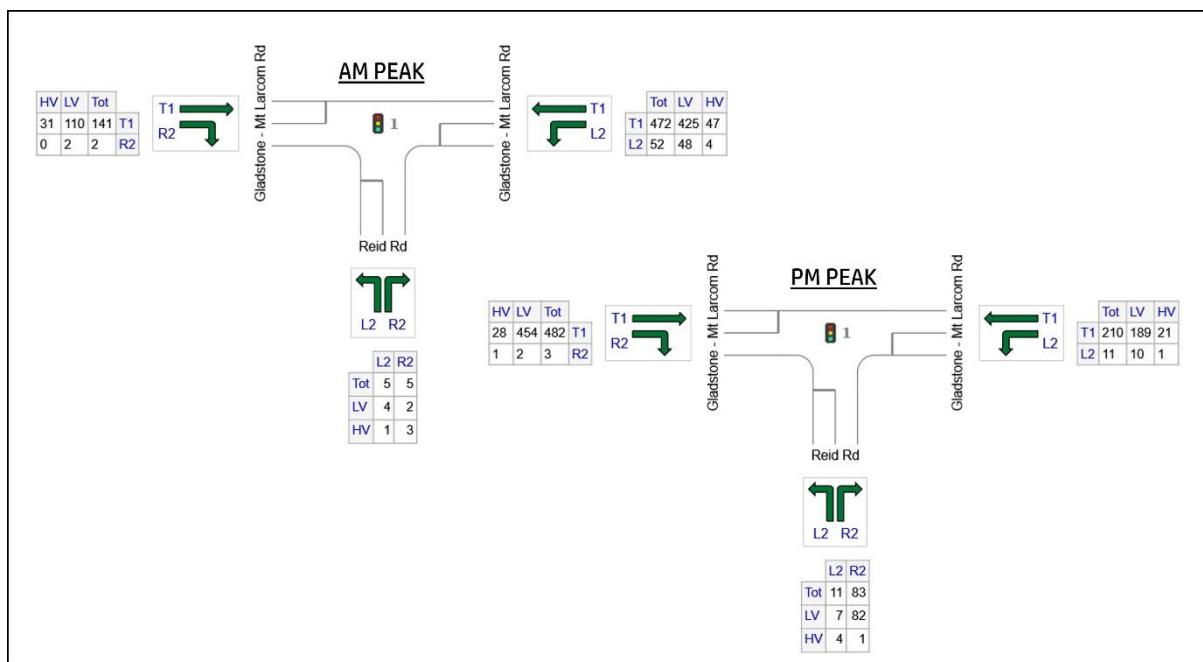


Figure 20 2024 AM & PM Peak Traffic Volumes (Pre Development)

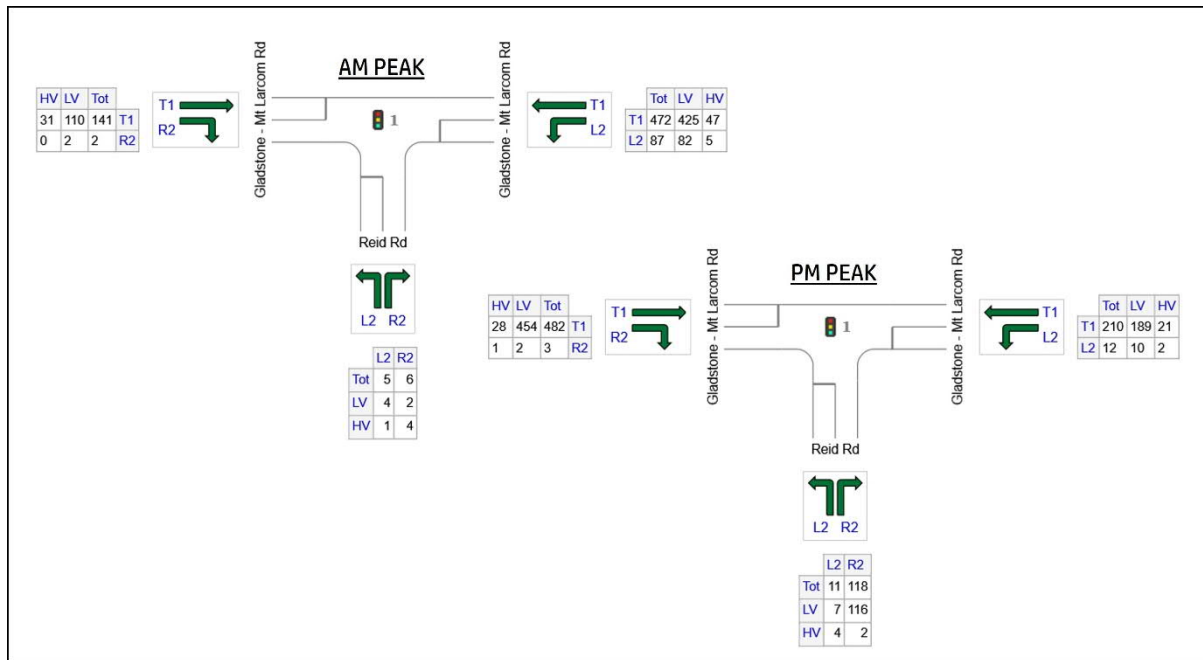


Figure 21 2024 AM & PM Peak Traffic Volumes (Stage 1 & 2 Operations)

5.2 Road Safety Impact Assessment and Mitigation

Based on the road environments (<8,000vpd) of the critical section of Gladstone - Mount Larcom Road in the vicinity of the site, it was determined that the completion of a lower order road safety assessment would be sufficient to establish the existing and post development road safety risks relevant to the staged development of the Project, in accordance with the provisions of TMR's Guide to Traffic Impact Assessment (Section 9.3.3). As part of this road safety assessment a site inspection of the existing traffic conditions at the proposed site access locations and the adjacent road network was undertaken by Andrew Barrie (RPEQ / TMR Senior Road Safety Auditor).

Based on the observed traffic conditions and the forecast Project traffic volumes, a number of minor road safety considerations were identified. To establish the level of risk regarding these road safety items, a safety risk score matrix (refer Figure 22) was utilised, with the results of the road safety risk assessment summarised in Table 12.

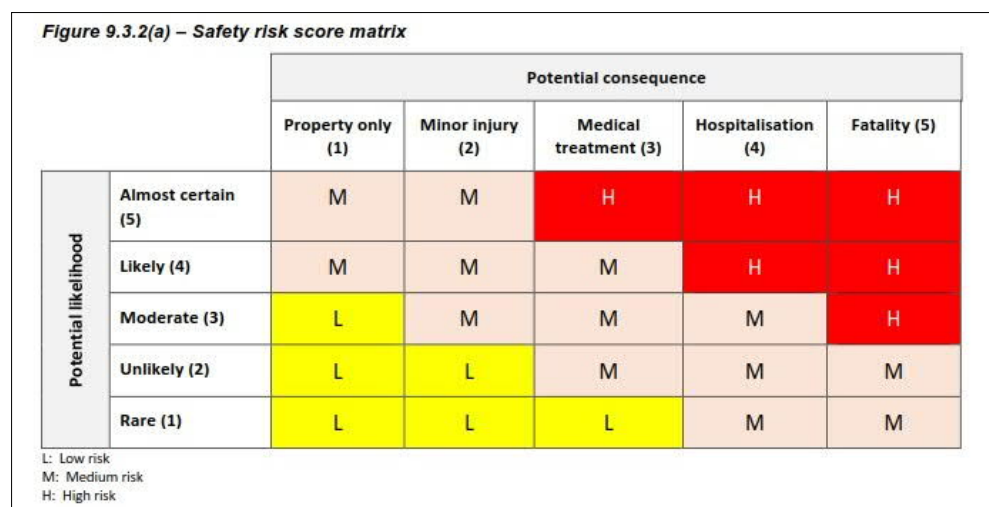


Figure 22 Adopted Risk Score Matrix

[Source: TMR GTIA]

Table 12 Road Safety Assessment – Alpha HPA Project

Risk Item		Existing / Pre-Development			With Project			Mitigation Measure	With Project & Mitigation		
		Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score		Likelihood	Consequence	Risk Score
1	The construction and operations phases of both Stage 1 and Stage 2 of the Project are anticipated to lead to an increase in turning movements at the Gladstone-Mount Larcom Road / Reid Road intersection, which could lead to excessive vehicle queueing, lower intersection performance and potentially additional vehicle conflicts.	Unlikely	Minor Injury / Medical Treatment	Low / Medium	Unlikely	Minor Injury / Medical Treatment	Low / Medium	Detailed intersection analysis identified that the impact of the increase in traffic volumes at the Gladstone-Mount Larcom Road / Reid Road intersection as a result of each stage of the Alpha HPA Project was minimal and that all expected vehicle queues in the critical turning lanes would be accommodated in current available storage lengths. As such no mitigation measures are deemed to be required.	Unlikely	Minor Injury / Medical Treatment	Low / Medium
2	The construction and operations phases of both Stage 1 and Stage 2 of the Project are also expected to lead to an increase in vehicle numbers on Reid Road, which in turn may lead to an increase in the potential for vehicle conflict at the existing Orica access points.	Unlikely	Property Only / Minor Injury	Low	Unlikely	Property Only / Minor Injury	Low	Based on the current low background traffic volumes on Reid Road, the temporary nature of the larger increase in traffic volumes of the construction phases of each stage of the Project and the relatively low ongoing increase in traffic volumes on the link from the operational phases of both stages of the project (up to 35vph), there is not anticipated to be a significant impact on the operation of the existing Orica access points. As such no mitigation measures are deemed to be required.	Unlikely	Property Only / Minor Injury	Low
3	The verge on the eastern side of Reid Road adjacent the northernmost / first Orica access is currently being utilised as an informal parking area. The increase in vehicles associated with the construction and operations phase of each stage of the Project may increase the potential for conflict between vehicles travelling on Reid Road and those manoeuvring into / out of the informal parking area.	Unlikely	Minor Injury / Medical Treatment	Low / Medium	Unlikely	Minor Injury / Medical Treatment	Low / Medium	The expected increase in traffic volumes during the construction and ongoing operations phases of each stage of the Alpha HPA Project are not anticipated to significantly increase the likelihood of the identified vehicle conflicts. As such no physical mitigation works are proposed as part of the Project, however the potential for conflict is recommended to be identified within any traffic management plans for the construction works and discussed in toolbox talks with construction staff and heavy vehicle operators, to minimise the risks of accidents occurring.	Unlikely	Minor Injury / Medical Treatment	Low / Medium

5.3 Access and Frontage Impact Assessment and Mitigation

5.3.1 Site Access

As previously identified, it is proposed that access for all vehicle movements for Stage 1 of the Project will be provided the existing site access, located approximately 740m south of Gladstone-Mount Larcom Road, while an additional access to the overall Project area is proposed as part of Stage 2, with this new access from Reid Road located approximately 505m south of Gladstone-Mount Larcom Road.

Further to this, a new access is proposed to be provided as part of the Stage 2 works, with the access to be configured generally in accordance with a Type B2 (9m) driveway access as per Standard Drawing CMDG-R-042A of the Capricorn Municipal Design Guidelines (refer **Appendix E**).

As such, based on a review of the forecast construction and operations phase Project traffic volumes at both access points, it has been determined that the use of the existing site access for Stage 1 and the provision of a new Type B2 (9m) access from Reid Road as part of the Stage 2 of the Project, is expected be adequate to cater for the expected volume and vehicle configuration of traffic associated with the construction and operations phase of each stage of the Project.

5.4 Intersection Impact Assessment and Mitigation

5.4.1 Intersection Operation Analysis

As noted in **Section 5.1.2** above, as the intersection of the Gladstone – Mount Larcom Road / Reid Road is not the direct access to the site, the assessment of the impacts of the proposed development on its operation are only required for the expected year of opening for the Project. However, to enable an assessment of the impacts of critical traffic period for each of the proposed stages of the Alpha HPA Project, analysis of this key intersection has been undertaken during each of the critical traffic scenarios identified, including:

- Stage 1 peak construction (2022).
- Stage 2 peak construction & Stage 1 operations phase concurrently (2023).
- Stage 1 and Stage 2 operations phases concurrently (2024).

5.4.1.1 Gladstone – Mount Larcom Road / Reid Road Intersection

The forecast traffic volumes at the relevant Gladstone – Mount Larcom Road / Reid Road intersection for each of the identified traffic scenarios (see **Section 5.1.2**) were utilised to undertake detailed intersection analysis (using SIDRA software) to establish the operational performance of the intersection at the nominated design horizons for the relevant stages of the Project. A summary of the results of the analysis of the Gladstone – Mount Larcom Road / Reid Road intersection for the identified traffic scenarios for the Project is provided in **Table 13** below, with detailed SIDRA results included for reference as **Appendix H**.

Table 13 SIDRA Results – Gladstone-Mt Larcom Road / Reid Road Intersection

Analysis Scenario	Intersection Degree of Saturation	Intersection Level of Service	Intersection Average Delay (sec)	Maximum 95% Back of Queue Length (m)
Pre Development 2022 AM Peak	0.717	LOS B	10.2	54.0
Pre Development 2022 PM Peak	0.656	LOS A	9.7	48.2
Stage 1 Construction 2022 AM Peak	0.717	LOS B	10.4	54.0
Stage 1 Construction 2022 PM Peak	0.656	LOS B	10.1	48.2
Pre Development 2023 AM Peak	0.723	LOS B	10.3	54.9
Pre Development 2023 PM Peak	0.661	LOS A	9.8	48.9
Stage 2 Construction & Stage 1 Operations 2023 AM Peak	0.723	LOS B	11.3	54.9
Stage 2 Construction & Stage 1 Operations 2023 PM Peak	0.740	LOS B	13.3	54.2
Pre Development 2024 AM Peak	0.732	LOS B	10.5	56.4

Analysis Scenario	Intersection Degree of Saturation	Intersection Level of Service	Intersection Average Delay (sec)	Maximum 95% Back of Queue Length (m)
Pre Development 2024 PM Peak	0.668	LOS A	9.9	49.8
Stage 1 & 2 Operations 2024 AM Peak	0.732	LOS B	10.6	56.4
Stage 1 & 2 Operations 2024 PM Peak	0.668	LOS B	10.2	49.8

The results above indicate that the existing signalised intersection configuration of the Gladstone – Mount Larcom Road / Reid Road intersection is expected to operate satisfactorily under all post development traffic conditions assessed for both the peak Stage 1 construction period (2022), the peak Stage 2 construction period including operations phase traffic from Stage 1 (2023) and the expected year of opening of the overall project (operations phase of Stage 1 & 2 - 2024). This is demonstrated by all values for DOS, LOS, average delay and vehicle queueing calculated being well within acceptable limits of operation for a signalised intersection.

As such it can be concluded that the existing configuration of the signalised Gladstone – Mount Larcom Road / Reid Road intersection will be adequate to cater for the additional traffic expected to be generated by the construction and operations phases of both stages of the proposed Alpha HPA project.

5.4.2 Intersection Delay Analysis

In addition to the SIDRA analysis of the operational performance of the state controlled Gladstone – Mount Larcom Road / Reid Road intersection, an assessment of the impact of the proposed overall operations phase (Stage 1 & 2) of the Alpha HPA Project on the intersection delay was also undertaken in accordance with the requirements of Clause 11.3.1 of TMR's Guide to Traffic Impact Assessment. A summary of this delay assessment is provided in **Table 14** below.

It is noted that no assessment was completed for the identified construction phases of either Stage 1 or 2 of the Project due to the temporary nature of the works, and the limited duration of the peak construction period during each stage (Stage 1 – approx. 4 months & Stage 2 – approx. 6 months), with the Project traffic volumes outside of this peak period expected to be significantly less. Further to this, it is also noted that the assessment of the intersection operation during the peak construction phases of both Stage 1 and 2 was shown to be within acceptable limits for the current signalised configuration. As such the impact on the intersection is considered to be minimal.

Table 14 Intersection Delay Assessment – Gladstone – Mount Larcom Road / Reid Road Intersection (2024)

Traffic Movement	2024 AM Peak					2024 PM Peak				
	Pre Dev Vols	Pre Dev Movement Avg Delay	Pre Dev Total Delay	Post Dev Movement Avg Delay	Post Dev Total Delay	Pre Dev Vols	Pre Dev Movement Avg Delay	Pre Dev Total Delay	Post Dev Movement Avg Delay	Post Dev Total Delay
Reid Road South										
Left	5	16.9	85	17	85	11	17.8	196	18.1	199
Right	5	17.4	87	17.5	88	83	17.4	1,444	17.7	1,469
Gladstone – Mount Larcom Road East										
Left	52	12.6	655	12.8	666	11	12.3	135	12.5	138
Through	472	11.2	5,286	11.2	5,286	210	7.8	1,638	7.8	1,638
Gladstone – Mount Larcom Road West										
Through	141	6.7	945	6.7	945	482	9.1	4,386	9.1	4,386
Right	2	23.5	47	23.5	47	3	24.7	74	24.7	74
		Total	7,105	Total	7,116		Total	7,874	Total	7,904

As identified above, the difference in the calculated overall (combined AM and PM peak) intersection delay between the pre development (14,978 seconds) and post development conditions (15,050 seconds) is a slight increase of approximately 42 seconds. This calculated increase in intersection delay equates to an increase of approximately 0.28% from the pre development intersection delay, which is well below the identified 5% increase trigger as per TMR's Guide to Traffic Impact Assessments.

It can therefore be concluded that no works are required to be undertaken to the existing Gladstone – Mount Larcom Road / Reid Road intersection to mitigate the intersection delay impacts of the proposed Alpha HPA Project.

5.5 Road Link Capacity Assessment and Mitigation

As identified in **Section 5.1.1** above, traffic volumes on the relevant sections of the road network were established for both the forecast pre development traffic conditions and for the various traffic scenarios identified through the staged development of the proposed Alpha HPA project.

Using these calculated volumes an assessment of the percentage increase in daily traffic volumes as a result of various stages of the Project was undertaken, with a summary for the periods of Stage 1 peak construction, Stage 2 peak construction (with Stage 1 operations) and Stage 1 and 2 operations provided in **Table 15** to **Table 17** respectively.

Further details of the calculations completed as part of this comparison are also provided for reference in **Appendix I**.

Table 15 Road Link Daily Traffic Volume Comparison (Stage 1 Peak Construction Phase)

Site ID	AADT Segment		Background AADT (2022)		Max Daily Project Traffic Volumes		% Increase	
	Start (km)	End (km)	Gaz	A-Gaz	Gaz	A-Gaz	Gaz	A-Gaz
Gladstone – Mount Larcom Road - 181								
60071	0.000	1.409	3,671	3,178	28	28	0.77%	0.89%
60073	1.409	3.258	3,148	3,278	28	28	0.90%	0.86%
61052	3.258	4.625	4,897	4,726	28	28	0.58%	0.60%
60074	4.625	9.833	3,336	3,318	28	28	0.85%	0.85%
	9.833	12.292	3,336	3,318	2	2	0.06%	0.05%
60076	12.292	19.030	1,540	1,542	2	2	0.13%	0.11%
	19.030	32.140	1,540	1,542	0	0	0.00%	0.00%
Reid Road								
GRC	0.000	0.275	358	358	28	28	7.91%	7.91%
	0.275	0.430	312	312	28	28	9.07%	9.07%
	0.430	0.505	46	46	28	28	62.15%	62.15%
	0.505	0.710	46	46	28	28	62.15%	62.15%
	0.710	0.740	16	16	28	28	173.62%	173.62%
	0.740	2.600	16	16	10	10	61.27%	61.27%

Table 16 Road Link Daily Traffic Volume Comparison (Stage 2 Peak Construction & Stage 1 Operations)

Site ID	AADT Segment		Background AADT (2023)		Max Daily Project Traffic Volumes		% Increase	
	Start (km)	End (km)	Gaz	A-Gaz	Gaz	A-Gaz	Gaz	A-Gaz
Gladstone – Mount Larcom Road - 181								
60071	0.000	1.409	3,708	3,210	260	260	7.01%	8.09%
60073	1.409	3.258	3,179	3,311	260	260	8.17%	7.85%
61052	3.258	4.625	4,946	4,774	260	260	5.25%	5.44%
60074	4.625	9.833	3,370	3,352	260	260	7.71%	7.75%
	9.833	12.292	3,370	3,352	11	11	0.33%	0.33%
60076	12.292	19.030	1,555	1,558	11	11	0.71%	0.71%
	19.030	32.140	1,555	1,558	0	0	0.00%	0.00%
Reid Road								
GRC	0.000	0.275	362	362	260	260	71.84%	71.84%
	0.275	0.430	316	316	260	260	82.32%	82.32%
	0.430	0.505	46	46	260	260	564.08%	564.08%
	0.505	0.710	46	46	260	260	564.08%	564.08%
	0.710	0.740	16	16	260	260	1575.91%	1575.91%
	0.740	2.600	16	16	0	0	0.00%	0.00%

Table 17 Road Link Daily Traffic Volume Comparison (Stage 1 & 2 Operations)

Site ID	AADT Segment		Background AADT (2024)		Max Daily Project Traffic Volumes		% Increase	
	Start (km)	End (km)	Gaz	A-Gaz	Gaz	A-Gaz	Gaz	A-Gaz
Gladstone – Mount Larcom Road - 181								
60071	0.000	1.409	3,745	3,242	119	119	3.17%	3.66%
60073	1.409	3.258	3,211	3,344	119	119	3.70%	3.55%
61052	3.258	4.625	4,996	4,821	119	119	2.38%	2.46%
60074	4.625	9.833	3,403	3,385	119	119	3.49%	3.51%
	9.833	12.292	3,403	3,385	0	0	0.00%	0.00%
60076	12.292	19.030	1,571	1,573	0	0	0.00%	0.00%
	19.030	32.140	1,571	1,573	0	0	0.00%	0.00%
Reid Road								
GRC	0.000	0.275	365	365	119	119	32.49%	32.49%
	0.275	0.430	319	319	119	119	37.23%	37.23%
	0.430	0.505	47	47	119	119	255.11%	255.11%
	0.505	0.710	47	47	119	119	255.11%	255.11%
	0.710	0.740	17	17	119	119	712.73%	712.73%
	0.740	2.600	17	17	0	0	0.00%	0.00%

As can be seen by the results in **Table 13** and **Table 14** above, the addition of the expected Project traffic volumes under the identified traffic scenarios throughout the stages development of the Project is shown to increase the daily volumes on a number of sections of the surrounding road network by more than 5%.

While the increase in traffic volumes on these road sections appear significant, with values exceeding the 5% increase trigger, it should be noted that the high percentages of increase calculated (particularly on the relevant sections of the GRC controlled Reid Road) are primarily due to the low background traffic volumes, and with the calculated post development traffic volumes during both the construction and operations phase still within the identified capacities of a rural arterial road / highway (Gladstone – Mount Larcom Road - approx. 15,000 vpd) and local rural distributor road (Reid Road - 5,000 vpd) respectively.

As such it is considered that the additional traffic from the construction and operations phases of both Stage 1 and Stage 2 of the proposed Alpha HPA Project are not anticipated to have a significant impact on the operation of the surrounding road links.

5.6 Pavement Impact Assessment and Mitigation

5.6.1 Background Pavement Loadings

Traffic loads on the road pavements are defined in terms of Standard Axle Repetitions (SARs), with the background or pre-development pavement loadings on each of the identified road segments calculated based on the identified heavy vehicle percentages for the relevant road sections, with the following assumptions applied to these calculations.

- The existing percentage of heavy vehicles will be maintained for future years.
- The impact of light vehicles can be ignored as the contribution to pavement loading (SARs) is negligible in comparison to heavy vehicles.
- Standard Axle Repetitions per Heavy Vehicle (SARs/HV) were adopted as follows (based on advice previously received from TMR for similar pavement impact assessments):
 - 2.9 ESAs/HV for the Bruce Highway.
 - 3.2 ESAs/HV for all other State controlled roads (including Gladstone-Mount Larcom Road).

Based on these assumptions, estimates of the background or pre-development pavement loadings were established for each of the peak periods of traffic loading for the staged development of the site, namely the construction phases of both Stage 1 and Stage 2 of the Project. These estimates utilised the following timeframes for the calculation of the background or pre development pavement loadings, noting that the

- Stage 1 construction phase - 10 months (approx. 304 days).
- Stage 2 construction phase – 24 months (or 730 days).

A summary of the forecast background SARs for each of the relevant road segments for the expected Stage 1 and Stage 2 construction phases is provided in **Table 18** overpage, with further details of the calculations undertaken to establish these baseline loading values provided in **Appendix J**.

Table 18 Forecast Future Background ESAs

AADT Segment		Base Data Year	Base Year HV % & Volume				10 Yr. GR %	ESAs / HV	Stage 1 Construction Phase					Stage 2 Construction Phase				
			2022		No. Days	Background ESAs			2023		No. Days	Background ESAs						
Gaz			A-Gaz			Gaz			A-Gaz	Gaz		A-Gaz						
Start (km)	End (km)		HV%	HV Vol		HV%			HV Vol	HV Vol		HV Vol	Gaz	A-Gaz	HV Vol	HV Vol	Gaz	A-Gaz
Gladstone-Mount Larcom Road (181)																		
0.000	1.409	2019	18.52%	660	15.24%	470	1.00	3.2	680	484	304	661,733	471,483	687	489	730	1,604,040	1,142,874
1.409	3.258	2018	16.07%	486	16.16%	509	1.00	3.2	506	530	304	492,366	515,583	511	535	730	1,193,496	1,249,774
3.258	4.625	2018	11.52%	542	14.11%	641	1.00	3.2	564	667	304	549,100	649,114	570	674	730	1,331,019	1,573,453
4.625	9.833	2018	13.54%	434	15.96%	509	1.00	3.2	452	530	304	439,672	515,507	456	535	730	1,065,766	1,249,589
9.833	12.292	2018	13.54%	434	15.96%	509	1.00	3.2	452	530	304	439,672	515,507	456	535	730	1,065,766	1,249,589
12.292	19.030	2018	21.89%	324	30.23%	448	1.00	3.2	337	466	304	328,137	453,768	340	471	730	795,403	1,099,933
19.030	32.140	2018	21.89%	324	30.23%	448	1.00	3.2	337	466	304	328,137	453,768	340	471	730	795,403	1,099,933
Reid Road (GRC)																		
0.000	0.275	2020	6.84%	24	6.84%	24	1.00	3.2	24	24	304	23,830	23,830	25	25	730	57,763	57,763
0.275	0.430	2020	3.92%	12	3.92%	12	1.00	3.2	12	12	304	11,915	11,915	12	12	730	28,881	28,881
0.430	0.505	2020	26.85%	12	26.85%	12	1.00	3.2	12	12	304	11,915	11,915	12	12	730	28,881	28,881
0.505	0.710	2020	26.85%	12	26.85%	12	1.00	3.2	12	12	304	11,915	11,915	12	12	730	28,881	28,881
0.710	0.740	2020	10.00%	2	10.00%	2	1.00	3.2	2	2	304	1,589	1,589	2	2	730	3,851	3,851
0.740	2.600	2020	10.00%	2	10.00%	2	1.00	3.2	2	2	304	1,589	1,589	2	2	730	3,851	3,851

** Chainage and gazettal direction for Reid Road assumed to be south from Gladstone-Mount Larcom Road.

TMR Ch. 9.833km (181) – Gladstone-Mount Larcom Road / Reid Road intersection.

TMR Ch. 14.284km (832) – Gladstone-Mount Larcom Road / Quarry Road intersection.

Ch. 0.275km Reid Road – Existing Orica (1st) access.

Ch. 0.430km Reid Road – Existing Orica (2nd) access.

Ch. 0.505km Reid Road – Proposed Alpha HPA site access (Stage 2).

Ch. 0.710km Reid Road – Existing Orica (3rd) access.

Ch. 0.740km Reid Road – Proposed Alpha HPA site access (Stage 1).

Ch. 2.600km Reid Road – EDQ Borrow Pit access.

