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Alpha HPA

Material Change of Use – Warehouse (Temporary Laydown)

SDA Application under the *State Development and Public Works Organisation Act 1971*

April 2025

Document History and Status

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Glossary

Acronym	Meaning
AHD	Australian Height Datum
CEMP	Construction Environmental Management Plan
CMP	Construction Management Plan
Council	Gladstone Regional Council
CQG	CQ Environmental Pty Ltd (ABN 61 107 574 514) trading as CQG Consulting
DA	Development Application
Development Scheme	*Gladstone SDA Development Scheme 2022*
DCCEWW	Department of Climate Change, Energy, the Environment and Water
DLGWV	Department of Local Government, Water and Volunteers
DPI	Department of Primary Industries
DTMR	Department of Transport and Main Roads
EIS	Environmental Impact Statement
EDQ	Economic Development Queensland
GBRWHA	Great Barrier Reef World Heritage Area
GSDA	Gladstone State Development Area
HPA	High Purity Alumina
HV	Heavy Vehicle
LV	Light Vehicle
MCU	Material Change of Use
MSES	Matters of State Environmental Significance
OCG	Office of the Coordinator General
OPW	Operational Works
OUV	Outstanding Universal Value
PA	*Planning Act 2016 (Qld)*
Planning Scheme	*Gladstone Region Planning Scheme 2015*

Acronym	Meaning
PPF	Precursor Production Facility
SARA	State Assessment and Referral Agency
SDA	State Development Area
SDAP	Queensland State Development Assessment Provisions
SPP	Queensland State Planning Policy
STP	Sewage treatment plant
SX	Solvent Extraction
the Site	Part of Lot 1 on SP338512
TEC	Threatened Ecological Communities
WWBW	Waterway barrier works

1 Introduction

1.1 Background

Alpha HPA (The Proponent) is a publicly listed, Australian-based company which has commercialised the world's first adoption of the solvent extraction (SX) purification technique to aluminium to produce a growing range of ultra-high purity aluminium materials.

Alpha HPA currently operates its Stage One development over Lot 12 SP239343 on Reid Road, Yarwun in the Gladstone State Development Area (GSDA). This facility is a Precursor Production Facility (PPF) to produce its full high-purity aluminium product range in small commercial quantities including Aluminium Nitrate, Aluminium Sulfate, High Purity Alumina (HPA), Nano High Purity Alumina and High Purity Aluminium Hydroxides.

Stage Two of the HPA project is currently under construction with bulk earthworks activities being carried out immediately adjacent to Stage One operations. Stage Two will build Australia's first large scale ultra-high-purity alumina refinery to supply key high technology growth sectors that are driving the global energy transition. The state-of-the-art alumina refinery facility will leverage off the Stage One PPF and will ultimately produce commercial volumes of the full high-purity aluminum product range, positioning it as one of the largest single-site HPA refineries in the world. The Stage Two project will be completed between Q4 2026 and Q3 2027.

To facilitate efficient construction of the Stage Two facility, a temporary laydown area is required. In accordance with the *Gladstone SDA Development Scheme 2022* (Development Scheme), an SDA development approval is required for development involving a warehouse (laydown) that does not meet the requirements for self-assessable development. This planning report has been prepared by CQG Consulting (CQG) on behalf of Alpha HPA to support an SDA material change of use (MCU) application for a warehouse (temporary laydown area) (the Proposal) to be submitted to the Office of the Coordinator-General (OCG).

The proposed laydown area is located over part of Lot 1 on SP338512 (the Site) directly adjacent to the Stage One facility and Stage Two construction area. The Site will provide support to Stage Two construction by allowing for heavy vehicle deliveries and parking and efficient assembly of plant components and buildings in a pre-assembly area. Allowing for pre-assembled plant components will minimise current workforce interface, reduce working at heights risks, and enhance overall efficiency. Temporary facilities including cribbing for blue collar staff, complimented with office facilities for company and contractor management personnel will also be accommodated on the Site.

This Planning Report provides information about the Site where the development is proposed, and details about the Proposal. It also provides an assessment of the Proposal against the applicable code benchmarks under relevant planning instruments.

Refer to **Appendix A** for a copy landowner's consent, and **Appendix B** for the applicable code responses. The relevant SDA application form will be completed as part of the online lodgement process.

1.2 Development Approval Triggers

The key planning instruments and development approval triggers for the proposed development are summarised in **Table 1.1** and further discussed at **Section 2**.

Table 1.1: Development Approval Triggers

Instrument	Trigger	Level of Assessment	Comment
Gladstone State Development Area Development Scheme 2022	MCU – warehouse (temporary laydown area)	Code assessable	The proposed laydown area exceeds the maximum timeframes for accepted development under the Development Scheme (up to 3 months). Development approval is required.
Gladstone State Development Area Development Scheme 2022	Operational Works (OPW) – clearing native vegetation	Self – Assessable	Clearing of native vegetation required as part of the Proposal will be carried out in accordance with the provisions for self-assessable operational works under the Development Scheme post MCU approval.

1.3 Supporting Technical Reports

Technical reports and drawings supporting this DA are summarised in **Table 1.2**.

Table 1.2: Supporting Documentation

Drawing / Report Title	Prepared by	Date	Reference	Appendix
MEDQ Site Temporary Laydown Facility (Proposal Plan)	Prudentia Engineering	25/03/25	MC23050	**Appendix C**
Construction Environmental Management Plan	Alpha HPA	1/11/24	04184 Rev 1	**Appendix D**
Construction Management Plan	Alpha HPA	25/07/24	HPAF-PLN-00008	**Appendix E**
Technical Memorandum – Laydown Area Ecology Investigation	CQG	27/03/25	20118 Rev 2	**Appendix F**
Traffic Impact Assessment	Access Traffic Consulting	19/10/20	ALP0121-002	**Appendix G**

1.4 Development Application Details

Details about the DA are provided in **Table 1.3.**

Table 1.3: DA Details

Proposed Development:	Temporary Laydown Area
Type of Development:	MCU – Warehouse
Type of Development Approval sought:	SDA Development Approval
Site Address:	Reid Road, Yarwun QLD
Real Property Description:	Part of Lot 1 on SP338512
Site Area:	Approx. 4.71 ha
Assessment Manager:	Office of the Coordinator General
Owner Details:	Economic Development Queensland (EDQ)
Applicant Details:	Alpha HPA c/- CQG

Applicant details will be provided in the online SDA application form when submitted. As noted in **Table 1.3**, the applicant is not the owner of the premises subject to the DA for the works over the Site. The written consent of the landowner is therefore required and is provided in **Appendix A**.

2 Planning Instruments

Details of relevant planning instruments are provided in **Table 2.1**.

Table 2.1: Planning Instrument Details

Type	Comments
State Planning Policy:	Economic growth, Environment and heritage, Infrastructure. Refer to **Section 5.5.1.**
Ports:	*The Sustainable Ports Development Act 2015 – Priority Ports Master Planned Area.*
Development Scheme:	*Gladstone State Development Area Development Scheme 2022* (Development Scheme).
Planning Scheme:	*Gladstone Regional Council Planning Scheme 2015* (Planning Scheme).
Zoning:	Port Related Industry Precinct (Development Scheme). Special Purpose (Planning Scheme). Port Industry and Commerce Precinct (Priority Ports Master Planned Area).
Level of Assessment:	Assessable development – Development Scheme

Type	Comments
	TBC – referral stage - other ancillary approval triggers e.g. OPW filling and excavation under Planning Scheme
Applicable Overlays:	Council Overlay Mapping (part of Lot 1 only – Site limits): • Acid Sulphate Soils 5-20m AHD; • MSES (State Planning Policy) – Wildlife Habitat; and • Medium Bushfire Potential Intensity. State Overlay Mapping (part of Lot 1 only – Site limits): • Coastal Management District; • Qld waterways for waterway barrier works – amber waterway; and • Regulated vegetation management map – Category B (remnant) Category X (non-remnant), Category R (reef regrowth).
Applicable Assessment Benchmarks	Refer to **Appendix B**: Development Scheme: • The strategic vision for the Gladstone SDA; • The overall objectives for development in the Gladstone SDA; • The preferred development intent for each development precinct; and • SDA wide assessment criteria. Priority Ports Master Planned Area: • Port Overlay – Port Industry and Commerce Precinct.

3 Site Details

The Site forms part of the larger extent of Lot 1 on SP338512 which covers an area of 109.9 ha and is owned by EDQ.

The larger extent of Lot 1 is the subject of an Environmental Impact Statement (EIS) referral for the H2-Hub project currently under assessment. Advice received from both the DCCEEW and the OCG confirms that there are no restrictions to submitting an SDA application over a land parcel that is the subject of an EIS referral currently under assessment. Due to the temporary nature of the proposal not exceeding 3 years, there is expected to be no interaction in hindrance to the final proposed land use for the H2-Hub project.

The Site was earmarked by Alpha HPA given its position directly adjacent to the Stage Two construction project, Development Scheme port related industry zoning, essential services available for connection and direct access off Hanson Road for heavy vehicle transport.

The Proposed use of a warehouse is also consistent with the preferred development intent of the Port Related Industry Precinct.

There are adjoining existing industrial land uses to the south and west of the Site. There is an existing Gladstone Regional Council (GRC) sewage treatment plant (STP) immediately to the south of the Site over Lot 139 on CTN2130, however the Proposal will not be impeded or impact upon the existing functionality of the STP. Orica's existing chemical manufacturing facility is situated to the west of the Site. The construction and operational activities associated with the Proposal will not impact upon Orica's existing operations.

The Site is greenfield and has not been cleared previously. Proposed clearing and grubbing works will be carried out in accordance with the provisions for self-assessable development under the Development Scheme (refer to **Section 5.3** and **Appendix B**). An ecological investigation was carried out by CQG ecologists on 13 February 2025 for the purpose of determining if there were any significant vegetation or habitat values present over the Site (refer to **Appendix F**). The results of the investigation found that the Site consisted of majority Category B – least concern vegetation, with no conservation significant fauna sighted. It was determined that the proposed action - activities associated with the preparation and use of the laydown area - is **not likely** to have a significant impact to matters listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) negating the need to submit a referral for the Proposal. Areas to avoid during clearing and grubbing activities include regional ecosystems RE 12.3.12 and 12.3.3 on the boundaries of the Site known to correspond with endangered threatened ecological communities (TEC). These areas will not be impacted as part of clearing and grubbing activities and will be micro sighted by an ecologist prior to and during clearing.

3.1 Gully / Unmapped Drainage Feature

The ecological survey also found there was a mapped amber waterway (see **Figure A.9** waterway mapping, **Appendix F**) in accordance with the *Fisheries Act 1994 Qld* which runs parallel to Reid Road along the frontage of the Site. The Proposal will avoid impacts to fish passage and waterway barrier works (WWBW) requirements by being setback from this area.

There is also an unmapped dry gully / drainage feature that runs west – east across the Site (see **Figure A.9** waterway mapping **Appendix F**) OCG staff on behalf of EDQ advised that there was historical evidence of works in the road reserve and area generally including table drains, overhead powerlines, underground services (water/sewer) and driveway / earthworks for GRC's STP over Lot 139 on CTN2130. These previous construction works may have contributed to the upstream catchment and drainage characteristics being modified, which has contributed to water being diverted resulting in the gully / drainage feature remaining dry even post rainfall events. From further site investigations carried out on 28 March 2025 by Alpha HPA staff and 3 April 2025 post recent rainfall (refer to **Table 3.1** for photograph log), it was confirmed that there is an existing earthen bund in place running along the boundary of the existing GRC STP and the adjoining electrical services easement. All water travelling from upstream is being diverted to a cleared table drain which runs north-west / south-east and into tidal flats / tributaries of the Calliope River (refer photos / desktop imagery at **Table 3.1**).

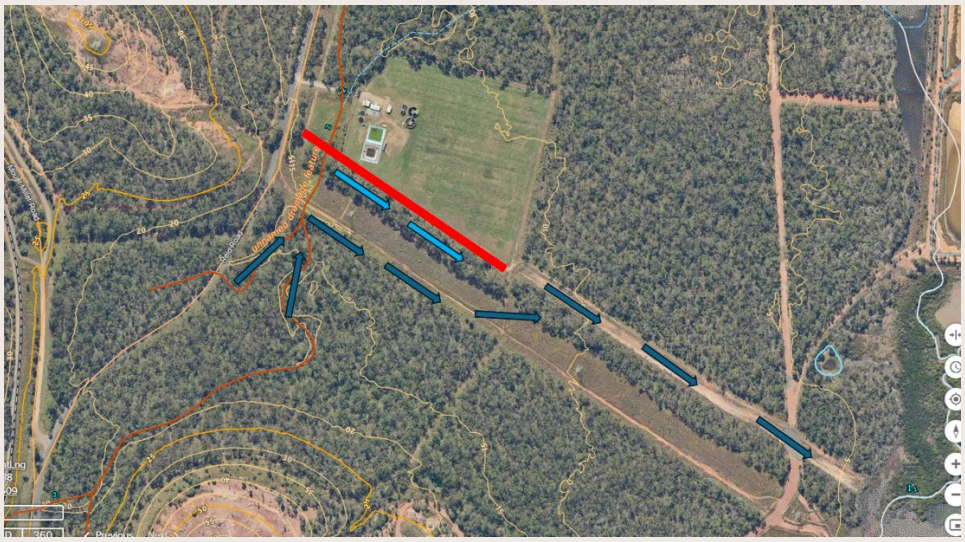
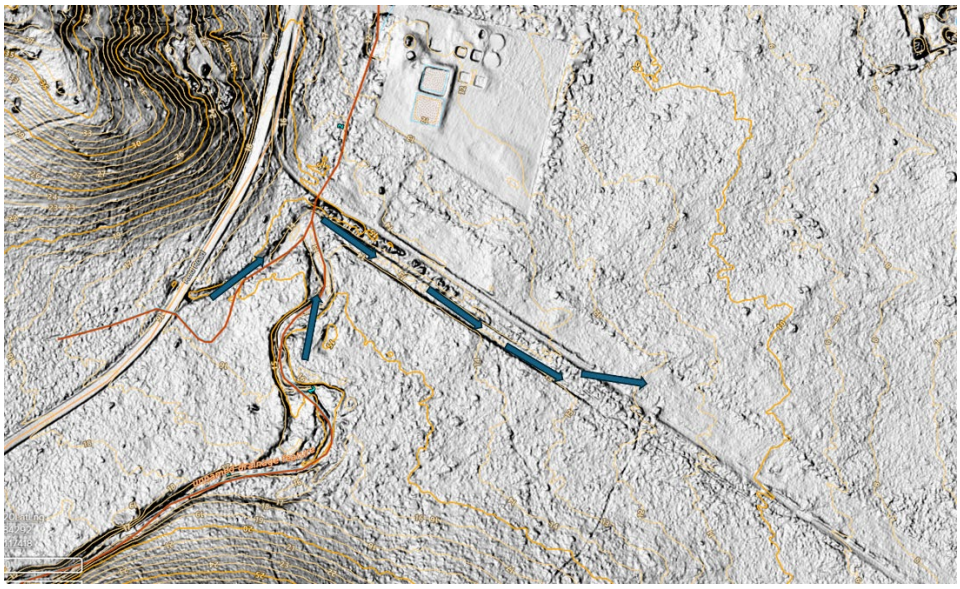
As such it is assumed that with respect to the unmapped existing drainage / gully feature:

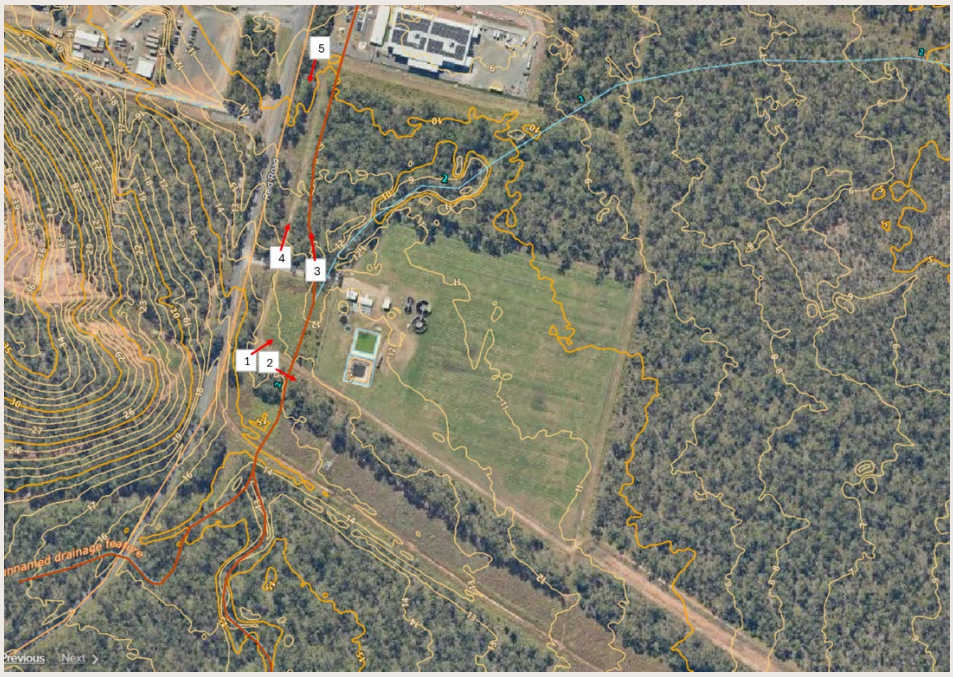
- It does not allow for fish passage and considerations for waterway barrier works are not required in this location;

- The accuracy of mapping on the Queensland waterways for waterway barrier works mapping showing the alignment of an amber waterway parallel to Reid Road may need to be reviewed by the Department of Primary Industries (DPI); and
- Watercourse mapping – unmapped - a watercourse determination has been submitted in parallel with this SDA MCU submission to get confirmation from the Department of Local Government Water and Volunteers (DLGWV) that the existing gully is a drainage feature to enable filling and levelling works to occur in this area in accordance with the Proposal Plan (refer to **Appendix C**).

Refer to **Section 4.1.2.** for further details with respect to proposed works within this area.

Table 3.1: Photograph Log – Upstream Diversion and Drainage Paths

Location	Photos
Desktop Aerial Imagery – red line indicating existing earthen bund wall and dark blue arrows indicating primary and light blue arrows indicating secondary drainage flow paths along an existing cleared table drain.	
Desktop LiDAR imagery showing ground formation and clear diversion of flow paths to the east at the confluence of the unnamed drainage feature	

Location	Photos
Desktop Image – Photo Key for images **3.1 - 3.5** below	
Photo 3.1: facing north-east looking into existing GRC STP facility	

Location	Photos
Photo 3.2: facing east on top of the existing earthen bund	
Photo 3.3: facing north-west immediately downstream of the confluence of the unmapped drainage feature and gully / unnamed drainage feature running through part of the Site. This channel is being diverted to the table drain along Reid Road.	

Location	Photos
Photo 3.4: facing north at table drain running parallel to Reid Road (mapped amber waterway)	
Photo 3.5: facing south at table drain running parallel to Reid Road (mapped amber waterway)	

Location	Photos
Photo 3.6: Stormwater runoff after recent rainfall on 2/4/2025 running from upstream of the Site along the table drain adjacent to the powerline services easement	

Table 3.2 details an overview of the Site and its existing environment, and **Table 3.3** provides photographs of the Site for context. Refer to **Figure A.10** for site locality.

Table 3.2: Site description (proposed laydown area)

Site characteristic	Description
Existing land use	Greenfield site
Existing structures	Nil
Frontage and access	The Site has frontage of approximately 145 m to Reid Road. Access will be taken from Reid Road via the existing established driveway to the Alpha HPA facility. Refer to **Appendix C** Proposal Plan.
Transport environment	Refer to Traffic Impact Assessment **Appendix G.**
Topography and drainage	The Site is generally flat sloping gradually towards the eastern end of the Site.

Site characteristic	Description
Soils and geology	The Site is mapped on Queensland Globe (2025) as having hard pedal mottled-yellow duplex soils. The site is mapped under GRC Planning Scheme as 5-20m AHD Acid Sulphate Soils.
Existing flora and fauna	Refer to ecological report **Appendix F.**
Existing water features and watercourse	Amber waterway (Qld Waterways for WWBW) and unmapped gully / drainage feature under the *Water Act 2000*. Refer to ecological report **Appendix F.**
Heritage, cultural and archaeological values	A cultural heritage desktop search undertaken did not identify any Aboriginal or Torres Strait Islander cultural heritage recorded on the Site (refer to **Appendix H**). The Bailai, Gurang, Gooreng Gooreng, Taribelang Bunda People are the Traditional Owners of the area and will be contacted to gauge their interest in having cultural heritage monitors present during earth disturbing works.
Contaminated land	Lot 1 on SP338512 is included on the Environmental Management Register (EMR) (refer to **Appendix I** for search details) for notifiable activities as listed below: • Chemical storage; • Foundry operations; and • Mineral processing. These notifiable activities were over historical lot 141 on CP865942 which has since been subdivided to include Lot 1 on SP338512. The above listed notifiable activities are suspected to be applicable to area adjacent to the existing disturbed and cleared area to the southwest of the electrical services easement and may not be applicable to the subject Site where the proposed laydown area will be constructed. Soil will not be removed from Site unless prior testing and clearance is undertaken.



Legend

- Subject Site
- Cadastral Boundaries

N

Scale 1:140,972 (A3)

0 15 30 60

Metres

Map Projection: Map Grid of Australia 1994 Zone 56

Figure A.10

Site Locality

Subject Site

CQG Consulting

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: 20118-19-10
Revision: Rev 0
28 March 2025

Layer Credits- Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; QSpatial - Cadastral Boundaries, Roads; CQG - Survey Points.

Table 3.2: Site Photographs

Location	Photos
Photo 3.7: Stage Two Construction Footprint in red (currently under construction) – Proposed Laydown Site immediately to the south in greenfield area between Stage 1 PPF and GRC STP in the distance.	
Photo 3.8: Facing north towards Alpha HPA facility – general vegetation across the Site.	
Photo 3.9: General vegetation across Site.	

Location	Photos
Photo 3.10: Facing south towards existing GRC STP facility.	
Photo 3.11: Existing gully / drainage feature in middle of Site.	

4 Proposed Development Details

4.1 Proposed Development Summary

4.1.1 Purpose

The proposed development, the subject of this SDA MCU, is for the following purposes:

- Provide a laydown area which will deliver direct support to Alpha HPA Stage Two construction project currently underway by limiting vehicle movements and reducing impacts to the external road network and adjoining established industrial uses;
- Allow for onsite facilities for construction contractors to improve efficiency; and
- Provide significant cost savings during construction through having an area adjacent to the construction site that could be used for storage of materials.

The site use proposed is temporary only i.e., will not exceed three (3) years based on the current Stage Two projected construction program of Q4 2027.

4.1.2 Key elements

The key elements of the Proposal are as follows (refer to Proposal Plan **Appendix C** for site layout):

- Construction:
  - clearing and grubbing activities;
  - filling and levelling of the Site; and
  - establish internal access roads and drainage.
- Operation:
  - pre assembly area - To support site laydown constraints, the preassembly facility will be utilized to assemble plant components and buildings which will be transferred to the main site to minimize workforce interface, reduce working at heights risk and enhance efficiency;
  - temporary facilities area - The facilities will be utilized for cribbing of the blue-collar workforce off the site footprint, these will be complimented with office facilities for company and contractor management personnel;
  - Heavy Vehicle (HV) Staging Area - The staging area will allow Heavy Vehicles to consolidate on plot and minimize interface with Reid Road;
  - Light Vehicle (LV) Car Park - The primary transport to the site will be through Bus Transfers, however it is recognized a portion of the workforce and visitors will require car parking for LVs onsite; and
  - site rehabilitation - Post Stage Two project completion, fencing and waste will be removed from Site. The Site will be revegetated/rehabilitated to the satisfaction of the current landowner EDQ, allowing for continuation of the laydown use if required.

4.2 Management Measures

4.2.1 General

All activities will be managed generally in accordance with the CEMP and CMP (refer to **Appendix D** and **E**), including any specific contractor management plans that will be prepared prior to construction.

4.2.2 Traffic

Traffic generated by the Proposal will consist of minor construction related traffic for clearing and grubbing and bulk earthworks associated with the temporary laydown. During operation of the laydown – construction staff movements associated with the current works at Stage Two will be a combination of buses to site and LV movements associated with approx. 298 construction staff.

Refer to TIA for Stage Two prepared by Access Traffic Consulting provided in **Appendix G.**

4.2.3 Noise

During clearing and grubbing / construction / bulk earthworks for the temporary laydown noise generation will occur from earthmoving equipment., with due regard to the adjoining existing established industrial.

Noise generated during operation of the temporary laydown will be limited to vehicle movements for deliveries, which may occur over a 24-hour basis.

Considering the Site is located within an industrial zone, noise generation from Alpha HPA activities is expected to be in keeping with other existing industrial uses.

4.2.4 Dust

The proposed internal manoeuvring areas will be unsealed with compacted gravel where required. Water trucks will be in regular use during construction and operation to ensure dust generation is minimised as far as practicable. In the unlikely event that dust associated with construction / operation cannot be managed effectively, a pavement binder / gravel sealer may be implemented.

4.2.5 Stormwater

Stormwater will be captured in the temporary sediment basin as shown on the Proposal Plan (refer to **Appendix C**) and in accordance with any site-specific management plans to be prepared by the successful contractor engaged to prepare the Site.

5 Development Assessment

5.1 Pre-lodgement

A pre-lodgement meeting was held on 4 March 2025 to discuss the Proposal prior to lodging the development application to discuss planning requirements and key issues applicable to the development application.

The pre-lodgement meeting involved:

- The Applicant – Alpha HPA;
- The Applicant's representatives – CQG Consulting; and
- Representatives from the OCG and EDQ.

General advice was provided with respect to the OCG's jurisdiction, application requirements and response to applicable assessment benchmarks as part of the submission.

The key issues discussed at the pre-lodgement meeting are summarised in **Table 4.1**.

Table 4.1: Summary of key issues

Issue	OCG response	Applicant response
MCU SDA Submission / existing EPBC referral interactions	Officers of the OCG were unsure as to any implications of progressing with the lodgement of an SDA MCU over the same allotment as an existing EPBC referral. Further discussions with the coordinated projects impact assessment team will be made to clarify. ***Post meeting response** – the OCG requested that written advice from DCCEEW in agreeance with statements regarding referrals and the findings of the ecological report be provided prior to lodgement of the SDA MCU application.	Contact has been made with DCCEEW and advice given that each action is to be considered stand alone in terms of potential impacts to matters of national environmental significance (MNES) and there was no hindrance for another proponent to propose an action if they are not associated with the EPBC applicant. CQG's self assessment on the findings of the ecological survey and report (refer to **Appendix F**) concluded that the proposed action for the laydown area would not cause significant impact to MNES and hence would not require a referral under the EPBC Act.

A copy of the pre-lodgement meeting minutes is attached in **Appendix J.**

5.2 State Development and Public Works Organisation Act 1971

The primary purpose of the SDPWO Act is to facilitate co-ordinated and environmentally responsible development in Queensland. The GSDA Development Scheme, which relates to Proposal, is administered under Section 77 of the SDPWO Act.

5.3 Gladstone State Development Area Development Scheme 2022

The Site is located within the GSDA, with the *GSDA Development Scheme 2022* (Development Scheme) being the relevant categorising instrument for development proposed within its boundaries.

The Site is located within the Port Related Industry Precinct under the Development Scheme.

In accordance with section 1.3.1(1) of the Development Scheme, development identified in Tables 1-6 as SDA assessable development requires an SDA application to be made to the Coordinator-General in accordance with Schedule 2 in order to obtain an SDA approval.

Further, in accordance with section 1.3.1(2) of the Development Scheme, development identified in Tables 1-6 as SDA self-assessable development does not require an SDA approval but must comply with the requirements identified in Schedule 3.

Regulated development within the Port Related Industry Precinct under the Development Scheme associated with the Proposal includes:

- Table 1 Column 2 - Assessable development - MCU – Warehouse (temporary laydown); and
- Table 1 Column 1 - Self-Assessable development – OPW – clearing native vegetation where associated with an MCU and where able to comply with the requirements for SDA self-assessable development.

Self-assessable OPW requirements for clearing native vegetation in accordance with Schedule 3 of the Development Scheme are addressed in **Appendix B.**

Assessable MCU requirements for a warehouse (temporary laydown) in accordance with Section 2.1.1 Development assessment framework of the Development Scheme are summarised below and addressed further in **Appendix B.**

2.1.1 (3) an SDA application will be assessed against the following, to the extent they are considered relevant by the Coordinator-General:

a) The strategic vision for the Gladstone SDA
b) The overall objectives for development in the Gladstone SDA
c) The preferred development intent for each development precinct
d) SDA wide assessment criteria

The Proposal will comply with all Assessment Benchmarks under the Development Scheme for both assessable and self-assessable development.

5.4 Priority Ports Master Planned Area – Gladstone Ports Corporation

The Proposal Site is located within the Port Industry and Commerce precinct of the priority ports master planned area. *The Sustainable Ports Development Act 2015* (Ports Development Act) was established to sustainably manage port-related development in and adjoining the Great Barrier Reef World Heritage Area. The Ports Development Act declared the Port of Gladstone as a priority port to optimise the use of existing infrastructure and address operational, economic, environmental relationships, as well as surrounding land uses, through port master plans and port overlays.

The Master Plan and associated Port Overlay recognizes the purpose of the GSDA and refers to the GSDA Development Scheme. The outcomes for the Port Industry and Commerce precinct are:

"Development within this precinct provides for a range of industries which are of regional, State, national and global economic significance, and supply chain infrastructure that supports the operation of the port and industry. For example, uses in this precinct may include manufacturing industries, refineries, ***warehouses****, wholesale trade, transport services, distribution centres and associated residue storage and waste management facilities…This precinct may also include other development that does not compromise the existing and future expansion of port operations, port related industry and supply chain infrastructure."*

The Proposal is for a warehouse (temporary laydown) associated with the Alpha HPA stage 2 project and aligns with the outcomes of the Port Industry and Commerce Precinct and the Master Plan as outlined above.

A full response to the Port Overlay – Port Industry and Commerce Precinct Code is provided in **Appendix B.** The Proposal will comply with all Assessment Benchmarks under the Port Industry and Commerce Precinct Code.

5.5 State Assessment and Other Matters

5.5.1 State Planning Policy

The State Planning Policy (SPP) establishes that State Government's interests in planning and development across Queensland. Introduced in 2017, the SPP coincided with the Planning Act 2016 and details matters of State interest which enable development, seek to protect the natural environment, and allow communities to grow and prosper.

The State interests relevant to the Proposal are detailed below including where they are addressed in this Planning Report and appendices where relevant:

- Economic growth:
    - Development and construction - Development in an SDA creating jobs.
- Environment and heritage:
    - Biodiversity: MSES – regulated vegetation (Category B). Refer to Ecological Survey and Report (refer to **Appendix F**).
- Infrastructure:
    - Priority ports: Gladstone priority port precincts.

The Proposal has considered the prescribed matters under the SPP and likely impacts which have been addressed in the technical reporting supporting this DA.

5.5.2 Central Queensland Regional Plan

The Proposal Site is located within the boundaries of the Central Queensland Regional Plan. The Central Queensland Regional Plan provides a regional planning framework to *"identify regional outcomes for the region, regional policies for achieving the regional outcomes, and the state's intent for the future spatial structure of the region, including Priority Agricultural Areas, Priority Living Areas, and priority outcomes for infrastructure".*

The Proposal Site is located outside priority living areas and priority agricultural areas. The Proposal will however support the expanding industrial development in Gladstone.

5.6 Assessment of referral requirements

It is understood that as part of the referral stage of an SDA application, the OCG decides if an application requires referral.

5.6.1 State Government Entities

Based on preliminary discussions with the OCG as part of the pre-lodgement stage, it is understood that this SDA application may be referred to the State government entity - Department of Primary Industries (DPI) for state interests relating to fish passage. Other State entities may also subject to referral of this SDA MCU subject to the discretion of the OCG.

Regarding the existing gully / drainage feature that runs west – east through the Site, it is noted that Alpha HPA has already requested a watercourse determination separate to this SDA MCU submission, for State interests relating to excavating or placing fill in a watercourse.

Based on the Proposal elements and development triggers as listed under **Table 1.1** of the Planning Report, the Proposal does not require formal assessment against the benchmarks prescribed under the State Development

Assessment Provisions (SDAP). It is expected that the OCG will refer this SDA MCU to State government entities for technical input or advice only in relation to matters as described above.

5.6.2 Gladstone Regional Council

It is understood that Councils are generally consulted on all SDA applications that fall within their respective local government areas.

Regarding matters that may require Gladstone Regional Council's attention, Existing approval is in place for works in a road reserve for the existing driveway access to the Alpha HPA Stage One facility. The same access will be used for the Proposal.

Alpha HPA will take further advice from GRC and the OCG with respect to any requirements regarding OPW for filling and excavation or otherwise as required during the referral stage.

6 Conclusion

The proposed development subject of this application is a MCU for a warehouse (temporary laydown) in accordance with the Development Scheme over part of Lot 1 on SP338512 in support of the Alpha HPA Stage Two project.

Clearing of native vegetation required as part of the construction phase will be carried out under the provisions of self-assessable OPW post MCU approval.

The Proposal is considered to comply with the relevant assessment benchmarks established under the Development Scheme and Port Overlay.

Alpha HPA looks forward to the OCG's favourable consideration of this SDA MCU, subject to reasonable and relevant conditions. Considering the time sensitive nature of the Alpha HPA Stage Two construction project, we would appreciate if any queries regarding application material or requests for further information can be addressed expediently and where appropriate informally.

Limitations

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

CQG[1] 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 Consulting 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.

[1] *CQ Environmental Pty Ltd (ABN 61 107 574 514) trading as CQG Consulting (CQG)*

APPENDIX A:

Landowner's Consent – Economic Development Queensland

Economic Development Queensland
Creating and investing in sustainable places for Queensland to prosper

Our reference: OUT25/1602

31 March 2025

Scott Lucke
Senior Planner
CQG Consulting
180 Quay Street, Rockhampton QLD 4700

Emailed to – scott.lucke@cqgroup.com.au

Dear Scott,

RE: Request for Owners Consent to Lodge Application over part of Lot 1 on SP338512, Yarwun Industrial Precinct, Gladstone State Development Area land owned by the Minister for Economic Development Queensland.

I, John White, Executive Director, Industrial Development, Economic Development Queensland as delegate of the Minister for Economic Development Queensland, hereby consent to the lodgment of applications or permits to the relevant administering authority by the following entity, Alpha HPA Limited (the Applicants), or their agents and / or nominees required for the application which relates to a temporary laydown area (as per Appendix A) being located on part of Lot 1 on SP338512 in the Gladstone Regional Council local government area within the Gladstone State Development Area.

This owners consent is provided on the basis that:

- This consent is not an agreement by, or confirmation from, the Minister for Economic Development Queensland, that the Applicants will be given rights to permanently occupy or permanently use any part of the land for the proposed development.
- It does not remove the statutory obligation of the Applicants to obtain all necessary cultural, environmental and development approvals from the administering authority prior to the commencement of any construction.
- It will not prejudice Economic Development Queensland from undertaking day to day operations or further detailed reviews of the proposed development and its impacts on land controlled by the Minister of Economic Development Queensland.
- It is only related to the Applicants lodging an application with the relevant approving authority.
- It does not allow the Applicants to act on behalf of the Minister of Economic Development Queensland. The Applicants are not the Minister for Economic Development Queensland's agent.
- It has an expiry date of twelve (12) months from the date of this letter

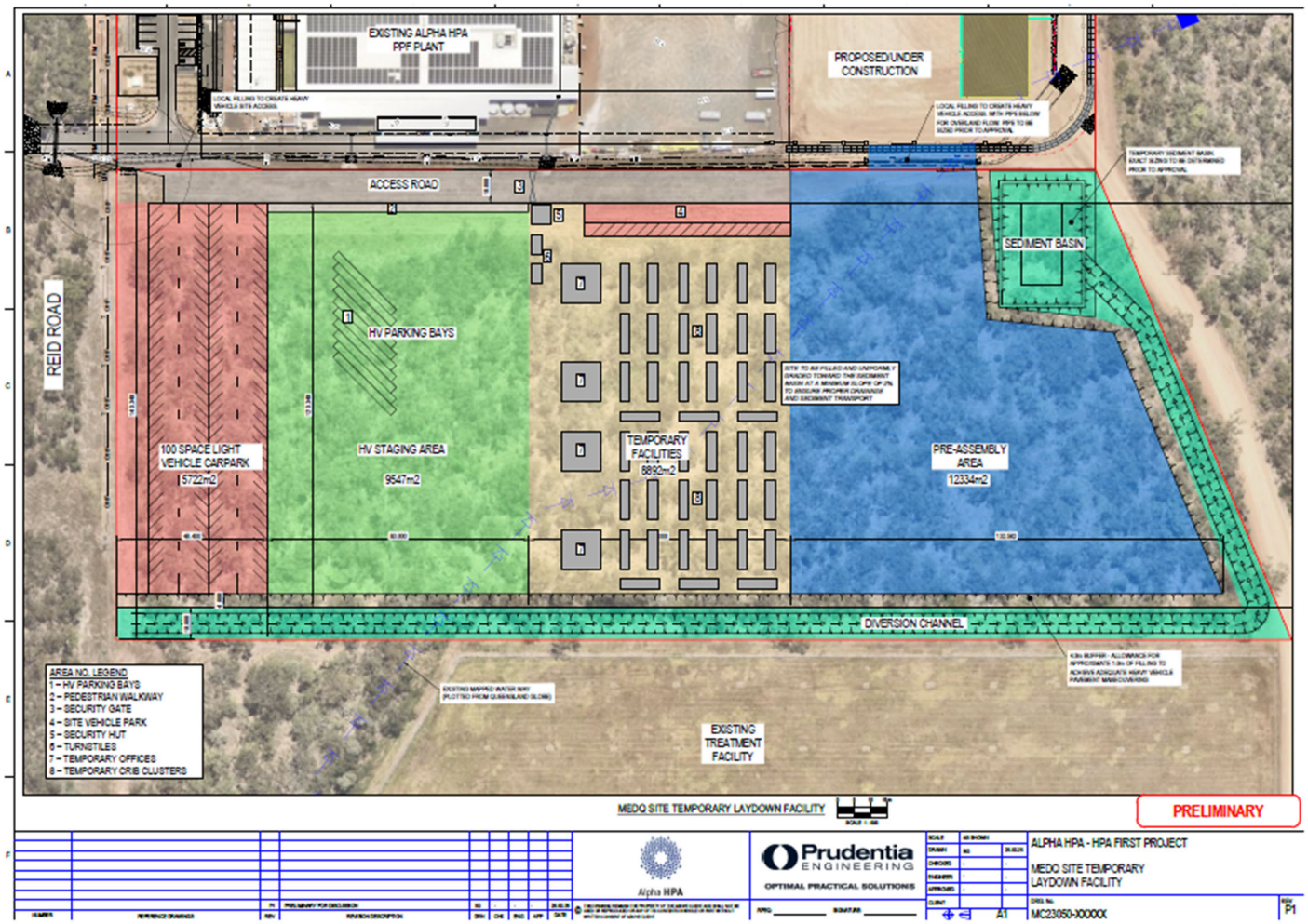
If you require any further information, please contact Mr Matt Morris, Development Manager, Economic Development Queensland by telephone on 0472 866 464 or by email matthew.morris@edq.qld.gov.au, who will be pleased to assist.

Yours sincerely



John White
Executive Director – Industrial Development
Economic Development Queensland

APPENDIX A:



Economic Development Queensland
GPO Box 2202
Brisbane Queensland 4001 Australia
Website www.edq.qld.gov.au
ABN 76 590 288 697

Queensland Government

APPENDIX B:

Code Responses

Table B.1 Assessment Against the Strategic Visions for the GSDA

Strategic Vision Gladstone SDA	Statement of Compliance
1. The vision for the GSDA is: a) Be Central Queensland's economic powerhouse, with an efficient concentration of large-scale industry of national, State and regional significance that benefit from the SDA's strategic location near the Port of Gladstone and major road and rail networks.	**a) Complies.** The Proposal is for a warehouse (temporary laydown) facility that will directly support construction of the Alpha HPA Stage Two project. The Stage One Project directly adjacent to the Proposal Site in Gladstone is now in production and produces full high-purity aluminium product ranges in small commercial quantities including: • Aluminium Nitrate; • Aluminium Sulfate; • High Purity Alumina (HPA); • Nano HPA; and • High Purity Aluminium Hydroxides. Stage One operates 24/7 and powered by renewable energy while creating 50 full-time jobs in the local community. Stage Two is complimentary to Stage One, and once operational in late 2026 will be capable of producing 10,000 tonnes of HPA equivalent per year. Once completed Stage Two will create 120 additional full-time job opportunities for the local community and during construction it will generate more than 300 jobs. The site will continue to run on renewable energy. Collectively, both stages of the Alpha HPA project in the GSDA represent an efficient concentration of large-scale industry and benefit from the existing strategic infrastructure availability for delivery to market and operations among other industrial uses. The presence of a laydown area adjacent to the exiting Alpha HPA site will ensure efficiencies for the construction of Stage Two.
b) Support development that aligns with the Queensland Government's strategic priorities for the region, particularly related to the hydrogen industry.	**b) Complies.** The Proposal supports strategic priorities for the region by providing a cost-effective construction laydown area supporting construction of Stage Two of a modern refinery facility, that will produce high-purity aluminium products which are essential in supporting energy storage and other breakthrough technologies. The Stage Two Alpha HPA project which will be powered by renewable energy which aligns with future strategic priorities for the region developing high end products which will return dividends to the region and Queensland.
c) Maintain environmental, cultural heritage and community values where possible to support wider	**c) Complies.** The Proposal for an MCU warehouse (temporary laydown) cannot avoid clearing of native vegetation, proposed to be undertaken as SDA self-assessable development being

Strategic Vision Gladstone SDA	Statement of Compliance
ecological processes and provide community benefits.	associated with the MCU. Findings from an ecological survey and report carried out by CQG on 13 February 2025 (refer to **Appendix F**) recommended avoidance of mapped threatened ecological communities (TEC) at the edge of the Site, which will be implemented into the clearing and grubbing methodology. Translocation of grass trees prior to any clearing and grubbing activities. Traditional Owners will be engaged in the grasstree translocation activities. Refer to response to Item 1(a) regarding community benefits with jobs created.
d) The strategic vision is supported by the overall objectives for development and preferred development intents of development precincts within the GSDA.	**d) Complies.** Refer to Response to overall objectives for development in the GSDA provided in **Table 6.1**.

Table B.2 Assessment Against the Overall Objectives of the GSDA

Overall Objectives Gladstone SDA	Statement of Compliance
1. The vision for the GSDA is: a) Capitalise on Gladstone SDA's strategic location and support the role and function of the Port of Gladstone	**a) Complies.** The Proposal is in support of the Alpha HPA Stage Two project which utilises the strategic location of the Gladstone SDA and supports the function of the Port of Gladstone by export / transport of commercial products.
b) Identify and implement opportunities for synergies and co-location between other uses, services and infrastructure to minimise waste and inefficiencies	**b) Complies.** The proposed laydown site is located immediately adjacent to Alpha HPA's Stage One and Two projects which will minimise inefficiencies during the construction phase. Co-location with the construction area will prevent unnecessary expenditure on transport and storage of materials and impacts to the existing transport network of Reid and Hanson Roads.
c) Use land and infrastructure efficiently and be adequately serviced by infrastructure	**c) Complies.** The Site will be adequately serviced by infrastructure including use of the existing access location to the Alpha HPA Stage One and Two Site, effective stormwater management, water, power etc. The Proposal layout as depicted in **Appendix C** is considered to be the most efficient use of the land available.
d) Ensure the integrity and functionality of the Gladstone SDA, including infrastructure corridors and future development opportunities, is maintained and protected from incompatible land uses	**d) Complies.** The Site does not impact upon infrastructure corridors. Future development opportunities will be maintained due to the temporary nature of the Proposal. Site improvements as a result of the Proposal will enable cost savings for future development opportunities. The Proposal for a warehouse is a compatible use in the Port Related Industry Precinct.
e) Ensure new lots are appropriately sized to accommodate preferred development	**e) Not applicable.** The Proposal does not include reconfiguring a lot.
f) Be designed, constructed, and operated to a high quality consistent with best practice	**f) Complies.** The Proposal will be designed, constructed, and operated in accordance with current design standards where relevant. In line with the current operation of the Alpha Stage One project and Stage Two construction, the Proposal will be operated to the highest quality.

Overall Objectives Gladstone SDA	Statement of Compliance
g) Avoid impacts on environmental, cultural heritage, and community values (including sensitive land uses), or minimise or mitigate impacts where they cannot be avoided and offset any residual impacts	**g) Complies.** Environmental impacts are unavoidable due to clearing of vegetation, however it is noted that this will be carried out as self-assessable development in accordance with Schedule 3 of the Development Scheme. In accordance with the recommendations of the CQG ecology report provided as **Appendix F**, avoidance of TEC's will be adhered to during clearing and grubbing activities, as well as translocation of grasstrees which hold cultural significance for local traditional owner groups.
h) Not adversely impact on the outstanding universal values of the Great Barrier Reef World Heritage Area (GBRWHA)	**h) Complies.** The Proposal will not have direct impacts upon the GBRWHA. Appropriate erosion and sediment control measures will be implemented during construction and operation to ensure stormwater is captured and not released into the receiving environment under normal circumstances.
i) Manage the risks associated with the projected impacts of climate change and natural hazards to protect people and property	**i) Complies.** Due to the temporary nature of the Proposal, projected impacts of climate change are minimal. Risks of natural hazards will be managed appropriately during construction and operation of the temporary laydown.
j) Manage impacts of air quality on the capacity of the Gladstone airshed.	**j) Complies.** air quality will be managed appropriately during construction and operation in accordance with the CEMP provided in **Appendix D** and any additional management plans prepared by the successful contractor.

Table B.3 Assessment Against the Port Related Industry Precinct – Preferred Development Intent

Strategic Vision Gladstone SDA	Statement of Compliance
1. The preferred development intent for the Port Related Industry Precinct is described below. (a) This precinct is to accommodate industrial development that: (i) has links to the Port of Gladstone through the import and export of material (ii) benefits from close proximity to port related infrastructure and services (iii) is difficult to locate and requires separation from sensitive land uses. (b) This precinct may also accommodate industrial development that requires co-location with uses that support the preferred development intent.	**1(a)-(b) Complies.** The Proposal supports the preferred development intent for the Port Related Industry Precinct by being directly associated with the construction of the Alpha HPA Stage Two project which has links to the Port of Gladstone through import and export of material.
2. Defined uses that support the preferred development intent are: (a) high impact industry (b) medium impact industry (c) port facilities (d) special industry.	**2 Complies.** refer to response to 3 below. The Proposal for a warehouse (temporary laydown) is directly supporting the Alpha HPA Stage Two project which is a special industry.
3. Defined uses that may be considered where the use does not compromise the preferred development intent include: (a) extractive industry (where required for port functions and activities) (b) freight terminal (c) linear infrastructure facility (d) research and technology industry (e) substation (f) utility installation (g) warehouse.	**3 Complies.** The Proposal is for a warehouse.

Table B.3 Assessment Against SDA Wide Assessment Criteria

Strategic Vision Gladstone SDA	Statement of Compliance
2.5.1 Infrastructure and Services	
(1) Development: (a) is designed to maximise efficiency and minimise the cost for infrastructure and services (b) plans for and manages its impacts on existing and planned infrastructure and services (c) is adequately serviced by the infrastructure and services necessary to meet the demand generated by the development (d) integrates with existing and planned infrastructure and services where possible. *Note: infrastructure and services include telecommunications, transport (including corridors and operations), water, wastewater, recycled water and energy networks, and state or local government infrastructure and services.*	**(1)(a)-(d) Complies. T**he Proposal will be designed to maximise efficiency and infrastructure costs as far as practicable. The Sites location adjacent to the Alpha HPA Stage Two project offers direct support during construction maximises efficiency by reducing transport impacts to the existing road network and integrates with the existing access location off Reid Road. The temporary nature of the Proposal ensures there is no impact to planned infrastructure and services and offers efficient continuation of the site area for future development post Stage Two construction.
2.5.2 Transport	
(1) Increased traffic arising from the development is either able to be accommodated within existing road networks, or works are undertaken to minimise adverse impacts on existing and future uses and road networks. (2) Road networks in the Gladstone SDA are designed to accommodate the proposed vehicle type and predicted traffic volumes associated with the development and the precinct/s. (3) Development is designed to facilitate safe and efficient vehicular ingress and egress and does not unduly impact on the safe and efficient operation of transport infrastructure, including corridors. (4) Adequate onsite parking for the number and nature of vehicles expected is provided.	**(1)-(4) Complies.** Refer to Traffic Impact Assessment (TIA) for the Alpha HPA Stage One and Two project provided in **Appendix G**. The TIA includes consideration for construction related traffic which will be directly related to the Proposal. The findings of the TIA found that additional traffic from the proposed Stage Two development is not anticipated to have a significant impact on the operation of the surrounding state or local government controlled road links. Safe and efficient vehicle ingress and egress will be accommodated. Adequate onsite parking for all vehicles is provided (refer Proposal plan **Appendix C**). No additional traffic due to the development and use of the laydown area.

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Strategic Vision Gladstone SDA	Statement of Compliance
2.5.3 Environmental Nuisance	
(1) Development is located, designed, and operated to avoid, minimise or manage: (a) adverse impacts from air, noise and other emissions that will affect the environment and/or health and safety, wellbeing, and amenity of communities and individuals (b) conflicts with sensitive uses arising from (but not limited to) spray drift, odour, noise, light spill, dust, smoke, or ash emissions. *(2)* The location, design and operation of development achieves the relevant acoustic objectives of the *Environmental Protection (Noise) Policy 2019* and achieves the relevant air quality objectives of the *Environmental Protection (Air) Policy 2019.* (3) Development: (a) avoids adverse impacts on the cumulative[1] air quality of the Gladstone airshed or (b) where impacts cannot be avoided, conducts air shed modelling in accordance with current best practice to demonstrate compliance with air quality standards.	**(1)-(3) Complies.** The Proposal may include potential noise and dust impacts during construction and operation. Due to the nature of the surrounding land usage, noise impacts are expected to have a negligible impact. Dust impacts will be managed via regular use of water carts and in accordance with further objectives outlined in the CEMP provided in **Appendix D** and any additional management plans prepared by the successful contractor.
2.5.4 Contaminated Land	
(1) Development on land likely to be contaminated or recorded on the Environmental Management Register or Contaminated Land Register does not adversely impact on human health or the environment by exposure, management, or movement of contaminants. *Note: Refer to Department of Environment and Science (DES) if a site is subject to a per-and poly-fluoroalkyl substances site investigation.* (2) Where required, develop a strategy to manage any existing contamination and the potential for additional contamination, so that human health and the environment are not adversely affected.	**(1)-(2) Not Applicable.** The Site is on the EMR (see **Appendix I**) due to historic land use on the larger lot. Appropriate measures will be put in place to manage soil on the Site.

[1] Consideration of cumulative impacts includes the impacts of one or more existing and future pressures and the interactions between those pressures.

Strategic Vision Gladstone SDA	Statement of Compliance
2.5.5 Natural Hazards	
(1) Development, in accordance with current best practice: (a) identifies relevant natural hazards that may impact upon the project (b) appropriately manages risk associated with identified hazards (c) avoids increasing the severity of natural hazards (d) avoids adverse impacts from natural hazards to protect people and property and enhances the community's resilience to natural hazards, or where adverse impacts cannot be avoided, impacts are minimised, mitigated, or offset (e) avoids directly or indirectly increasing the severity of coastal erosion either on or off the site. (2) Development, in accordance with current best practice, achieves an appropriate level of flood immunity and: (a) does not adversely affect existing flow rates, flood heights, or cause or contribute to other flooding impacts on upstream, downstream, and adjacent properties, or the state transport network (including potential impacts from changes to stormwater flows and local flooding).	**(1)(a)-(e) Complies.** The Proposal reduces risk of natural hazards through clearing of vegetation as part of self-assessable OPW, of which bushfire risk is the only relevant significant hazard in the surrounding area. There is no risk of coastal erosion due to the Sites location. **(2)(a) Complies.** The Proposal involves filling activities within the existing gully / drainage feature that runs west – east through the Site. Upstream or downstream impacts are expected to be negligible due to existing historical modifications of the natural flow path of the drainage feature being in place upstream resulting in water being diverted to the table drain along Reid Road. Downstream impacts will be managed by capturing stormwater in the proposed stormwater detention basin as depicted on the Proposal Plan (refer **Appendix C**).
2.5.6 Climate Change	
(1) Development: (a) Avoids or, if avoidance cannot be achieved, minimises net increases in the emission of greenhouse gases (b) Can adapt to current and future impacts of a changing climate. *Note: projected climate change conditions include potential impacts from sea level rises, increased maximum cyclone intensity, increased rainfall intensity or increased likelihood and intensity of bushfires.*	**(1)(a)-(b) Complies.** It is expected that the Proposal will have negligible greenhouse gas (GHG) emissions during construction and operation. The Proposal will reduce the likelihood of bushfires by creating an additional buffer to infrastructure and buildings through accepted development vegetation clearing.

Strategic Vision Gladstone SDA	Statement of Compliance
2.5.7 Acid Sulfate Soils	
(1) Development, in accordance with current best practice, is to: (a) avoid the disturbance of acid sulfate soils (ASS) or (b) ensure that the disturbance of ASS avoids or minimises the mobilisation and release of contaminants.	**(1)(a)-(b) Complies.** The Site is located within a mapped 5-20m AHD potential ASS area under the GRC Planning Scheme Mapping. The Proposal will seek to minimise disturbance to ASS and filling and excavation activities during construction will be carried out in accordance with the relevant guidelines of a CEMP to be determined by the successful contractor
2.5.8 Water quality	
(1) Consistent with the Environmental Protection (Water and Wetland Biodiversity) Policy 2019, development avoids or, if avoidance cannot be achieved, minimises, mitigates or offsets adverse impacts on the environmental values and water quality objectives of receiving waters and wetlands arising from: (a) altered stormwater quality and/or flow (b) wastewater (other than contaminated stormwater and sewage) (c) the creation or expansion of regulated structures or non-tidal artificial waterways (d) the release and mobilisation of nutrients and sediments. (2) Development encourages a precinct-wide stormwater management approach that achieves an improved water quality outcome. (3) Development protects the ecological and hydraulic function of waterway corridors in and adjacent to the Gladstone SDA, with particular regard to the Great Barrier Reef World Heritage Area, fish passage and marine plants.	**(1)-(2) Complies.** Water quality objectives established by the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* will be adhered to during construction and managed in accordance with a CEMP prepared by the successful contractor. Stormwater will be managed appropriately in accordance with a stormwater management plan to be prepared by the successful contractor. Indicative stormwater management measures are shown on the Proposal plan provided in **Appendix C**. **(3) Complies.** The Proposal will avoid impacts to fish passage by not interfering with the flow of the mapped amber waterway (table drain) that runs parallel to Reid Road at the Site frontage. There is evidence of an existing gully / drainage feature that runs west-east through the Site that, according to advice received by the OCG, has had historical upstream construction works which may have resulted in water being diverted upstream refer to **Section 3.1** of the Planning Report and **Table 3.1** for further details in this regard. The existing gully / drainage feature that runs west-east through the site is also the subject of a watercourse determination currently being sought with DLGWV to confirm characteristics of a drainage feature before carrying out any filling and levelling activities in this area. Proposed filling and levelling activities will manage stormwater runoff appropriately and direct stormwater to the proposed detention basin via drainage channels to ensure contaminated stormwater is not released offsite.

Strategic Vision Gladstone SDA	Statement of Compliance
2.5.9 Risk management – activities	
(1) Development is located, designed, and operated to: (a) minimise the health and safety risks to communities and individuals (b) avoid any potential adverse impacts from emissions and hazardous activities, or where adverse impacts cannot be avoided, impacts are minimised or mitigated (c) protect high pressure gas pipelines from encroachment that would compromise the ability of the pipelines to function safely and effectively. (2) Activities involving the use, storage, and disposal of hazardous materials and prescribed hazardous chemicals, dangerous goods, and flammable or combustible substances are located and managed to minimise the health and safety risks to communities and individuals. (3) Development provides adequate protection from the harmful effects of noxious and hazardous materials and chemicals manufactured or stored in bulk during natural hazard events.	**(1)-(3) Complies.** The Proposal for a warehouse (temporary laydown area) is considered to be low risk in terms of any hazardous activities or interactions with existing infrastructure. There are no interactions with high pressure gas pipelines over the Site. Storage of materials will be appropriately managed in accordance with relevant management plans to be prepared by the successful contractor. Primary storage of materials over the Site will be for construction only with no hazardous material or chemical storage proposed.
2.5.10 Cultural heritage and community	
(1) Indigenous and non-Indigenous cultural heritage values, and community values of the premises on which the development is undertaken, and immediate surrounds, are identified and managed, consistent with current best practice. *Note: Duty of Care under Section 23 of the Aboriginal Cultural Heritage Act 2003 should be considered a minimum requirement of all development.*[2] (2) Development is located, designed and operated to avoid adverse impacts on cultural heritage and community values, or where adverse impacts cannot be avoided, impacts are minimised, mitigated, or offset. (3) Development recognises and protects the cultural heritage values associated with:	**(1)-(2) Complies.** There are no registered cultural heritage sites over the Site in accordance with the Aboriginal Cultural Heritage Database Register search conducted on 28 March 2025 (refer **Appendix H**). There may be grasstrees encountered during clearing and grubbing activities. Grasstrees hold cultural significance for Aboriginal Cultural Heritage. Grasstrees on the Site will be translocated with assistance from local Traditional Owners. **(3) Not applicable.** the Proposal does not impact upon the listed sites.

[2] Information on cultural heritage duty of care, including guidelines, can be found at https://www.qld.gov.au/firstnations/environment-landuse-native-title/cultural-heritage/cultural-heritage-duty-of-care

Strategic Vision Gladstone SDA	Statement of Compliance
(a) the Euroa Homestead on Lot 200 on SP239672 (b) the Mount Larcombe Station Original Homestead Site on Lot 73 on SP272417 and Lot 20 on SP272417 (c) the Targinnie Cemetery on Lot 95 on DS287. (4) Where development requires a buffer to mitigate the adverse amenity impacts of the development, including, but not limited to, visual and acoustic impacts, that buffer is accommodated within the development site.[3]	**(4) Complies**. a four-metre buffer will be applied internal to the Site perimeter. Refer to Proposal Plan in **Appendix C.**
2.5.11 Environment	
(1) Environmental values of the premises on which the development is undertaken, and immediate surrounds are identified and managed, consistent with current best practice. (2) Development is located, designed, and operated to: (a) avoid adverse impacts on environmental values including matters of local, state, and national environmental significance or where adverse impacts cannot be avoided, impacts are minimised, mitigated, or offset (b) maintain ecological connectivity and processes (c) maintain the outstanding universal value (OUV) of the Great Barrier Reef World Heritage Area including the local attributes of the OUV identified in the Master plan for the Priority Port of Gladstone and Port overlay (d) retain, to the greatest extent possible, tidal fish habitat and marine plants. (3) Any residual significant adverse impacts are offset in accordance with the relevant Commonwealth or Queensland environmental offset framework. (4) Lighting associated with the construction and operation of development is designed to limit the impacts on aquatic wildlife, including turtles and migratory species.	**(1) Complies.** The Proposal will be managed in accordance with guidelines established under a CEMP prepared by the successful contractor. **(2) Complies.** Impacts to environmental values are unavoidable due to the nature of the Proposal requiring a cleared area for a temporary laydown. In accordance with the results of the ecological survey and report provided in **Appendix F,** vegetation to be cleared as part of the Proposal will be within mapped least concern areas and will avoid TECs to ensure vegetation clearing can meet the objectives of self-assessable development under the Development Scheme. The clearing will have minimal impact on ecological connectivity and it will not have an impact on OUV, tidal fish habitats or marine plants. **(3) Not Applicable.** As the Proposal for clearing native vegetation will be carried out as self-assessable development in accordance with the Development Scheme, no residual significant adverse impacts are anticipated. **(4) Not Applicable.** Due to the Site's location, impacts to aquatic wildlife are not anticipated. **(5) Complies**. Refer to response 2.5.10 (4) above. **(6) Complies.** Native vegetation clearing cannot be avoided. Vegetation clearing will meet the objectives of

[3] Examples of buffers include: a vegetated screen to mitigate the visual impacts of a large industrial facility from a public road; retaining additional vegetation around a protected flora species; or using separation distances.

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Strategic Vision Gladstone SDA	Statement of Compliance
(5) Where development requires a buffer to mitigate the impacts of the development, that buffer must be accommodated within the development site.[3] (6) Development avoids native vegetation clearing, or where avoidance is not reasonably possible, minimises clearing to: (a) conserve vegetation (b) avoid land degradation (c) avoid fragmentation and conserve connectivity.	self-assessable development under the Development Scheme and will avoid impacts as far as practicable. Translocation of culturally significant grass trees is considered to conserve vegetation. Avoidance of TECs will also conserve significant native vegetation.
2.5.12 Engineering and Design Standards	
(1) Development is to be designed and constructed in accordance with the relevant engineering and design standards (and any subsequent revisions to the relevant standards) stated in Table 7 below. Alternative and innovative solutions that demonstrate compliance with the relevant standards are encouraged	**(1) Complies.** where appropriate, relevant engineering and design standards will be met during project design and construction.
2.5.13 Other government matters	
(1) Development is to demonstrate consistency with any other relevant legislative requirements that may be necessary for the development to proceed and to the extent practicable, be consistent with regional plans, the State Planning Policy, the Port Overlay for the priority Port of Gladstone, and the State Development Assessment Provisions, where the State interests articulated by these instruments are likely to be affected by the development.[4] (2) Development recognises and protects the long-term availability of the extractive resource and access related to the Targinnie Key Resource Area (Number 119). (3) Development does not compromise existing or future port facilities and operation on Strategic Port Land.	**(1) Complies.** Where relevant other legislative requirements have been addressed in this planning report and appendices. Refer to the Planning Report for statements concerning the State Planning Policy and Central Queensland Regional Plan. Refer to a response to the Port Overlay for the Priority Port of Gladstone in the following section of this Appendix. A response to the State Development Assessment Provisions is not required. **(2)-(3) Complies.** The Proposal does not impact on key resource area 119. The Proposal will have no impact upon future port facilities or current operations over Strategic Port Land.

[4] Information on the matters listed, including mapping, can be found at https://planning.statedevelopment.qld.gov.au/planning-framework and https://www.tmr.qld.gov.au/business-industry/Transport-sectors/Ports/Sustainable-port-development-and-operation/Masterplanning-for-priority-ports/Master-planning-for-the-priority-Port-of-Gladstone Additional mapping of mining and resource tenures can also be found at https://georesglobe.information.qld.gov.au/

Strategic Vision Gladstone SDA	Statement of Compliance
2.5.14 Energy and water efficiency	
(1) Building, site design, and layout maximises energy efficiency having regard to: (a) building orientation and passive solar design (b) maximising opportunities for cross ventilation (c) appropriate shade treatments (d) landscaping treatments to the western side of the building. (2) Water efficiency is optimised with alternative water supply sources, including: (a) Rainwater harvesting systems (b) Recycled water source. (3) Where practicable, development should be consistent with the Queensland government's renewable energy policies.	**(1)-(3) Complies.** Layout and orientation of temporary facilities as shown on the Proposal Plan (refer **Appendix C**) will maximise energy and water efficiency as far as practicable considering the temporary nature of the Proposal.
2.5.15 Visual Impacts	
(1) Visual impacts of buildings, retaining structures, or other development are minimised through building design, landscaping, and use of appropriate materials when viewed from a publicly accessible viewpoint such as major roads and the Mount Larcom landform. (2) Development maintains and enhances significant vegetation where possible and provides landscaping that: (a) minimises the visual impacts of the development (b) incorporates at least 50 per cent local species (c) is low maintenance.	**(1) Complies.** The Site is not located on a major road or publicly accessible viewpoint. Due to the temporary nature of the proposal, Visual impacts are not considered to be a significant issue and will be minimal. **(2)(a)-(c) Complies.** Clearing of native vegetation cannot be avoided. The Proposal will avoid TECs and translocation of grasstrees, considered to be significant vegetation. Landscaping is not proposed due to the temporary nature of the proposal and inability for mature landscaping to establish within the operating time of the Proposal
2.5.16 Reconfiguring a lot – not applicable. The Proposal does not include reconfiguring a lot.	

Table B.4 Assessment Against the SDA wide requirements for SDA self-assessable development – operational works for the clearing of native vegetation

Number	SDA wide requirements	Requirements	Statement of Compliance
1	Vegetation Type	(1) Clearing is for the following vegetation: (a) regulated regrowth vegetation (b) an of concern regional ecosystem in a category B area (c) a least concern regional ecosystem in a category B area	**(1) Complies.** The proposed clearing is of least concern regional ecosystems in a Category B area. Refer to the ecological report in **Appendix F** for further details and mapping.
2	Land use	(1) Clearing is associated with reconfiguring a lot that is authorised by an SDA approval or (2) clearing is associated with a material change of use that is authorised by an SDA approval and is for development listed in Schedule 1 Part 2 but (3) does not include development associated with animal husbandry, animal keeping or cropping.	**(1) and (3) Not applicable.** **(2) Complies.** The proposed clearing is associated with a material change of use for a warehouse which is listed in Schedule 1 Part 2. Clearing activities will not be carried out independent of or prior to MCU SDA approval being obtained as a requirement of meeting the provisions of accepted development.

6.2.8 Port, industry and commerce precinct code

6.2.8.1 Application

The Port, Industry and commerce precinct code applies to development:

- Located within the Port, industry and commerce precinct (including the Port central sub-precinct and the Connectivity);
- Interface sub-precinct, excluding the East Shores sub-precinct);
- Located within the Marine infrastructure precinct and within 400 m of the Port, industry and commerce precinct; and
- Identified as requiring assessment by Table 5 of the Code.

6.2.8.2 Purpose and outcomes

The purpose of the Port, Industry And Commerce Precinct Code is to provide for efficient and coordinated port operations, industry, port-related commercial activities, supply chain infrastructure and other complementary supporting or related development.

The purpose of the Port, Industry And Commerce Precinct Code will be achieved through the following outcomes:

1. Development and supply chain infrastructure are appropriately located, designed, constructed and operated to support consolidated and efficient port operations;
2. Development does not compromise or adversely impact on existing or future supply chain infrastructure;
3. Development not related to port land use activities does not constrain port operations or port facilities; and
4. Development is appropriately designed and constructed to avoid or minimise amenity impacts to surrounding sensitive uses.

6.2.8.3 Criteria for assessment

Table 13 of the Code contains the performance outcomes and acceptable outcomes (where relevant) for the Port, industry and commerce precinct code.

Table B.5: Port, Industry and commerce precinct code

Performance Outcomes	Acceptable Outcomes	Response
Port optimisation		
PO1 Development and supply chain infrastructure are located, designed and operated to maximise the efficient and coordinated use of port land and infrastructure. Note—Supporting reports addressing the principles of port optimisation may assist in addressing this performance outcome.	No acceptable outcome is prescribed.	**PO1 Complies** The Site is situated on Reid Road which intersects with Hanson Road a designated heavy vehicle transportation route. Efficient transportation of construction related traffic and materials to and from the Site is a key requirement of the Proposal.
Protection of supply chain infrastructure		
PO2 Development, structures, services and utilities do not compromise the future location and efficient operation of supply chain infrastructure.	No acceptable outcome is prescribed.	**PO2 Complies** The Proposal will have no impact upon supply chain infrastructure for the Gladstone Port.
Safeguarding port operations		
PO3 Development does not constrain port operations or port facilities.	No acceptable outcome is prescribed.	**PO3 Complies** The Proposal will have no impact on port facilities. The Proposal will not constrain the operation of Hanson Road.
Amenity		
PO4 Development avoids or minimises the generation of noise[1] and background creep so that: (a) adverse impacts are not caused to adjoining premises or other nearby sensitive land uses; (b) desired ambient noise levels in surrounding sensitive receptors are not exceeded.	No acceptable outcome is prescribed.	**PO4 Complies** Due to the Site location within the Port Related Industry Precinct and nature of surrounding uses being heavy industrial and subject to 24-hour operation, it is not considered there are sensitive land uses or sensitive receptors in proximity to the Site.

Performance Outcomes	Acceptable Outcomes	Response
PO5 Development is designed and constructed to avoid or minimise air emissions[2], and provides: (a) external storage, parking, loading and access areas which are built and maintained to prevent dust generation; (b) landscaping to prevent the generation and transmission of dust; (c) stockpiles which are managed and screened / landscaped to minimise the release of windblown dust or particulate matter to the atmosphere; (d) loading and unloading equipment including but not limited to dump stations, conveyors and chutes to be managed to minimise the release of dust or particulate matter to the atmosphere; (e) measures which minimise the impact of odour; (f) construction timings that minimise the length of time soil is exposed; and (g) construction measures which minimise dust emissions.	No acceptable outcome is prescribed.	**PO5 Complies** The Proposal incorporates storage, parking, loading and access areas. These areas will be built and maintained to prevent dust generation with regular use of watercarts during construction and operation. Due to the temporary nature of the Proposal, landscaping is not considered suitable as there would not be sufficient time for mature landscaping to establish over the Site.

[1] Refer to the Environmental Protection (Noise) Policy 2019 assessment hierarchy and acoustic quality objectives. A report may be required to demonstrate compliance with this performance outcome.
[2] Refer to the Environmental Protection (Air) Policy 2019 assessment hierarchy and air quality objectives. A report may be required to demonstrate compliance with this performance outcome.

APPENDIX C:

MEDQ Temporary Laydown Facility (Proposal Plan) – prepared by Prudentia Engineering

EXISTING ALPHA HPA PPF PLANT

PROPOSED/UNDER CONSTRUCTION

LOCAL FILLING TO CREATE HEAVY VEHICLE SITE ACCESS.

LOCAL FILLING TO CREATE HEAVY VEHICLE ACCESS. WITH PIPE BELOW FOR OVERLAND FLOW. PIPE TO BE SIZED PRIOR TO APPROVAL

TEMPORARY SEDIMENT BASIN. EXACT SIZING TO BE DETERMINED PRIOR TO APPROVAL

ACCESS ROAD

REID ROAD

SEDIMENT BASIN

HV PARKING BAYS

100 SPACE LIGHT VEHICLE CARPARK
5722m2

HV STAGING AREA
9547m2

TEMPORARY FACILITIES
8892m2

PRE-ASSEMBLY AREA
12334m2

SITE TO BE FILLED AND UNIFORMLY GRADED TOWARD THE SEDIMENT BASIN AT A MINIMUM SLOPE OF 2% TO ENSURE PROPER DRAINAGE AND SEDIMENT TRANSPORT

DIVERSION CHANNEL

4.0m BUFFER - ALLOWANCE FOR APPROXIMATE 1.0m OF FILLING TO ACHIEVE ADEQUATE HEAVY VEHICLE PAVEMENT MANEOUVERING

EXISTING MAPPED WATER WAY (PLOTTED FROM QUEENSLAND GLOBE)

EXISTING TREATMENT FACILITY

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

MEDQ SITE TEMPORARY LAYDOWN FACILITY

SCALE 1 : 500

PRELIMINARY

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

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Alpha HPA

Prudentia ENGINEERING
OPTIMAL PRACTICAL SOLUTIONS

RPEQ: _____ SIGNATURE: _____

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

A1

ALPHA HPA - HPA FIRST PROJECT

MEDQ SITE TEMPORARY LAYDOWN FACILITY

DRG. No. MC23050-XXXXX

REV P1

APPENDIX D:

Construction Environmental Management Plan – Prepared by Alpha HPA

Construction Environmental Management Plan

HPA First Project - Stage Two - Execution Phase

Alpha HPA Ltd

Document: 04184

Revision Status: Issued for Use

Rev	Date	Description	By	Checked	Approved
0	Jul 2024	Issued for Use	Environmental Advisor	Construction Manager	GM - Projects
1	November 2024	Stage 2 Review	Environmental Advisor	HSE Lead	Construction Manager

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Confidential Information

This document contains information that is confidential and a trade secret to HP Alumina Pty Ltd. Only persons who have executed the HP Alumina Pty Ltd confidentiality agreement are authorised to access this document.

Acronym	Meaning
ASS	Acid Sulfate Soils
CEMP	Construction Environmental Management Plan
CG	Coordinator-General
CHMA	Cultural Heritage Management Agreement
CPESC	Certified Professional in Erosion and Sediment Control
DESI	Department of Environment, Science and Innovation
EA	Environmental Authority
EDQ	Economic Development Queensland
EP Act	Environmental Protection Act 1994
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ERA	Environmentally Relevant Activity
ESCP	Erosion and Sediment Control Plan
EVNT	Endangered, Vulnerable and Near Threatened
FSC	Fauna Spotter Catcher
GED	General Environmental Duty
GRC	Gladstone Regional Council
HPA	High Purity Alumina
HSE	Health, Safety and Environment
IECA	International Erosion Control Association
JSEA	Job Safety Environmental Analysis
LRSMP	Low Risk Species Management Plan
MCU	Material Change of Use
NC Act	Nature Conservation Act 1992
NEPM	National Environmental Protection Measures
PPF	Precursor Production Facility
RE	Regional Ecosystem
SDA	State Development Area
SSI	Safety System Inspection
SWMS	Safe Work Method Statement

1 Introduction

The Alpha HPA First Project Stage Two (the project) is an integral part of the company's vision to successfully commercialise the ultra-high purity aluminium product range that will support the global decarbonization transition.

Alpha HPA's vision is to sustainably produce saleable, future-facing, ultra-high purity aluminium products, on a commercially viable scale, that are critical to the decarbonisation of the world.

The ultimate objective of the project is to effectively, efficiently, and sustainably deliver a viable operational business that meets stakeholder expectations and achieves the expected business outcomes.

1.1 Project Location and Infrastructure

The Project will be co-located with the Precursor Production Facility (PPF), a demonstration sized plant currently in operation.

The Project site is square in shape, 300 meters long and 300 meters wide, totaling a plot area 90,000m^2. The PPF takes up 16,000 m^2 within the plot area.

The Project site is located at Lot 12 Reid Road, Yarwun, nine kilometers west of Gladstone City in Queensland, Australia. The plant is adjacent to Orica's ammonium nitrate production plant which will supply the key reagents of ammonia and nitric acid to the Project once in operation. Alpha HPA is one of many industrial facilities located in the Gladstone Regional Council and within the State Development Area (SDA) Yarwun Precinct, which is administered by the Department of State Development, Infrastructure, Local Government and Planning (Qld).

The location of Alpha HPA's facility is shown below in Figure 1-1.

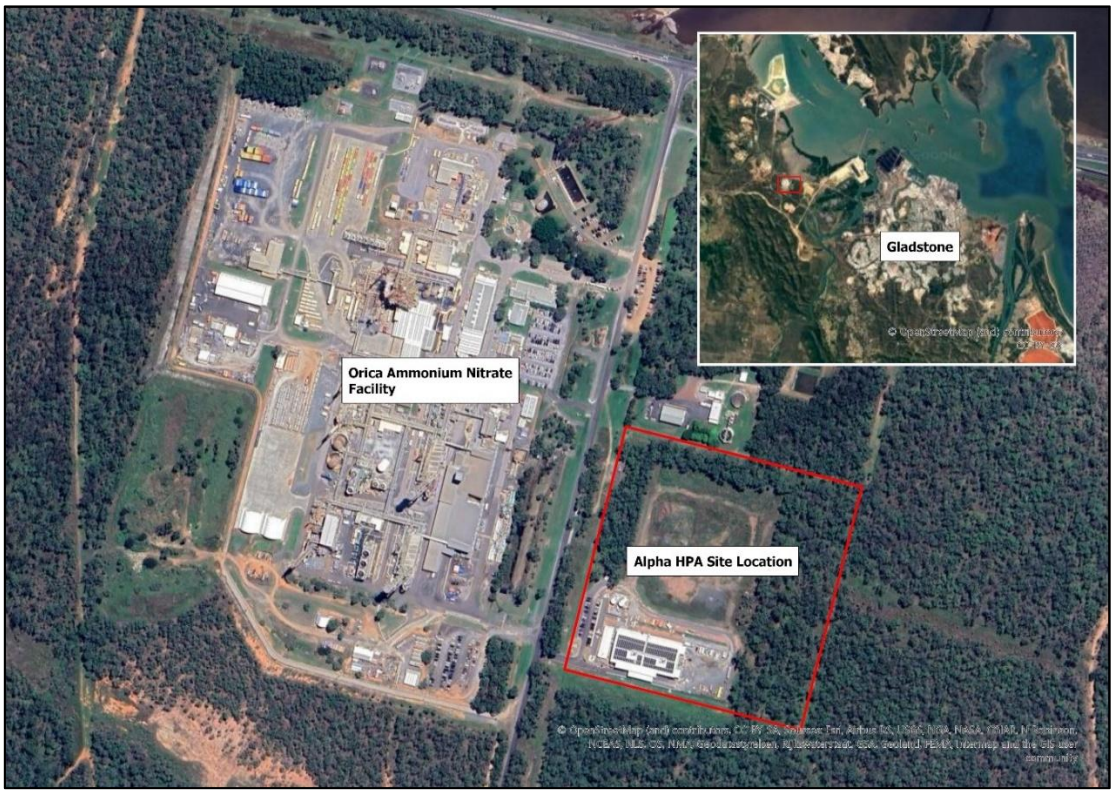


Figure 1-1. Alpha HPA Project Location

1.2 Purpose of this document

The construction environmental management plan (CEMP) summarizes the commitment of Alpha HPA to comply with statutory requirements to protect environmental values in accordance with the Environmental Protection Act 1994 (QLD) (EP Act), Project Approvals and other applicable legislation.

The CEMP relates to activities associated with construction of the Project and provides both practical and achievable commitments to ensure the works have minimal impacts to the environment. Furthermore, this CEMP provides an integrated plan for monitoring, assessing and controlling potential impacts.

Implementing this CEMP and associated sub-plans will effectively ensure that the Project meets regulatory requirements in a systematic manner and continually improve performance.

1.3 Environmental Management Commitment

Alpha HPA is committed to protecting the environment, in line with Alpha HPA's Health, Safety, Environment and Quality Policy. This commitment is achieved through a high standard of environmental performance and continuous improvement of the business and its practices.

1.4 Environmental Approvals

Consultation with regulatory authorities has been undertaken and approvals obtained, or are to be obtained, for the Project as outlined in Table 1-1.

Table 1-1. Overview of Relevant Permits, Licenses and Approvals

Relevant Activity	Licence / Approval / Permit	Regulatory Authority
• ERA 16 – Extraction and Screening – 2(a) – Extracting, other than by dredging, in a year, the following quantity of material – 5,000t to 100,000t • ERA 16 – Extraction and Screening – 3(a) – Screening, in a year, the following quantity of material – 5,000t to 100,000t	EA approved (P-EA-100136163), takes effect on 15 October 2021	Department of Environment, Science and Innovation (DESI)
• ERA 7 – (4)(a) – Chemical Manufacturing (manufacturing, in a year, 200 tonnes – 5,000 tonnes of fertilizer). • ERA 07 (6)(d) – Chemical Manufacturing 6: Manufacturing, in a year, the following quantities of inorganic chemicals, other than inorganic chemicals to which items 1 to 4 apply (d) more than 100,000t. • ERA 33 – Crushing, milling, grinding, or screening (Crushing, milling, grinding or screening more than	EA approved (P-EA-100167564), takes effect on 27 March 2024	Department of Environment, Science and Innovation (DESI)

5,000t of material in a year).		
State Development Application (SDA) – Material Change of Use (MCU) for a Special Industry and Linear Infrastructure Facility	SDA Change Application approved on 26 October 2021. Change application was lodged June 2024 and waiting for approval.	Coordinator-General (CG)
State Development Applications (SDA) – Operational Works Permit for Retaining Walls, Sewer, Road Works, Stormwater, and Landscaping	OPW Approved (OPW/17/2024), takes effect on 8th October 2024	Gladstone Regional Council (GRC)
Borrow Area Agreement – removal of up to 100,000t of fill material for use on site	Borrow Area Agreement Land at Yarwun, Gladstone HPAF-110011-CON-01174_0.pdf	EDQ
Cement Australia Lot 3 SP346693 Agreement – removal of approximately 4,000m^3 of gravel material	Letter of Access & Indemnity – 185 Landing Road, Yarwun QLD 4694 being Lot 3 on SP346693, Title Reference 51347871 (the Property)	Cement Australia
Construct (and maintain) a Temporary Industrial Driveway (Vehicle Crossover)	Approved, Non-Standard Temporary Drive Way Application Permit DW/27/2024	GRC
Culture Heritage Management Agreement (CHMA)	To be confirmed once approved	First Nations Bailai, Gurang, Gooreng Gooreng, Taribelang Bunda People Aboriginal Corporation RNTBC (ICN 8650)
Low-Risk Species Management Plan (LRSMP) for tampering with breeding places of protected animals	LRSMP approved, takes effect on 27 March 2024	DESI

A conditions register has been developed for approvals obtained and will be communicated as required and is available upon request.

1.5 Referenced Documents

The following documents must be read in conjunction with the Construction Environmental Management Plan and must always be adhered to. Documents will be added as created and document numbers updated once approved.

Table 1-2. Overview of Alpha HPA Environmental Management System

Document Number	Document Name
Pol-01-HSEQ Policy	Health, Safety, Environment and Quality Policy
MC23050-000-Z-PLN-00013	Construction Environmental Management Plan
PLN-02	Construction Emergency Response Management Plan
HPAF-PLN-00012	Construction Workplace Health and Safety Management Plan
MC23050-000-Z-PLN-00003_0	Project Execution Plan
HPAF-STD-00222	Water Management Standard
HPAF-STD-00221	Waste Management Standard
HPAF-STD-00218	Air Quality Standard
HPAF-STD-04603	Contaminated Land Standard
HPAF-PRO-04157	Surface Water Quality Monitoring Procedure
HPAF-PRO-04600	Construction Bioretention Basin Operating Procedure
HPAF-PRO-04601	Groundwater Quality Monitoring Procedure
HPAF-PRO-04165	Spill Response Procedure
HPAF-PRO-04602	Complaints Management Procedure
HSEQ-PROC-0028	Incident Investigation Procedure
HPAF-REG-00035	Project Risk Register
HPAF-REG-04129	Project Approvals Conditions Register
HPAF-REG-04605	Environmental Aspects and Impacts Register
HPAF-REG-04436	Alpha HPA Training Register

2 Project Methodology

This section details the methodology likely to be used for project-related construction activities. Key work elements of the Project relevant to the CEMP are listed below:

- Site Establishment (Early Works)
- Bulk Earthworks and Civil Works
- Structural, mechanical and piping installation
- Electrical and instrumentation installation
- Control building and warehouse construction
- Pre-commissioning

Project activities are restricted to the following hours:

- 6:00 am – 5:00 pm (Monday to Sunday)

Any work undertaken outside of these hours will require prior approval from Alpha HPA.

3 Environmental Values and Potential Impacts

AECOM conducted an ecological assessment of the Project site in 2020 and concluded the Project site contains, or is immediately adjacent to, the following environmental values:

- Suitable habitat for the:
    - Greater glider (Petauroides volans) – listed as vulnerable under both the Nature Conservation Act 1992 (Qld) (NC Act) and the Environment Protection and Biodiversity Conservation Act 1999 (Cwth) (EPBC Act);
    - White-throated needletail (Hirundapus caudacutus) – listed as vulnerable under both the NC Act and EPBC Act;
    - Powerful owl (Ninox strenua) – listed as vulnerable under the NC Act;
    - Koala (Phascolarctos cinereus) – listed as Vulnerable under both the NC Act and EPBC Act;
    - Grey-headed flying-fox (Pteropus poliocephalus) – listed as Vulnerable under the EPBC Act and;
    - Several migratory birds
- Non-remnant cleared grassland with fringing remnant vegetation consisting of regional ecosystem (RE) 11.3.29 (*Eucalyptus crebra, E. exserta, Melaleuca spp*. Woodland on alluvial plains);
- Fauna habitat in the form of mixed eucalypt woodland and cleared pasture with habitat features including leaf litter, dense grass cover, decorticating bark, koala food trees, connected and mature canopy and hallows; and
- Invasive species listed under the Biosecurity Act 2014 (Qld) and or as Weeds of National Significance (WoNS) including lantana, creeping lantana and pricky pear.
- Non-perennial watercourse on the western boundary of property

Figure 3-1 and Figure 3-2 outline some of the environmental values and sensitive receptors associated with the Project.

Figure 3-1: Environmental Values and Sensitive Receptors Surrounding Alpha HPA Lot

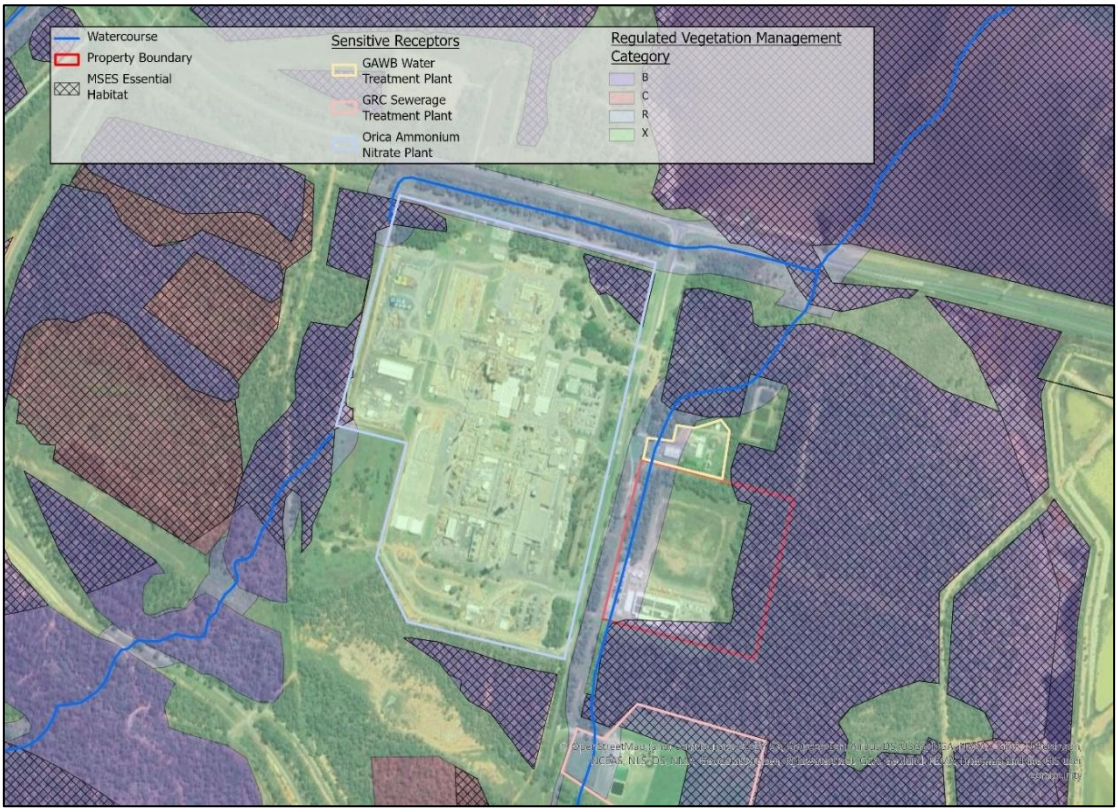
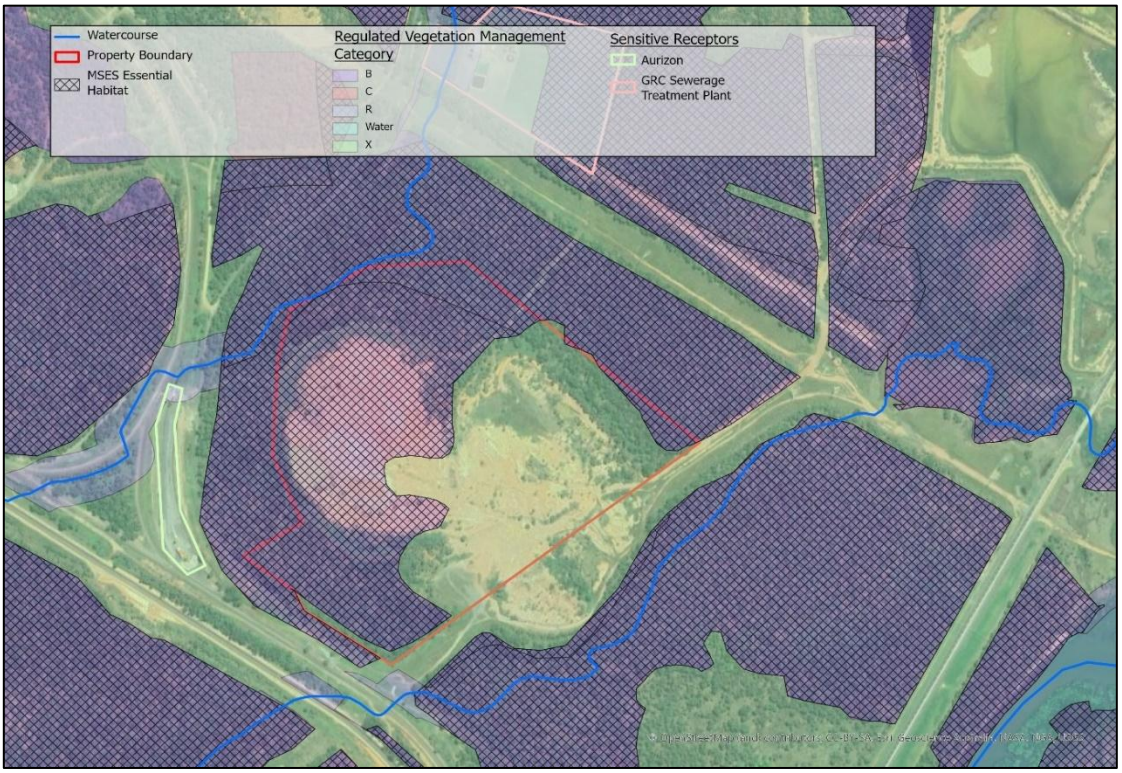


Figure 3-2: Environmental Values and Sensitive Receptors Surrounding Borrow Pit Lot



Alpha HPA and its Contractors must exercise due diligence to ensure environmental nuisance and harm is avoided and minimized during construction works.

Potential impacts, if mitigation measures are not adopted, on existing environmental values identified at the Project Site may include but are not limited to:

- Fauna deaths;
- Accidental destruction of significant habitat for an important population of an identified species;
- Introduction of pests and disease that impact important populations of identified species;
- Introduction or spread of WoNS or other invasive species;
- Accidental clearing of a protected plant without relevant approvals;
- Accidental clearing of endangered vegetation communities or plants without relevant approvals;
- Impacts to quality and quantity of receiving surface and/or groundwaters;
- Impacts to natural, Indigenous, and built heritage;
- Disturbance of potentially contaminated land from historic land uses and/or natural sources (acid sulfate soils (ASS));
- Land degradation including contamination and erosion;
- Risks to human health and lives;
- Noise, vibration and air quality impacts on neighboring properties and native flora/fauna; and
- Potential to increase bushfire and flooding risks (frequency and/or intensity)

The intention of this CEMP is to ensure these risks are avoided or minimized.

4 Environmental Objectives and Targets

Alpha HPA and its Contractors will endeavor to achieve all required environmental objectives and targets as outlined in Table 4.1 and summarized in the remainder of the CEMP.

Table 4-1:Key Environmental Objectives

Objective	Target	Monitoring
Adequate environmental controls	• Implemented prior to works commencing; and • Updated to reflect changing conditions; and • Maintained for the duration of the Project	Daily pre-starts / diary / audits and inspections
Environmental performance	• Compliance with all relevant permits, licenses and approvals (refer to Table 1.1); • Zero major environmental incidents; • Minor incidents/hazards and near misses are immediately mitigated; • Environmental spills are reported to the Site Manager within one hour of occurrence; and • Incidents/hazards/near misses are reported	Daily visual inspections Two monthly environmental audits Monthly environmental report Incident report forms and outcomes of relevant investigations

	within the required timeframes	
Effective management of community/stakeholder/cultural heritage concerns	• Zero impact to cultural heritage values; • No major community and/or stakeholder complaints; and • Complaints are dealt with and resolved as soon as possible.	Meeting minute records Incident report forms and outcomes of relevant investigations Complaints register

5 Legislation

Key environmental and cultural legislation which may be applicable to the Project is listed in Table 5-1.

Table 5-1: Key Environmental Legislation

Key Legislation	Purpose of Legislation	Requirements
Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth)	Preserves and protects from injury or desecration those places, areas or objects that are of particular significance to Aboriginal people.	Requirement to report discovery of Aboriginal remains to the Minister for Aboriginal and Torres Strait Islander Partnerships Ministerial actions may move to protect significant Aboriginal places, areas and objects in response to an application staying that a place, area or object is under threat.
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)	Establishes an assessment and approval framework for activities that have the potential for significant environmental impacts and a permitting system for protected matters.	Ministerial approval is required for activities likely to have an impact on any Matters of National Environmental Significance.
National Environment Protection Council Act 1994 (Commonwealth)	Defines National Environment Protection Measures (NEPMS) which are agreed national objectives for protecting or managing aspects of the environment. Decisions about how the NEPMs are implemented are made by the individual States and Territories.	Each jurisdiction has a requirement to comply with NEPM standards, monitoring and reports. NEPMs that may have some relevance to the Project include: • National pollutant inventory; • Assessment of site contamination; • Diesel vehicle emissions; • Movement of controlled

		waste; and • Ambient air quality
National Greenhouse and Energy Reporting Act 2007 (Commonwealth)	Introduces a single national reporting framework for the reporting and dissemination of information on greenhouse gas emissions, energy consumption and energy production of corporations	Maintaining an appropriate record of fuel consumption for reporting requirements under the Act may be required.
Aboriginal Cultural Heritage Act 2003 (Queensland)	To provide effective recognition, protection, and conservation of Aboriginal cultural heritage	A person: • Must exercise due diligence and reasonable precaution before undertaking an activity which may harm Aboriginal cultural heritage; and • Carrying out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal cultural heritage
Biosecurity Act 2014 (Queensland)	To manage the impacts of animal and plant disease and pests in a timely and effective way.	The Act provides comprehensive biosecurity measures to safeguard our economy, agricultural and tourism industries, environment, and way of life, from: • Pests (e.g. wild dogs and weeds) • Diseases (e.g. foot and mouth disease); and • Contaminants (e.g. lead on grazing land) Diseases and pests listed in the Biosecurity Act 2014 (Qld) must be controlled as directed.

Environmental Protection Act 1994 (Queensland)	To ensure activities that cause or are likely to cause environmental harm do not occur without all reasonable and practicable measures to prevent or minimize the harm	It is an offence to conduct an activity likely to cause environmental harm unless all reasonable and practical measures have been taken to prevent or minimize the harm. It is an offense to cause serious or material environmental harm or nuisance. Potential or actual material environmental harm caused or witnessed by a person must be notified. The Act requires that pollution to areas outside of the Project footprint must not occur. Information regarding the Duty to Notify of Harm (DESI 2021) is provide din **Appendix B**.
Environmental Protection Regulation 2008 (Queensland) and Environmental Protection Policies – Air, Noise, and Water (Queensland)	To protect Queensland's environment while allowing for development that improves the quality of life while maintaining the ecological processes on which it depends.	The works must be undertaken in accordance with the general environmental duty (GED): '*A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to minimize the harm.'* The site is listed on the Environmental Management Register. Contaminated soil can only be removed from the Site under a Soil Disposal Permit that is issued by DESI.

Fisheries Act 1994 (Queensland)	To provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats.	Ensure that Project activities occurring adjacent to watercourses consider ecologically sustainable development, having regard to fishery resources and fish habitats so that ecological processes on which life depend are maintained and total quality of life now and in the future can be improved.
Nature Conservation Act (NC Act) 1992 (Queensland)	To protect all native flora and fauna, including Endangered, vulnerable and near threatened (EVNT) species listed under the Act or Regulation.	The NC Act is relevant to this Project as there is potential for EVNT species to be present within the Project footprint or immediate surrounds.
Queensland Heritage Act 1994 (Queensland)	To provide for the conservation of Queensland's cultural heritage for the benefit of the community and future generations.	Requirement to report discovery of archaeological remains that may be considered an important source of information about Queensland's history.
Vegetation Management Act 1999 (Queensland)	To regulate the clearing of vegetation in a way that conserves remnant of concern regional ecosystems.	Provides guidance to the Project commitments to minimize clearing and avoid unnecessary clearing wherever possible.
Waste Regulation and Recycling Act 2011 (Queensland)	The legislation establishes a new framework to modernize waste management and resource recovery practices in Queensland. It promotes waste avoidance and reduction and encourages resource recovery and efficiency.	Construction activities must be undertaken in a way to: 'Promote waste avoidance and reduction, and resource recovery and efficiency actions.'

6 Management System

6.1 Responsibilities

Alpha HPA, construction contractors and any personnel involved in construction activities are responsible for the overall environmental performance of the activities they have control over and for complying with their GED as defined in Table 5.1.

The roles and responsibilities of personnel involved in the Project are described in Table 6.1.

Table 6-1: CEMP Roles and Responsibilities

Role	Responsibility
General Manager - Projects	• Responsible for managing, directing and promoting the environmentally sustainable operation and development of the company.
Construction Manager	• Responsible for ensuring incidents are reported and investigated and external notifications made when required • Overall responsibility for the implementation of the CEMP • Ensuring the team is adequately resourced to enable all personnel to carry out their duties in an environmentally responsible manner through the implementation of the CEMP
Procurement and Contracts Manager	• Responsible for ensuring contracts and agreements include identification and management of environmental risks.
HSE Team	• Responsible for assisting with the implementation of the CEMP and ongoing awareness of health, safety and environment • Maintaining and updating this CEMP as required • Conducting audits of the implementation of this CEMP; and • Collating of records relating to this CEMP
Workers including construction contractors and sub-contractors engaged to undertake work	• Responsible for ensuring all personnel under their supervision are aware of their responsibilities under the CEMP • Onsite operations including regular site audits of environmental controls • To ensure all environmentally significant areas are clearly demarcated and communicated to all personnel under their supervision • Responsible for working in accordance with the CEMP and to report any incidents, hazards and near misses. • Complying with the GED provisions of the *Environmental Protection Act 1994*.

6.2 Competence, Training and Awareness

All personnel attending the Site will complete an induction and appropriate environmental awareness training where required prior to commencing work to ensure they are competent to carry out their required tasks. More advanced environmental training may be required to carry out specialized environmental monitoring. These requirements will be outlined in the associated sub-plan or procedure.

Emergency response training will be provided to all Alpha HPA employees. Emergency response training provides details on emergency procedures, including spill containment, evacuation and use of emergency equipment. Further information on emergency response training is available in the Construction Workplace Health and Safety Management Plan.

Daily pre-start meetings will include discussion on environmental issues, site specific environmental values and impact mitigation for key risks to these values. Records will be kept for all internal training and inductions in the Training Register.

6.3 Emergency and Incident Management

The management of environment related near-misses and incidents, as described below, is important to reduce the likelihood of an event occurring that could cause harm to the environmental or cultural heritage values of the Site and surrounds. These are defined as:

- A near miss is any event that could have resulted in environmental harm and/or a pollution event; and
- An incident is any event that has resulted in environmental harm and/or a pollution event

Environmental incidents, such as spills, unauthorized clearing or an unauthorized release must be managed promptly to minimize impact. All personnel are required to follow the incident management process outlined in the Incident Investigation Procedure. The Incident Investigation Procedure provides detailed steps for:

- Reporting: Provides guidance on notifying internal stakeholders and authorities within required timeframes
- Roles and Responsibilities: Assigns responsibilities to ensure a coordinated response
- Response Actions: Provides guidance on responding to incidents, such as containment, mitigation and cleanup
- Investigation and Corrective Action: Provides guidance on conducting root cause analyses and implementing corrective actions as required
- Documentation, Training and Communication: Provides guidance on maintaining records in the nominated HSE Management System, ensures personnel have the required training and the process for updating stakeholders on incident status

Records of all incidents will be maintained. The HSE Lead (or delegate) will review and investigate all incidents and assess or direct a response. Corrective actions and other recommendations will be made and documented. Based on the classification of the incident and severity, the incident may be subject to further investigation to determine the root cause.

In the case of an emergency, all personnel are required to adhere to Alpha HPA's Emergency Response Plan.

6.4 Non-Conformances and Corrective Actions

Any non-conformance with this CEMP will be reported to the Construction Manager immediately. A non-conformance may result in a Stop Work Authority being issued until the non-conformance is rectified.

Corrective and preventative actions may include:

- Review and improvement of existing environmental controls, Job Safety and Environment Analysis (JSEAs) and Safe Work Method Statements (SWMS);
- Site rehabilitation;
- Increased site inspections and monitoring;
- Modification of construction methods; and
- Increased environmental awareness including retraining and toolbox talks

Each incident must be sufficiently investigated to allow specific and detailed corrective and preventative actions to be identified, actioned and closed out. Corrective actions are to be addressed and implemented within 48 hours.

6.5 Complaint Management

Any complaints received must be managed in accordance with the Complaints Management Procedure.

Details of any complaints received in relation to construction activities must be recorded and reported to the Construction Manager.

Complaints are to be recorded in the Complaints Register including details of time, date, complainant contact details, reason for the complaint, and investigation undertaken, conclusions and actions taken.

6.6 Risk Management

Risks associated with the Project have been identified in the Project Risk Register. An Environmental Aspects and Impacts Register has been created to identify required EMS documentation to appropriately manage environmental aspects and compliance obligations. Identified aspects and impacts are evaluated, managed and monitored as per this CEMP and associated sub-plans. As new risks are introduced with new work scopes, risks will be added to the Risk Register, with CEMP and sub-plans updated accordingly.

6.7 Monitoring, Reporting and Continuous Improvement

Environmental audits and monitoring will be used as fundamental tools for verifying compliance with Project requirements. All Contractors are required to have their own internal environmental audit and review program as part of their Environmental Management System. The Contractor's environmental audit and review schedule will be reviewed and approved by the Alpha HPA Environmental Advisor. Alpha HPA will ensure the Contractor adheres to their schedule and results will be included in the monthly report.

6.7.1 Environmental Audits, Monitoring and Reporting

Alpha HPA's environmental audit and inspection targets for the Project are listed below:

Table 6-2. Audit and Inspection Targets

Method	Frequency
Visual inspections	Daily
Safety System Inspections (Environmental)	2 per month
Environmental Monitoring	As required in sub-plans

A monthly environmental report will be submitted to the HSE Lead providing an overview of the findings from the results of the audits and inspections conducted. The report will also outline any areas of

concern and recommend any corrective actions. Any non-compliance with the performance criteria shall be documented as a near miss or incident, as per Section 6.3. Corrective actions will be undertaken in consultation with the Construction Manager, HSE Lead and any relevant authorities.

Two environmental safety system inspections will be conducted per month of work areas and work practices to ensure compliance with this CEMP. Additional environmental monitoring (i.e. surface water, air quality) will be conducted in accordance with the associated procedure or plan. Environmental monitoring will be used to inform compliance and identify any areas of improvement required for existing environmental controls. The reporting requirements for the Project are listed below:

Table 6-3. Project Reporting Requirements

Report Type	Content	Frequency	Responsible Person	Submission Process
Incident and Non-Compliance Report	Details of all environmental incidents, near-misses, or non-compliances	Within 6 hours or 24 hours depending on the severity of the incident	Environmental Team Member	Use Incident Management Procedure for reporting. Complete incident report form
Monthly Environmental Performance Report	Summary of environmental metrics, incident summary, and corrective actions	Monthly	Environmental Team Member/Contractor	Compile from inspections and monitoring data. Submit to internal stakeholders.
Compliance Audits and Inspections	Findings from routine inspections, compliance checks and audits - including risks and improvement opportunities	As outlined in Section	Environmental Team Member/Contractor	Record findings in action register, track corrective actions, and submit audit report
Continuous Improvement and Lessons Learned	Summary of improvements in environmental practices, incident reviews and preventative actions taken	Quarterly	Environmental Team Member/Contractor	Submit a summary of incident root causes and proactive improvements to stakeholders

External audits by a suitably qualified person will be conducted within 30 days of commencement of construction and prior to commencement of operation of Stage 2 and as required throughout the Project.

6.7.2 CEMP Review

This CEMP will be regularly reviewed on a 6-monthly basis. If ongoing monitoring proves any management strategies outlined in the CEMP are unsuitable or inadequate, a review and update of the CEMP will be undertaken at that time.

6.8 Communications and Consultation

Effective communication of the CEMP is essential to ensure that all personnel, contractors and stakeholders understand environmental responsibilities and updates. Key communication methods include:

- Site Notice Board: Displays important environmental information, procedures and updates for easy access by all site personnel
- Site Notifications: Sent to relevant stakeholders to inform them of any updates or changes to the CEMP, specific environmental risks or incident alerts
- Toolbox Talks and Prestart Meetings: Regular sessions where environmental requirements, key risks and procedural changes are discussed with teams. These meetings provide an opportunity for questions and ensure ongoing awareness
- Inductions: All new personnel and visitors receive an overview of the CEMP, including site specific environmental protocols and reporting procedures
- Change Management: Any updates or changes to the CEMP will be promptly communicated through the above channels. Changes will also be documented and tracked to ensure all personnel are informed

6.8.1 Stakeholder Engagement

Please refer to the Project Execution Plan for all Stakeholder Engagement processes for the Project.

Effective, efficient, and timely communication between the entire Project team is essential to the successful completion of the Project. Recognising the importance of good project communications, the IOT will:

- Clearly identify and define the roles of persons involved in the Project
- Prepare a communications matrix which maps communication requirements

7 Environmental Aspects and Impacts

The following key environmental components at risk from construction activities have been identified:

- Air quality
- Biosecurity
- Contaminated land
- Cultural heritage
- Flora and fauna
- Noise and vibration
- Soil erosion and sediment management
- Traffic management
- Waste
- Water
- Hazardous goods

8 Management Procedures

Procedures and controls to manage aspects and impacts that are likely to be associated with the construction activities provide a framework for mitigating impact and reducing the risk of causing environmental harm. Minimum mitigation measures and operational controls are summarized in Section 8.1 to Section 8.10 and must be implemented by Alpha HPA and construction contractors to achieve

the objectives for each environmental aspect. Construction environmental management sub-plans support the CEMP.

8.1 Air Quality Management

Table 8-1. Air Quality Management

Air Quality	
Objectives	Minimize environmental impacts from emissions and visible dust to the environment and community
Performance Criteria/Targets	• Comply with Alpha HPA's Air Quality Standard • Contractor must provide dust management plans when undertaking activities with a risk of producing nuisance dust • No fugitive emissions (including odours, dust, smoke and fume emissions) causing, or likely to cause, an environmental nuisance beyond the boundaries of the Site; and • No complaints from sensitive receptors or the workforce in relation to air quality
Mitigation Measures	• Vehicle speed restricted to 30 km/hr on site; • Bare soil areas to be minimized and restricted to the track routes and the footprint of the infrastructure being constructed; • Avoid clearing or construction works during gale force winds (i.e. >33 knots) • Dust suppression of exposed soil and stockpiles is to be conducted as necessary to prevent dust generation • Equipment to be maintained in good repair, including exhaust systems and emission control devices; • Service records and machinery daily pre-starts are to be maintained • Wherever practicable, machines will be switched off when not in use • Smoking is restricted to designated smoking areas to reduce risk of fire • No burning of any material is permitted • Wastes will be collected in designated covered receptacles and disposed of at previously nominated waste facilities on a regular basis (depending on volume of waste generated) • Any stockpiles or exposed batters required to be in place for more than 30 days are to be covered, stabilized, or wet down as necessary to prevent the generation of dust
Monitoring and Reporting	• Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports • Complaints to be recorded in a register for auditing purposes • Live dust and weather monitoring dashboard

8.2 Biosecurity Management

Table 8-2. Biosecurity Management

Biosecurity	
Objectives	Minimize the introduction and spread of invasive species (weeds and pest animals)
Performance Criteria/Targets	• No introduction or spread of invasive species listed under the *Biosecurity Act 2014* (Qld); and • Eradication or reduction in numbers of existing invasive species present on site
Mitigation Measures	• Weed types and infestation areas on the Site mapped and identified by a suitably qualified person (prior to clearing and site works commencing) • Site specific weed and hygiene requirements will be outlined within the Flora and Fauna Management Plan • Identified weeds will be treated and treatment activities recorded (i.e. dates, treatment used, success, etc.) • Stockpiles will be monitored for weed growth and treated, where necessary • All vehicles and machinery must be cleared and weed hygiene declarations completed by a competent person prior to arriving at the Site • Imported materials are to be inspected and may need to be accompanied by a weed hygiene certificate • Copies of weed hygiene certificates are to be retained for auditing purposes
Monitoring and reporting	• Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports

8.3 Contaminated Land

Table 8-3. Contaminated Land Management

Contaminated Land	
Objectives	To minimize environmental impacts to soils and the surrounding land and environment
Performance Criteria/Targets	• Comply with Alpha HPA's Contaminated Land Management Plan • No unauthorized removal of soil from the Site • Sufficient erosion controls • Meet the requirements of the GED; and • No release of contaminants to the land i.e. from spills or poor stormwater management

Mitigation Measures	• Contaminants from any activities must not be released to land • No soils to be removed from the Site without an approved soil disposal permit • All suspected contaminated soils when disturbed must be treated in situ and remediated or transported to a licensed waste facility • Maintain a register of hazardous substances and wastes on Site • Hazardous chemicals are to be stored in appropriately sealed, bunded and labelled containers • Refueling on site is to be avoided where practicable. Where unavoidable, refueling must occur on impermeable surfaces with controlled drainage, at least 100m from any watercourse or drainage feature • Spill kits are to be located at all points where hazardous substances are stored and used • Safety Data Sheets will be maintained and made readily accessible on Site • Any potentially contaminated materials (identified through visual inspection or records of incidents) should be stockpiled separately. These stockpiles should be appropriately bunded to prevent any potential leaching into the environment. • ASS, acid-producing rock and marine sediments must not be processed. Should any potential ASS be identified within the disturbance footprint, all work is to cease immediately in that location and the Alpha HPA Construction Manager informed. The area should be assessed by a suitably qualified person and work is not to recommence in that area until treatment or remediation has occurred, and approval is granted in writing by the Construction Manager. • Rehabilitation of the areas disturbed by construction activities will commence as soon as practicable following completion of activities and the following must be achieved: ○ The land is safe for humans and fauna ○ No subsidence or erosion gullies are remaining ○ No risk of contamination to waters remains ○ The maintenance requirements for the land are not greater than before it was disturbed • Water quality monitoring in accordance with the EA by a suitably qualified person may be required if a rain event results in discharge from the Site, visible contamination is observed immediately adjacent to the Site or complaints are received

Monitoring and Reporting	• Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports • Monitoring required by plans and procedures

8.4 Cultural Heritage Management

Table 8-4. Cultural Heritage Management

Cultural Heritage	
Objectives	To prevent unintended impacts to known or unknown archaeological and heritage items
Performance Criteria/Targets	• Construction works conducted in accordance with the CHMA for the Project • No disturbance or damage to known heritage sites or items • Unknown or undocumented heritage sites are not knowingly destroyed, defaced or damaged
Mitigation Measures	• Project footprint to be culturally cleared by relevant Aboriginal Party and/or regulatory authority and/or archaeologist prior to works commencing • Cultural heritage awareness of known or potential significant features is to be identified and communicated to site personnel prior to commencement of work • In the event of a discovery of a suspected cultural artefact, works are to cease immediately and notify the Construction Manager for reporting. Works cannot recommence at the Site until clearance has been provided in writing by the relevant authority
Monitoring and Reporting	• Aboriginal parties to be present during clearing and stripping of topsoil • Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports

8.5 Flora and Fauna Management

Table 8-5. Flora and Fauna Management

Flora and Fauna	
Objectives	To minimize environmental impacts to flora, introduction and spread of invasive species and unintentional clearing of vegetation to be retained, no go areas or vegetation beyond the Project footprint. To minimize environmental impacts on abundance and distribution of fauna and their habitat to prevent the introduction and spread of invasive species

Performance Criteria/Targets	• Comply with Alpha HPA's Flora and Fauna Management Plan • No unauthorized clearing of native vegetation • Authorized clearing undertaken in accordance with the approved low risk SMP • No disturbance beyond approved site limits • No introduction or spread of invasive plant and animals • Eradication/reduction in numbers of invasive species • No animal deaths as a result of the Project • No increase in bushfire occurrence from poor vegetation management strategies
Mitigation Measures	• No unauthorized clearing of vegetation • Where clearing is approved, a qualified ecologist is to undertake a preclearance inspection of any areas to be cleared and a licensed fauna spotter catcher is to be present on Site to inspect potential breeding places prior to removal or felling of trees as per the requirements of the low-risk SMP • Any sick, injured or dead wildlife on site is to be reported to DESI • No domestic animals are permitted on the Site • Cleared vegetation or stockpiled material is not to be pushed up against trees or placed within drainage lines • Machinery contact with standing trees on vegetated margins is to be avoided • No plant or equipment is to be parked or stored within the drip line of trees to prevent root damage • Clearing footprint is to be minimized as much as possible • Routine site inspections will occur to ensure no fauna are trapped within trenching or likely to be harmed by works • Restrict access to areas outside of Project footprint to minimize disturbance of flora and fauna • Night-time lighting, if absolutely required, is to be shielded or directed towards the ground to restrict spread of light into surrounding habitats • Vegetation to be retained, protected and clearly delineated by barrier mesh fencing with clear signage such as a 'no go area' • Information regarding no go areas and their location is to be included in the induction and awareness training • Smoking is limited to designated areas to reduce risk of fire
Monitoring and Reporting	• Pre- and post- clearance ecology reports, where relevant • Fauna Spotter Catch (FSC) reports/data, where relevant • Daily visual monitoring by Construction

	Contractors • Monthly site environmental inspections and reports

8.6 Noise and Vibration Controls

Table 8-6. Nosie and Vibration Controls Management

Noise and Vibration	
Objectives	To minimize the environmental impacts of noise and vibration at the Project Site and surrounding areas on sensitive receptors including fauna
Performance Criteria/Targets	• Minimize operational activities causing, or likely to cause, an environmental nuisance beyond the boundaries of the Project Site • No complaints from sensitive receptors in relation to noise or vibration
Mitigation Measures	• Equipment and machinery to be maintained in good repair • Service records and machinery daily pre-start records are to be maintained • Wherever practicable, machinery is to be switched off when not in use • Restrict the use of machinery to operating hours of 6:00am to 5:00pm Monday to Sunday • Use equipment with lower noise levels and/or those with low-noise options • Avoid operation of loud equipment in the early morning and at night (if night works permitted)
Monitoring and Reporting	• Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports • Noise and/or vibration monitoring (if required)

8.7 Soil Erosion and Sediment Management

Table 8-7. Soil Erosion and Sediment Management

Land	
Objectives	To minimize the environmental impacts on soil at the Site and surrounding land caused by erosion
Performance Criteria/Targets	• Comply with Alpha HPA's Contaminated Land Management Plan and Water Management Plan • No increase in soil degradation due to construction activities • No sedimentation into nearby watercourses as a result of construction works
Mitigation Measures	• An erosion and sediment control plan (ESCP) meeting International Erosion Control Association Standards will be developed by a Certified Professional in Erosion and Sediment (CPESC) should be developed by each Contractor where a risk of sediment loss to the

	receiving environment is likely • Alpha HPA and their contractors will ensure relevant ESCP implementation and ongoing maintenance across the Site • Appropriate erosion and sediment control devices will be implemented around exposed areas and stockpiles • ESC devices must be established prior to work commencing and work maintained from commencement of construction activities until demobilization and rehabilitation works are completed, particularly after heavy rain events • Limit vegetation clearing to the approved construction footprint area • Stockpile areas are to be located in approved areas away from drainage lines and protected from sediment loss • Construction activities are not to be undertaken during significant wet weather • Any excess spoil must be disposed of in a suitable location to prevent sedimentation • Where possible, topsoil material will be respread directly from stripped areas onto areas being rehabilitated • Prior to the respreading of topsoil, the ground surface is to be ripped to assist with binding of soil layers, water penetration and revegetation • Rehabilitation of the areas disturbed by construction activities will commence as soon as practicable following completion of activities • Water quality monitoring in accordance with the Surface Water Quality Monitoring Program
Monitoring and Reporting	• Surface water quality monitoring procedure • Ground water quality procedure • Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports • Water quality monitoring results (where required)

8.8 Traffic Management

Table 8-8. Traffic Management

Traffic	
Objectives	To minimize impacts to road users and the environment from the Project, including from the construction of the pipeline overpass over Reid Road
Performance Criteria/Targets	• Comply with all developed Traffic Management Plans • No adverse interactions between: ○ Pedestrians and vehicles/equipment ○ Wildlife and vehicles/equipment ○ Light vehicles ○ Light vehicles and equipment

	○ Trucks and all of the above • No prolonged delays to traffic movements on Reid Road as a result of works • No fatigue, drug or alcohol related incidents • No fuel or chemical spills into the stormwater system from road accidents
Mitigation Measures	• Specific traffic management plans are to be developed and implemented for hauling of fill material to the Site from the two borrow areas, the construction works on the Site, the construction of the trade waste line and the construction of the pipeline overpass on Reid Road • Safe traffic and pedestrian movement around the Site it to be implemented as per the traffic management plan, to include as a minimum: ○ Designated pedestrian areas ○ Separate parking and site access areas ○ Restricted areas and lifting/unloading zones ○ Speed limit signage • Any sick, injured or dead wildlife may be required to be reported to DESI (Reporting an injured or dead animal | Environment, land and water | Queensland Government (www.qld.gov.au)) • Spill kits are to be located at all points where hazardous substances are stored and used
Monitoring and Reporting	• Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports

8.9 Waste Management

Table 8-9. Waste Management

Waste	
Objectives	To minimize the environmental impact of waste generation by reusing and recycling materials where possible and to minimize the risk of environmental harm caused by inappropriate waste management
Performance Criteria/Targets	• Comply with Alpha HPA's Waste Management Plan • No unauthorized waste disposal • Promote and adhere to waste minimization and recycling principles • No contamination of soil, air or water due to inappropriate waste management
Mitigation Measures	• Records of all waste (as well as regulated waste) are to be kept and must specify the type, amount and location of waste reused, recycled, stockpiled, or disposed of, name of transport company and facility licenses. The register must be kept for auditing purposes for a minimum of five years

	• Wastes to be collected in a designated, covered and secured receptacle, and disposed of at a pre-determined licensed waste facility as required • Recyclables to be segregated into separate receptacles and removed to an appropriate resource recovery facility • All temporary storage/stockpiling of waste is to be located at least 50 meters away from any watercourse or drainage line • Regulated waste is to be stored in appropriately sealed, bunded and labelled containers and transported by licensed entities only. Waste tracking must be completed for any regulated wastes • Toilet facilities and other amenities will be available on site during Project activities • Appropriate cigarette butt disposal bins are to be provided in designated smoking areas
Monitoring and Reporting	• Daily visual monitoring • Monthly site environmental inspections and reports

8.10 Water Management

Table 8-10. Water Management

Water Resources	
Objectives	To reduce environmental impacts on receiving surface waters and groundwater levels and quality
Performance Criteria/Targets	• Comply with Alpha HPA's Water Management Standard • Prevent contamination of land, surface waters and groundwater • Prevent impacts on receiving environment
Mitigation Measures	• 'No go areas' are to be clearly demarcated • No work or access outside of the Project footprint • Water for onsite use is externally sourced • An ESCP meeting IECA Standards will be developed by a CPESC for the Site. The Construction Contractors will ensure relevant ESCP implementation and ongoing maintenance across the Site. • Storage and handling of hazardous substances and refueling activities will not occur within 100 meters of a watercourse or drainage line • Spill kits are to be located at all points where hazardous substances are stored and used • Any potentially contaminated materials (identified through visual inspection or records of incidents) should be stockpiled separately. These stockpiles should be appropriately bunded to prevent any potential contaminants leaching into the environment, treated and/or transported to a licensed waste facility • Construction activities will be limited during wet

	weather events as far as practicable. If significant rainfall is predicted (>30mm in 48 hours or more than 10mm in one hour) works areas must be cleared and prepared to minimize the risk of contamination from run-off • No release of aqueous waste to receiving waters • Closed system amenities will be provided for all site personnel • Project works will not occur to a depth that will impede the underlying groundwater tables • Discharge of groundwater to surface waters from the Project works must comply with the Calliope fresh waters inside state development area – lowland
Monitoring and Reporting	• Daily visual monitoring by Construction Contractors • Monthly site environmental inspections and reports • Water quality monitoring in accordance with the Surface and Groundwater Monitoring Programs by a suitably qualified person

9 Management Review

The performance of the CEMP will be reviewed regularly during Project construction. The information considered at pre-start meetings and environmental site inspections will include non-conformances, incidents, complaints, and any other relevant information regarding achieving the objectives of this CEMP.

APPENDIX E:

Construction Management Plan – Prepared by Alpha HPA



Construction Management Plan

HPA First Project - Stage Two - Execution Phase

Alpha HPA Ltd

Document: HPAF-PLN-00008

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Confidential Information

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LIST OF ACRONYMS IN THIS DOCUMENT

Acronym	Description
4N	>99.99% Purity
5N	>99.999% Purity
AE	Advance Electrolyte
AL	Aluminium
ALARP	As Low As Reasonably Practicable
AN	Ammonium Nitrate
CM	Construction management
D&C	Design and Construction
D&S	Design and Supply
E&I	Electrical and Instrumentation
E, I & C	Electrical, Instrumentation and Control
EMP	Environmental Management Plan
ENVID	Environmental Risk Assessment
EPCM	Engineering Procurement Construction Management
FEED	Front End Engineering Design
FID	Final Investment Decision
FIFO	Fly in fly out
FMEA	Failure Mode Effect Analysis
GSDA	Gladstone State Development Area
HAZID	Hazard Identification
HAZOP	Hazard and Operability
HPA	High Purity Alumina
HSE	Health, Safety and Environment
IOM	Information, Operation and Maintenance
IOT	Integrated Owner's Team
IR	Industrial Relations
ITP	Inspection and Test Plan
MDR	Manufacturer's Data Record
P&ID	Piping and Instrumentation Diagram
PDC	Process Design Criteria
PEP	Project Execution Plan
PLS	Pregnant Leach Solution
PM	Project Manager
PMC	Project Management Consultant
PPF	Precursor Production Facility
PUMP	Project Uncertainty Management Process
QA/QC	Quality Assurance / Quality Control
RACI	Responsible, Accountable, Consulted and Informed
RBS	Risk Breakdown Structure
SE	Spent Electrolyte
SMP	Structural, Mechanical and Piping
SX	Solvent Extraction
TLC	Transport and Logistics Contractor
WBS	Work Breakdown Structure

1 Purpose

The Construction Management Plan (CMP) for the Alpha HPA Stage Two Project is a comprehensive guide designed to ensure the safe, efficient, and successful execution of all construction activities. It serves as a comprehensive roadmap for the project team, outlining the processes, roles, and responsibilities required to navigate the complexities of the construction phase and deliver the project on time, within budget, and to the highest quality standards.

Key to the CMP's effectiveness is its emphasis on clear expectations and guidelines, fostering seamless communication and collaboration among team members. This proactive approach mitigates potential risks and streamlines workflows, ultimately ensuring the project's success.

Aligned with Alpha HPA's core business principles, the project prioritizes the safe development of facilities while maintaining cost efficiency and a rapid development timeline. Health, Safety, and Environment (HSE) performance is paramount, with a steadfast commitment to upholding the highest safety standards throughout construction and commissioning.

The project's construction management team plays a pivotal role in achieving these objectives, their responsibilities encompassing:

- **HSE Leadership**: Implementing and enforcing a robust HSE plan to ensure all work is conducted safely and responsibly.
- **Efficient Construction:** Minimizing on-site work through streamlined module assembly off-site.
- **Contractual Compliance:** Ensuring contractors adhere to all contract documents and project specifications.
- **Proactive Risk Management:** Identifying and mitigating potential cost and schedule risks before they impact the project.
- **Change Management:** Effectively managing changes while safeguarding the company's commercial interests.
- **Performance Measurement**: Defining clear success factors and key performance indicators for construction activities.
- **Stakeholder Engagement**: Protecting the company's interests in industrial relations and coordinating with Traditional Owners and environmental experts to ensure sustainable practices.
- **Regulatory Compliance:** Obtaining and monitoring compliance with all required statutory construction permits.
- **Collaborative Partnership**: Working closely with contractors to achieve project milestones and objectives.
- **Quality Assurance:** Ensuring compliance with Alpha HPA's stringent standards as outlined in all contracts.

  By diligently executing these responsibilities, the construction management team ensures the Alpha HPA Stage Two Project will be a success, delivering a state-of-the-art facility safely, efficiently, and to the highest standards.

2 Scope

This CMP outlines how construction activities for Stage Two will be effectively managed, adhering to legislative, regulatory, contractual, and Alpha HPA corporate mandates, to achieve the project's desired outcomes.

The scope encompasses on-site activities from the moment construction contractors mobilize and work commences. It covers the entirety of construction, beginning with early work packages and site establishment (following completion of engineering design) and continuing through to pre-commissioning and handover to the commissioning team.

In broad terms, the management of construction activities will be divided into the following key areas:

- **Permits and Approvals:** Securing and managing all necessary permits and approvals, including those related to environmental and cultural heritage.
- **Site Preparation:** Establishing site surveys, facilities, access controls, security measures, construction equipment, and site vehicle protocols. Defining construction methodologies and procedures.
- **Contract Administration:** Rigorous oversight of construction contracts, including reviewing and approving:
    - IOT review/approval of the contractors Health Safety Management Plans (HSMP),
    - Safe Work Method Statements (SWMS), Safe Work Procedures (SWP),
    - Risk Management Plan (RMP)
    - Construction Risk Assessment Workshops and other procedures/plans so that the contractors demonstrate:
        - A rigorous commitment to safety
        - Working effectively as a team
        - Project delivery in accordance with the scope of work
        - Working to meet the project objectives.
        - Effectively establishing internal and external relationships
- **Construction Coordination:** Overseeing the coordination of on-site construction activities to ensure smooth progress and effective resource utilization.
- **Materials Management:** Managing the delivery, storage, and handling of Alpha HPA equipment and materials for installation by contractors.
- **Quality:** Monitoring and auditing contractor compliance with safety, environmental, and quality control systems to ensure adherence to best practices and project standards.
- **External Stakeholder Management:** Managing relationships and communication with third-party stakeholders, including government agencies, local councils, utility providers, and other relevant organizations.
- **Progress Tracking:** Tracking and reporting on scope, cost, and time across all contractors, ensuring alignment with project plans and objectives.
- **Pre-Commissioning and Handover:** Managing the pre-commissioning process and facilitating a smooth handover of the completed facility to Alpha HPA for wet commissioning and start-up.
- **Technical Oversight:** Continuous monitoring and liaison with contractors to ensure that all work is performed in accordance with approved project plans and engineering standards.

2.1 Definitions

The use of capital letters in the text of this document signifies that there is a definition of the term. The definitions are provided under the section titled List of Acronyms in this Documents.

2.2 Standards and References

Table 2.2-1 Project Management Plans

Management Plan Title	Document Number
Project Execution Plan	HPAF-PLN-00003.docx
Procurement and Contracts Plan	HPAF-PLN-00004.docx
Engineering Management Plan	HPAF-PLN-00005.docx
Planning and Controls Management Plan	HPAF-PLN-00007.docx
Project Approvals Management Plan	HPAF-PLN-00008.docx
Commissioning Management Plan	HPAF-PLN-00009.docx
Operational Readiness Management Plan	HPAF-PLN-00010.docx
Quality Management Plan	HPAF-PLN-00011.docx
Construction Health Safety Management Plan	HPAF-PLN-00012.docx
Construction Environmental Management Plan	HPAF-PLN-00013.docx
Risk Management Plan	HPAF-PLN-00014.docx
Employee Relations Management Plan	HPAF-PLN-00015.docx

Figure 2-1 Project Document Hierarchy

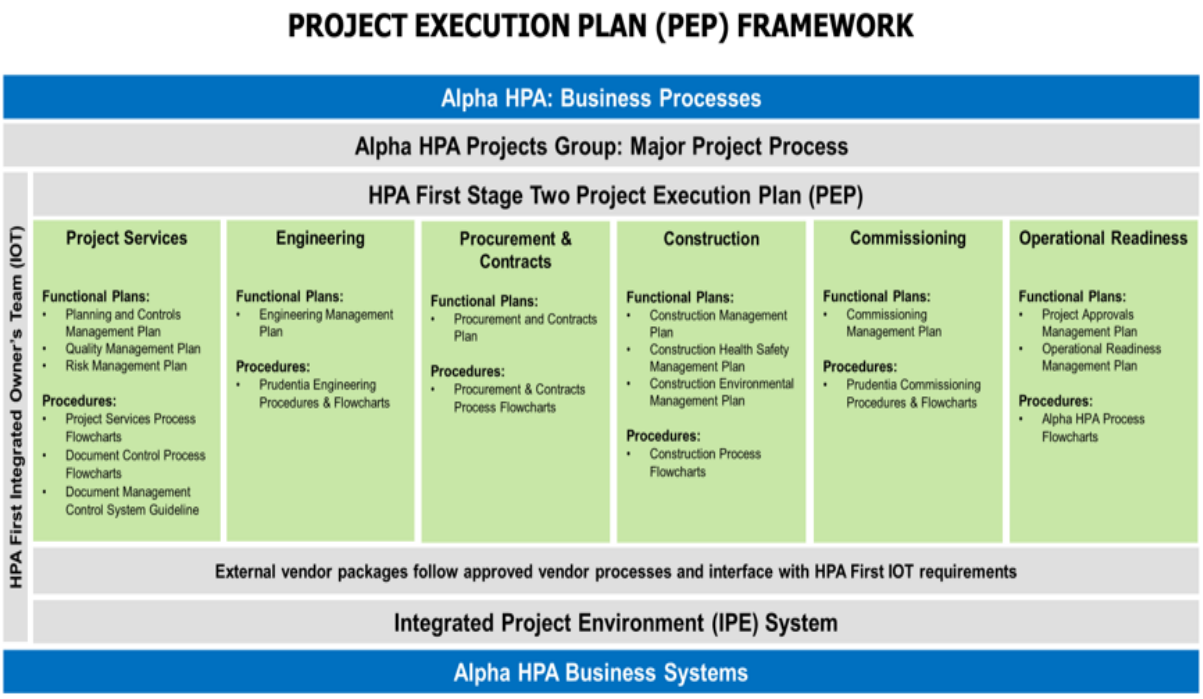


Table 2.2-2 Project reference documents

Document Number	Document Name
HPAF-PRO-00001_0.xlsx	Alpha HPA Major Project Process Flowchart & RACI
MC23050-000-Z-REG-00003_A.pdf	Project Work Breakdown Structure (WBS)
Project Package Plan Matrix_A.pdf	Project Package Plan Matrix Feasibility Study
MC23004-RPT-001_A.pdf	HPA First Project Study Definitive Feasibility Study Report
ADV-AU-00562_Alpha HPA_Stage2 ITE Final_Report_v01.pdf	Alpha HPA First Project Independent Technical Expert Review RPM Feasibility Study
HPAF-PLN-00036.vsdx	Integrated Owners Team (IOT) Execution Phase Organisational Chart
HPAF-PLN-00038.pptx	Alpha HPA First Stage Two IOT Kick-Off Meeting Presentation
HPAF-PLN-00039.pptx	IOT Internal Kick-Off Meeting Presentation
HPAF-PRO-00041.vsdx	Project Services Process Flowcharts
HPAF-PRO-00042.vsdx	Document Control Process Flowcharts
HPAF-PRO-00043.vsdx	Procurement & Contracts Process Flowcharts
HPAF-PLN-00800.pptx	Document Management Control System Guideline
POL-01 HSEQ Policy	Alpha HPA Health, Safety, Environment & Quality Policy
HSEQ-POL-0042	Alpha HPA Environment Policy
HSEQ-STD-0004	Alpha HPA HSE Management System

Table 2.2-3 Execution Phase Baseline Documents

Document Number	Document Name
MC23050-000-Z-BOD-00002_C.docx	Project Scope Definition Basis of Design Summary
HPAF-PLN-00030_0.docx	Project Controls Baseline Approval - Execution Phase
HPAF-PLN-00030_0.pdf	Project Controls Baseline Approval - Execution Phase
HPAF-EST-00031_0.xlsm	Control Estimate and Baseline Budget
HPAF-EST-00032.docx	Basis of Estimate - Execution Phase
HPAF-SCH-00033.mpp	Baseline Schedule - Execution Phase
HPAF-SCH-00034.docx	Basis of Schedule - Execution Phase
HPAF-REG-00035.xlsx	Project Risk Register
HPAF-PLN-00037_0.xlsx	Alpha HPA IOT Staff Plan

3 Project Overview

3.1 Introduction

Alpha HPA's vision is to sustainably produce future-facing high-purity aluminium based products, on a commercial scale, that are critical to the decarbonisation of our world.

The HPA First Project Stage Two (the project) will build Australia's first large scale ultra-high-purity alumina refinery to supply key high technology growth sectors that are driving the global energy transition.

The alumina refinery will be located adjacent to the HPA First Stage 1 Precursor Production Facility (PPF) in Gladstone Queensland and will produce commercial volumes of high purity alumina (HPA) and related premium aluminium-based products through proprietary solvent extraction (SX) and refining technology. This Australian owned and developed Intellectual Property (IP) technology, enables the facility to create near zero waste, recycle nearly 100% of its reagents, operate on 100% renewable energy and produce 70% lower carbon emissions compared to traditional HPA refining methods.

The state-of-the-art facility will leverage the operational PPF and Alpha HPA's IP, to produce over 10,000 tonnes of high-purity aluminium products per year, positioning it as one of the largest single-site HPA refineries in the world.

The Project Team are committed to achieving zero harm and meeting regulatory compliance standards throughout the asset lifecycle.

The project will be delivered within the approved capital budget, ensuring timely completion of chemical commissioning for the product range to meet customer requirements. This facilitates the final handover and operational ramp-up phase of the HPA facility, enabling the achievement of nameplate production specifications over a two-year period.

3.2 Project Overview

The project aims to establish a commercial scale high purity alumina (HPA) facility in Gladstone, capable of producing Alpha HPA's ultra-high purity premium aluminium products as per the table below:

Table 3.2-1 Key Project Metrics

	Plant Design Basis (Mass Balance)	Product Mix Basis (Production Plan)
Primary Product, HPA	5,300 tpa (>99.99% purity)	5,300 tpa (>99.99% purity)
Gamma Phase	2,100 tpa	2,100 tpa
Milled	700 tpa	700 tpa
Un-milled	2,500 tpa	2,500 tpa
Aluminium Nitrate Nonahydrate	2,000 tpa (3,500tpa bagging capacity)*	3,500 tpa*
Aluminium Trihydrate (ATH)	2,000 tpa*	1,700 tpa*
Feed	Alumina Trihydrate - $Al(OH)_3$	
Location	Yarwun, Gladstone, Qld, Australia	
Operation	24hrs per day, 7 days per week 365 days per year	

* The plant is designed to produce the range of products shown as per the production plan. The Mass Balance Basis shall be used for ATH production rates however there shall be capacity in nonahydrate plant to produce the Product Mix Basis.

The alumina refinery will be located adjacent to the HPA First Stage 1 Precursor Production Facility (PPF) in Gladstone Queensland and will produce commercial volumes of high purity alumina (HPA) and related premium aluminium-based products through proprietary solvent extraction (SX) and refining technology. This Australian owned and developed Intellectual Property (IP) technology, enables the facility to create near zero waste, recycle nearly 100% of its reagents, operate on 100%

renewable energy and produce 70% lower carbon emissions compared to traditional HPA refining methods.

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The project will be delivered within the approved capital budget, ensuring timely completion of chemical commissioning for the product range to meet customer requirements. This facilitates the final handover and operational ramp-up phase of the HPA facility, enabling the achievement of nameplate production specifications over a two-year period.

This CMP outlines the construction strategy and proposed management methodology to be used by the Integrated Owner's Team (IOT) for the effective and efficient delivery of the Project in Gladstone, Australia.

3.3 Project Location and Infrastructure

The Project will be co-located with the Precursor Production Facility (PPF), a demonstration sized plant currently in operation.

The Project site is square in shape (see **Error! Reference source not found.**), being 300 m long and 300 m wide, with a total plot area of 90,000 m^2. The PPF takes up 200 x 80m within the plot area.



Figure 3.3-1: Project Site with the PPF shown in top right.

3.3.1 Project Location

The Alpha HPA plant is located at Reid Road, Yarwun, 9km west of Gladstone city in Queensland, Australia. The plant is adjacent to Orica's ammonium nitrate production plant which will supply the key reagents of ammonia and nitric acid to Alpha's plant.

The Alpha plant is one of many industrial facilities located in the Gladstone Regional Shire Council and within the Gladstone State Development Area (GSDA) Yarwun Precinct, which is administered by the Department of State Development, Infrastructure and Planning (Queensland).

The Project will be co-located with the Precursor Production Facility (PPF), a demonstration sized plant currently in operation.

The location of Alpha's facility is shown below at Figure 3.2.

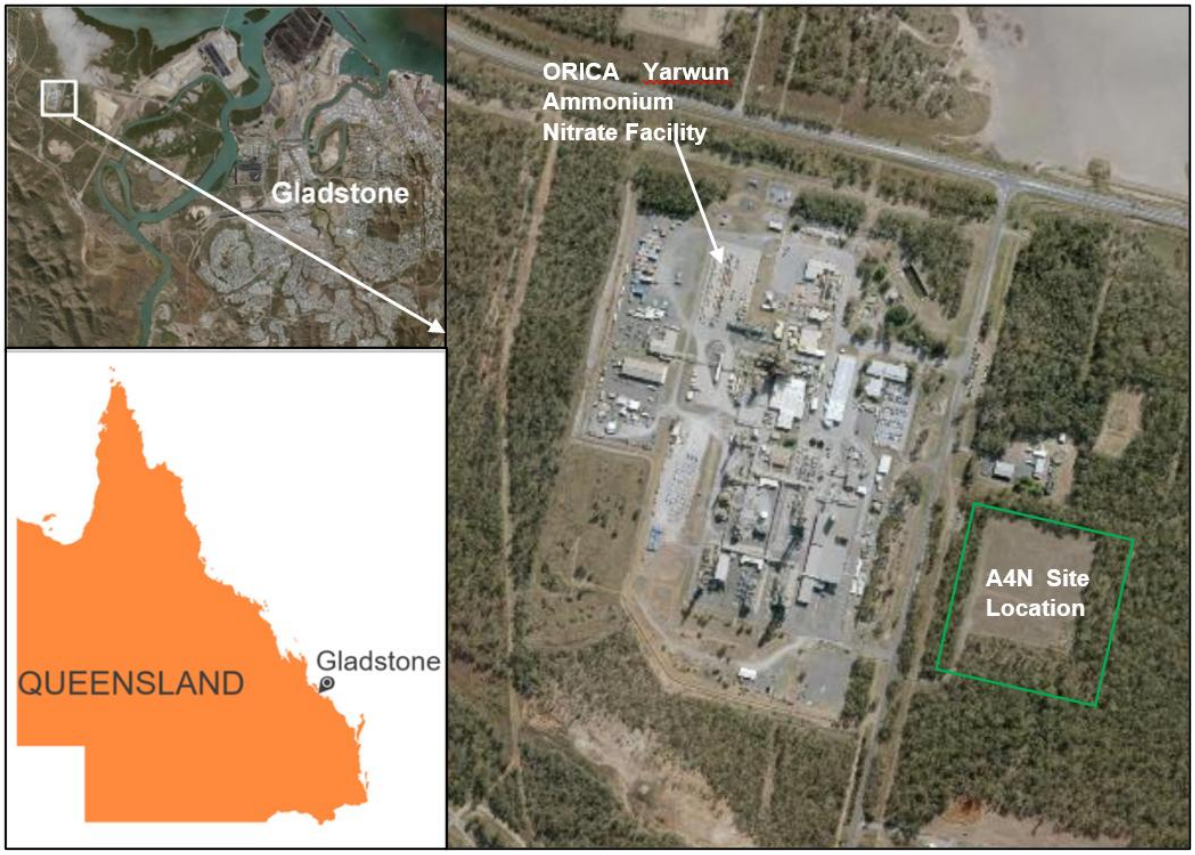


Figure 3.3-2 Project Site Location

3.3.2 Infrastructure

This site has been selected due to its close proximity to the preferred feed supplier of the commercially available alumina trihydrate, $Al(OH)_3$ and proximity to Orica's ammonium nitrate facility which will supply the key process reagents of ammonia and nitric acid. Orica can also accept the main byproduct of the refining process, *ammonium nitrate*, which will be utilised by Orica to produce ammonia nitrate.