5.6.2 Project Traffic Loading

5.6.3 Construction Phases

The assessment of potential pavement impacts of Stage 1 and Stage 2 of the Project involved the comparison of the pavement loadings (SAR) associated with the background traffic volumes on the road links to the SARs estimated to be generated by the heavy vehicle movements throughout the construction period of each stage.

Table 19 shows the assumed heavy vehicle classes that are expected to be used throughout the construction phase of the Project and the average loaded and unloaded SARs/HV values for each configuration.

Table 19 Assumed Vehicle Class and ESA/HV Values

Vehicle Class	Vehicle Configuration	Task	Average Loaded SARs / HV	Average Unloaded SARs / HV
Truck and 4 Axle Dog (GML)		Earthworks material transport	7.66	0.53
6 Axle Semi-trailer (GML)		General material and equipment transport	4.93	0.51
3 Axle Rigid Truck		Delivery and concrete trucks	3.57	0.50

A summary of the comparison of the background and Project traffic generated pavement loadings for both Stage 1 and Stage 2 is provided in **Table 20** and **Table 21**, with further details of the Project pavement loading calculations undertaken included for reference in **Appendix J**.

Table 20 Stage 1 Construction Phase - Pavement Loading Comparison

Segment ID	AADT Segment		Background ESA		Project-Generated SAR		% Increase	
	Start (km)	End (km)	Gaz	A-Gaz	Gaz	A-Gaz	Gaz	A-Gaz
Gladstone – Mount Larcom Road (181)								
60071	0.000	1.409	661,733	471,483	2,137	266	0.32%	0.06%
60073	1.409	3.258	492,366	515,583	2,137	266	0.43%	0.05%
61052	3.258	4.625	549,100	649,114	2,137	266	0.39%	0.04%
60074	4.625	9.833	439,672	515,507	2,137	266	0.49%	0.05%
	9.833	12.292	439,672	515,507	72	1,042	0.02%	0.20%
60076	12.292	19.030	328,137	453,768	72	1,042	0.02%	0.23%
	19.030	32.140	328,137	453,768	0	0	0.00%	0.00%
Reid Road (GRC)								
GRC	0.000	0.275	23,830	23,830	3,178	338	13.34%	1.42%
GRC	0.275	0.430	11,915	11,915	3,178	338	26.68%	2.83%
GRC	0.430	0.505	11,915	11,915	3,178	338	26.68%	2.83%
GRC	0.505	0.710	11,915	11,915	3,178	338	26.68%	2.83%
GRC	0.710	0.740	1,589	1,589	3,178	338	200.07%	21.26%
GRC	0.740	2.600	1,589	1,589	212	3,064	13.34%	192.87%

Table 21 Stage 2 Construction Phase (including Stage 1 Operations) - Pavement Loading Comparison

Segment ID	AADT Segment		Background ESA		Project-Generated SAR		% Increase	
	Start (km)	End (km)	Gaz	A-Gaz	Gaz	A-Gaz	Gaz	A-Gaz
Gladstone – Mount Larcom Road (181)								
60071	0.000	1.409	1,604,040	1,142,874	17,138	1,952	1.07%	0.17%
60073	1.409	3.258	1,193,496	1,249,774	17,138	1,952	1.44%	0.16%
61052	3.258	4.625	1,331,019	1,573,453	17,138	1,952	1.29%	0.12%
60074	4.625	9.833	1,065,766	1,249,589	17,138	1,952	1.61%	0.16%
	9.833	12.292	1,065,766	1,249,589	17,138	1,952	1.61%	0.16%
60076	12.292	19.030	795,403	1,099,933	1,470	21,241	0.18%	1.93%
	19.030	32.140	795,403	1,099,933	0	0	0.00%	0.00%
Reid Road (GRC)								
GRC	0.000	0.275	57,763	57,763	38,379	3,422	66.44%	5.92%
GRC	0.275	0.430	28,881	28,881	38,379	3,422	132.88%	11.85%
GRC	0.430	0.505	28,881	28,881	38,379	3,422	132.88%	11.85%
GRC	0.505	0.710	28,881	28,881	38,379	3,422	132.88%	11.85%
GRC	0.710	0.740	3,851	3,851	38,379	3,422	996.63%	88.86%
GRC	0.740	2.600	3,851	3,851	0	0	0.00%	0.00%

The results in **Table 20** and **Table 21** above indicate that the heavy vehicle movements associated with the construction works for Stage 1 and Stage 2 of the Project are expected to lead to negligible increases in pavement loadings on the identified sections of the State-controlled road network (Gladstone-Mount Larcom Road), with all calculated values of loading increase below the typical 5% increase trigger threshold.

The results above did however indicate that the additional vehicle movements generated by the both the Stage 1 and Stage 2 construction phases will lead to an increase in pavement loadings >5% on a number of sections of the GRC controlled Reid Road.

As a result, GRC may request a contribution from Alpha HPA for the increased road maintenance costs as a means to offset or mitigate the impact of the additional pavement loadings from the Stage 1 and Stage 2 construction phases of the Project on the existing sealed road pavement of Reid Road.

It is recommended that the value of any contribution be based on the percentage increase in pavement loadings, with the reference value being GRC's current maintenance expenditure for the on the relevant sections of Reid Road, noting that further discussions with Council will be required to establish an acceptable contribution for the required mitigation measures for these road pavements. Should this occur, it is also recommended that pre and post construction dilapidation inspections be undertaken for both the Stage 1 and Stage 2 construction phases to ensure that the relevant sections of Reid Road are left in a similar condition to that observed prior to the commencement of the construction works for each stage of the Project.

5.6.4 Ongoing Operations Phase

Based on the relatively low volume of heavy vehicles generated by the operations phase of the Project (approx. 10vpd), and the existing heavy vehicle movements on the relevant sections of the state controlled road network, and Reid Road (in particular those generated by the adjacent Orica Ammonium Nitrate facility) the pavement impacts of the overall (Stage 1 and Stage 2) operation of the Alpha HPA project are expected to be minimal. Based on this, no further pavement mitigation measures are considered necessary as part of the ongoing operations of the Project (post construction).

6.0 Conclusions and Recommendations

6.1.1 Traffic Impacts

Based on the identified increase in traffic numbers anticipated as a result of the construction and operational phases of Stage 1 and Stage 2 of the Project, it is anticipated that the proposed Alpha HPA facility will have a minimal impact on the traffic operation of the identified road links and intersections forming part of the relevant road network from a capacity perspective.

Notwithstanding this, the following mitigation treatments are recommended to maximise the safety and operation of the surrounding road network:

- Provision of a new site access point, approximately 505m south of Gladstone-Mount Larcom Road, as part of the Stage 2 construction works. These access works are to be provided generally in accordance with a Type B2 (9m) driveway in accordance with the Standard Drawing CMDG-R-042A of the Capricorn Municipal Design Guidelines.

6.1.2 Pavement Impacts

The assessment undertaken indicates that the HV movements associated with the development of the Project are expected to lead to negligible increases in pavement loadings on all identified sections of the state-controlled road network, with most calculated increase values below the typical 5% increase trigger threshold.

The results above did however indicate that the additional vehicle movements generated by the both the Stage 1 and Stage 2 construction phases will lead to an increase in pavement loadings >5% on a number of sections of the GRC controlled Reid Road. As a result, GRC may request a contribution from Alpha HPA for the increased road maintenance costs as a means to offset or mitigate the impact of the additional pavement loadings from the Stage 1 and Stage 2 construction phases of the Project on the existing sealed road pavement of Reid Road.

It is recommended that the value of any contribution be based on the percentage increase in pavement loadings, with the reference value being GRC's current maintenance expenditure for the on the relevant sections of Reid Road, noting that further discussions with Council will be required to establish an acceptable contribution for the required mitigation measures for these road pavements. Should this occur, it is also recommended that pre and post construction dilapidation inspections be undertaken for both the Stage 1 and Stage 2 construction phases to ensure that the relevant sections of Reid Road are left in a similar condition to that observed prior to the commencement of the construction works for each stage of the Project.

Finally, it is also noted that the overall (Stage 1 and Stage 2) operations phase of the Project will only generate a relatively low volume of heavy vehicles (approx. 10vpd). Based on the existing heavy vehicle movements on the relevant sections of the state controlled road network, and Reid Road (in particular those generated by the adjacent Orica Ammonium Nitrate facility) the pavement impacts of the ongoing operation of the proposed Alpha HPA project are expected to be minimal. As such, no further pavement mitigation measures are considered necessary as part of the ongoing operations of the Project.

6.2 Recommendations

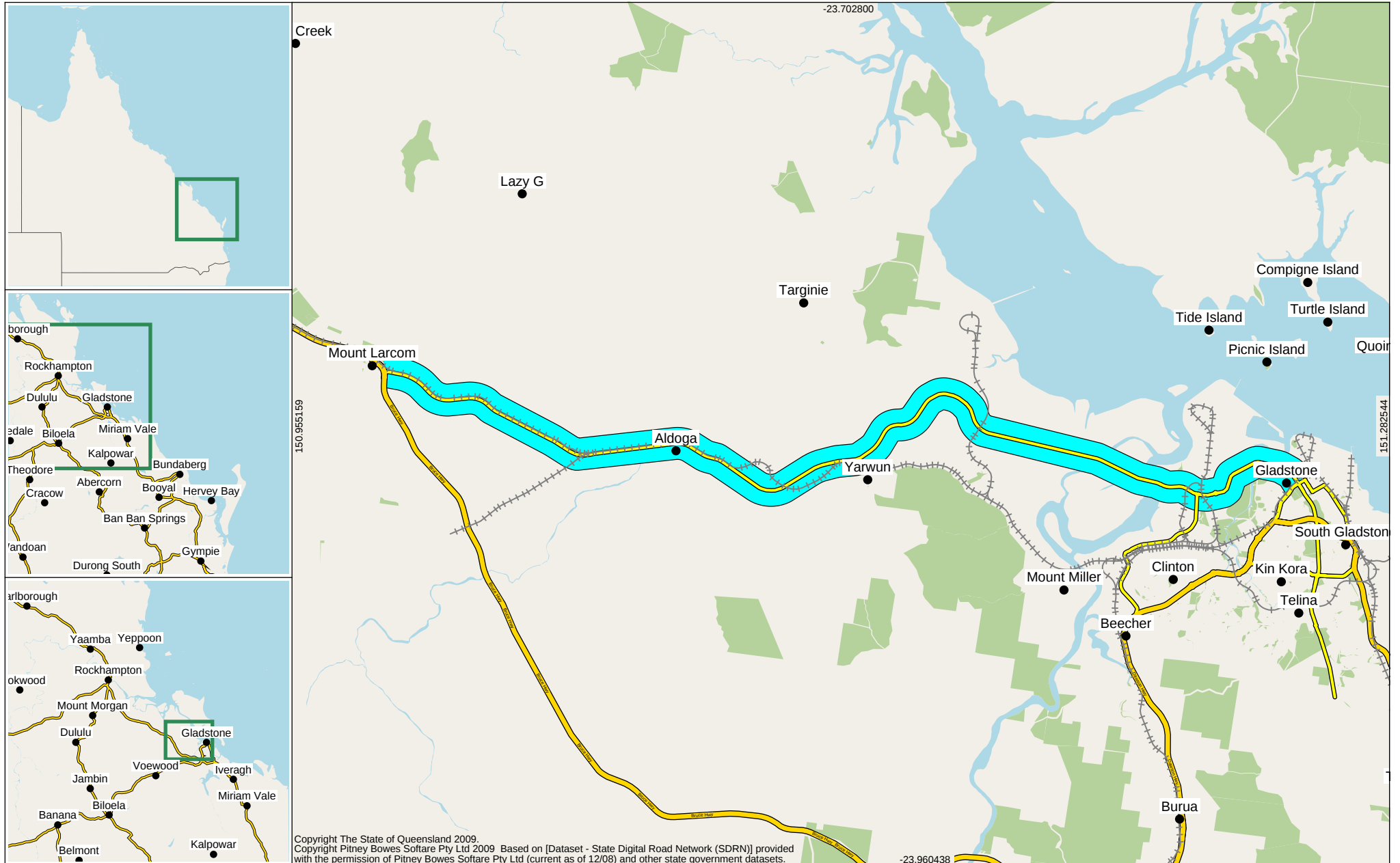
In light of the information provided above, it can be considered that conditional to the provision of a mitigation measure agreed with Council to offset the potential pavement impacts of the Stage 1 and Stage 2 construction works on Reid Road, that the proposed staged development of the Alpha HPA Project will have a minor impact on the surrounding road network. Therefore, it is recommended that the Project be approved from a traffic engineering viewpoint.

6.3 Certification Statement and Authorisation

A copy of the RPEQ certification and authorisation statement covering this traffic impact assessment of the proposed staged development of the Alpha HPA Project located on Lot 12 SP239343, Yarwun, is included for reference as **Appendix K**.



Appendix A – TMR AADT Segment Data



Traffic Analysis and Reporting System
AADT Segment Analysis Report (Complete)
Road Section 181 - GLADSTONE - MT LARCOM ROAD
Traffic Year 2019

Road Segments Summary - All Vehicles

Region	Segment Start Tdist	Segment End Tdist	Site	Site Tdist	Description	AADT			VKT (Millions)			Data Year	Page
						G	A	B	G	A	B		
404	0.000 km	1.409 km	60071	1.200 km	G'stone-Mt Larcom Rd 200m N Lord St	3,563	3,085	6,648	1.83240	1.58657	3.41897	2019	2
404	1.409 km	3.258 km	60073	2.550 km	G'stone-Mt Larcom Rd 50m S Auckland Ck	3,025	3,150	6,175	2.04153	2.12589	4.16741	2018	3
404	3.258 km	4.625 km	61052	3.344 km	G'stone-Mt Larcom Rd 500m S Red Rover Rd	4,706	4,542	9,248	2.34808	2.26625	4.61434	2018	4
404	4.625 km	12.292 km	60074	6.270 km	G'stone-Mt Larcom Rd1km N Calliope River	3,206	3,189	6,395	8.97185	8.92427	17.89612	2018	5
404	12.292 km	32.140 km	60076	16.451 km	G'stone-Mt Larcom Rd 150m N Yarwun Rd	1,480	1,482	2,962	10.72189	10.73638	21.45827	2018	6
								Totals	25.91574	25.63936	51.55511		

Road Segments Summary - Heavy Vehicles only

VKT totals are calculated only if traffic class data is available for all sites.

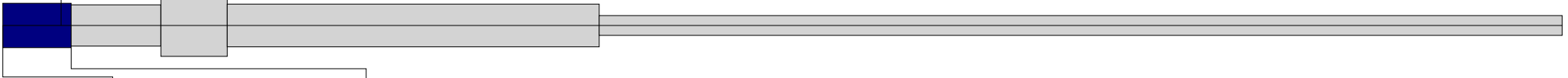
Region	Segment Start Tdist	Segment End Tdist	Site	Site Tdist	Description	HV AADT						HV VKT (Millions)			Data Year	Page
						G		A		B						
						AADT	HV %	AADT	HV %	AADT	HV %	G	A	B		
404	0.000 km	1.409 km	60071	1.200 km	G'stone-Mt Larcom Rd 200m N Lord St	660	18.52%	470	15.24%	1,130	17.00%	0.33943	0.24171	0.58114	2019	2
404	1.409 km	3.258 km	60073	2.550 km	G'stone-Mt Larcom Rd 50m S Auckland Ck	486	16.07%	509	16.16%	995	16.11%	0.32799	0.34352	0.67151	2018	3
404	3.258 km	4.625 km	61052	3.344 km	G'stone-Mt Larcom Rd 500m S Red Rover Rd	542	11.52%	641	14.11%	1,183	12.79%	0.27043	0.31983	0.59026	2018	4
404	4.625 km	12.292 km	60074	6.270 km	G'stone-Mt Larcom Rd1km N Calliope River	434	13.54%	509	15.96%	943	14.75%	1.21453	1.42441	2.63894	2018	5
404	12.292 km	32.140 km	60076	16.451 km	G'stone-Mt Larcom Rd 150m N Yarwun Rd	324	21.89%	448	30.23%	772	26.06%	2.34722	3.24554	5.59277	2018	6
											Totals	4.49961	5.57502	10.07463		



Site 60071. Point 260000128.
G'stone-Mt Larcom Rd 200m N Lord St.

1.20 km

The width of each Road Segment is proportional to its AADT.



0.00 km

Start Point 260000129. Glenlyon
St to Mt Larcom @ Dawson Rd.

1.41 km

End Point 260000130. Hanson Road
to Mt Larcom @ Hilderbrand St.

This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

All Vehicles (00)

G	3,563	100%
A	3,085	100%
B	6,648	100%

Annual Segment Growth

	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	7.32%	-5.32%	-3.07%
A	-8.43%	-8.25%	-5.44%
B	-0.61%	-6.73%	-4.23%

Light Vehicles (0A)

G	2,903	81.48%
A	1,618	52.45%
B	4,521	68.01%

Heavy Vehicles (0B)

G	660	18.52%
A	470	15.24%
B	1,130	17.00%

Short Vehicles (1A)

G	2,903	81.48%
A	1,618	52.45%
B	4,521	68.01%

Trucks and Buses (1B)

G	438	12.29%
A	309	10.02%
B	747	11.24%

Articulated Vehicles (1C)

G	132	3.70%
A	90	2.92%
B	222	3.34%

Road Trains (1D)

G	90	2.53%
A	71	2.30%
B	161	2.42%

Short 2-Axle
Vehicles (2A)

G	2,849	79.96%
A	1,583	51.31%
B	4,432	66.67%

Short Vehicles
Towing (2B)

G	54	1.52%
A	35	1.13%
B	89	1.34%

2-Axle Trucks
and Buses (2C)

G	384	10.78%
A	257	8.33%
B	641	9.64%

3-Axle Trucks
and Buses (2D)

G	44	1.23%
A	44	1.43%
B	88	1.32%

4-Axle
Trucks (2E)

G	10	0.28%
A	8	0.26%
B	18	0.27%

3-Axle
Articulated (2F)

G	7	0.20%
A	6	0.19%
B	13	0.20%

4-Axle
Articulated (2G)

G	6	0.17%
A	6	0.19%
B	12	0.18%

5-Axle
Articulated (2H)

G	8	0.22%
A	4	0.13%
B	12	0.18%

6-Axle
Articulated (2I)

G	111	3.12%
A	74	2.40%
B	185	2.78%

B Double (2J)

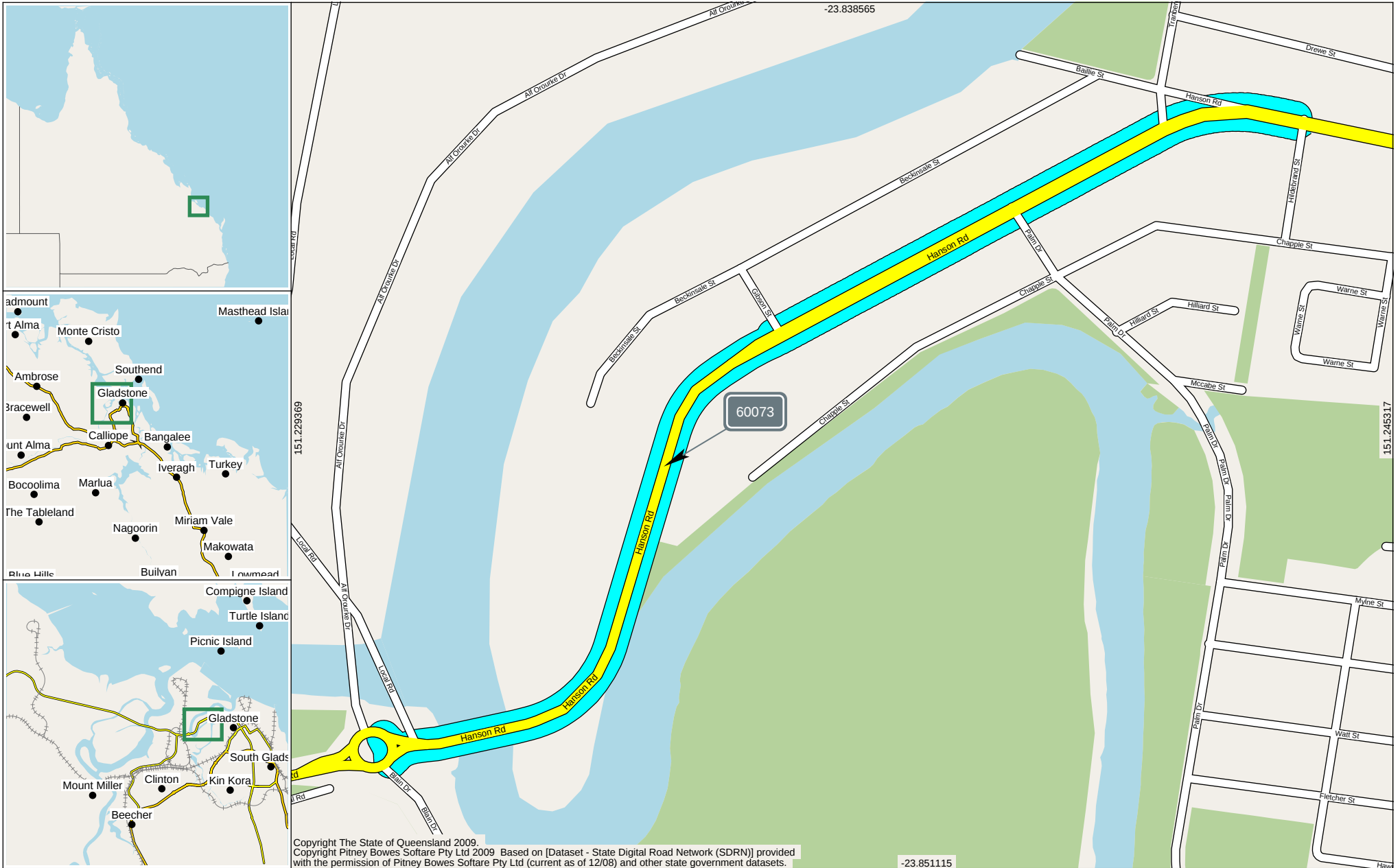
G	90	2.53%
A	71	2.30%
B	161	2.42%

Double Road
Trains (2K)

G	0	0%
A	0	0%
B	0	0%

Triple Road
Trains (2L)

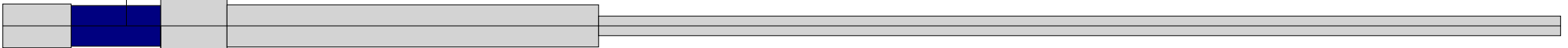
G	0	0%
A	0	0%
B	0	0%



Site 60073. Point 260000132. G'stone-Mt Larcom Rd 500m S Auckland Ck.

2.55 km

The width of each Road Segment is proportional to its AADT.



1.41 km

Start Point 260000130. Hanson Road to Mt Larcom @ Hilderbrand St.

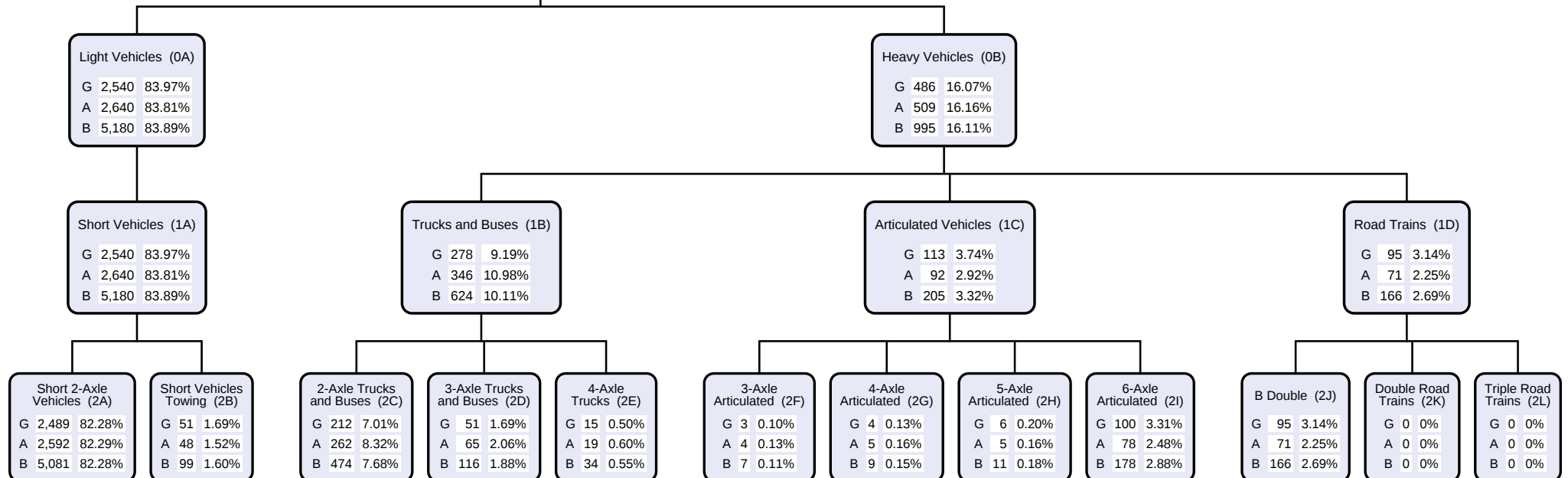
3.26 km

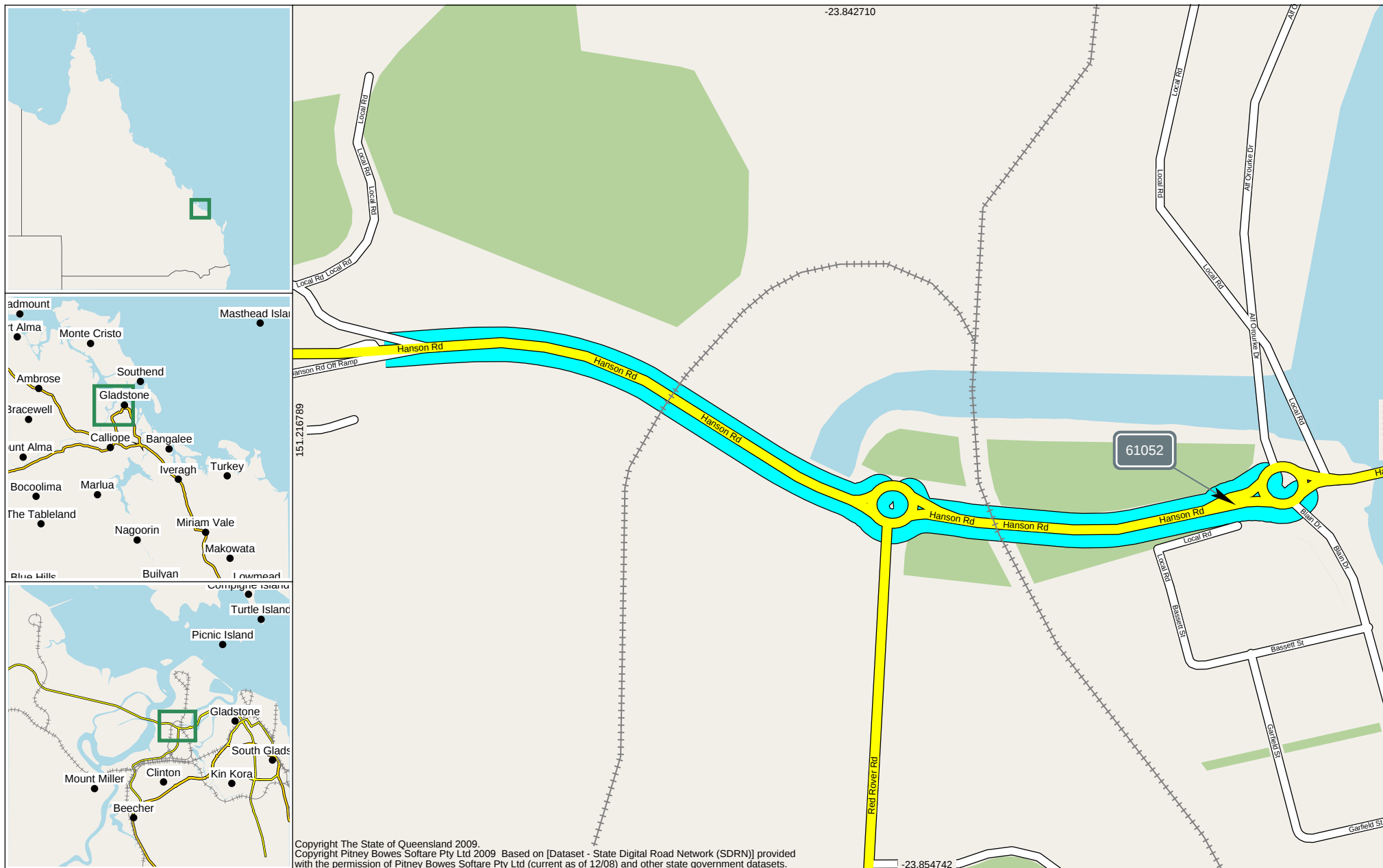
End Point 260000133. Hanson Rd.

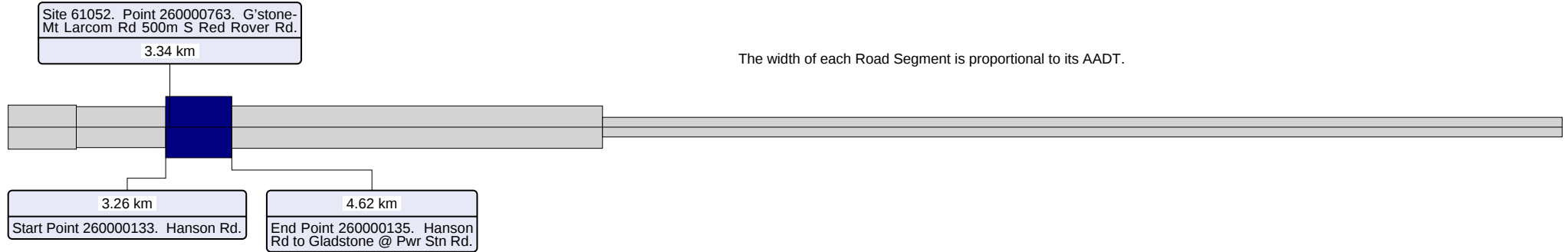
This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

All Vehicles (00)			
G	3,025	100%	
A	3,150	100%	
B	6,175	100%	

Annual Segment Growth			
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	0.00%	-4.01%	-2.88%
A	0.00%	-2.83%	-1.87%
B	0.00%	-3.43%	-2.38%

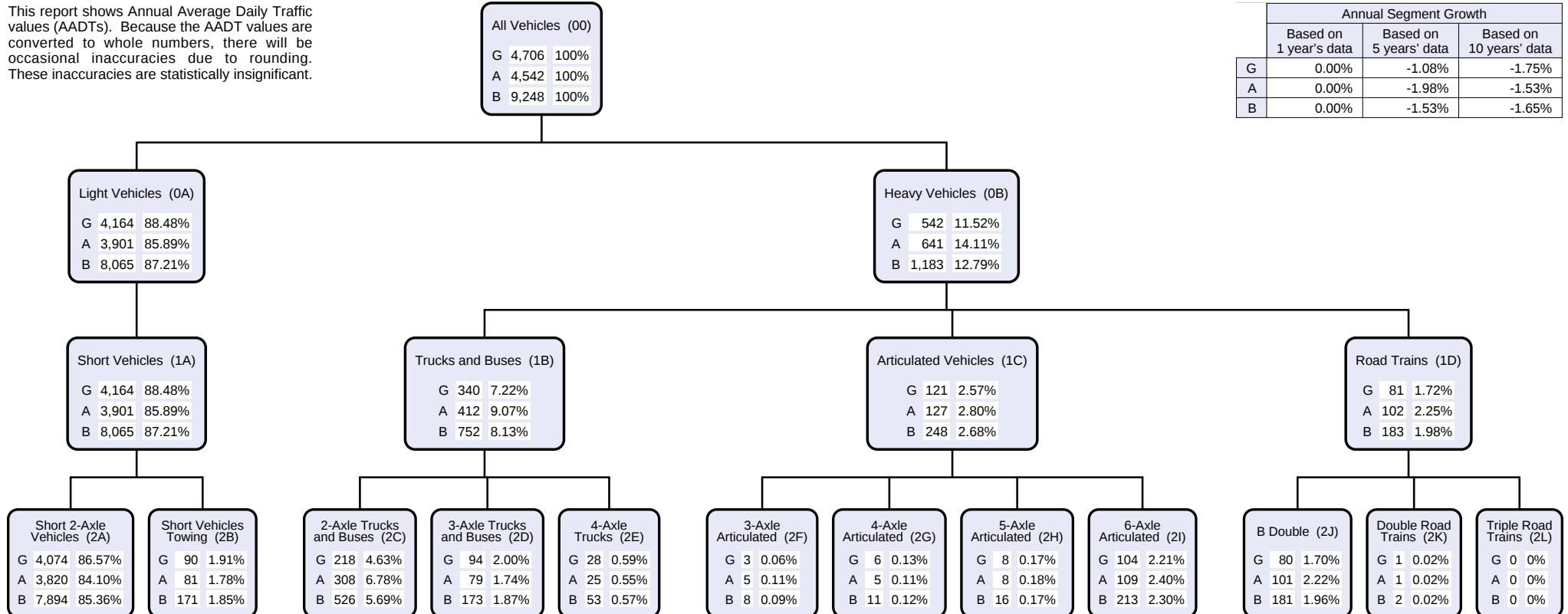


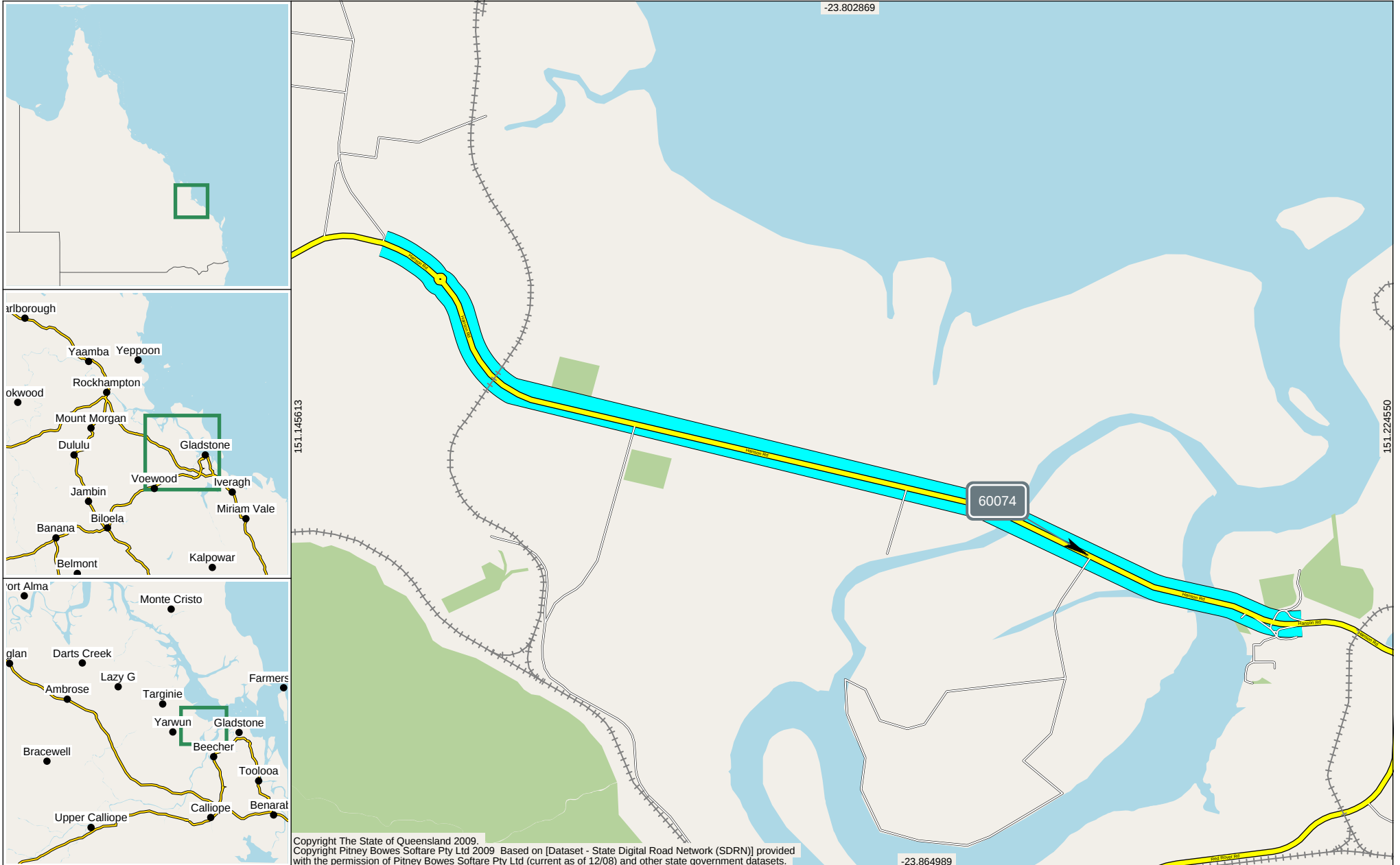


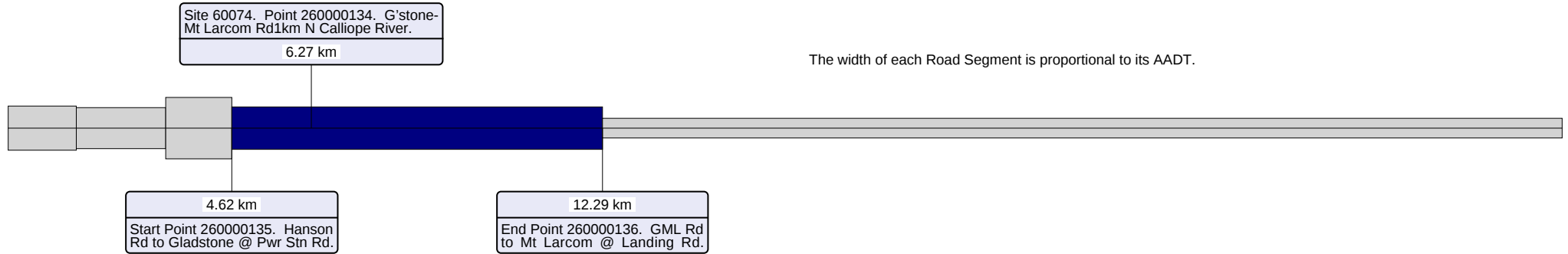


This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

Annual Segment Growth			
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	0.00%	-1.08%	-1.75%
A	0.00%	-1.98%	-1.53%
B	0.00%	-1.53%	-1.65%





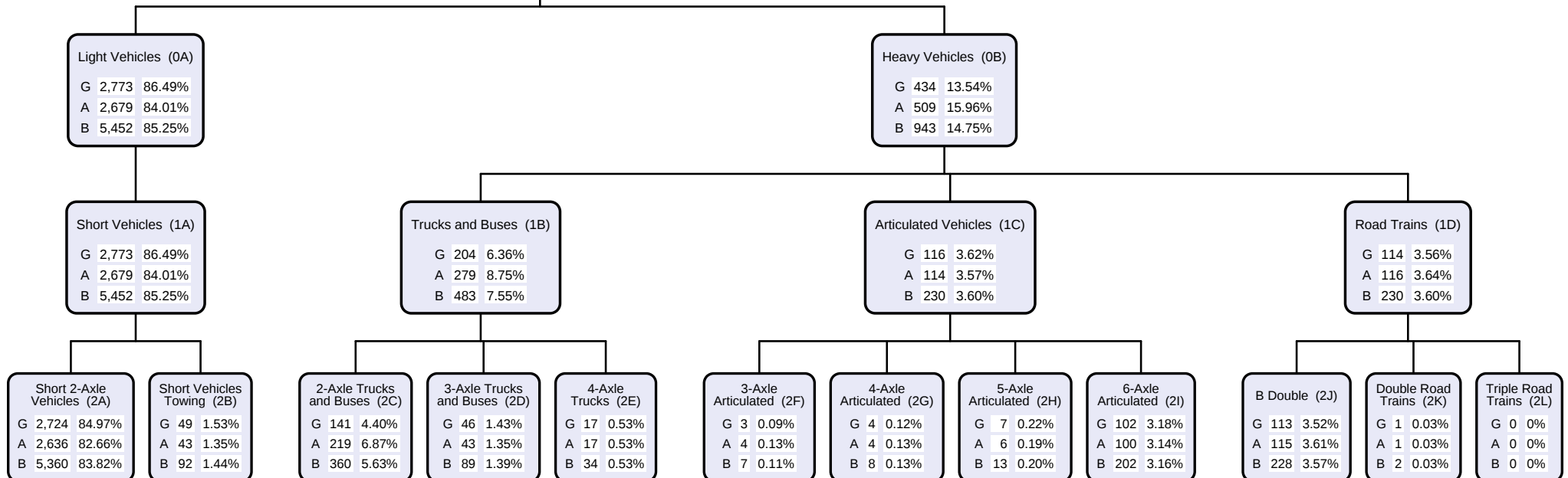


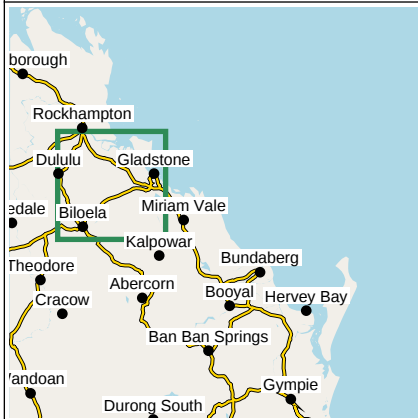
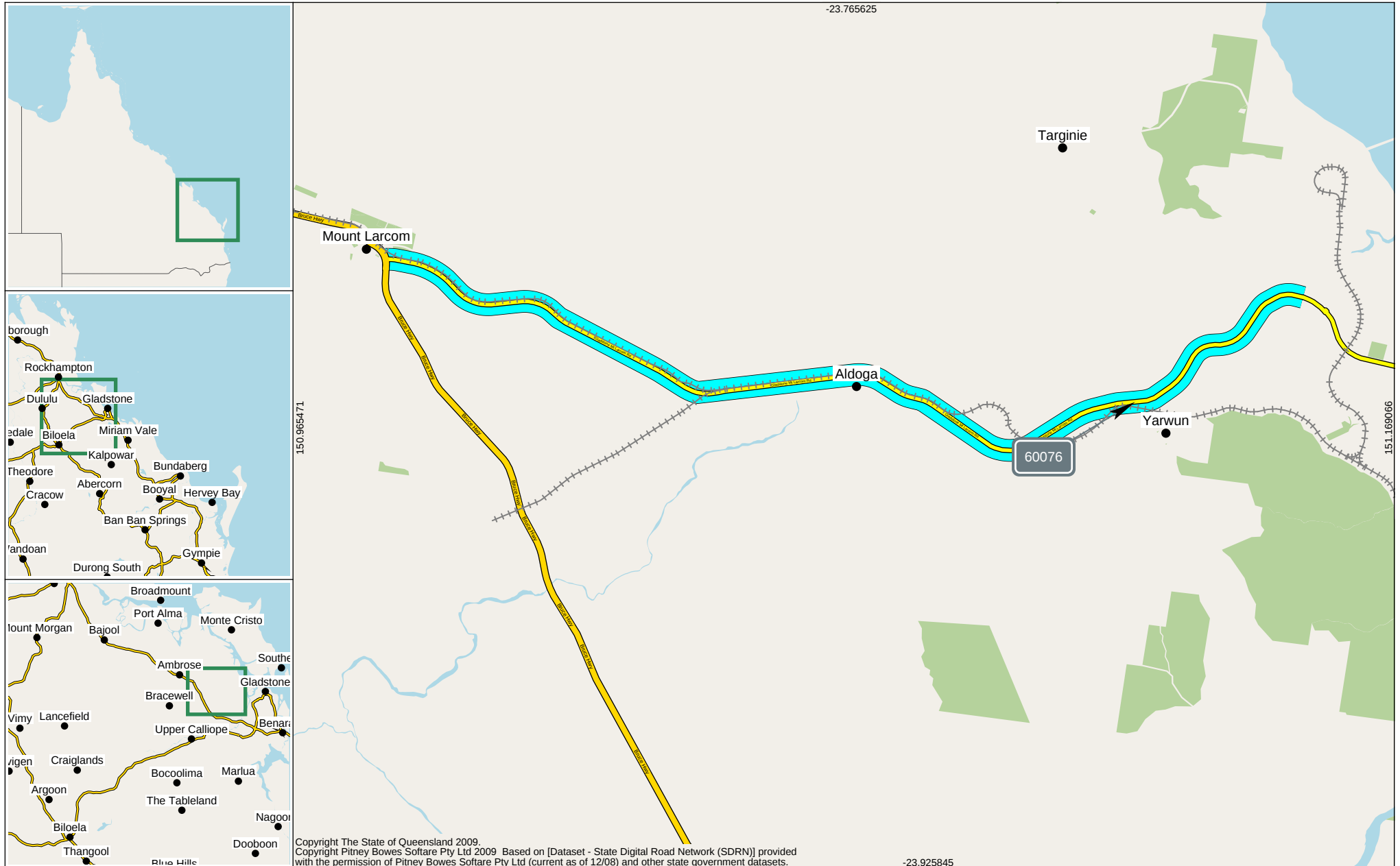
The width of each Road Segment is proportional to its AADT.

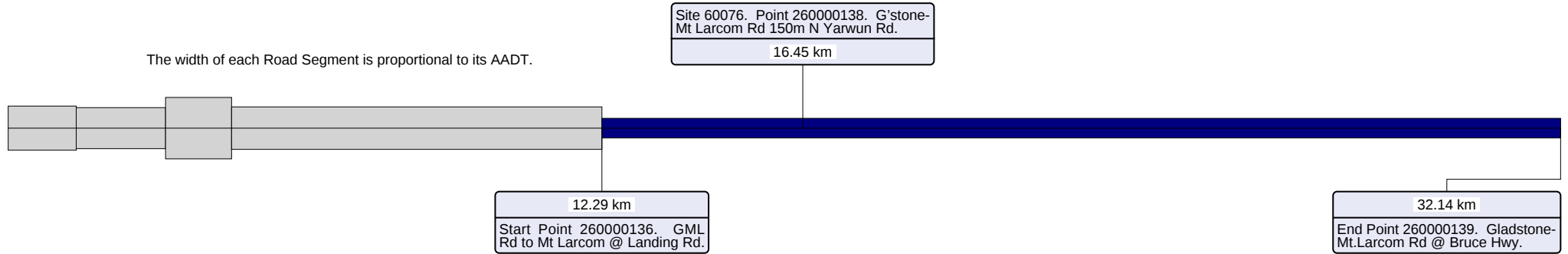
This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

All Vehicles (00)	
G	3,206 100%
A	3,189 100%
B	6,395 100%

Annual Segment Growth			
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	0.00%	0.41%	-1.41%
A	0.00%	0.17%	-1.90%
B	0.00%	0.28%	-1.66%

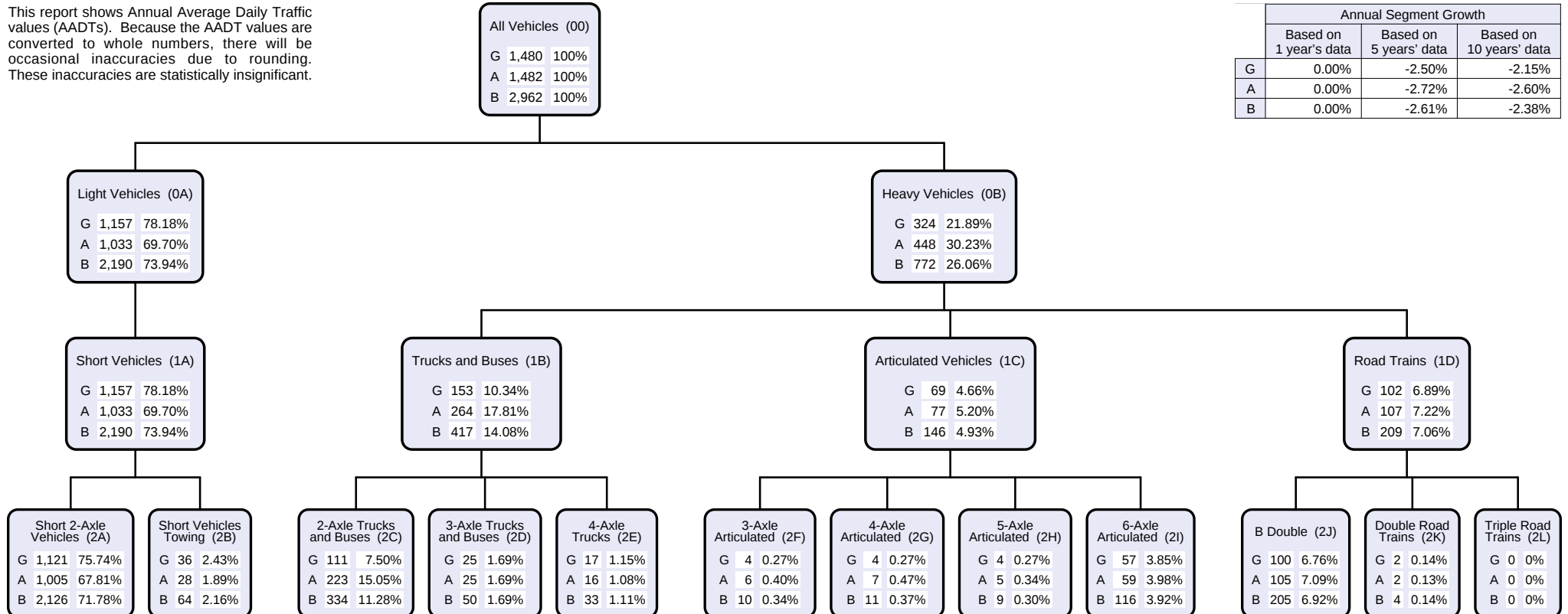






This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

Annual Segment Growth			
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	0.00%	-2.50%	-2.15%
A	0.00%	-2.72%	-2.60%
B	0.00%	-2.61%	-2.38%

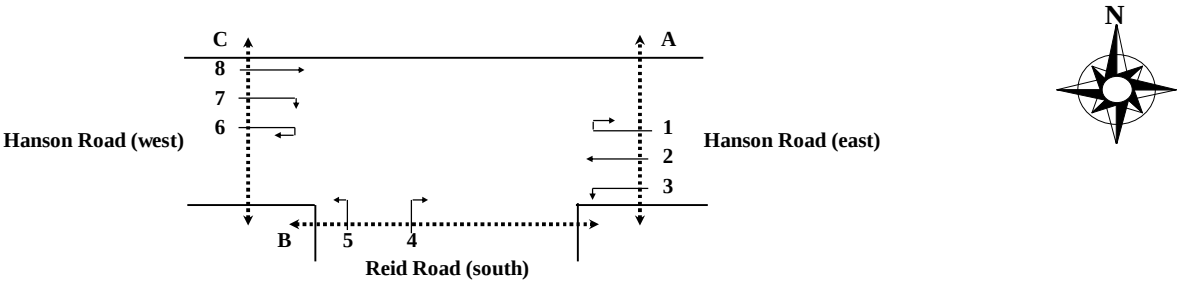




Appendix B – Gladstone-Mt Larcom Road / Reid Road Intersection Count (Austraffic)

AUSTRAFFIC VIDEO INTERSECTION COUNT

Site No.: 1 Weather: Fine
Location: Gladstone-Mt Larcom Road/Reid Road, Gladstone
Day/Date: Tuesday, 14 July 2020
AM Peak: Hour ending - 7:00 AM
PM Peak: Hour ending - 5:00 PM



TIME (1/4 hr end)	Movement 1				Movement 2				Movement 3				Movement 4				Movement 5				Movement 6				Movement 7				Movement 8				Pedestrian Movements		
	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	A	B	C				
6:15 AM	0	0	0	0	165	18	183	0	15	0	15	0	1	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	45	2	47	0	0	0	0
6:30 AM	0	0	0	0	91	9	100	0	13	4	17	0	0	2	2	0	2	0	2	0	0	0	0	0	0	0	0	26	8	34	0	0	0	0	
6:45 AM	0	0	0	0	91	11	102	0	10	0	10	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	13	7	20	0	0	0	0		
7:00 AM	0	0	0	0	61	7	68	0	8	0	8	0	0	1	1	0	0	1	1	0	0	0	0	0	1	0	1	0	22	13	35	0	0	0	0
7:15 AM	0	0	0	0	53	6	59	0	6	1	7	0	1	1	2	0	2	0	2	0	0	0	0	0	2	0	2	0	27	9	36	0	0	0	0
7:30 AM	0	0	0	0	35	6	41	0	7	2	9	0	1	1	2	0	1	1	2	0	0	0	0	1	0	1	0	29	9	38	0	0	0	0	
7:45 AM	0	0	0	0	34	9	43	0	15	0	15	0	2	0	2	0	2	2	4	0	0	0	0	2	0	2	0	32	8	40	0	0	0	0	
8:00 AM	0	0	0	0	30	8	38	0	2	1	3	0	1	0	1	0	1	0	1	0	0	0	0	0	2	0	2	0	34	10	44	0	0	0	0
8:15 AM	0	0	0	0	36	7	43	1	12	1	13	0	0	1	1	0	0	2	2	0	0	0	0	0	1	0	1	0	36	15	51	1	0	0	0
8:30 AM	0	0	0	0	21	8	29	0	4	4	8	0	4	0	4	0	0	1	1	0	0	0	0	3	0	3	0	36	10	46	0	0	0	0	
8:45 AM	0	0	0	0	25	9	34	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	2	0	2	0	29	10	39	0	0	0	0
9:00 AM	0	0	0	0	27	10	37	0	2	1	3	0	1	0	1	0	1	2	3	0	0	0	0	0	0	0	35	7	42	0	0	0	0	0	
3 hr Total	0	0	0	0	669	108	777	1	96	14	110	0	14	6	20	0	11	9	20	0	0	0	0	10	5	15	0	364	108	472	1	0	0	0	
AM Peak	0	0	0	0	408	45	453	0	46	4	50	0	2	3	5	0	4	1	5	0	0	0	2	0	2	0	106	30	136	0	0	0	0		

TIME (1/4 hr end)	Movement 1				Movement 2				Movement 3				Movement 4				Movement 5				Movement 6				Movement 7				Movement 8				Pedestrian Movements		
	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	Light Vehicles	Heavy Vehicles	Total	Cyclists	A	B	C				
3:15 PM	0	0	0	0	29	6	35	0	0	0	0	0	3	2	5	0	0	0	0	0	0	0	0	0	68	11	79	0	0	0	0				
3:30 PM	0	0	0	0	49	9	58	0	3	1	4	0	9	0	9	0	0	1	1	0	0	0	0	66	13	79	0	0	0	0					
3:45 PM	0	0	0	0	36	10	46	0	0	1	1	0	9	0	9	0	1	0	1	0	0	0	1	69	10	79	0	0	0	0					
4:00 PM	0	0	0	0	36	5	41	0	0	0	0	0	12	0	12	1	1	0	1	0	0	0	1	69	14	83	0	0	0	0					
4:15 PM	0	0	0	0	46	7	53	0	0	1	1	0	28	0	28	0	0	3	3	0	0	0	1	116	8	124	0	0	0	0					
4:30 PM	0	0	0	0	52	3	55	0	2	0	2	0	18	0	18	0	0	0	0	0	0	0	0	79	6	85	0	0	0	0					
4:45 PM	0	0	0	0	33	5	38	0	1	0	1	1	23	1	24	0	5	1	6	1	0	0	1	172	6	178	0	0	0	0					
5:00 PM	0	0	0	0	51	5	56	0	7	0	7	0	10	0	10	0	2	0	2	0	0	0	0	69	7	76	0	0	0	0					
5:15 PM	0	0	0	0	48	5	53	0	6	0	6	0	14	1	15	0	1	1	2	0	0	0	0	109	5	114	0	0	0	0					
5:30 PM	0	0	0	0	73	5	78	0	2	0	2	0	13	1	14	0	0	0	0	0	0	0	0	50	6	56	0	0	0	0					
5:45 PM	0	0	0	0	56	3	59	0	0	0	0	0	7	1	8	0	1	0	1	0	0	0	0	151	5	156	0	0	0	0					
6:00 PM	0	0	0	0	25	1	26	0	0	0	0	0	5	0	5	0	0	1	1	0	0	0	0	96	8	104	1	0	0	0					
3 hr Total	0	0	0	0	534	64	598	0	21	3	24	1	151	6	157	1	11	7	18	1	0	0	5	3	8	0	1114	99	1213	1	0	0	0		
PM Peak	0	0	0	0	182	20	202	0	10	1	11	1	79	1	80	0	7	4	11	1	0	0	2	1	3	0	436	27	463	0	0	0	0		