Being within the Gladstone State Development Area (GSDA), the proposed site is near to industrial capacity services including town water supply, natural gas, HV power and liquid and solids wasted disposal facilities.

The GSDA is well serviced by modern road infrastructure facilitating the transportation of heavy and wide construction loads and for the safe and reliable transport of materials and products once in production.

Gladstone has well established port facilities located approximately 12 kms to the east of the Project site. The facility provides both bulk carrier and containerised freight handling options. For wide construction loads, it may be more practical to utilise Fisherman Landing Terminal which is located approximately 8 kms north of the Project site.

Gladstone airport is a modern regional airport with an efficient terminal with regular connections to Brisbane domestic and international terminals and other regional centres.

Due to the recent industrial development in the Gladstone region, the city and surrounds provide a range of accommodation options including purpose-built accommodation villages suitable for construction and operational workforces. With the completion of the recent development phase, accommodation has become readily available at a reasonable cost.

Gladstone is well serviced by industrial construction contractors competent in providing construction services for earthworks, civil works, steel fabrication and mechanical and electrical installation.

4 Construction Execution

4.1 Construction Execution Strategy

The construction execution strategy utilizes an Integrated Owners Team (IOT) model, comprising seasoned project delivery personnel and professional engineers from Alpha HPA (Alpha), Prudentia Engineering and specialized Project Management Consultants (PMC). Acting as the Principal Contractor, the IOT will spearhead engineering and procurement, collaborating with key partners:

- **Prudentia Engineering:** Process engineering and E/I&C
- **Prospect Engineering:** Civil design
- **Turner and Townsend Jukes Todd**
- **Cosermo (Spain):** SMP Design and Construct package
- **Douglas and Partners:** (Geotechnical investigation
- **AECOM:** Approvals and studies
- **FSS:** Fire

The Execution Strategy focuses on:

- **Optimized Contracting:** Streamlining interfaces through separate construction packages.
- **Loal Engagement:** Maximizing the use of local contractors (where possible)
- **Phased Approach:** Minimizing the impact of the construction workforce on site by phasing work packages. .
- **Early Contractor Engagement:** Expediting contract awards for early construction input.
- **Proven Expertise:** Leveraging from previous known high performing Contractors by the IOT
- **Off site Manufacturing:** Prioritizing modularization for efficient transport and installation.
- **Specialized Procurement:** Expediting tendering for long-lead components, including vendor-led commissioning support, to leverage specialized expertise.

For a comprehensive overview of the procurement strategy, refer to the Procurement and Contracts Management Plan (Document No. MC23050-000-Z-PLN-00004).

Table 4-1 *Project Contract Packages* provided overleaf, further details the typical procurement battery limits for each project contract package

Table 4.1-1 Project Contract Packages

Contract No	Package Description	Comments	Contractor Selection Basis	Commercial Basis	Scope Basis
C-01A	Bulk Earthworks		Competitive Tender	Bill of Quantity - Schedule of Rates	Construct
C-01B	Civils		Competitive Tender	Bill of Quantity - Schedule of Rates	Construct
C-02	E & I Installation		Competitive Tender	Schedule of Rates	Construct
C-03	SMP Design, Procurement, Fabrication & Installation	Cosermo	Sole Source	Lump Sum	Design & Construct
C-04	Ergon Power Supply	Provision of 66kV / 19MVA Supply from boat creek substation	Sole Source	Lump Sum	Design & Construct
C-05	Geotechnical Investigation	Dougals & Partners	Sole Source	Schedule of Rates	Investigation and report
C-06	Survey	Establishment survey, ongoing survey / progress	Competitive Tender	Schedule of Rates	Service
C-07	Logistic & Freight	Consolidation of freight, International shipping to be FOB, C07 includes shipping, duty, customs and deliver to site for procurement. Excl Contracting costs (included within contracts)	Competitive Tender	Schedule of Rates	Service
C-08	3rd party inspection	Vendor package inspection before shipment	Competitive Tender	Schedule of Rates	Service
C-09	Temporary Site facilities		Competitive Tender	Schedule of Rates	Service
C-10	Construction Power	Possible to incl C18/ Use PPF surplus for construction buildings			
C-11	Major Cranes / Lift Studies	Local suppliers	Competitive Tender	Schedule of Rates	Service
C-12	Site Fuel Supply	Contract to supply fuel to all contractor	TBC		
C-13	Building Certifier				
C-14	Site Security / Medical	Local suppliers	Competitive Tender	Schedule of Rates	Service
C-15	Site maintenance	Local suppliers	Competitive Tender	Schedule of Rates	Service
C-16	Office Consumables	Local suppliers	Competitive Tender	Schedule of Rates	Service
C-17	Piling	Could incorporate into C-01	Competitive Tender	Schedule of Rates	Service

Contract No	Package Description	Comments	Contractor Selection Basis	Commercial Basis	Scope Basis
C-18	Early Works	Site preparation for temporary construction facility. Inc Clearing of laydown and construction office area, Provision of temp power connection to PPF, Sewer and water, rental temp construction office and amenities	Package merged with C-01A		
C-19	Acoustics		Competitive	Schedule of Rates	Service
C-20	Insulation (Pipe/Tanks)	For steam heat tracing of piping, thermal & PP insulation on pipes & tanks. EXCL tank jackets	Competitive Tender	Schedule of Rates	Service
C-21	Building contractor	Inc. CCTV System, Access control system	Competitive Tender	Schedule of Rates	Service
C-22	Heat Tracing Pipe	This could be incorporated into C-20	Competitive Tender	Schedule of Rates	Service
C-23	Painting	This could be incorporated into C-20	Competitive Tender	Schedule of Rates	Service
C-24	Concrete Contractor	TBC			
C-25	BOP Contractor	TBC			
C-26	Building Cladding	TBC			
C-100	IOT - PMC				
C-101	IOT - PPC				
C-102	Statutory Approval consultant	AECOM	Sole Source	Schedule of Rates	Approvals
C-103	Detail Design - Process and Commissioning	PPC		Schedule of Rates	Detail Design
C-104	Detail Design: E I & C	PPC		Schedule of Rates	Detail Design
C-105	Detail Design Earthworks and Foundations	Prospect Eng			Detail Design
C-106	Control Programming	TBC	Competitive Tender	Schedule of Rates	Service
C-107	Offsite Inspections	TBC	Competitive Tender	Schedule of Rates	Service
C-108	Fire System	TBC	Competitive Tender	Schedule of Rates	Service

4.2 Construction Key Performance Indicators

The Project will be co-located with the Precursor Production Facility (PPF), a demonstration sized

Site construction activities are meticulously planned to align with established objectives and key performance indicators (KPIs). These objectives and KPIs, detailed in the functional management plans listed in *Table 2 1 Project Management Plans*, will guide our efforts to achieve the following major goals:

Table 4.2-1 Construction Key Performance Indicators

Key Performance Indicators				
Criteria	**Description**	**Targets**	**Minimum Targets**	**Measurement**
Health & Safety (Zero Harm)	• Implement Proactive Measures • Safety observation reporting • Recordables • Reporting • Inductions • Training • Lessons Learnt • Loss Prevention Inspections	• Contractor Proactive Measure: Step back 5x5 • JHA Compliance • Proactive Monitoring Ratio (PMR) • Proactive Reporting Ratio (PRR) • Safety Observations / Verifications / day • Recordables: LTI's, MTI's, FAI, NMI	• Step back 5x5 = 1 per task • JHA required for all applicable tasks and in accordance with PTW • ≥27 PMR = Observations & Inspections x 10 /Total No personnel • ≥18 PRR = No of Non Injuries & hazards/Number of injuries reported • LPI's 1/wk by all IOT site Personnel	Leading & Lagging indicators (refer to the CHSMP)
Environmental	• Compliance and Assurance reporting against the project regulatory conditioned obligations (weekly and monthly) • Weekly Site inspections and monitoring • Monthly reporting	No exceedances on limits imposed for: Dust / Noise / ESC's / Spills / Waste disposal reporting / Water disposal / Soil disposal / Cultural Heritage	Acceptable, low-level impact on the external environment	Leading and Lagging indicators (refer to the CEMP)
Quality (Optimised Start up)	• Cleanliness • Tightness • Integrity/Reliability (static and rotating equipment) • Preservation			Leading and Lagging indicators (refer to the QMP)
Cost		• Complete within approved CAPEX		• Applicable to schedule of rates work • Lump Sum with incentive scheme
Industrial Relations	• Zero Disruptions or disputes • Harmonious workforce	• Agreed regional EBA negotiated up front		
Community and Stakeholders relations	• Project Town halls and updates • Focus on Local content suppliers. • Target and exhaust local labour content	TBC	• No adverse impacts on the local community	
Plant performance	• New facilities to meet the specified performance criteria	• Key Project Metrics (Within the BoD)		

4.3 Construction Phases

The project will be constructed in phases to optimize financial planning, facilitate early issue detection, enhance risk management, and provide flexibility for potential adjustments. The specific construction stages are outlined below.

Table 4.3-1 Construction Phasing

Phase	Approx Timing	Contractors
Offsite Procurement/Fabrication (equipment)	Jan-24 to Oct -25	Various (refer Procurement Plan)
Offsite SMP fabrication	Jan-24 to Oct -25	Various
Site Establishment (Early Works)	July-24 to Sep-24	Civil Contractor
Bulk Earthworks and Civil Works	Sep-24 to May-26	Civil Contractor
Onsite SMP Installation	Apr-25 to Nov-26	SMP Contractor
Onsite E&I Installation	Apr-25 to Nov-26	E&I Contractor
Controls (DCS)	Apr-25 to Nov-26	DCS Contractor
Pre-Commissioning	Nov-25 to Sep-26	IOT/Alpha HPA
Wet Commissioning & Start Up (not part of this plan)		IOT/Alpha HPA

Note: dates are preliminary and subject to change.

4.4 Constructability Objectives

Constructability execution phase aims to optimise project delivery through the following key objectives:

- **Safety:** Prioritize safety requirements during construction.
- **Quality:** Embed quality standards throughout construction to ensure the final product meets expectations.
- **Risk Management:** Integrate constructability into the Risk Management Process.
- **Timely Delivery:** Meet pre-fabrication and construction schedules.
- **Integrated Planning:** Incorporate constructability into project execution plans.
- **Comprehensive Design:** Include construction phases in design studies, inclusive of load case conditions.
- **Construction Expertise:** Leverage construction knowledge and experience in design and project planning.
- **Strategic Contracting:** Involve construction teams in contract development.
- **Schedule Optimization:** Prioritize construction's impact on overall project timeline.
- **Proven Methods:** Utilize established construction methods for efficiency.
- **Efficiency:** Promote efficient construction operations and plant maintenance through effective site layout.
- **Environmental Responsibility:** Minimize environmental impact.
- **Community Responsibility:** Develop a traffic management plan for transporting fabricated equipment to minimise impact to the community.
- **Efficient Construction Methods:** Explore pre-assembly of components for on-site efficiency, minimizing HSE impact and maximizing productivity.

4.5 Integrated Owners Team (IOT) Roles and Responsibility

The IOT is responsible for overseeing and coordinating various aspects of site construction, including:

- **Contractor Interface Management:**
  - General co-ordination of interfaces of the multi disciplined contractors.
  - Clarification of engineering drawings and documentation.
  - Resolution of technical queries
  - Enforcement of project standards.
- **Free-Issued Items / Client Provided Items Management**:
  - Vendor engagement and management of delivery schedules
  - Timely updates to contractors on expected deliveries
  - Ensuring proper unloading and laydown areas are available.
  - Coordination & assistance with transport and receipt of goods.
  - Inspection and handover of goods to contractors.

- **Procurement Interface and Claims Management:**
  - Addressing claims, variations and other procurement related issues.
- **Permitting and Approvals Coordination:**
  - Assisting with obtaining necessary permits and approvals
  - Implementing compliance assurance.
- **Contract Management and Support:**
  - Liaising with contractors on contract terms and conditions.
- **Cost and Schedule Reporting:**
  - Tracking and reporting project costs and schedule progress.
- **Progress Claims and Invoice Management:**
  - Processing progress claims and verifying invoices for construction work.

4.6 The Alpha IOT Role and Responsibility as Principal Contractor

Acting as the Principal Contractor, the IOT is responsible for managing all site construction activities in accordance with the agreed scope of work and fulfilling obligations under the Queensland Work Health and Safety Regulation 2011. This includes:

- Signage identifying principal contractor.
- Developing a comprehensive work health and safety (WHS) management plan, including site rules.
- Preparing site-specific inductions for all personnel.
- Reviewing and approving all safe work method statements (SWMS) before high-risk construction work begins.
- Ensuring compliance with specified requirements for facilities and amenities
- Managing risks associated with construction materials, waste, plant, traffic and essential services.

The general requirements are detailed below.

4.6.1 Construction / Project Management

As the Principal Contractor, the IOT will provide comprehensive project management services to ensure successful completion of the Site Works. This includes:

General project management activities shall include;

- Management of contractor scope
- Scheduling
- Risk Management
- Reporting
- Health & Safety compliance and initiatives
- Environmental compliance and assurance
- Procurement
- Logistics
- Site Administration

4.6.2 Health, Safety and Environment Management

All work undertaken on this project shall be performed in compliance with:

- The Queensland Workplace Health and Safety Act 1995 and Queensland Workplace Health and Safety Regulations 2011
- Alpha HPA Corporate Safety Policies and Procedures and the Construction Health and Safety Management Plan
- Observance of the Building & Construction Industry Improvement Act 2005 or legal replacement
- Environmental Regulatory and Permitting Requirements
- State Approvals

A safety management system (NOGGIN) will be implemented to ensure that risks to persons from construction operations are at an acceptable risk level. The safety management system will provide for adequate training, planning, Organization, leadership and control, supervision, monitoring and assessment of the working environment, work procedures, equipment, and installations.

The management of safety on the site will form the major component of the Construction Health, Safety Management Plan (CHSMP) and Construction Environmental Management Plan (CEMP). To meet the

objectives of the CHSMP and the CEMP, the associated legislative requirements, and the expectations of all stakeholders the project has as its mission, the achievement and maintenance of “zero” harm.

This is in addition to the instigation of appropriate controls, as identified through the risk management processes, to eliminate and/or mitigate the associated health, safety and environmental risks. Alpha’s IOT members approach to achieving the goal of “zero harm” is based on the establishment of a culture that proactively promotes the prevention of harm to people, the environment, and the community.

This occurs through demonstrated leadership by leaders at all levels through genuine commitment, personal example, positive behaviour, consistency and passion to pro-actively demonstrate that health and safety is an integral part of the project execution. All site IOT members, contractors and sub-contractors are to be made familiar with the requirements of the plan through site inductions.

The key safety focus areas for the site-based team include:

- Providing visible lead roles in promoting and ensuring that contractors’ management and supervisory staff are fully committed to the very high standards of safety expected on site.
- Ensuring that contractors are aware that safety will not be compromised.
- Audit of site safety against each contractor’s Safety Management Plan
- All critical construction high risk work activities are planned and managed by a combination of Risk Assessments (CRAWs, SWMS, JHAs, HAZOPS, etc) and work method statements or Safe Work Procedures
- Training of staff and competency verification
- Collection, collation and reporting of site safety statistics.
- Timely contractor provision of incident notices and investigation reports.
- Pre-employment medical requirements
- Inductions
- Safety Management personnel
- Training
- Safety Statistics and reporting
- PPE requirements
- Housekeeping
- Reporting
- Drug and Alcohol Testing
- Accident and Emergency Response Management
- Training and Competency
- Implementing the site Permit to Work (PTW) Procedure

All site-based Contractors shall submit a CHSMP and a CEMP to Alpha’s IOT Representative prior to mobilisation for approval.

4.6.2.1 Resources

Acting as the Principal Contractor, the IOT will provide resources to establish the site safety management system and processes, including the implementation, auditing, monitoring, and review of the system for effectiveness. The following resources will oversee the execution and implementation, with additional support provided by the contractors health, safety, and environmental team for their key areas and activities:

- Health, Safety and Environment Lead
- Environmental Adviser
- Safety advisers as required for each of the main workplace areas.
- Safety Administration Officer
- Training/Emergency Response Coordinator

Additional equipment inspection support may be required during peak periods, particularly for Bulk Earthworks and SMP activities. This can be handled by the Safety Advisors or an external organization if needed.

4.6.2.2 Site Safety Meetings

All on-site personnel must participate in the following information and briefing sessions:

- Site inductions
- Weekly toolbox meetings

- Daily Job pre-starts
- Hazard Reviews
- Weekly Site Safety Meetings

In cases of frequent near misses and/or incidents within a specific contract, a weekly safety meeting will be convened until control is re-established and improvement is demonstrated. Typically chaired by the IOT HSE Lead, this meeting aims to address issues affecting the contract and determine the appropriate safety approach for ongoing works.

Attendees will include:

- HSE Lead
- Construction Manager
- Contractor Project Manager
- Contractor Safety Advisors
- Contractor safety representative and possibly the workforce

Meeting minutes and decisions will be communicated to the workforce through various channels, including safety notice boards in the crib huts, notice boards, safety huddles and toolbox meetings.

4.6.2.3 Site Critical Safety Rules

The Alpha HPA IOT have established site “Critical Safety Rules” that are mandatory and will be enforced as non-negotiable conditions of working on the project site. Any safety breach that conflicts with the “Safety Critical Rules” will result in the following disciplinary process:

- Level 1 – Formal counselling
- Level 2 – Written Warning
- Level 3 – Final Written Warning

Any breach of “Safety Critical Rules” may result in instant dismissal and removal from site.

Safety Critical Rules are shown at Figure 4-1 overleaf.

Figure 4.6-1 Safety Critical Rules



4.6.2.4 Emergency Response

A Project Emergency Response Plan will be developed for the construction site. For the purposes of the plan, emergencies are any incidents on site or off-site activities that are project related.

The Project Emergency Response Plan will form part of the induction programme and be displayed in prominent locations around each site and at the project construction site office.

As part of establishing the Plan the Construction Manager will arrange for input from and a visit to the site by personnel from Fire, Ambulance, Police and other applicable agencies and Stakeholders such as Orica and Rio Tinto (Yarwun) to familiarise them with layout, access etc.

From time to time during the construction period, the HSE Lead will arrange for the Emergency Response Plan to be tested using an exercise involving the emergency services. All site personnel will be required to participate in these brief but effective exercises.

The CHSMP will identify the location of the necessary muster areas used during the construction period and the location at the site boundary where an IOT nominated person will meet emergency vehicles to guide them to the point of the emergency/incident as applicable.

4.6.2.5 Site Orientation (Induction)

All personnel will participate in a comprehensive Site Orientation program, conducted by the IOT representatives on behalf of Alpha HPA. This multi-part orientation will cover the following key areas:

- **Welcome to the project:** An introduction to the project by the IOT representative.
- **Cultural Heritage:** Information on the Traditional Owners and their cultural significance to the site.
- **Environment:** Overview of the site's environmental context and the environmental commitments of the project and workers.
- **Health and Safety Induction:** A detailed induction on the site-specific health and safety procedures and expectations, led by the IOT HSE representative.

All site orientation induction materials are available and maintained within the project Sharepoint site.

4.6.2.6 Construction Plant Equipment, Tools etc

The Contractor is responsible for ensuring that all construction plant, equipment, power and hand tools brought onto the site by the Contractor or its subcontractors meet the following requirements:

- **Suitability:** Equipment must be appropriate for the intended work.
- **Inspection and Certification:** Equipment must be approved, inspected, tested, and tagged (if applicable) according to safety and health statutory regulations before importation onto site.
- **Maintenance:** Equipment must be maintained in safe and operable condition.

- **Operator Competency:** Users must be trained, competent, experienced, and (where necessary) licensed and certified to operate the equipment.
- **Guarding:** Rotating or moving parts must be adequately guarded to prevent accidental contact.
- **Emergency Stop:** Power-driven machines must have accessible and identifiable emergency stop mechanisms. Hand-held power tools must have automatic or emergency shutdown ("dead man") switches.

All equipment and structures, both fixed and temporary, must be regularly maintained under a planned maintenance system, with intervals not exceeding manufacturer recommendations, to ensure the safety of operators.

The Contractor must provide the IOT with inspection certifications within the previous twelve months for all mobile/earthmoving equipment, cranes, lifting slings, shackles, harnesses, etc., before use. Additionally, any tests and inspections required by regulatory authorities must be carried out. Safe working load (SWL) and radius charts must be available and clearly marked on all lifting equipment. If certifications expire while on-site, the Contractor must ensure timely recertification to maintain compliance.

The Contractor must maintain a register of all lifting equipment and tackle. All equipment and tools are subject to a final inspection before use by the contractor.

4.6.3 Environmental

All work undertaken on this project will be carried out in strict accordance with the relevant clauses of the General and Special Conditions of Contract including compliance with:

- Pre-scribed approved conditions from Federal, State, Local Government, including referral agencies.
- Construction Environmental Management Plan

Contractors will be required to develop a project specific Environmental Management Plan based on the above, covering all environmental aspects related to their scope of work.

The IOT Environmental advisor will review the contractors' Environmental Management Plans. Work will not be permitted to commence on site until the plan is approved.

4.6.4 Quality Management

Refer to the project-specific Quality Management Plan (Document No: MC23050-000-Z-PLN-00011) developed and implemented by the IOT to include:

- Meeting the requirements of all stakeholder quality objectives
- A statement for the quality objectives for the project
    - Zero harm to people and the environment in the delivery of the project
    - Maintain confidentiality of ALPHA HPA information
    - Supply equipment and materials to the required standards.
    - Complete construction and commissioning to the required standards
    - Manage changes to the scope, budget, and schedule.
    - Meet legal, statutory and regulatory requirements.
- The projects approach to quality management

4.6.5 Key components of the project quality management system

- Quality responsibilities (assurance and control)
- Minimising errors and reducing re-work
- Performance monitoring
    - Project reports, reviews and audits
    - Support quality control of all service providers, suppliers and contractors.

All service providers, suppliers and contractors shall submit a QMP to Alpha's IOT Representative prior to mobilisation for approval.

4.6.6 Supervision

Acting as the Principal Contractor, the IOT shall ensure that all personnel on site are trained and competent and have all regulatory tickets and licenses for the work scope and tasks performed. The Contractors shall provide all training records if requested by Alpha's IOT Representative. All contractors shall keep and maintain live records on site for auditing and compliance verification.

4.6.7 Training and Competency

Acting as the Principal Contractor, the IOT shall ensure that all personnel on site are trained and competent and have all regulatory tickets and licenses for the work scope and tasks performed. The Contractors shall provide all training records if requested by Alpha's IOT Representative. All contractors shall keep and maintain live records on site for auditing and compliance verification.

4.6.8 Meetings

Acting as the Principal Contractor, the IOT shall attend and chair the following meetings.

4.6.8.1 Pre-Site Mobilisation

- Kick off meetings.
- Construction Risk Assessment Workshops (CRAW's)

4.6.8.2 Post Site Mobilisation

- Daily pre-start meetings
- Weekly progress meetings
- Interface meetings

4.6.9 Reporting

Contractor progress reports shall be provided weekly, including.

- Items progressed during the period.
- Items to be progressed next period.
- Key issues and Opportunities
- Safety Statistics
- Variations
- Document Management

4.7 Cultural Heritage

Alpha HPA IOT will manage all cultural heritage requirements with assistance of the Port Curtis Coral Coast (PCCC) native title claimants Broadly, Alpha HPA takes reasonable steps to preserve, protect and salvage any items of Cultural Heritage. This is largely achieved through cooperation and involvement of the native title claimants prior to commencing any new activities.

4.8 Risk Management

The Project Risk and Uncertainty Management Process (PUMP) aligns with the ISO 31000:2018 standard as illustrated in Figure 4-1 and is detailed in the Project Risk Management Plan (Doc Number: MC23050-000-Z-PLN-00014).

The Project Director, Construction Manager, and the project team conduct monthly risk reviews, assessing risks across disciplines and project stages. These reviews focus on implementing and evaluating the effectiveness of agreed controls, with updates to the risk register as needed.

Construction processes aimed at mitigating risks to successful project completion, as outlined in the Risk Management Plan, encompass:

- Design completion
- Performance of Alpha HPA IOT staff
- Performance of engaged consultants
- Availability of procured materials and equipment
- Initial site survey by Contractor
- Availability of site to contractors
- Delay in awarding of contracts
- Performance of contractors/suppliers
- Review of CRAW's and High-Risk Work activities

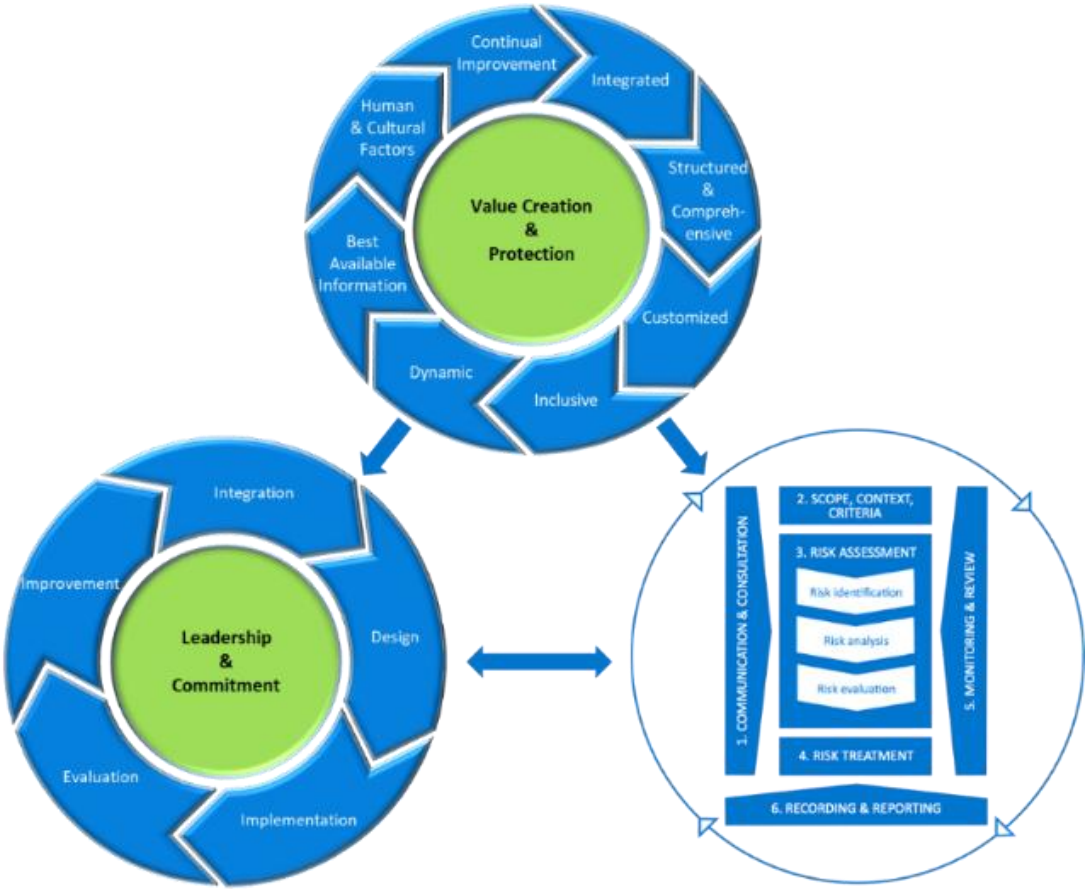


Figure 4.8-1: ISO31000:2018 Risk Management Guidelines – Principles, framework and process

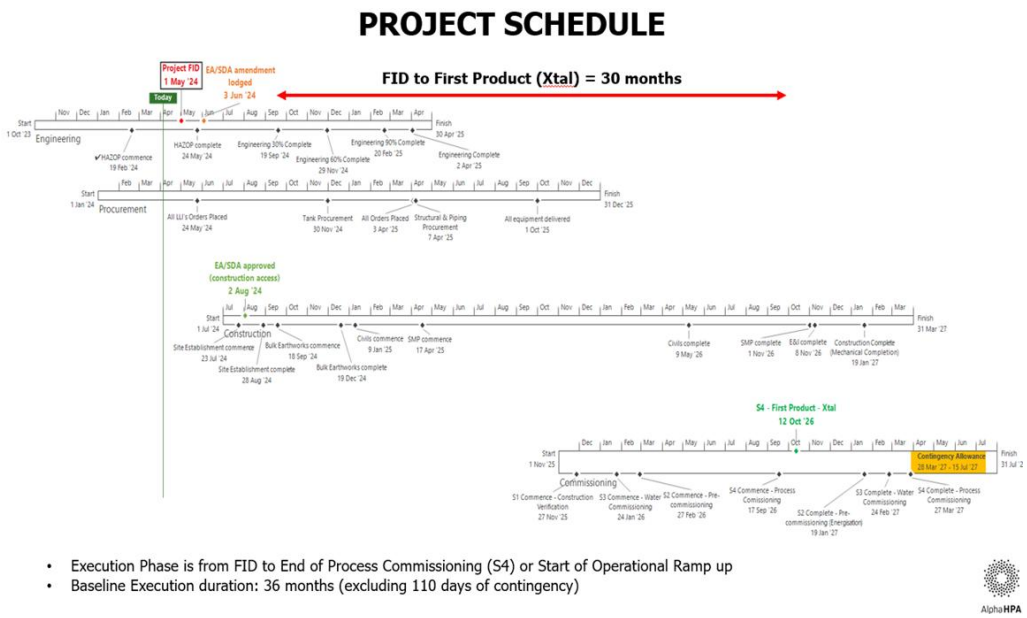
5 Project Schedule & Work Breakdown Structure

5.1 Basis of Schedule

The Basis of Schedule for the execution phase (Refer HPAF-SCH-00034.docx) contains activity durations, sequence of work, project calendars, key milestones, and critical path for the project.

The baseline schedule for the execution phase is outlined within HPAF-SCH-00033.

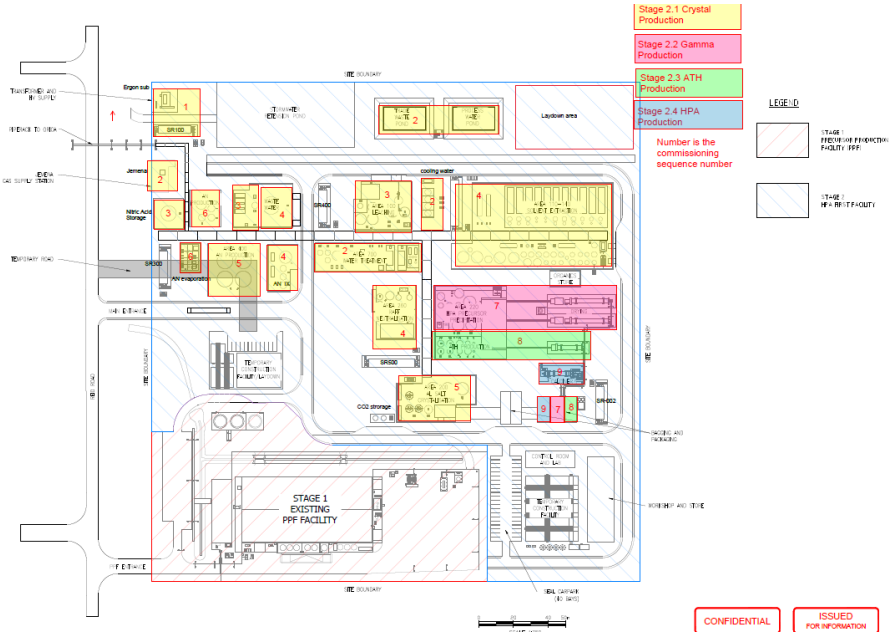
Figure 5.1-1 Project Schedule



5.2 Work Breakdown Structure (WBS)

The construction planning for the plant has been divided into work breakdown structure (WBS) areas to separate works and allow series / parallel on-site construction. The schedule allows for multiple work fronts where practical. Further work on the construction sequencing will be required during early design with construction contractor involvement.

Figure 5.2-1 Project Site Location



5.3 Early Works

Generally, no construction work on the project will commence until Alpha HPA have obtained Final Investment Decision (FID), and all the regulatory approvals required to enable commencement of works.

Prior to this date procurement activities associated with tender preparation, bid, evaluation and recommendation will be undertaken for contracts that require a commencement as soon as possible. Early works (Site Establishment) scope activities shown in the table below:

Scope Activities	Description
Clearing Site	Clear and Grub of the full site
Clearing Temporary Site	Clear, Grub and hardstand of temporary construction area
Temporary site access road	Preliminary works
Services relocation	Relocation of existing site serves (Telstra fibre, Ergon power)
Construction laydown	Hardstand and appropriate storage racks
Temporary Site Office services	Hook up of power, water and sewage.
Construction security fencing	Supply and Installation of suitable fencing for construction works .

6 Construction Establishment and Organization

6.1 General

A competent and experienced site team is a key requirement to properly managing all aspects of the construction phase. The Alpha HPA IOT will assemble the project construction team, drawing on personnel from Alpha HPA, Prudentia, PMC or sourcing externally if required.

6.2 Organizational Structure

The Construction Organization Chart, detailed in Appendix 1 – IOT Organization Structure (HPAF-DOC-01002), outlines the team composition, which will evolve as the project progresses. Periodic updates to the organization chart will be maintained within the project Sharepoint site.

During the pre-FID phase, the Construction Manager, Package Managers and several discipline Engineers will form the core Construction Team, based in the Brisbane Project office. Their responsibilities include providing support in documentation, procedures, planning and constructability, aligning with the timeframe and requirements of the Project Director. Some of the construction personnel involved in the early site works (Package C-01a after FID will be located as per section 6.3 below).

Following FID, some construction personnel involved in the early site works (Package C-01a) will be located as outlined in section 6.3.

6.3 Site Organization

Alpha HPA IOT shall supply the following personnel to form the site team:

- Construction Manager
- Field (Package) Superintendents
-
- Discipline Field Engineers
- HSE Lead
- HSE Advisors
- Permitting Authorities
- Quality & Risk Lead
- Site Administration and Document Control
- Contracts Administrators
- Scheduler
- Cost Controllers
- Material and Logistics Coordinators

6.3.1 Responsibilities

The Construction Manager is responsible for the complete administration and organisation of construction and field personnel and directs the field effort through the activities of his staff.

The Construction Manager reports directly to the Project Director. Specific responsibilities of the Construction Manager include:

- Leading the management of HSE on site.
- Assisting in developing the Construction portion of the schedule for the project.
- Participating in the development of the contracting plan and participating in contract enquiry package development and bid reviews.
- Developing of the site resourcing plan and selecting/mobilising the Construction Site Execution Team.
- Establishment of the project site facilities.
- Managing and administering of the site contracts to achieve safety, quality, budget, and schedule objectives.
- Managing interfaces on site including between contractors, and between Construction and Operations.
- Testing and Completion of construction.

- Handover to Commissioning and/or Operations.
- Commercial closeout of contracts.

The Field (Package) Superintendents are the leaders on the project for the specific allocated construction packages. Reporting to the Construction Manager. Specific responsibilities include:

- Leading the management of HSE on site.
- Co-ordination and production (on-schedule and in-budget) responsibilities for all work in the field including interfaces with other contractors and disciplines.

Project Site Engineers report to the Superintendents, however also has a functional and administrative reporting line to the Engineering Manager (Brisbane Based).

Specific responsibilities include:

- Champion all matters HSE related on site.
- Resolution of Field Technical Queries
- Input into quality inspections and audits
- Reporting on schedule and cost
- Supporting system completion and turnover
- Champion all matters HSE related in the field.

The HSE Lead reports to the Construction Manager and has a functional and administrative reporting line to the HSEQ and Risk Manager (Brisbane Based). The HSE advisors including the Permitting Authority will report directly to the HSE Lead

Specific responsibilities include:

- Lead the management and administration of HSE on site.
- Lead the Site security and emergency response team.
- Ensure compliance to safety regulations.
- Conduct training for all personnel.

The Project Services Superintendent reports to the Contracts and Procurement Manager (Brisbane based) but will also have an administrative reporting line to the Construction Manager. Site contracts administrators, schedulers and cost controllers including procurement and logistics report to the Project Services Superintendent

Specific responsibilities include:

- Champion all matters HSE related on site.
- Develop and champion the quality management on site
- Conduct inspections and audits(surveillances) on site
- Prepare reports for the execution phase
- Cost and Schedule progress reporting
- Site procurement and control
- Overall Logistics planning and implementation

6.4 Construction Site Facilities (Buildings, Services & Contractor Facilities)

Temporary site offices for the IOT will be arranged as part of the Early Works Package C-01a. Temporary access road will be established from Reid Road to site, including preparation of hardstand and laydown areas.

The construction contractor/s will provide their own temporary buildings and facilities as agreed by the IOT.

Initially, services will be established to facilitate site mobilisation, building and facilities for the Early Works scope. The electrical services required for contractor establishment will be provided as the construction programme demands. The electrical supply will be via diesel generators.

6.4.1 Internet

Temporary internet will need to be sourced by the Contractors using mobile broadband or equivalent.

6.4.2 Sewer

Permanent sewerage connection is available at the PPF however this may not be available during initial set up and consultation with the Gladstone Regional Council is required prior to connecting to the system. Construction contractors will need to provide their own disposal of septic waste.

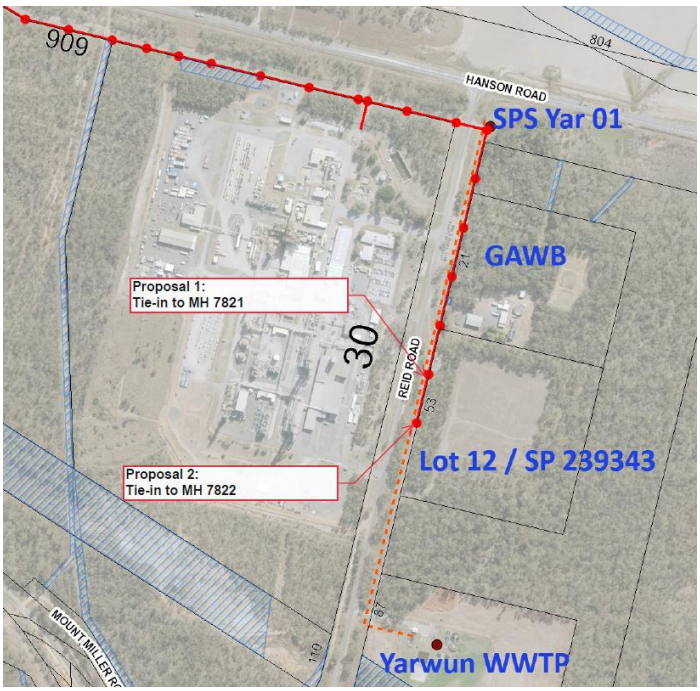


Figure 6.4-1 Sewer Connection

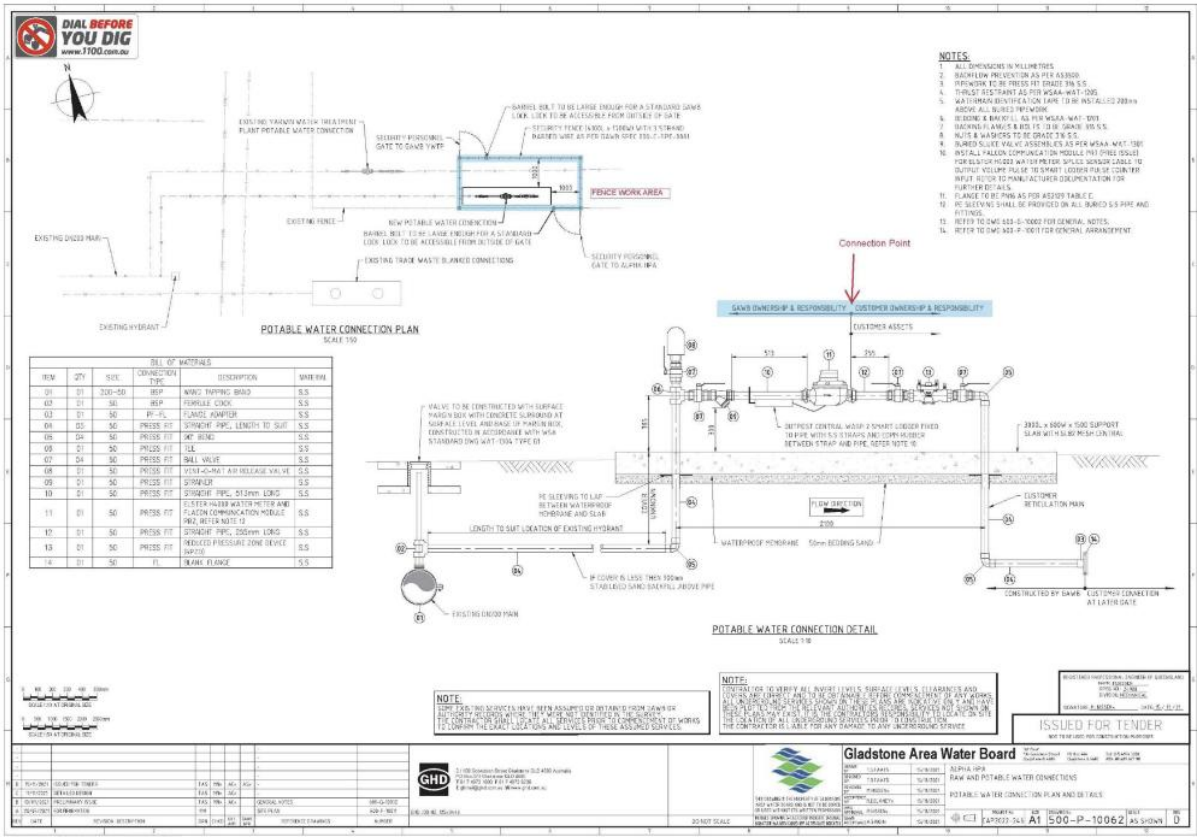
6.4.3 Water Supply

The supply of treated water for construction via a temporary connection on site at the location below. This connection was made available by the GAWB during the construction phase of the PPF. This includes a connection for a standpipe to load water carts and the permanent connection to the PPF.

Figure 6.4-2 GAWB Potable Water Supply Location



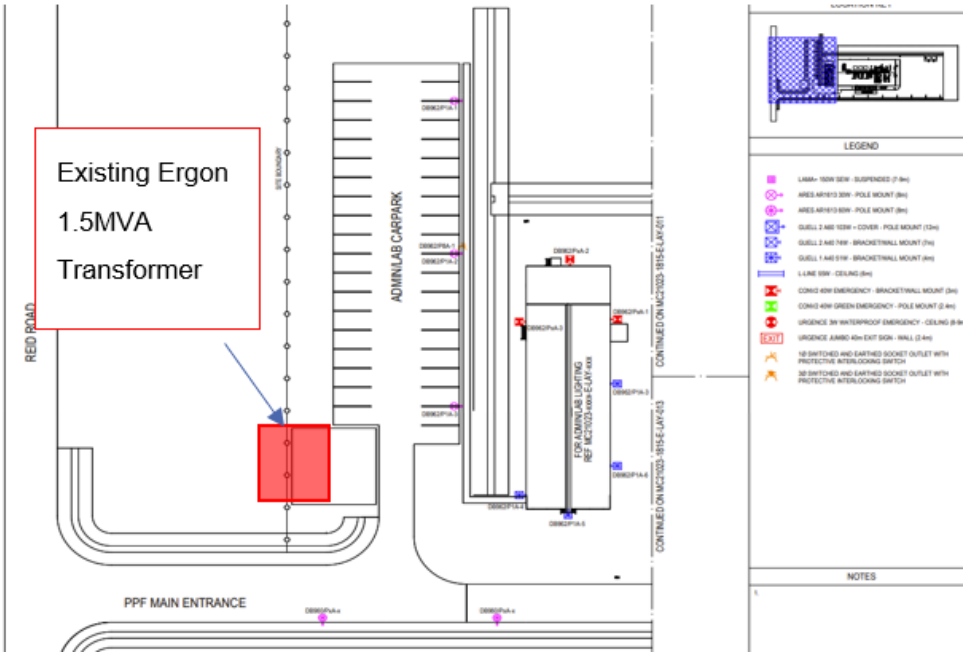
Figure 6.4-3 GAWB Potable Water Supply Connection Detail



6.4.4 Power Supply

Permanent power for the site facilities is being explored via the existing Ergon 1.5MVA transformer surplus without causing any disruptions (redundancy issues) to the PPF. Temporary power will be provided by the construction contractors via diesel generators.

Figure 6.4-4 Ergon Power Supply



6.5 Warehousing and Storage

A warehousing facility will be available at the Alpha HPA Beckinsale Street facility in Gladstone. This facility will store equipment requiring some form of preventative maintenance or needing to be in a controlled environment (i.e: Critical electrical and instrumentation components).

Site warehousing areas will be required and made available for contractors to use with fitted out containers to primarily store consumables, fittings, valves, pipe etc.

The majority of site warehousing and inventory control will be by the SMP and E & I/C Contractors who will provide and manage their own facilities.

6.6 Laydown/Staging Areas

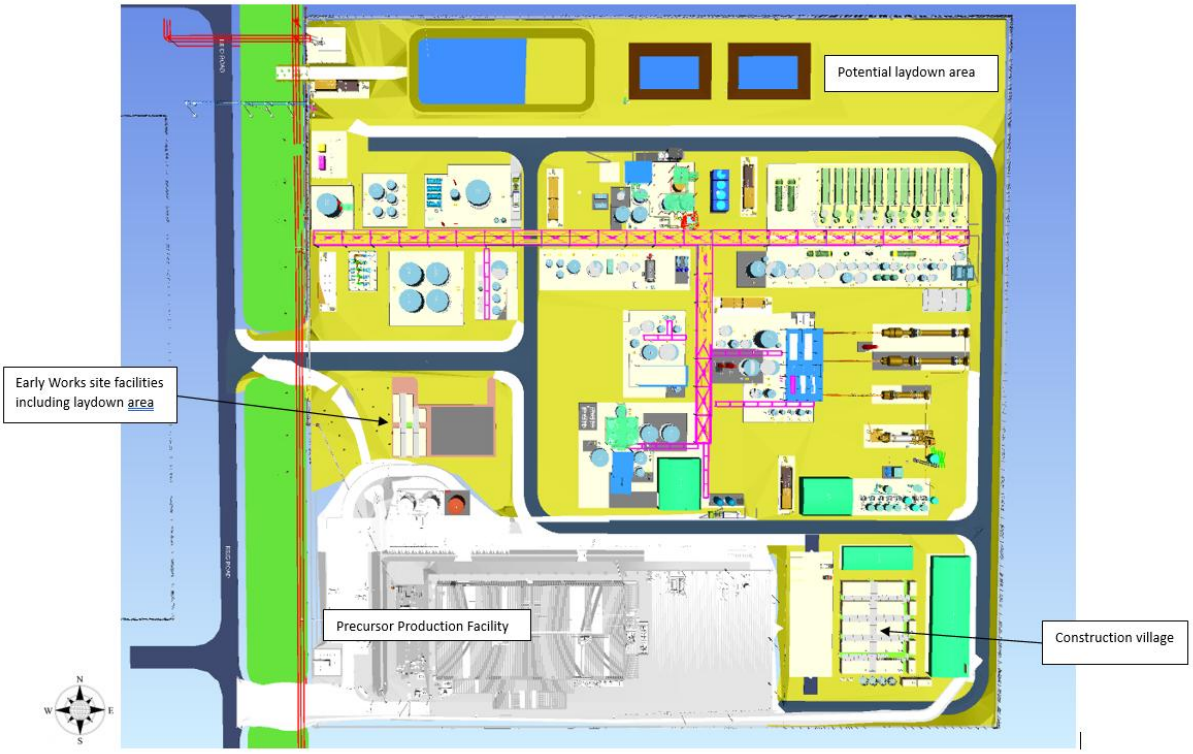
Site Laydown areas (refer figures 6-5 and 6-6 below) and Staging areas (refer figure 8 below) will be assigned and agreed with construction contractors as each is mobilised on site. The location and size of the lay down areas will be determined by each contractor's scope of work and need for space. Where required he lay down areas are be fenced and secured by the contractor. Additional laydown (stagging) areas will be required offsite. The Gladstone Ports Corporation has areas available within proximity of site. These include areas at Port Curtis and Alf O'Rourke drive in Gladstone. Other alternatives will be explored on a "as needed basis"

Figure 6.6-1 Port Central Land Status



Figure 6.6-2 Staging (laydown) Areas

The main laydown area available on site is depicted on the location below designated Hardstand Area.



6.7 Site Survey

A site survey was completed by Northgroup as listed in the reference documents. The IOT will determine the level of surveying activity required to establish site reference points/base lines and RL's for the construction activities. Survey information will be included in contract documentation and the IFC drawings.

6.8 Site Layout and Access

The areas allocated for the construction site facilities and construction laydown will be agreed by the IOT and the various contractors so as not to impede on scope progression and minimise interfaces/SIMOPS with other suppliers.

The plans identify the access roads for contractors and respective laydown areas and will be issued to all contractors. Only nominated access roads are to be used by contractors. Contractors will be required to familiarise themselves with the existing roads, laydown areas and access ways and, in particular, height/width clearances for large loads and existing ground conditions.

6.9 Off Site Construction Activities

The IOT will be actively involved in inspecting and expediting off site manufacture of equipment and materials. Design and project personnel will develop an inspection/expediting plan tailored around the procurement requirements of each order/contract. Where required inspections will be outsourced to a third-party inspection agency, if a project member is not available.

6.10 Buried Services

The IOT will be responsible for identification and management of buried services. A dial before you dig (DBYD) and excavation permits will need to be obtained by the Contractors prior to any excavation taking place.

The site is a “Greenfields Site” with only a few buried services identified within the disturbance footprint for Stage 2. These include water supply from GAWB connection to the PPF, GRC sewer line from the PPF to the sewer pit.

The majority of buried services are located on the western boundary of the site in the GRC easement.

6.11 Contaminated Soil

The site was previously used by the Australian Magnesium Corporation Pilot Plant. Soil testing was performed during the geotechnical investigation scope. Laboratory results were compared to trigger values from the following guideline to assess the soil contamination status at the site based on land use (industrial).

National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) (as amended 2013). Table 1A(1) Health Investigation levels (HILs) for soil contaminants Commercial/Industrial

All soil sample results (from test pits and surface soil samples) reported below the NEPM guideline limits for industrial sites.

If contaminated soil or existing latent conditions are identified the Contractor shall advise the IOT for direction.

6.12 Site Administration

6.12.1 Security

Site security will be provided for the project. The construction site will be delineated by a temporary security fence during the Bulk Earthworks scope and followed by the installation of the permanent security fence once the Bulk Earthworks scope is completed. The permanent security fence, including personnel turnstiles will provide control with site access and safety. The construction of the perimeter fencing will progress as the works dictate but will ultimately surround the entire site.

A security firm will be engaged to provide the services which would generally cover:

- General site access
- Perimeter patrols
- Spot checks for theft or contraband
- Assist in the co-ordination of emergency procedures.

Operational hours for security guards manning the project security gates will be determined by project needs, based on the actual/perceived security risk at any particular phase and/or scope of work.

The local police force would be used to respond to all illegal activities and local emergency services for emergency response.

Contractors will remain responsible for their own security of their facilities and equipment.

6.12.2 Access Control

Specific access control procedures will be developed for the main work area with access from the main access road from Reid Road including:

- Use of the photo ID electronic tags will be part of the Induction process and incorporated into the Access procedure.
- Access to the site is restricted to the project workforce and will be based on the following:
    - Valid site inductions
    - Conformance to the IOT CHSMP with respect to vehicle type and fit out and pre-issued access permit.
- Conformance to the IOT CHSMP with respect to drug and alcohol policies and fitness for work rules

Visitors are not permitted onto the project site unless they have been approved by the IOT Construction Manager or delegate, have undertaken a visitors safety induction, have a duly authorised visitors pass from security, and remain in the company of an inducted site representative at all times while on site.

6.12.3 Site Key Register

A nominated IOT site administrator will be responsible for maintaining a site key register. A record of names and contact details for the following will be included:

- All IOT members holding keys to the offices, compounds, etc
- Names of all personnel holding keys to entry gates, buildings, etc
- Names of all contractor personnel holding keys to the contractor's facilities in case of
- emergency

The register will be updated monthly as a minimum.

6.12.4 First Aid Facility

A first aid facility will be established on site.

The facility will be manned during normal working hours. Should further treatment be required, the contractor will provide transport and support for the injured person to their nominated medical centre. Emergency transport to a hospital would be provided by the local Ambulance Service. First Aiders will be nominated by all contractors to ensure coverage across site

6.12.5 Maintenance of Site

The project site will need to be maintained in line with good construction practice and in line with the development consent conditions.

6.12.6 Landscaping and Ground Maintenance

Periodic maintenance of all grassed and or landscaped areas will be carried out as required, including but not limited to fire breaks at the property boundaries, temporary IOT and contractor site offices and crib areas, construction roads and boundaries with Reid Road.

6.12.7 Construction Waste

Contractors will be responsible to remove general construction waste to an approved waste management facility. No construction or domestic waste will be disposed of on site.
Hazardous waste removal to a registered disposal facility will be the responsibility of the contractor.
No waste will be removed off site without written approval by the IOT Construction Manager or delegate

6.12.8 Site Drainage and Water Management

Temporary erosion and sediment controls will be established early in the construction work (Early Works and the Bulk Earthworks scopes after which periodic maintenance will be carried out on all drains and water-retaining structures. Special inspections will be carried out in storm events for signs of failure.
Compliance with the reporting requirements will be ensured by the IOT site environmental adviser.

6.12.9 Construction Roads

The site construction roads will be unsealed for an extended period and will require periodic maintenance. Dust suppression will be part of the contractor's responsibility.

6.12.10 Local Roads

Care will be taken to avoid contamination of the local road system with earthworks material. The Bulk earthworks contractor will be responsible for ensuring the public roads used during the scope execution are kept clean and clear of any deposited material. Installation of rumble pads (or equivalent) will be required.

6.12.11 Office Cleaning

A contract will be established for cleaning and provision of consumables associated with the IOT site offices and amenities. Its is the Contractors responsibility to provide cleaning services and consumables to their facilities whilst on site.

6.12.12 Transport / Site Vehicles

A limited number of Vehicles will be supplied for the IOT construction site under the following conditions:

- For the purpose of carrying out the works on site or suppliers located off site
- Not for private use unless approved by the CM

- Not allocated for the sole use of an individual
- The nominated responsible driver to take their vehicle to their accommodation each night if on a FiFo roster
- The responsible driver to check air, water, oil and fuel on a daily basis and replenish as necessary, and arrange for regular maintenance servicing as required.
- Carry out daily vehicle inspections.

6.12.13 Traffic Management

Traffic management is to be planned and executed both on public roads providing access to the site and within the site.

Each time there is a need to alter the access arrangements to or around the site, a traffic management plan is required to be approved by the Construction Manager or delegate. Where traffic on public roads is affected, prior approval in writing is to be obtained from the appropriate road authority, Main Roads Department or Gladstone Regional Council.

Access Traffic Consulting (ATC) was commissioned by Alpha HPA Limited to undertake a Traffic Impact Assessment (TIA) for the Site (refer reference documents).

The IOT with the collaboration of the Contractors at the varying phases of execution will manage all traffic management accessing the site and including the access to the EDQ Borrow Pit area in line with local requirements.

Any deviation from the Traffic Impact assessment will need to be brought to the IOT Construction Manager for approval.

7 General Services

7.1 Temporary Facilities

Facilities on site for the execution phase of the project will consist of the following:

- A fully furnished office, including workstations and communications will be provided to accommodate the IOT and SMP construction team and support personnel.
- An additional building will also be provided, which will be primarily used for inductions and safety meetings, etc.
- The project will provide a site first-aid facility The first aid facility will be operated by a specialist provider.
- Contractors will be required to provide first-aid kits at all respective work areas.
- Installation contractors will be allocated specific laydown areas.
- All contractors will provide all necessary construction offices, cribs, workshops and facilities, including storage
  of materials, tools and equipment. Contractors will also provide fenced compounds, if security storage is required.
- A 3-phase 415 V power supply and potable water source will be made available to each contractor. However, ablutions and toilet facilities as well as construction and workshop power will remain the responsibility of the contractors.
- These facilities will be required to comply with the local statutory regulations.
- Pedestrian access walkways will be constructed to provide all personnel with defined, safe access to their respective areas of work.
- Parking area for all personnel will be provided and will be identified in the Temporary Facilities Plan

7.2 Communications (on site)

Proper communications between the IOT and the various Contractor personnel are essential. Once the IOT site team is mobilised the Construction Manager, in conjunction with the HSE teams will develop a communication procedure to be followed.

The use of two-way radios will be the main means of communication on site.

7.3 Communications with Community

There will be no communication between the IOT site personnel and the community or interested external parties. Communication with the community and interested external parties will be undertaken by Alpha HPA and may take one or all of the following forms:

- Community meetings
- Presentations
- Project brochure
- Letter drops
- Site tours
- Project signboard

However, the IOT will carry some responsibility [to be advised by Alpha HPA] for Community Relations for the construction activities on the site.

7.4 Materials Management

The IOT responsible Materials Controller in conjunction with the Contractor site personnel carrying out this role will be responsible for acceptance, inspection, unloading and recording and the secure storage of all Principal Supply items for the project. This process will be managed in accordance with the procedure established in the Procurement and Contracts Management Plan and the Quality Management plan.

Laydown and delivery points will be stipulated either in the contract or prior to delivery to site.

7.5 Vendor Representatives and Consultants

Where it is necessary for a supplier's representative to supervise or check installation and/or commission individual equipment, the conditions of the supply contract are to be reviewed and the supplier contacted at an appropriate time to suit progress of the work. Where applicable, supplier travel, site and time costs are to be suitably recorded and approved by the Construction Manager. A written report of the activities on site of the supplier's representative must be obtained.

The IOT site team will require periodic support from several specialist service providers/consultants, such as those listed below. These services would be sourced under a project contract/order either from internal qualified personnel or through externally engaged service providers/consultants.

- NDT
- Soil and Concrete Testing
- Survey
- Specialised Hydrostatic and Pneumatic testing
- Environmental, Noise, Dust, Water, Vibration
- Geotechnical reviews and consultation
- Heavy Lift Specialist
- Security
- First Aid Provider

Where consultants are involved in supporting IOT management of a contract they are to be coordinated to suit the progress of the work. Authority to use service providers/consultants for these support services is to be obtained from the Construction Manager.

8 Project Controls

8.1 General

The Planning and Controls Management Plan (Document No: MC23050-000-Z-PLN-00006) sets out how project controls are carried out during the implementation and construction phase of the Project. For this phase, project controls comprise:

- Organisation and Responsibilities
- Scope Management
- Planning and Scheduling
- Cost Control (Trend management and Cost forecasting)
- Change Management (Control)
- Project Reporting
- Project Systems
- Project Close Out

8.2 Reporting

The Contractors will report to the IOT key information relative to progress and costs as stipulated under the contract. The IOT Project Controls Lead will maintain schedule and cost for reporting to the IOT leadership.

8.3 Planning and Scheduling

A Baseline Schedule has been developed for the project with key milestones identified. The development will evolve from the project end requirements for commissioning and delivery, logically worked backwards and then forwards level resource peaks and inconsistencies. All project personnel are to work to maintain milestone targets are achieved where practical.

The schedules will be updated with individual contractor contract programs as they are submitted and reviewed for each contract. The Project Controls Lead will carry out maintenance of the schedule. The IOT members are required to monitor each contractor's schedule with respect to:

- Keep informed on all activities which will affect the master construction schedule.
- Determine strategies and solutions to problems in conjunction with the Package Managers, Construction Manager, and contractor(s)
- Carry out detailed planning for specific critical areas.
- Analyse contractor's S curve and critical path schedules for discussion at site meetings
- Evaluate the effect of variations on the contract and master construction schedules.
- Ensure other Contractors and stakeholders who may be affected are aware of the schedule status and any resultant effects.
- Assess extension of time claims for additional work or unavoidable delays.

8.4 Document Control

The Alpha HPA standard document management process (HPA-PRO-00042) system will be utilised for the Project for all formal correspondence and transmittal of drawings and other Project related documentation between the IOT and Alpha HPA, IOT and vendors, contractors or other third parties. The Alpha HPA 's document control procedure will be used.

All documents will be issued in accordance with the document distribution matrix which will be developed by the IOT.

The IOT will setup and maintain a user-based network drive filing system and structure for the Project.

8.5 Materials Management

The IOT shall perform materials management services, using the principles documented in the Quality Management Plan (Document No MC23050-000-Z-PLN-00011) including;

- Procurement management of all 'Free Issued' items to the various construction Contractors
- Vendor engagement and management of delivery schedules
- Updating Contractors to when items can be expected on site, so Contractors can manage resources accordingly.
- Ensuring the Contractors notify the IOT of when deliveries are expected on site, so that suitable unloading and laydown areas are available.
- Management of delivery of goods to the site.
- Inspection of goods prior to hand-over to the IOT (Overs/Shorts and damaged Reports)
- Handover of goods to Contractors
- Expediting

8.6 Project Approval / Responsibility Matrix

The following provides guidance on project approvals;

Item	IOT Construction Manager	IOT Engineering Manager	IOT Package Manager	IOT Project Director
Contractor Status Reports	For information	For information	For information	For information
Invoicing and Claims	Reviewed by	For information	Approval	Final Approval
Contractor Safety Plans	Approval	Reviewed by	Final Approval	For information
RFI / TQ's (engineering)*	Reviewed by	Approval	For information	For information
RFI / TQ's (non-engineering)*	Approval	For information	Final Approval	For information
Scope Change – engineering *	Reviewed by	Approval	Final Approval	Final Approval
Non-conformance	Reviewed by	Approval	Final Approval	For information
Variation – time or cost	Reviewed by	Reviewed by	Approval	Final Approval
Environmental or Regulatory issue	Reviewed by	Reviewed by	Approval	Final Approval
Incident Report	Reviewed by	For information	For information	For Information

* If cost or schedule impact then follow Approval for Variation

9 Employee Relations

Employee Relations of the Alpha HPA Project will be performed in accordance with the IOT Conditions of Contract, and the employment agreements as documented in the Employee Relations Management Plan (Document No: HPAF-PLN-00015)

Contractors are to ensure that induction procedures are complied with for every contractor employee working on the site, and at all times act to create a positive and cooperative working relationship between all management and contractor's employees.

The IOT and Contractors will be responsible for Industrial Relations and Employee Relations for their workforce and sub-contractors for all site works. It is the contractors' responsibility to manage their contracts, ensuring total compliance with the relevant industrial legislative requirements and the General and Special Conditions of Contract including Employee Relations requirements.

The IOT, Contractors and all sub-contractors shall advise the IOT Construction Manager of any industrial relations concerns or issues. All parties shall:

- Maintain industrial awareness and try to anticipate problems.
- Understand the conditions of contract relating to industrial relations.
- Keep management advised regularly as to the apparent industrial mood on site:
- Keep good records.
- Be aware of the rights of union officials in particular the "right of entry".

A Code of Ethics must be maintained to clearly identify the values and standards required, that apply to everyone on the project, as well as the consequences for individuals failing to meet these values and standards. The Code of Ethics will set the minimum standard of behaviour expected of everyone employed on the Project.

10 Quality Management

10.1 Quality Assurance and Quality Control

The IOT, as part of its roles and responsibilities, will employ a risk-based approach to ensure the delivery of a compliant project. This approach focuses on operational criticality, as detailed in the IOT Quality Management Plan (Document No MC23050-000-Z-PLN-00011)

The Quality Management Plan emphasizes defect prevention, with swift detection and correction as secondary measures. It encompasses the development, implementation and control of quality planning, review, inspection, surveillance, verification, monitoring, and audit processes.

Non-conformance reports (NCR) will be issued by the IOT to address procedural deviations; specification non-compliance, or work that fails to meet quality and health safety standards. These reports, detailing the problem, its cause, and preventative actions, aid in problem resolution and corrective action documentation. Instructions and templates for raising NCRs are available within the Project Quality Plan and supporting workflows within SharePoint site. Lessons Learned from NCRs will be incorporated to prevent future occurrence.

Compliance with the Quality Management Plan will be verified through internal and external audits of each contractor, utilizing Inspection and Test Plans (ITPs) and Inspection and Test Records (ITR's). If required, specialized resources will be sourced either through existing contractors or external providers.

10.2 Manufacture and Construction

Quality assurance and quality control measures, including material test certificates, manufacture procedures, traceability, factory acceptance tests (FATs), site acceptance tests (SATs), and recording methods, are outlined within the relevant Supply Scope of Work. These measures shall generally be included in the Manufacturers Data Report (MDR).

The IOT will collect all MDRs and submit them to the Alpha Owners team for record keeping. Any non-compliances identified shall be documented and included in the MDR.

10.3 As Built Drawings

When changes to the “Approved for Construction” drawings are found to be necessary during the course of the site work, the IOT and Contractors shall liaise to mark up the working set of drawings accordingly per the agreed scope of work. At the close-out of each contract, the IOT responsible person will review the ‘as built’ information and drawings received from contractors to ensure all changes have been clearly identified and detailed. These will be forwarded to the appropriate engineering personnel for the “as built” revisions to be issued, and these revisions then checked for accuracy before final issue to Alpha HPA.

As-build drawings shall be ‘red pen’ marked up and issued as PDF to the IOT responsible person.

10.4 Quality Audits

Responsibility for developing, maintaining, distributing, implementing and reviewing the Audit Plan for internal and external audits of the project lies with the IOT and the Contractors in accordance with the IOT Quality Management Plan, Project Specifications, Procedures and Drawings. The IOT and the Contractors are expected to carry out audits and schedule them in the audit plan. Non-conformances shall be advised to the IOT.

11 Contract Development and Administration

11.1 Selection of Tenderers and Vendors

Selection of bidders/contractors for the major project works will be carried out in accordance with the Procurement and Contracts Management Plan (Document no: MC23050-000-Z-PLN-00004). The preferred Tenderers shall be selected based on location, experience and capability. A Technical Evaluation shall be completed with recommendation For Award (RFA) being issued to Alpha HPA for approval. Commercial contracts shall use the pre-approved Contract Standard Terms and Conditions.

11.2 Contracts Administration

Contracts administration on site will be managed in accordance with the IOT guidelines and the level of responsibility given to the construction team, and within the authority levels.

11.2.1 Design Queries/Request for Information (RFI)

On matters relating to design and constructability, contact will be made through the IOT Construction Manager, one of whom will address the issue directly or contact the relevant engineering discipline team for resolution.

RFIs such as technical queries and clarifications will be managed using a tracking register system during the construction phase of the project. The register will record resolutions and reference site instructions and pending/approved variations to the scope of work for each contract.

11.2.2 Progress and Coordination Meetings

Contract Progress Review Meetings will be conducted by the IOT with each contractor weekly to update contract plans and to communicate contract progress.

Coordination Meetings will be conducted weekly by the IOT with all contractors working in an area to ensure work plans are aligned and potential conflict issues are managed.

Progress and coordination meetings will have a nominated chair and will generally have a fixed day and time so attendees can plan accordingly. Each of these meetings is to have fixed agenda to be agreed between the IOT and the contractors Site Managers or delegate. Copies of the agreed minutes will be emailed to all attendees who will arrange for permanent copies to be filed for future reference.

All IOT site personnel, for all directions and RFI responses to the contractor, will use a formal documentation system which may also include Site Instructions. A Site Instruction may be formalised in letter form, depending on the nature of the issue.

11.2.3 Daily Diaries and Reports

The IOT members will complete a daily diary or report for each contractor and daily activities being performed on site. The diary/report format will include date, weather conditions/ temperature, labour numbers and equipment on the contract site, areas of work interruptions and potential claims, work conducted for the day (progress), particular issues of note, cyclic claims etc. Contractor's equipment is to be individually identified as follows: Description, make/model, ownership, road registration if applicable, if on site working or idle, if used for what purpose.

Diaries/Reports are to be completed on a daily basis and are not to fall more than one week in arrears. The IOT Construction Manager will be responsible to ensure that the Diaries are completed and accurate by carrying out a regular audit of the process.

Refer project SharePoint site for Daily Diary Template.

11.2.4 Contractor Liaison

The IOT Construction Manager with the aid of the site IOT supervision will be responsible for day-to-day on-site liaison with the various Contractor, paying close attention to safety and environmental issues, including quality control and assurance inspections.

The IOT Construction Manager will also progress claims by the contractor and collate weekly contractor status reports and status updates for use in the monthly report and analysis of any delay, variation or conflict/claim, etc. Site relevant photographic records shall be taken of the site and site activities on a regular basis to support reporting.

11.2.5 Measurement for Contractor Progress Claims

For each contractor's monthly progress claims, progress is to be measured on site for each activity listed in the contract priced schedule. The IOT site team is responsible for verifying these measurements for each site activity and agreeing with the contractor the quantities or percentages to be claimed.

The method of measurement for each activity to assess progress will be consistent for each progress claim and be predetermined either in the contract or agreed between the IOT representative and the contractor prior to commencement of the work. Following agreement between the contractor and the IOT site team of the quantity or percentage of site progress, the contractor submits its tax invoice to the Project Manager who will arrange for a progress certificate issued in accordance with the Contract. Where off-site activities are included in the progress certificate, the progress percentage is to be agreed by the appropriate supervisory personnel responsible for the off-site work.

11.2.6 Contract Close Out

After completion by the contractors of the scope of works under their contracts, the contracts will be closed out and punch lists, deliverables, certificates, notices, manuals, drawings, vendor data, MDR's etc. securities and retentions dealt with in accordance with the contract. A standard format Contract Close Out Report is to be completed to ensure that the relevant data is captured as a record of the contractor's performance and lessons learnt. All contract closeout reports will become part of the Project Closeout Report. A procedure for the preparation of Contract Close Out will be prepared at the beginning of project implementation.

11.2.7 Claim and Variation Management

Following contract award and to suit the IOT requirements, the scope of work in a contract may require varying - by addition, increase, reduction, or deletion of the scope of work. Procedures will be developed to cover the following:

- Issuing site instructions to clarify the scope of work or matters concerning construction activities.
- Managing possible changes to the scope of work
- Deciding that a variation is required.
- Preparing and submitting a variation for approval
- Issuing variations to the contractor
- Maintaining a Variation Register for each contract.