Appendix C – SIDRA Results – Existing Conditions

MOVEMENT SUMMARY

Site: 1 [2021 AM Existing (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	5	1	5	20.0	0.035	16.9	LOS B	0.1	1.3	0.83	0.66	0.83	45.5
3	R2	5	3	5	60.0	* 0.035	17.4	LOS B	0.1	1.3	0.83	0.66	0.83	44.3
Approach		10	4	11	40.0	0.035	17.2	LOS B	0.1	1.3	0.83	0.66	0.83	44.9
East: Gladstone - Mt Larcom Rd														
4	L2	50	4	53	8.0	0.082	12.6	LOS B	0.5	3.9	0.68	0.70	0.68	48.4
5	T1	457	45	481	9.8	* 0.708	10.7	LOS B	7.0	52.8	0.91	0.86	1.07	51.0
Approach		507	49	534	9.7	0.708	10.9	LOS B	7.0	52.8	0.89	0.84	1.03	50.8
West: Gladstone - Mt Larcom Rd														
11	T1	137	30	144	21.9	0.209	6.7	LOS A	1.5	12.1	0.69	0.55	0.69	54.1
12	R2	2	0	2	0.0	* 0.035	23.5	LOS C	0.0	0.2	0.98	0.59	0.98	42.2
Approach		139	30	146	21.6	0.209	6.9	LOS A	1.5	12.1	0.69	0.55	0.69	53.9
All Vehicles		656	83	691	12.7	0.708	10.1	LOS B	7.0	52.8	0.85	0.78	0.95	51.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2021 AM Existing (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

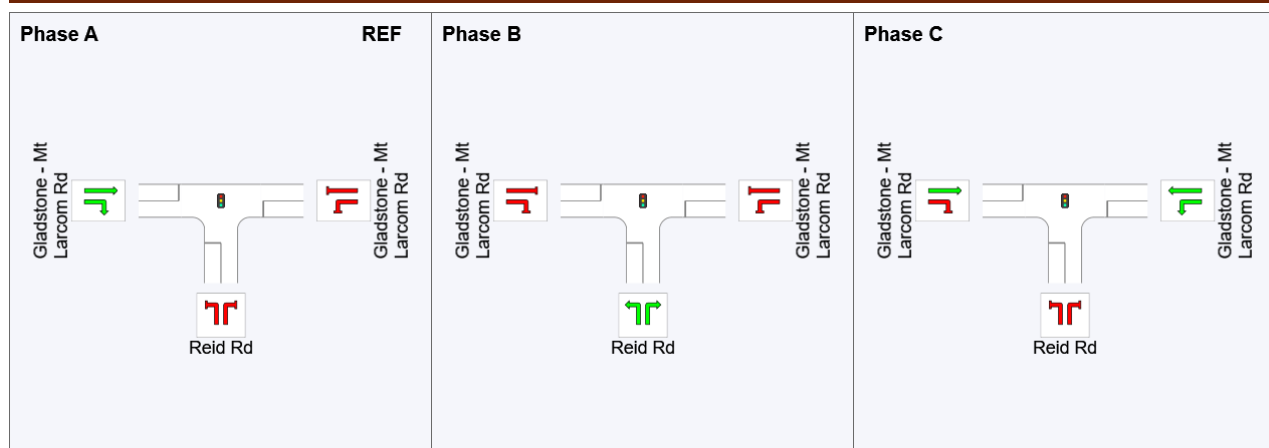
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

Site: 1 [2021 PM Existing (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	11	4	12	36.4	0.261	17.8	LOS B	1.3	9.5	0.88	0.75	0.88	44.6
3	R2	81	1	85	1.2	* 0.261	17.4	LOS B	1.3	9.5	0.88	0.75	0.88	45.7
Approach		92	5	97	5.4	0.261	17.5	LOS B	1.3	9.5	0.88	0.75	0.88	45.5
East: Gladstone - Mt Larcom Rd														
4	L2	11	1	12	9.1	0.018	12.3	LOS B	0.1	0.8	0.66	0.65	0.66	48.5
5	T1	204	20	215	9.8	0.316	7.7	LOS A	2.4	18.0	0.76	0.62	0.76	53.2
Approach		215	21	226	9.8	0.316	8.0	LOS A	2.4	18.0	0.75	0.62	0.75	53.0
West: Gladstone - Mt Larcom Rd														
11	T1	467	27	492	5.8	* 0.647	8.8	LOS A	6.4	47.0	0.86	0.78	0.93	52.4
12	R2	3	1	3	33.3	0.064	24.7	LOS C	0.1	0.5	0.99	0.61	0.99	41.0
Approach		470	28	495	6.0	0.647	8.9	LOS A	6.4	47.0	0.86	0.77	0.93	52.3
All Vehicles		777	54	818	6.9	0.647	9.7	LOS A	6.4	47.0	0.83	0.73	0.87	51.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2021 PM Existing (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

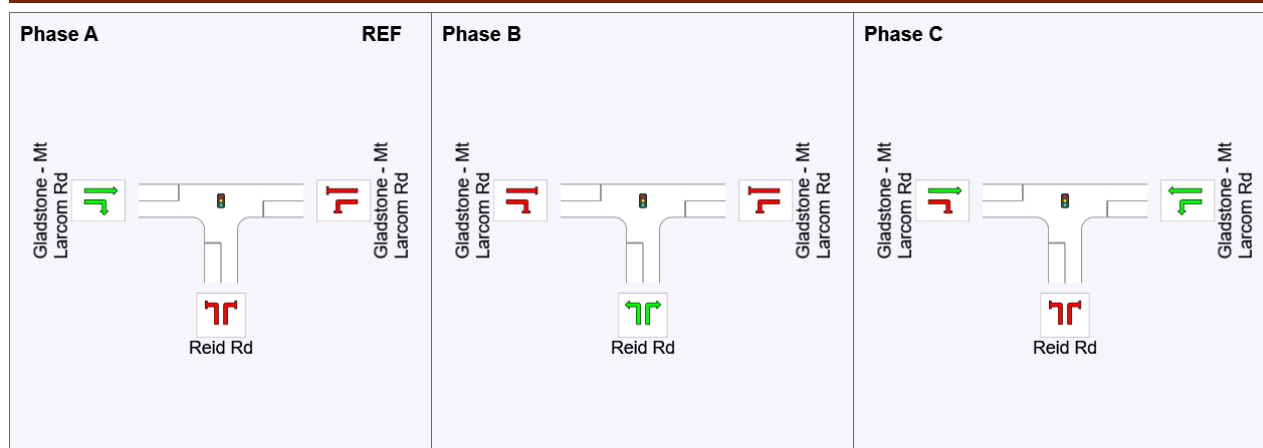
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied



Appendix D – Plan of Development



SITE BOUNDARY

SITE BOUNDARY

SITE BOUNDARY

SITE BOUNDARY

— REID ROAD —

GENERAL SITE ACCESS

CONFIDENTIAL

ISSUED
FOR DFS

		E	UPDATED OCT 2021	AMC	JH	JH		19.10.21
		D	RE-ISSUED FOR INFORMATION	CAM	JH	JH		27.07.21
		C	RE-ISSUED FOR INFORMATION	CAM	JH	JH		16.07.21
		B	RE-ISSUED FOR INFORMATION	AMC	JH	JH		27.06.21
MC1868-G-002	SITE PLAN - GENERAL ARRANGEMENT	A	ISSUED FOR INFORMATION	AMC	JH	JH		15.05.21
DOC No.	DESCRIPTION	REV No	DESCRIPTION	DRN	CHK'D	ENG	APPR'D	DATE
	REFERENCE DOCUMENTS		AMENDMENTS					



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CHECKED		
ENGINEER		
APPROVED		
CLIENT		
		A 1

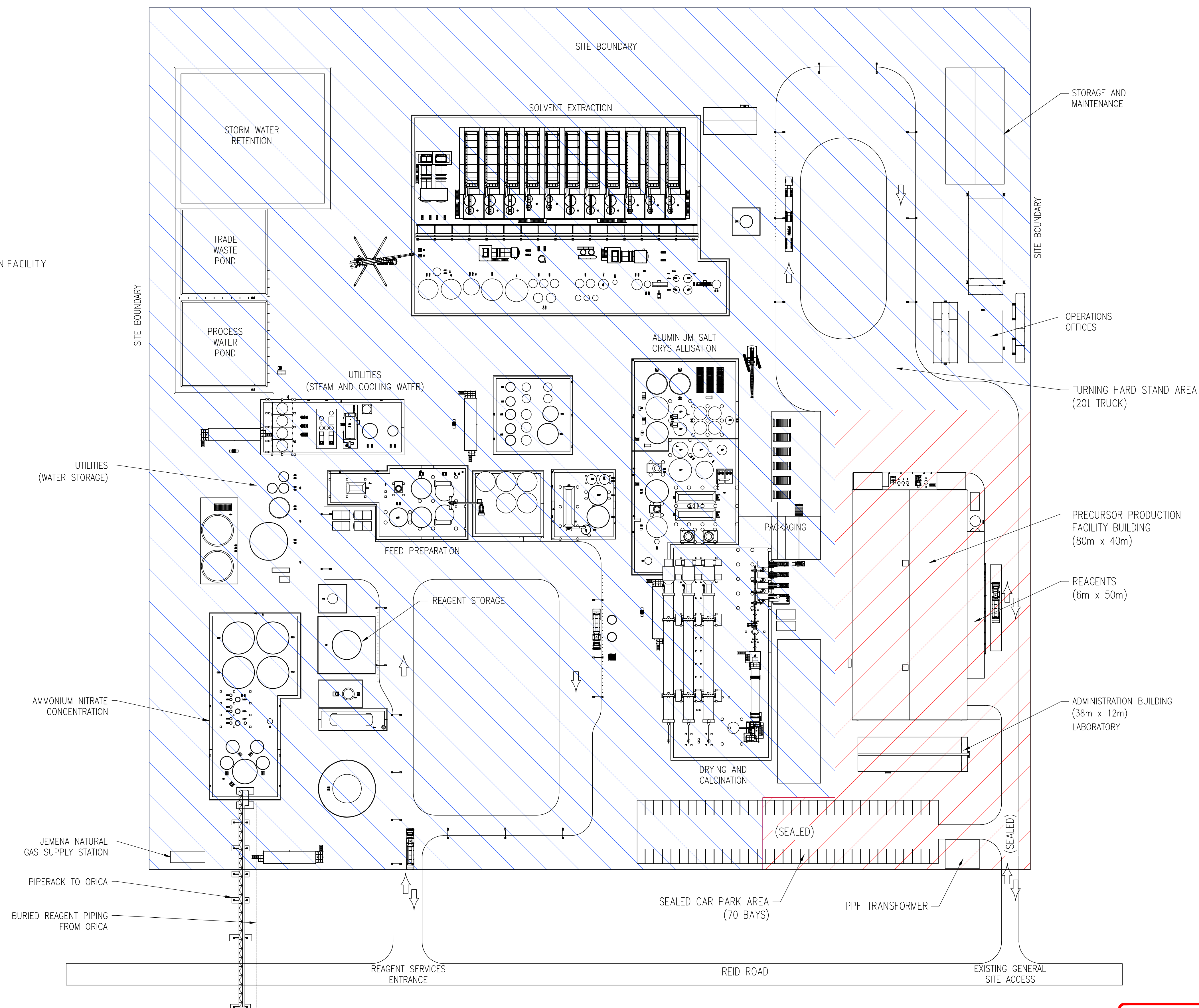
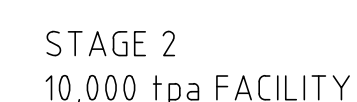
ALPHA HPA
HPA FIRST PROJECT
SITE GENERAL ARRANGEMENT
STAGE 1 - PRECURSOR PRODUCTION PLANT

DRG. No.	MC1868-G-030
----------	--------------

Rev	E
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LEGEND



CONFIDENTIAL

ISSUED
FOR APPROVAL

		D	UPDATED FOR LAYOUT OCT 21	AMC	JH	JH			15.10.21
		C	RE-ISSUED FOR APPROVAL WITH ORICA CONNECTION	AMC	JH	JH			03.10.21
		B	ISSUED FOR INFORMATION	CAM	JH	JH			27.07.21
MC1868-G-002	SITE PLAN – GENERAL ARRANGEMENT	A	ISSUED FOR INFORMATION	CAM	JH	JH			16.07.21
DOC No.	DESCRIPTION	REV No	DESCRIPTION	DRN	CHK'D	ENG	APPR'D	DATE	
	REFERENCE DOCUMENTS		AMENDMENTS						



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ENGINEER		
APPROVED		
CLIENT		
 		A1

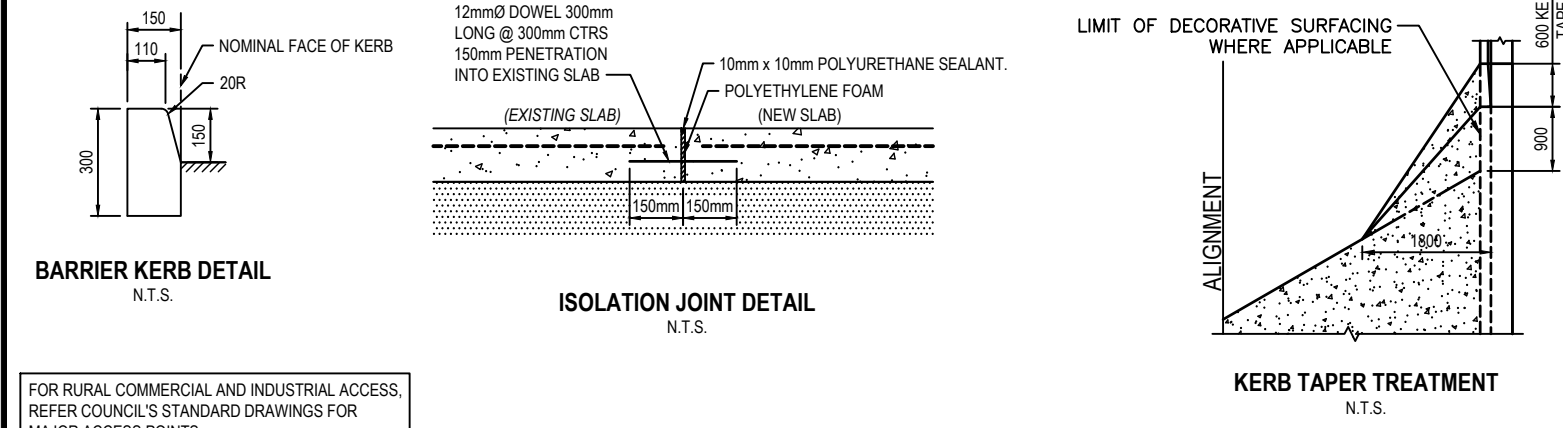
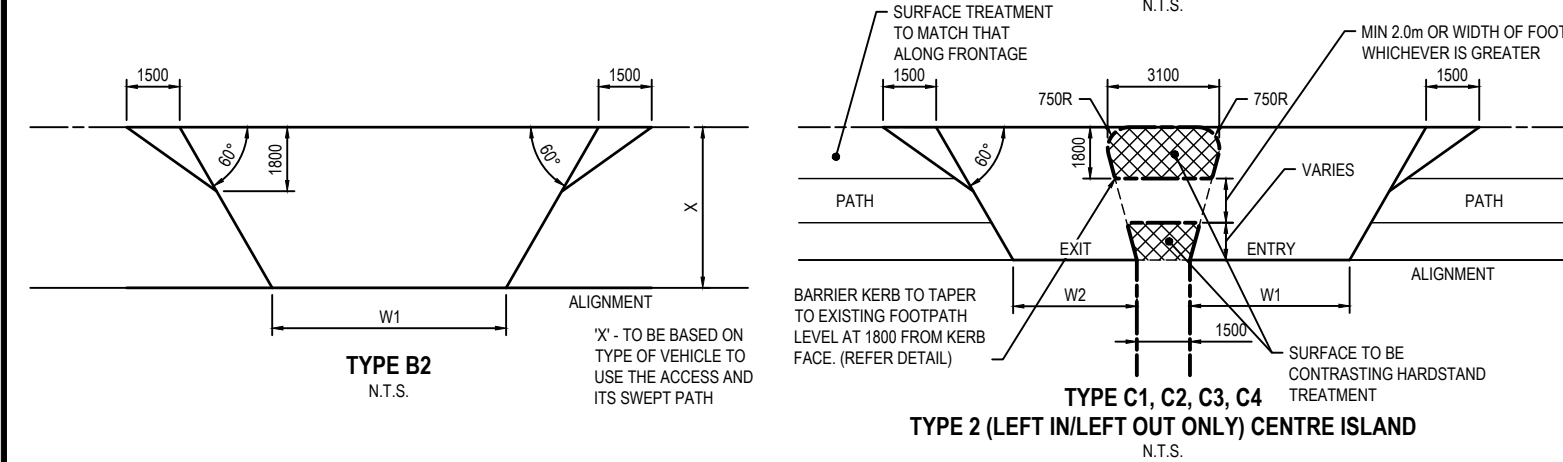
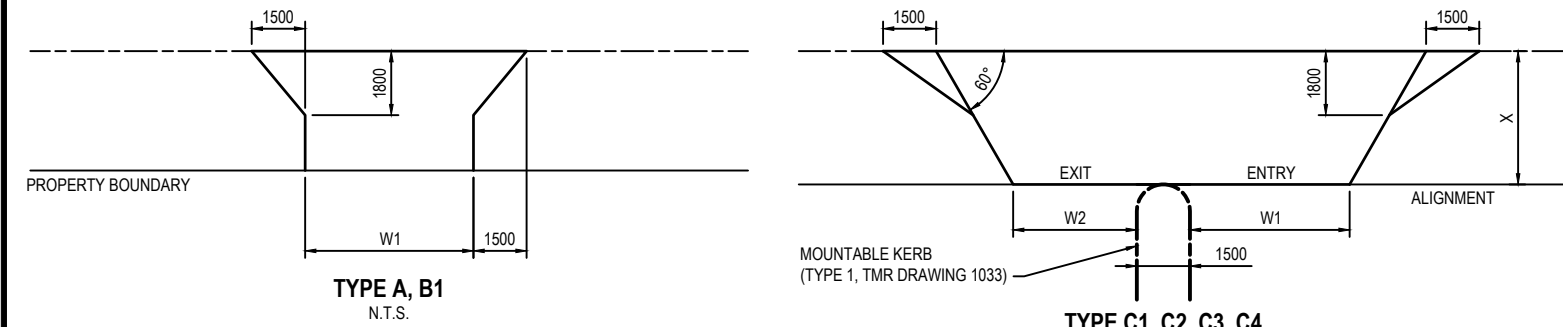
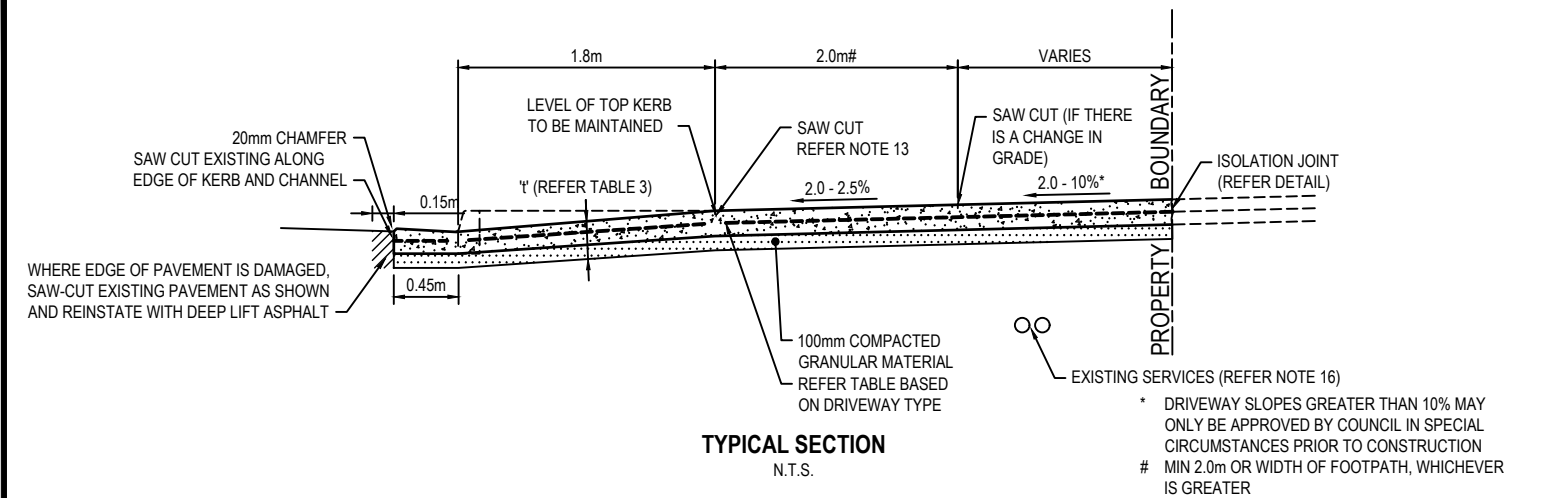
21	ALPHA HPA HPA FIRST PROJECT SITE GENERAL ARRANGEMENT STAGE 1 & STAGE 2
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Appendix E – CMDG Standard Drawing CMDG-R-042A



FOR RURAL COMMERCIAL AND INDUSTRIAL ACCESS, REFER COUNCIL'S STANDARD DRAWINGS FOR MAJOR ACCESS POINTS

REVISIONS		DATE
C	MRC ADDED	07/2021
B	IRC ADDED	12/2016
A	NEW DRAWING FOR GRC	04/2016

DISCLAIMER.
The authors and sponsoring organisations shall have no liability or responsibility to the user or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused, directly or indirectly, by the adoption and use of these Standard Drawings including, but not limited to, any interruption of service, loss of business or anticipatory profits, of consequential damages resulting from the use of these Standard Drawings. Persons must not rely on these Standard Drawings as the equivalent of, or a substitute for, project-specific design and assessment by an appropriately qualified professional.

Capricorn Municipal Development Guidelines
Incorporating:
Banana Shire Council (BSC)
Central Highlands Regional Council (CHRC)
Gladstone Regional Council (GRC)
Isaac Regional Council (IRC)

TABLE 1: DRIVEWAY SELECTION FOR CARS ONLY						
TURNOVER RATE OF CAR PARKING AREA (a)	TYPE OF FRONTAGE ROAD	TYPE OF DRIVEWAY FOR THE NUMBER OF SPACES IN CAR PARKING AREA				NOTE
		1-25	26-250	251-500	OVER 500 (b)	
LOW/MED	MINOR	A (c)	B2	C1	C3	a) LOW TO MEDIUM PARKING TURNOVER RATES ARE LIKELY TO BE GENERATED BY RESIDENTIAL, INDUSTRIAL AND COMMERCIAL DEVELOPMENTS. HIGH PARKING TURNOVER RATES ARE LIKELY TO BE GENERATED BY ENTERTAINMENT, TRANSPORT, RETAIL AND FAST FOOD DEVELOPMENTS.
LOW/MED	MAJOR	B1 (6m)	C1	C2	C3	b) CAR PARKING AREAS CONTAINING OVER 500 SPACES OR GENERATING MORE THAN 1,000vpd ARE TO BE ASSESSED FOR THE NEED OF AN APPROPRIATELY DESIGNED CHANNELISED ACCESS INTERSECTION.
HIGH	MINOR	B1 (7m)	C1	C2	C3	c) ON MINOR ROADS, RESIDENTIAL (TYPE A) DRIVEWAYS LESS THAN 6m WIDE ARE ACCEPTABLE FOR STREETScape ENHANCEMENT, PROVIDED NORMAL MANOEUVRING AND QUEUING REQUIREMENTS ARE SATISFIED
HIGH	MAJOR	B2 (7m)	C2	C3	C3	

TABLE 2: DRIVEWAY SELECTION FOR SERVICES OR OTHER LARGE VEHICLES				
FRONTAGE ROAD	MINOR ROAD	MAJOR ROAD <100vpd	MAJOR ROAD	NOTE
NOMINATED DESIGN VEHICLE (d)	DRIVEWAY TYPE			
CAR AND TRAILER	A (6m)		C1	M
SERVICE VEHICLE 8.8m	B2 (7m)		C2	
SINGLE UNIT TRUCK 12.5m	B2 (7m)		C2	PATHS OF THE VEHICLES IS REQUIRED TO BE SUBMITTED TO COUNCIL TO DEMONSTRATE HOW THE VEHICLE WILL PRACTICALLY ACCESS THE PROPERTY.
REFUSE COLLECTION VEHICLE	B2 (7m)		C2	
BUS	B2 (9m)		C4	
PRIME MOVER	B2 (9m)		C4	
B-DOUBLE	B2 (9m)		C4	ACCESS FOR SUCH VEHICLES REQUIRE FORWARD ONLY MANOEUVRE FOR ENTRY AND EXIT OF THE PROPERTY.

RELEVANT STANDARDS:

- AS3600, CONCRETE STRUCTURES
- AS1379, SPECIFICATIONS AND SUPPLY OF CONCRETE
- AS/NZS A4671, STEEL REINFORCING MATERIALS.