Should it be found that the scope of work needs to be varied, be it an increase, decrease, addition or deletion, the contract has provisions for valuing, approving and issuing a variation to the scope of work, with corresponding adjustments to the contract price and date for practical completion.

Care is required regarding the use of contract prices/rates etc for larger variations and must be used in assessing variations strictly in accordance with the contract conditions. The following is to be considered in assessing variations as they can influence the prices/rates:

- The nature of the work, including the work method statement, is different.
- The supplier price is different for a much smaller or larger order.
- The supply and /or installation may be staged over a different period of time.
- The time to complete the works may be different in nature from that for the original scope of work.

11.2.8 Dispute Resolution

Dispute resolution will be undertaken in accordance with the terms of a contract. However, every attempt is to be made to prevent disputes escalating by developing and maintaining good relationships with contractors and assisting them in solving problems which may or may not be entirely of their own making.

Causes of disputes which may be avoided or resolved early include:

- Access to site or possession of site is late or denied when compared with the terms of contract.
- A method of measurement is ambiguous or absent in the terms of the contract.
- Non-cooperation of one contractor with another beyond the terms of their contracts in not providing access, not sharing a site or causing a delay
- Providing a timely clarification to a contractual provision so as not to cause delay or additional cost to the contractor.

11.2.9 Interface Management

The IOT Construction Manager has a primary role in facilitating the interfaces between contracts/contractors in the same or adjacent areas and with external parties providing facilities associated with the project, which enable the project to be constructed and/or subsequently operate. Weekly Progress and Coordination meetings shall identify any conflicting interfaces and simultaneous operations.

12 Completion and Commissioning

In general construction completion, pre-commissioning, commissioning, start up and handover will be carried out in accordance with the Commissioning Management Document No: MC23050-000-Z-PLN-00009.

The Commissioning Management Plan shall have maximum priority to enable reversed planning in all project phases. Successful commissioning and handover will ensure that the shortest possible ramp-up time is achieved for the plant. The plan will be developed in conjunction with Alpha HPA and will be used as a base plan, where applicable, for reference by the respective contractors in developing their own commissioning plans. At the completion of commissioning, all documentation relating to the project (drawings, manuals, vendor data, calculations, spares lists, test sheets etc) is to be compiled and handed over in a way that is directly usable by Alpha HPA operations personnel.

For the purposes of this plan construction is considered complete at the end of Stage 2 commissioning.

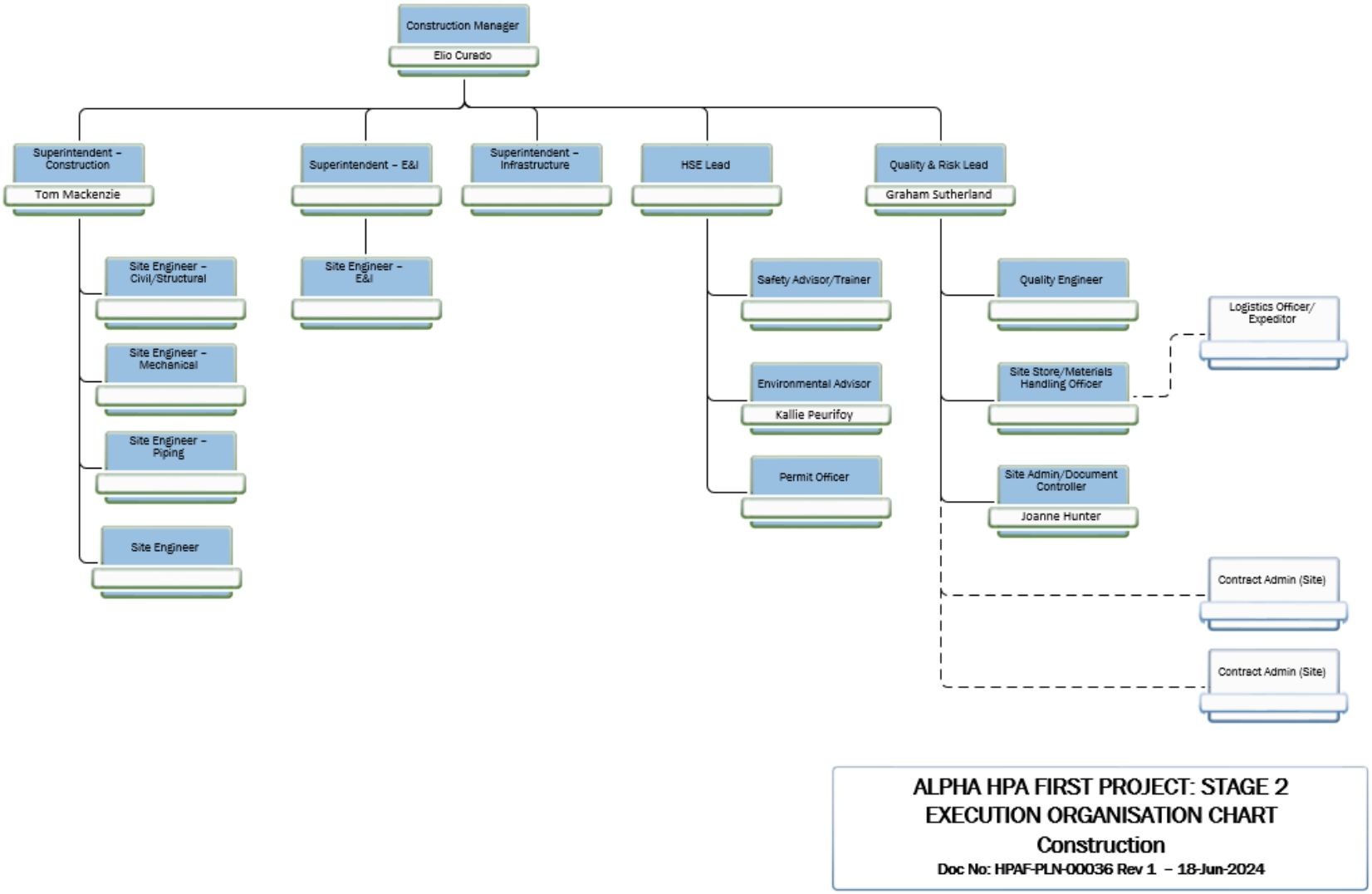
13 Appendices

Appendix 1: IOT Site Construction Organisation Structure

Appendix 2: Project Schedule

Appendix 3: Temp Facilities Layout Plan Daily Diary

Appendix 1 – IOT Site Construction Organization Structure



Appendix 2 – Project Schedule

HPAF-SCH-00033.mpp

Appendix 3 – Temporary Facilities

HOLD (Will be updated upon final decision of early works contract

APPENDIX F:

Technical Memorandum – Laydown Area Ecology Investigation – Prepared by CQG

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 microsighting 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

- 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 where 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 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	*Eucalyptus crebra*, *E. exserta*, Melaleuca spp. woodland on alluvial plains.	Least concern (remnant)	Sparse	25,470	2.547
11.3.29 / 12.3.12	*Eucalyptus crebra*, *E. exserta*, Melaleuca spp. woodland on alluvial plains / *Eucalyptus latisinensis* or *E. exserta*, *Melaleuca viridiflora* var. *viridiflora* woodland on alluvial plains.	Least concern (remnant and high value regrowth)	Sparse	250	0.025
12.11.6	*Corymbia citriodora* subsp. *variegata*, *Eucalyptus crebra* woodland on metamorphics +/- interbedded volcanics.	Least concern (remnant)	Sparse	19,360	1.936
11.3.29 / 12.3.3	*Eucalyptus crebra*, *E. exserta*, Melaleuca spp. woodland on alluvial plains / E. tereticornis 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 heterogenous 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 inhabitant 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	*Pteropus poliocephalus*	LC	V	Possible
Short-beaked echidna	*Tachyglossus aculeatus*	SL	-	Likely
Squatter pigeon (southern subspecies)	*Geophaps scripta scripta*	V	V	Likely
Central greater glider	*Petauroides volans volans*	E	E	Possible
Yellow-bellied Glider	*Petaurus australis australis*	V	V	Possible
Powerful owl	*Ninox strenua*	V	-	Possible
Koala	*Phascolarctos cinereus*	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 *Fisheries Act 1994* (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,



Rebbekah 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.

CQG[3] 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
Ph: +61 7 4922 9252 Fax: +61 7 49220195

Project No: 20118
Map No: 20118-19-01
Revision: Rev 0
20 February 2025

Layer Credits- Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; QSpatial - Cadastral Boundaries, Roads; CQG - Study Area.



Legend

- Study
- Cadastral Boundaries

Proposed Layout

- Access Road
- HV Turnaround and Staging Area
- LV Carpark
- Temporary Offices

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.2

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Proposed Layout

CQG Consulting

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: 20118-19-02
Revision: Rev 0
20 February 2025

Layer Credits- ; QSpatial - Cadastral Boundaries, Roads; Alpha HPA - Site Layout; CQG - Study Area.



Legend

- Study Area
- Cadastral Boundaries

Regulated Vegetation

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

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.3

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Regulated Vegetation Mapping

CQG Consulting

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: 20118-19-03
Revision: Rev 0
20 February 2025

Layer Credits- ; QSpatial - Cadastral Boundaries, Roads, Regulater Vegetation; Alpha HPA - Site Layout; CQG - Study Area.



Layer Credits- ; QSpatial - Cadastral Boundaries, Roads, RE Mapping; Alpha HPA - Site Layout; CQG - Study Area.

Legend

- Study Area
- Cadastral Boundaries

Regional Ecosystem Mapping

- Non-remnant / regrowth
- Endangered - Sub-dominant
- Not Of Concern

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.4

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

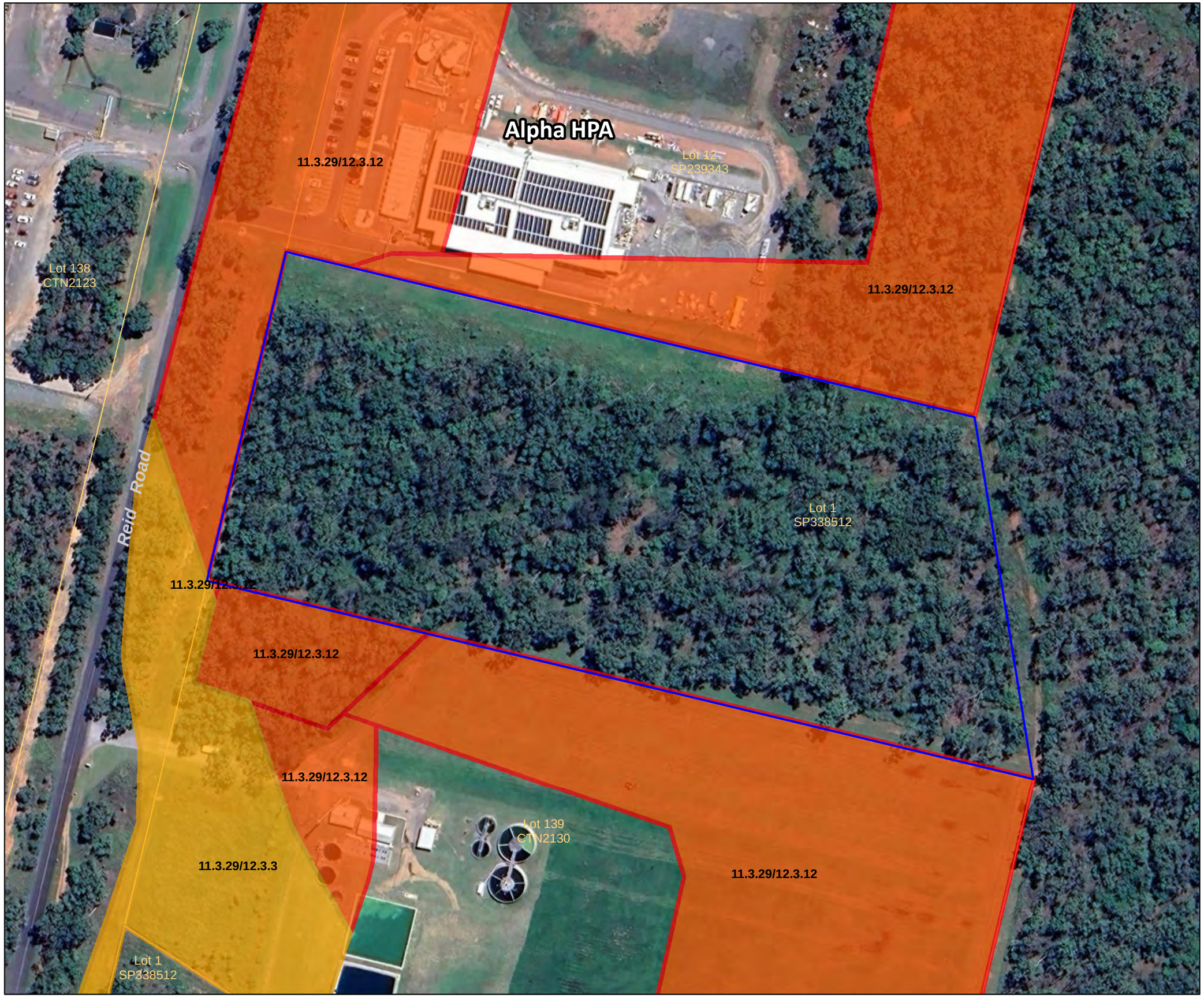
Ecological Investigation
13 February 2025

Regional Ecosystem Mapping

CQG Consulting

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: 20118-19-04
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)

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.5

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

RE Areas to be avoided

CQG Consulting
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: 20118-19-05
Revision: Rev 0
3 March 2025

Layer Credits- ; QSpatial - Cadastral Boundaries, Roads, RE Mapping; Alpha HPA - Site Layout; CQG - Study Area.



Layer Credits- ; QSpatial - Cadastral Boundaries, Roads; Alpha HPA - Site Layout; CQG - Study Area, Verified RE mapping.

Legend

- Study Area
- Cadastral Boundaries

Verified Regional Ecosystem

- 12.11.6

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.6

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Verified Regional Ecosystem

CQG Consulting

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: 20118-19-06
Revision: Rev 0
3 March 2025



Legend

- Study Area
- Grass Trees
- Cadastral Boundaries

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.7

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Grass Trees

CQG Consulting

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

Layer Credits- ; QSpatial - Cadastral Boundaries, Roads; Alpha HPA - Site Layout; CQG - Study Area, Grass Tree locations.



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

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.8

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Habitat features and
Potential Breeding Places

CQG Consulting

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: 20118-19-08
Revision: Rev 0
3 March 2025

Layer Credits- ; QSpatial - Cadastral Boundaries, Roads; Alpha HPA - Site Layout; CQG - Study Area, Habitat Features.



Legend

- Study Area
- Cadastral Boundaries
- Approximate location of watercourse

Waterway Barrier Works

Risk of Impact

- 2 - Moderate

N

Scale 1:1,500 (A3)

0 15 30 60

Metres

Coordinate System: GDA2020 MGA Zone 56

Figure A.9

Alpha HPA

MEDQ Temporary Laydown Area
Approvals Support

Ecological Investigation
13 February 2025

Waterway Mapping

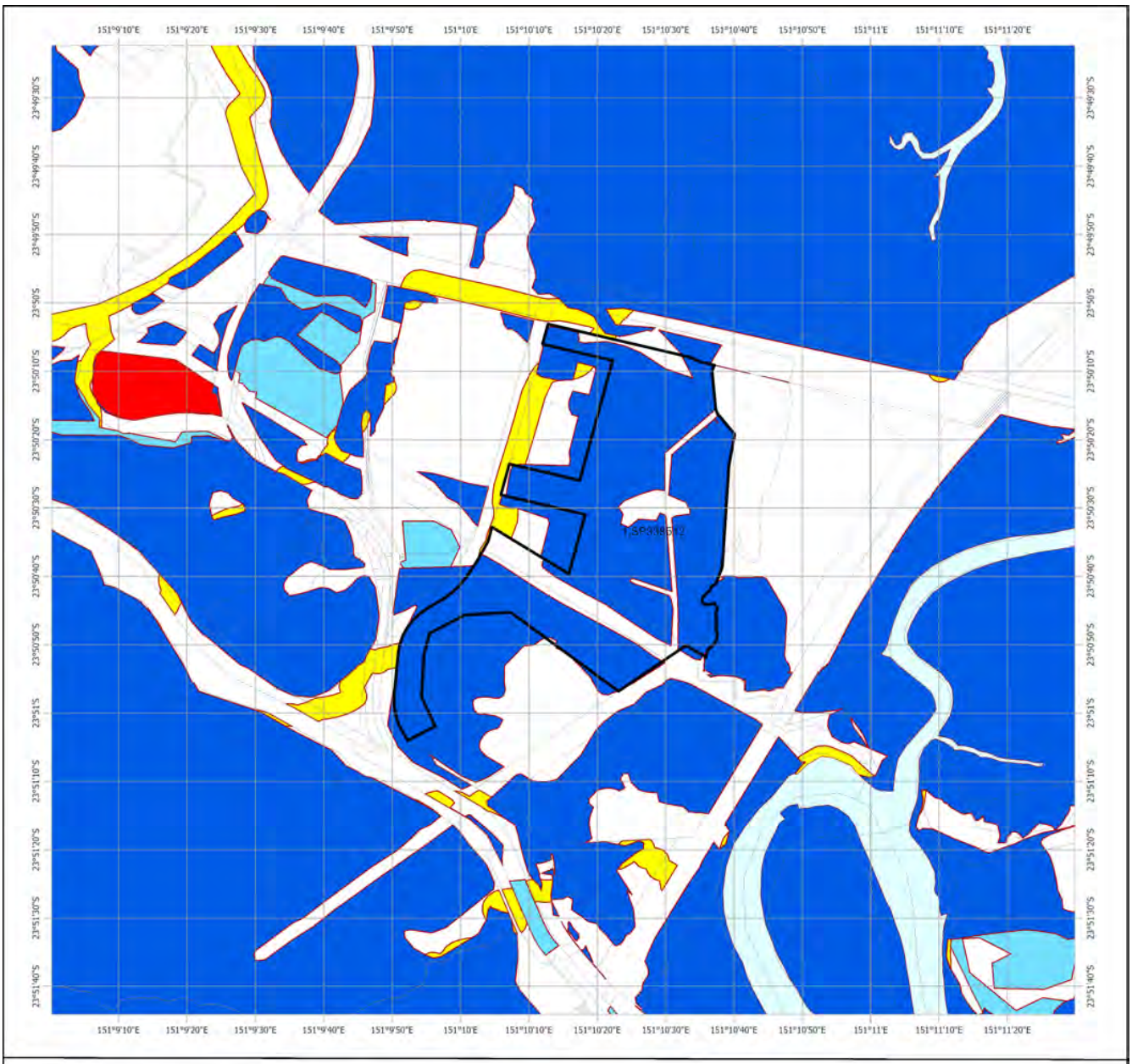
CQG Consulting
180 Quay Street, Rockhampton Q 4700
PO Box 8384, Allenstown 4700
Ph: +61 7 4922 9252 Fax: +61 7 49220195

Project No: 20118
Map No: 20118-19-09
Revision: Rev 0
3 March 2025

Layer Credits- ; QSpatial - Cadastral Boundaries, Roads, Waterway Barrier Works; Alpha HPA - Site Layout; CQG - Study Area, Approx. Watercourse.

Attachment B:

Database Search Results



Regulated Vegetation Management Map

- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Other land parcel boundaries
- Selected Lot and Plan



N

0 250 500 750 1,000 1,250 m

This product is displayed in:
GDA2020

Disclaimer:
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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

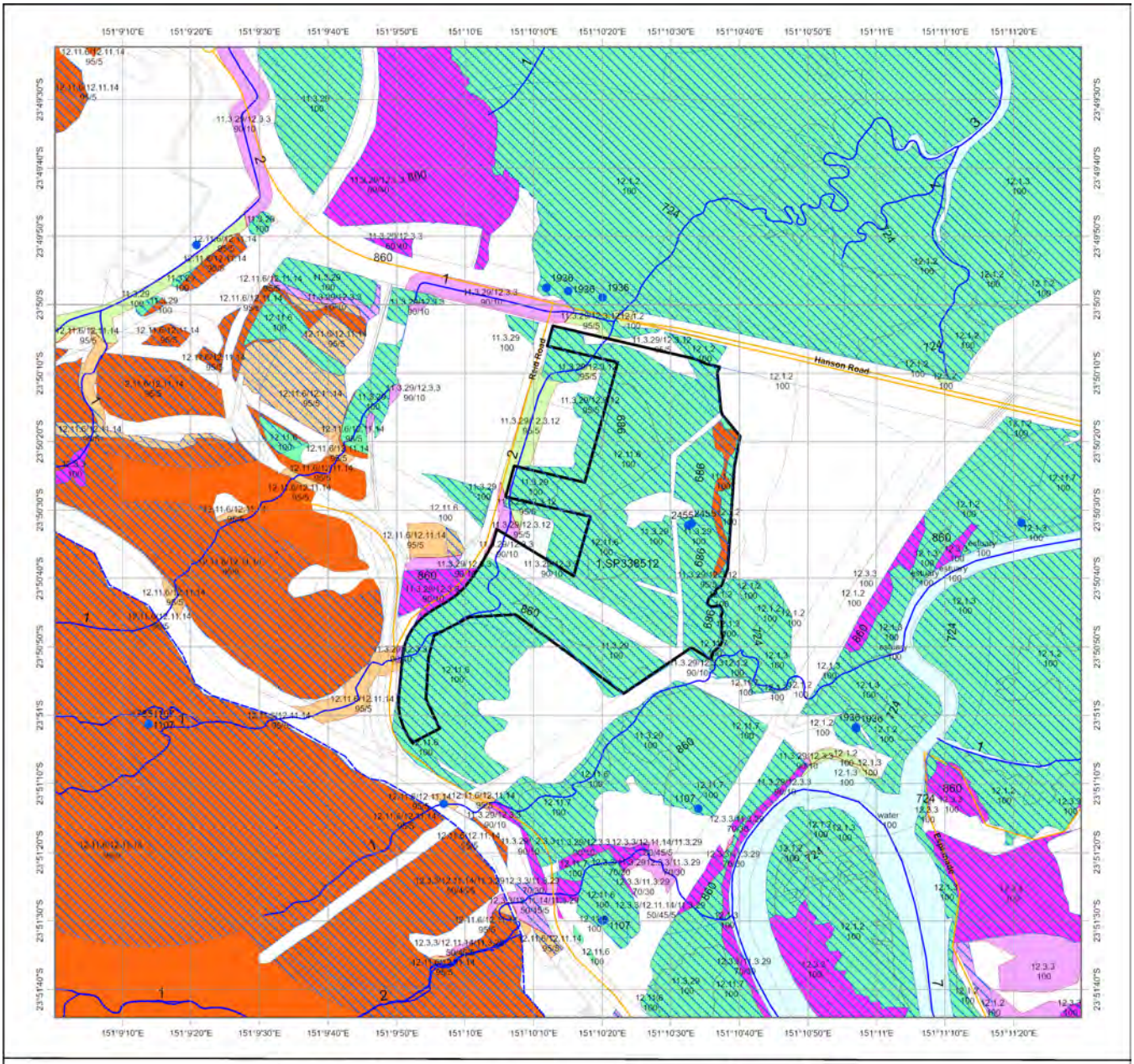
Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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Vegetation Management Supporting Map

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

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LOCALITY DIAGRAM



N

0 180 360 540 720 900 m

This product is displayed in: GDA2020

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

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Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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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

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Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
724	Xeromys myoides	water mouse	V	Sedgeland (Juncus, Baumea, Lepironia, Cyperus, Eleocharis), salt meadow/saline grassland (Sporobolus virginicus), wet heathland (Banksia robur, Gahnia spp.) and saltmarsh-chenopod grassland behind mangroves; and in open-closed mangrove scrub-forest (e.g. Avicennia marinus subsp. australasica in SEQ, Ceriops tagal & Bruguiera spp. but forage in adjacent Avicennia and saltpan areas in CQC), Melaleuca quinquenervia swamp forest or fresh-water mangrove, and supralittoral banks with Callitris and Casuarina.	Sea level to 100m.		Coastal areas near mangroves/swamps.
860	Phascolarctos cinereus	koala	E	Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon or Melaleuca 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: Corymbia citriodora, Corymbia henryi, Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus bancroftii, Eucalyptus biturbinata, Eucalyptus blakelyi, Eucalyptus brownii, Eucalyptus camaldulensis, Eucalyptus carnea, Eucalyptus chloroclada, Eucalyptus coolabah, Eucalyptus crebra, Eucalyptus dealbata, Eucalyptus drepanophylla, Eucalyptus dunnii, Eucalyptus eugenioides, Eucalyptus exserta, Eucalyptus fibrosa, Eucalyptus grandis, Eucalyptus helidonica, Eucalyptus latisinensis, Eucalyptus longirostrata, Eucalyptus major, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus microcarpa, Eucalyptus microcorys, Eucalyptus microtheca, Eucalyptus moluccana, Eucalyptus montivaga, Eucalyptus orgadophila, Eucalyptus papuana, Eucalyptus pilularis, Eucalyptus platyphylla, Eucalyptus populnea, Eucalyptus portuensis, Eucalyptus propinqua, Eucalyptus racemosa, Eucalyptus resinifera, Eucalyptus robusta, Eucalyptus saligna, Eucalyptus seeana, Eucalyptus siderophloia, Eucalyptus sideroxylon, Eucalyptus tereticornis, Eucalyptus thozetiana, Eucalyptus tindaliae, Eucalyptus umbra, Lophostemon confertus, Melaleuca leucadendra, Melaleuca quinquenervia.	Sea level to 1000m.		Riparian areas, plains and hill/escarpment slopes.
686	Crinia tinnula	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 Melaleuca (e.g. M. quinquenervia) swamps, sedgeland, wet and dry heathland (e.g. Banksia robur, Xanthorrhoea) and wallum (Banksia aemula shrubland/woodland) areas coastal lowlands on sand or sandstone, occasionally in adjacent open forest/woodland (e.g. Eucalyptus racemosa, Corymbia citriodora) 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	Ninox strenua	powerful owl	V	Wet and dry tall open eucalypt forest (Eucalyptus pilularis, E. acmenoides, E. tereticornis, E. camaldulensis, E. crebra, E. melliodora, Corymbia citriodora & C. intermedia), including mountain forest gullies/gorges; forests aged 60+ years (large & old) on fertile soils with suitable hollows; roosting in dense foliage of closed forest (occasionally caves) and foraging in open forest and woodland including areas adjacent to urban/rural development. Nest in large hollows (45-75cm diameter, 50-180cm deep) 6-45m above ground, in large (>100cm dbh) old eucalypts on the side or at the head of heavily wooded gully.	Sea level to 1000m.		Gully.
1936	Charadrius mongolus	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	Petauroides armillatus	central greater glider	E	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	

Queensland Government

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, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.8, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.20, 10.3.22, 10.3.27, 10.3.28, 10.4.2, 10.4.3, 10.4.5, 10.4.8, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 10.5.12, 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.7.7, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.7.13, 10.9.2, 10.9.3, 10.9.5, 10.10.1, 10.10.3, 10.10.4, 10.10.5, 10.10.7, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.5, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.21, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.11, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.13, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.14, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.5, 12.5.6, 12.5.7, 12.5.10, 12.5.12, 12.8.1, 12.8.8, 12.8.9, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.24, 12.8.25, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.21, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.23, 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, 12.12.13, 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, 11.5.3, 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, 12.11.9, 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, 12.12.7, 12.12.11, 12.12.12, 12.12.14, 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

Queensland Government

Queensland Government

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 in to 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 Xeromys myoides 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 Cycas megacarpa and Macrozamia parcifolia. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus).
12.3.12	12.3.12: Habitat for threatened plant species including Germainia capitata.
12.3.3	12.3.3: Habitat for threatened plant species including Rhaponticum australe. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus). 12.3.3a: Habitat for threatened plant species including occasional Rhaponticum australe. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus). 12.3.3b: Habitat for threatened flora species including Melaleuca irbyana. 12.3.3c: Habitat for threatened flora species including Melaleuca irbyana and Marsdenia coronata. 12.3.3d: Habitat for threatened plant species including Rhaponticum australe. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus).
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 Corymbia citriodora (spotted gum).	4.39	4.00
16c	Woodlands and open woodlands dominated by Eucalyptus coolabah (coolabah) or E. microtheca (coolabah) or E. largiflorens (black box) or E. tereticornis (blue gum) or E. chlorophylla 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 Eucalyptus crebra (sens. lat.) (narrow-leaved red ironbark) frequently with Corymbia spp. or Callitris spp. on flat to undulating plains.	80.17	72.92
21a	Low woodlands and low open woodlands dominated by Melaleuca viridiflora (coarse-leaved paperbark) on depositional plains.	3.05	2.78
35b	Bare saltpans ± areas of Tecticornia spp. (samphire) sparse forbland and/or Xerochloa imberbis or Sporobolus virginicus (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/

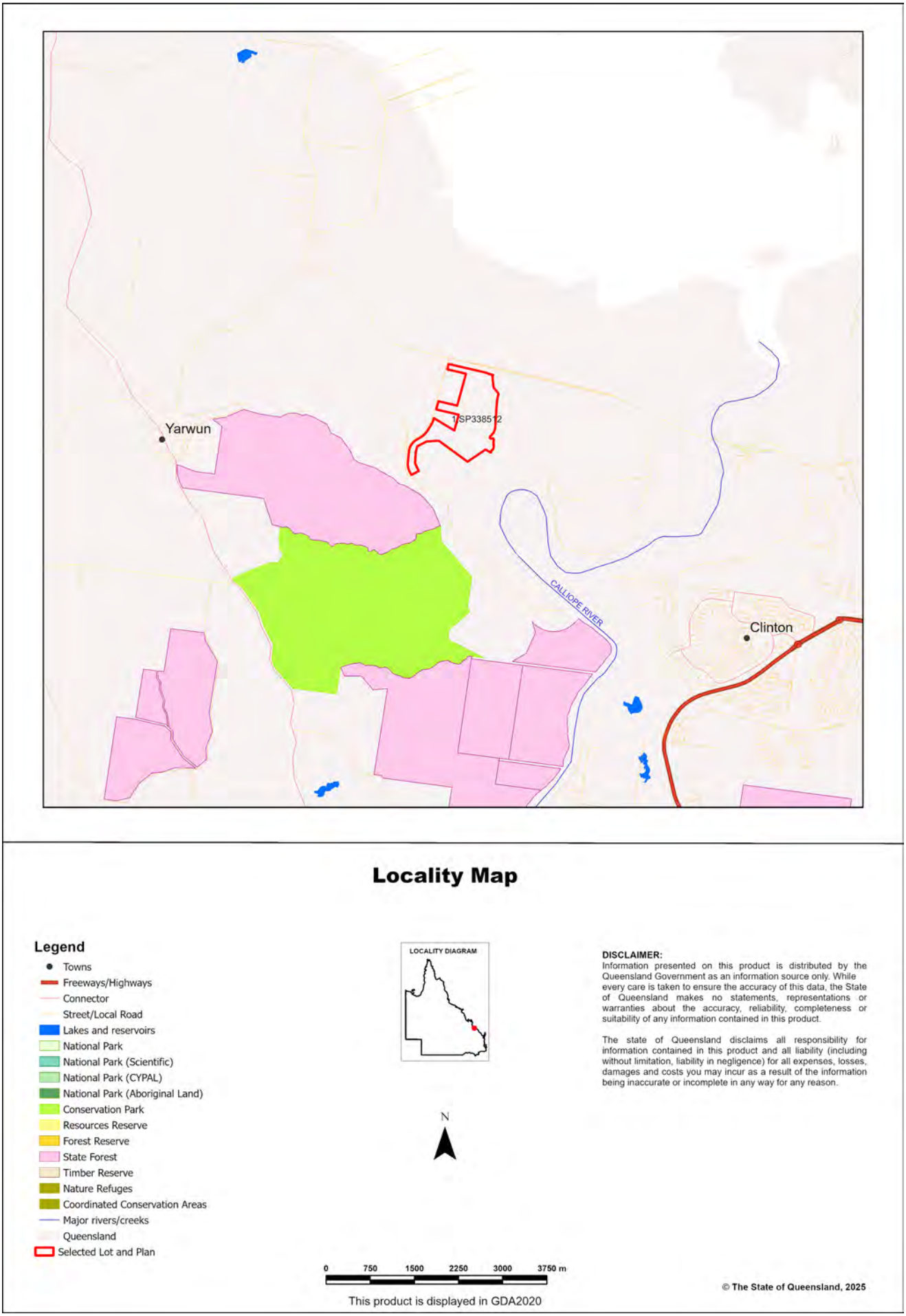
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance 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

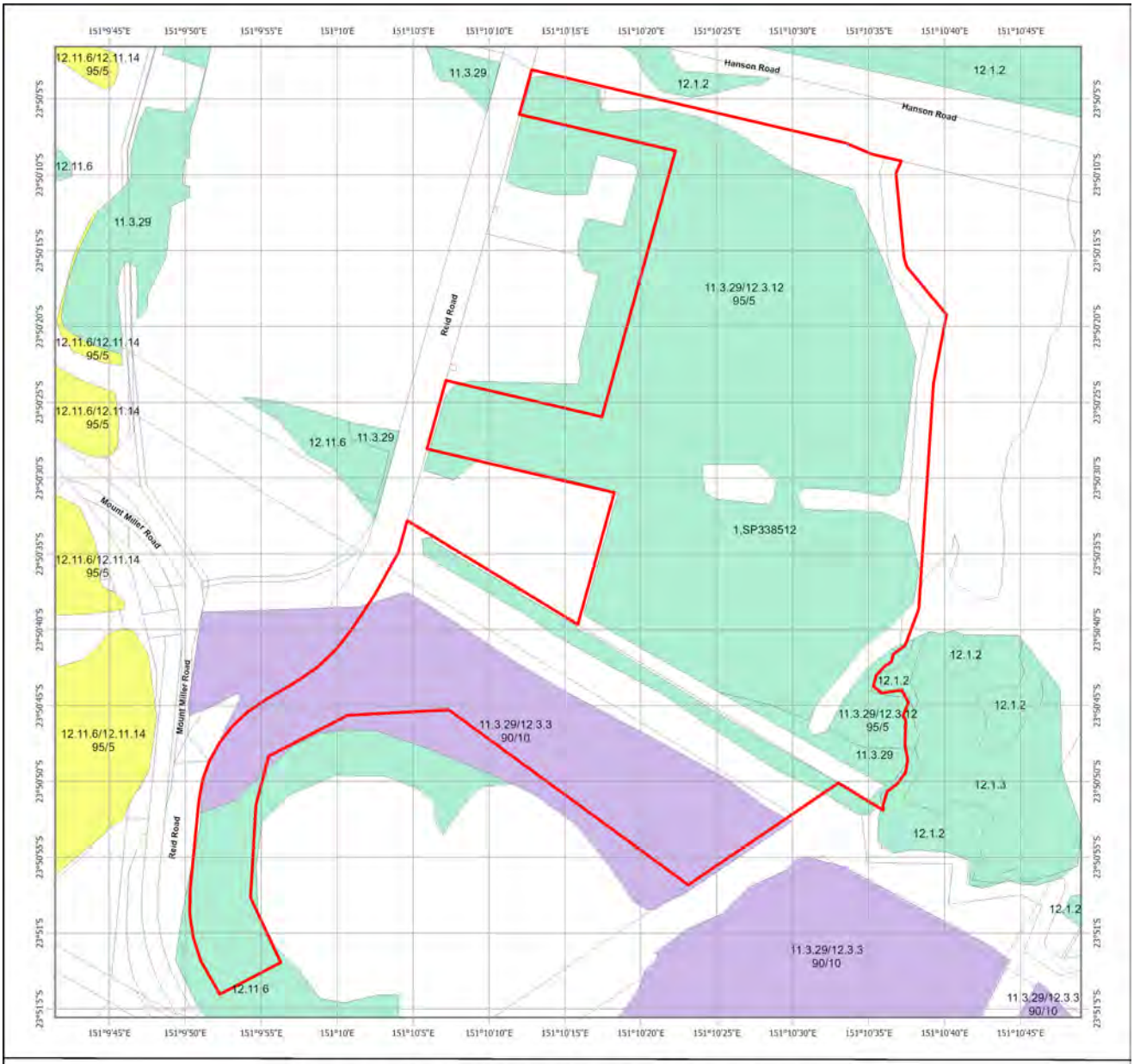
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
11.3.29	Not currently available	Not currently available
12.1.2	Not currently available	Available
12.11.6	Not currently available	Available
12.3.12	Available	Available
12.3.3	Available	Available
non-remnant	Not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

Maps

Map 1 - Location



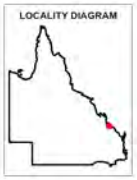
Map 2 - Remnant 2021 regional ecosystems



Remnant 2021 Regional Ecosystems

Biodiversity Status

- Endangered - Dominant vegetation
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- No concern at present
- Non-remnant vegetation, cultivated or built environment
- Plantation
- Water
- Cadastral Boundaries
- Selected Lot and Plan



N

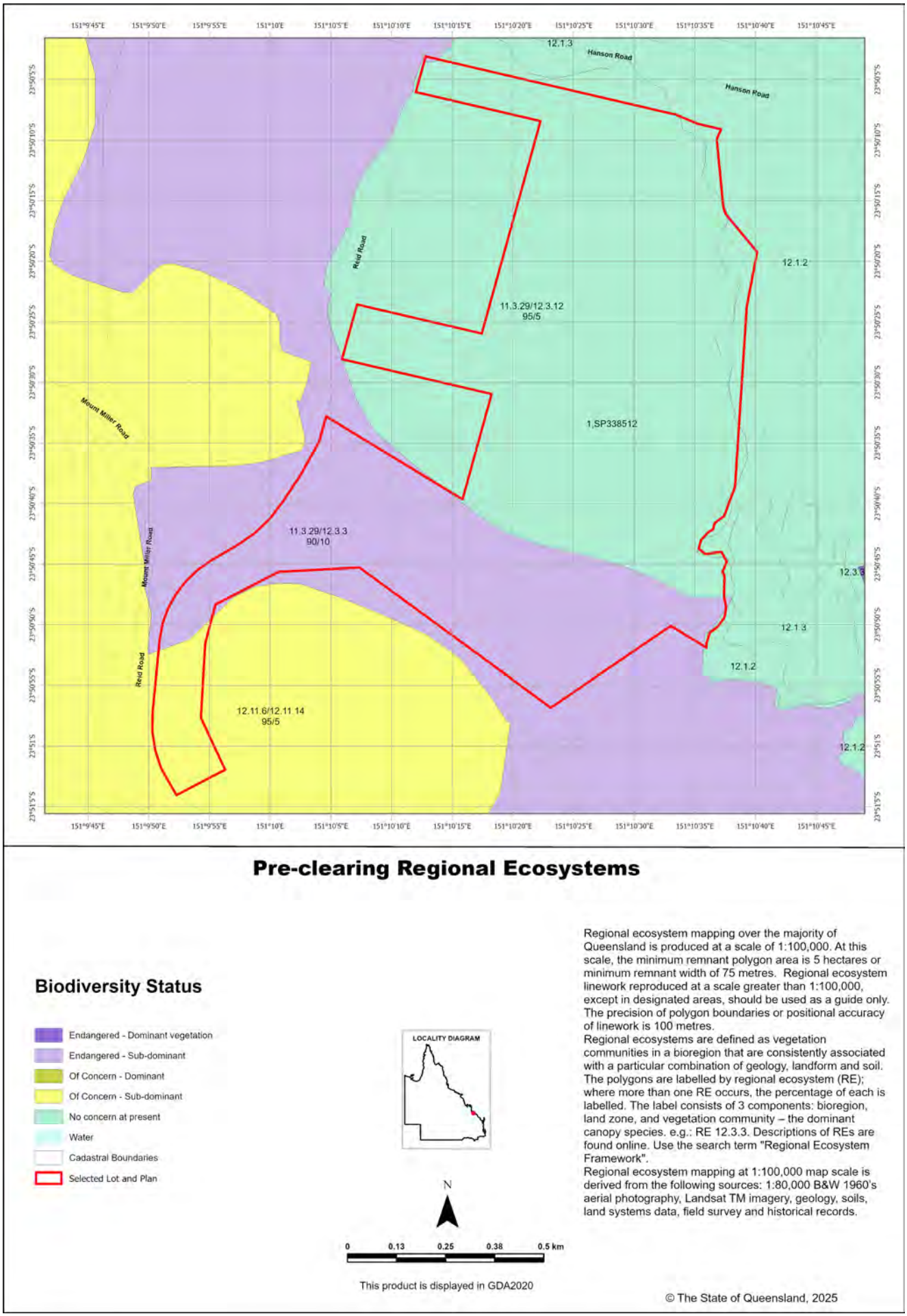
0 0.13 0.25 0.38 0.5 km

This product is projected into GDA2020

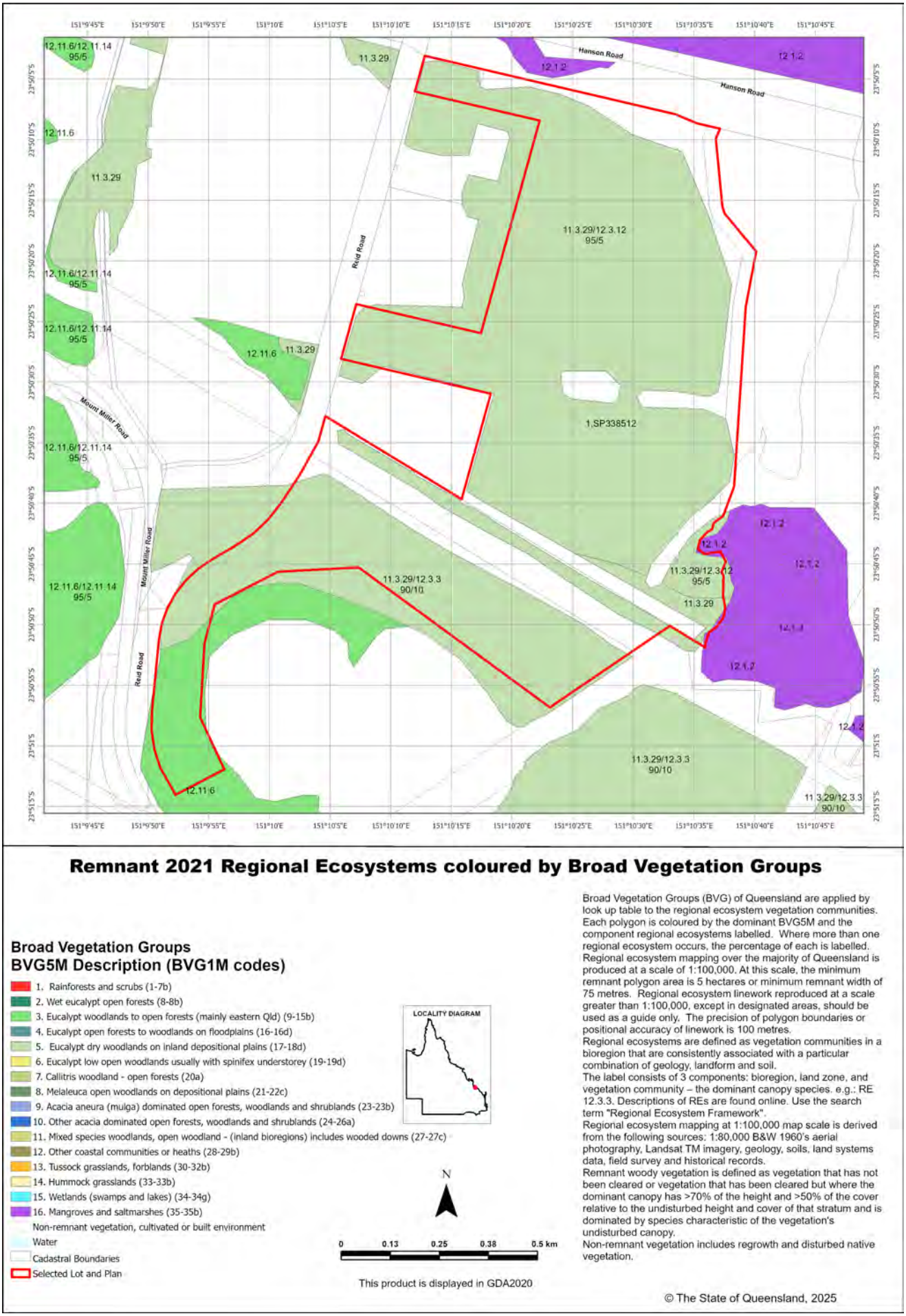
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

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Map 3 - Pre-clearing regional ecosystems



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



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



Pre-clearing Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups
BVG5M Description (BVG1M codes)

- 1. Rainforests and scrubs (1-7b)
- 2. Wet eucalypt open forests (8-8b)
- 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
- 4. Eucalypt open forests to woodlands on floodplains (16-16d)
- 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
- 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
- 7. Callitris woodland - open forests (20a)
- 8. Melaleuca open woodlands on depositional plains (21-22c)
- 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
- 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
- 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
- 12. Other coastal communities or heaths (28-29b)
- 13. Tussock grasslands, forblands (30-32b)
- 14. Hummock grasslands (33-33b)
- 15. Wetlands (swamps and lakes) (34-34g)
- 16. Mangroves and saltmarshes (35-35b)
- Water
- Cadastral Boundaries
- Selected Lot and Plan



N

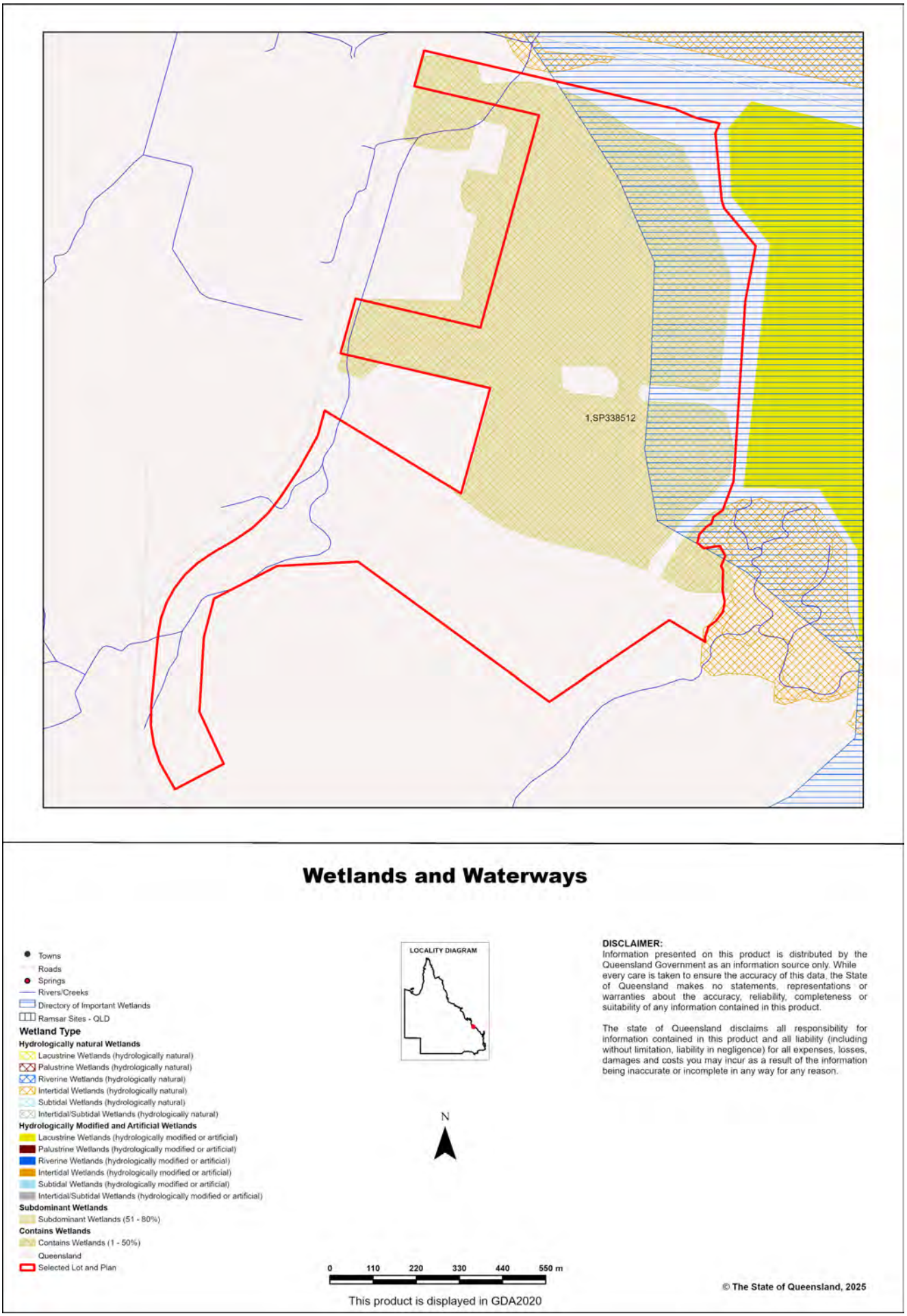
0 0.13 0.25 0.38 0.5 km

This product is displayed in GDA2020

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

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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)

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)

- 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 - *Vegetation Management Act 1999*

resources.QLD.GOV.AU



Vegetation management report

For Lot: 1 Plan: SP338512
2/10/2025

Queensland Government

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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	Sedgelands 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	Xeromys myoides	water mouse	V	Sedgeland (Juncus, Baumea, Lepironia, Cyperus, Eleocharis), salt meadow/saline grassland (Sporobolus virginicus), wet heathland (Banksia robur, Gahnia spp.) and saltmarsh-chenopod grassland behind mangroves; and in open-closed mangrove scrub -forest (e.g. Avicennia marinus subsp. australasica in SEQ, Ceriops tagal & Bruguiera spp. but forage in adjacent Avicennia and saltpan areas in CQC), Melaleuca quinquenervia swamp forest or fresh-water mangrove, and supralittoral banks with Callitris and Casuarina.	Sea level to 100m.		Coastal areas near mangroves/swamps.
860	Phascolarctos cinereus	koala	E	Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon or Melaleuca 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: Corymbia citriodora, Corymbia henryi, Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus bancroftii, Eucalyptus biturbinata, Eucalyptus blakelyi, Eucalyptus brownii, Eucalyptus camaldulensis, Eucalyptus carnea, Eucalyptus chloroclada, Eucalyptus coolabah, Eucalyptus crebra, Eucalyptus dealbata, Eucalyptus drepanophylla, Eucalyptus dunnii, Eucalyptus eugenioides, Eucalyptus exserta, Eucalyptus fibrosa, Eucalyptus grandis, Eucalyptus helidonica, Eucalyptus latisinensis, Eucalyptus longirostrata, Eucalyptus major, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus microcarpa, Eucalyptus microcorys, Eucalyptus microtheca, Eucalyptus moluccana, Eucalyptus montivaga, Eucalyptus orgadophila, Eucalyptus papuana, Eucalyptus pilularis, Eucalyptus platyphylla, Eucalyptus populnea, Eucalyptus portuensis, Eucalyptus propinqua, Eucalyptus racemosa, Eucalyptus resinifera, Eucalyptus robusta, Eucalyptus saligna, Eucalyptus seeana, Eucalyptus siderophloia, Eucalyptus sideroxylon, Eucalyptus tereticornis, Eucalyptus thozetiana, Eucalyptus tindaliae, Eucalyptus umbra, Lophostemon confertus, Melaleuca leucadendra, Melaleuca quinquenervia.	Sea level to 1000m.		Riparian areas, plains and hill/escarpment slopes.
686	Crinia tinnula	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 Melaleuca (e.g. M. quinquenervia) swamps, sedgeland, wet and dry heathland (e.g. Banksia robur, Xanthorrhoea) and wallum (Banksia aemula shrubland/woodland) areas coastal lowlands on sand or sandstone, occasionally in adjacent open forest/woodland (e.g. Eucalyptus racemosa, Corymbia citriodora) 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	Ninox strenua	powerful owl	V	Wet and dry tall open eucalypt forest (Eucalyptus pilularis, E. acmenoides, E. tereticornis, E. camaldulensis, E. crebra, E. melliodora, Corymbia citriodora & C. intermedia), including mountain forest gullies/gorges; forests aged 60+ years (large & old) on fertile soils with suitable hollows; roosting in dense foliage of closed forest (occasionally caves) and foraging in open forest and woodland including areas adjacent to urban/rural development. Nest in large hollows (45-75cm diameter, 50-180cm deep) 6-45m above ground, in large (>100cm dbh) old eucalypts on the side or at the head of heavily wooded gully.	Sea level to 1000m.		Gully.
1936	Charadrius mongolus	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	Petauroides armillatus	central greater glider	E	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	

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, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.8, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.20, 10.3.22, 10.3.27, 10.3.28, 10.4.2, 10.4.3, 10.4.5, 10.4.8, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 10.5.12, 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.7.7, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.7.13, 10.9.2, 10.9.3, 10.9.5, 10.10.1, 10.10.3, 10.10.4, 10.10.5, 10.10.7, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.5, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.21, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.11, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 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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, 12.12.13, 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
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3.6 Area Management Plan(s)

Nil

3.7 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), this property is regarded as*

Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

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

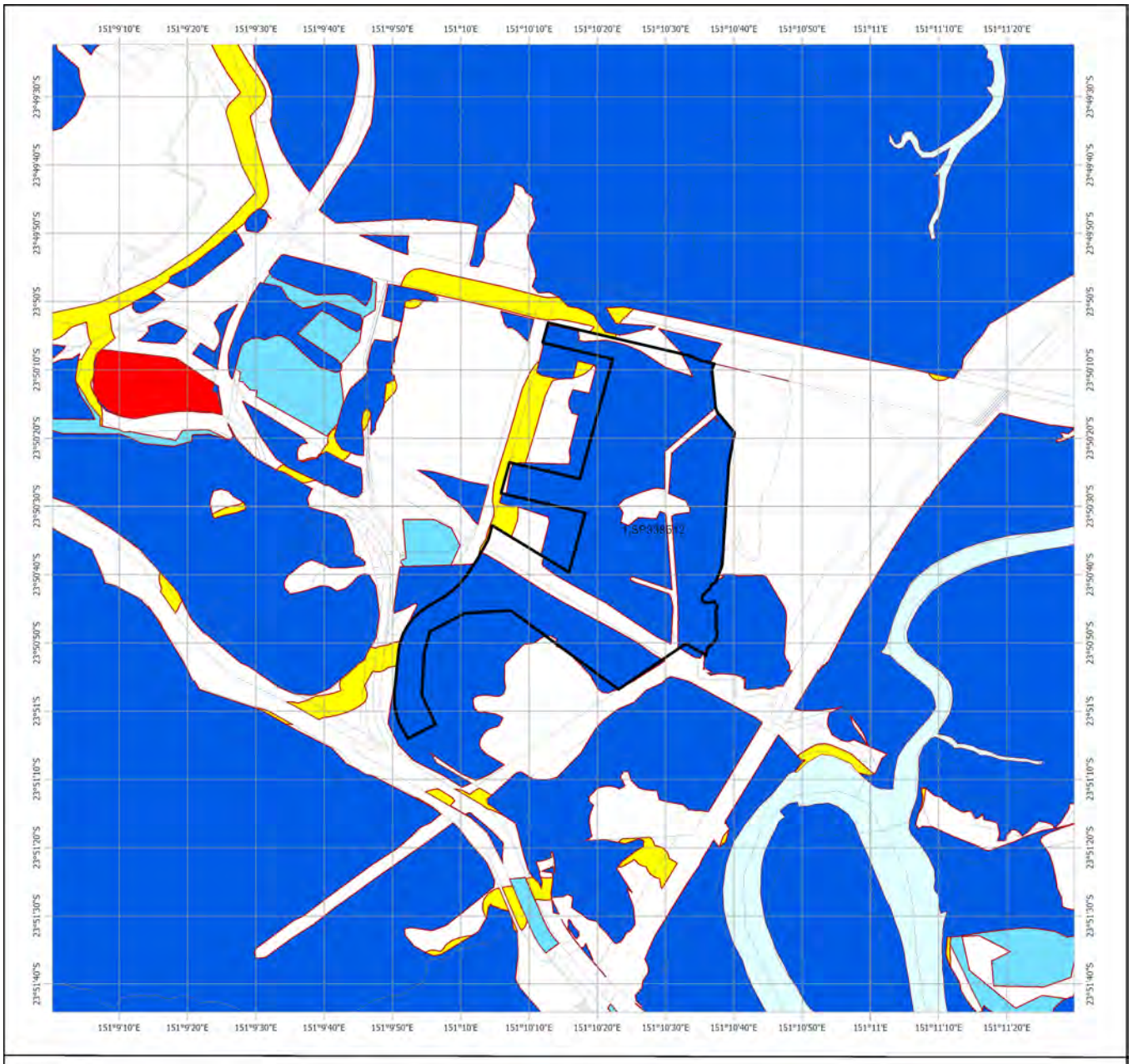
Regulated vegetation management map
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

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



Regulated Vegetation Management Map

Category A area (Vegetation offsets/compliance notices/VDecs)
Category B area (Remnant vegetation)
Category C area (High-value regrowth vegetation)
Category R area (Reef regrowth watercourse vegetation)
Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
Water
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM

N

0 250 500 750 1,000 1,250 m

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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

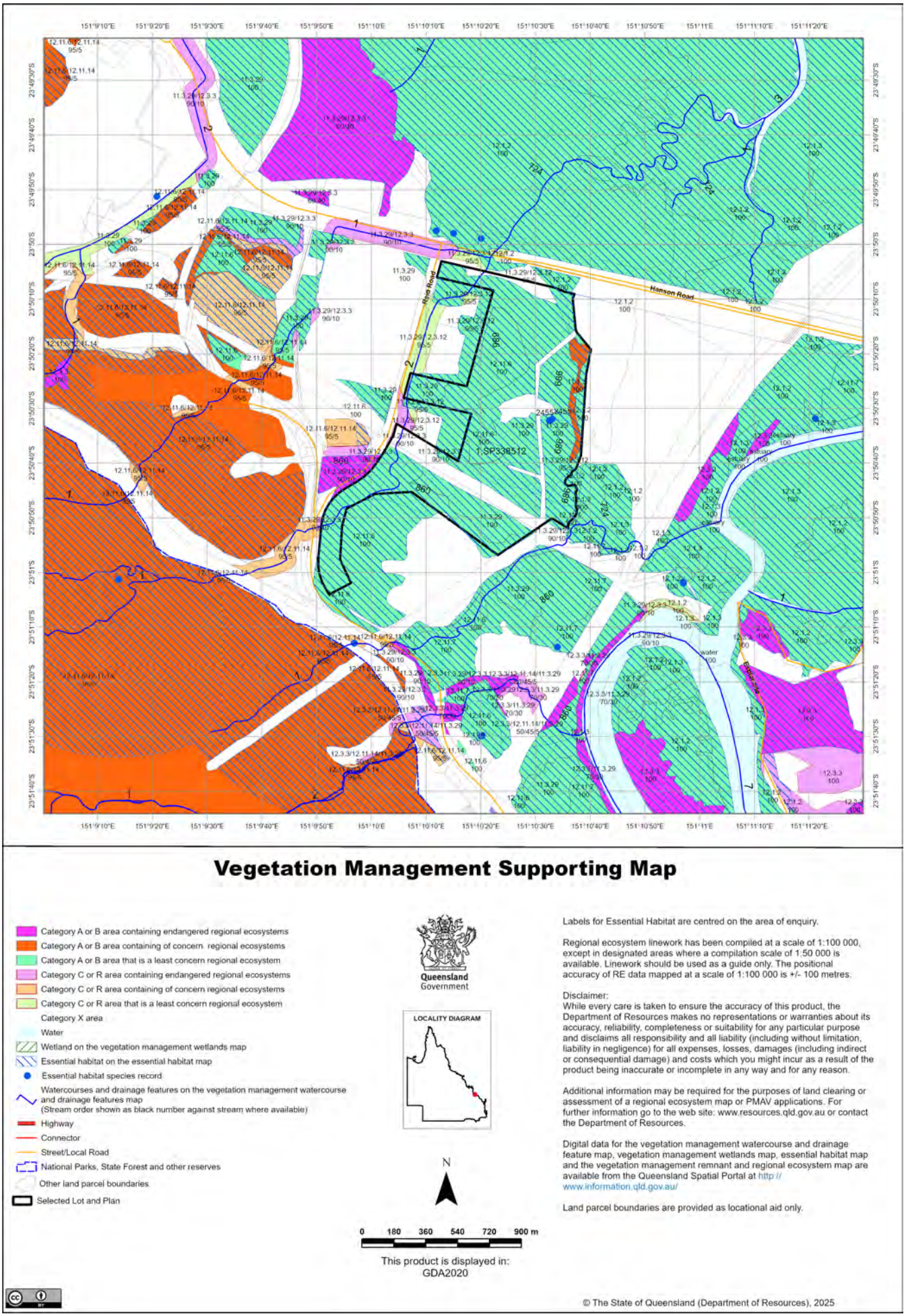
Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

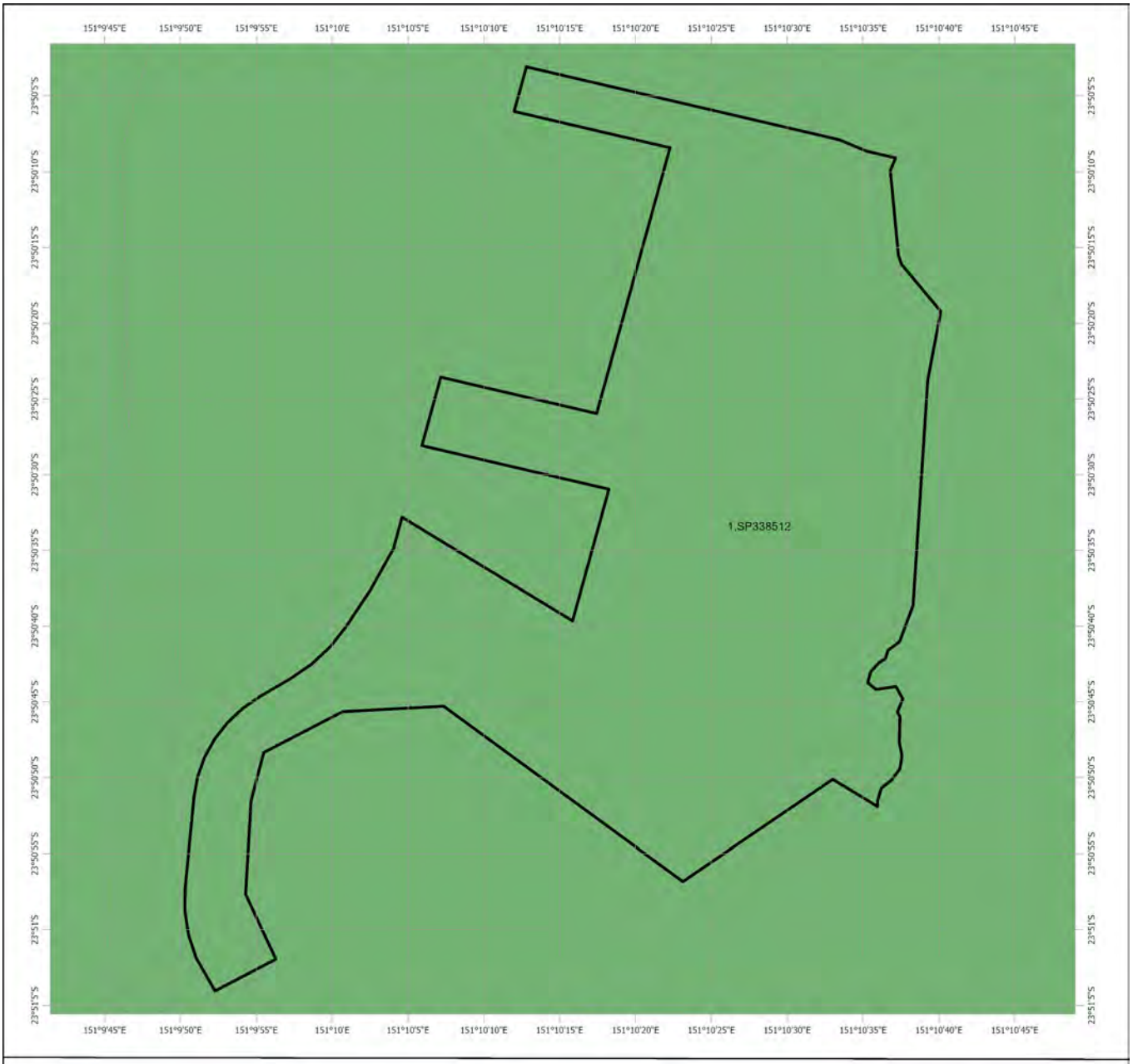
Queensland Government

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4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



Coastal/Non Coastal Map

Coastal
Non Coastal
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



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Land parcel boundaries shown are provided as a locational aid only.