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
- CROSSING TYPE, LOCATION AND IF RELEVANT, DIMENSIONS W1 AND W2 WILL BE DETERMINED BY COUNCIL.
- NEW FOOTPATH PROFILE TO VARY WHERE NECESSARY TO MATCH WITH EXISTING CONCRETE FOOTPATHS AND VERGE PROFILES. BASE LAYER MUST BE WELL COMPACTED AND TRANSITION SMOOTHLY TO AND FROM DRIVEWAY. ADJOINING FOOTPATH SURFACES SHALL NOT HAVE A GRADE GREATER THAN 1:8 OR 12.5%.
- PEDESTRIAN REFUGE AREA TREATMENT TO MATCH TREATMENT ADJACENT TO CROSSING.
- NO TRACKS PERMITTED ACROSS FOOTPATH.
- CONCRETE PATH SHALL BE CONTINUOUS ACROSS DRIVEWAYS AS PEDESTRIAN AND CYCLISTS SHOULD HAVE RIGHT OF WAY.
- VARIATION TO THE DESIGNS SHOWN ARE SUBJECT TO APPROVAL FROM THE MANAGER ROAD SERVICES OR THIS DELEGATE.
- CONCRETE GRADE N32 OR BETTER; REINFORCEMENT AS PER TABLE, MIN LAP 210 MIN, MIN CLEAR TOP COVER 50mm.
- ALL VERTICAL FACES ARE TO BE FORMED, INCLUDING THE INTERFACE WITH THE ROADWAY.
- FORMWORK AND REINFORCEMENT MUST BE IN PLACE AND INSPECTED AND APPROVED BY COUNCIL OFFICER BEFORE DELIVERY OF THE CONCRETE.
- THE THICKNESS OF DECORATIVE SURFACING WHERE APPROVED IS ADDITIONAL TO THE THICKNESS DIMENSIONS 't' SHOWN IN TABLE.
- BRASS DISKS EMBEDDED IN KERB AND CHANNEL SHALL NOT BE REMOVED WITH OUT THE PERMISSION OF COUNCIL.
- SAW CUT TO BE 3-6mm WIDE x $\frac{D}{4}$, WHERE D = DEPTH OF PAVEMENT. APPLY BEAD OF POLYSULPHIDE SEALANT TO BOND BREAKING TAPE.
- FINISH: WOOD FLOAT OR STEEL FOLLOWED BY NYLON BROOM OR OTHER APPROVED NON-SLIP SURFACE.
- SURFACE TREATMENT MAY NOT BE MATCHED BY COUNCIL IF REPAIRS ARE NEEDED TO SERVICES UNDER DRIVEWAY.
- ENSURE MIN. COVER TO SERVICES IN FOOTPATH AND DRIVEWAY IS ACHIEVED TO MEET RELEVANT AUTHORITY STANDARD. A DIAL BEFORE YOU DIG (DBYD) IS TO BE UNDERTAKEN PRIOR TO COMMENCING WORK ON SITE.
- ALL WATER VALVES, HYDRANTS, SEWER MANHOLE, TELECOMMUNICATION PITS AND THE LIKE TO BE RELOCATED CLEAR OF PROPERTY ACCESS AT THE EXPENSE OF THE PROPERTY OWNER. THE RELEVANT AUTHORITY IS TO BE CONTACTED SO THAT CONFLICTING SERVICES CAN BE RELOCATED PRIOR TO CROSS OVER CONSTRUCTION
- THE PROPERTY OWNER / APPLICANT / CONTRACTOR IS TO TAKE ALL NECESSARY MEASURES TO ENSURE PEDESTRIAN SAFETY INCLUDING BUT NOT LIMITED TO BARRICADES, SAFETY LIGHTING, WARNING DEVICES OR OTHER MEANS OF PROTECTING PUBLIC RISK IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- WHERE NEW CONCRETE WORKS ABUTS EXISTING CONCRETE WORK, 12Ø DOWELS 300mm LENGTH (500mm LENGTH AT INVERT OF KERB AND CHANNEL) AT 300mm CENTRES TO BE INSTALLED TO PREVENT DIFFERENTIAL MOVEMENT (REFER ISOLATION JOINT DETAIL).
- COUNCIL TAKES NO RESPONSIBILITY FOR A VEHICLE SCRAPING WHEN USING A FOOTPATH CROSSOVER OR INVERT CROSSING. THE PROPERTY OWNER/APPLICANT/CONTRACTOR IS TO ENSURE ADEQUATE VEHICLE CLEARANCE IS PROVIDED.
- MANDATORY COUNCIL INSPECTIONS ARE REQUIRED PRIOR TO CONSTRUCTION INCLUDING CONCRETE SLAB SET-UP AND REINFORCEMENT, AND FINAL INSPECTION FOLLOWING COMPLETION OF CONSTRUCTION, INCLUDING BACK FILLING TO EDGES AND ENSURING THE NEW DRIVEWAY WILL NOT CAUSE A TRIPPING HAZARD.
- AN APPLICATION TO "CARRY OUT WORKS ON A COUNCIL ROAD" IS TO BE SUBMITTED BEFORE WORKS ARE UNDERTAKEN.

APPLICABILITY TABLE							
	BSC	CHRC	GRC	IRC	LSC	MRC	RRC
Applicable	No	No	Yes	No	No	Yes	No
Applicable DWG	CMDG-R-042						

ROADS		STANDARD DRAWING		CMDG-R-042A	
REV.	A	B	C		



Appendix F – Project Traffic Calculations

Stage 1 Project Location	CCS Description	UOM	Sum of Est.	Const. Phase	Truck Movement Req	Truck Type	Truck Cap.	Truck Nos.	Comments	Origin / Destination	
A	Earthworks										
	ADA	Mass / area excavation	ea	1							
			m3								
	AEA	Detailed excavation	m3	1,000	E'works	Assume 50% truck	Truck & 4 Axle Dog	20	0	Based on 1.8t / m3 material	Quarry to west on GML Rd
	AEB	Detailed fill and compaction	m3	8,000	E'works	Assume 50% truck	Truck & 4 Axle Dog	20	25	Based on 1.8t / m3 material	Quarry to west on GML Rd
			m3						400	Based on 1.8t / m3 material	EDQ Borrow Pit via Reid Road
	ACA	Clearing and grubbing	m2	21,000	E'works	N/A	N/A	-	0	On site - no external movements	
	ACB	Scrub Clearing	m2	21,000	E'works	N/A	N/A	-	0	On site - no external movements	
	AGB	Reinforced earth walls	ea	0							
			m3								
	ACC	Site establishment	ea	1	E'works	Truck	Truck & 4 Axle Dog	20	0	Based on 1.8t / m3 material	Quarry to west on GML Rd
			ea						2	Assume 2 semi movements for equipment / building delivery	G'stone
	AEC	Disposal of materials on site	ea	1	E'works	N/A	N/A	-	0	On site - no external movements	
	AHB	Erosion control	ea	1	E'works	N/A	N/A	-	0		
	ABD	Excavation, hauling (hazmat) and disposal	ea	1	E'works	N/A	N/A	-	0		
	AAA	Site survey	Item	1	E'works	N/A	N/A	-	0		
	ADG	Disposal of materials on site	m3	3,000	E'works	N/A	N/A	-	0	On site - no external movements	
	ABI	Geotechnical Supervision	ea	1	E'works	N/A	N/A	-	0		
	ABJ	Seeding and fertilisation	m2	500	E'works	Assume 500m2 truck in	Truck & 4 Axle Dog	20	13	Based on 1.8t / m3 material, 50mm thick (topsoil)	Quarry to west on GML Rd
	ABK	Hydromulching	m2	250	E'works	Assume 250m2 truck in	Delivery Truck (3 Axle Rigid)	-	1	Conservatively assume 1 delivery truck movements	G'stone
	ABH	Turfing	m2	500	E'works	Truck	Delivery Truck (3 Axle Rigid)	-	2	Conservatively assume 2 delivery truck movements	G'stone
	ABL	Vegetation Management Plan	ea	1	E'works	N/A	N/A	-	0		
	ABM	Fauna Spotter (Habitat Management Plan)	ea	1	E'works	N/A	N/A	-	0		
	ADE	Cut, fill and compaction	m3	16,702	E'works	N/A	N/A	-	0	On site - no external movements	
	AFB	Trenching excavation - rock	m3	1,500	E'works	N/A	N/A	-	0	Allowance for rock excavation	
	ADH	Trim and compaction	m2	32,475	E'works	N/A	N/A	-	0		
	AJA	Breakwater, causeways and containment structures	m2	160	E'works	N/A	N/A	-	0		
	AFE	Trenching backfill	m2	150	E'works	N/A	N/A	-	0		
	AAE	Test including reports	ea	1	E'works	N/A	N/A	-	0		
	MISC	MISC - E'works plant delivery to site	ea	2	E'works	Truck	Semi	-	10	Assume 10 semi movement for e'works plant delivery	G'stone
	MISC	MISC - E'works plant pick-up from site	ea	2	E'works	Truck	Semi	-	10	Assume 10 semi movement for e'works plant pickup	G'stone
								E'works Total	463	truck movements	
									11.6	per day over 2 months	
								1.0	per hour over 2 months		
B	Civil										
	BDA	Liner - clay	m3	0	Civil	Truck	Truck & 4 Axle Dog	20	0	Based on 1.8t / m3 material	Quarry to west on GML Rd
	BDC	Liner - HDPE	m2	0	Civil	Truck	Semi	-	3	Conservatively assume 3 delivery truck movements	G'stone
	BFA	Asphalt roads (including subgrade preparation)	m2	1,860	Civil	Truck	Truck	15	5	Based on 1.8t / m3 material, 40mm thick	Gladstone
	BGA	Fencing	m	498	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movements	G'stone
	BFK	Traffic control	ea	1	Civil	N/A	N/A	-	0		
	BFB	Crushed Rock Base Course (200 mm)	m3	961	Civil	Truck	Truck & 4 Axle Dog	20	49	Based on 1.8t / m3 material	Quarry to west on GML Rd
	BFC	Limestone or Recycled Crushed Concrete (200 mm)	m3	961	Civil	Truck	Truck & 4 Axle Dog	20	49	Based on 1.8t / m3 material	Quarry to west on GML Rd
	BED	Subsoil drains	m	100	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BFD	Kerbs (including subgrade preparation)	m	100	Civil	Truck	Concrete Truck (3 Axle Rigid)	-	2	Assume 0.1m2 kerb cross section / 6m3 per concrete truck	G'stone
	BCF	Reinforced concrete pipe	m	40	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BEE	Storm water pit and grates	ea	2	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BEF	Storm water maintenance hole with cover	ea	0	Civil	Truck	Semi	-			
	BEG	Swale Drain	m2	405	Civil	N/A	N/A	-	0		
	BCE	Box culverts	m	50	Civil	Truck	Semi	-	3	Assume 20 RBCs per truck	G'stone
	BFE	Barriers	m	150	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BFF	Guide Posts	ea	60	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BFG	Road markings	ea	1	Civil	Truck	Semi	-	1	Assume 1 linemarking truck movement	G'stone
	BFL	Temporary truck wash	ea	2	Civil	Truck	Semi	-	2	Assume delivery & pickup truck movements to site	G'stone
	BFH	Road signs	ea	1	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BFM	Cut Existing Pavement	m	80	Civil	N/A	N/A	-	0		
	BFN	Bollards (165mm diameter, Galv. Steel)	ea	20	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	C	Concrete									
CBA		Structure Footings 32 MPa 160 kg/m3	m3		Civil	Truck	Concrete Truck (3 Axle Rigid)	6	0	Assume 6m3 per truck	G'stone
CBC		Ground slabs 25 MPa 100kg/m3 150 mm thick	m3	1,176	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	196	Assume 6m3 per truck	G'stone
CBG		Bund Walls 25 MPa 200kg/m3 300 mm thick	m3	5	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	1	Assume 6m3 per truck	G'stone
CBR		Tank Ring Beams 32 MPa	m3	60	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	10	Assume 6m3 per truck	G'stone
CEC		Chemical protection and lining	m2	4,686	Civil	N/A	N/A	-	0		
CED		Blinding Concrete 15 MPa 50 mm Thick	m3	90	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	15	Assume 6m3 per truck	G'stone
CBH		Concrete Pedestals 25 MPa 0.5 m Diameter	m3		Civil	Truck	Concrete Truck (3 Axle Rigid)	6	0	Assume 6m3 per truck	G'stone
CBB		Equipment Plinths 25 MPa	m3		Civil	Truck	Concrete Truck (3 Axle Rigid)	6	0	Assume 6m3 per truck	G'stone
CEA		Cementitious Grouting (25mm thick)	m3	1	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	1	Assume 6m3 per truck	G'stone
CEB		Foundations Fasteners	ea	1,300	Civil	Truck	Semi	-	1	Assume 1 delivery truck for fasteners	G'stone
CDG		Cement Grouted Stone Pitching	m2	220	Civil	N/A	N/A	-	0		
								Civil Total	346	truck movements	
									5.8	per day over 3 months	

F	Safety Equipment
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	FVA	Fire Protection Systems	ea	1	SMP	Truck	Semi	-	1		
								SMP Total	213	truck movements	
									2.7	per day over 4 months	
									0.2	per hour over 4 months	
T	Electrical Equipment										
	TAL	Variable speed drives	ea	95	E&I	Truck	Semi	-	0	Will come in MCC or other package	G'stone
	TBA	Local push button station	ea	20	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TBP	Isolators, Decontactors and plugs	ea	100	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TAG	Circuit breakers	ea		E&I	Truck	Semi	-	0	With packages	G'stone
	TBE	Small power / general power outlets (SPO/GPO)	ea	50	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TBF	Lighting fixtures and panels	ea	100	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TAH	Motor control centres	ea	6	E&I	Truck	Semi	-	3	Conservatively assume 1 delivery truck movement / 2 piece	G'stone
	TAM	Generators	ea	1	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
	TBG	Communication devices	ea	10	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TBH	Security devices / systems and alarm panels / CCTV	ea	1	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TAB	Transformers	ea	1	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
	TAK	UPS system	ea	1	E&I	Truck	Semi	-	0	Will come in MCC	G'stone
	TBD	Junction boxes	ea	200	E&I	Truck	Semi	-	2	Conservatively assume 1 delivery truck movement / 100 pieces	G'stone
	TAP	Miscellaneous Electrical Equipment	ea	10	E&I	Truck	Semi	-	2		G'stone
	TAA	Switchyard / substation	ea	1	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
W	Wire and Cable										
	WAD	Power - <1kV (low voltage)	ea	300							
			m	18,000	E&I	Truck	Semi	-	5	Conservatively assume 5 delivery truck movements	G'stone
	WBA	Control Cables	ea	300							
			m	18,000	E&I	Truck	Semi	-	5	Conservatively assume 30 delivery truck movements	G'stone
	WBB	Ethernet cable	ea	1							
			m	500	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 10000m	G'stone
	WCE	Grounding	ea	1							
			m	300	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 10000m	G'stone
	WBC	Fibre optic	ea	1							
			m	100	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 10000m	G'stone
	WCD	Lightning protection	ea	381	E&I	N/A	N/A	-	0		
	WDE	Testing and Pre-commissioning	ea	2,682	E&I	N/A	N/A	-	0		
	WDA	PLC/SCADA Bench Test	ea	4	E&I	N/A	N/A	-	0		
U	Raceway										
	UBA	Conduit - above ground	m	200	E&I	Truck	Semi	-	2		G'stone
	UAA	Cable ladder	ea	8,020							
			m	720	E&I	Truck	Semi	-	3		G'stone
	UBB	Conduit - below ground	m	500	E&I	Truck	Semi	-	1	Conservatively assume 6 delivery truck movements	G'stone
	UBP	Cable Pits - below ground	ea	3	E&I	Truck	Semi	-	1	Conservatively assume 10 delivery truck movements	G'stone
								E&I Total	36	truck movements	
									0.36	per day over 5 months	
									0.03	per hour over 5 months	
I	First Fills										
	Reagent	Unit	First Fill	Delivery							
	Diluent (Organic)	Tonnes	5	40 t Truck	Commissioning	Truck	Semi	40	1	Assume 40t per truck	G'stone
	Extractant 1	Tonnes		Truck - IBC's	Commissioning	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 20 IBCs	G'stone
	Extractant 2	Tonnes		Truck - IBC's	Commissioning	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 20 IBCs	G'stone
	Al(OH)3	Tonnes		Truck 20 t	Commissioning	Truck	Semi	20	0	Assume 20t per truck	G'stone
	56% HNO3	Tonnes	25	Truck 25 T	Commissioning	Truck	Semi	25	1		
	NH3	Tonnes	16	Truck 20 t	Commissioning	Truck	Semi	20	1		
	CO2	Tonnes	10	Truck 20 t	Commissioning	Truck	Semi	10	1		G'stone
	LPG	Tonnes	4	Truck 5 t	Commissioning	Truck	Delivery Truck (3 Axle Rigid)	5	1		G'stone
	MISC	MISC - Site demobilisation (buildings / equipment)			Commissioning	Truck	Semi	-	5	Assume 10 semi movements for construction site demobilisation	G'stone
								Commissioning Total	12	truck movements	
									0.6	per day over 1 month	
									0.1	per hour over 1 month	

ALP0121-002 | Alpha HPA TIA

Indicative Project (Stage 1) Construction Labour Calculations

Stage 1 Project Labour (hrs by month)

BOQ Category		A	B+C	D+E+N+J+M+P+F	TWU	N/A just labour	Labour only	Labour only	Grand Total (hrs)	FTE Staff Numbers
Year	Month	Construction total (direct and indirect)					PPC Manually added	PPC Manually added		
		Earthworks	Civil	SMP	E&I	Commissioning	EPCM (TOTAL)	Operations (Total)		
2020	January								0	0
	February								0	0
	March								0	0
	April								0	0
	May								0	0
	June								0	0
	July								0	0
	August								0	0
	September								0	0
	October								0	0
	November	4433					516		4949	19
	December	4433	2596				516		7545	29
2022	January		2596				516		3112	12
	February		2596				516		3112	12
	March			6471	1916		1032		9419	37
	April			6471	1916		1032		9419	37
	May			6471	1916		1032		9419	37
	June			6471	1916		1032		9419	37
	July				1916		1032	1075	4023	16
	August					3458	774	2580	6812	26
	September							5160	5160	20
	October							5160	5160	20
	November							5160	5160	20
	December							5160	5160	20
2023	January							5160	5160	20
	February							5160	5160	20
	March							5160	5160	20
	April							5160	5160	20
	May							5160	5160	20
	June							5160	5160	20
	July							5160	5160	20
	August							5160	5160	20
	September							5160	5160	20
	October							5160	5160	20
	November							5160	5160	20
	December							5160	5160	20
2024	January							5160	5160	20
	February							5160	5160	20
	March							5160	5160	20
	April							5160	5160	20
	May							5160	5160	20
	June							5160	5160	20
	July							5160	5160	20
	August							5160	5160	20
	September							5160	5160	20
	October							5160	5160	20
	November							5160	5160	20
	December							5160	5160	20

Indicative Stage 1 Vehicle Movement Calculations

[illegible][illegible]

Indicative Stage 2 BOO for HV Movement Calculations

D	Steelwork
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	DBA	Structural Steel - Light (<25kg/m)	t	161	SMP	Truck	Delivery Truck (3 Axle Rigid)	4	41		G'stone
	DBB	Structural Steel - Medium (25-60kg/m)	t	395	SMP	Truck	Delivery Truck (3 Axle Rigid)	6	66		G'stone
	DBC	Structural Steel - Heavy (60-150kg/m)	t	196	SMP	Truck	Delivery Truck (3 Axle Rigid)	6	33		G'stone
	DCD	Handrail w/ and w/o toeplate	m	5,209	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	10	Assume 10 trucks	G'stone
	DCA	Framing, girts, purlins, wind bracing	m	10,531	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	20	Assume 20 trucks	G'stone
	DBD	Structural Steel - Extra Heavy (>150kg/m)	t	21	SMP	Truck	Delivery Truck (3 Axle Rigid)	3	8		G'stone
	DDC	FRP Floor Grating	m2	3,859	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	39	Assume 100m2 per truck	G'stone
	DDF	Stair assemblies and stair treads	ea	1,193	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	10	Assume 10	G'stone
	DCJ	Structural Fasteners	kg	2,275	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	4	Assume 4 trucks	G'stone
	DAA	Structural Steel - Light (<25kg/m)	t	7	SMP	Truck	Delivery Truck (3 Axle Rigid)	3	3		G'stone
	DAB	Structural Steel - Medium (25-60kg/m)	t	17	SMP	Truck	Delivery Truck (3 Axle Rigid)	4	5		G'stone
	DAC	Structural Steel - Heavy (60-150kg/m)	t	13	SMP	Truck	Delivery Truck (3 Axle Rigid)	6	3		G'stone
	DAD	Structural Steel - Extra Heavy (>150kg/m)	t	0	SMP	N/A	N/A	-	0		
	DAF	Handrail w/ and w/o toeplate	m	0	SMP	N/A	N/A	-	0		
	DAG	FRP Floor Grating	m2	45	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	1	Conservatively assume 1 delivery truck movement	G'stone
	DAE	Framing, girts, purlins, wind bracing	m	1,554	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	10		G'stone
E	Buildings & Architecture										
	EGB	Laboratory	ea	14	SMP	Truck - 2 building	Semi	-	2	Conservatively assume 1 delivery truck movement / building	G'stone
	EBC	Sheeting Walls & Roofs	m2	13,081	SMP	Truck	Semi	-	20	Assume 20 trucks	G'stone
	EPA	Storage Buildings	ea	3	SMP	Truck	Semi	-	3	Conservatively assume 1 delivery truck movement / building	G'stone
	EPB	Admin and Control Buildings	ea	1	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / building	G'stone
	EPS	Substaion Buildings	ea	5	SMP	Truck	Semi	-	5	Conservatively assume 1 delivery truck movement / building	G'stone
N	Mechanical Equipment										
	NFS	Separation Equipment	ea	7	SMP	Truck	Semi	-	4		G'stone
	NEB	Agitator	ea	36	SMP	Truck	Semi	-	8		G'stone
	NFA	Centrifuge	ea	2	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
	NBA	Conveyors	ea	6	SMP	Truck	Semi	-	6	Conservatively assume 1 delivery truck movement / piece	G'stone
	NPA	Air receiver	ea	3	SMP	Truck	Semi	-	2		G'stone
	NFI	Magnetic separator	ea	4	SMP	Truck	Semi	-	4	Conservatively assume 1 delivery truck movement / piece	G'stone
	NHB	Heat exchanger (plate)	ea	23	SMP	Truck	Semi	-	6		G'stone
	NEC	Mixer	ea	1	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
	NCA	Pumps	ea	147	SMP	Truck	Semi	-	25		G'stone
	NBD	Feeders	ea	1	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
	NMA	Autotitrator	ea	9	SMP	Truck	Semi	-	1		G'stone
	NYA	Package Plants	ea	38	SMP	Truck	Semi	-	114	Assume 3 trucks per plant	G'stone
J	Mobile Equipment, Maintenance Tools, Workshop Fit-out										
	JDA	Mobile Equipment Hire	ea	1	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	JDB	Maintenance Tools	ea	1	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	JDC	Accessories	ea	1	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	JDD	Storage	ea	1	SMP	N/A	N/A	-	0		
	JDE	Fitout	ea	1	SMP	N/A	N/A	-	0		
M	Mechanical Bulks										
	MAE	Chutes and skirts	ea	1	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
	MAF	Skips	ea	7	SMP	Truck	Semi	-	3		G'stone
	MAD	Ductwork	ea	4	SMP	Truck	Semi	-	4	Conservatively assume 1 delivery truck movement / piece	G'stone
	MTA	Tanks General	ea	102	SMP	Truck	Semi	-	306	Assume 3 trucks each	G'stone
	MAG	Hoppers	ea	3	SMP	Truck	Semi	-	3	Conservatively assume 1 delivery truck movement / piece	G'stone
	MCG	Low temperature insulation	m2	4,132	SMP	Truck	Semi	-	4	Conservatively assume 4 delivery truck movements	G'stone
P	Piping										
	PGC	Control Valving	ea	143	SMP	Truck	Semi	-	3	Assume 3 trucks	G'stone
	PCB	Safety shower / eyewash	ea	41	SMP	Truck	Semi	-	2	Conservatively assume 2 delivery truck movements	G'stone
	PAB	Metallic (51mm to 150mm)	m	7,145	SMP	Truck	Semi	-	36	Assume 200m per truck	G'stone
	PAC	Metallic (151mm to 600mm)	m	1,954	SMP	Truck	Semi	-	10	Conservatively assume 1 delivery truck movement / 200m	G'stone
	PAE	Non-ferrous materials (50mm and below)	m	3,206	SMP	Truck	Semi	-	16	Conservatively assume 1 delivery truck movement / 200m	G'stone
	PAF	Non-ferrous materials (51mm to 150mm)	m	7,239	SMP	Truck	Semi	-	36	Conservatively assume 1 delivery truck movement / 200m	G'stone
	PAG	Non-ferrous materials (151mm to 600mm)	m	3,145	SMP	Truck	Semi	-	16	Conservatively assume 1 delivery truck movement / 200m	G'stone
	PAA	Metallic (50mm and below)	m	5,082	SMP	Truck	Semi	-	25	Conservatively assume 1 delivery truck movement / 200m	G'stone
	PGB	Actuated Valving	ea	377	SMP	Truck	Semi	-	2	Conservatively assume 1 delivery truck movement	G'stone
	PGM	Manual Valving	ea	2,420	SMP	Truck	Semi	-	2	Conservatively assume 2 delivery truck movements	G'stone
	PAH	Non-ferrous materials (Above 600mm)	m	41	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 200m	G'stone
	PAD	Metallic (Above 600mm)	m	27	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 200m	G'stone
	PCX	SP items general	Item	200	SMP	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
F	Safety Equipment										
	FVA	Fire Protection Systems	ea	1	SMP	N/A	N/A	-	0		
							SMP Total	931	truck movements		
								5.2	per day over 9 months		
								0.6	per hour over 9 months		
T	Electrical Equipment										
	TAL	Variable speed drives	ea	95	E&I	Truck	Semi	-	0	Will come in MCC	G'stone



	TBA	Local push button station	ea	211	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TBP	Isolators, Decontactors and plugs	ea	440	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TAG	Circuit breakers	ea	393	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TBE	Small power / general power outlets (SPO/GPO)	ea	54	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TBF	Lighting fixtures and panels	ea	922	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TAH	Motor control centres	ea	8	E&I	Truck	Semi	-	8	Conservatively assume 1 delivery truck movement / piece	G'stone
	TAM	Generators	ea	3	E&I	Truck	Semi	-	3	Conservatively assume 1 delivery truck movement / piece	G'stone
	TBG	Communication devices	ea	117	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TBH	Security devices / systems and alarm panels / CCTV	ea	13	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	TAB	Transformers	ea	8	E&I	Truck	Semi	-	8	Conservatively assume 1 delivery truck movement / piece	G'stone
	TAK	UPS system	ea	10	E&I	Truck	Semi	-	0	Will come in MCC	G'stone
	TBD	Junction boxes	ea	651	E&I	Truck	Semi	-	7	Conservatively assume 1 delivery truck movement / 100 pieces	G'stone
	TAP	Miscellaneous Electrical Equipment	ea	2,720	E&I	Truck	Semi	-	20	Conservatively assume 20 delivery truck movements	G'stone
	TAA	Switchyard / substation	ea	5	E&I	Truck	Semi	-	5	Conservatively assume 1 delivery truck movement / piece	G'stone
W	Wire and Cable										
	WAD	Power - <1kV (low voltage)	ea	2,969							
			m	78,096	E&I	Truck	Semi	-	20	Conservatively assume 20 delivery truck movements	G'stone
	WBA	Control Cables	ea	3,720							
			m	115,285	E&I	Truck	Semi	-	30	Conservatively assume 30 delivery truck movements	G'stone
	WBB	Ethernet cable	ea	221							
			m	1,450	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 10000m	G'stone
	WCE	Grounding	ea	1,226							
			m	20,170	E&I	Truck	Semi	-	3	Conservatively assume 1 delivery truck movement / 10000m	G'stone
	WBC	Fibre optic	ea	44							
			m	3,400	E&I	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement / 10000m	G'stone
	WCD	Lightning protection	ea	381	E&I	N/A	N/A	-	0		
	WDE	Testing and Pre-commissioning	ea	2,682	E&I	N/A	N/A	-	0		
	WDA	PLC/SCADA Bench Test	ea	4	E&I	N/A	N/A	-	0		
U	Raceway										
	UBA	Conduit - above ground	m	4,000	E&I	Truck	Semi	-	4	Conservatively assume 4 delivery truck movements	G'stone
	UAA	Cable ladder	ea	8,020							
			m	450	E&I	Truck	Semi	-	15		G'stone
	UBB	Conduit - below ground	m	10,622	E&I	Truck	Semi	-	5	Conservatively assume 6 delivery truck movements	G'stone
	UBP	Cable Pits - below ground	ea	57	E&I	Truck	Semi	-	10	Conservatively assume 10 delivery truck movements	G'stone
								E&I Total	147	truck movements	
									0.8	per day over 9 months	
									0.1	per hour over 9 months	
I	First Fills										
	Reagent	Unit	First Fill	Delivery							
	Diluent (Organic)	Tonnes	345	40 t Truck	Commissioning	Truck	Semi	40	9	Assume 40t per truck	G'stone
	Extractant 1	Tonnes	212	Truck - IBC's	Commissioning	Truck	Semi	-	11	Conservatively assume 1 delivery truck movement / 20 IBCs	G'stone
	Extractant 2	Tonnes	67	Truck - IBC's	Commissioning	Truck	Semi	-	4	Conservatively assume 1 delivery truck movement / 20 IBCs	G'stone
	Al(OH)3	Tonnes	707	Truck 20 t	Commissioning	Truck	Semi	20	36	Assume 20t per truck	G'stone
	56% HNO3	Tonnes	5912	Pipeline	Commissioning	N/A	N/A	-	0		
	NH3	Tonnes	558	Pipeline	Commissioning	N/A	N/A	-	0		
	CO2	Tonnes	77	Truck 20 t	Commissioning	Truck	Semi	20	4	Assume 20t per truck	G'stone
	MISC	MISC - Site demobilisation (buildings / equipment)			Commissioning	Truck	Semi	-	10	Assume 10 semi movements for construction site demobilisation	G'stone
								Commissioning Total	74	truck movements	
									0.6	per day over 6 months	
									0.1	per hour over 6 months	