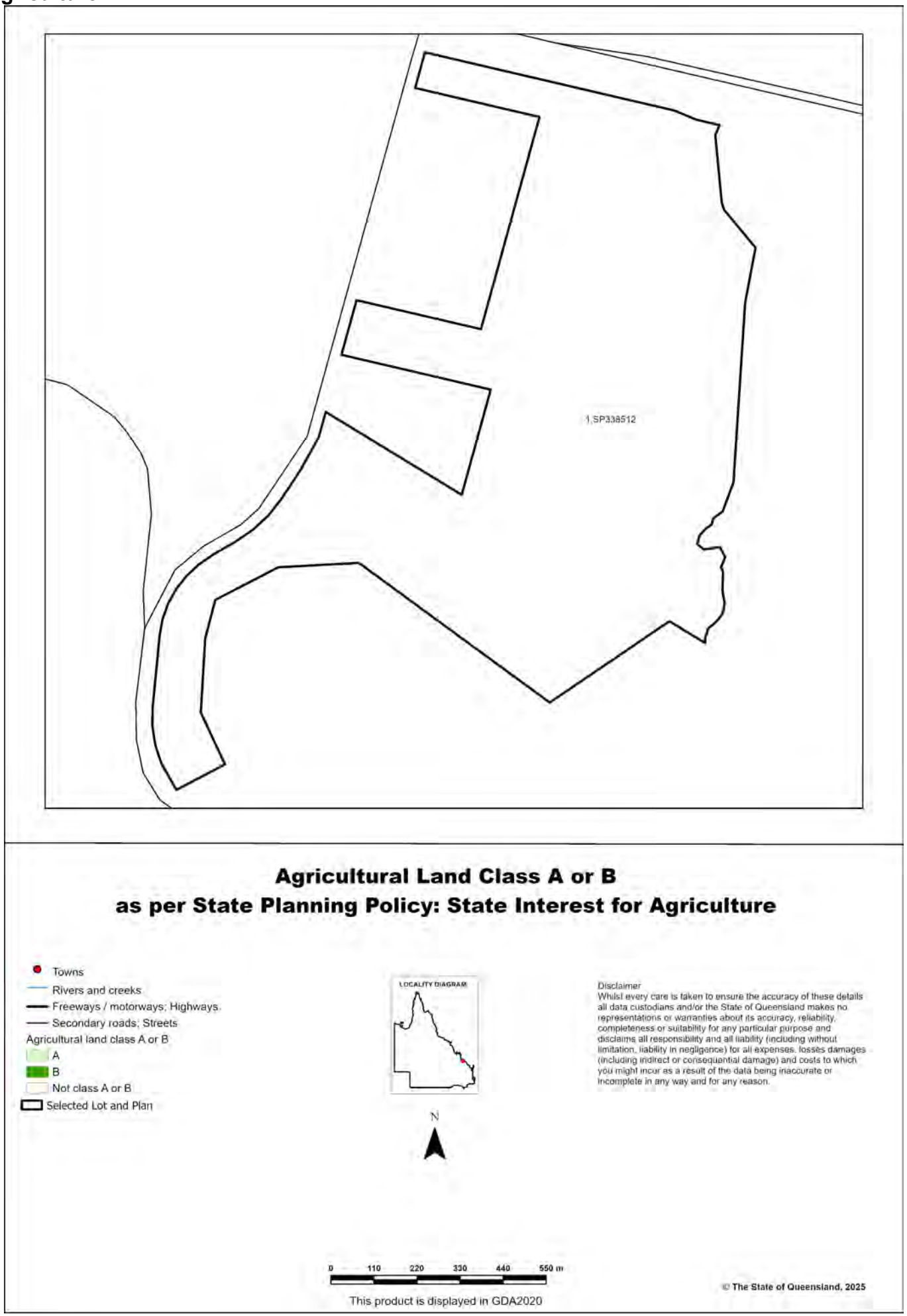
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0 110 220 330 440 550 m

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



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 plantsare 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

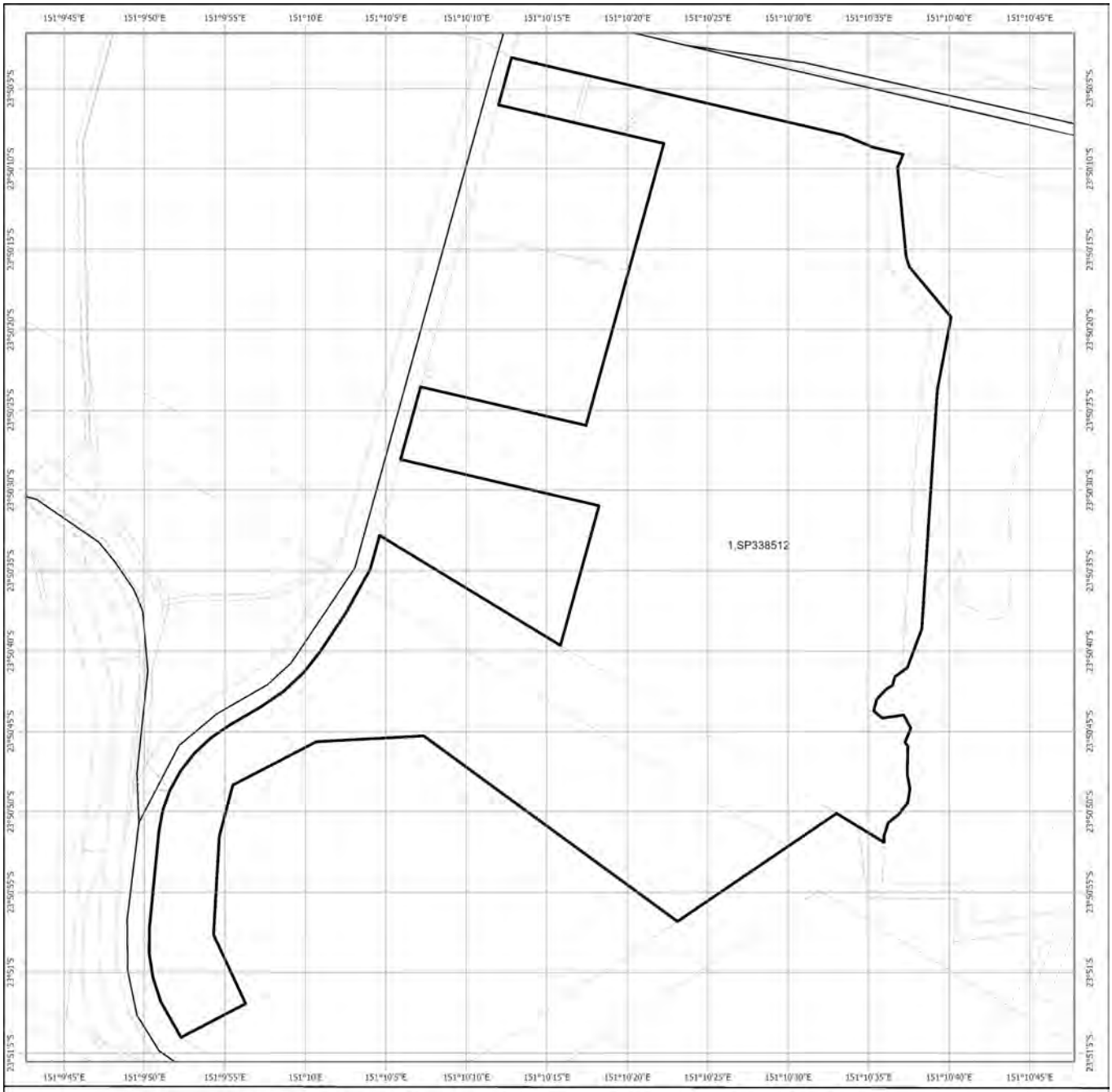
This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

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

LOCALITY DIAGRAM



N

0 77 154 231 308 385 m

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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

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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

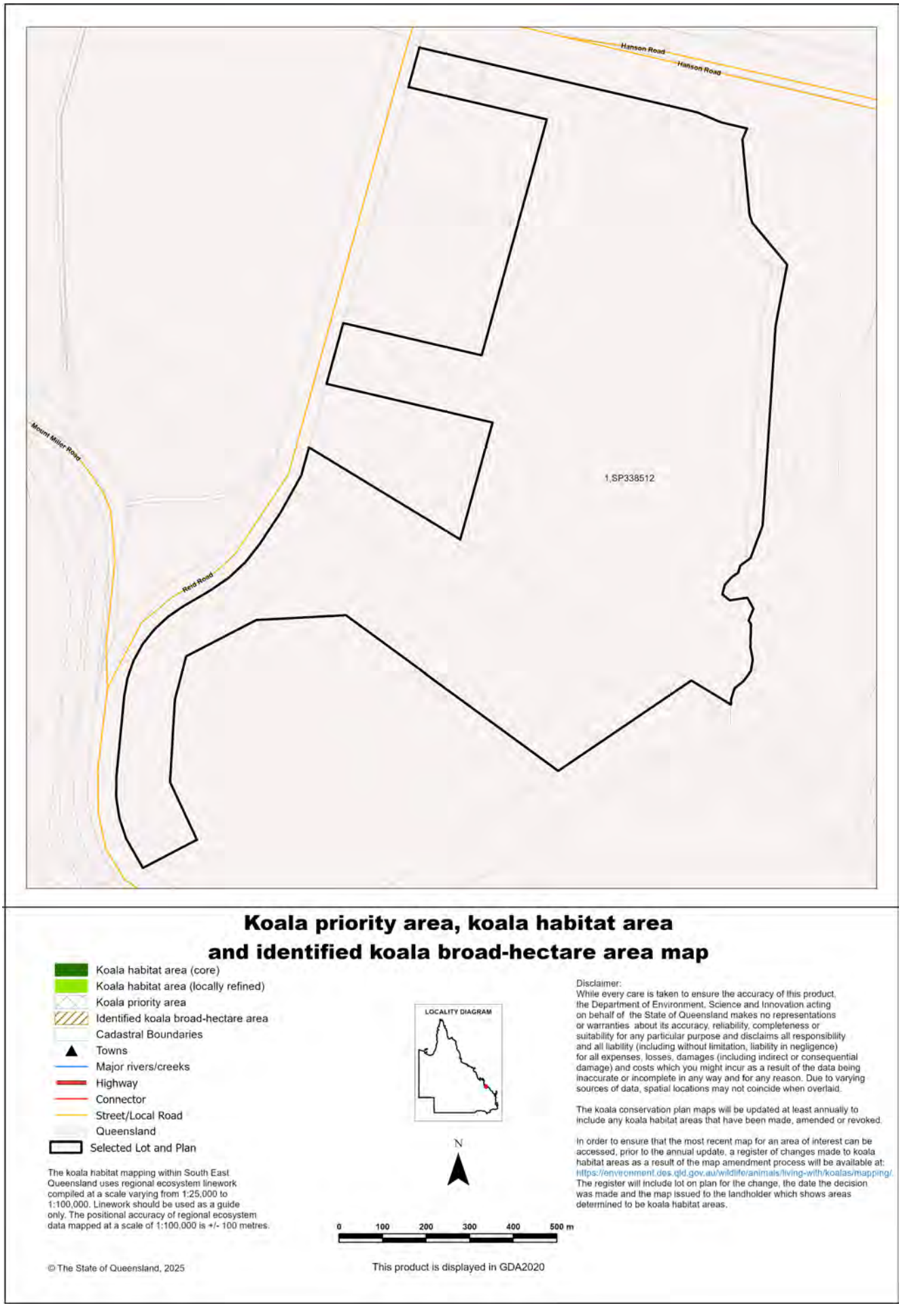
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@des.qld.gov.au
Visit https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

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



Koala habitat regional ecosystems for core koala habitat areas

Koala habitat area (core)
Towns
Highway
Connector
Street/Local Road
Major rivers/creeks
Queensland
Selected Lot and Plan

LOCALITY DIAGRAM

N

0 100 200 300 400 500 m

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Due to varying sources of data, spatial locations may not coincide when overlaid.

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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This product is displayed in GDA2020

8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow	*Water Act 2000*	Queensland Department of Regional Development, Manufacturing and Water	Ph: 13 QGOV (13 74 68) www.rdmw.qld.gov.au
Earthworks, significant disturbance	*Soil Conservation Act 1986*	Queensland Department of Resources	Ph: 13 QGOV (13 74 68) www.resources.qld.gov.au
Fire Permits	*Fire and Emergency Services Act 1990*	Queensland Fire Department	Ph: 13 QGOV (13 74 68) www.fire.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Queensland Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communites and the Arts	Ph: 13 QGOV (13 74 68) www.dsdsatsip.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Queensland Department of Environment, Science and Innovation	Ph: 13 QGOV (13 74 68) www.desi.qld.gov.au
Protected plants and protected areas	*Nature Conservation Act 1992* *Planning Act 2016*	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	*Nature Conservation Act 1992*	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	*Fisheries Act 1994* *Forestry Act 1959*	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	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Climate Change, Energy, the Environment and Water (Australian Government)	Ph: 1800 803 772 www.dcceew.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Queensland Department of Housing, Local Government, Planning and Public Works	Ph: 13 QGOV (13 74 68) www.planning.qld.gov.au
Coordinated projects	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Office of the Coordinator-General	Ph: 13 QGOV (13 74 68) www.statedevelopment.qld.gov.au/coordinator-general
Wet Tropics World Heritage Area	*Wet Tropics World Heritage Protection and Management Act 1993*	Queensland Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au
Requirements on State controlled road	*Transport Infrastructure Act 1994*	Queensland Department of Transport and Main Roads	Ph: 13 QGOV (13 74 68) https://www.tmr.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	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 occurence 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

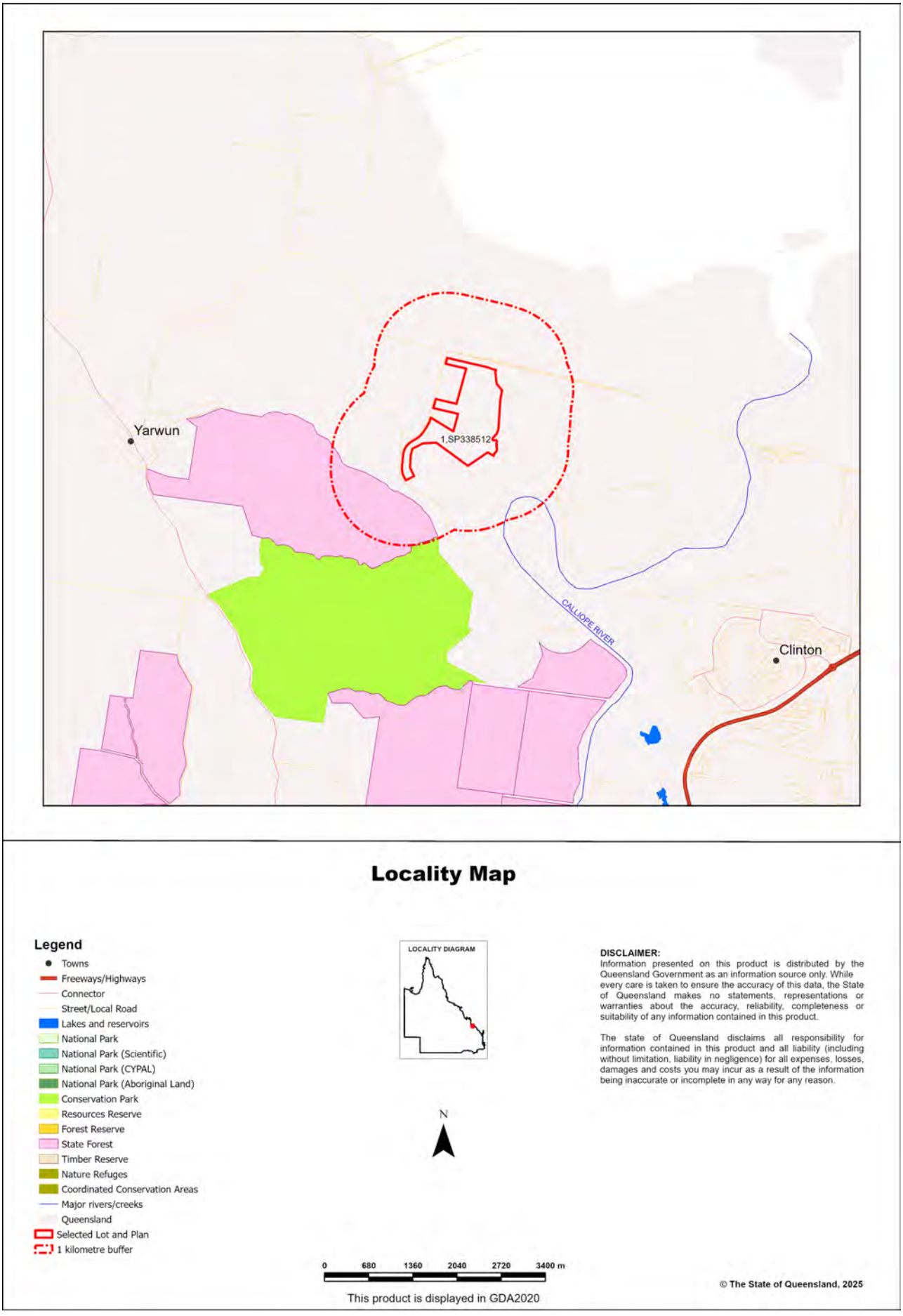


Table 2. Conservation significant species recorded within the area of interest and its one kilometre buffer

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

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Queensland Government

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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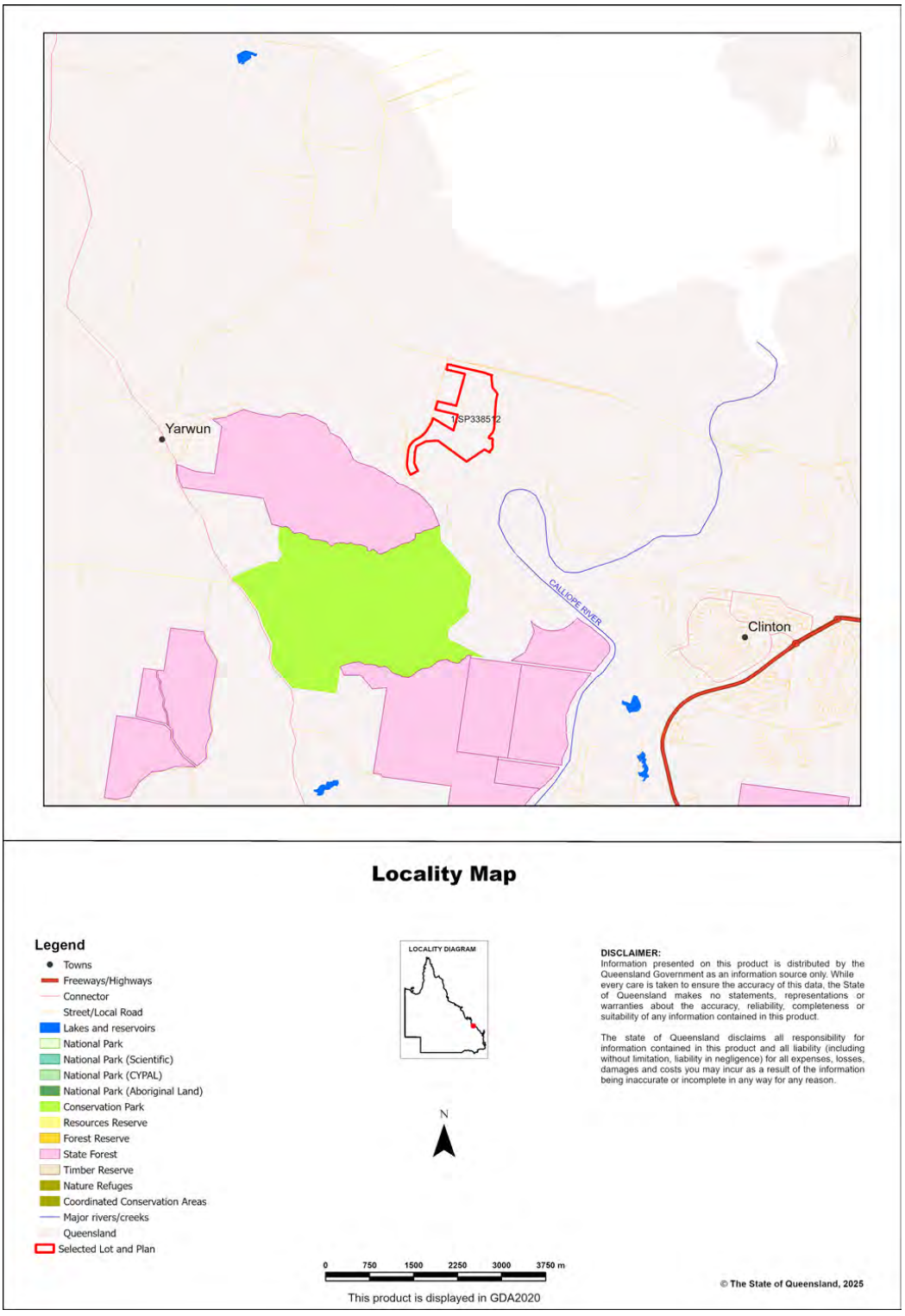
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Assessment Area Details

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
Boronia keysii	Keys boronia	V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	None
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	Core
Denisonia maculata	Ornamental snake	V	None
Euastacus bindal	Mount Elliot crayfish	CR	None
Euastacus binzayedi		CR	None
Euastacus eungella		E	None
Euastacus hystricosus		E	None
Euastacus jagara	Jagara hairy crayfish	CR	None
Euastacus maidae		CR	None
Euastacus monteithorum		E	None
Euastacus robertsi		E	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Macadamia integrifolia		V	None
Melaleuca irbyana	swamp tea-tree	E	None
Macadamia ternifolia		V	None
Macadamia tetraphylla	bopple nut	V	None
Petrogale penicillata	brush-tailed rock-wallaby	V	None
Petrogale coenensis	Cape York rock-wallaby	E	None
Petrogale purpureicollis	purple-necked rock-wallaby	V	None
Petrogale sharmani	Sharmans rock-wallaby	V	None
Petrogale xanthopus celeris	yellow-footed rock-wallaby (Qld subspecies)	V	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Phascolarctos cinereus	Koala - outside SEQ*	E	Core
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Xeromys myoides	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
Limosa lapponica baueri	Western Alaskan bar-tailed godwit	V	V	M-C/J/R/B/E
Calidris ferruginea	curlew sandpiper	CR	CE	M-C/J/R/B/E
Numenius madagascariensis	eastern curlew	E	CE	M-C/J/R/B/E
Charadrius mongolus	lesser sand plover	E	E	M-C/J/R/B/E
Petauroides armillatus	central greater glider	E	E	None
Ninox strenua	powerful owl	V	None	None

Special least concern animal species records

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

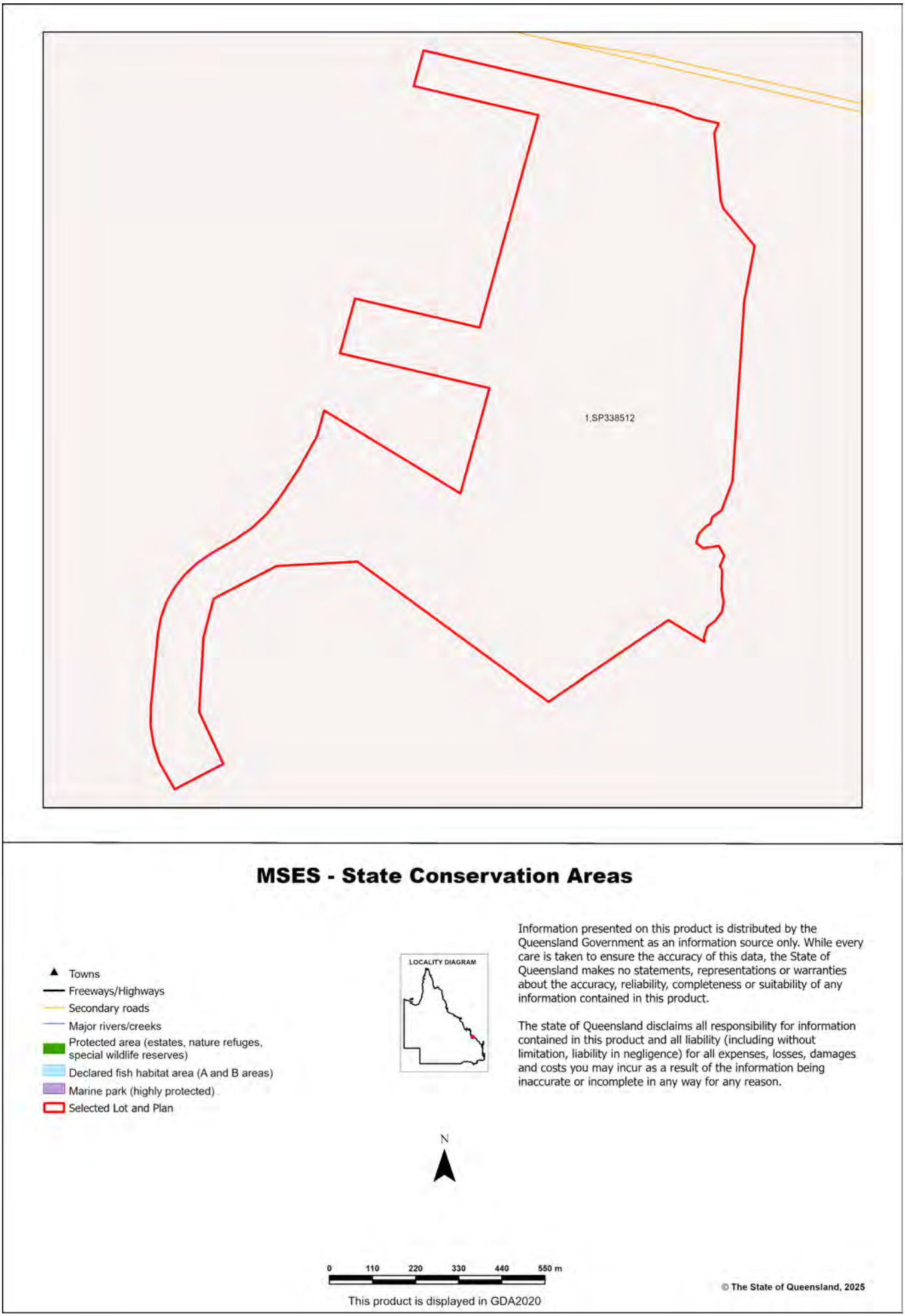
(No results)

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

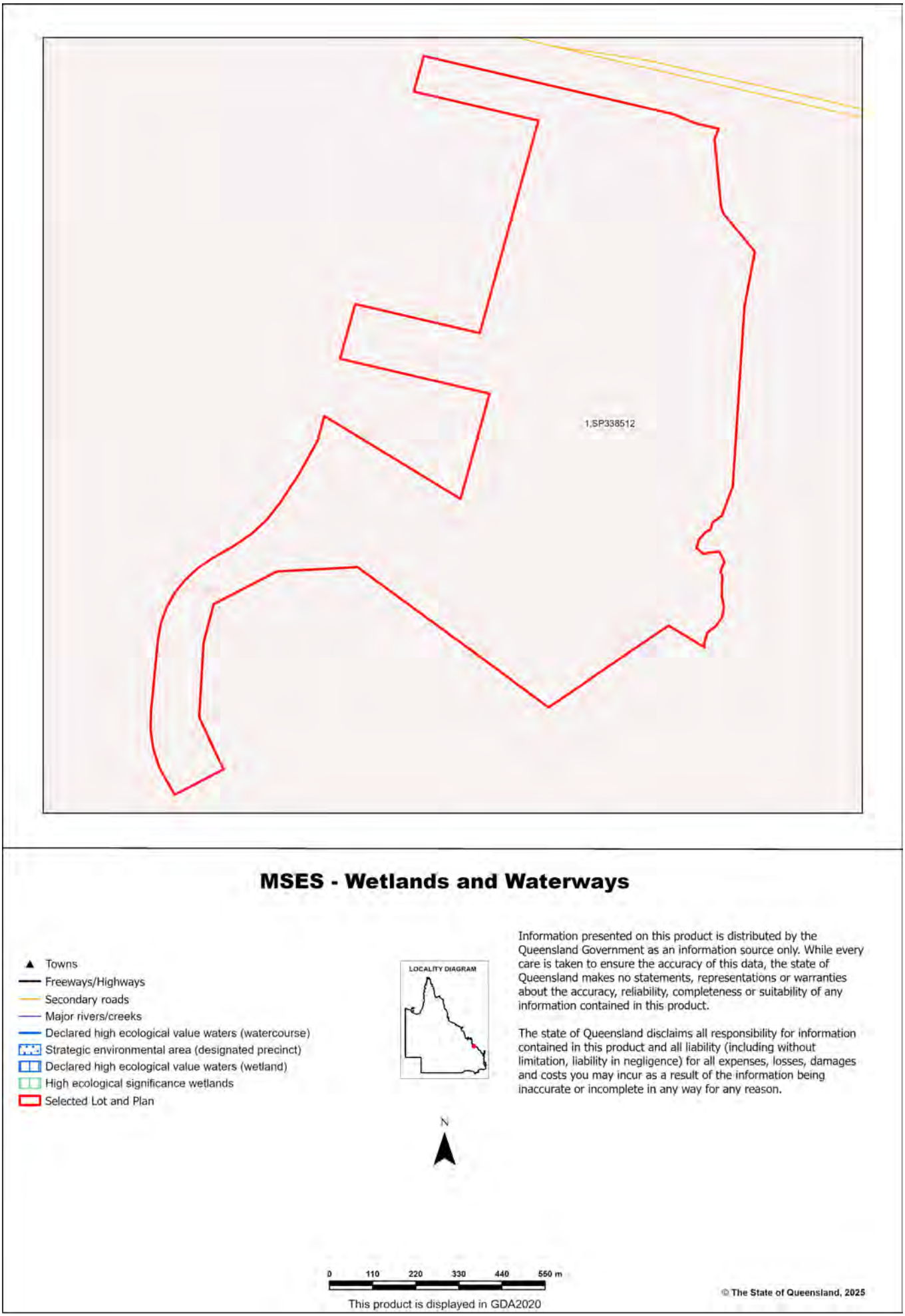
(No results)

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

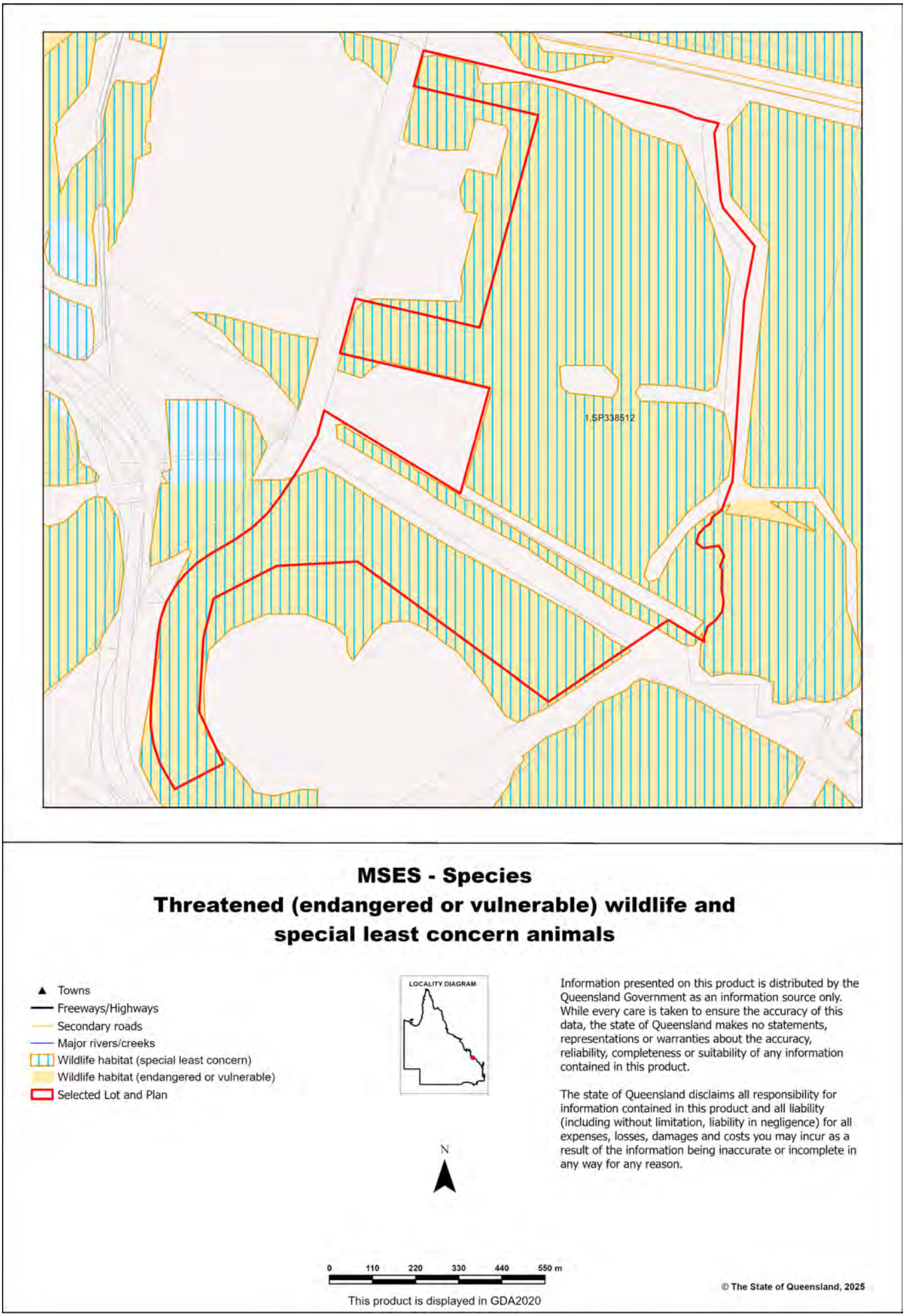
Map 1 - MSES - State Conservation Areas



Map 2 - MSES - Wetlands and Waterways



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



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

LOCALITY DIAGRAM



While every care is taken to ensure the accuracy of this product, the Department of the Environment, Tourism, Science and Innovation acting on behalf of the State of Queensland makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the data being inaccurate or incomplete in any way and for any reason. Due to varying sources of data, spatial locations may not coincide when overlaid.

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

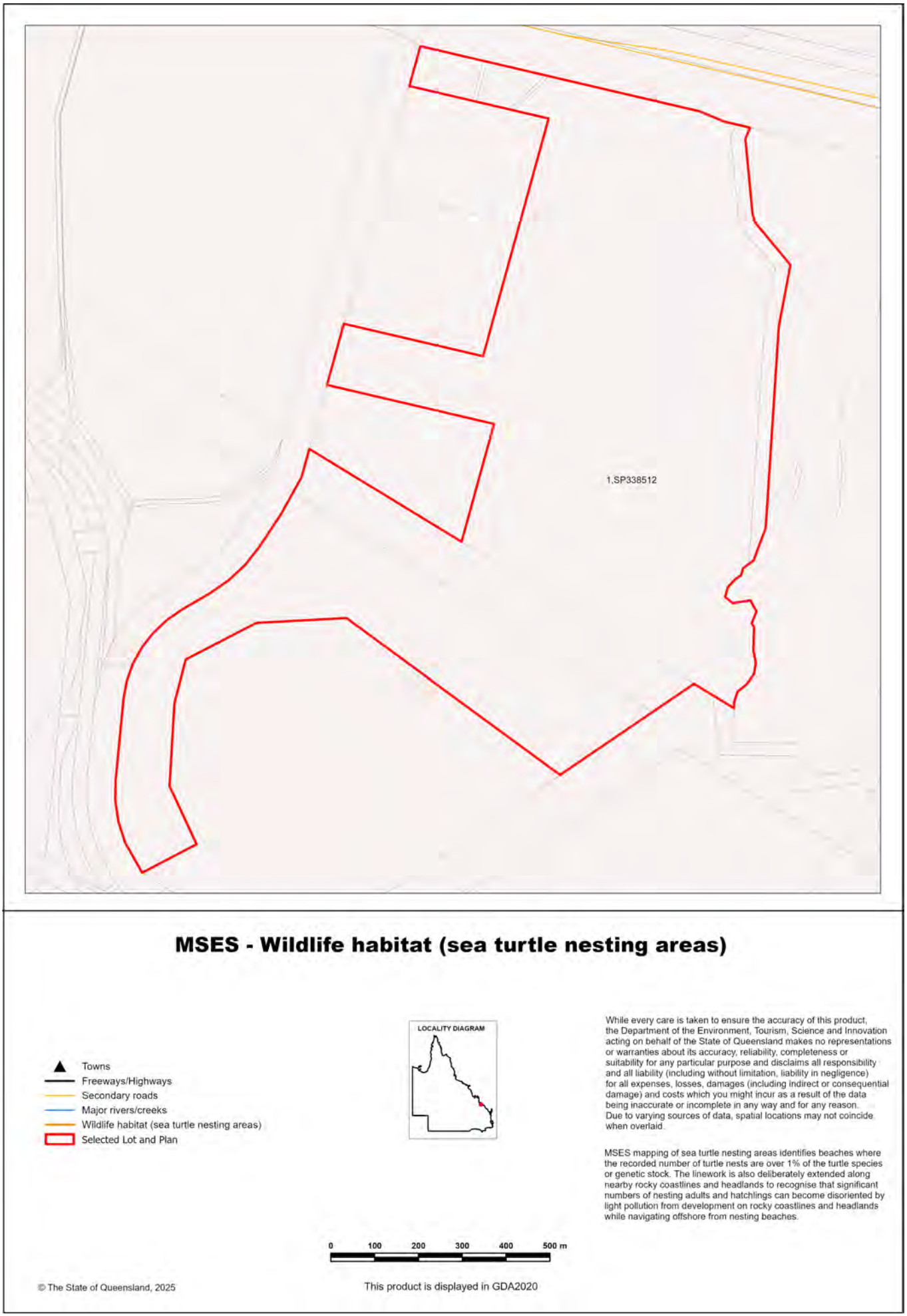
The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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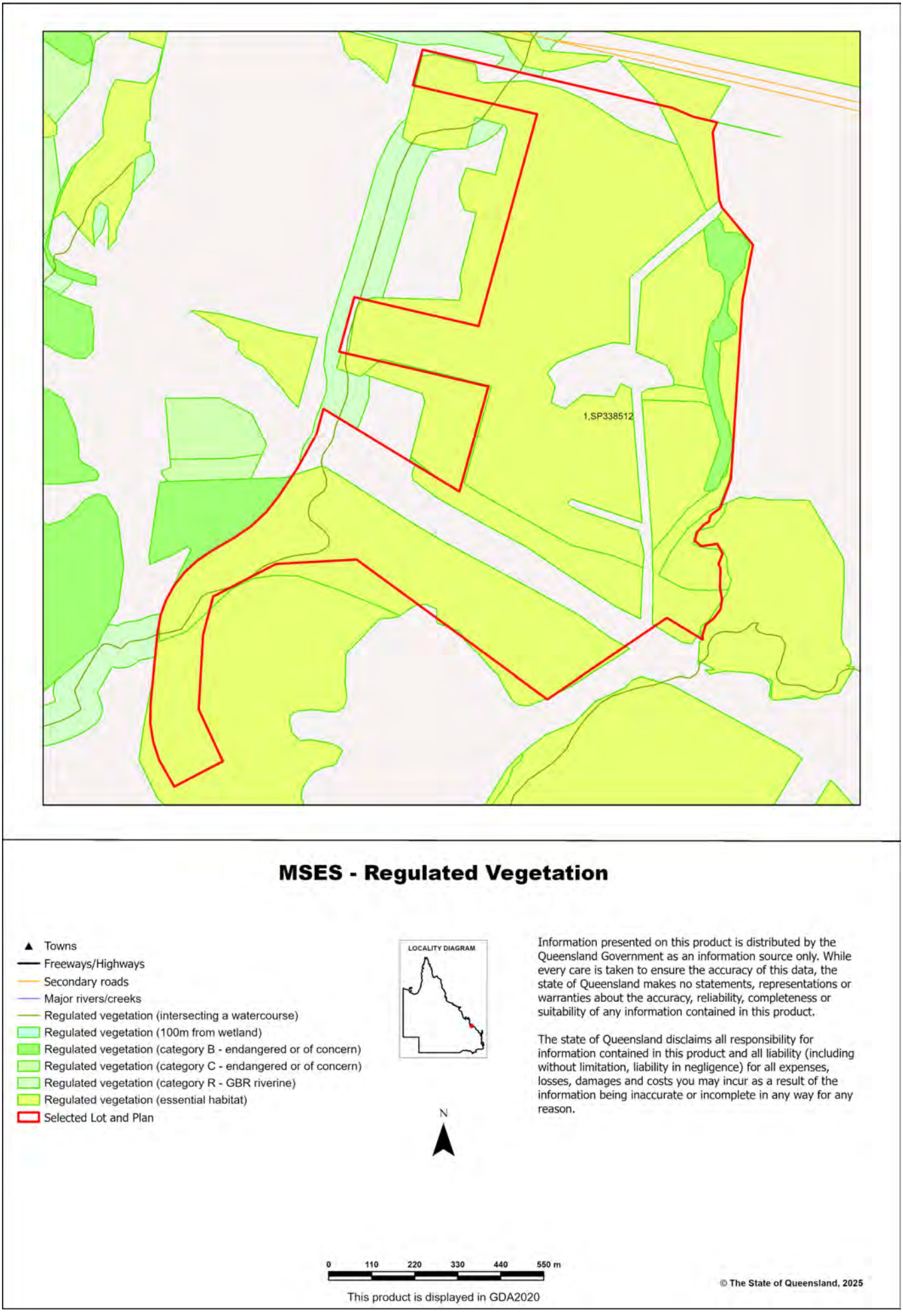
0 100 200 300 400 500 m

This product is displayed in GDA2020

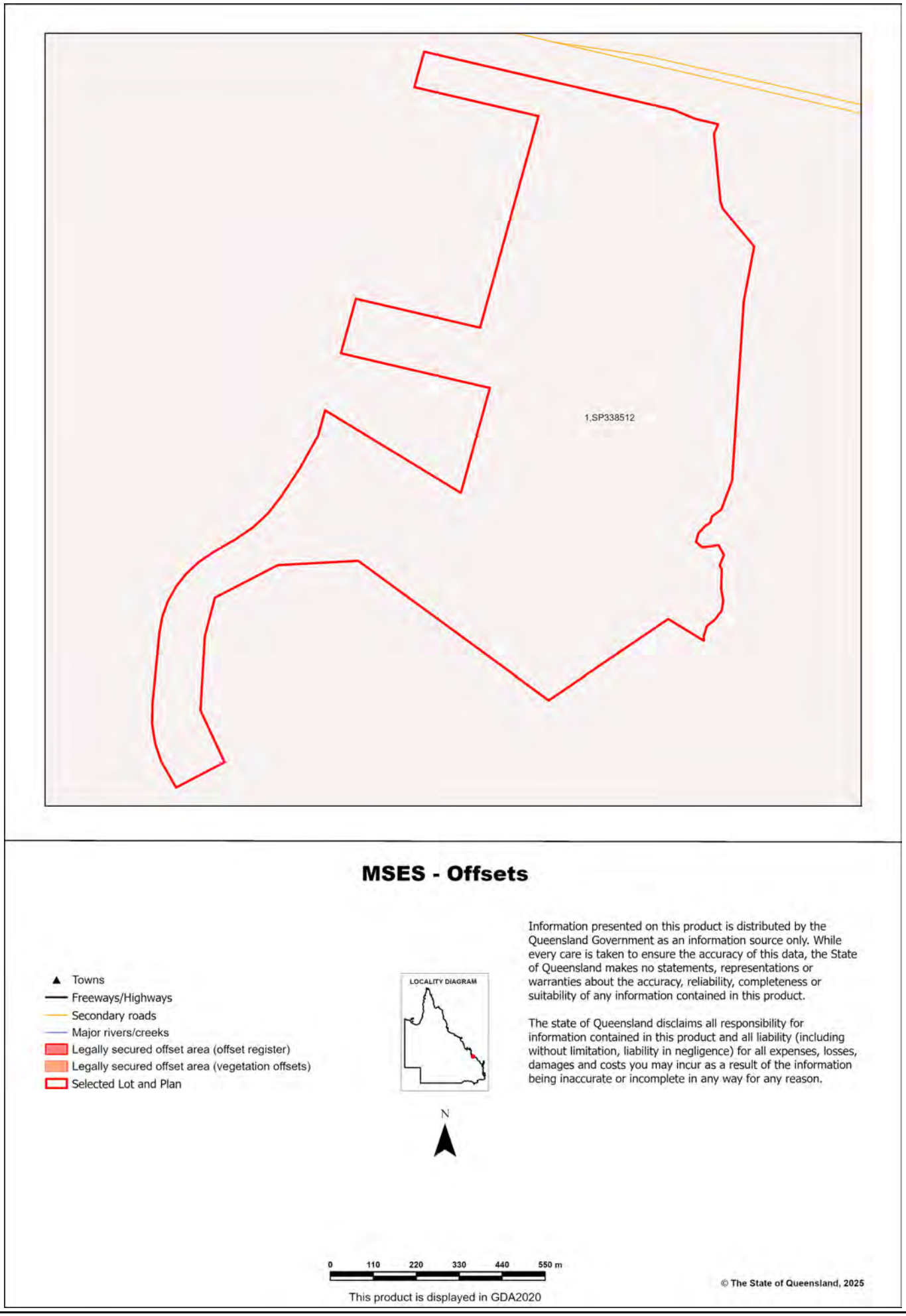
Map 3c - MSES - Species - Wildlife habitat (sea turtle nesting areas)



Map 4 - MSES - Regulated Vegetation



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

Queensland Government

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

Disclaimer

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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 access 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_l_17a	Terrestrial Bioregional Corridors	State	J (terrestrial corridor): STATE
seqn_l_01	Terrestrial bioregional corridors	State or Regional	Criterion J
seqn_l_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 prcesses

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
Calidris ferruginea	curlew sandpiper	CR	CE	Y	I	FA
Charadrius mongolus	lesser sand plover	E	E	Y	I	FA
Crocodylus porosus	estuarine crocodile	V		Y	I	FA
Dugong dugon	dugong	V		Y	I	FA
Gallinago hardwickii	Latham's snipe	SL	V	Y	I	FA
Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	V			FA
Limnodromus semipalmatus	Asian dowitcher	SL	V	Y	I	FA
Limosa lapponica baueri	Western Alaskan bar-tailed godwit	V	E	Y	I	FA
Ninox strenua	powerful owl	V				FA

Species	Common name	NCA status	EPBC status	Migratory species*	Wetland species**	Identified flora/fauna
Numenius madagascariensis	eastern curlew	E	CE	Y	I	FA
Petauroides volans volans	southern greater glider	E	E			FA
Phascolarctos cinereus	koala	E	E			FA
Pluvialis squatarola	grey plover	SL	V	Y	I	FA
Pteropus poliocephalus	grey-headed flying-fox	C	V			FA
Tringa nebularia	common greenshank	SL	E	Y	I	FA
Xenus cinereus	terek sandpiper	SL	V	Y	I	FA
Xeromys myoides	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
Chlamydosaurus kingii	frilled lizard	FA
Climacteris picumnus	brown treecreeper	FA
Figuladra incei curtisiana	Port Curtis Dark Snail	FA
Lampropholis adonis	diamond-shielded sunskink	FA
Melaleuca nervosa		FL
Melaleuca viridiflora		FL
Mogurnda adspersa	southern purplespotted gudgeon	FA
Mugil cephalus	sea mullet	FA
Ninox connivens	barking owl	FA
Notamacropus agilis	agile wallaby	FA
Petrogale herberti	Herbert's rock-wallaby	FA
Pomatostomus temporalis	grey-crowned babbler	FA

Species	Common name	Identified flora/fauna
Pteropus alecto	black flying-fox	FA
Scoteanax rueppellii	greater broad-nosed bat	FA
Varanus semiremex	rusty monitor	FA
Varanus varius	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
Ardea alba modesta	Eastern Great Egret	FA
Casuarina cunninghamiana		FL
Eucalyptus tereticornis		FL
Lates calcarifer	Barramundi	FA
Lomandra longifolia		FL
Megalops cyprinoides	Oxeye Herring/Tarpon	FA
Melaleuca leucadendra	broad-leaved tea-tree	FL
Melaleuca viminalis		FL
Mugil cephalus	Sea Mullet	FA
Nymphoides indica	water snowflake	FL

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

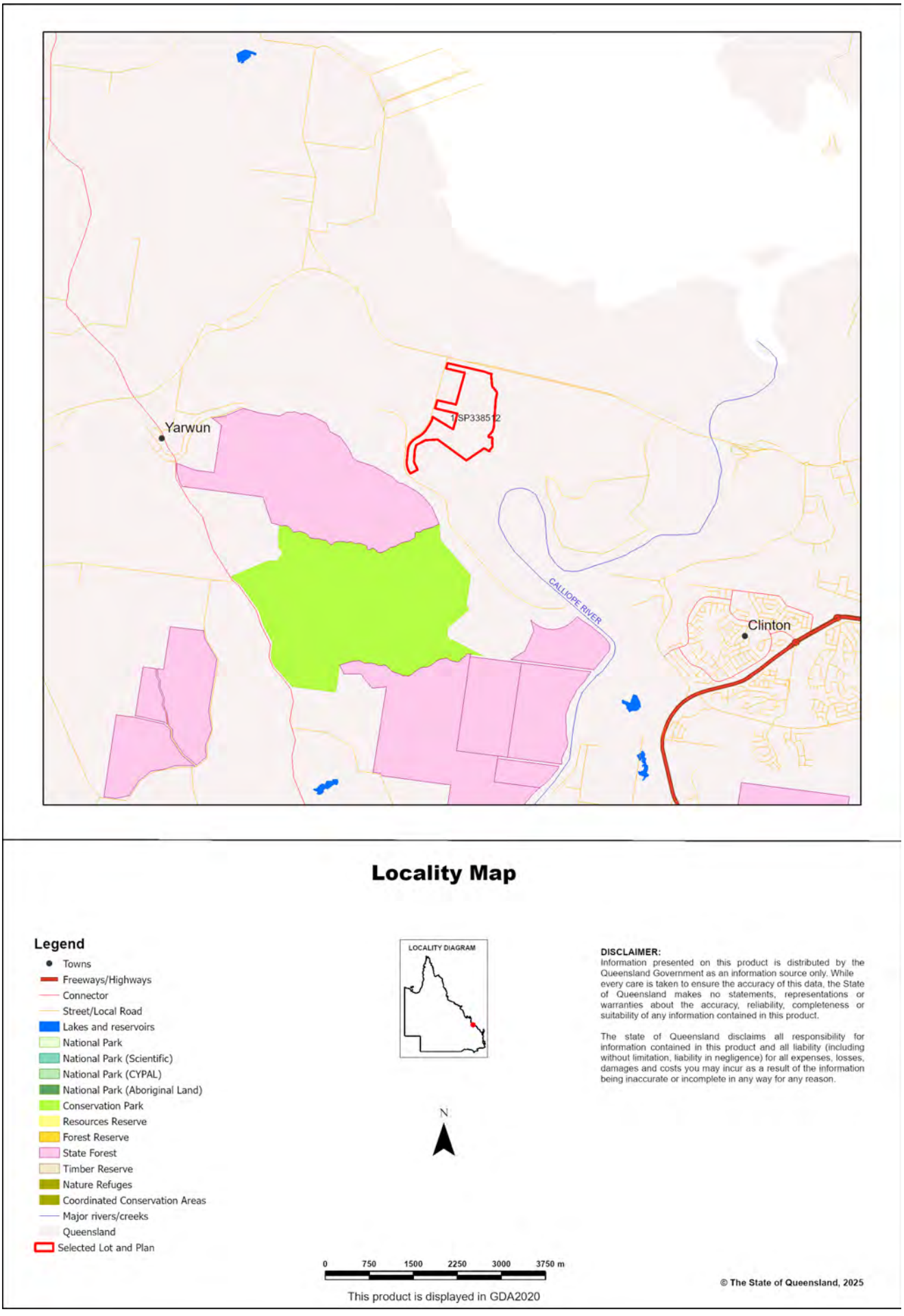
Species	Common name	Identified flora/fauna
Ardea alba modesta	Eastern Great Egret	FA
Cyperus exaltatus	tall flatsedge	FL
Eucalyptus tereticornis		FL
Lates calcarifer	Barramundi	FA
Machaerina articulata	jointed twigrush	FL
Megalops cyprinoides	Oxeye Herring/Tarpon	FA
Melaleuca leucadendra	broad-leaved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

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

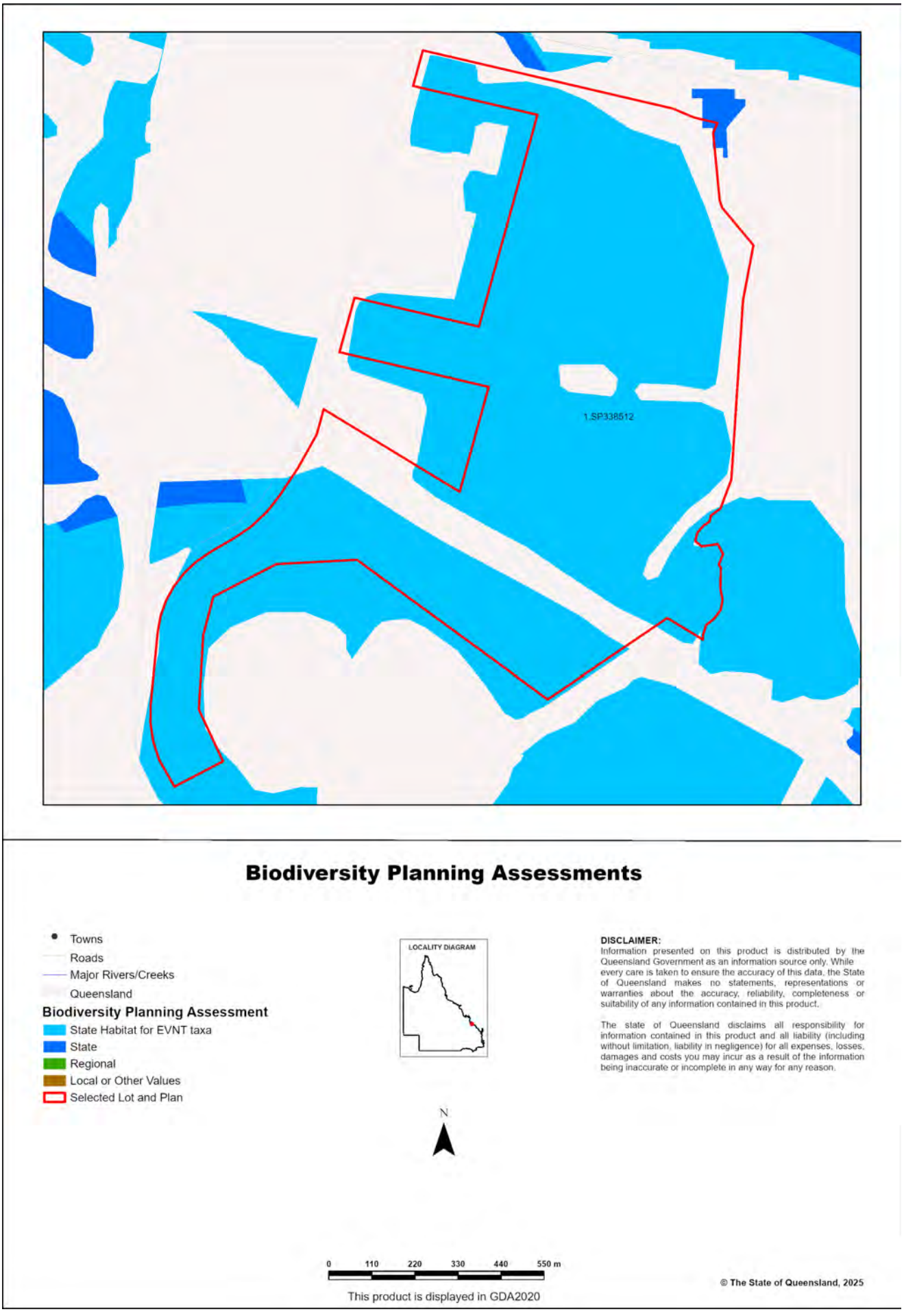
NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details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

Maps

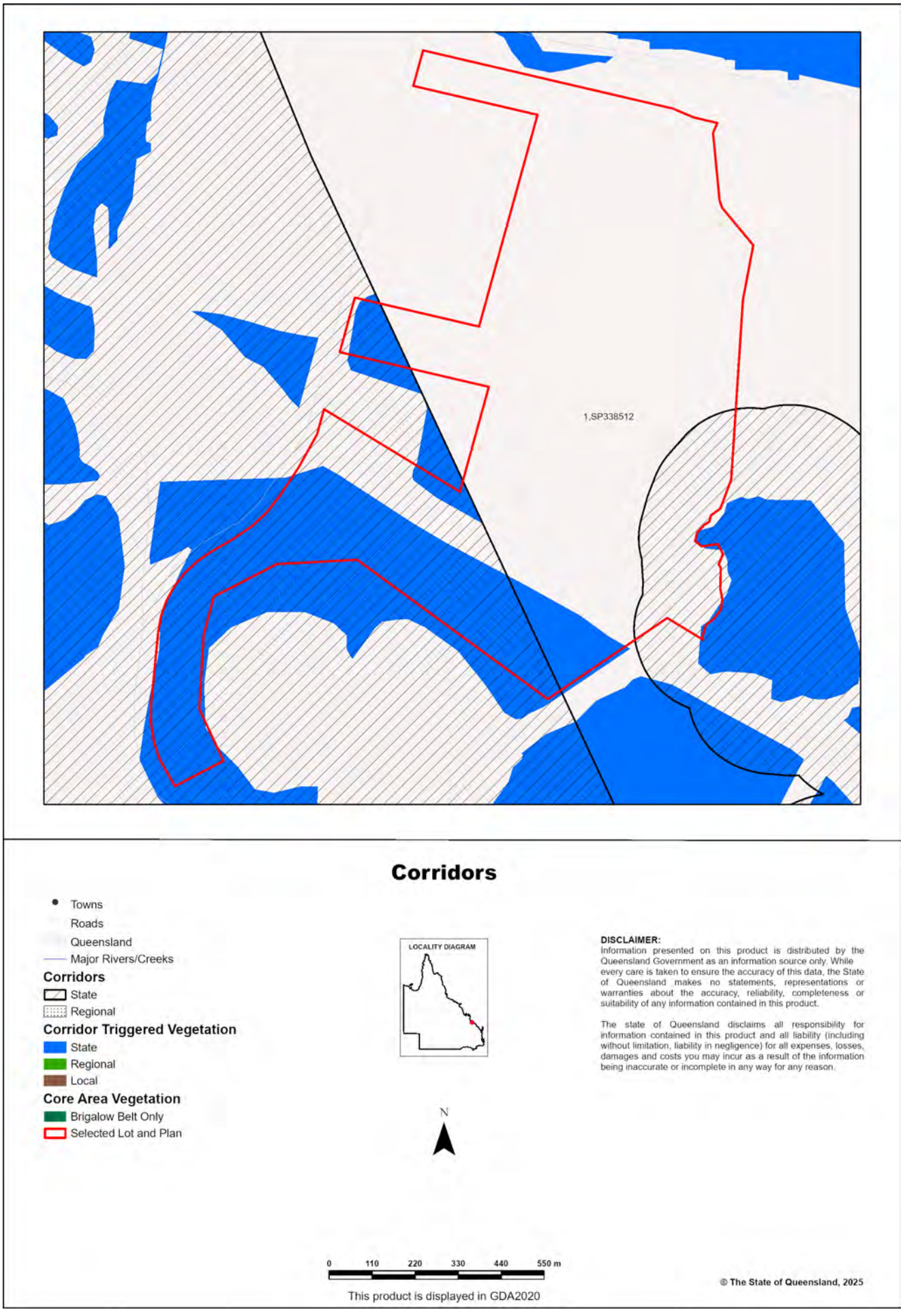
Map 1 - Locality Map



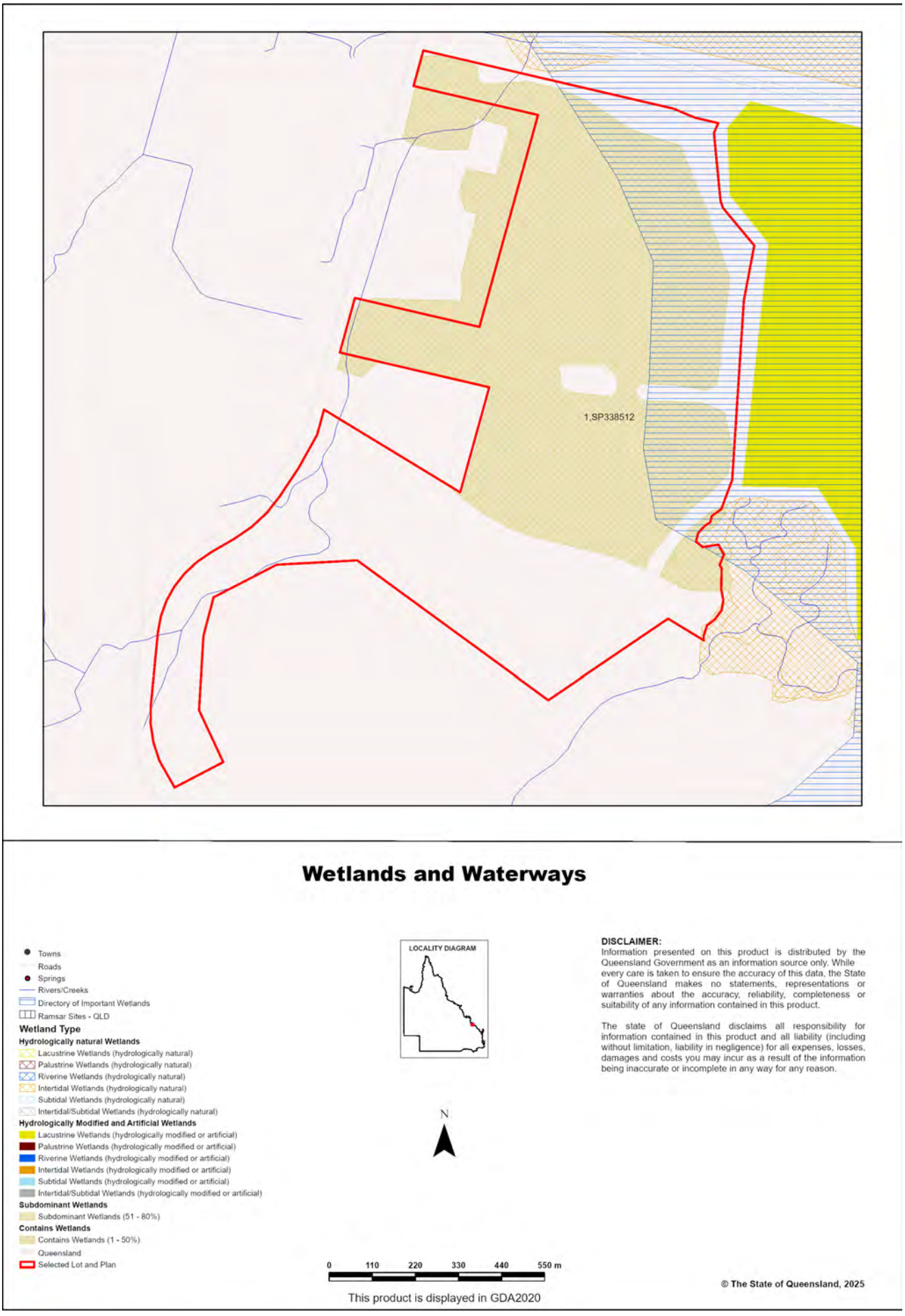
Map 2 - Biodiversity Planning Assessment (BPA)



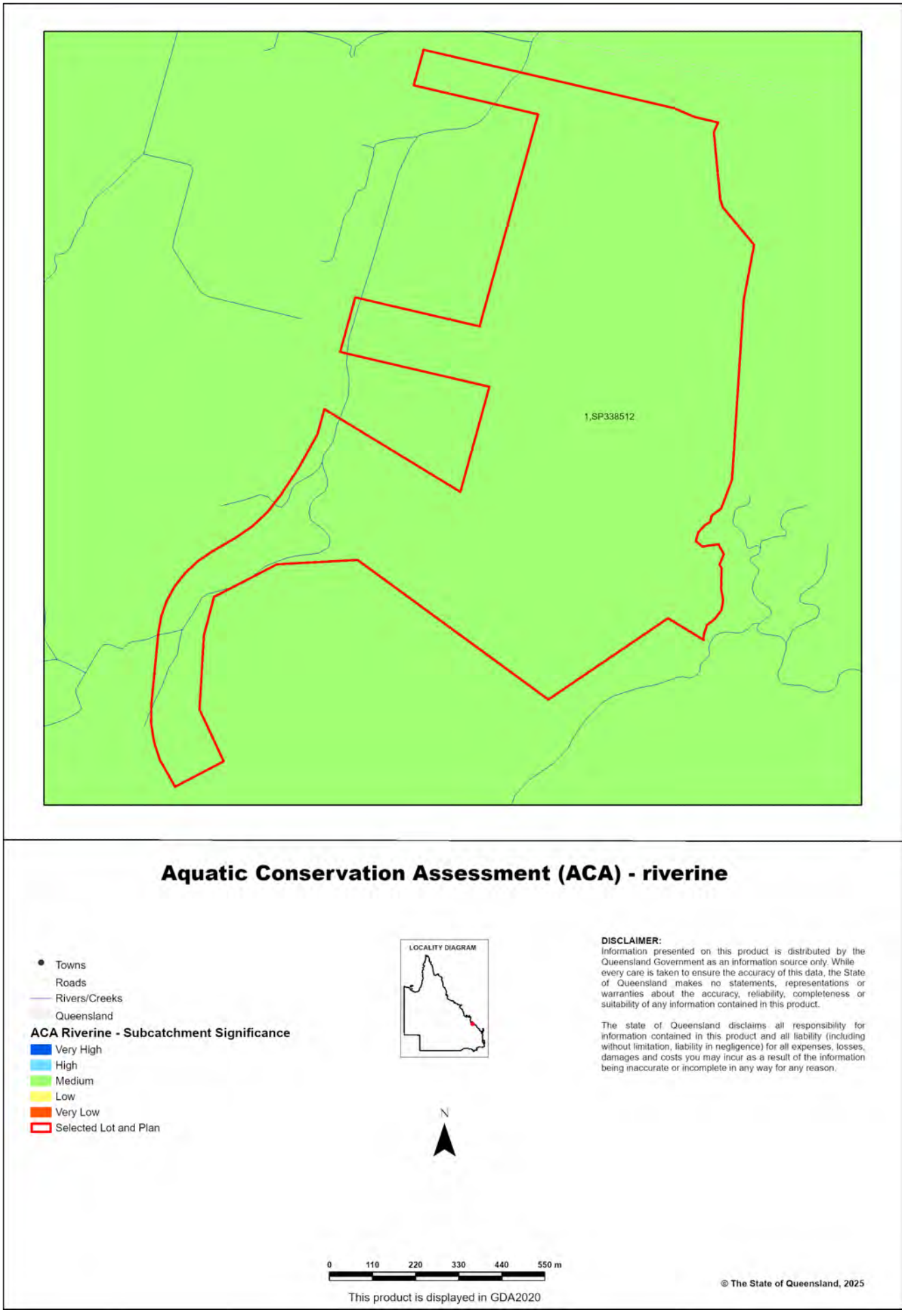
Map 3 - Corridors



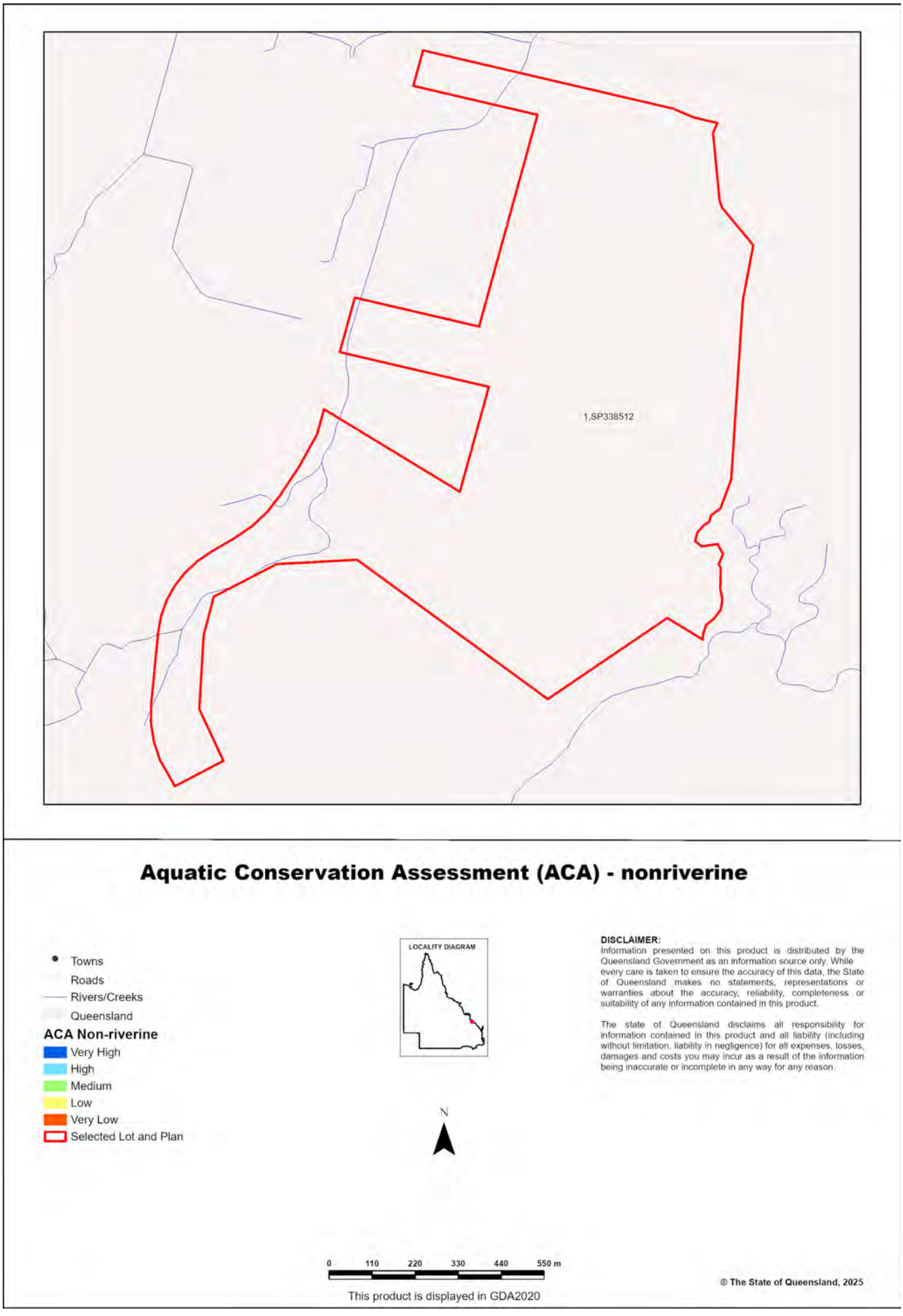
Map 4 - Wetlands and waterways



Map 5 - Aquatic Conservation Assessment (ACA) - riverine



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



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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, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
BPA Priority Species	An internal DETSI database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DETSI database compiled from Wildnet, Herbrecs, 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	- *Environment Protection and Biodiversity Conservation Act 1999*
EVNT	- Endangered, Vulnerable, Near Threatened
GDA2020	- Geocentric Datum of Australia 2020
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement

AREA REPORT

ATLAS OF LIVING AUSTRALIA
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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

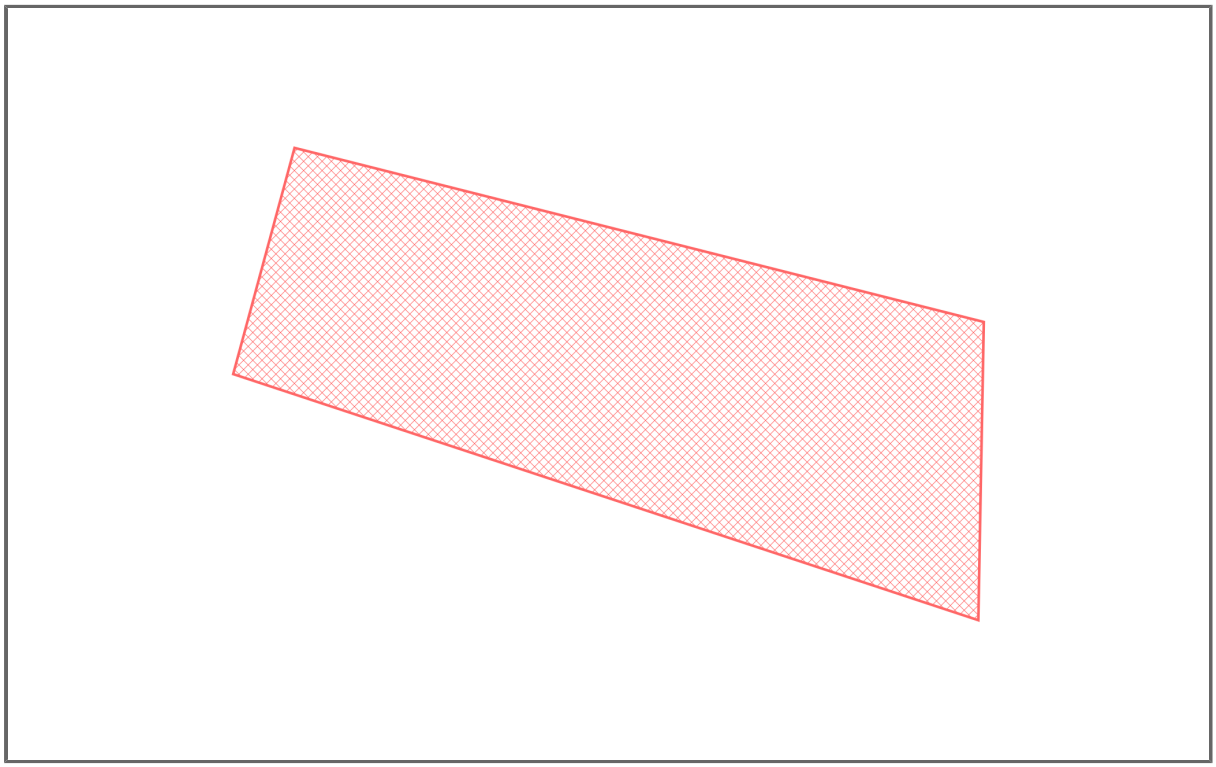


Figure 3 : Map of Global Context Ecoregions

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

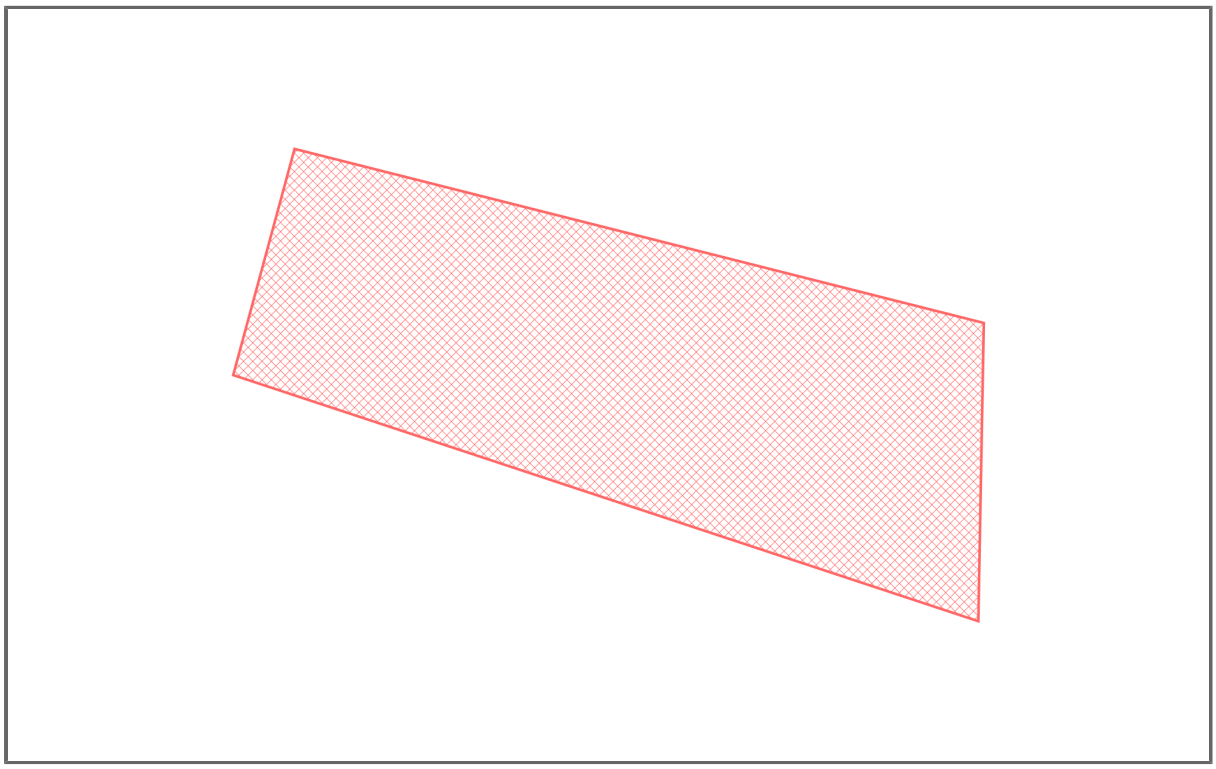


Figure 4 : Map of Freshwater Ecoregions of the World (FEOW)

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**

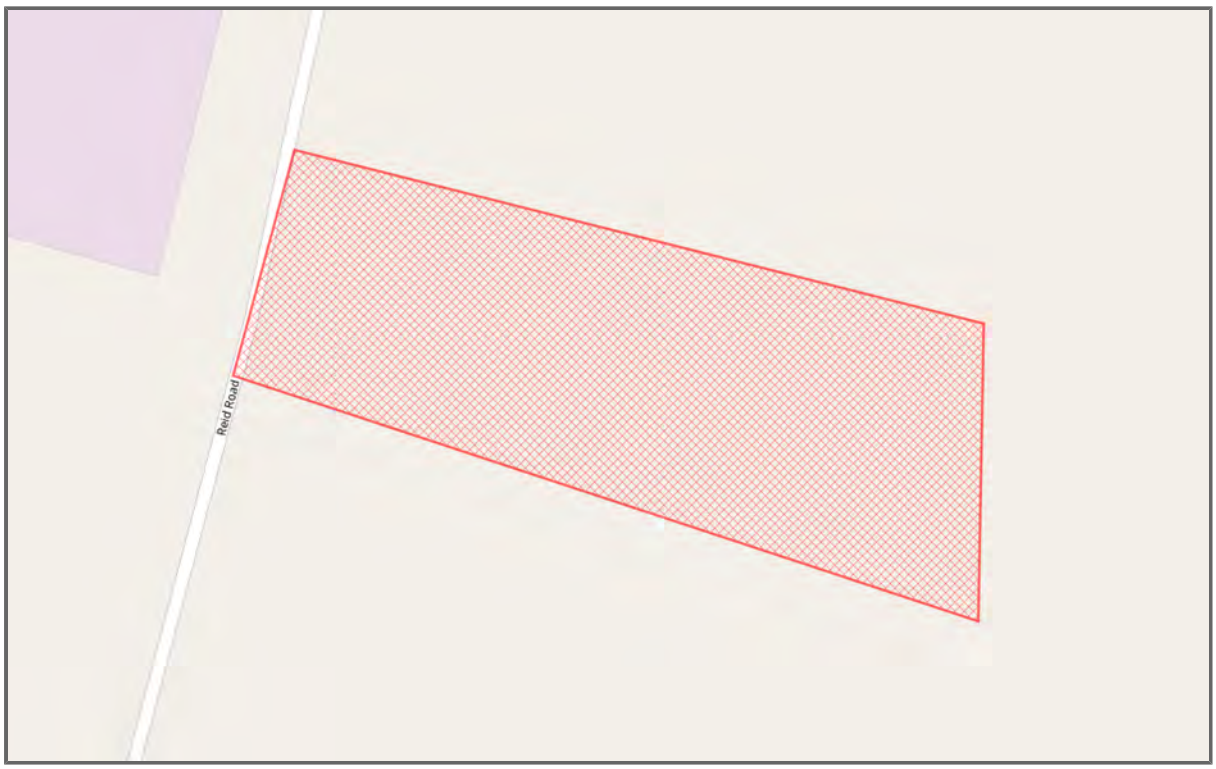


Figure 5 : Map of Occurrences

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**

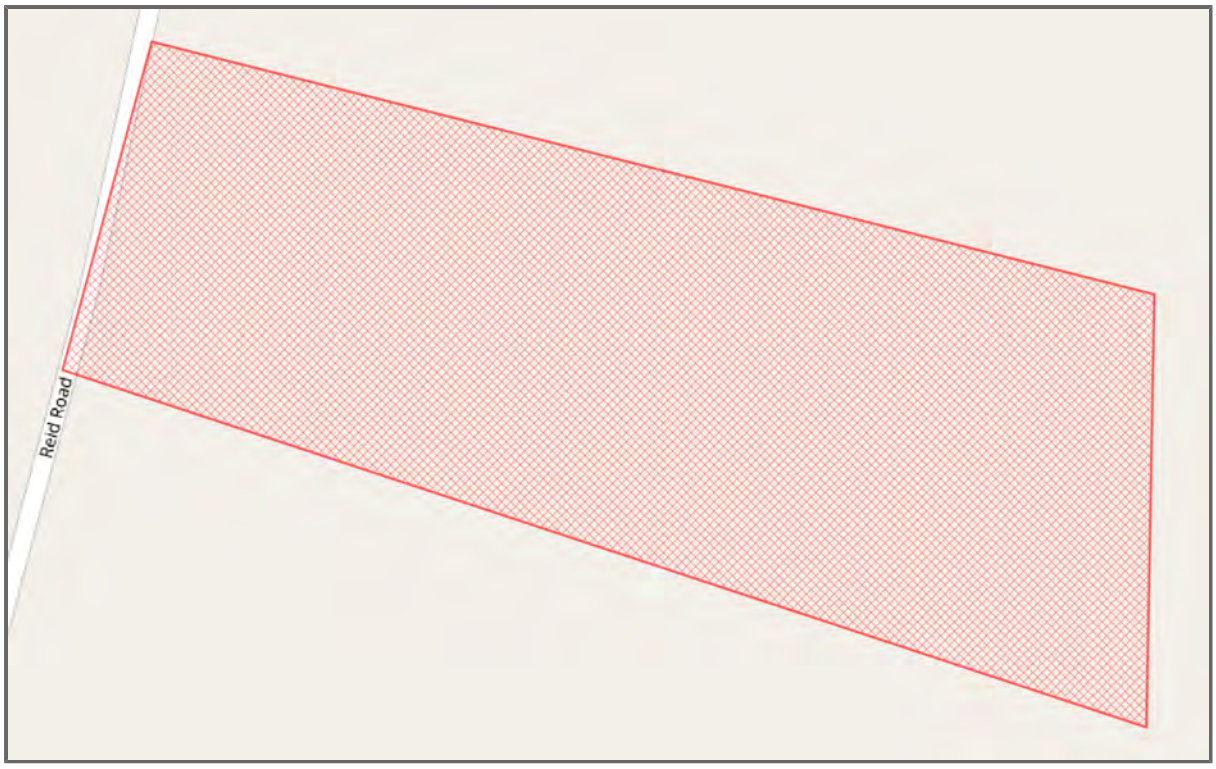


Figure 6 : Map of All invasive species

Table 5: All invasive species (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Iconic species

Number of iconic species: **0**

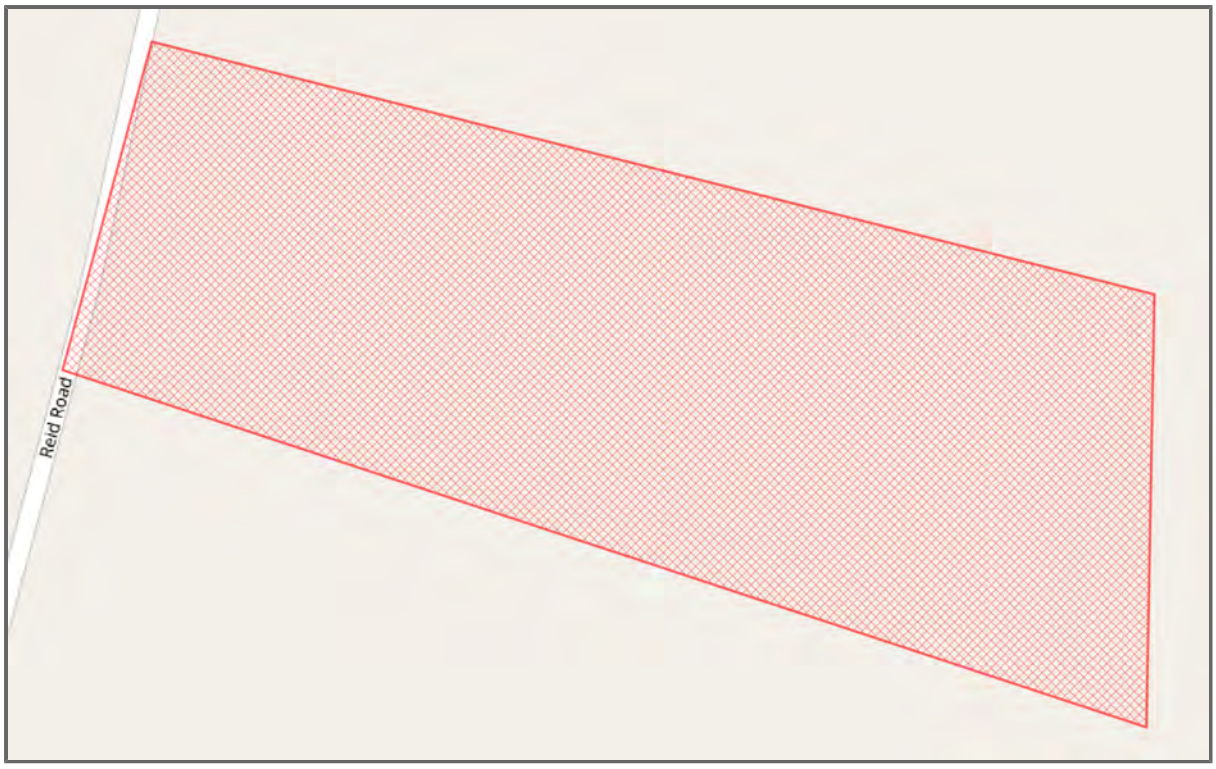


Figure 7 : Map of Iconic species

Table 6: Iconic species (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Migratory species

Number of migratory species: **0**

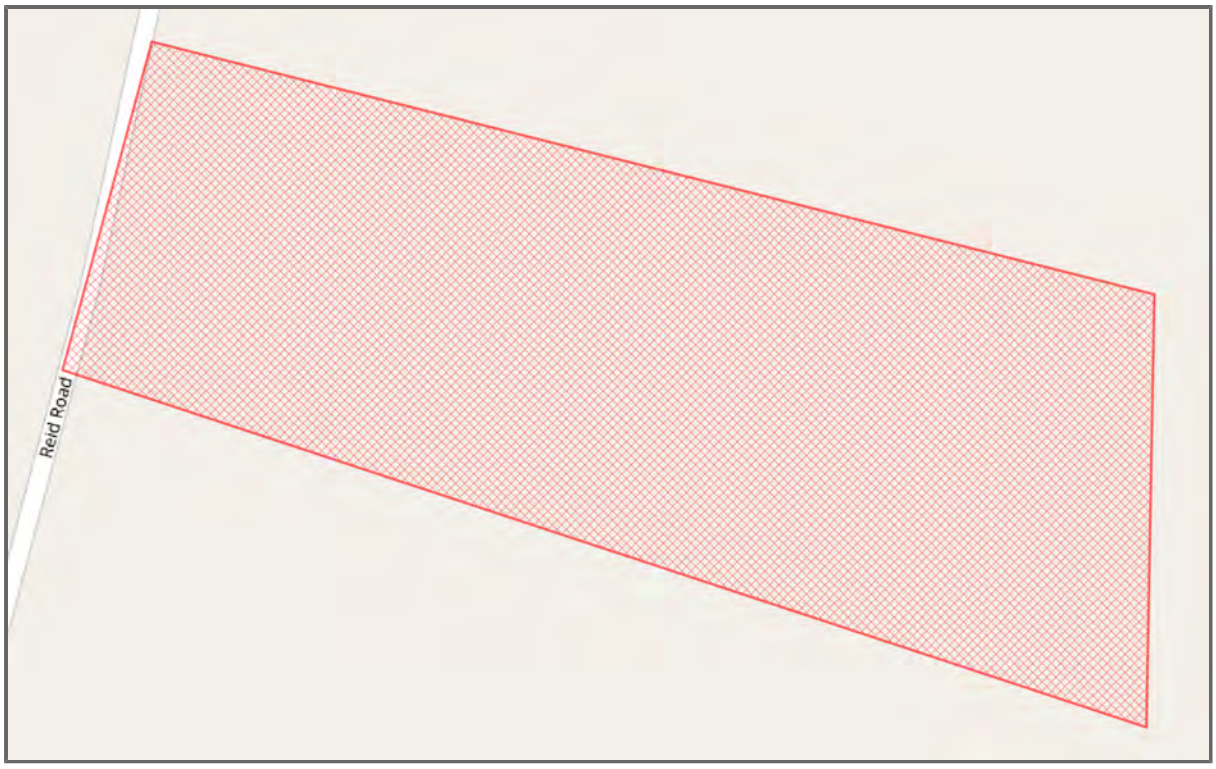


Figure 8 : Map of Migratory species

Table 7: Migratory species (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Algae

Number of Algae **0**

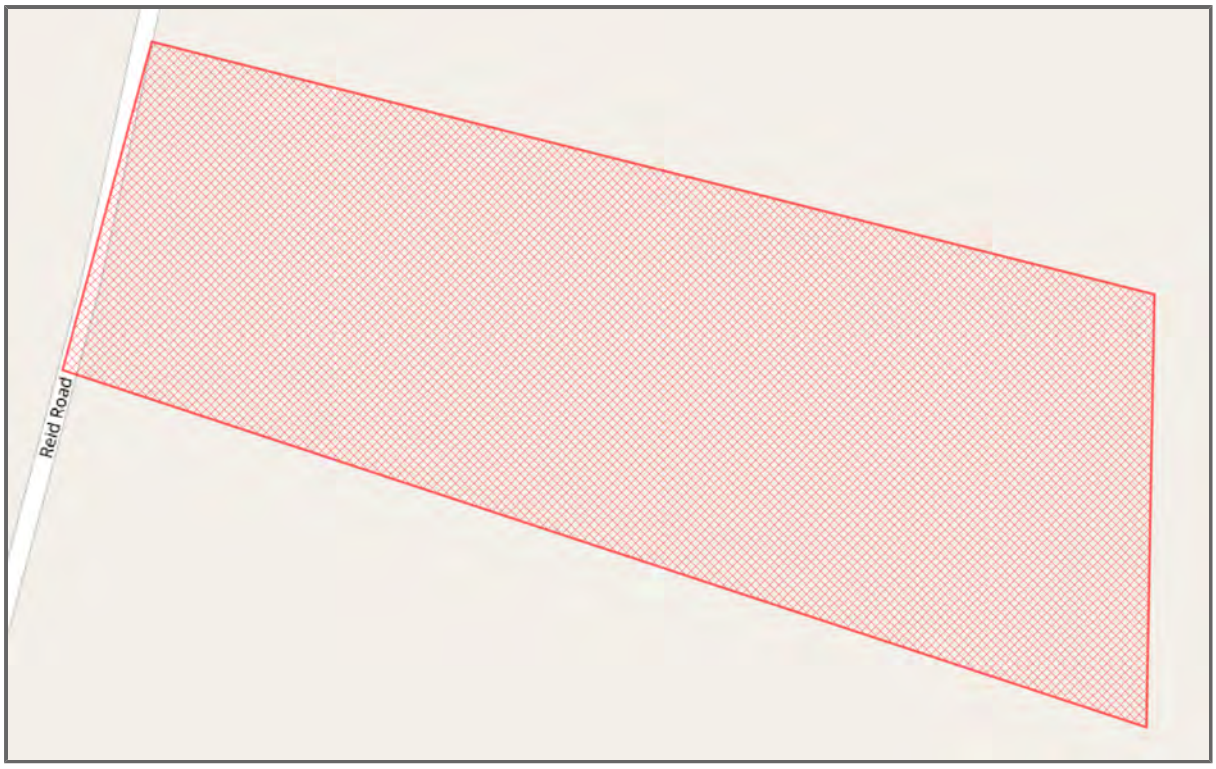


Figure 9 : Map of Lifeform - Algae

Table 8: Lifeform - Algae (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Amphibians

Number of Amphibians **0**

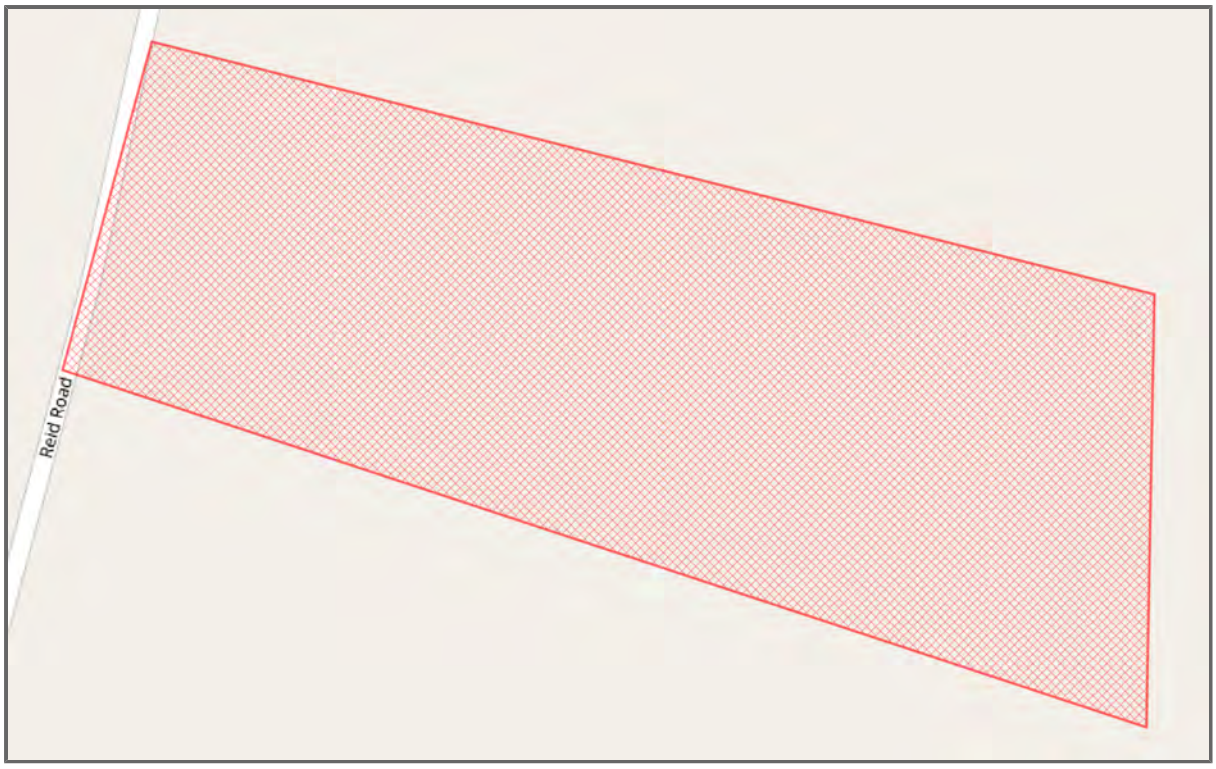


Figure 10 : Map of Lifeform - Amphibians

Table 9: Lifeform - Amphibians (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Angiosperms

Number of Angiosperms **0**

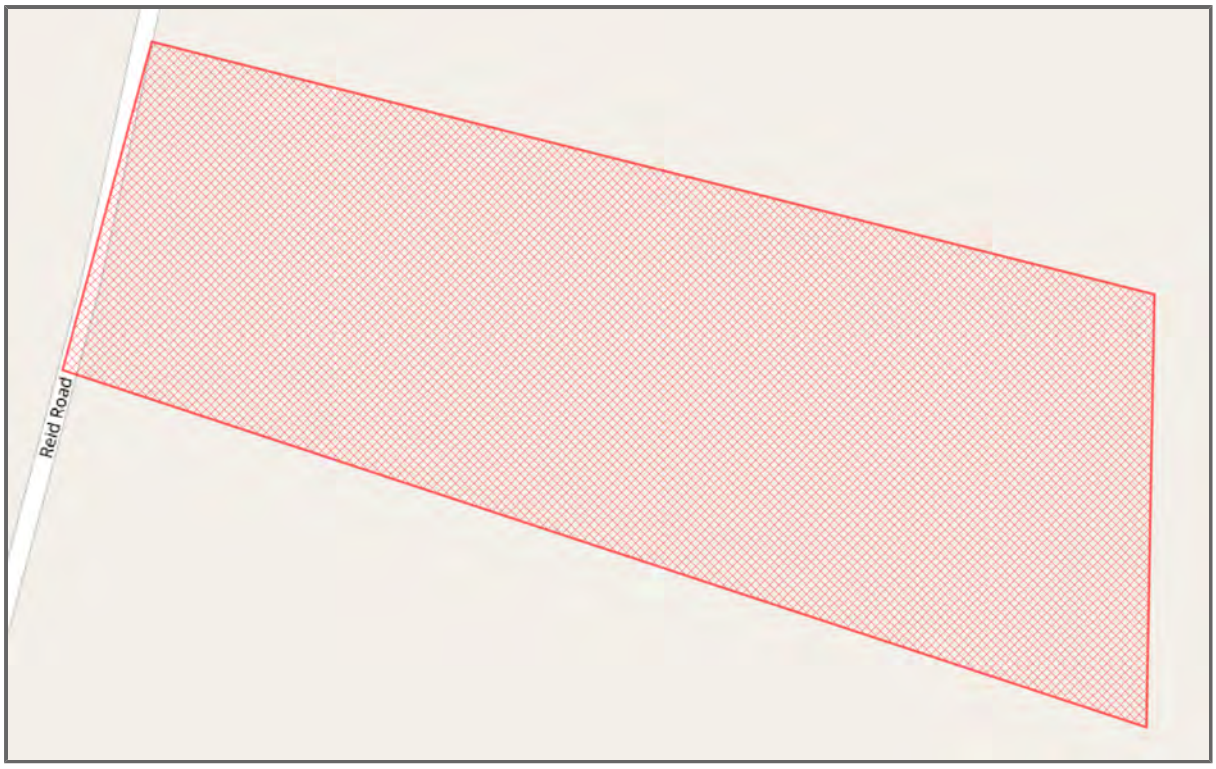


Figure 11 : Map of Lifeform - Angiosperms

Table 10: Lifeform - Angiosperms (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Animals

Number of Animals **0**

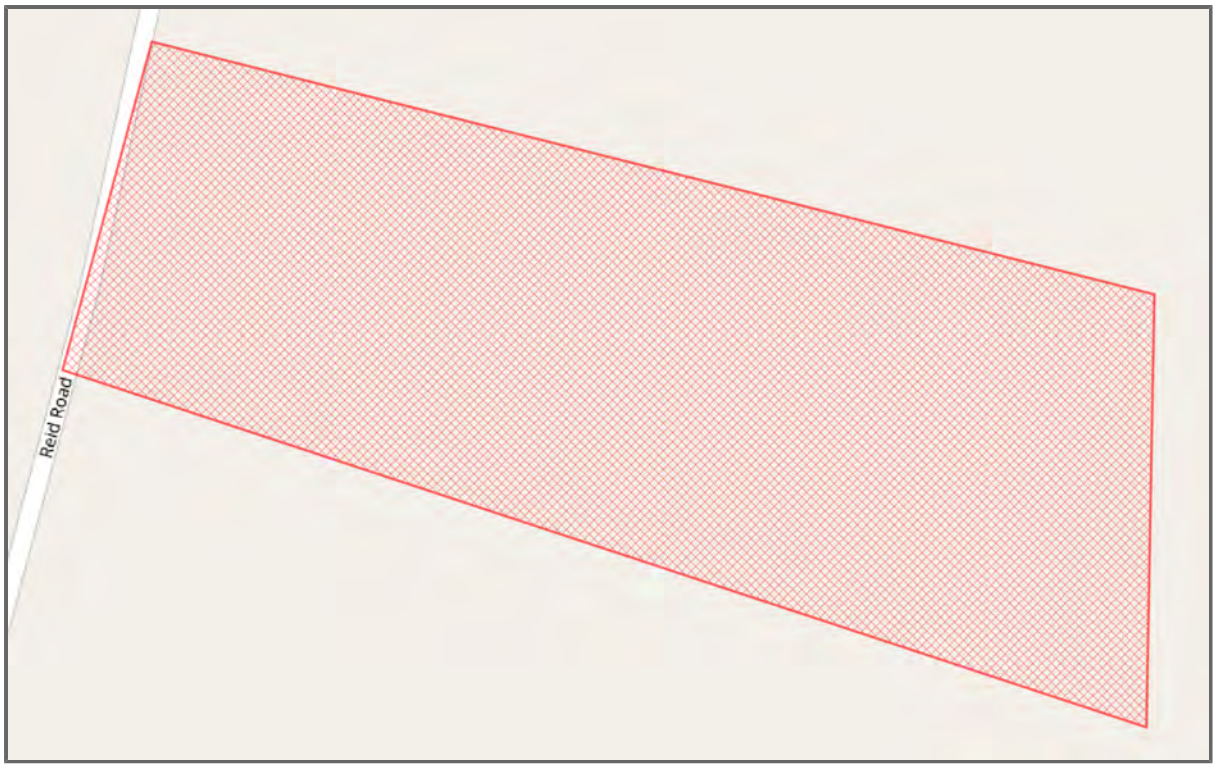


Figure 12 : Map of Lifeform - Animals

Table 11: Lifeform - Animals (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Arthropods

Number of Arthropods **0**

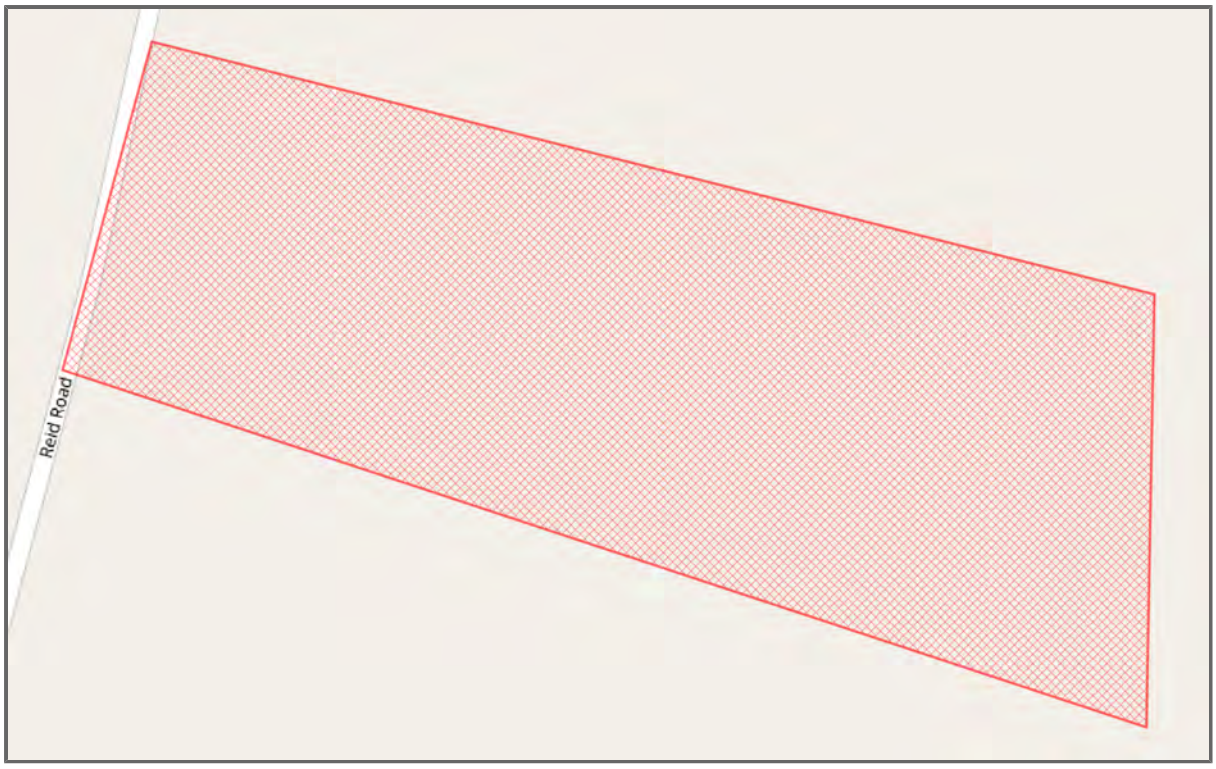


Figure 13 : Map of Lifeform - Arthropods

Table 12: Lifeform - Arthropods (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Bacteria

Number of Bacteria **0**

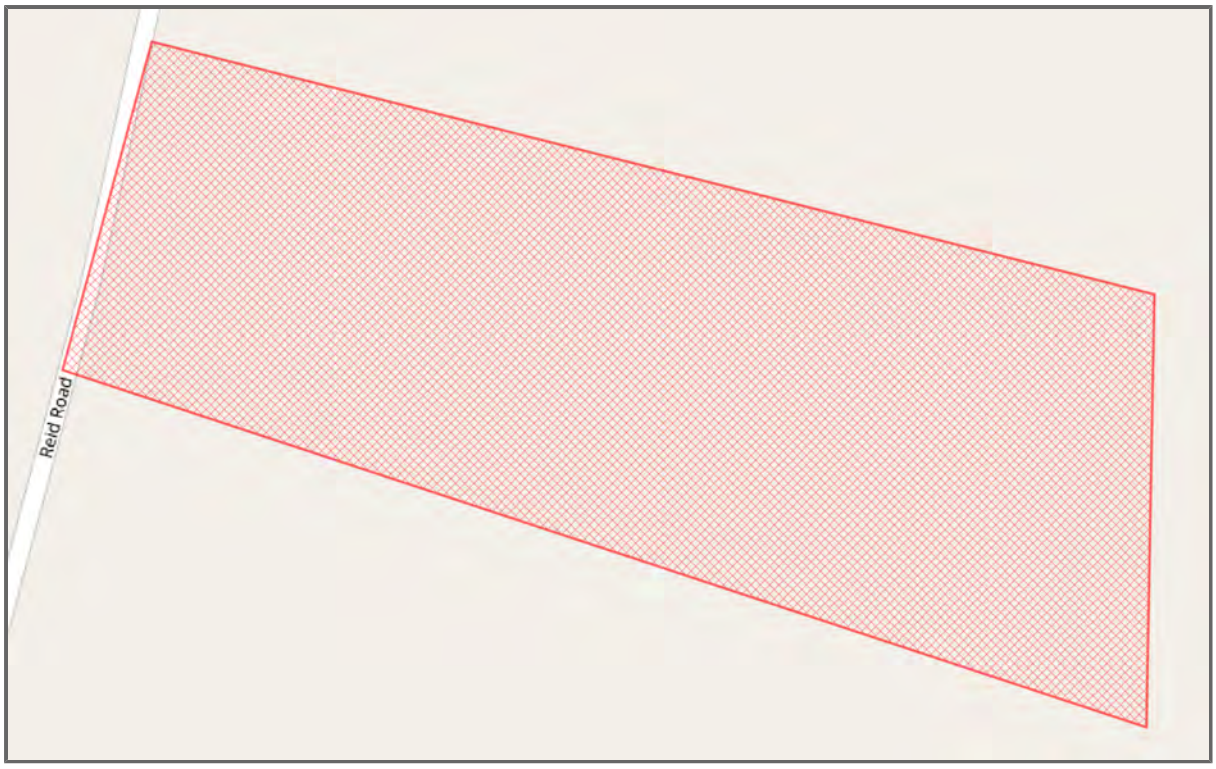


Figure 14 : Map of Lifeform - Bacteria

Table 13: Lifeform - Bacteria (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Birds

Number of Birds **0**

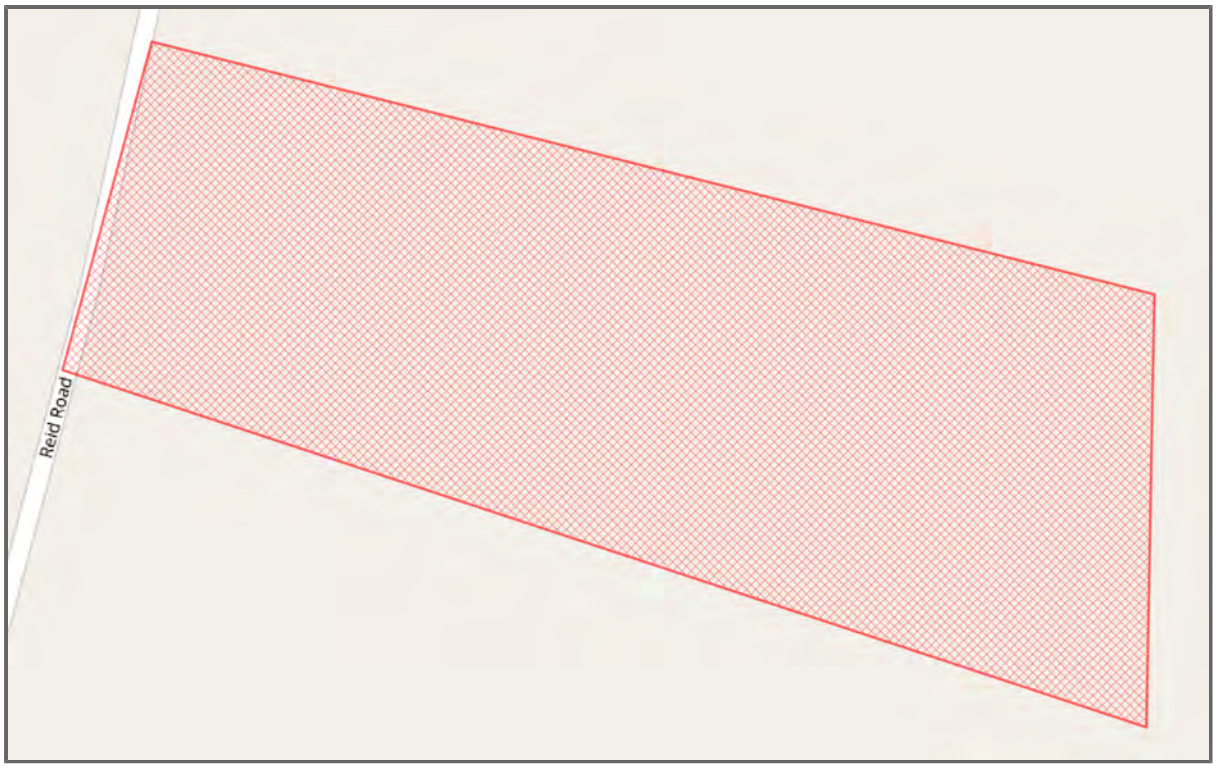


Figure 15 : Map of Lifeform - Birds

Table 14: Lifeform - Birds (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Bryophytes

Number of Bryophytes **0**

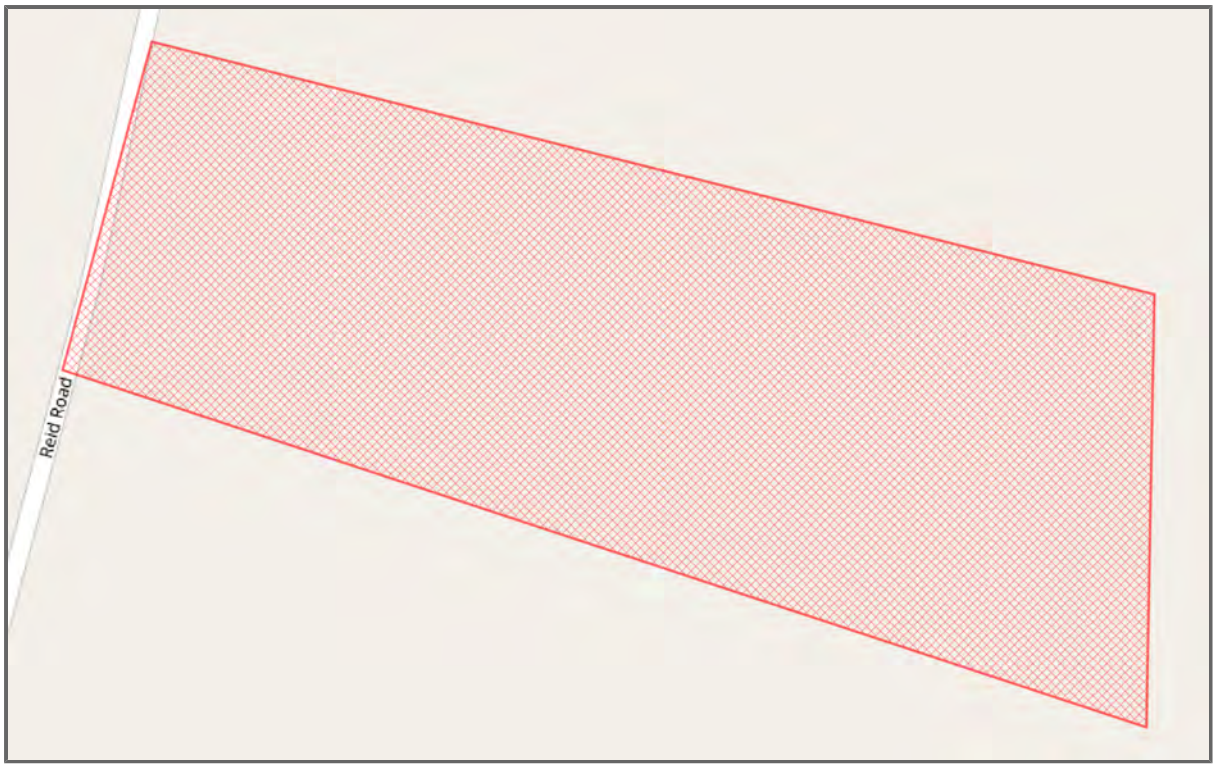


Figure 16 : Map of Lifeform - Bryophytes

Table 15: Lifeform - Bryophytes (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Chromista

Number of Chromista **0**

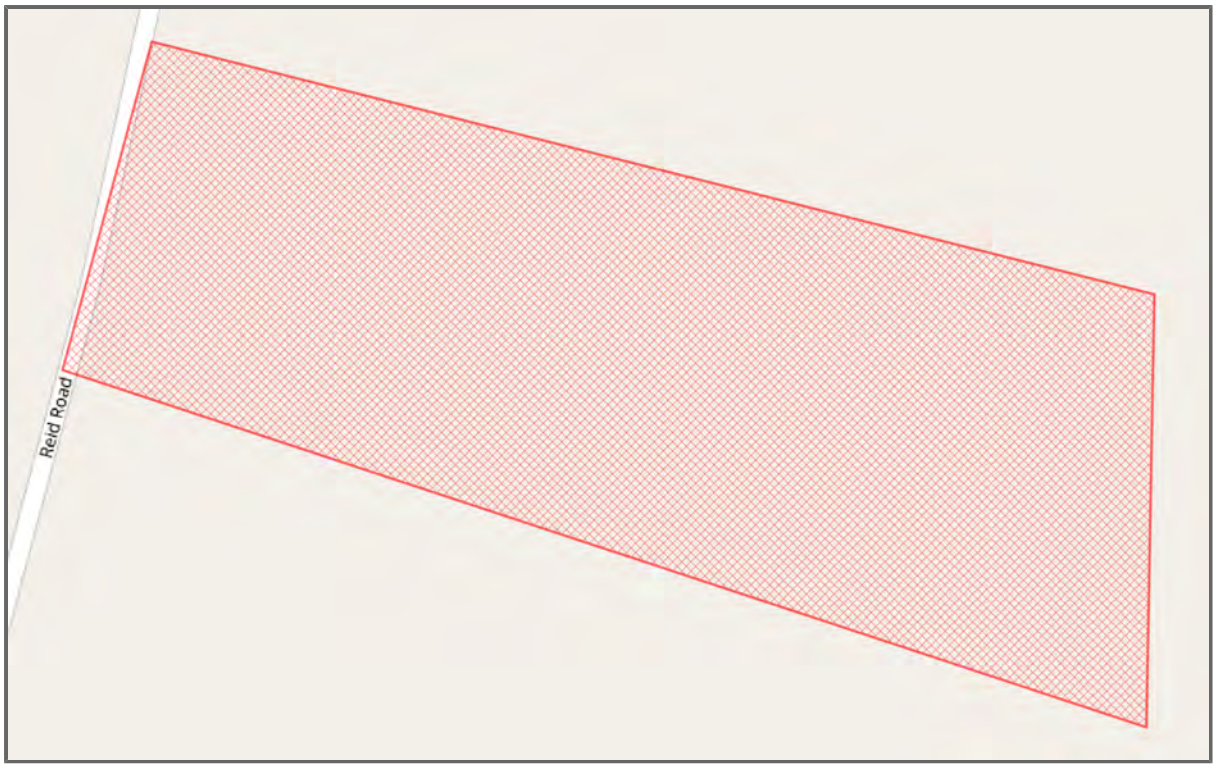


Figure 17 : Map of Lifeform - Chromista

Table 16: Lifeform - Chromista (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Crustaceans

Number of Crustaceans **0**

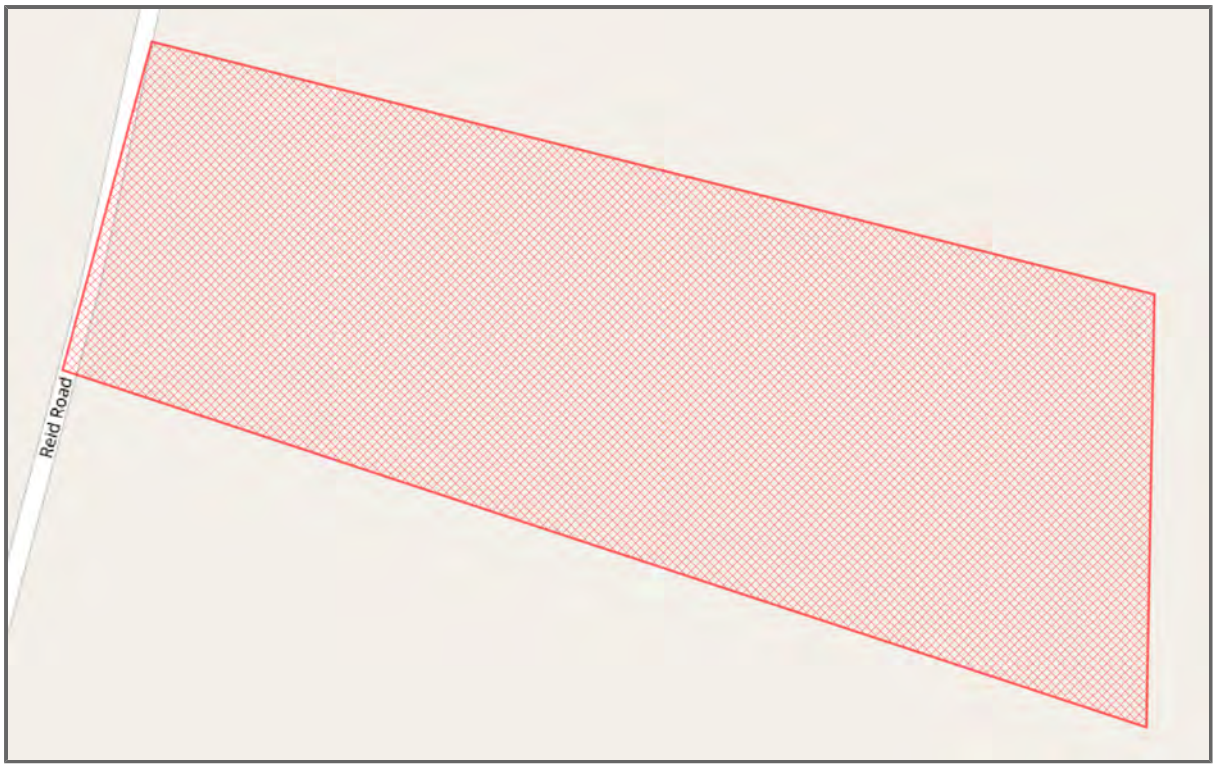


Figure 18 : Map of Lifeform - Crustaceans

Table 17: Lifeform - Crustaceans (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Dicots

Number of Dicots **0**

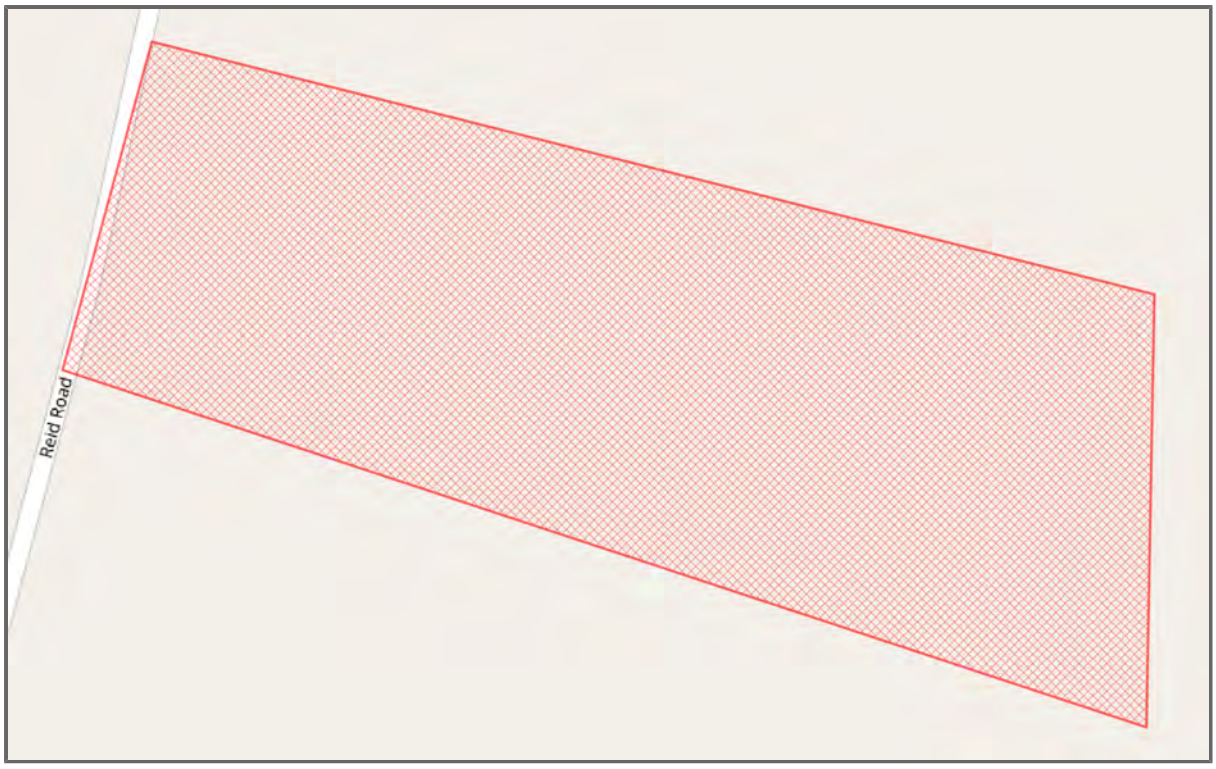


Figure 19 : Map of Lifeform - Dicots

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

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - FernsAndAllies

Number of FernsAndAllies **0**

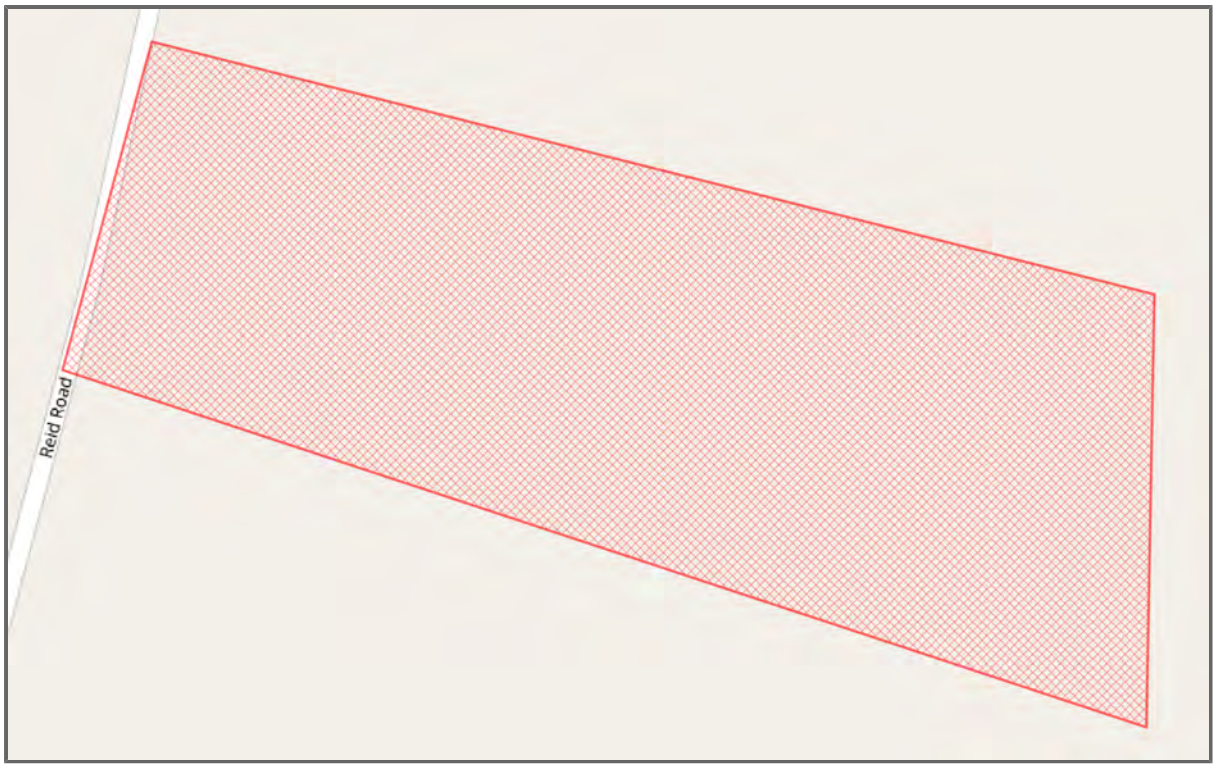


Figure 20 : Map of Lifeform - FernsAndAllies

Table 19: Lifeform - FernsAndAllies (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Fishes

Number of Fishes **0**

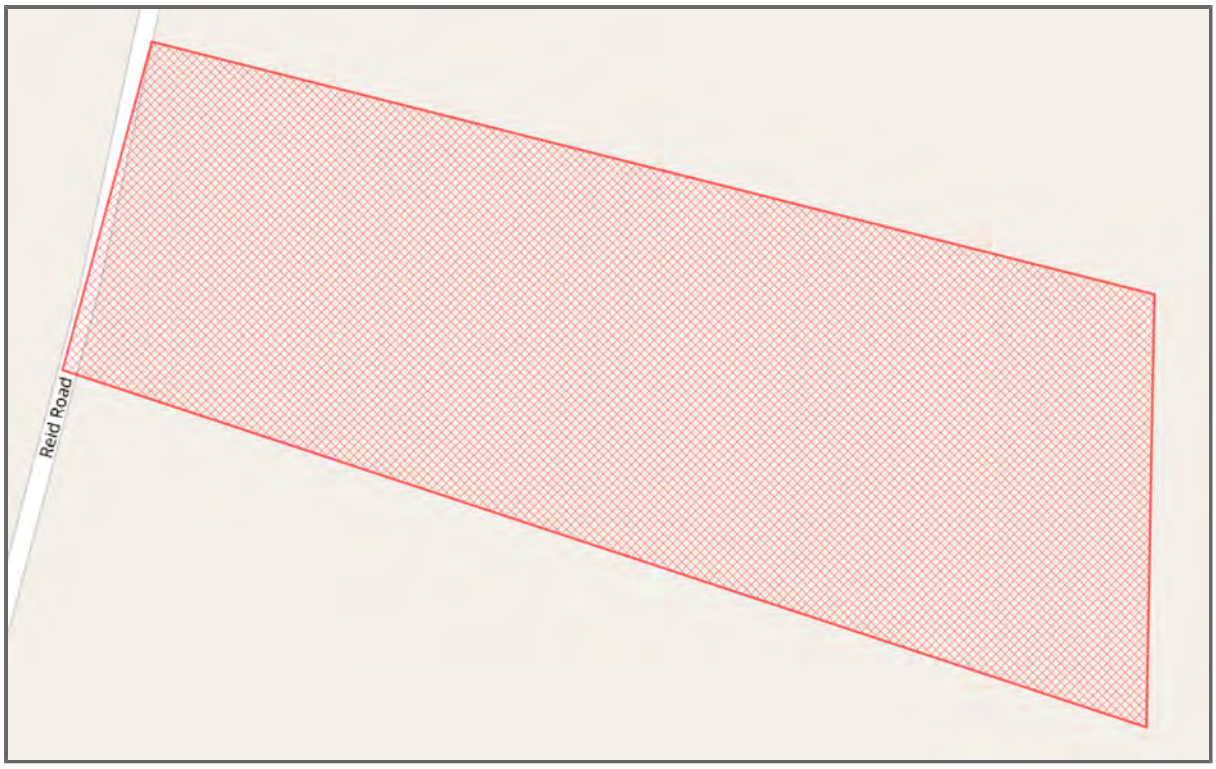


Figure 21 : Map of Lifeform - Fishes

Table 20: Lifeform - Fishes (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Fungi

Number of Fungi **0**

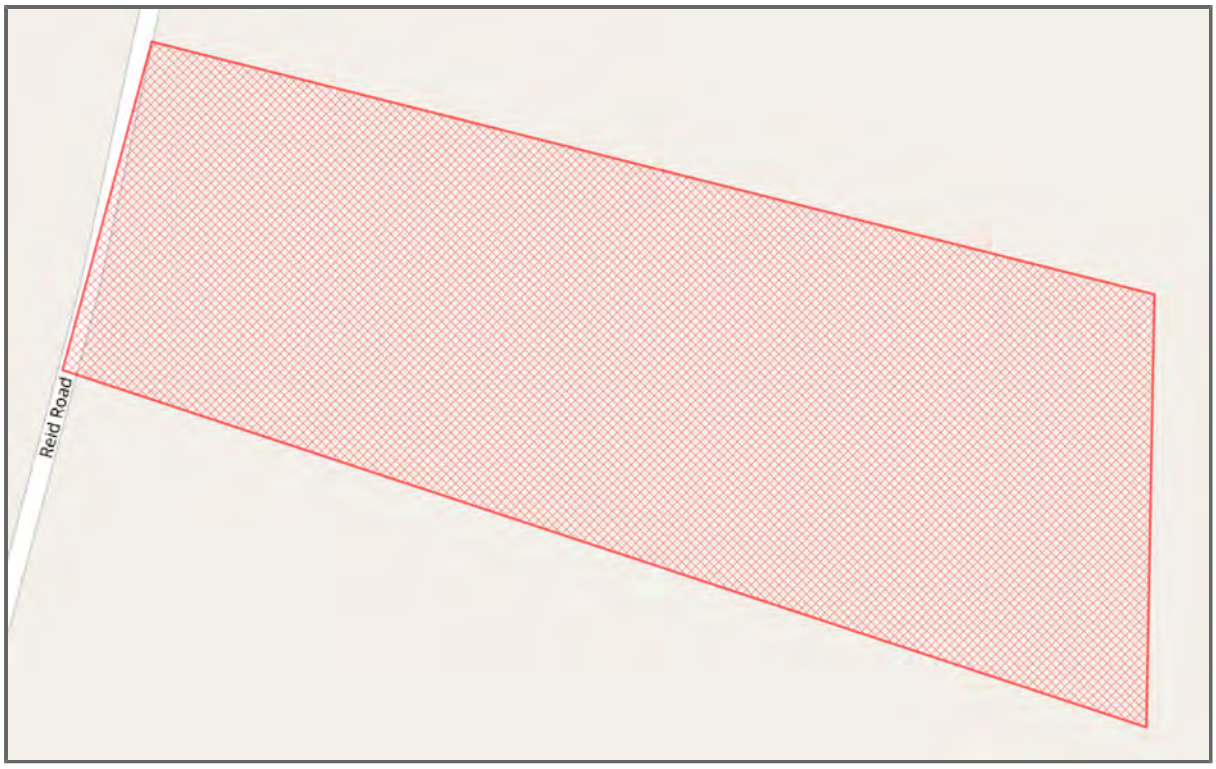


Figure 22 : Map of Lifeform - Fungi

Table 21: Lifeform - Fungi (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Gymnosperms

Number of Gymnosperms **0**

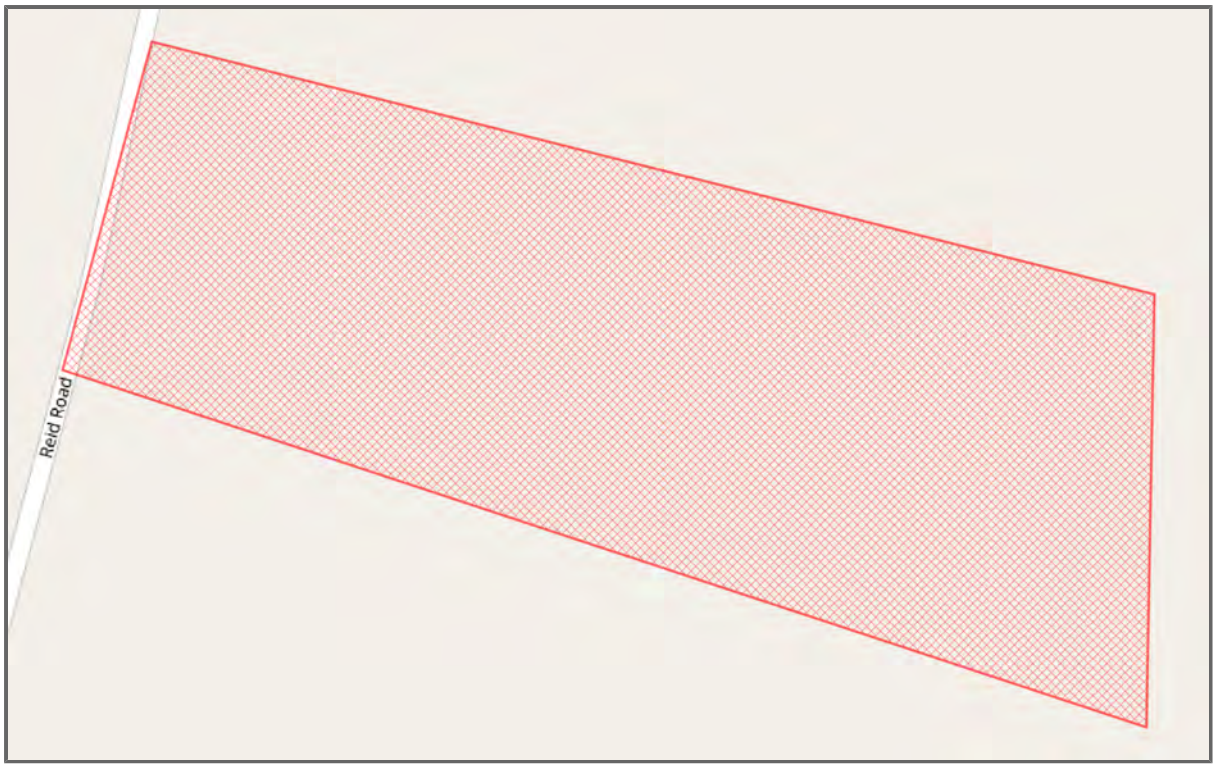


Figure 23 : Map of Lifeform - Gymnosperms

Table 22: Lifeform - Gymnosperms (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Insects

Number of Insects **0**

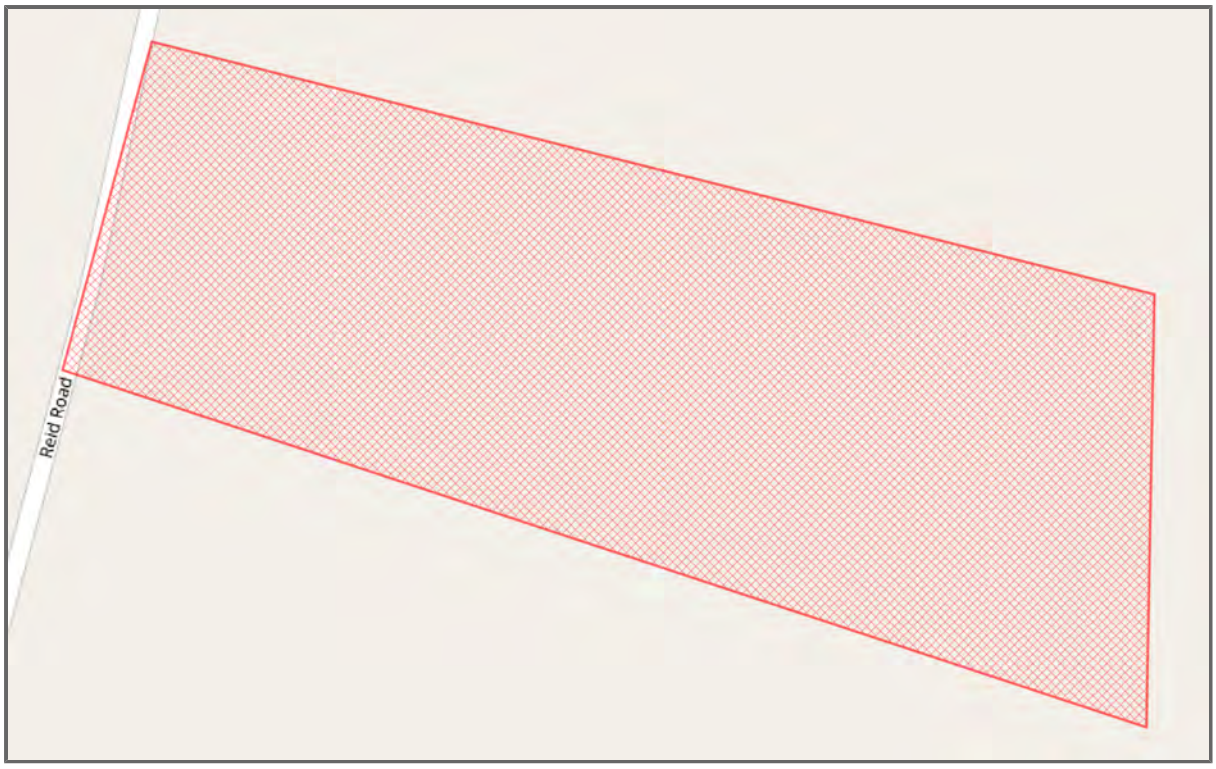


Figure 24 : Map of Lifeform - Insects

Table 23: Lifeform - Insects (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Mammals

Number of Mammals **0**

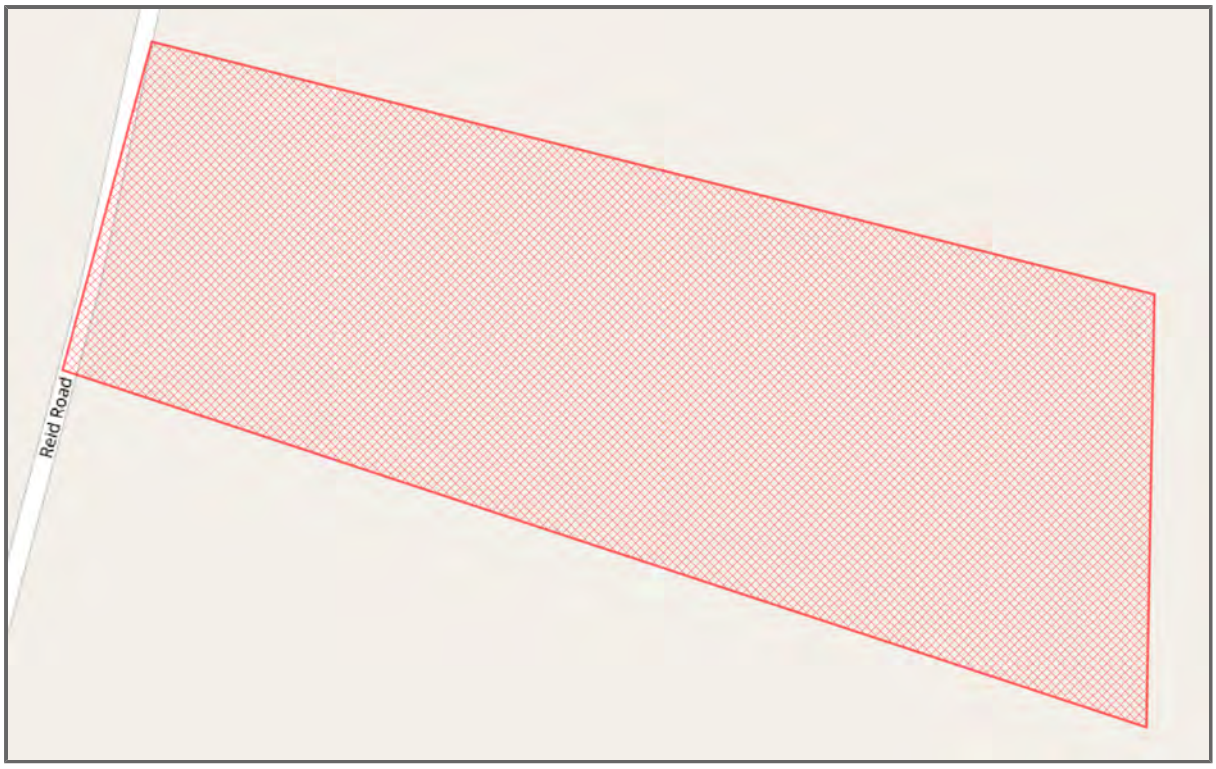


Figure 25 : Map of Lifeform - Mammals

Table 24: Lifeform - Mammals (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Molluscs

Number of Molluscs **0**

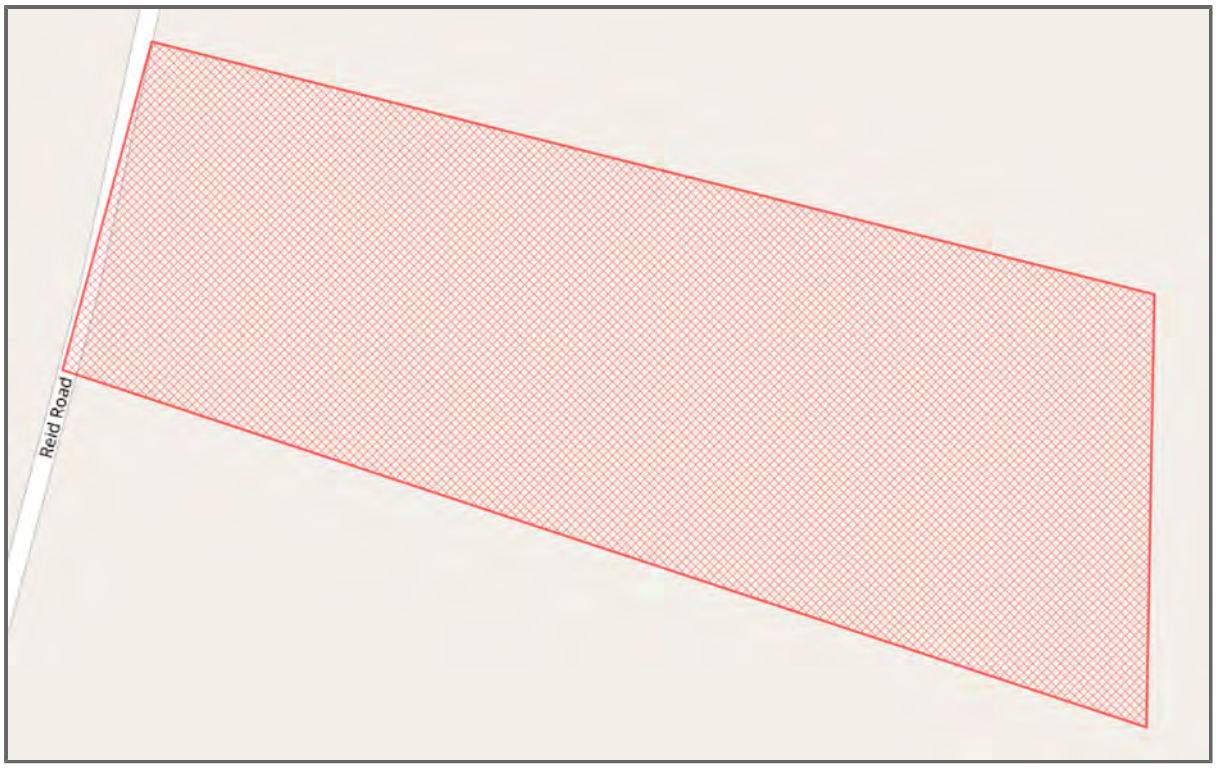


Figure 26 : Map of Lifeform - Molluscs

Table 25: Lifeform - Molluscs (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Monocots