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Indicative Project (Stage 2) Construction Labour Calculations

Construction Labour (hrs by month)

BOQ Category		A	B+C	D+E+N+J+M+P+F	TWU	N/A just labour	Labour only	Labour only	Grand Total (hrs)	FTE Staff Numbers
Year	Month	Construction total (direct and indirect)					PPC Manually added	PPC Manually added		
		Earthworks	Civil	SMP	E&I	Commissioning	EPCM (TOTAL)	Operations (Total)		
2020	January								0	0
	February								0	0
	March								0	0
	April								0	0
	May								0	0
	June								0	0
	July								0	0
	August								0	0
	September								0	0
	October								0	0
	November								0	0
	December								0	0
2022	January								0	0
	February								0	0
	March								0	0
	April								0	0
	May								0	0
	June								0	0
	July								0	0
	August	10660					1290		11950	46
	September	7800					1290		9090	35
	October	10400					1290		11690	45
	November	10400					1290		11690	45
	December	10400	130				1290		11820	46
2023	January	10400	9360				2580		22340	87
	February	10400	14560				2580		27540	107
	March	3640	23530				2580		29750	115
	April	5720	11570	11830			2580		31700	123
	May	4810	7410	38740			2580		53540	208
	June	4030	7540	60190	1300		3870		76930	298
	July		3770	53820	4810		3870		66270	257
	August			39520	14040		3870	1075	58505	227
	September			30680	18460		3870	1075	54085	210
	October			18850	23140		3870	1075	46935	182
	November			3510	21190		3870	4300	32870	127
	December			1690	9360		3870	10750	25670	99
2024	January				2210		3870	10750	16830	65
	February				1300	5200	3870	25370	35740	139
	March					5200	1290	25370	31860	123
	April					7020	1290	25370	33680	131
	May					6630	1290	25370	33290	129
	June					7670	1290	25370	34330	133
	July					2860		25370	28230	109
	August							25370	25370	98
	September							25370	25370	98
	October							25370	25370	98
	November							25370	25370	98
	December							25370	25370	98



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Indicative Project (Stage 2) Operations Labour Calculations

Day time

38 people

Shift

20 people

Area	Job Title	Comments	Total Required	Shift	1st shift	2nd shift	3rd shift	4th shift	dayshift
MANAGEMENT									
	Operation/Plant Manager		1.0	No					1
	Maintenance Manager		1.0	No					1
	Process Superintendent		1.0	No					1
	QSE Manager		1.0	No					1
	Admin Manager		1.0	No					1
	Personal Assistants		1.0	No					1
	Total		6.0		0	0	0	0	6
GENERAL ADMINISTRATION									
Reception									
	Receptionist and Secretaries - Plant		1.0	No					1
	Receptionist and Secretaries - Office	Used above	0.0	No					0
Finance									
	Accountants		1.0	No					1
Human Resources									
	Human Resources Officer		1.0	No					1
Other									
	Payroll Officer		1.0	No					1
	Logistics		1.0	No					1
	Total		5.0		0	0	0	0	5
PROCESS PLANT									
	Process Lead		1.0	No					1
	Shift Supervisor		4.0	Yes	1	1	1	1	1
	Process Engineer		5.0	No	1	1	1	1	1
	Waste Mobile Machine Operator		1.0	No					1
	Control Room Operator		8.0	Yes	2	2	2	2	2
100-Leaching	Shift Process Operators	Filter operation, field checks, AI (OH)3 Loader	12.0	Yes	3	3	3	3	3
110-Aluminium Solvent Extraction - Extraction	Shift Process Operators	Inspection, sampling, adjustments	2.0	Yes	0.5	0.5	0.5	0.5	0.5
120-Aluminium Solvent Extraction - Loaded Organic Washing	Shift Process Operators	Inspection, sampling, adjustments	0.5	Yes	0.2	0.2	0.2	0.2	0.2
130-Aluminium Solvent Extraction - Stripping	Shift Process Operators	Inspection, sampling, adjustments	0.8	Yes	0.2	0.2	0.2	0.2	0.2
140-Iron Removal	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	0.1	0.1	0.1	0.1	0.1
150-Aluminium Solvent Extraction - Crud Treatment	Shift Process Operators	Operating batch manual filter	1.6	Yes	0.4	0.4	0.4	0.4	0.4
200-Aluminium Salt Crystallisation	Shift Process Operators	Inspection, sampling, adjustments	4.0	Yes	1	1	1	1	1
210-Aluminium Salt Dissolution	Shift Process Operators	Inspection, sampling, adjustments	0.8	Yes	0.2	0.2	0.2	0.2	0.2
220-HPA Pre-cursor Precipitation	Shift Process Operators	Inspection, sampling, adjustments	2.0	Yes	0.5	0.5	0.5	0.5	0.5
230-HPA Pre-cursor Dewatering	Shift Process Operators	Filter operation, field checks	8.0	Yes	2	2	2	2	2
240-HPA Production	Shift Process Operators	Kiln operation, blockage management	0.2	Yes	0.05	0.05	0.05	0.05	0.05
250-HPA Bagging	Shift Process Operators	Drum management, inspection, clean-up	13.0	Yes	3	3	3	3	3
260-Bleed Stream & Waste Water Treatment	Shift Process Operators	Inspection, sampling, adjustments	1.2	Yes	0.3	0.3	0.3	0.3	0.3
400-Ammonium Nitrate Production	Shift Process Operators	Inspection, sampling, adjustments	4.0	Yes	1	1	1	1	1
600-Nitric Acid & Sulphuric Acid Storage	Shift Process Operators	Unloading, inspection, sampling	0.4	Yes	0.1	0.1	0.1	0.1	0.1
610-SX Reagents	Shift Process Operators	Inspection, sampling, adjustments	0.8	Yes	0.2	0.2	0.2	0.2	0.2
620-Ammonia and Carbon Dioxide Storage	Shift Process Operators	Inspection, sampling, adjustments	0.8	Yes	0.2	0.2	0.2	0.2	0.2
710-Water Treatment	Shift Process Operators	Inspection, sampling, adjustments	0.8	Yes	0.2	0.2	0.2	0.2	0.2
720-Bleed Stream & Waste Water Treatment	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	0.1	0.1	0.1	0.1	0.1
730-Cooling Water	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	0.1	0.1	0.1	0.1	0.1
740-Steam Generation & Hot Water Circuit	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	0.1	0.1	0.1	0.1	0.1
750-Air Compressors	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	0.1	0.1	0.1	0.1	0.1
760-Natural Gas & Fuels	Shift Process Operators	Inspection, sampling, adjustments	0.2	Yes	0.05	0.05	0.05	0.05	0.05
Spare	Roundup		1.6	Yes	0.4	0.4	0.4	0.4	0.4
	Total		76.0		18.00	18.00	18.00	18.00	4
MAINTENANCE									
	Planner		1.0	No					1
	Storeman		1.0	No					1
	Purchasing Officer	Deleted 1 off R.Kairaitis	1.0	No					1
	Mechanical Supervisor		1.0	No					1
	Mechanical Trades		3.0	No					3
	I/E Supervisor		1.0	No					1
	Instrument Trade		2.0	No					2
	Electrical Trade		2.0	No					2
	Engineering Lead		1.0	No					1
	Mechanical Engineer		1.0	No					1
	Electrical Engineer		1.0	No					1
	PCS Engineer		1.0	No					1
	Total		16.0		0	0	0	0	16
HEALTH, SAFETY, ENVIRONMENT AND QUALITY									
	HSE Officer		1.0	No					1
	Nurse	Deleted R.Kairaitis	0.0	No					0
	Laboratory Supervisor		1.0	No					1
	Chemist/Lab Shift Analyser		8.0	Yes	2	2	2	2	0
	Chemist/Lab Shift Analyser		1.0	No					1
	Trainer	Deleted R.Kairaitis	0.0	No					0
	IT		1.0	No					1
	Security		2.0	No					2
	Compliance Officer		1.0	No					1
	Total		15.0		2	2	2	2	7
Grand Total			118		20	20	20	20	38

Construction Phase Traffic Volume Calculations

ID	Task	Duration	Month																																															
			Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34														
A	Earthworks	11 M											41	30	40	40	40	40	40	40	14	22	19	16																										
B	Civil	8 M														1	37	57	92	45	29	30	15																											
C	SMP	9 M																		46	151	234	209	154	119	74	14	7																						
D	E&I	9 M																					6	19	55	72	90	83	37	9	6																			
E	Commissioning	6 M																												21	21	28	26	30	12															
F	EPCM	24 M											5	5	5	5	5	10	10	10	10	10	15	15	15	15	15	15	15	15	15	5	5	5	5	0														
G	Operations	-																												5	5	5	17	42	42	99	99	99	99	99	99	99	118							
FTE Staff Numbers			0	0	0	0	0	0	0	0	0	0	46	35	45	45	46	87	107	116	123	209	301	258	229	211	184	129	101	66	141	125	132	130	134	111	118													
% Staff Travelling by Light Vehicle		100%																																																
Volume Staff Travelling by Light Vehicles			0	0	0	0	0	0	0	0	0	46	35	45	45	46	87	107	116	123	209	301	258	229	211	184	129	101	66	141	125	132	130	134	111	118														
Average Staff per Light Vehicle		1.5																																																
Number of Staff Light Vehicles per day			0	0	0	0	0	0	0	0	0	0	31	23	30	30	31	58	72	77	82	139	200	172	153	141	123	86	67	44	94	83	88	87	89	74	79													



Appendix G – Intersection Volume Calculations

ALP0121-002 | Alpha HPA TIA

Gladstone-Mt Larcom Road / Reid Road - Future Volume Forecasts

AM PEAK 06:00-07:00am

GR %	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Year	(North) Leg 1 - Gladstone-Mt Larcom Road						(South) Leg 3 - Gladstone-Mt Larcom Road						(West) Leg 4 - Reid Road			
	Thru		Right		U-Turn		Left		Thru		U-Turn		Left		Right	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
2020	106	30	2	0	0	0	46	4	408	45	0	0	4	1	2	3
2021	107	30	2	0	0	0	46	4	412	45	0	0	4	1	2	3
2022	108	31	2	0	0	0	47	4	416	46	0	0	4	1	2	3
2023	109	31	2	0	0	0	47	4	420	46	0	0	4	1	2	3
2024	110	31	2	0	0	0	48	4	425	47	0	0	4	1	2	3

PEAK PROJECT VOLUMES - STAGE 1 (CONSTRUCTION)

AM PEAK	0	0	0	1	0	0	24	1	0	0	0	0	0	1	0	1
---------	---	---	---	---	---	---	----	---	---	---	---	---	---	---	---	---

PEAK PROJECT VOLUMES - STAGE 2 (STG 2 CONSTRUCTION + STG 1 OPERATIONS)

AM PEAK	0	0	0	2	0	0	209	4	0	0	0	0	0	2	0	4
---------	---	---	---	---	---	---	-----	---	---	---	---	---	---	---	---	---

PEAK PROJECT VOLUMES - ONGOING OPERATIONS (STAGE 1 & 2)

AM PEAK	0	0	0	0	0	0	34	1	0	0	0	0	0	0	0	1
---------	---	---	---	---	---	---	----	---	---	---	---	---	---	---	---	---

POST DEVELOPMENT VOLUMES - STAGE 1 CONSTRUCTION

2022	108	31	2	1	0	0	71	5	416	46	0	0	4	2	2	4
------	-----	----	---	---	---	---	----	---	-----	----	---	---	---	---	---	---

POST DEVELOPMENT VOLUMES - STAGE 1 OPERATIONS + STAGE 2 CONSTRUCTION

2023	109	31	2	2	0	0	256	8	420	46	0	0	4	3	2	7
------	-----	----	---	---	---	---	-----	---	-----	----	---	---	---	---	---	---

POST DEVELOPMENT VOLUMES - STAGE 1 & 2 OPERATIONS

2024	110	31	2	0	0	0	82	5	425	47	0	0	4	1	2	4
------	-----	----	---	---	---	---	----	---	-----	----	---	---	---	---	---	---

PM PEAK 16:00-17:00pm

GR %	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Year	(North) Leg 1 - Gladstone-Mt Larcom Road						(South) Leg 3 - Gladstone-Mt Larcom Road						(West) Leg 4 - Reid Road			
	Thru		Right		U-Turn		Left		Thru		U-Turn		Left		Right	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
2020	436	27	2	1	0	0	10	1	182	20	0	0	7	4	79	1
2021	440	27	2	1	0	0	10	1	184	20	0	0	7	4	80	1
2022	445	28	2	1	0	0	10	1	186	20	0	0	7	4	81	1
2023	449	28	2	1	0	0	10	1	188	21	0	0	7	4	81	1
2024	454	28	2	1	0	0	10	1	189	21	0	0	7	4	82	1

PEAK PROJECT VOLUMES - STAGE 1 (CONSTRUCTION)

PM PEAK	0	0	0	1	0	0	0	1	0	0	0	0	0	1	24	1
---------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----	---

PEAK PROJECT VOLUMES - STAGE 2 (STG 2 CONSTRUCTION + STG 1 OPERATIONS)

PM PEAK	0	0	0	2	0	0	0	4	0	0	0	0	0	2	209	4
---------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	-----	---

PEAK PROJECT VOLUMES - ONGOING OPERATIONS (STAGE 1 & 2)

PM PEAK	0	0	0	0	0	0	0	1	0	0	0	0	0	0	34	1
---------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----	---

POST DEVELOPMENT VOLUMES - STAGE 1 CONSTRUCTION

2022	445	28	2	2	0	0	10	2	186	20	0	0	7	5	105	2
------	-----	----	---	---	---	---	----	---	-----	----	---	---	---	---	-----	---

POST DEVELOPMENT VOLUMES - STAGE 1 OPERATIONS + STAGE 2 CONSTRUCTION

2023	449	28	2	3	0	0	10	5	188	21	0	0	7	6	290	5
------	-----	----	---	---	---	---	----	---	-----	----	---	---	---	---	-----	---

POST DEVELOPMENT VOLUMES - STAGE 1 & 2 OPERATIONS

2024	454	28	2	1	0	0	10	2	189	21	0	0	7	4	116	2
------	-----	----	---	---	---	---	----	---	-----	----	---	---	---	---	-----	---

Reid Road Daily Traffic Volume Estimation

Road Link	AM Peak				PM Peak			
	Approach		Departure		Approach		Departure	
	LV	HV	LV	HV	LV	HV	LV	HV
2020 Existing								
Aldoga Road	48	4	6	4	12	2	86	5

Peak Hour Volume		LV	HV
Peak Hour % of Average Daily Traffic (ADT)		98	7
Estimated Daily Traffic Volume		654	47
Assumed Daily Directional Split		50%	
Estimated Daily Directional Traffic Volume		327	24



Appendix H – SIDRA Results – Construction and Operations Phase

MOVEMENT SUMMARY

Site: 1 [2022 AM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	5	1	5	20.0	0.035	16.9	LOS B	0.1	1.3	0.83	0.66	0.83	45.5
3	R2	5	3	5	60.0	* 0.035	17.4	LOS B	0.1	1.3	0.83	0.66	0.83	44.3
Approach		10	4	11	40.0	0.035	17.2	LOS B	0.1	1.3	0.83	0.66	0.83	44.9
East: Gladstone - Mt Larcom Rd														
4	L2	51	4	54	7.8	0.084	12.6	LOS B	0.5	4.0	0.68	0.70	0.68	48.4
5	T1	462	46	486	10.0	* 0.717	10.9	LOS B	7.1	54.0	0.91	0.87	1.08	50.9
Approach		513	50	540	9.7	0.717	11.0	LOS B	7.1	54.0	0.89	0.85	1.04	50.6
West: Gladstone - Mt Larcom Rd														
11	T1	139	31	146	22.3	0.213	6.7	LOS A	1.5	12.3	0.69	0.55	0.69	54.1
12	R2	2	0	2	0.0	* 0.035	23.5	LOS C	0.0	0.2	0.98	0.59	0.98	42.2
Approach		141	31	148	22.0	0.213	6.9	LOS A	1.5	12.3	0.69	0.55	0.69	53.8
All Vehicles		664	85	699	12.8	0.717	10.2	LOS B	7.1	54.0	0.85	0.79	0.97	51.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2022 AM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

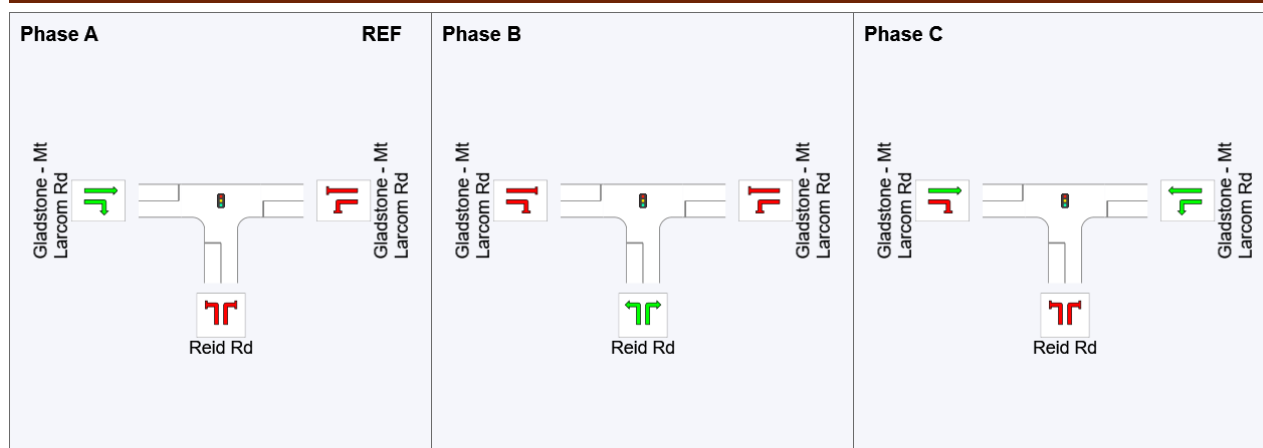
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

Site: 1 [2022 PM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	11	4	12	36.4	0.264	17.8	LOS B	1.3	9.6	0.88	0.75	0.88	44.6
3	R2	82	1	86	1.2	* 0.264	17.4	LOS B	1.3	9.6	0.88	0.75	0.88	45.7
Approach		93	5	98	5.4	0.264	17.5	LOS B	1.3	9.6	0.88	0.75	0.88	45.5
East: Gladstone - Mt Larcom Rd														
4	L2	11	1	12	9.1	0.018	12.3	LOS B	0.1	0.8	0.66	0.65	0.66	48.5
5	T1	206	20	217	9.7	0.319	7.7	LOS A	2.4	18.2	0.76	0.62	0.76	53.2
Approach		217	21	228	9.7	0.319	8.0	LOS A	2.4	18.2	0.75	0.62	0.75	53.0
West: Gladstone - Mt Larcom Rd														
11	T1	473	28	498	5.9	* 0.656	9.0	LOS A	6.6	48.2	0.87	0.78	0.94	52.3
12	R2	3	1	3	33.3	0.064	24.7	LOS C	0.1	0.5	0.99	0.61	0.99	41.0
Approach		476	29	501	6.1	0.656	9.1	LOS A	6.6	48.2	0.87	0.78	0.94	52.2
All Vehicles		786	55	827	7.0	0.656	9.7	LOS A	6.6	48.2	0.84	0.73	0.88	51.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2022 PM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

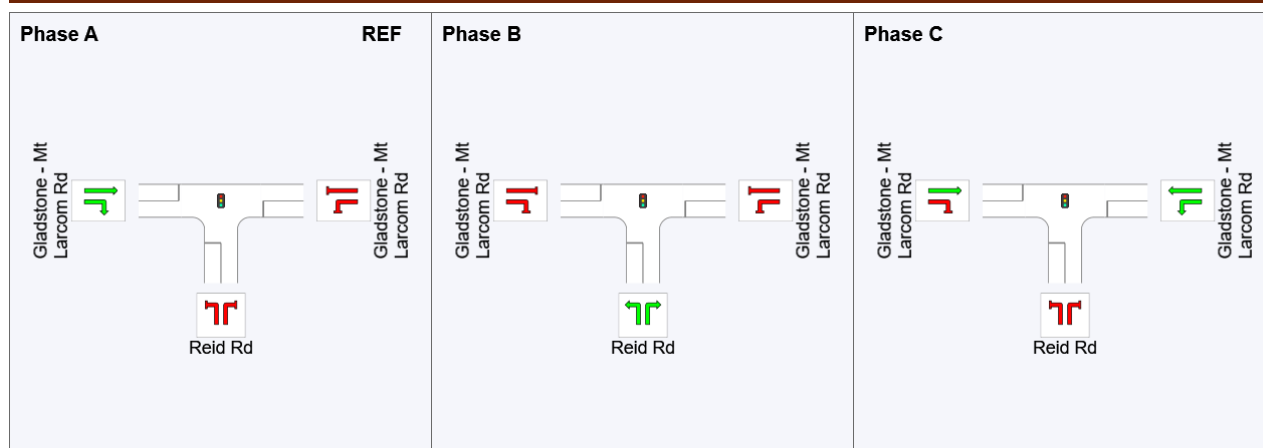
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

Site: 1 [2023 AM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	5	1	5	20.0	0.035	16.9	LOS B	0.1	1.3	0.83	0.66	0.83	45.5
3	R2	5	3	5	60.0	* 0.035	17.4	LOS B	0.1	1.3	0.83	0.66	0.83	44.3
Approach		10	4	11	40.0	0.035	17.2	LOS B	0.1	1.3	0.83	0.66	0.83	44.9
East: Gladstone - Mt Larcom Rd														
4	L2	51	4	54	7.8	0.084	12.6	LOS B	0.5	4.0	0.68	0.70	0.68	48.4
5	T1	466	46	491	9.9	* 0.723	11.0	LOS B	7.2	54.9	0.92	0.88	1.09	50.8
Approach		517	50	544	9.7	0.723	11.1	LOS B	7.2	54.9	0.89	0.86	1.05	50.6
West: Gladstone - Mt Larcom Rd														
11	T1	140	31	147	22.1	0.214	6.7	LOS A	1.5	12.4	0.69	0.55	0.69	54.1
12	R2	2	0	2	0.0	* 0.035	23.5	LOS C	0.0	0.2	0.98	0.59	0.98	42.2
Approach		142	31	149	21.8	0.214	6.9	LOS A	1.5	12.4	0.69	0.56	0.69	53.8
All Vehicles		669	85	704	12.7	0.723	10.3	LOS B	7.2	54.9	0.85	0.79	0.97	51.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2023 AM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

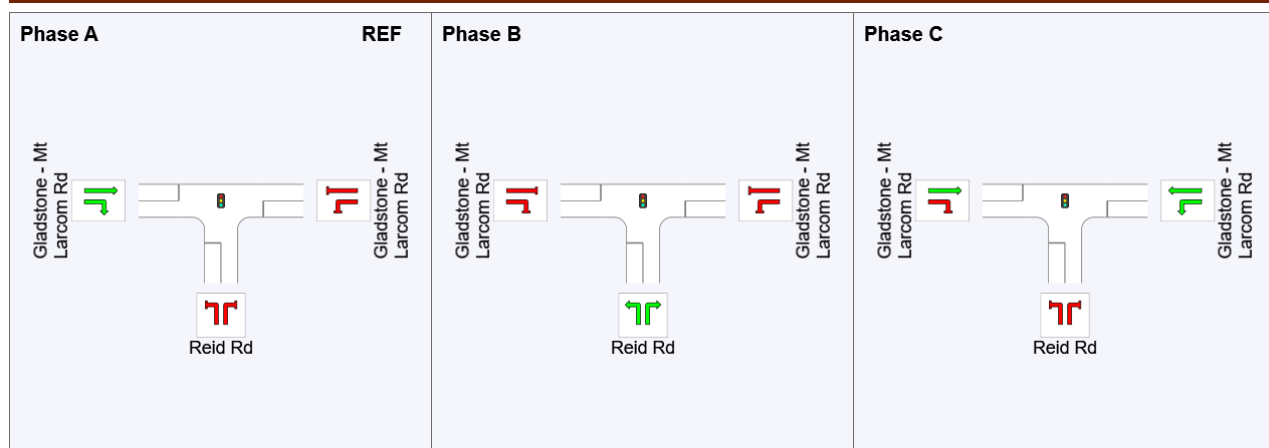
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

Site: 1 [2023 PM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
						v/c	sec							km/h
South: Reid Rd														
1	L2	11	4	12	36.4	0.264	17.8	LOS B	1.3	9.6	0.88	0.75	0.88	44.6
3	R2	82	1	86	1.2	* 0.264	17.4	LOS B	1.3	9.6	0.88	0.75	0.88	45.7
Approach		93	5	98	5.4	0.264	17.5	LOS B	1.3	9.6	0.88	0.75	0.88	45.5
East: Gladstone - Mt Larcom Rd														
4	L2	11	1	12	9.1	0.018	12.3	LOS B	0.1	0.8	0.66	0.65	0.66	48.5
5	T1	209	21	220	10.0	0.324	7.8	LOS A	2.4	18.6	0.76	0.62	0.76	53.2
Approach		220	22	232	10.0	0.324	8.0	LOS A	2.4	18.6	0.75	0.62	0.75	52.9
West: Gladstone - Mt Larcom Rd														
11	T1	477	28	502	5.9	* 0.661	9.0	LOS A	6.7	48.9	0.87	0.79	0.95	52.2
12	R2	3	1	3	33.3	0.064	24.7	LOS C	0.1	0.5	0.99	0.61	0.99	41.0
Approach		480	29	505	6.0	0.661	9.1	LOS A	6.7	48.9	0.87	0.79	0.95	52.1
All Vehicles		793	56	835	7.1	0.661	9.8	LOS A	6.7	48.9	0.84	0.74	0.89	51.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2023 PM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

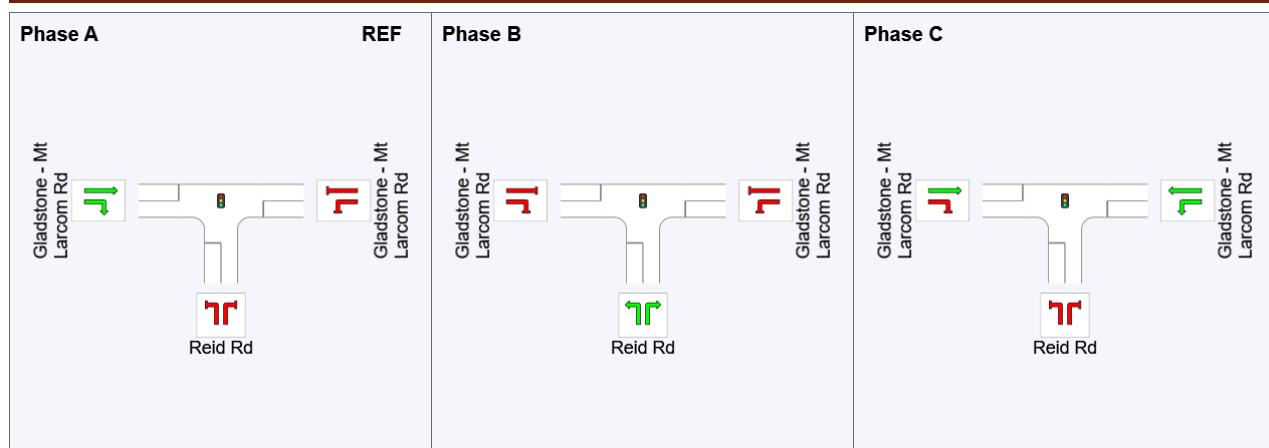
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