Number of Monocots **0**

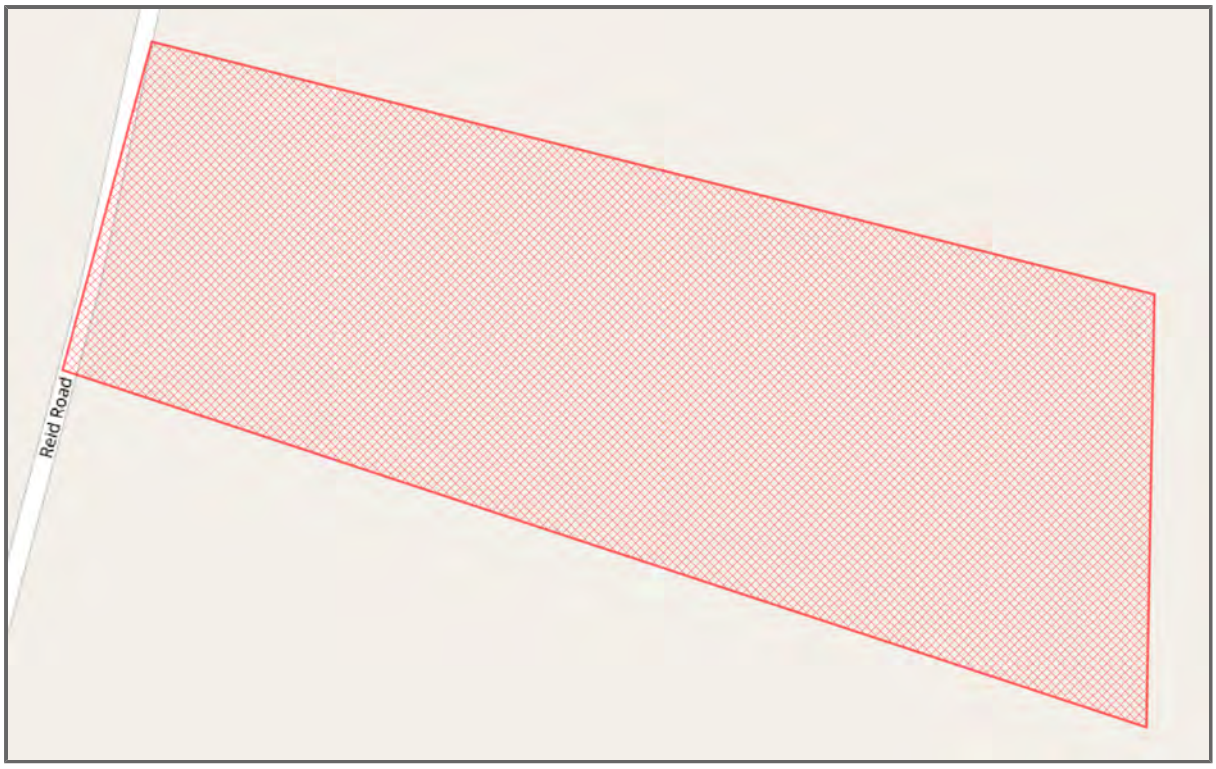


Figure 27 : Map of Lifeform - Monocots

Table 26: Lifeform - Monocots (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Plants

Number of Plants **0**

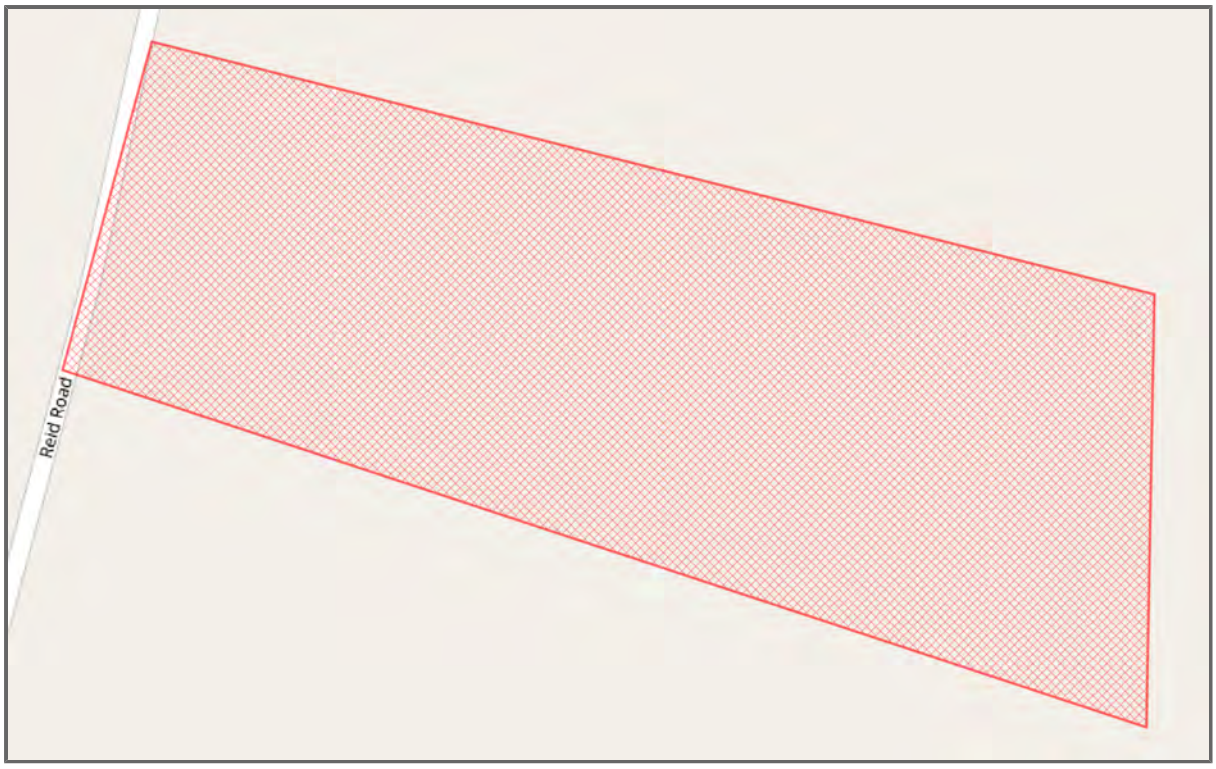


Figure 28 : Map of Lifeform - Plants

Table 27: Lifeform - Plants (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Protozoa

Number of Protozoa **0**

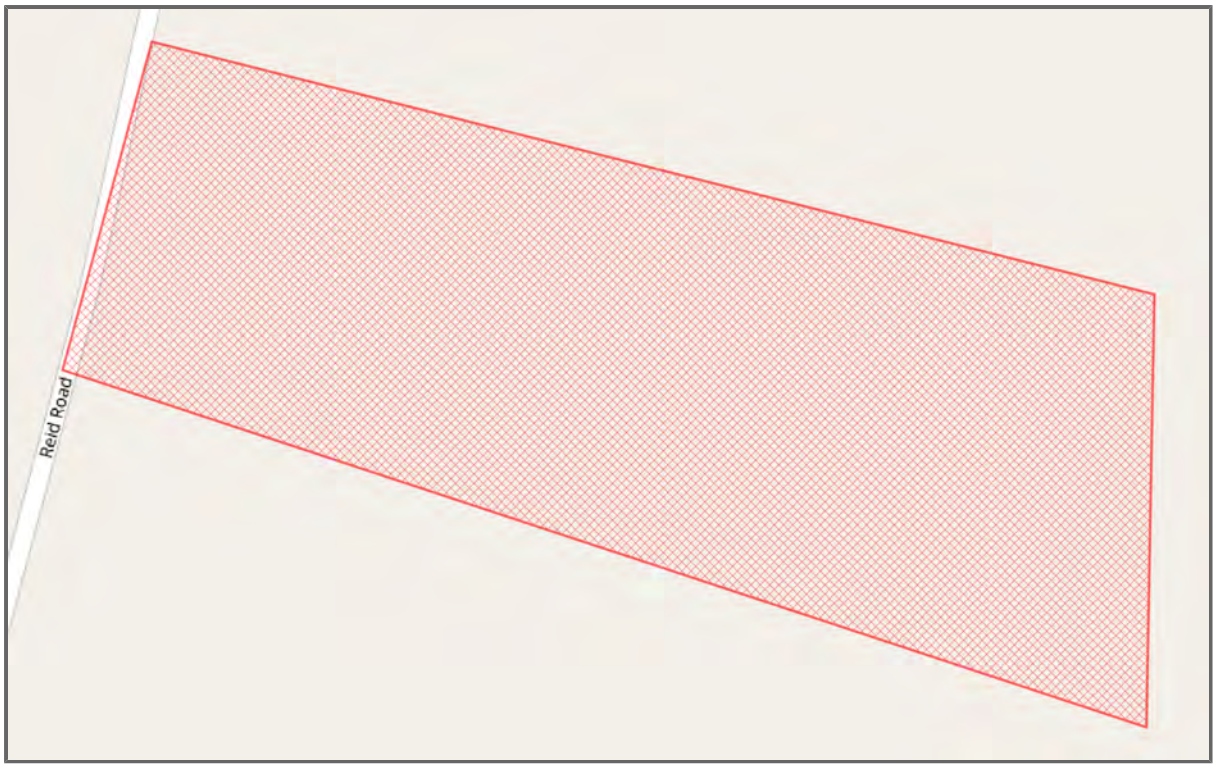


Figure 29 : Map of Lifeform - Protozoa

Table 28: Lifeform - Protozoa (Link to full list)

Family	*Scientific Name*	Common Name	No. Occurrences

Lifeform - Reptiles

Number of Reptiles **0**

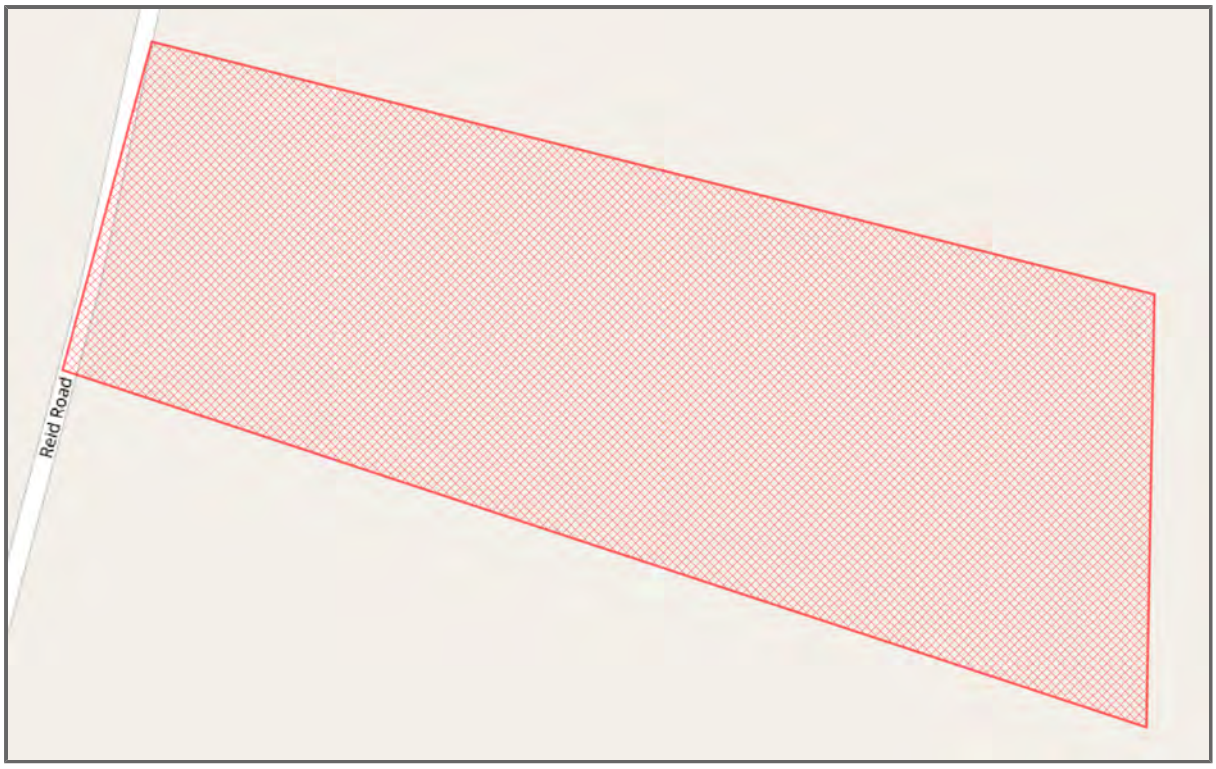


Figure 30 : Map of Lifeform - Reptiles

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 dunmalli	Dunmall's Snake	Expert distribution (maybe) Furina dunmalli	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 lathami	Australian Brush-turkey	Expert distribution Alectura lathami	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 (Paragraucalus) 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) fasciogularis	Mangrove Honeyeater	Expert distribution Lichenostomus fasciogularis	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) leucorynchus	White-breasted Woodswallow	Expert distribution Artamus leucorynchus	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-goose	Expert distribution Nettapus coromandelianus	9275135.80
HIRUNDINIDAE	Petrochelidon (Hylochelidon) nigricans nigricans	Australian Tree Martin	Expert distribution Hirundo nigricans	8367826.45
ANATIDAE	Cygnus (Chenopis) 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
Diomedeidae	Thalassarche carteri	Indian Yellow-nosed Albatross	Expert distribution (maybe) Thalassarche carteri	3699956.72
Diomedeidae	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
MEROPIDAE	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	Mirafra (Mirafra) javanica	Horsfield's Bushlark	Expert distribution Mirafra 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
ORIOLIDAE	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	Smicrornis brevirostris	Weebill	Expert distribution Smicrornis 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	Poliocephalus 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	Silvereye	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	Elseyornis melanops	Black-fronted Dotterel	Expert distribution Elseyornis 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	

MELIPHAGIDAE	tenuirostris	Eastern Spinebill	Acanthorhynchus tenuirostris	765597.21

Checklist Areas

Number of checklist areas: **0**

Table 31: Checklist Areas

Family	*Scientific Name*	Common Name	Area Name	Area sq km

JournalMap Articles

Number of JournalMap articles: **0**

Table 32: JournalMap Articles

Author/s	Year	Title	Publication	DOI	URL

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/

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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

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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 within area	In feature 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
Erythrotriorchis 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 sahulensis 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]		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]	Vulnerable	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]		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]	Vulnerable	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]		Species or species habitat known to occur within area overfly marine 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 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]		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]	Vulnerable	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]		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]	Endangered	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 sahulensis](#) 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 Pipleine 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
Erythrotriorchis 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 - *Corymbia citriodora subsp. variegata, Eucalyptus crebra* woodland on metamorphics +/- interbedded volcanics.	11.3.29 - *Eucalyptus crebra, E. exserta,* Melaleuca 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 *Corymbia citriodora subsp. variegata*	T1 *Corymbia citriodora subsp. variegata*
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 *Corymbia citriodora subsp. variegata* with *Eucalyptus crebra* 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 *Corymbia citriodora subsp. variegata* with *Eucalyptus crebra* 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	*Blakella dallachiana* *Corymbia citriodora subsp. variegata*	*Blakella dallachiana* *Blakella tessellaris*

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Appendix C: RE Verification

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

Attachment D:

Photograph Log

Attachment D: Photograph Log

Quaternary Site Photographs

Site 1	Site 2
	

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Grass trees

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

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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	

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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	

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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	

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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	

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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	

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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	

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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	

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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	

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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	

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

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

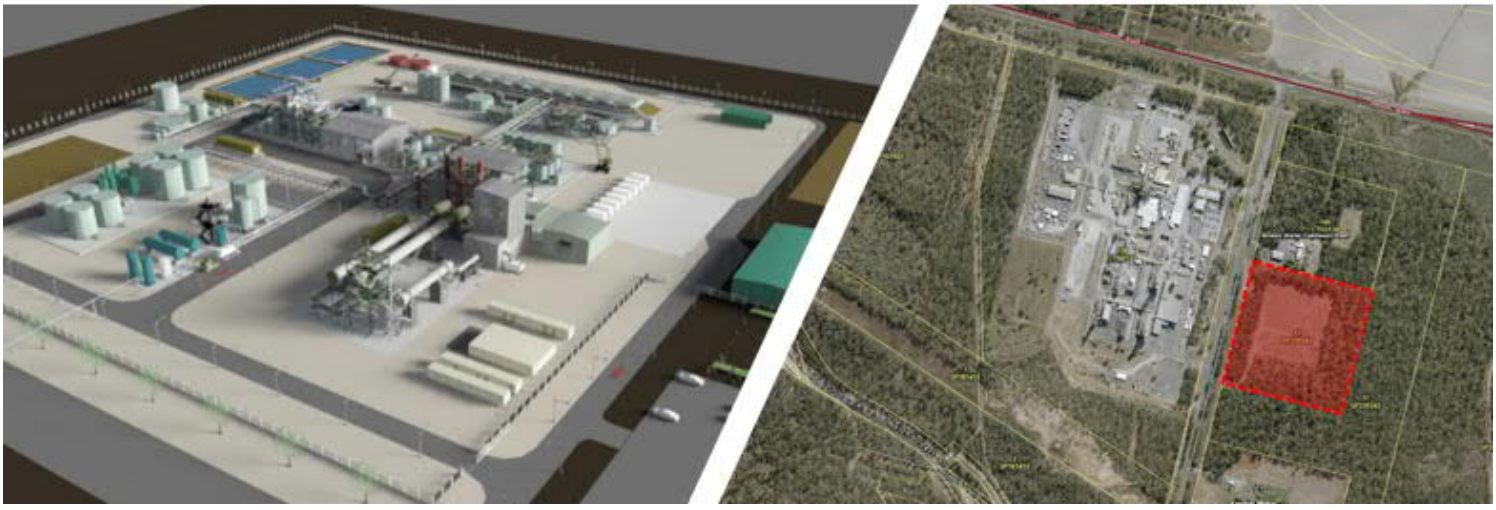
APPENDIX G:

Traffic Impact Assessment - prepared by Access Traffic Consulting

MC23050-000-Z-RPT-00002

ACCESS TRAFFIC CONSULTING





Alpha HPA Project, Yarwun

Traffic Impact Assessment

October 2021

Prepared for Alpha HPA Limited

Quality Information

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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 2, 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 1 (approx. 58 staff), as well as a nominal provision for visitor parking.
- The two nominated site accesses, proposed to be located approximately 505m (Stage 2) and 740m (Stage 1 – 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 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.**

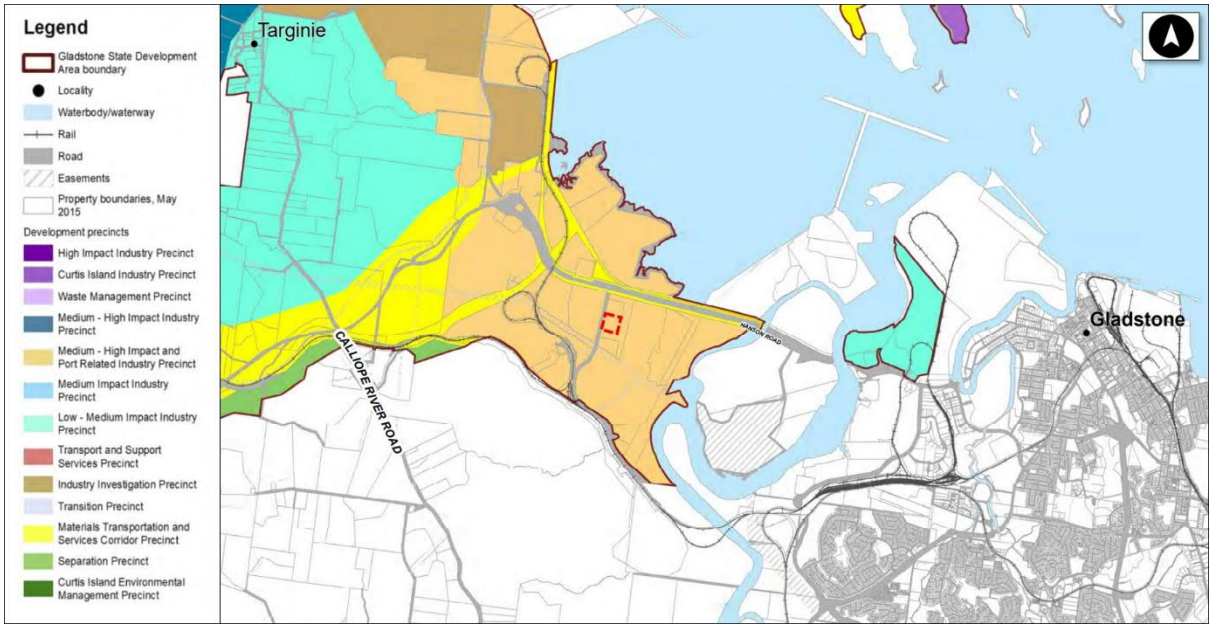


Figure 2 Land Use Zoning – Lot 12 SP239343 **[Source: GSDA Planning Scheme]**

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.

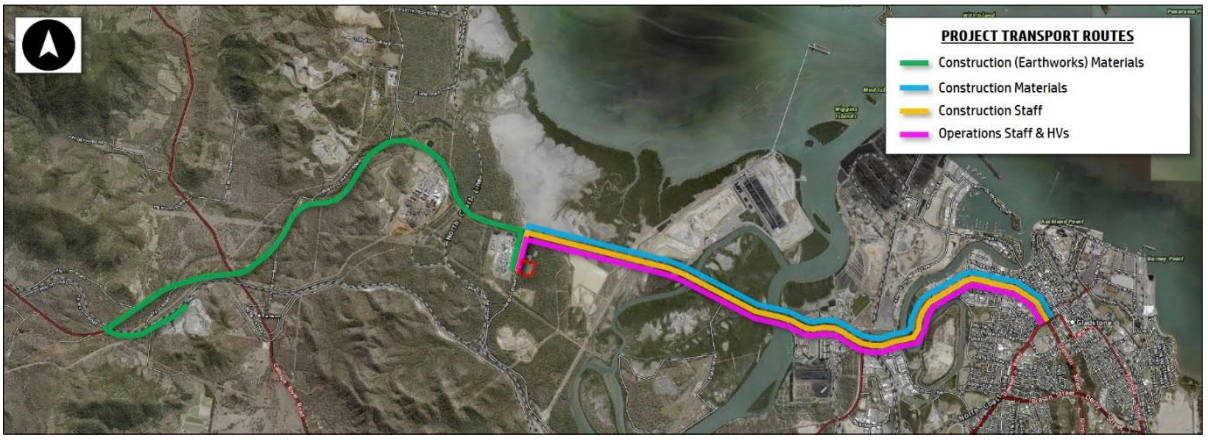


Figure 3 Project Transport Routes **[Source: QLD Globe]**

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.

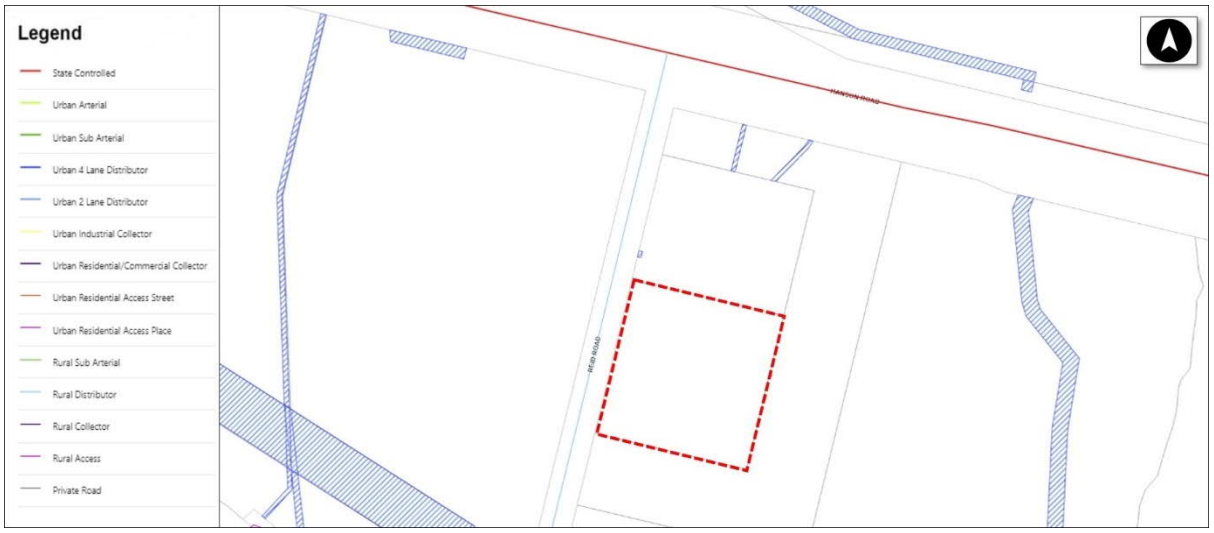


Figure 4 GRC Existing Road Hierarchy **[Source: GRC Online Mapping]**

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]**

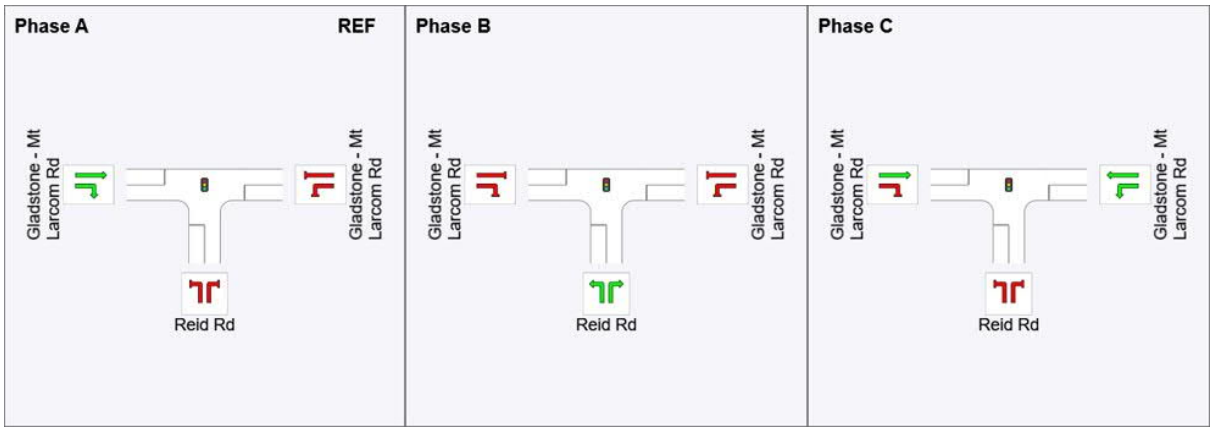


Figure 8 Gladstone-Mount Larcom Road / Reid Road Intersection – Indicative Signal Phasing

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 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.

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**.

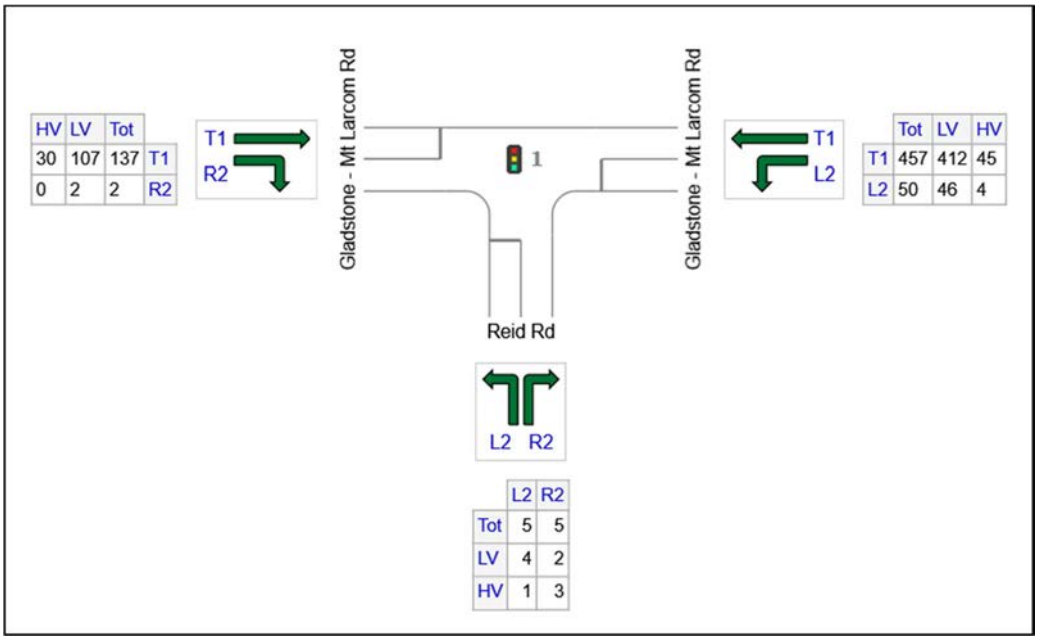


Figure 9 2021 AM Peak Hour Traffic Volumes – Gladstone-Mt Larcom Road / Reid Road Intersection

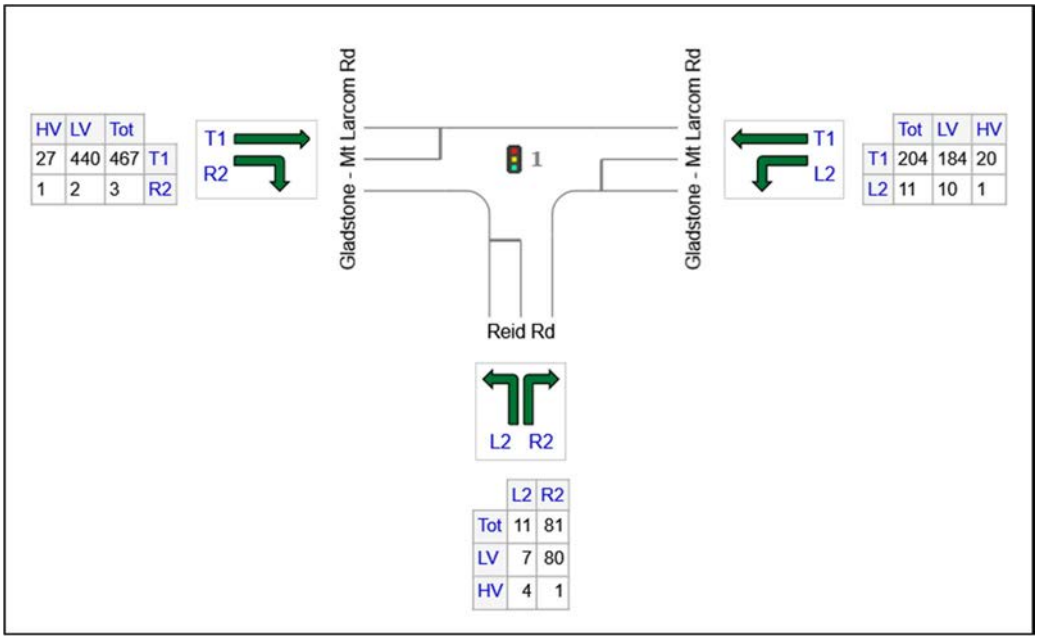


Figure 10 2021 AM Peak Hour Traffic Volumes – Gladstone-Mt Larcom Road / Reid Road Intersection

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 (PFF) 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**.

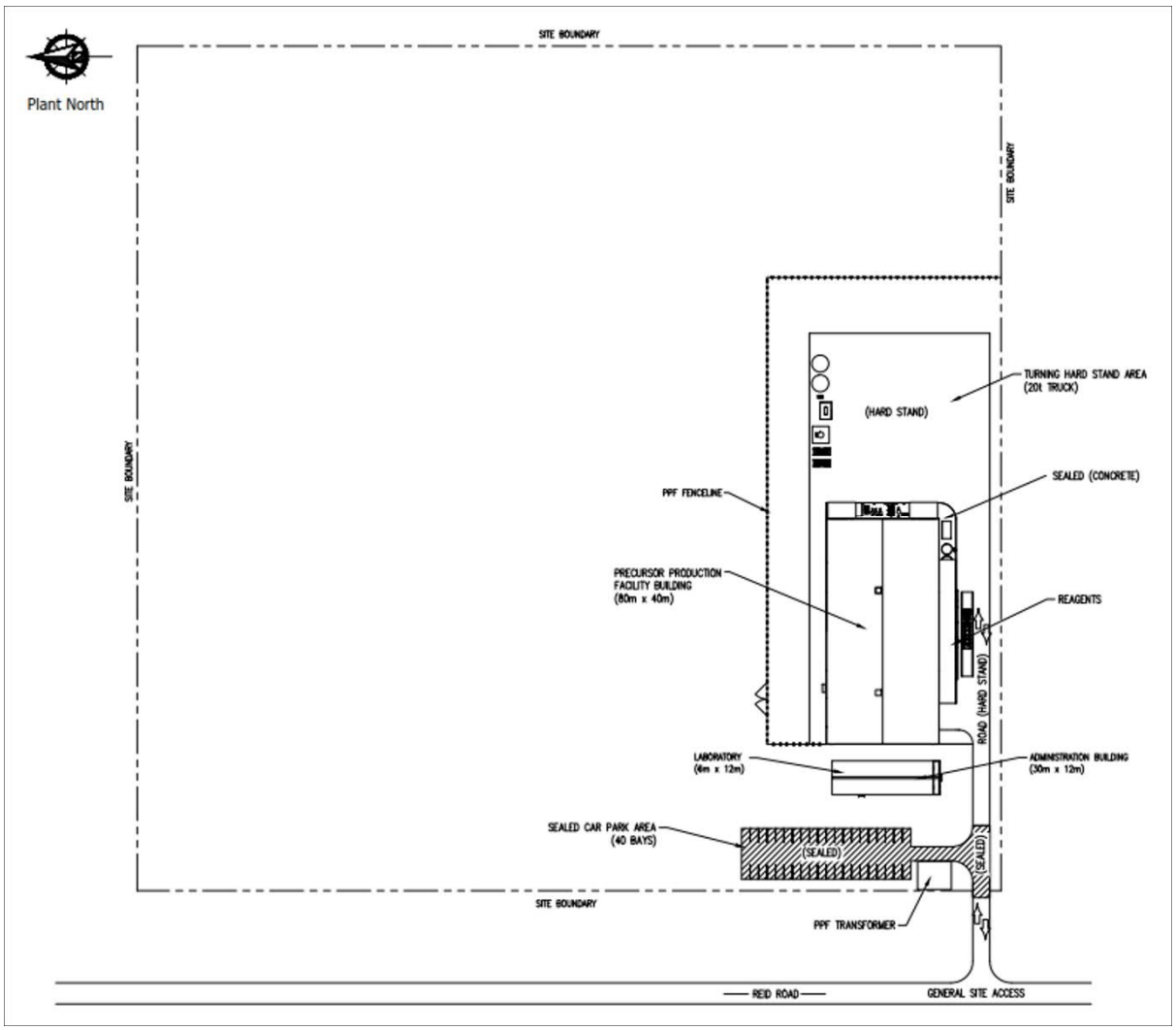


Figure 12 Stage 1 (PPF) Plan of Development – Alpha HPA Project **[Source: Dwg. MC1868-G-030_E]**

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**.

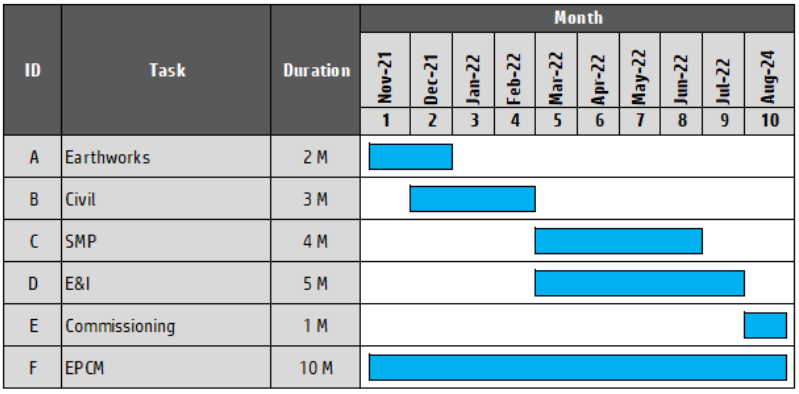


Figure 13 Stage 1 (PPF) Alpha HPA Project – Indicative Project Schedule

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 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**.

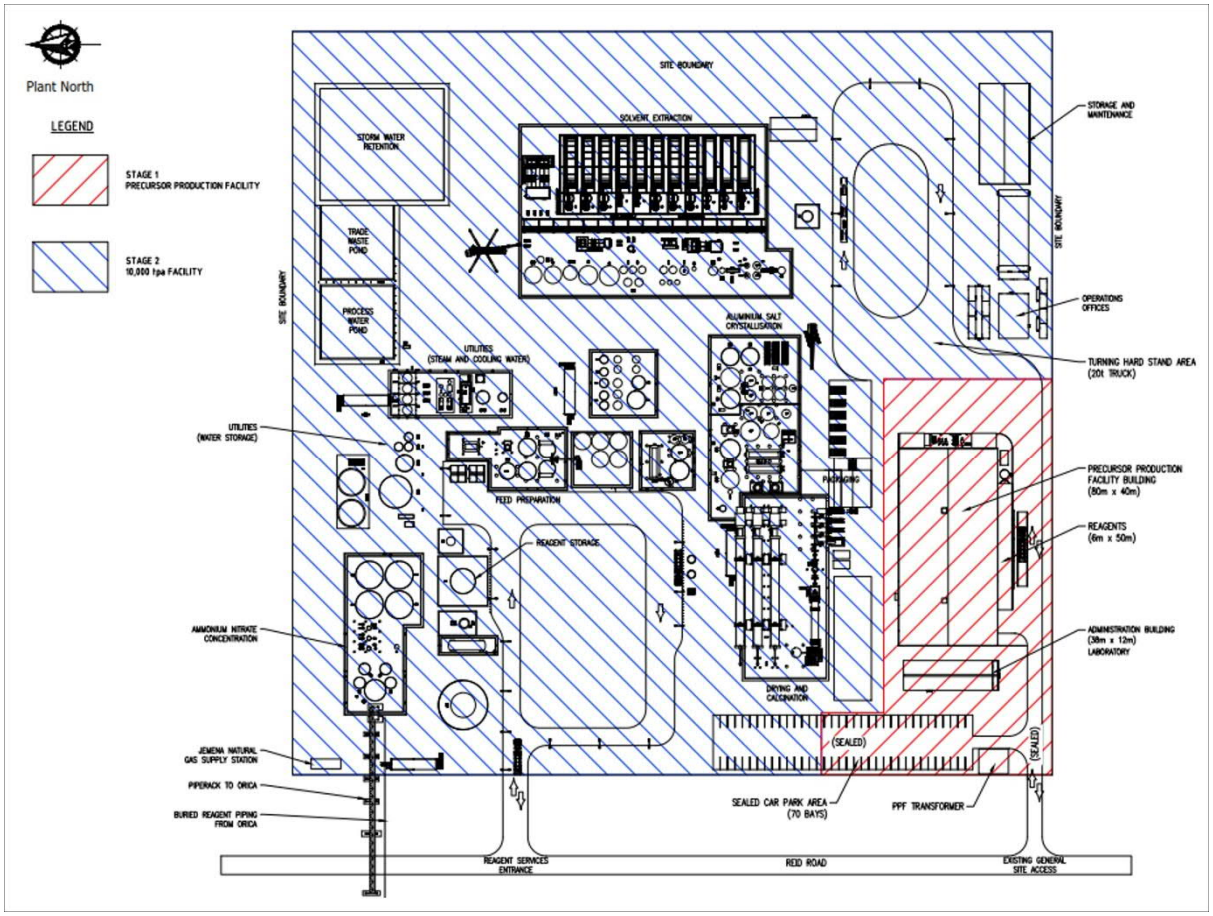


Figure 14 Stage 2 Plan of Development – Alpha HPA Project **[Source: Dwg. MC1868-G-031_D]**

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 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	
G	Operations Phase	1 M									1	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	45
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, 7days 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	11														
B	Civil	8 M						11	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	
G	Operations	-														5	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	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**.

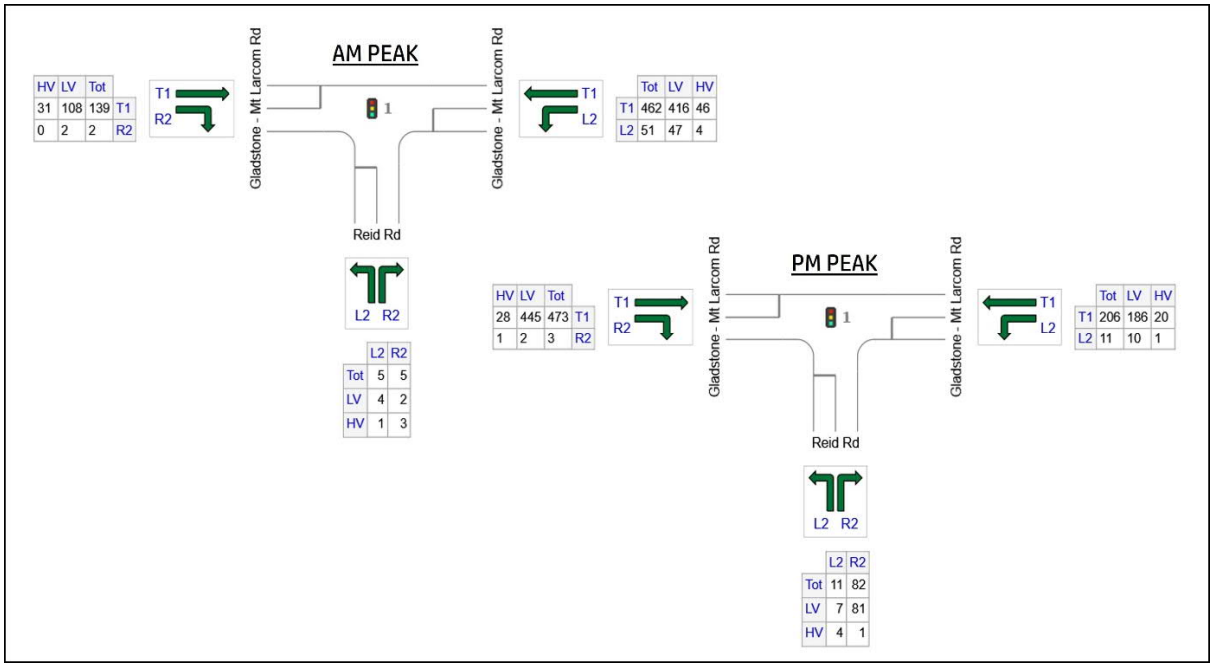


Figure 16 2022 AM & PM Peak Traffic Volumes (Pre Development)

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	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.

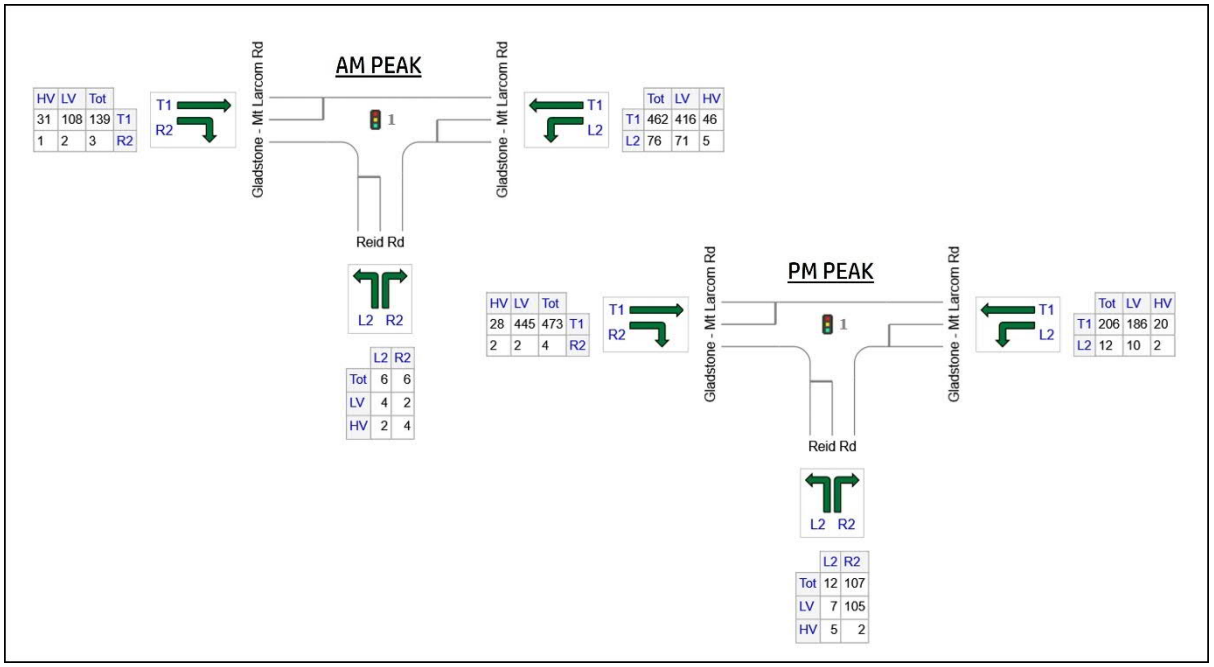


Figure 17 2022 AM & PM Peak Traffic Volumes (Stage 1 Peak Construction)

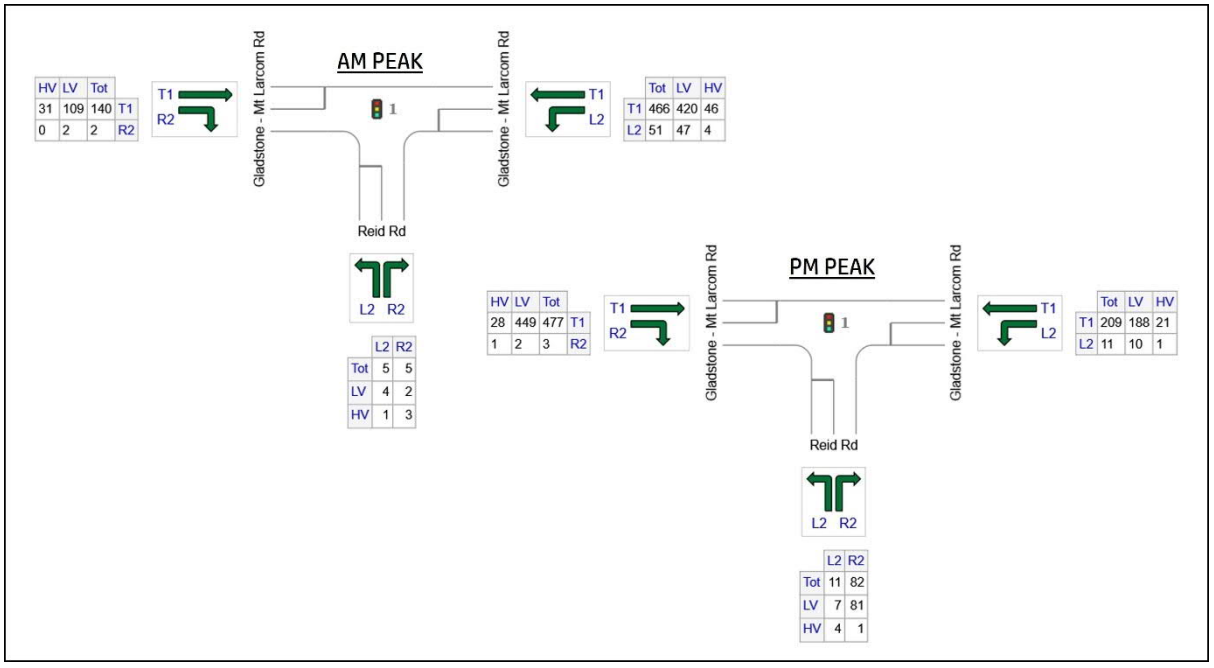


Figure 18 2023 AM & PM Peak Traffic Volumes (Pre Development)

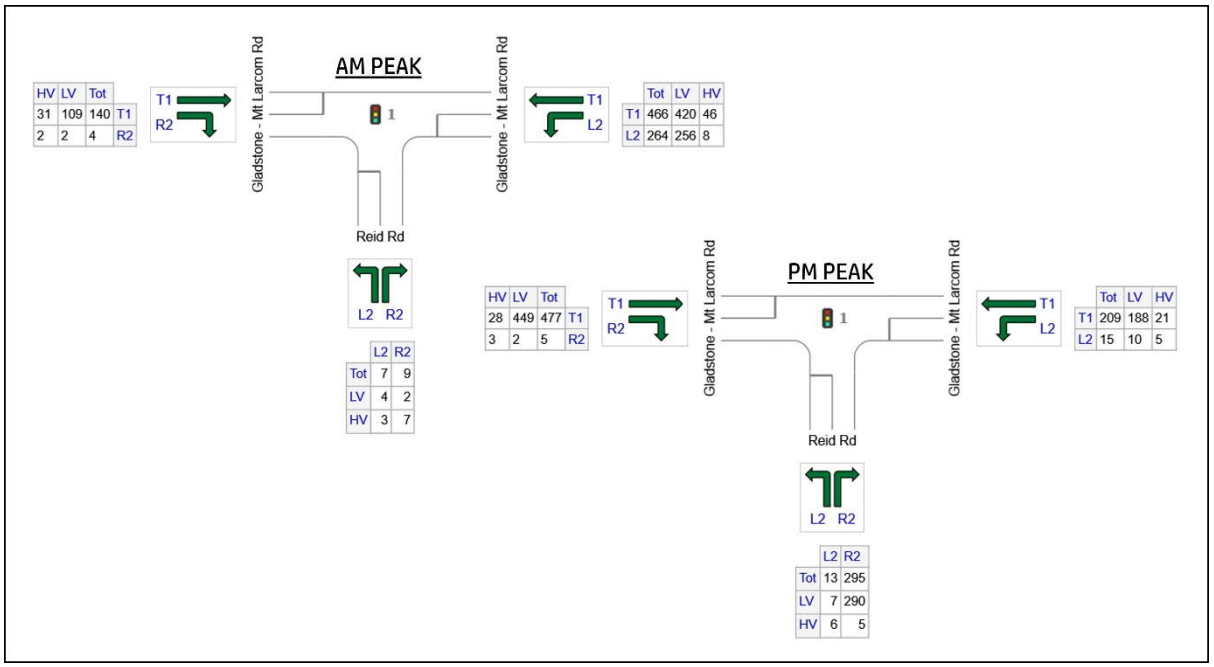


Figure 19 2023 AM & PM Peak Traffic Volumes (Stage 2 Peak Construction & Stage1 Operations)

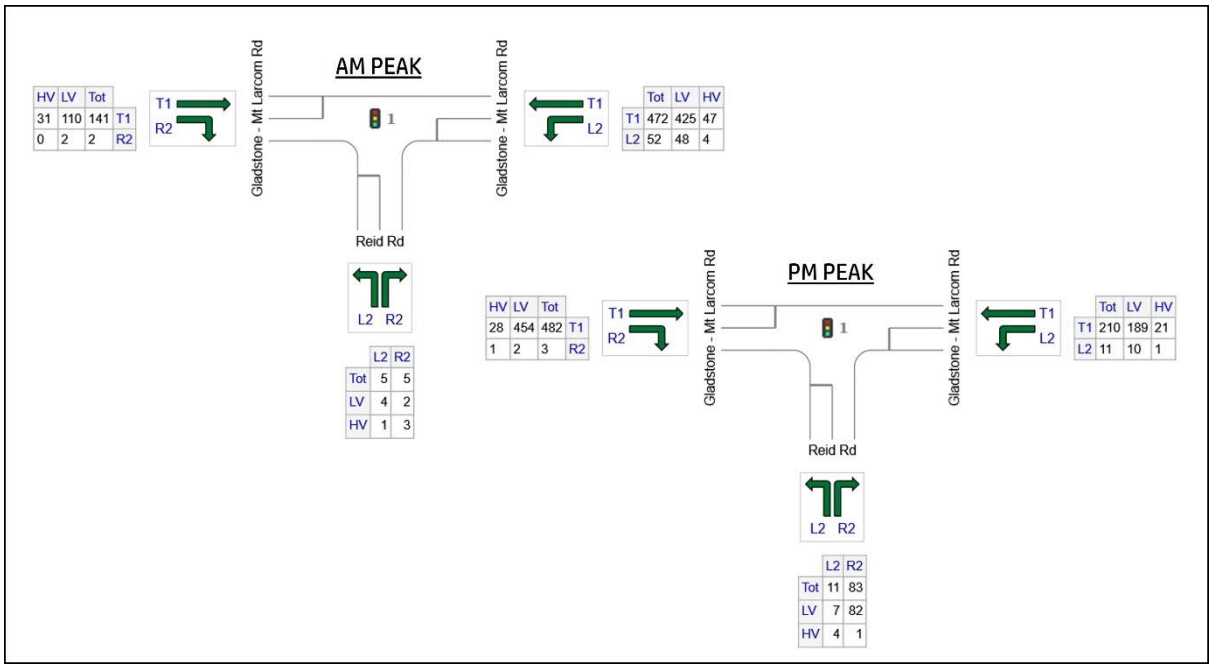


Figure 20 2024 AM & PM Peak Traffic Volumes (Pre Development)

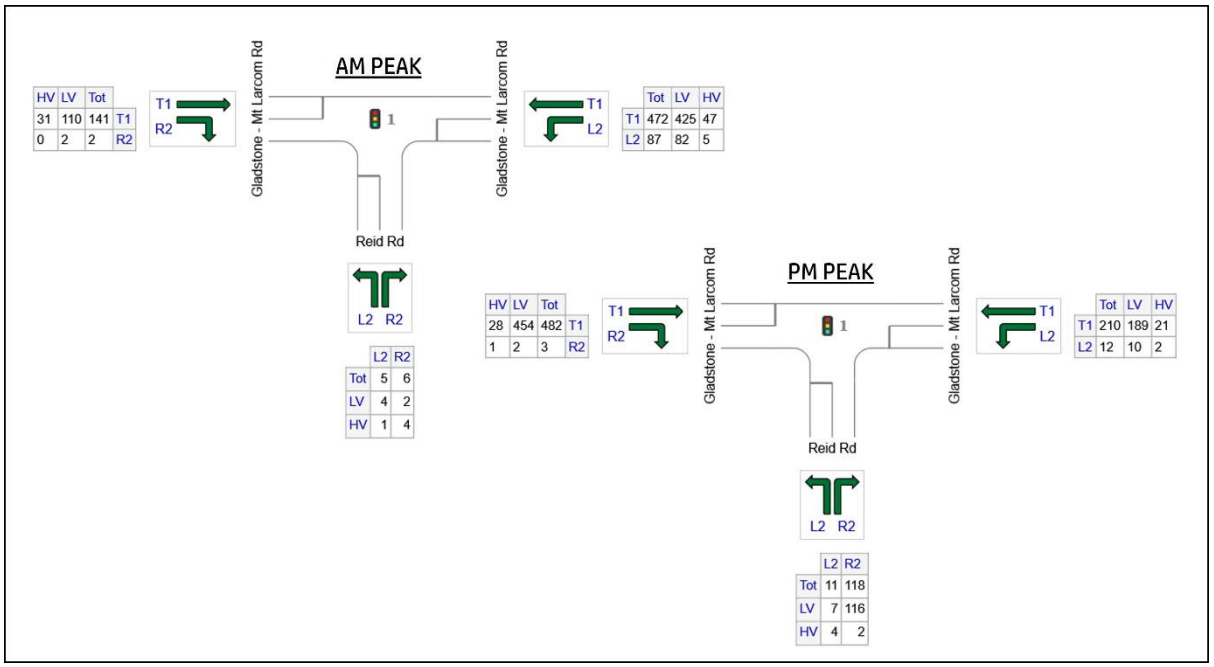


Figure 21 2024 AM & PM Peak Traffic Volumes (Stage 1 & 2 Operations)

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 9.3.2(a) – Safety risk score matrix

		Potential consequence				
		Property only (1)	Minor injury (2)	Medical treatment (3)	Hospitalisation (4)	Fatality (5)
Potential likelihood	Almost certain (5)	M	M	H	H	H
	Likely (4)	M	M	M	H	H
	Moderate (3)	L	M	M	M	H
	Unlikely (2)	L	L	M	M	M
	Rare (1)	L	L	L	M	M

L: Low risk
M: Medium risk
H: High risk

Figure 22 Adopted Risk Score Matrix **[Source: TMR GTIA]**

Table 12 Road Safety Assessment – Alpha HPA Project

		Existing / Pre-Development			With Project				With Project & Mitigation		
Risk Item		Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score	Mitigation Measure	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.

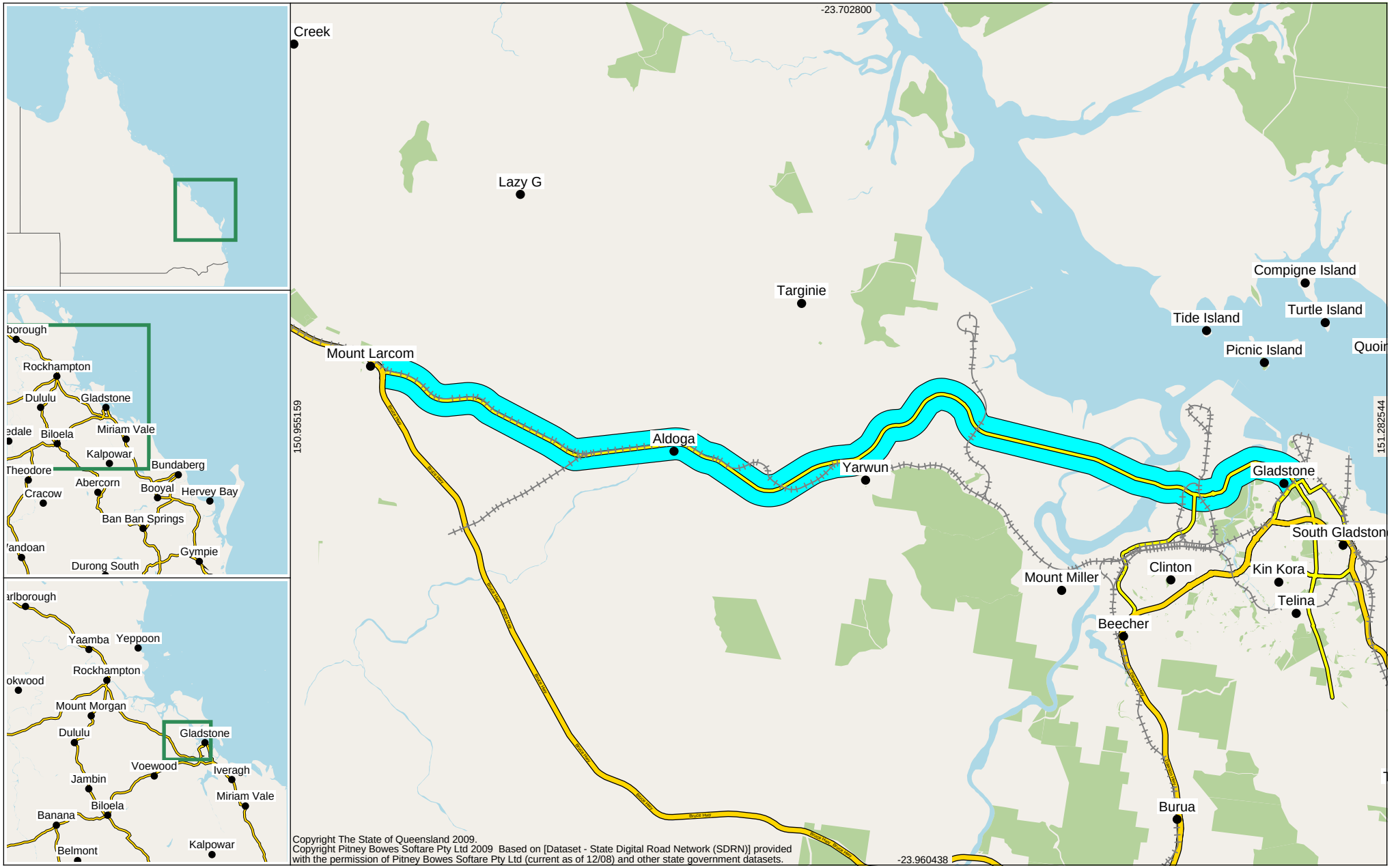
6.2 Recommendations

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



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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		

AADT Segment Analysis Report (Complete)

Area 404 - Fitzroy District Road Section 181 - GLADSTONE - MT LARCOM ROAD

Traffic Year 2019 - Data Collection Year 2019



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Site 60071. Point 260000128.
G'stone-Mt Larcom Rd 200m N Lord St.
1.20 km



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.

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.

	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%

All Vehicles (00)

G	3,563	100%
A	3,085	100%
B	6,648	100%

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)

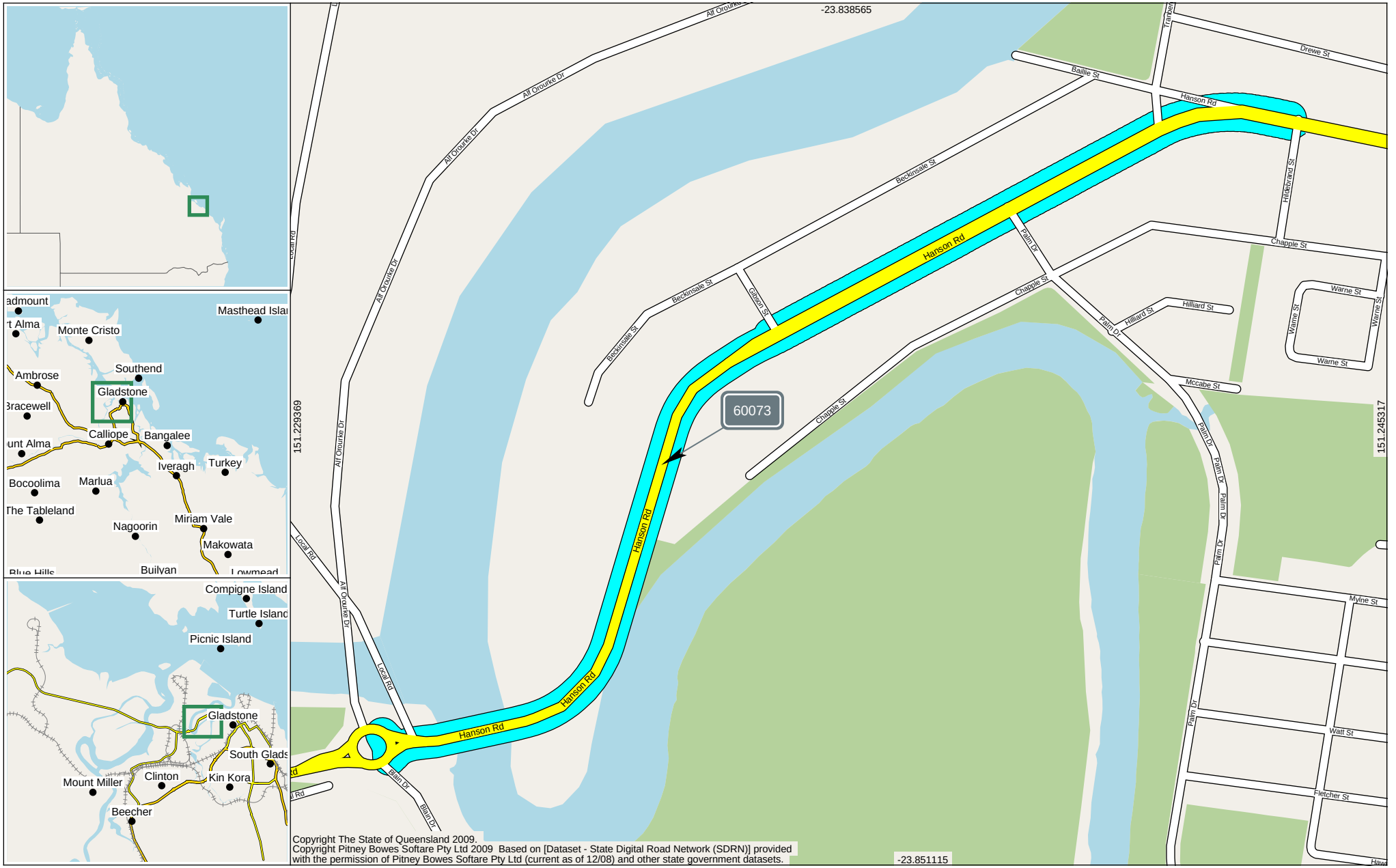
G	90	2.53%
A	71	2.30%
B	161	2.42%

Double Road Trains (2K)

G	0	0%
A	0	0%
B	0	0%

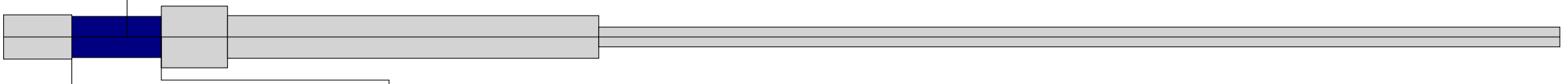
Triple Road Trains (2L)

G	0	0%
A	0	0%
B	0	0%


-23.838565
-23.851115
151.229369
151.245317
60073
Hanson Rd
Alf Orourke Dr
Beckinsale St
Chapple St
Palm Dr
Hilliard St
Warne St
Mccabe St
Drewe St
Baillie St
Tranbert
Hilderbrand St
Gibson St
Local Rd
Blain Dr
Myrne St
Watt St
Fletcher St
Admount
Masthead Isla
Mt Alma
Monte Cristo
Ambrose
Southend
Gladstone
Bracewell
Calliope
Bangalee
Mount Alma
Iveragh
Turkey
Bocoolima
Marlua
The Tableland
Nagoorin
Miriam Vale
Makowata
Builyan
Lowmead
Compigne Island
Turtle Island
Picnic Island
Gladstone
South Glads
Clinton
Kin Kora
Mount Miller
Beecher
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Site 60073. Point 260000132. G'stone-Mt Larcom Rd 500m S Auckland Ck.

2.55 km



1.41 km

Start Point 260000130. Hanson Road to Mt Larcom @ Hilderbrand St.

3.26 km

End Point 260000133. Hanson Rd.

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.

	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%

All Vehicles (00)

G	3,025	100%
A	3,150	100%
B	6,175	100%

Light Vehicles (0A)

G	2,540	83.97%
A	2,640	83.81%
B	5,180	83.89%

Heavy Vehicles (0B)

G	486	16.07%
A	509	16.16%
B	995	16.11%

Short Vehicles (1A)

G	2,540	83.97%
A	2,640	83.81%
B	5,180	83.89%

Trucks and Buses (1B)

G	278	9.19%
A	346	10.98%
B	624	10.11%

Articulated Vehicles (1C)

G	113	3.74%
A	92	2.92%
B	205	3.32%

Road Trains (1D)

G	95	3.14%
A	71	2.25%
B	166	2.69%

Short 2-Axle Vehicles (2A)

G	2,489	82.28%
A	2,592	82.29%
B	5,081	82.28%

Short Vehicles Towing (2B)

G	51	1.69%
A	48	1.52%
B	99	1.60%

2-Axle Trucks and Buses (2C)

G	212	7.01%
A	262	8.32%
B	474	7.68%

3-Axle Trucks and Buses (2D)

G	51	1.69%
A	65	2.06%
B	116	1.88%

4-Axle Trucks (2E)

G	15	0.50%
A	19	0.60%
B	34	0.55%

3-Axle Articulated (2F)

G	3	0.10%
A	4	0.13%
B	7	0.11%

4-Axle Articulated (2G)

G	4	0.13%
A	5	0.16%
B	9	0.15%

5-Axle Articulated (2H)

G	6	0.20%
A	5	0.16%
B	11	0.18%

6-Axle Articulated (2I)

G	100	3.31%
A	78	2.48%
B	178	2.88%

B Double (2J)

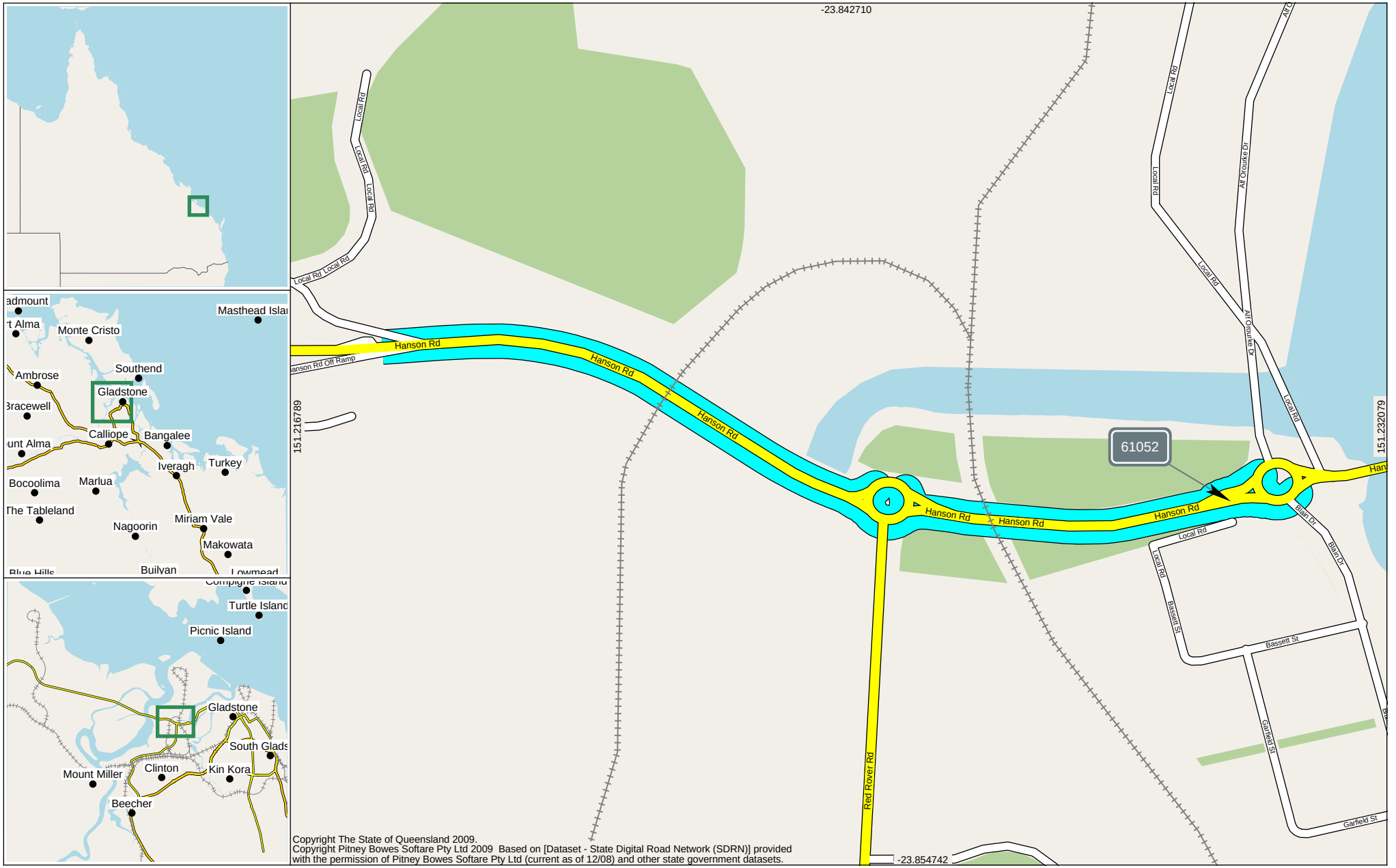
G	95	3.14%
A	71	2.25%
B	166	2.69%

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%



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Site 61052. Point 260000763. G'stone-Mt Larcom Rd 500m S Red Rover Rd.
3.34 km



3.26 km
Start Point 260000133. Hanson Rd.