Site: 1 [2024 AM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road
Existing Intersection Configuration
Site Category: -
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	5	1	5	20.0	0.035	16.9	LOS B	0.1	1.3	0.83	0.66	0.83	45.5
3	R2	5	3	5	60.0	* 0.035	17.4	LOS B	0.1	1.3	0.83	0.66	0.83	44.3
Approach		10	4	11	40.0	0.035	17.2	LOS B	0.1	1.3	0.83	0.66	0.83	44.9
East: Gladstone - Mt Larcom Rd														
4	L2	52	4	55	7.7	0.085	12.6	LOS B	0.5	4.1	0.68	0.70	0.68	48.4
5	T1	472	47	497	10.0	* 0.732	11.2	LOS B	7.4	56.4	0.92	0.89	1.11	50.6
Approach		524	51	552	9.7	0.732	11.4	LOS B	7.4	56.4	0.90	0.87	1.07	50.4
West: Gladstone - Mt Larcom Rd														
11	T1	141	31	148	22.0	0.215	6.7	LOS A	1.5	12.5	0.69	0.56	0.69	54.1
12	R2	2	0	2	0.0	* 0.035	23.5	LOS C	0.0	0.2	0.98	0.59	0.98	42.2
Approach		143	31	151	21.7	0.215	6.9	LOS A	1.5	12.5	0.69	0.56	0.69	53.8
All Vehicles		677	86	713	12.7	0.732	10.5	LOS B	7.4	56.4	0.85	0.80	0.99	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

PHASING SUMMARY

Site: 1 [2024 AM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

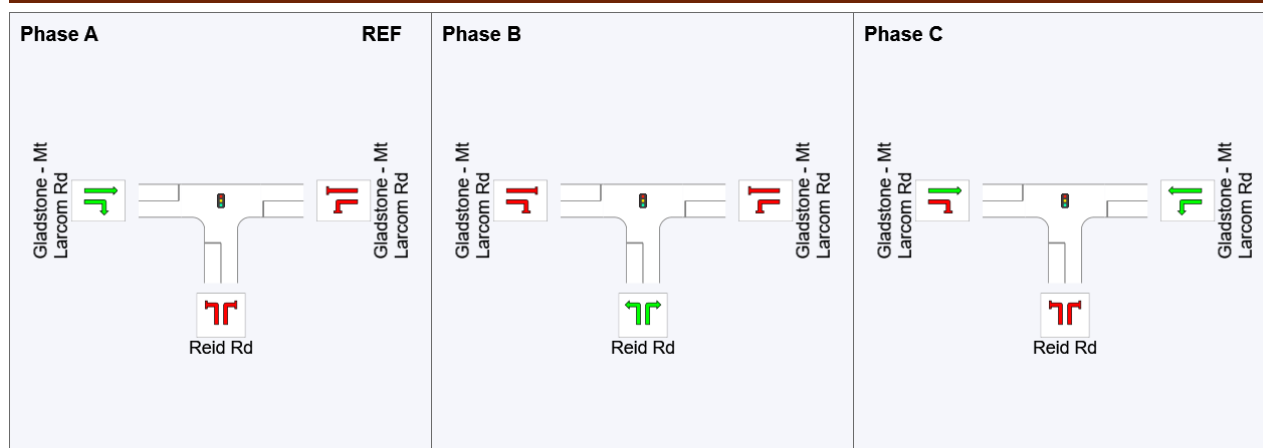
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 **Site: 1 [2024 PM Pre Dev (Site Folder: GML Rd - Reid Rd)]**

Gladstone - Mount Larcom Road / Reid Road
Existing Intersection Configuration
Site Category: -
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	11	4	12	36.4	0.267	17.8	LOS B	1.3	9.7	0.88	0.75	0.88	44.6
3	R2	83	1	87	1.2	* 0.267	17.4	LOS B	1.3	9.7	0.88	0.75	0.88	45.7
Approach		94	5	99	5.3	0.267	17.5	LOS B	1.3	9.7	0.88	0.75	0.88	45.5
East: Gladstone - Mt Larcom Rd														
4	L2	11	1	12	9.1	0.018	12.3	LOS B	0.1	0.8	0.66	0.65	0.66	48.5
5	T1	210	21	221	10.0	0.326	7.8	LOS A	2.5	18.7	0.76	0.62	0.76	53.2
Approach		221	22	233	10.0	0.326	8.0	LOS A	2.5	18.7	0.75	0.62	0.75	52.9
West: Gladstone - Mt Larcom Rd														
11	T1	482	28	507	5.8	* 0.668	9.1	LOS A	6.8	49.8	0.87	0.80	0.96	52.1
12	R2	3	1	3	33.3	0.064	24.7	LOS C	0.1	0.5	0.99	0.61	0.99	41.0
Approach		485	29	511	6.0	0.668	9.2	LOS A	6.8	49.8	0.87	0.80	0.96	52.1
All Vehicles		800	56	842	7.0	0.668	9.9	LOS A	6.8	49.8	0.84	0.74	0.89	51.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

PHASING SUMMARY

Site: 1 [2024 PM Pre Dev (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

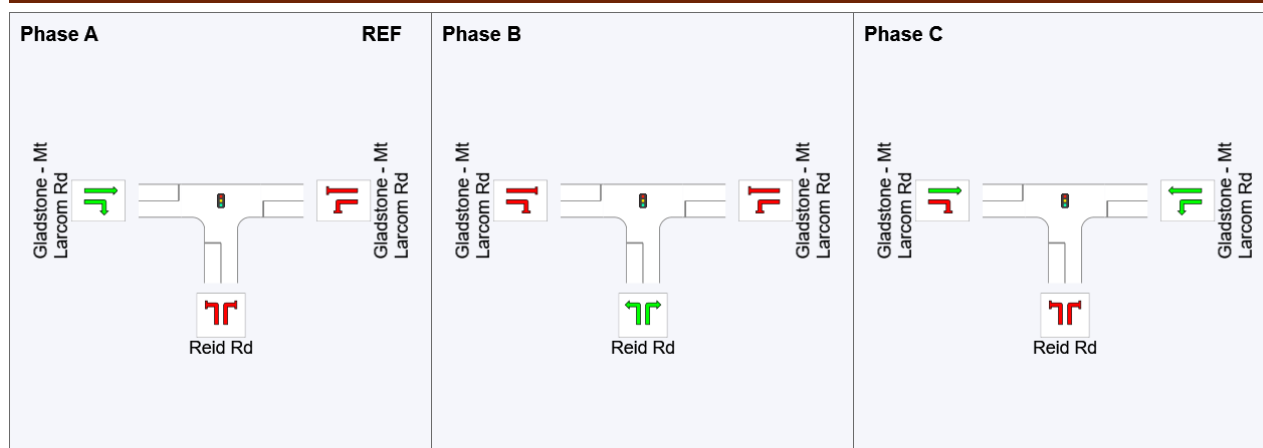
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 **Site: 1 [2022 AM Post Dev (Stg 1 Construction) (Site Folder: GML Rd - Reid Rd)]**

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	6	2	6	33.3	0.045	17.2	LOS B	0.2	1.6	0.83	0.67	0.83	45.0
3	R2	6	4	6	66.7	* 0.045	17.6	LOS B	0.2	1.6	0.83	0.67	0.83	44.0
Approach		12	6	13	50.0	0.045	17.4	LOS B	0.2	1.6	0.83	0.67	0.83	44.5
East: Gladstone - Mt Larcom Rd														
4	L2	76	5	80	6.6	0.124	12.7	LOS B	0.8	6.0	0.69	0.71	0.69	48.3
5	T1	462	46	486	10.0	* 0.717	10.9	LOS B	7.1	54.0	0.91	0.87	1.08	50.9
Approach		538	51	566	9.5	0.717	11.1	LOS B	7.1	54.0	0.88	0.85	1.03	50.5
West: Gladstone - Mt Larcom Rd														
11	T1	139	31	146	22.3	0.213	6.7	LOS A	1.5	12.3	0.69	0.55	0.69	54.1
12	R2	3	1	3	33.3	* 0.064	24.7	LOS C	0.1	0.5	0.99	0.61	0.99	41.0
Approach		142	32	149	22.5	0.213	7.1	LOS A	1.5	12.3	0.70	0.56	0.70	53.7
All Vehicles		692	89	728	12.9	0.717	10.4	LOS B	7.1	54.0	0.84	0.78	0.96	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

 **Site: 1 [2022 AM Post Dev (Stg 1 Construction) (Site Folder: GML Rd - Reid Rd)]**

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

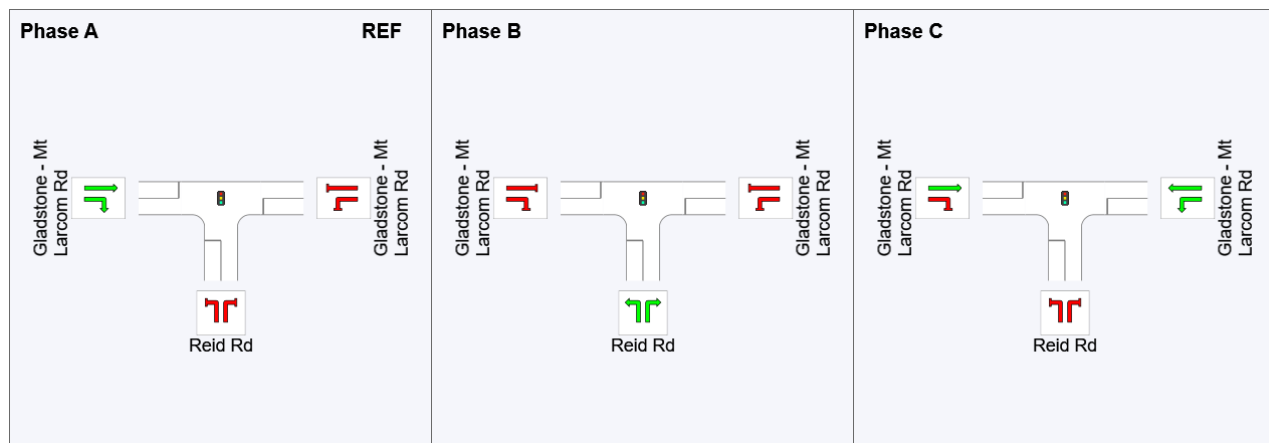
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

 Normal Movement	 Permitted/Opposed
 Slip/Bypass-Lane Movement	 Opposed Slip/Bypass-Lane
 Stopped Movement	 Turn On Red
 Other Movement Class (MC) Running	 Undetected Movement
 Mixed Running & Stopped MCs	 Continuous Movement
 Other Movement Class (MC) Stopped	 Phase Transition Applied

MOVEMENT SUMMARY

 Site: 1 [2022 PM Post Dev (Stg 1 Construction) (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	12	5	13	41.7	0.339	18.1	LOS B	1.7	12.6	0.90	0.76	0.90	44.3
3	R2	107	2	113	1.9	* 0.339	17.7	LOS B	1.7	12.6	0.90	0.76	0.90	45.5
Approach		119	7	125	5.9	0.339	17.7	LOS B	1.7	12.6	0.90	0.76	0.90	45.4
East: Gladstone - Mt Larcom Rd														
4	L2	12	2	13	16.7	0.021	12.5	LOS B	0.1	1.0	0.66	0.65	0.66	48.2
5	T1	206	20	217	9.7	0.319	7.7	LOS A	2.4	18.2	0.76	0.62	0.76	53.2
Approach		218	22	229	10.1	0.319	8.0	LOS A	2.4	18.2	0.75	0.62	0.75	52.9
West: Gladstone - Mt Larcom Rd														
11	T1	473	28	498	5.9	* 0.656	9.0	LOS A	6.6	48.2	0.87	0.78	0.94	52.3
12	R2	4	2	4	50.0	0.094	25.3	LOS C	0.1	0.8	0.99	0.62	0.99	40.3
Approach		477	30	502	6.3	0.656	9.1	LOS A	6.6	48.2	0.87	0.78	0.94	52.2
All Vehicles		814	59	857	7.2	0.656	10.1	LOS B	6.6	48.2	0.84	0.74	0.88	51.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2022 PM Post Dev (Stg 1 Construction) (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

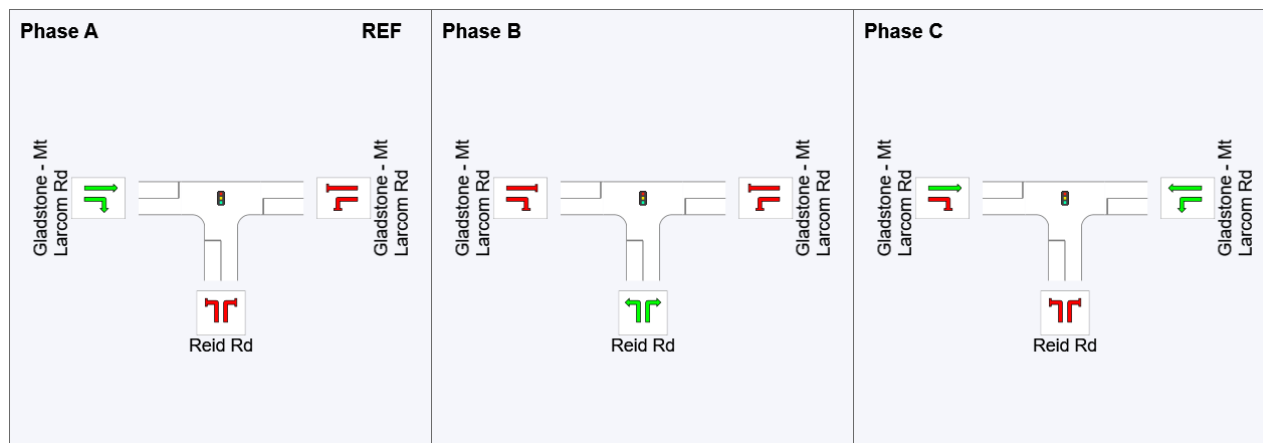
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

Site: 1 [2023 AM Post Dev (Stg 1 Operations & Stg 2 Construction) (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	7	3	7	42.9	0.063	17.4	LOS B	0.2	2.3	0.84	0.68	0.84	44.6
3	R2	9	7	9	77.8	* 0.063	17.8	LOS B	0.2	2.3	0.84	0.68	0.84	43.6
Approach		16	10	17	62.5	0.063	17.7	LOS B	0.2	2.3	0.84	0.68	0.84	44.1
East: Gladstone - Mt Larcom Rd														
4	L2	264	8	278	3.0	0.419	13.7	LOS B	3.2	23.2	0.79	0.78	0.79	47.8
5	T1	466	46	491	9.9	* 0.723	11.0	LOS B	7.2	54.9	0.92	0.88	1.09	50.8
Approach		730	54	768	7.4	0.723	12.0	LOS B	7.2	54.9	0.87	0.84	0.98	49.7
West: Gladstone - Mt Larcom Rd														
11	T1	140	31	147	22.1	0.214	6.7	LOS A	1.5	12.4	0.69	0.55	0.69	54.1
12	R2	4	2	4	50.0	* 0.094	25.3	LOS C	0.1	0.8	0.99	0.62	0.99	40.3
Approach		144	33	152	22.9	0.214	7.2	LOS A	1.5	12.4	0.70	0.56	0.70	53.6
All Vehicles		890	97	937	10.9	0.723	11.3	LOS B	7.2	54.9	0.84	0.79	0.94	50.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2023 AM Post Dev (Stg 1 Operations & Stg 2 Construction) (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

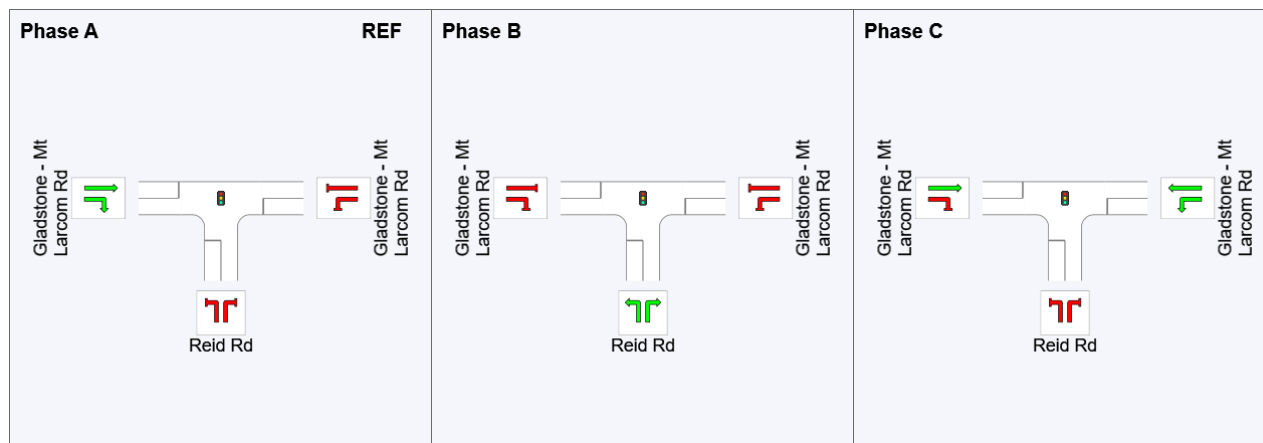
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 **Site: 1 [2023 PM Post Dev (Stg 1 Operations & Stg 2 Construction) (Site Folder: GML Rd - Reid Rd)]**

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	13	6	14	46.2	0.740	20.4	LOS C	5.2	37.7	0.98	0.94	1.26	43.0
3	R2	295	5	311	1.7	* 0.740	19.8	LOS B	5.2	37.7	0.98	0.94	1.26	44.3
Approach		308	11	324	3.6	0.740	19.9	LOS B	5.2	37.7	0.98	0.94	1.26	44.2
East: Gladstone - Mt Larcom Rd														
4	L2	15	5	16	33.3	0.032	13.5	LOS B	0.2	1.5	0.70	0.66	0.70	47.1
5	T1	209	21	220	10.0	0.357	8.6	LOS A	2.6	19.7	0.80	0.65	0.80	52.5
Approach		224	26	236	11.6	0.357	9.0	LOS A	2.6	19.7	0.79	0.65	0.79	52.1
West: Gladstone - Mt Larcom Rd														
11	T1	477	28	502	5.9	* 0.722	10.9	LOS B	7.4	54.2	0.92	0.87	1.09	50.9
12	R2	5	3	5	60.0	0.123	25.7	LOS C	0.1	1.0	0.99	0.63	0.99	39.9
Approach		482	31	507	6.4	0.722	11.1	LOS B	7.4	54.2	0.92	0.87	1.09	50.7
All Vehicles		1014	68	1067	6.7	0.740	13.3	LOS B	7.4	54.2	0.91	0.84	1.07	48.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

Site: 1 [2023 PM Post Dev (Stg 1 Operations & Stg 2 Construction) (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Leading Right Turn

Reference Phase: Phase A

Input Phase Sequence: A, B, C

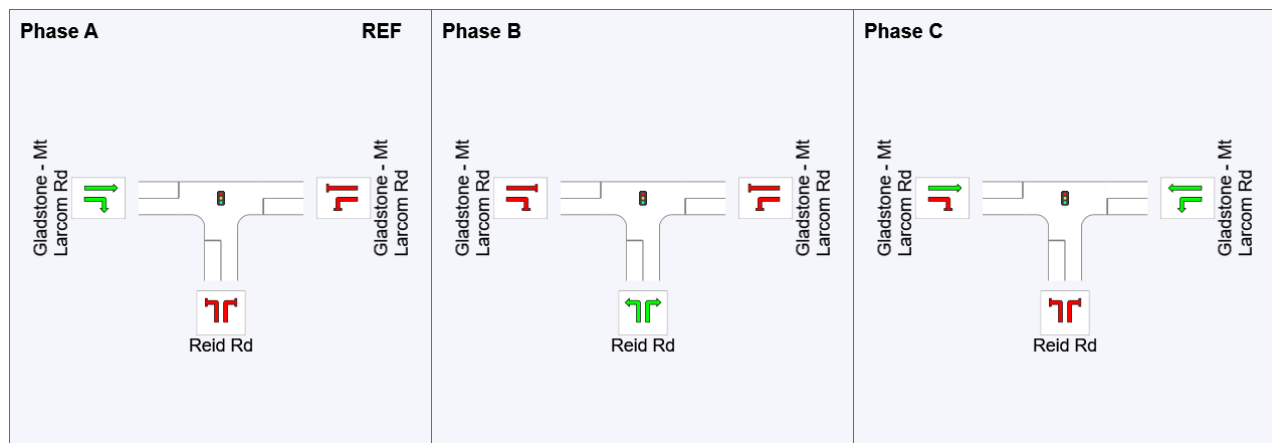
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	14
Green Time (sec)	1	7	10
Phase Time (sec)	7	13	10
Phase Split	23%	43%	33%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 **Site: 1 [2024 AM Post Dev (Stg 1 & 2 Operations) (Site Folder: GML Rd - Reid Rd)]**

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	5	1	5	20.0	0.040	17.0	LOS B	0.1	1.4	0.83	0.67	0.83	45.4
3	R2	6	4	6	66.7	* 0.040	17.5	LOS B	0.1	1.4	0.83	0.67	0.83	44.0
Approach		11	5	12	45.5	0.040	17.3	LOS B	0.1	1.4	0.83	0.67	0.83	44.7
East: Gladstone - Mt Larcom Rd														
4	L2	87	5	92	5.7	0.141	12.8	LOS B	0.9	6.9	0.70	0.72	0.70	48.3
5	T1	472	47	497	10.0	* 0.732	11.2	LOS B	7.4	56.4	0.92	0.89	1.11	50.6
Approach		559	52	588	9.3	0.732	11.5	LOS B	7.4	56.4	0.89	0.86	1.05	50.3
West: Gladstone - Mt Larcom Rd														
11	T1	141	31	148	22.0	0.215	6.7	LOS A	1.5	12.5	0.69	0.56	0.69	54.1
12	R2	2	0	2	0.0	* 0.035	23.5	LOS C	0.0	0.2	0.98	0.59	0.98	42.2
Approach		143	31	151	21.7	0.215	6.9	LOS A	1.5	12.5	0.69	0.56	0.69	53.8
All Vehicles		713	88	751	12.3	0.732	10.6	LOS B	7.4	56.4	0.85	0.80	0.97	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

 **Site: 1 [2024 AM Post Dev (Stg 1 & 2 Operations) (Site Folder: GML Rd - Reid Rd)]**

Gladstone - Mount Larcom Road / Reid Road
Existing Intersection Configuration
Site Category: -
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

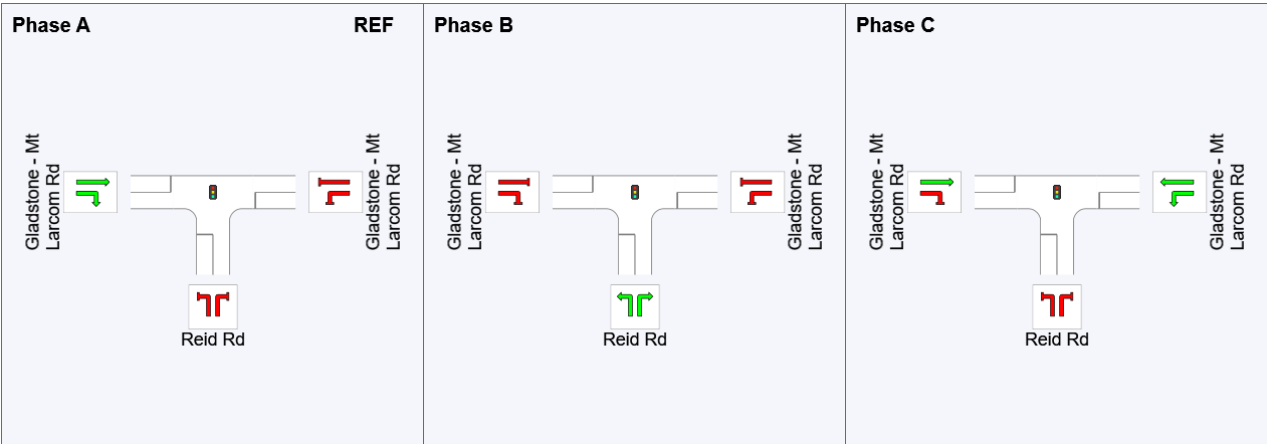
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

 Normal Movement	 Permitted/Opposed
 Slip/Bypass-Lane Movement	 Opposed Slip/Bypass-Lane
 Stopped Movement	 Turn On Red
 Other Movement Class (MC) Running	 Undetected Movement
 Mixed Running & Stopped MCs	 Continuous Movement
 Other Movement Class (MC) Stopped	 Phase Transition Applied

MOVEMENT SUMMARY

 Site: 1 [2024 PM Post Dev (Stg 1 & 2 Operations) (Site Folder: GML Rd - Reid Rd)]

Gladstone - Mount Larcom Road / Reid Road

Existing Intersection Configuration

Site Category: -

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Reid Rd														
1	L2	11	4	12	36.4	0.364	18.1	LOS B	1.9	13.6	0.90	0.77	0.90	44.4
3	R2	118	2	124	1.7	* 0.364	17.7	LOS B	1.9	13.6	0.90	0.77	0.90	45.5
Approach		129	6	136	4.7	0.364	17.8	LOS B	1.9	13.6	0.90	0.77	0.90	45.4
East: Gladstone - Mt Larcom Rd														
4	L2	12	2	13	16.7	0.021	12.5	LOS B	0.1	1.0	0.66	0.65	0.66	48.2
5	T1	210	21	221	10.0	0.326	7.8	LOS A	2.5	18.7	0.76	0.62	0.76	53.2
Approach		222	23	234	10.4	0.326	8.0	LOS A	2.5	18.7	0.75	0.62	0.75	52.9
West: Gladstone - Mt Larcom Rd														
11	T1	482	28	507	5.8	* 0.668	9.1	LOS A	6.8	49.8	0.87	0.80	0.96	52.1
12	R2	3	1	3	33.3	0.064	24.7	LOS C	0.1	0.5	0.99	0.61	0.99	41.0
Approach		485	29	511	6.0	0.668	9.2	LOS A	6.8	49.8	0.87	0.80	0.96	52.1
All Vehicles		836	58	880	6.9	0.668	10.2	LOS B	6.8	49.8	0.85	0.75	0.90	51.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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Project: C:\ACCESS TRAFFIC\Projects\2021\ALP0121-002\4. Technical\3. SIDRA\ALP0121_Alpha HPA.sip9

PHASING SUMMARY

 **Site: 1 [2024 PM Post Dev (Stg 1 & 2 Operations) (Site Folder: GML Rd - Reid Rd)]**

Gladstone - Mount Larcom Road / Reid Road
Existing Intersection Configuration
Site Category: -
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

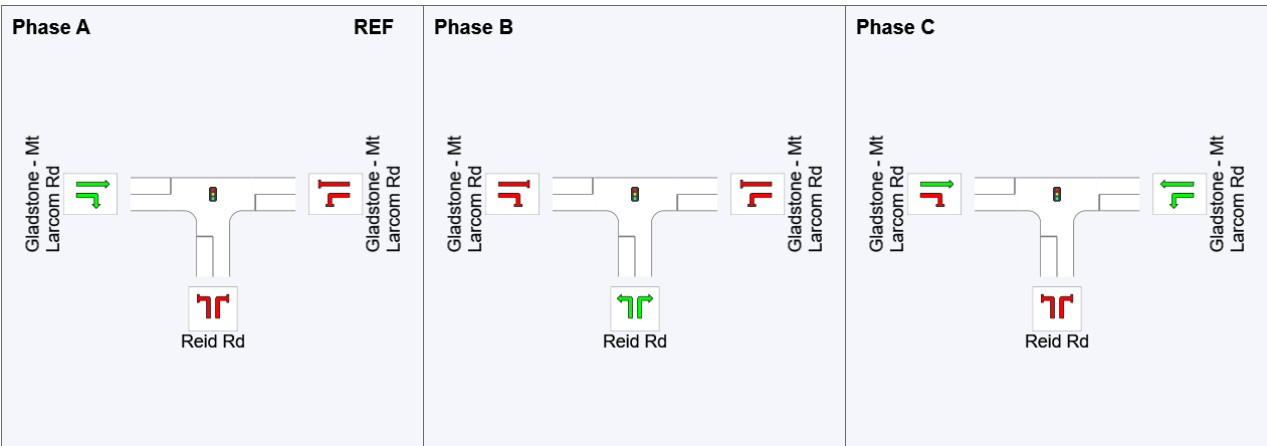
Timings based on settings in the Site Phasing & Timing dialog
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Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

 Normal Movement	 Permitted/Opposed
 Slip/Bypass-Lane Movement	 Opposed Slip/Bypass-Lane
 Stopped Movement	 Turn On Red
 Other Movement Class (MC) Running	 Undetected Movement
 Mixed Running & Stopped MCs	 Continuous Movement
 Other Movement Class (MC) Stopped	 Phase Transition Applied



Appendix I – Project Traffic Impact Calculations

ALP0121-002 | Alpha HPA TIA
Project Traffic Impact % Calculations

PEAK PROJECT VOLUMES - STAGE 1 (CONSTRUCTION)

Road ID	Road Description	AADT Segment	AADT Segment		Base Data Year	Base Year AADT			Base Year HV%		Base Year HV		10 Yr GR%	2021 AADT			2021 HV		2022 AADT			2022 HV		Max. Project Const. Traffic			Stg 1 Const Traffic % Impact			Gaz	A-Gaz
			Start (km)	End (km)		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz	Bi-Dir	Gaz %	A-Gaz %	Bi-Dir %	Gaz	A-Gaz
181	Gladstone- Mount Larcom Road	60071	0.000	1.409	2019	3,563	3,085	6,648	18.52%	15.24%	660	470	1.00%	3,635	3,147	6,782	673	480	3,671	3,178	6,849	680	484	28	28	57	0.77%	0.89%	0.83%	3,699	3,207
		60073	1.409	3.258	2018	3,025	3,150	6,175	16.07%	16.16%	486	509	1.00%	3,117	3,245	6,362	501	524	3,148	3,278	6,426	506	530	28	28	57	0.90%	0.86%	0.88%	3,176	3,306
		61052	3.258	4.625	2018	4,706	4,542	9,248	11.52%	14.11%	542	641	1.00%	4,849	4,680	9,528	559	660	4,897	4,726	9,624	564	667	28	28	57	0.58%	0.60%	0.59%	4,925	4,755
		60074	4.625	9.833	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,303	3,286	6,589	447	524	3,336	3,318	6,655	452	530	28	28	57	0.85%	0.85%	0.85%	3,365	3,347
			9.833	12.292	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,303	3,286	6,589	447	524	3,336	3,318	6,655	452	530	2	2	4	0.06%	0.05%	0.05%	3,338	3,320
			12.292	19.030	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,525	1,527	3,052	334	462	1,540	1,542	3,082	337	466	2	2	4	0.13%	0.11%	0.12%	1,542	1,544
		60076	19.030	32.140	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,525	1,527	3,052	334	462	1,540	1,542	3,082	337	466	0	0	0	0.00%	0.00%	0.00%	1,540	1,542
GRC	Reid Road	-	0.000	0.275	2020	351	351	702	6.84%	6.84%	24	24	1.00%	355	355	709	24	24	358	358	716	24	24	28	28	57	7.91%	7.91%	7.91%	386	386
			0.275	0.430	2020	306	306	613	3.92%	3.92%	12	12	1.00%	309	309	619	12	12	312	312	625	12	12	28	28	57	9.07%	9.07%	9.07%	341	341
			0.430	0.505	2020	45	45	89	26.85%	26.85%	12	12	1.00%	45	45	90	12	12	46	46	91	12	12	28	28	57	62.15%	62.15%	62.15%	74	74
			0.505	0.710	2020	45	45	89	26.85%	26.85%	12	12	1.00%	45	45	90	12	12	46	46	91	12	12	28	28	57	62.15%	62.15%	62.15%	74	74
			0.710	0.740	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	32	2	2	16	16	33	2	2	28	28	57	173.62%	173.62%	173.62%	45	45
			0.740	2.600	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	32	2	2	16	16	33	2	2	10	10	20	61.27%	61.27%	61.27%	26	26

TMR Chainage 9.833km - Gladstone-Mt Larcom / Reid Road

TMR Chainage 19.030km - Gladstone-Mt Larcom / Quarry Road

PEAK PROJECT VOLUMES - STAGE 2 (STG 2 CONSTRUCTION + STG 1 OPERATIONS)

Road ID	Road Description	AADT Segment	AADT Segment		Base Data Year	Base Year AADT			Base Year HV%		Base Year HV		10 Yr GR%	2021 AADT			2021 HV		2023 AADT			2023 HV		Max. Project Ops. Traffic			Stg 2 Const & Stg 1 Ops Traffic % Impact			Gaz	A-Gaz
			Start (km)	End (km)		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz	Bi-Dir	Gaz %	A-Gaz %	Bi-Dir %	Gaz	A-Gaz
181	Gladstone- Mount Larcom Road	60071	0.000	1.409	2019	3,563	3,085	6,648	18.52%	15.24%	660	470	1.00%	3,635	3,147	6,782	673	480	3,708	3,210	6,918	687	489	260	260	520	7.01%	8.09%	7.51%	3,967	3,470
		60073	1.409	3.258	2018	3,025	3,150	6,175	16.07%	16.16%	486	509	1.00%	3,117	3,245	6,362	501	524	3,179	3,311	6,490	511	535	260	260	520	8.17%	7.85%	8.01%	3,439	3,570
		61052	3.258	4.625	2018	4,706	4,542	9,248	11.52%	14.11%	542	641	1.00%	4,849	4,680	9,528	559	660	4,946	4,774	9,720	570	674	260	260	520	5.25%	5.44%	5.35%	5,206	5,033
		60074	4.625	9.833	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,303	3,286	6,589	447	524	3,370	3,352	6,721	456	535	260	260	520	7.71%	7.75%	7.73%	3,629	3,611
			9.833	12.292	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,303	3,286	6,589	447	524	3,370	3,352	6,721	456	535	11	11	22	0.33%	0.33%	0.33%	3,381	3,363
			12.292	19.030	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,525	1,527	3,052	334	462	1,555	1,558	3,113	340	471	11	11	22	0.71%	0.71%	0.71%	1,566	1,569
		60076	19.030	32.140	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,525	1,527	3,052	334	462	1,555	1,558	3,113	340	471	0	0	0	0.00%	0.00%	0.00%	1,555	1,558
GRC	Reid Road	-	0.000	0.275	2020	351	351	702	6.84%	6.84%	24	24	1.00%	355	355	709	24	24	362	362	723	25	25	260	260	520	71.84%	71.84%	71.84%	621	621
			0.275	0.430	2020	306	306	613	3.92%	3.92%	12	12	1.00%	309	309	619	12	12	316	316	631	12	12	260	260	520	82.32%	82.32%	82.32%	575	575
			0.430	0.505	2020	45	45	89	26.85%	26.85%	12	12	1.00%	45	45	90	12	12	46	46	92	12	12	260	260	520	564.08%	564.08%	564.08%	306	306
			0.505	0.710	2020	45	45	89	26.85%	26.85%	12	12	1.00%	45	45	90	12	12	46	46	92	12	12	260	260	520	564.08%	564.08%	564.08%	306	306
			0.710	0.740	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	32	2	2	16	16	33	2	2	260	260	520	1575.91%	1575.91%	1575.91%	276	276
			0.740	2.600	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	32	2	2	16	16	33	2	2	0	0	0	0.00%	0.00%	0.00%	16	16

TMR Chainage 9.833km - Gladstone-Mt Larcom / Reid Road

TMR Chainage 19.030km - Gladstone-Mt Larcom / Quarry Road

PEAK PROJECT VOLUMES - ONGOING OPERATIONS (STAGE 1 & 2)

Road ID	Road Description	AADT Segment	AADT Segment		Base Data Year	Base Year AADT			Base Year HV%		Base Year HV		10 Yr GR%	2021 AADT			2021 HV		2024 AADT			2024 HV		Max. Project Ops. Traffic			Stg 1&2 Ops. Traffic % Impact				
			Start (km)	End (km)		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz	Bi-Dir	Gaz %	A-Gaz %	Bi-Dir %	Gaz	A-Gaz
181	Gladstone-Mount Larcom Road	60071	0.000	1.409	2019	3,563	3,085	6,648	18.52%	15.24%	660	470	1.00%	3,635	3,147	6,782	673	480	3,745	3,242	6,987	694	494	119	119	237	3.17%	3.66%	3.40%	3,863	3,361
		60073	1.409	3.258	2018	3,025	3,150	6,175	16.07%	16.16%	486	509	1.00%	3,117	3,245	6,362	501	524	3,211	3,344	6,555	516	540	119	119	237	3.70%	3.55%	3.62%	3,330	3,462
		61052	3.258	4.625	2018	4,706	4,542	9,248	11.52%	14.11%	542	641	1.00%	4,849	4,680	9,528	559	660	4,996	4,821	9,817	575	680	119	119	237	2.38%	2.46%	2.42%	5,114	4,940
		60074	4.625	9.833	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,303	3,286	6,589	447	524	3,403	3,385	6,788	461	540	119	119	237	3.49%	3.51%	3.50%	3,522	3,504
			9.833	12.292	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,303	3,286	6,589	447	524	3,403	3,385	6,788	461	540	0	0	0	0.00%	0.00%	0.00%	3,403	3,385
			12.292	19.030	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,525	1,527	3,052	334	462	1,571	1,573	3,144	344	476	0	0	0	0.00%	0.00%	0.00%	1,571	1,573
		60076	19.030	32.140	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,525	1,527	3,052	334	462	1,571	1,573	3,144	344	476	0	0	0	0.00%	0.00%	0.00%	1,571	1,573
GRC	Reid Road	-	0.000	0.275	2020	351	351	702	6.84%	6.84%	24	24	1.00%	355	355	709	24	24	365	365	731	25	25	119	119	237	32.49%	32.49%	32.49%	484	484
		-	0.275	0.430	2020	306	306	613	3.92%	3.92%	12	12	1.00%	309	309	619	12	12	319	319	637	12	12	119	119	237	37.23%	37.23%	37.23%	437	437
		-	0.430	0.505	2020	45	45	89	26.85%	26.85%	12	12	1.00%	45	45	90	12	12	47	47	93	12	12	119	119	237	255.11%	255.11%	255.11%	165	165
		-	0.505	0.710	2020	45	45	89	26.85%	26.85%	12	12	1.00%	45	45	90	12	12	47	47	93	12	12	119	119	237	255.11%	255.11%	255.11%	165	165
		-	0.710	0.740	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	32	2	2	17	17	33	2	2	119	119	237	712.73%	712.73%	712.73%	135	135
		-	0.740	2.600	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	32	2	2	17	17	33	2	2	0	0	0	0.00%	0.00%	0.00%	17	17
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Gladstone-Mount Larcom Road / Reid Road Intersection - Delay Impact % Calculations

Stage 1 & 2 Operations										
Movement	2024 AM Peak					2024 PM Peak				
	Pre Dev Vols	Pre Dev Movement Avg Delay	Pre Dev Total Delay	Post Dev Movement Avg Delay	Post Dev Total Delay	Pre Dev Vols	Pre Dev Movement Avg Delay	Pre Dev Total Delay	Post Dev Movement Avg Delay	Post Dev Total Delay
Reid Road (S)										
L	5	16.9	85	17.0	85	11	17.8	196	18.1	199
R	5	17.4	87	17.5	88	83	17.4	1,444	17.7	1,469
Gladstone - Mount Larcom Road (E)										
L	52	12.6	655	12.8	666	11	12.3	135	12.5	138
T	472	11.2	5,286	11.2	5,286	210	7.8	1,638	7.8	1,638
Gladstone - Mount Larcom Road (W)										
T	141	6.7	945	6.7	945	482	9.1	4,386	9.1	4,386
R	2	23.5	47	23.5	47	3	24.7	74	24.7	74
Total		7,105	Total	7,116		Total		7,874	Total	7,904

Pre Development Total Delay	=	14,978	secs
Post Development Total Delay	=	15,020	secs
Difference	=	42	secs
% Difference	=	0.28%	



Appendix J – Project Pavement Impact Calculations

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Project Traffic Impact % Calculations - Stage 1 Construction

Project Earthworks Phase ESA Calculations

Total Quarry Transport Movements = 38 vehicles

Quarry Transport Vehicle ESAs (Truck & 4 Axle Dog)

Loaded ESAs/veh = 7.66 ESAs

Unloaded ESAs/veh = 0.53 ESAs

Project ESAs (Loaded) = 291 ESAs

Project ESAs (Unloaded) = 20 ESAs

Total EDQ Borrow Pit Movements = 400 vehicles

EDQ Borrow Pit Transport Vehicle ESAs (Truck & 4 Axle Dog)

Loaded ESAs/veh = 7.66 ESAs

Unloaded ESAs/veh = 0.53 ESAs

Project ESAs (Loaded) = 3,064 ESAs

Project ESAs (Unloaded) = 212 ESAs

Total Construction Materials Transport Movements (Semi-Trailer) = 22 vehicles

Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh = 4.93 ESAs

Unloaded ESAs/veh = 0.51 ESAs

Project ESAs (Loaded) = 108 ESAs

Project ESAs (Unloaded) = 11 ESAs

Total Construction Materials Transport Movements (3 Axle Rigid) = 3 vehicles

Construction Materials Transport Vehicle ESAs (3 Axle Rigid)

Loaded ESAs/veh = 3.57 ESAs

Unloaded ESAs/veh = 0.5 ESAs

Project ESAs (Loaded) = 11 ESAs

Project ESAs (Unloaded) = 2 ESAs

Project Civil Phase ESA Calculations

Total Quarry Transport Movements = 98 vehicles

Quarry Transport Vehicle ESAs (Truck & 4 Axle Dog)

Loaded ESAs/veh = 7.66 ESAs

Unloaded ESAs/veh = 0.53 ESAs

Project ESAs (Loaded) = 751 ESAs

Project ESAs (Unloaded) = 52 ESAs

Total Concrete Transport Movements = 225 vehicles

Concrete Transport Vehicle ESAs (3 Axle Rigid)

Loaded ESAs/veh = 3.57 ESAs

Unloaded ESAs/veh = 0.50 ESAs

Project ESAs (Loaded) = 803 ESAs

Project ESAs (Unloaded) = 113 ESAs

Total Construction Materials Transport Movements (Semi-Trailer) = 17 vehicles

Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh = 4.93 ESAs

Unloaded ESAs/veh	=	0.51 ESAs
Project ESAs (Loaded)	=	84 ESAs
Project ESAs (Unloaded)	=	9 ESAs

Project SMP Phase ESA Calculations

Total Construction Materials Transport Movements = 99 vehicles

Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs
Project ESAs (Loaded)	=	488 ESAs
Project ESAs (Unloaded)	=	50 ESAs

Total Construction Materials Transport Movements = 114 vehicles

Construction Materials Transport Vehicle ESAs (3 Axle Rigid)

Loaded ESAs/veh	=	3.57 ESAs
Unloaded ESAs/veh	=	0.50 ESAs
Project ESAs (Loaded)	=	406 ESAs
Project ESAs (Unloaded)	=	57 ESAs

Project E&I Phase ESA Calculations

Total Construction Materials Transport Movements = 36 vehicles

Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs
Project ESAs (Loaded)	=	177 ESAs
Project ESAs (Unloaded)	=	18 ESAs

Project Commissioning Phase ESA Calculations

Total Construction Materials Transport Movements = 12 vehicles

Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs
Project ESAs (Loaded)	=	59 ESAs
Project ESAs (Unloaded)	=	6 ESAs

Project Traffic Impact % Calculations - Stage 2 Construction & Stage 1 Operations

Project Earthworks Phase ESA Calculations

Total Quarry Transport Movements = 2,320 vehicles

Quarry Transport Vehicle ESAs (Truck & 4 Axle Dog)

Loaded ESAs/veh	=	7.66 ESAs
Unloaded ESAs/veh	=	0.53 ESAs
Project ESAs (Loaded)	=	17,771 ESAs
Project ESAs (Unloaded)	=	1,230 ESAs

Total Construction Materials Transport Movements (Semi-Trailer) = 30 vehicles

Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs



Project ESAs (Loaded)	=	148 ESAs
Project ESAs (Unloaded)	=	15 ESAs

Total Construction Materials Transport Movements (3 Axle Rigid)	=	20 vehicles
Construction Materials Transport Vehicle ESAs (3 Axle Rigid)		

Loaded ESAs/veh	=	3.57 ESAs
Unloaded ESAs/veh	=	0.5 ESAs

Project ESAs (Loaded)	=	71 ESAs
Project ESAs (Unloaded)	=	10 ESAs

Project Civil Phase ESA Calculations

Total Quarry Transport Movements	=	453 vehicles
Quarry Transport Vehicle ESAs (Truck & 4 Axle Dog)		

Loaded ESAs/veh	=	7.66 ESAs
Unloaded ESAs/veh	=	0.53 ESAs

Project ESAs (Loaded)	=	3,470 ESAs
Project ESAs (Unloaded)	=	240 ESAs

Total Concrete Transport Movements	=	1101 vehicles
Concrete Transport Vehicle ESAs (3 Axle Rigid)		

Loaded ESAs/veh	=	3.57 ESAs
Unloaded ESAs/veh	=	0.50 ESAs

Project ESAs (Loaded)	=	3,931 ESAs
Project ESAs (Unloaded)	=	551 ESAs

Total Construction Materials Transport Movements (Semi-Trailer)	=	92 vehicles
Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)		

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs

Project ESAs (Loaded)	=	454 ESAs
Project ESAs (Unloaded)	=	47 ESAs

Project SMP Phase ESA Calculations

Total Construction Materials Transport Movements	=	679 vehicles
Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)		

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs

Project ESAs (Loaded)	=	3,345 ESAs
Project ESAs (Unloaded)	=	346 ESAs

Total Construction Materials Transport Movements	=	253 vehicles
Construction Materials Transport Vehicle ESAs (3 Axle Rigid)		

Loaded ESAs/veh	=	3.57 ESAs
Unloaded ESAs/veh	=	0.50 ESAs

Project ESAs (Loaded)	=	902 ESAs
Project ESAs (Unloaded)	=	126 ESAs

Project E&I Phase ESA Calculations

Total Construction Materials Transport Movements	=	147 vehicles
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Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs
Project ESAs (Loaded)	=	725 ESAs
Project ESAs (Unloaded)	=	75 ESAs

Project Commissioning Phase ESA Calculations

Total Construction Materials Transport Movements = 74 vehicles

Construction Materials Transport Vehicle ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs
Project ESAs (Loaded)	=	365 ESAs
Project ESAs (Unloaded)	=	38 ESAs

Stage 1 Operations

Total Stage 1 Operations Phase HV Movements = 1460 vehicles

Stage 1 Operations Phase HV ESAs (Semi-Trailer Single Trailer)

Loaded ESAs/veh	=	4.93 ESAs
Unloaded ESAs/veh	=	0.51 ESAs
Project ESAs (Loaded)	=	7,198 ESAs
Project ESAs (Unloaded)	=	745 ESAs

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Project Pavement Impact % Calculations

STAGE 1 CONSTRUCTION

Road ID	Road Description	AADT Segment	AADT Segment		Base Data Year	Base Year AADT			Base Year HV%		Base Year HV		10 Yr GR%	2022 AADT			2022 HV	
			Start (km)	End (km)		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz
181	Gladstone-Mount Larcom Road	60071	0.000	1.409	2019	3,563	3,085	6,648	18.52%	15.24%	660	470	1.00%	3,671	3,178	6,849	680	484
		60073	1.409	3.258	2018	3,025	3,150	6,175	16.07%	16.16%	486	509	1.00%	3,148	3,278	6,426	506	530
		61052	3.258	4.625	2018	4,706	4,542	9,248	11.52%	14.11%	542	641	1.00%	4,897	4,726	9,624	564	667
		60074	4.625	9.833	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,336	3,318	6,655	452	530
			9.833	12.292	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,336	3,318	6,655	452	530
		60076	12.292	19.030	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,540	1,542	3,082	337	466
			19.030	32.140	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,540	1,542	3,082	337	466
GRC	Reid Road	-	0.000	0.275	2020	351	351	702	6.84%	6.84%	24	24	1.00%	358	358	716	24	24
			0.275	0.430	2020	306	306	613	3.92%	3.92%	12	12	1.00%	312	312	625	12	12
			0.430	0.505	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	91	12	12
			0.505	0.710	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	91	12	12
			0.710	0.740	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2
			0.740	2.600	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2

Project Duration	ESAs / HV	B'ground ESAs	
		Gaz	A-Gaz
304	3.2	661,733	471,483
304	3.2	492,366	515,583
304	3.2	549,100	649,114
304	3.2	439,672	515,507
304	3.2	439,672	515,507
304	3.2	328,137	453,768
304	3.2	328,137	453,768
304	3.2	328,137	453,768
304	3.2	23,830	23,830
304	3.2	11,915	11,915
304	3.2	11,915	11,915
304	3.2	11,915	11,915
304	3.2	1,589	1,589
304	3.2	1,589	1,589

Project Const. ESAs	
Gaz	A-Gaz
2,137	266
2,137	266
2,137	266
2,137	266
72	1,042
72	1,042
0	0
3,178	338
3,178	338
3,178	338
3,178	338
3,178	338
212	3,064

Project Cons. Incr ESAs	
Gaz %	A-Gaz %
0.32%	0.06%
0.43%	0.05%
0.39%	0.04%
0.49%	0.05%
0.02%	0.20%
0.02%	0.23%
0.00%	0.00%
13.34%	1.42%
26.68%	2.83%
26.68%	2.83%
26.68%	2.83%
200.07%	21.26%
13.34%	192.87%

STAGE 2 CONSTRUCTION & STAGE 1 OPERATIONS

Road ID	Road Description	AADT Segment	AADT Segment		Base Data Year	Base Year AADT			Base Year HV%		Base Year HV		10 Yr GR%	2023 AADT			2023 HV	
			Start (km)	End (km)		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz	Gaz	A-Gaz		Gaz	A-Gaz	Bi-Dir	Gaz	A-Gaz
181	Gladstone-Mount Larcom Road	60071	0.000	1.409	2019	3,563	3,085	6,648	18.52%	15.24%	660	470	1.00%	3,708	3,210	6,918	687	489
		60073	1.409	3.258	2018	3,025	3,150	6,175	16.07%	16.16%	486	509	1.00%	3,179	3,311	6,490	511	535
		61052	3.258	4.625	2018	4,706	4,542	9,248	11.52%	14.11%	542	641	1.00%	4,946	4,774	9,720	570	674
		60074	4.625	9.833	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,370	3,352	6,721	456	535
			9.833	12.292	2018	3,206	3,189	6,395	13.54%	15.96%	434	509	1.00%	3,370	3,352	6,721	456	535
		60076	12.292	19.030	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,555	1,558	3,113	340	471
			19.030	32.140	2018	1,480	1,482	2,962	21.89%	30.23%	324	448	1.00%	1,555	1,558	3,113	340	471
GRC	Reid Road	-	0.000	0.275	2020	351	351	702	6.84%	6.84%	24	24	1.00%	362	362	723	25	25
			0.275	0.430	2020	306	306	613	3.92%	3.92%	12	12	1.00%	316	316	631	12	12
			0.430	0.505	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	92	12	12
			0.505	0.710	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	92	12	12
			0.710	0.740	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2
			0.740	2.600	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2

Project Duration	ESAs / HV	B'ground ESAs	
		Gaz	A-Gaz
730	3.2	1,604,040	1,142,874
730	3.2	1,193,496	1,249,774
730	3.2	1,331,019	1,573,453
730	3.2	1,065,766	1,249,589
730	3.2	1,065,766	1,249,589
730	3.2	795,403	1,099,933
730	3.2	795,403	1,099,933
730	3.2	57,763	57,763
730	3.2	28,881	28,881
730	3.2	28,881	28,881
730	3.2	28,881	28,881
730	3.2	3,851	3,851
730	3.2	3,851	3,851

Project Oper. ESAs	
Gaz	A-Gaz
17,138	1,952
17,138	1,952
17,138	1,952
17,138	1,952
17,138	1,952
1,470	21,241
0	0
38,379	3,422
38,379	3,422
38,379	3,422
38,379	3,422
38,379	3,422
0	0

Project Oper. Incr ESAs	
Gaz %	A-Gaz %
1.07%	0.17%
1.44%	0.16%
1.29%	0.12%
1.61%	0.16%
1.61%	0.16%
0.18%	1.93%
0.00%	0.00%
66.44%	5.92%
132.88%	11.85%
132.88%	11.85%
132.88%	11.85%
996.63%	88.86%
0.00%	0.00%



Appendix K – TIA RPEQ Certification and Authorisation



Certification of Traffic Impact Assessment Report

Registered Professional Engineer Queensland

for

Project Title:	Alpha HPA Project, Yarwun
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As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the Professional Engineers Act 2002 as competent in my areas of nominated expertise, I understand and recognise:

- the significant role of engineering as a profession, and that
- the community has a legitimate expectation that my certification affixed to this engineering work can be trusted, and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

- I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the Guide to Traffic Impact Assessment published by the Queensland Department of Transport and Main Roads and using sound engineering principles, and
- where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment, and that
- the outcomes of this traffic impact assessment are a true reflection of results of assessment, and that
- I believe the strategies recommended for mitigating impacts by this traffic impact assessment,
- embrace contemporary practice initiatives and will deliver the desired outcomes.

Name:	Andrew Barrie	RPEQ No:	12801
RPEQ Competencies:	Civil		
Signature:		Date:	19 October 2021
Postal Address:	PO Box 9864, Frenchville QLD 4701		
Email:	andrew.barrie@accesstraffic.com.au		



Traffic impact assessment components to which this certification applies		✓
1. Introduction		
Background		✓
Scope and study area		✓
Pre-lodgement meeting notes		N/A
2. Existing Conditions		
Land use and zoning		✓
Adjacent land uses / approvals		✓
Surrounding road network details		✓
Traffic volumes		✓
Intersection and network performance		✓
Road safety issues		✓
Site access		✓
Public transport (if applicable)		N/A
Active transport (if applicable)		N/A
Parking (if applicable)		N/A
Pavement (if applicable)		✓
Transport infrastructure (if applicable)		N/A
3. Proposed Development Details		
Development site plan		✓
Operational details (including year of opening of each stage and any relevant catchment / market analysis)		✓
Proposed access and parking		✓
4. Development Traffic		
Traffic generation (by development stage if relevant and considering light and heavy vehicle trips)		✓
Trip distribution		✓
Development traffic volumes on the network		✓
5. Impact Assessment and Mitigation		
With and without development traffic volumes		✓
Construction traffic impact assessment and mitigation (if applicable)		✓
Road safety impact assessment and mitigation		✓
Access and frontage impact assessment and mitigation		✓
Intersection delay impact assessment and mitigation		✓
Road link capacity assessment and mitigation		✓
Pavement impact assessment and mitigation		✓
Transport infrastructure impact assessment and mitigation		N/A
Other impacts assessment relevant to the specific development type / location (if applicable)		N/A
6. Conclusions and Recommendations		
Summary of impacts and mitigation measures proposed		✓
Certification statement and authorisation		✓