4.62 km
End Point 260000135. Hanson Rd to Gladstone @ Pwr Stn Rd.

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.

	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%

All Vehicles (00)

G	4,706	100%
A	4,542	100%
B	9,248	100%

Light Vehicles (0A)

G	4,164	88.48%
A	3,901	85.89%
B	8,065	87.21%

Heavy Vehicles (0B)

G	542	11.52%
A	641	14.11%
B	1,183	12.79%

Short Vehicles (1A)

G	4,164	88.48%
A	3,901	85.89%
B	8,065	87.21%

Trucks and Buses (1B)

G	340	7.22%
A	412	9.07%
B	752	8.13%

Articulated Vehicles (1C)

G	121	2.57%
A	127	2.80%
B	248	2.68%

Road Trains (1D)

G	81	1.72%
A	102	2.25%
B	183	1.98%

Short 2-Axle Vehicles (2A)

G	4,074	86.57%
A	3,820	84.10%
B	7,894	85.36%

Short Vehicles Towing (2B)

G	90	1.91%
A	81	1.78%
B	171	1.85%

2-Axle Trucks and Buses (2C)

G	218	4.63%
A	308	6.78%
B	526	5.69%

3-Axle Trucks and Buses (2D)

G	94	2.00%
A	79	1.74%
B	173	1.87%

4-Axle Trucks (2E)

G	28	0.59%
A	25	0.55%
B	53	0.57%

3-Axle Articulated (2F)

G	3	0.06%
A	5	0.11%
B	8	0.09%

4-Axle Articulated (2G)

G	6	0.13%
A	5	0.11%
B	11	0.12%

5-Axle Articulated (2H)

G	8	0.17%
A	8	0.18%
B	16	0.17%

6-Axle Articulated (2I)

G	104	2.21%
A	109	2.40%
B	213	2.30%

B Double (2J)

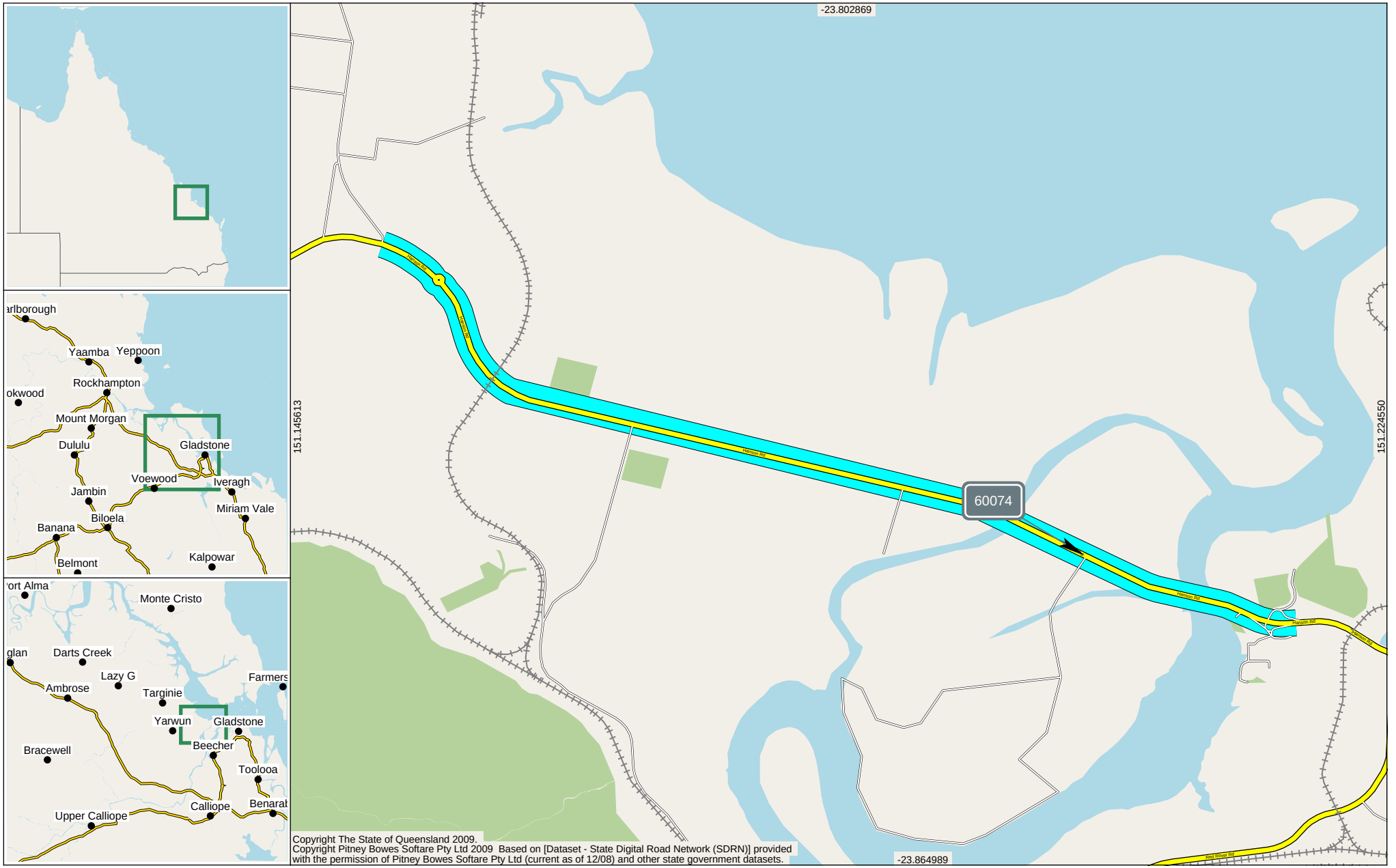
G	80	1.70%
A	101	2.22%
B	181	1.96%

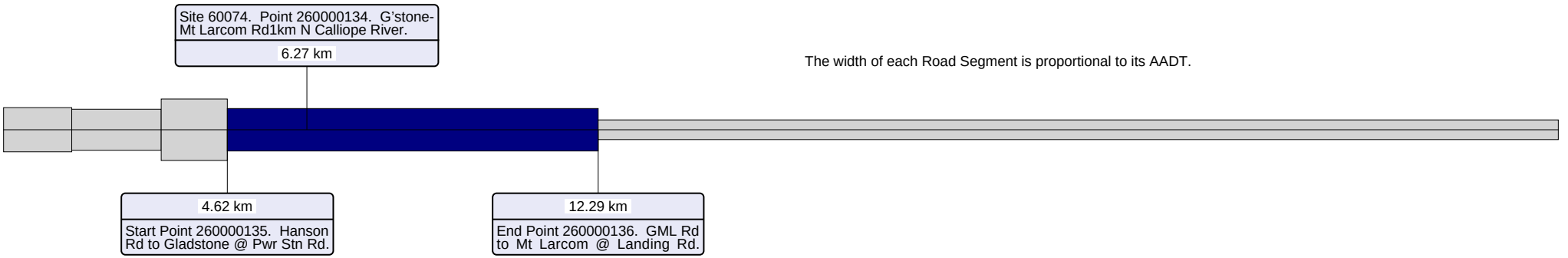
Double Road Trains (2K)

G	1	0.02%
A	1	0.02%
B	2	0.02%

Triple Road Trains (2L)

G	0	0%
A	0	0%
B	0	0%


-23.802869
151.145613
151.224550
60074
-23.864989
Yaamba
Yeppoon
Rockhampton
Mount Morgan
Dululu
Gladstone
Voewood
Iveragh
Jambin
Miriam Vale
Biloela
Banana
Belmont
Kalpowar
Monte Cristo
Darts Creek
Lazy G
Farmers
Ambrose
Targinie
Yarwun
Gladstone
Beecher
Bracewell
Toolooa
Calliope
Upper Calliope
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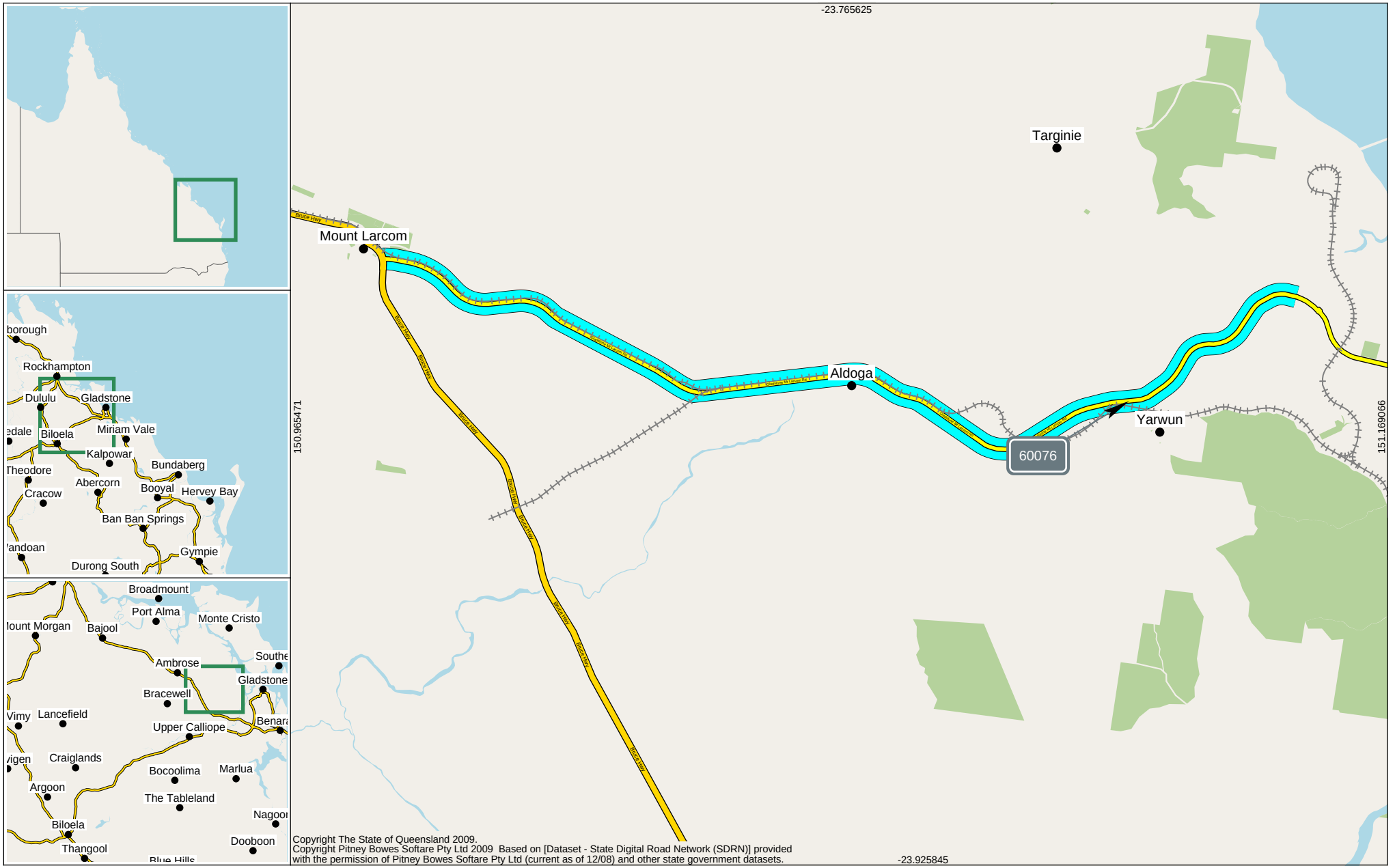


The width of each Road Segment is proportional to its AADT.

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.

	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%

- **All Vehicles (00)**: G 3,206 100% | A 3,189 100% | B 6,395 100%
  - **Light Vehicles (0A)**: G 2,773 86.49% | A 2,679 84.01% | B 5,452 85.25%
    - **Short Vehicles (1A)**: G 2,773 86.49% | A 2,679 84.01% | B 5,452 85.25%
      - **Short 2-Axle Vehicles (2A)**: G 2,724 84.97% | A 2,636 82.66% | B 5,360 83.82%
      - **Short Vehicles Towing (2B)**: G 49 1.53% | A 43 1.35% | B 92 1.44%
  - **Heavy Vehicles (0B)**: G 434 13.54% | A 509 15.96% | B 943 14.75%
    - **Trucks and Buses (1B)**: G 204 6.36% | A 279 8.75% | B 483 7.55%
      - **2-Axle Trucks and Buses (2C)**: G 141 4.40% | A 219 6.87% | B 360 5.63%
      - **3-Axle Trucks and Buses (2D)**: G 46 1.43% | A 43 1.35% | B 89 1.39%
      - **4-Axle Trucks (2E)**: G 17 0.53% | A 17 0.53% | B 34 0.53%
    - **Articulated Vehicles (1C)**: G 116 3.62% | A 114 3.57% | B 230 3.60%
      - **3-Axle Articulated (2F)**: G 3 0.09% | A 4 0.13% | B 7 0.11%
      - **4-Axle Articulated (2G)**: G 4 0.12% | A 4 0.13% | B 8 0.13%
      - **5-Axle Articulated (2H)**: G 7 0.22% | A 6 0.19% | B 13 0.20%
      - **6-Axle Articulated (2I)**: G 102 3.18% | A 100 3.14% | B 202 3.16%
    - **Road Trains (1D)**: G 114 3.56% | A 116 3.64% | B 230 3.60%
      - **B Double (2J)**: G 113 3.52% | A 115 3.61% | B 228 3.57%
      - **Double Road Trains (2K)**: G 1 0.03% | A 1 0.03% | B 2 0.03%
      - **Triple Road Trains (2L)**: G 0 0% | A 0 0% | B 0 0%

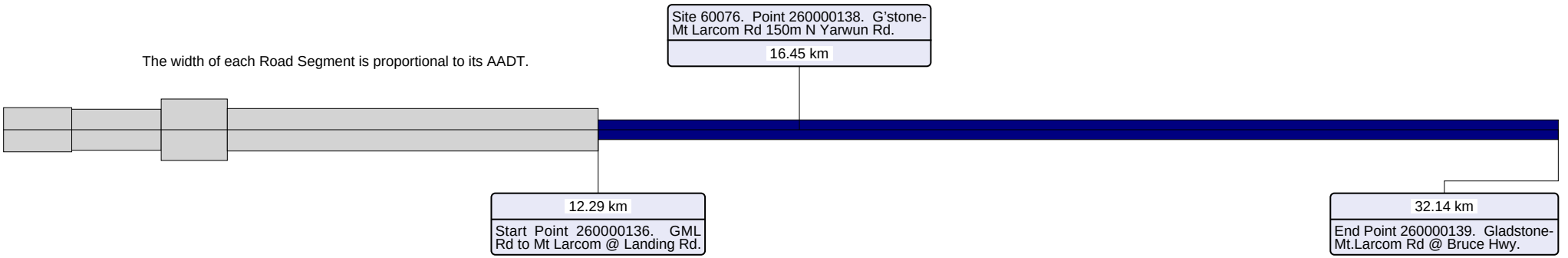

-23.765625
Targinie
Mount Larcom
Aldoga
60076
Yarwun
150.965471
151.169066
-23.925845
borough
Rockhampton
Dululu
Gladstone
Miriam Vale
Biloela
Kalpowar
Bundaberg
Theodore
Abercorn
Booyal
Hervey Bay
Cracow
Ban Ban Springs
Gympie
Durong South
Broadmount
Port Alma
Monte Cristo
Bajool
Ambrose
Gladstone
Bracewell
Lancefield
Upper Calliope
Craiglands
Bocoolima
Marlua
Argoon
The Tableland
Biloela
Thangool
Dooboon
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AADT Segment Analysis Report (Complete)

Area 404 - Fitzroy District Road Section 181 - GLADSTONE - MT LARCOM ROAD

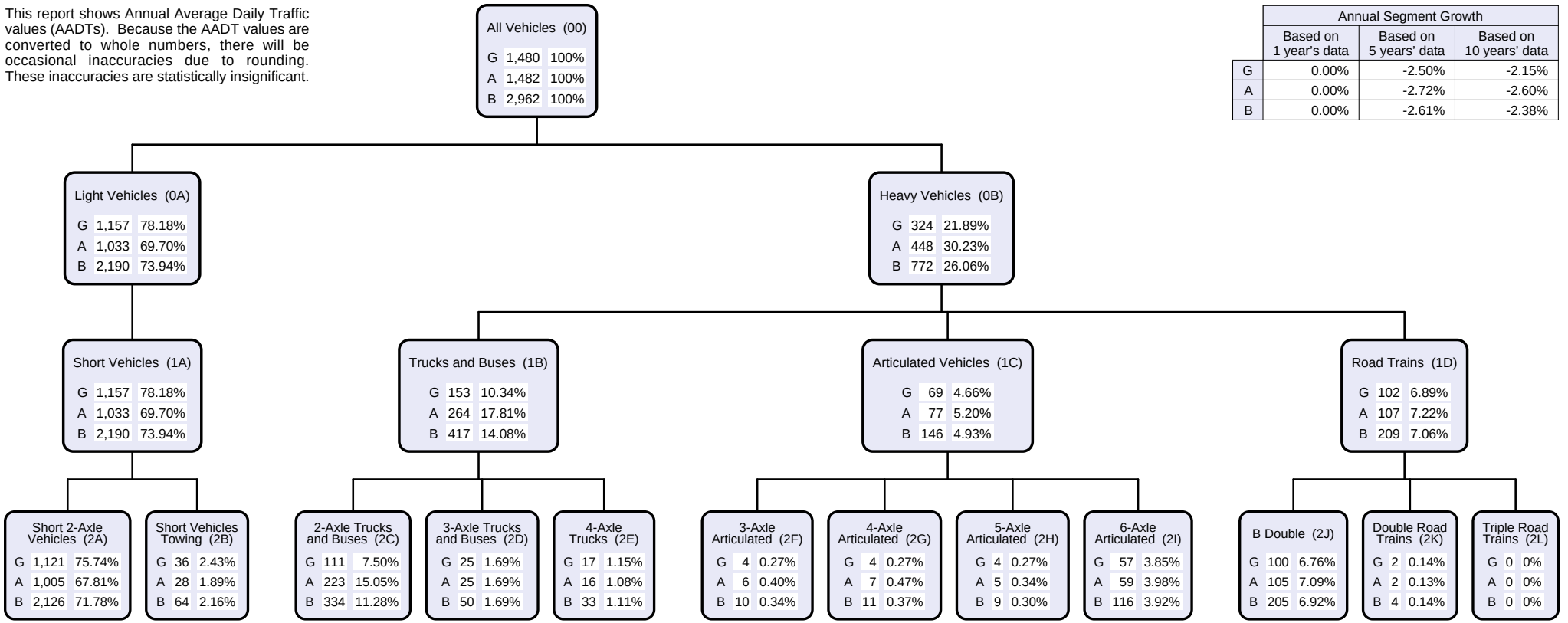
Traffic Year 2019 - Data Collection Year 2018

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.

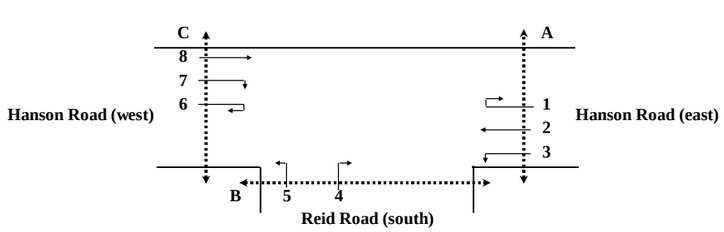
	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	0.00%	-2.50%	-2.15%
A	0.00%	-2.72%	-2.60%
B	0.00%	-2.61%	-2.38%



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*	*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**	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	**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**	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**	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	0	2	**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	0	1	**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**	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	0	2	**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	**0**	0	35	7	**42**	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**	**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**	**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*	*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	0	1	**1**	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**	0	1	0	**1**	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	**0**	0	1	0	**1**	0	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	**0**	0	1	0	**1**	0	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	**0**	0	1	1	**2**	0	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**	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	**0**	0	1	0	**1**	0	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**	0	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**	0	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**	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**	0	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**	0	0	1	**1**	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**	**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**	**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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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)

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)

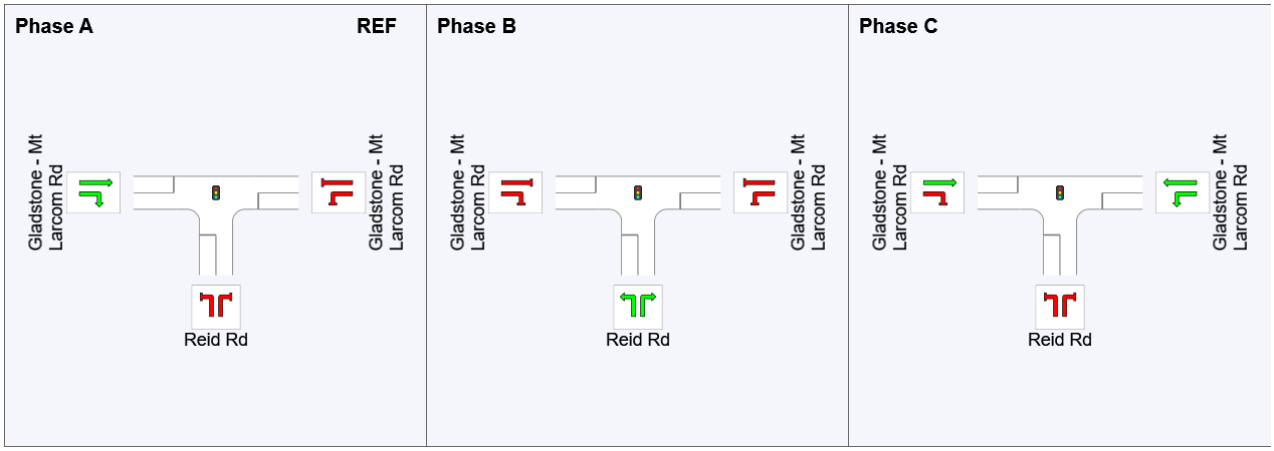
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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)

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)

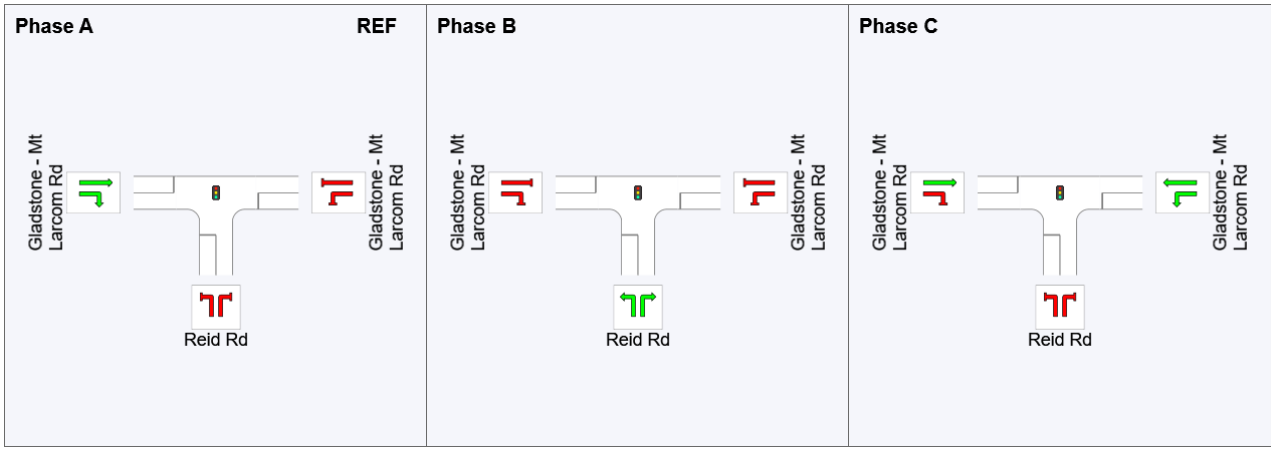
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

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

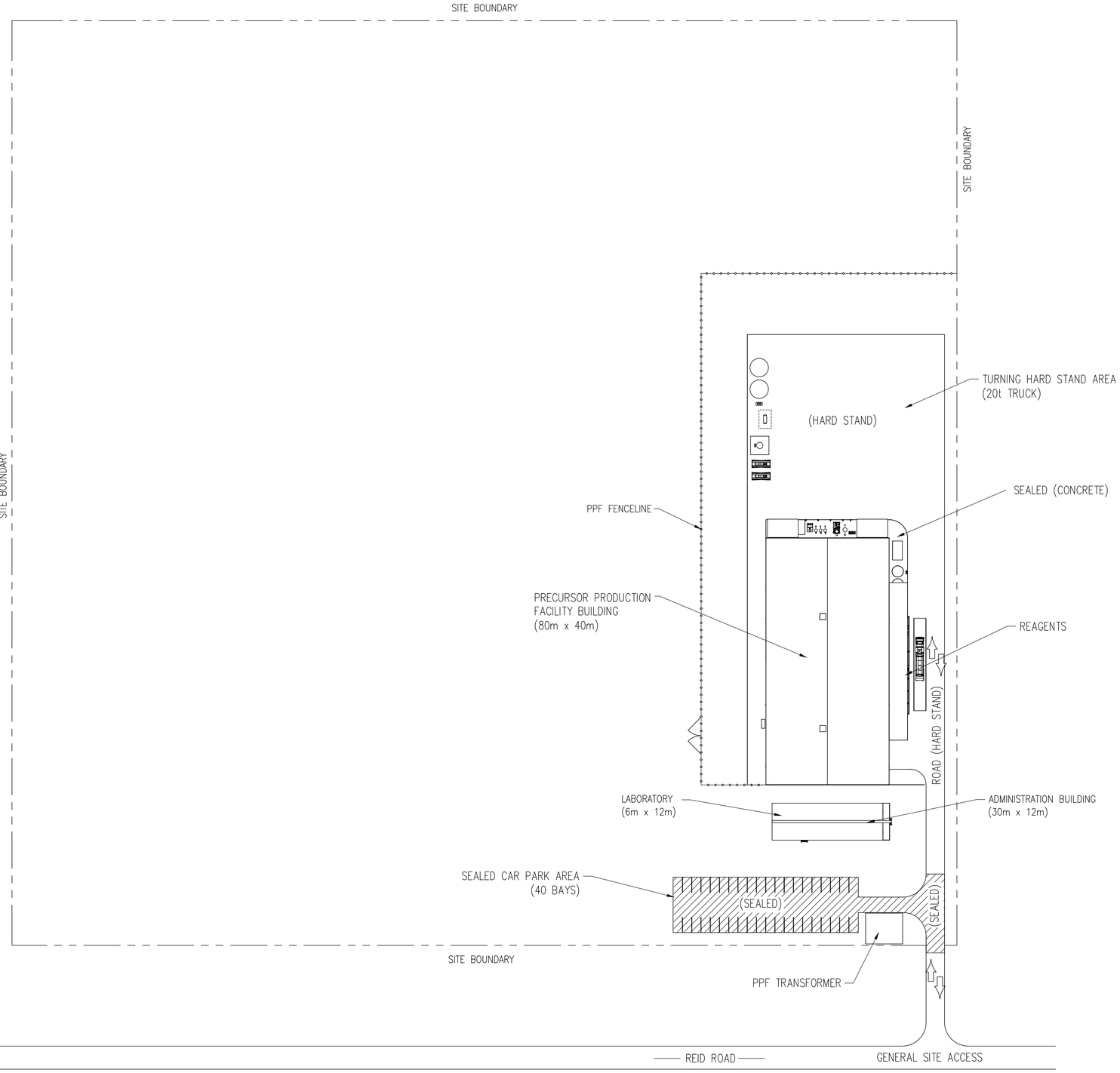


REF: Reference Phase
VAR: Variable Phase



Appendix D – Plan of Development

Plant North



CONFIDENTIAL

ISSUED
FOR DFS

DOC No.	DESCRIPTION	REV No	DESCRIPTION	DRN	CHK'D	ENG	APPR'D	DATE
		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
REFERENCE DOCUMENTS		AMENDMENTS						

Alpha HPA

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PRUDENTIA PROCESS CONSULTING

SCALE:	1:750	
DRAWN	AMC	MAY 21
CHECKED		
ENGINEER		
APPROVED		
CLIENT		
A1		

ALPHA HPA
HPA FIRST PROJECT
SITE GENERAL ARRANGEMENT
STAGE 1 - PRECURSOR PRODUCTION PLANT

DRG. No. MC1868-G-030

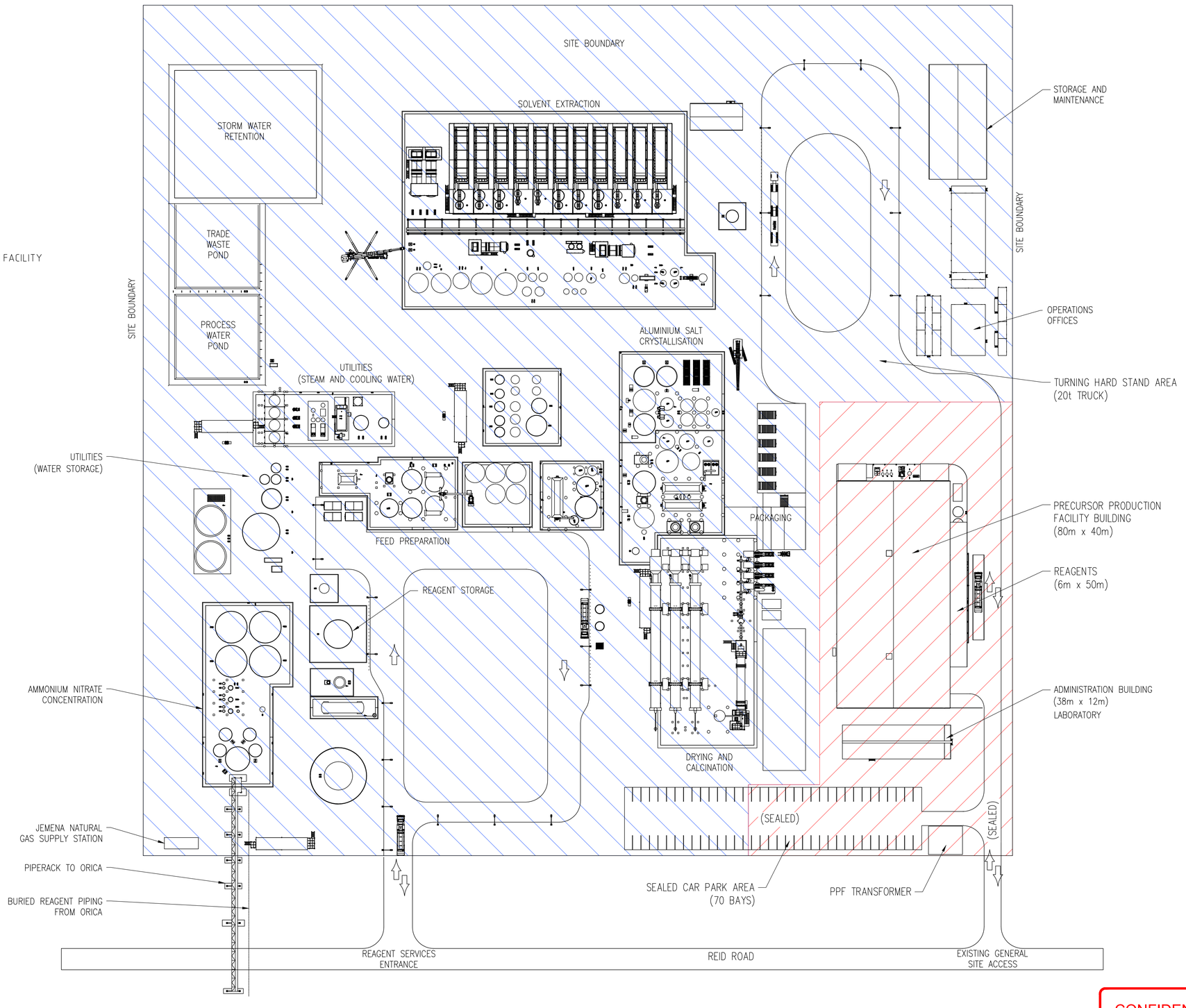
Rev E

Plant North

LEGEND

STAGE 1
PRECURSOR PRODUCTION FACILITY

STAGE 2
10,000 tpa FACILITY



CONFIDENTIAL

ISSUED
FOR APPROVAL

REV No	DESCRIPTION	DRN	CHK'D	ENG	APPR'D	DATE
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
A	ISSUED FOR INFORMATION	CAM	JH	JH		16.07.21

DOC No. MC1868-G-002 — SITE PLAN - GENERAL ARRANGEMENT
REFERENCE DOCUMENTS — AMENDMENTS

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Alpha HPA

PRUDENTIA PROCESS CONSULTING

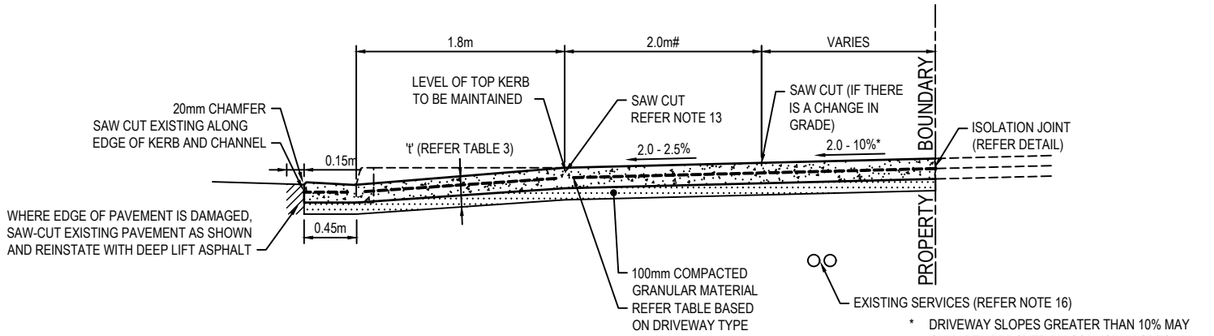
SCALE:	1:750	
DRAWN	CAM	JULY 21
CHECKED		
ENGINEER		
APPROVED		
CLIENT		
	A1	

ALPHA HPA
HPA FIRST PROJECT
SITE GENERAL ARRANGEMENT
STAGE 1 & STAGE 2

DRG. No. MC1868-G-031

Rev D

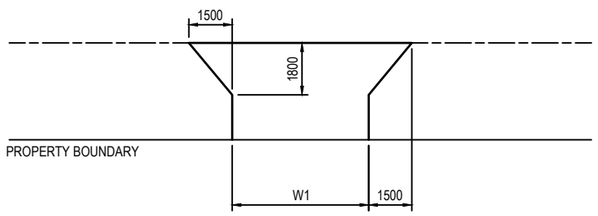
Appendix E – CMDG Standard Drawing CMDG-R-042A



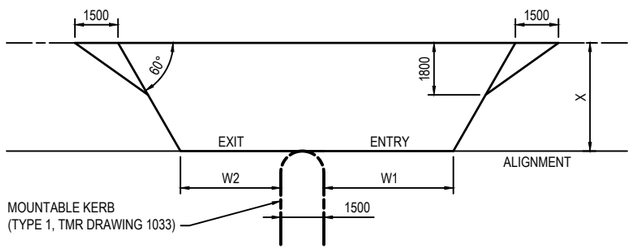
TYPICAL SECTION
N.T.S.

* DRIVEWAY SLOPES GREATER THAN 10% MAY ONLY BE APPROVED BY COUNCIL IN SPECIAL CIRCUMSTANCES PRIOR TO CONSTRUCTION

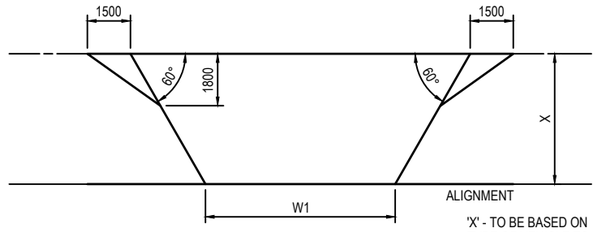
\# MIN 2.0m OR WIDTH OF FOOTPATH, WHICHEVER IS GREATER



TYPE A, B1
N.T.S.

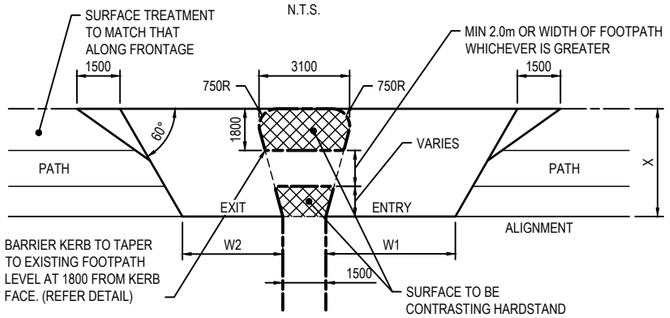


TYPE C1, C2, C3, C4
TYPE 1 CENTRE ISLAND
N.T.S.

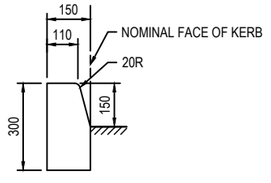


TYPE B2
N.T.S.

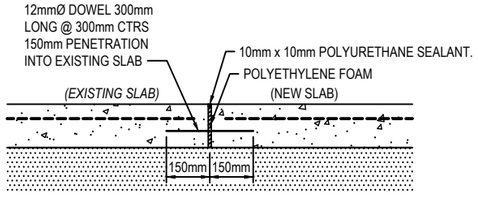
'X' - TO BE BASED ON TYPE OF VEHICLE TO USE THE ACCESS AND ITS SWEPT PATH



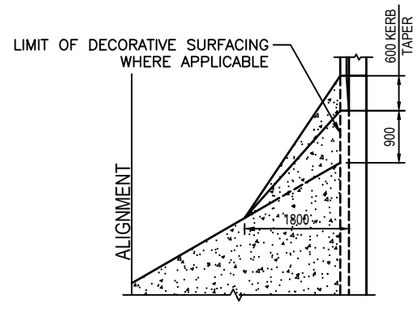
TYPE C1, C2, C3, C4
TYPE 2 (LEFT IN/LEFT OUT ONLY) CENTRE ISLAND
N.T.S.



BARRIER KERB DETAIL
N.T.S.



ISOLATION JOINT DETAIL
N.T.S.



KERB TAPER TREATMENT
N.T.S.

FOR RURAL COMMERCIAL AND INDUSTRIAL ACCESS, REFER COUNCIL'S STANDARD DRAWINGS FOR MAJOR ACCESS POINTS

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	PATHS OF THE VEHICLES IS REQUIRED TO BE SUBMITTED TO COUNCIL TO DEMONSTRATE HOW THE VEHICLE WILL PRACTICALLY ACCESS THE PROPERTY.
SINGLE UNIT TRUCK 12.5m	B2 (7m)		C2	ACCESS FOR SUCH VEHICLES REQUIRE FORWARD ONLY MANOEUVRE FOR ENTRY AND EXIT OF THE PROPERTY.
REFUSE COLLECTION VEHICLE	B2 (7m)		C2	
BUS	B2 (9m)		C4	
PRIME MOVER	B2 (9m)		C4	
B-DOUBLE	B2 (9m)		C4	

TABLE 3: LAYOUT DIMENSIONS

TYPE	W1 (m)	W2 (m)	t (mm)	REINFORCEMENT MESH
A	6.0	-	130	SL82
B1	6.0	-	180	SL92
B2	6.0 - 9.0	-	180	SL92
C1	4.5	3.5	180	SL92
C2	5.5	5.0	180	SL92
C3	7.5	6.0	180	SL92
C4	9.0	7.5	180	SL92

RELEVANT STANDARDS:

1. AS3600, CONCRETE STRUCTURES
2. AS1379, SPECIFICATIONS AND SUPPLY OF CONCRETE
3. AS/NZS A4671, STEEL REINFORCING MATERIALS.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.
2. CROSSING TYPE, LOCATION AND IF RELEVANT, DIMENSIONS W1 AND W2 WILL BE DETERMINED BY COUNCIL.
3. 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%.
4. PEDESTRIAN REFUGE AREA TREATMENT TO MATCH TREATMENT ADJACENT TO CROSSING.
5. NO TRACKS PERMITTED ACROSS FOOTPATH.
6. CONCRETE PATH SHALL BE CONTINUOUS ACROSS DRIVEWAYS AS PEDESTRIAN AND CYCLISTS SHOULD HAVE RIGHT OF WAY.
7. VARIATION TO THE DESIGNS SHOWN ARE SUBJECT TO APPROVAL FROM THE MANAGER ROAD SERVICES OR THIS DELEGATE.
8. CONCRETE GRADE N32 OR BETTER; REINFORCEMENT AS PER TABLE, MIN LAP 210 MIN, MIN CLEAR TOP COVER 50mm.
9. ALL VERTICAL FACES ARE TO BE FORMED, INCLUDING THE INTERFACE WITH THE ROADWAY.
10. FORMWORK AND REINFORCEMENT MUST BE IN PLACE AND INSPECTED AND APPROVED BY COUNCIL OFFICER BEFORE DELIVERY OF THE CONCRETE.
11. THE THICKNESS OF DECORATIVE SURFACING WHERE APPROVED IS ADDITIONAL TO THE THICKNESS DIMENSIONS 't' SHOWN IN TABLE.
12. BRASS DISKS EMBEDDED IN KERB AND CHANNEL SHALL NOT BE REMOVED WITH OUT THE PERMISSION OF COUNCIL.
13. 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.
14. FINISH: WOOD FLOAT OR STEEL FOLLOWED BY NYLON BROOM OR OTHER APPROVED NON-SLIP SURFACE.
15. SURFACE TREATMENT MAY NOT BE MATCHED BY COUNCIL IF REPAIRS ARE NEEDED TO SERVICES UNDER DRIVEWAY.
16. 16. 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.
17. 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
18. 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).
19. 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).
20. 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.
21. 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.
22. 22. 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						

REVISIONS		DATE
C	MRC ADDED	07/2021
B	IRC ADDED	12/2016
A	NEW DRAWING FOR GRC	04/2016

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Capricorn Municipal Development Guidelines
Incorporating:
Banana Shire Council (BSC)
Central Highlands Regional Council (CHRC)
Gladstone Regional Council (GRC)
Isaac Regional Council (IRC)
Livingstone Shire Council (LSC)
Maranoa Regional Council (MRC)
Rockhampton Regional Council (RRC)

URBAN COMMERCIAL/INDUSTRIAL DRIVEWAY

ROADS
STANDARD DRAWING
CMDG-R-042A
REV. A B C

Appendix F – Project Traffic Calculations

ALP0121-002 | Alpha HPA TIA

Indicative Stage 1 BOQ for HV Movement Calculations

Stage 1 Project Lasts 24 Months											
	CCS Code	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		E'works	Assume 50% truck	Truck & 4 Axle Dog	20	0	Based on 1.8t / m3 material	Quarry to west on GML Rd
	AEA	Detailed excavation	m3	1,000	E'works	Assume 50% truck	Truck & 4 Axle Dog	20	25	Based on 1.8t / m3 material	Quarry to west on GML Rd
	AEB	Detailed fill and compaction	m3	8,000	E'works	100% truck	Truck & 4 Axle Dog	20	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		E'works	Truck	Truck & 4 Axle Dog	20	0	Based on 1.8t / m3 material	Quarry to west on GML Rd
	ACC	Site establishment	ea	1	E'works	Truck	Semi	-	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	

								0.5	per hour over 3 months		
D	Steelwork										
	DBA				SMP	Truck	Delivery Truck (3 Axle Rigid)				G'stone
	DBB		t		SMP	Truck	Delivery Truck (3 Axle Rigid)				G'stone
	DBC		t		SMP	Truck	Delivery Truck (3 Axle Rigid)				G'stone
	DCD	Portal frames	m	840	SMP	Truck	Semi		2	Assume 2 trucks (advised by supplier)	G'stone
	DCA	Framing, girts, purlins, wind bracing - bldng steelwork	m	4,000	SMP	Truck	Semi	-	2	Assume 3 trucks (advsied by supplier)	G'stone
	DBD	Sheeting	m2	5,540	SMP	Truck	Semi	1	1	Assume 10 trucks	G'stone
	DDC	Other building structural	m2		SMP	Truck	Delivery Truck (3 Axle Rigid)	-	2		G'stone
	DDF				SMP	Truck					G'stone
	DCJ	Pipe rack 80 m x 2 m W x 3 m H (12 bays)			SMP	Truck	Delivery Truck (3 Axle Rigid)		6	Assume 6 trucks	G'stone
	DAA				SMP	Truck					G'stone
	DAB				SMP	Truck					G'stone
	DAC				SMP	Truck					G'stone
	DAD				SMP	N/A					
	DAF				SMP	N/A					
	DAG				SMP	Truck					G'stone
	DAE				SMP	Truck					G'stone
E	Buildings & Architecture										
	EGB	Laboratory	ea	1	SMP	Truck - 2 building	Semi	-	2	Conservatively assume 1 delivery truck movement / building	G'stone
	EBC	Sheeting Walls & Roofs	m2	0	SMP	Truck	Semi	-	0	Assume 20 trucks	G'stone
	EPA	Storage Buildings	ea	0	SMP	Truck	Semi	-	0	Conservatively assume 1 delivery truck movement / building	G'stone
	EPB	Admin and Control Buildings	ea	1	SMP	Truck	Semi	-	10	Conservatively assume 1 delivery truck movement / building	G'stone
	EPS	Substaion Buildings	ea	5	SMP	Truck	Semi	-	2	Conservatively assume 1 delivery truck movement / building	G'stone
N	Mechanical Equipment										
	NFS	Separation Equipment	ea		SMP	Truck	Semi	-			G'stone
	NEB	Agitator	ea	49	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	10	Assume 1 trucks per 10 items	G'stone
	NFA	Centrifuge	ea	1	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	1	Conservatively assume 1 delivery truck movement / piece	G'stone
	NBA	Conveyors	ea	12	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	6	Conservatively assume 1 delivery truck movement / 2 piece	G'stone
	NPA	Air receiver	ea	1	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	1		G'stone
	NFI		ea	4	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	4	Conservatively assume 1 delivery truck movement / piece	G'stone
	NHB	Heat exchanger (plate)	ea	13	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	3	Conservatively assume 1 delivery truck movement /4 piece	G'stone
	NEC		ea		SMP	Truck	Delivery Truck (3 Axle Rigid)	-	0	Conservatively assume 1 delivery truck movement / piece	G'stone
	NCA	Pumps	ea	77	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	8	Conservatively assume 1 delivery truck movement / 10 piece	G'stone
	NBD	Tanks	ea	106	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	18	Conservatively assume 1 delivery truck movement / 6 piece	G'stone
	NMA	Modules	ea	20	SMP	Truck	Semi	-	30	Conservatively assume 1.5 delivery truck movement / piece	G'stone
		Filters	ea	8	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	8	Conservatively assume 1 delivery truck movement / piece	G'stone
		Dryer	ea	2	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	2	Conservatively assume 1 delivery truck movement / piece	G'stone
	NYA	Package Plants	ea	30	SMP	Truck	Delivery Truck (3 Axle Rigid)	-	45	Assume 1.5 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	0	SMP	Truck	Semi	-	0	Conservatively assume 1 delivery truck movement / piece	G'stone
	MAF	Skips	ea	2	SMP	Truck	Semi	-	2		G'stone
	MAD	Ductwork	ea	0	SMP	Truck	Semi	-	0	Conservatively assume 1 delivery truck movement / piece	G'stone
	MTA	Tanks General - firewater	ea	2	SMP	Truck	Semi	-	6	Assume 3 trucks each	G'stone
	MAG	Hoppers	ea	0	SMP	Truck	Semi	-	0	Conservatively assume 1 delivery truck movement / piece	G'stone
	MCG	Low temperature insulation	m2	0	SMP	Truck	Semi	-	4	Conservatively assume 4 delivery truck movements	G'stone
P	Piping										
	PGC	Control Valving	ea	20	SMP	Truck	Semi	-	1		G'stone
	PCB	Safety shower / eyewash	ea	4	SMP	Truck	Semi	-	1		G'stone
	PAB	Valves and piping	m	7,145	SMP	Truck	Semi	-	30	Assume 1.5 trucks per module for valves and piping	G'stone
	PAC										G'stone
	PAE										G'stone
	PAF										G'stone
	PAG										G'stone
	PAA										G'stone
	PGB										G'stone
	PGM										G'stone
	PAH										G'stone
	PAD										G'stone
	PCX	SP items general	Item	100	SMP	Truck	Semi	-	2	Conservatively assume 2 delivery truck movement	G'stone
F	Safety Equipment										

	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	Islolators, 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	Generartors	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	

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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)		
	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
2020	December	4433	2596				516		7545	29
	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
2022	December							5160	5160	20
	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
2023	December							5160	5160	20
	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
2024	December							5160	5160	20

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Indicative Stage 1 Vehicle Movement 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	33						
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																														
G	Operations Phase	1 M									1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
Peak Daily HV Movements			12	18	6	6	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
Peak Hourly HV Movements (Assume 12hrs/day)			1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

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	33						
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	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45						
FTE Staff Numbers			19	29	12	12	37	37	37	37	16	26	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45						
% Staff Travelling by Light Vehicle		100%																																							
Volume Staff Travelling by Light Vehicles			19	29	12	12	37	37	37	37	16	26	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	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	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30						

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Indicative Stage 2 BOQ for HV Movement Calculations

Row Labels	CCS Desc.	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	9,120	E'works	Assume 50% truck	Truck & 4 Axle Dog	20	456	Based on 1.8t / m3 material	Quarry to west on GML Rd
	AEA	Detailed excavation	m3	20,090	E'works	Assume 50% truck	Truck & 4 Axle Dog	20	1,005	Based on 1.8t / m3 material	Quarry to west on GML Rd
	AEB	Detailed fill and compaction	m3	16,634	E'works	100% truck	Truck & 4 Axle Dog	20	832	Based on 1.8t / m3 material	Quarry to west on GML Rd
	ACA	Clearing and grubbing	m2	83,193	E'works	N/A	N/A	-	0	On site - no external movements	
	ACB	Scrub Clearing	m2	83,193	E'works	N/A	N/A	-	0	On site - no external movements	
	AGB	Reinforced earth walls	ea	12							
			m3	280	E'works	Truck	Truck & 4 Axle Dog	20	14	Based on 1.8t / m3 material	Quarry to west on GML Rd
	ACC	Site establishment	ea	1	E'works	Truck	Semi	-	10	Assume 10 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	5,000	E'works	Assume 500m3 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	2,500	E'works	Assume 250m3 truck in	Delivery Truck (3 Axle Rigid)	-	10	Conservatively assume 10 delivery truck movements	G'stone
	ABH	Turfing	m2	12,448	E'works	Truck	Delivery Truck (3 Axle Rigid)	-	10	Conservatively assume 10 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	10	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	10	E'works	Truck	Semi	-	10	Assume 10 semi movement for e'works plant pickup	G'stone
								E'works Total	2,370	truck movements	
									10.8	per day over 11 months	
									1.3	per hour over 11 months	
B	Civil										
	BDA	Liner - clay	m3	1,260	Civil	Truck	Truck & 4 Axle Dog	20	63	Based on 1.8t / m3 material	Quarry to west on GML Rd
	BDC	Liner - HDPE	m2	2,200	Civil	Truck	Semi	-	3	Conservatively assume 3 delivery truck movements	G'stone
	BFA	Asphalt roads (including subgrade preparation)	m2	26,352	Civil	Truck	Truck	15	71	Based on 1.8t / m3 material, 40mm thick	Gladstone
	BGA	Fencing	m	2,150	Civil	Truck	Semi	-	2	Conservatively assume 2 delivery truck movements	G'stone
	BFK	Traffic control	ea	1	Civil	N/A	N/A	-	0		
	BFB	Crushed Rock Base Course (200 mm)	m3	4,307	Civil	Truck	Truck & 4 Axle Dog	20	216	Based on 1.8t / m3 material	Quarry to west on GML Rd
	BFC	Limestone or Recycled Crushed Concrete (200 mm)	m3	3,467	Civil	Truck	Truck & 4 Axle Dog	20	174	Based on 1.8t / m3 material	Quarry to west on GML Rd
	BED	Subsoil drains	m	300	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BFD	Kerbs (including subgrade preparation)	m	300	Civil	Truck	Concrete Truck (3 Axle Rigid)	-	5	Assume 0.1m2 kerb cross section / 6m3 per concrete truck	G'stone
	BCF	Reinforced concrete pipe	m	80	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	3	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
	BEG	Swale Drain	m2	6,224	Civil	N/A	N/A	-	0		
	BCE	Box culverts	m	75	Civil	Truck	Semi	-	4	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	10	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	94	Civil	Truck	Semi	-	1	Conservatively assume 1 delivery truck movement	G'stone
C	Concrete										
	CBA	Structure Footings 32 MPa 160 kg/m3	m3	846	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	141	Assume 6m3 per truck	G'stone
	CBC	Ground slabs 25 MPa 100kg/m3 150 mm thick	m3	3,013	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	503	Assume 6m3 per truck	G'stone
	CBG	Bund Walls 25 MPa 200kg/m3 300 mm thick	m3	497	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	83	Assume 6m3 per truck	G'stone
	CBR	Tank Ring Beams 32 MPa	m3	361	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	61	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	906	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	151	Assume 6m3 per truck	G'stone
	CBH	Concrete Pedestals 25 MPa 0.5 m Diameter	m3	48	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	8	Assume 6m3 per truck	G'stone
	CBB	Equipment Plinths 25 MPa	m3	877	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	147	Assume 6m3 per truck	G'stone
	CEA	Cementitious Grouting (25mm thick)	m3	7	Civil	Truck	Concrete Truck (3 Axle Rigid)	6	2	Assume 6m3 per truck	G'stone
	CEB	Foundations Fasteners	ea	13,140	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	1,646	truck movements	
									10.3	per day over 8 months	
									1.3	per hour over 8 months	
D	Steelwork										

	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	Islolators, 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	Generartors	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)		
	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
2020	December								0	0
	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
2022	December	10400	130				1290		11820	46
	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
2023	December			1690	9360		3870	10750	25670	99
	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
2024	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	day shift
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	
	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	
100-Leaching	Shift Process Operators	Filter operation, field checks, Al (OH)3 Loader	12.0	Yes	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	
120-Aluminium Solvent Extraction - Loaded Organic Washing		Inspection, sampling, adjustments	0.8	Yes	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	
140-Iron Removal	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	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	
200-Aluminium Salt Crystallisation	Shift Process Operators	Inspection, sampling, adjustments	4.0	Yes	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	
220-HPA Pre-cursor Precipitation	Shift Process Operators	Inspection, sampling, adjustments	2.0	Yes	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	
240-HPA Production	Shift Process Operators	Kiln operation, blockage management	0.2	Yes	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	1
260-Bleed Stream & Waste Water Treatment	Shift Process Operators	Inspection, sampling, adjustments	1.2	Yes	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	
600-Nitric Acid & Sulphuric Acid Storage	Shift Process Operators	Unloading, inspection, sampling	0.4	Yes	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	
620-Ammonia and Carbon Dioxide Storage	Shift Process Operators	Inspection, sampling, adjustments	0.8	Yes	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	
720-Bleed Stream & Waste Water Treatment	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	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	
740-Steam Generation & Hot Water Circuit	Shift Process Operators	Inspection, sampling, adjustments	0.4	Yes	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	
760-Natural Gas & Fuels	Shift Process Operators	Inspection, sampling, adjustments	0.2	Yes	0.05	0.05	0.05	0.05	
Spare	Roundup		1.6	Yes	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

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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											11	11	11	11	11	11	11	11	11	11	11															
B	Civil	8 M															11	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	5	8	8
Peak Daily HV Movements				0	0	0	0	0	0	0	0	0	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)				0	0	0	0	0	0	0	0	0	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

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	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	118
FTE Staff Numbers				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	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

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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 CONSTRCUTION

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 CONSTRCUTION

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

	LV	HV
Peak Hour Volume	98	7
Peak Hour % of Average Daily Traffic (ADT)	15%	
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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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)

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)

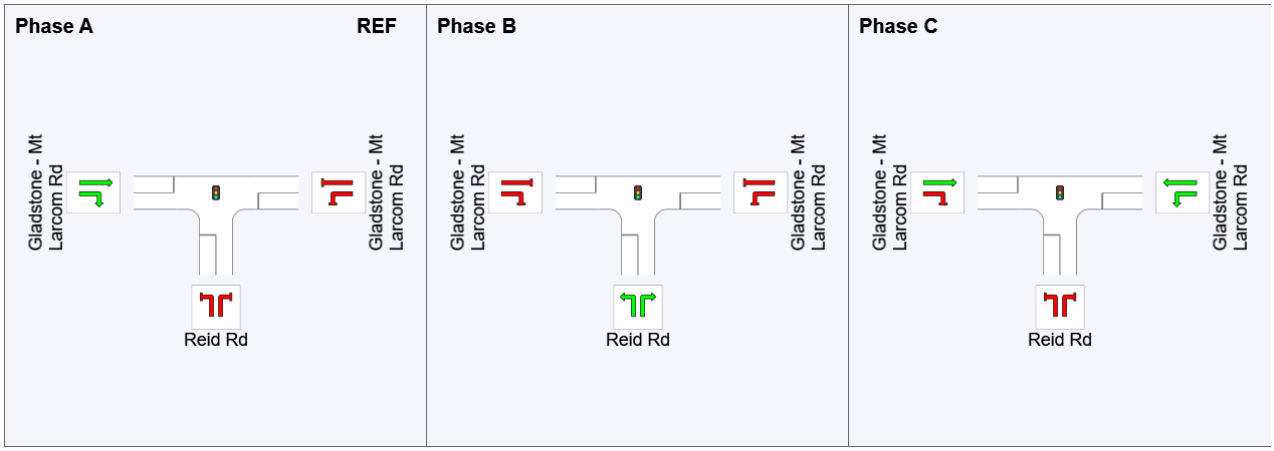
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

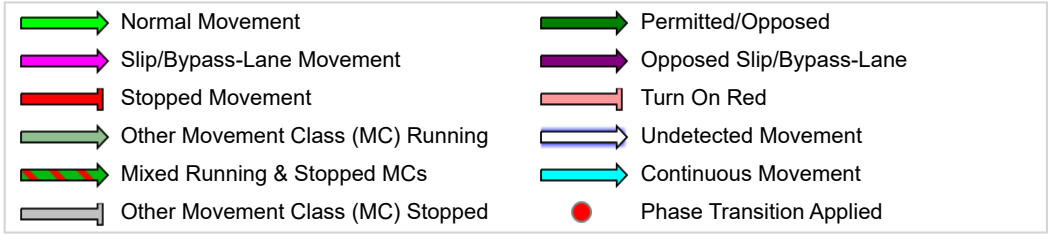
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed 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	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)

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)

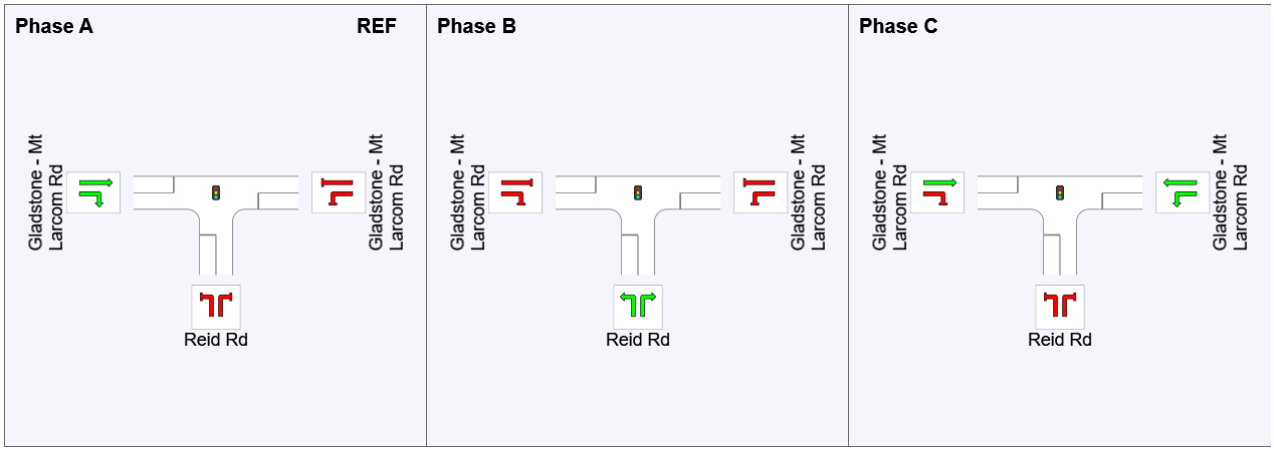
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

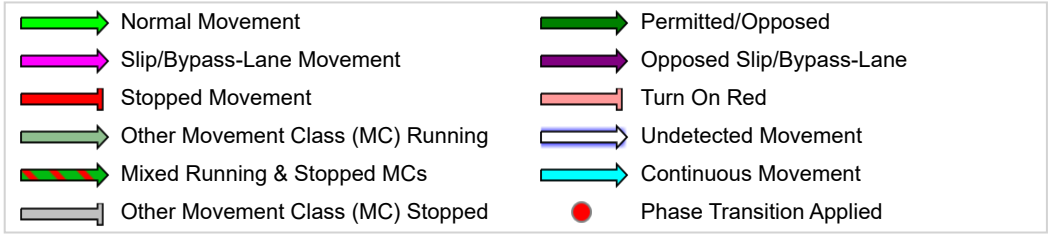
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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)

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)

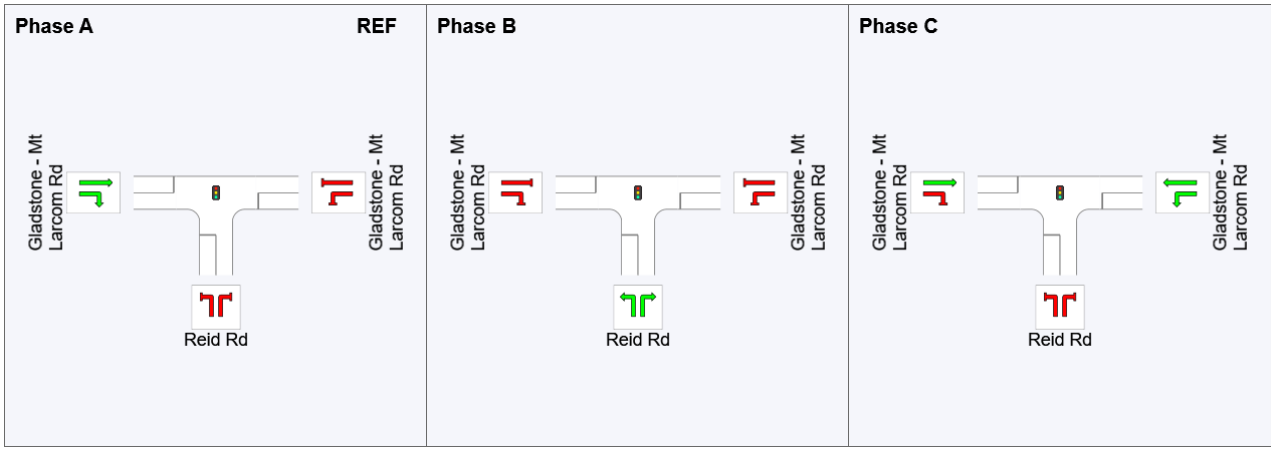
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed 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.
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 [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)

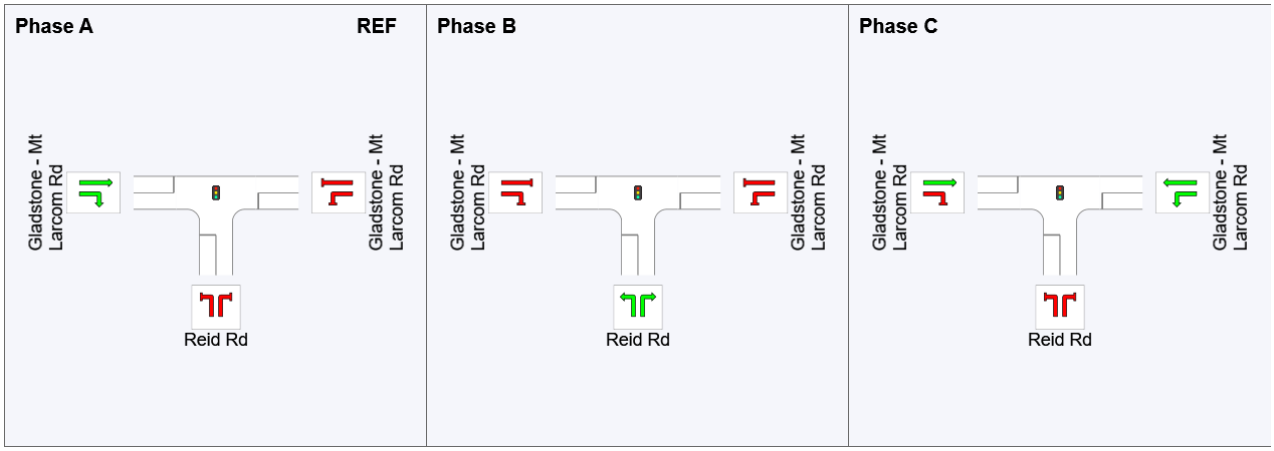
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

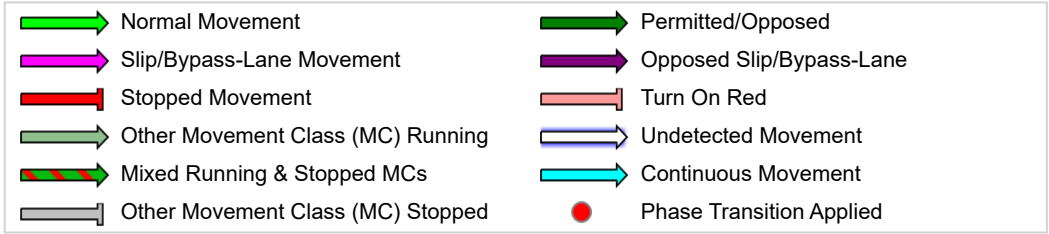
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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)

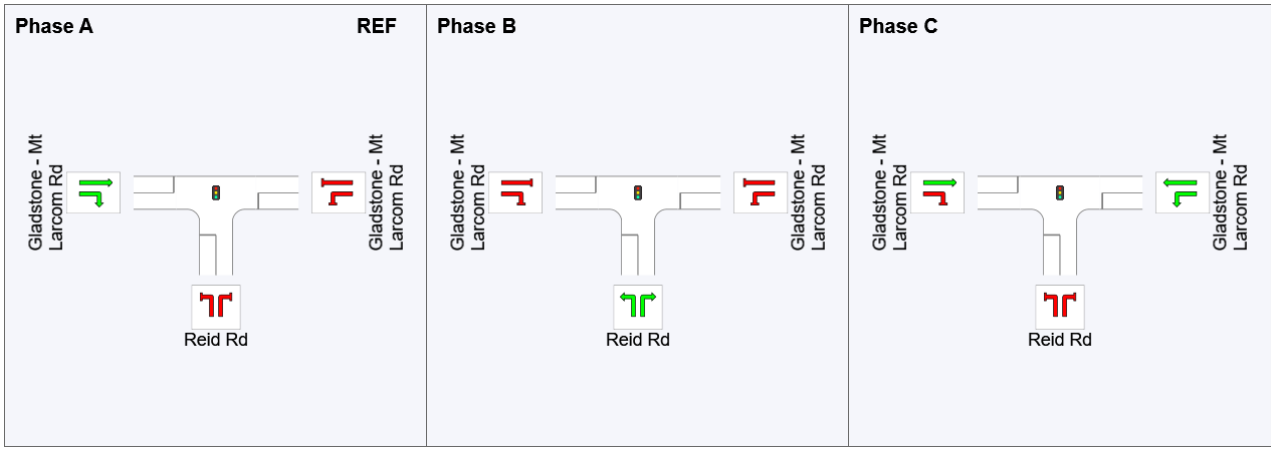
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

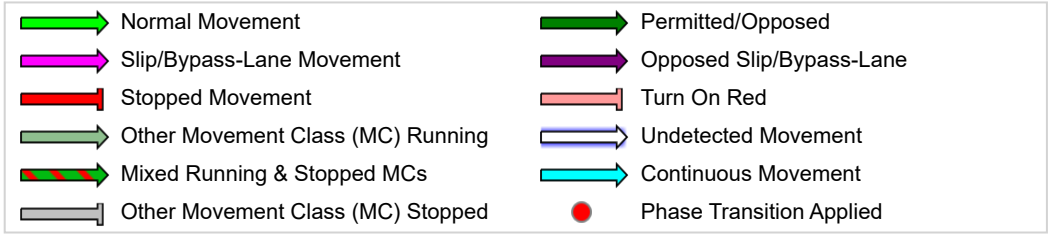
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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)

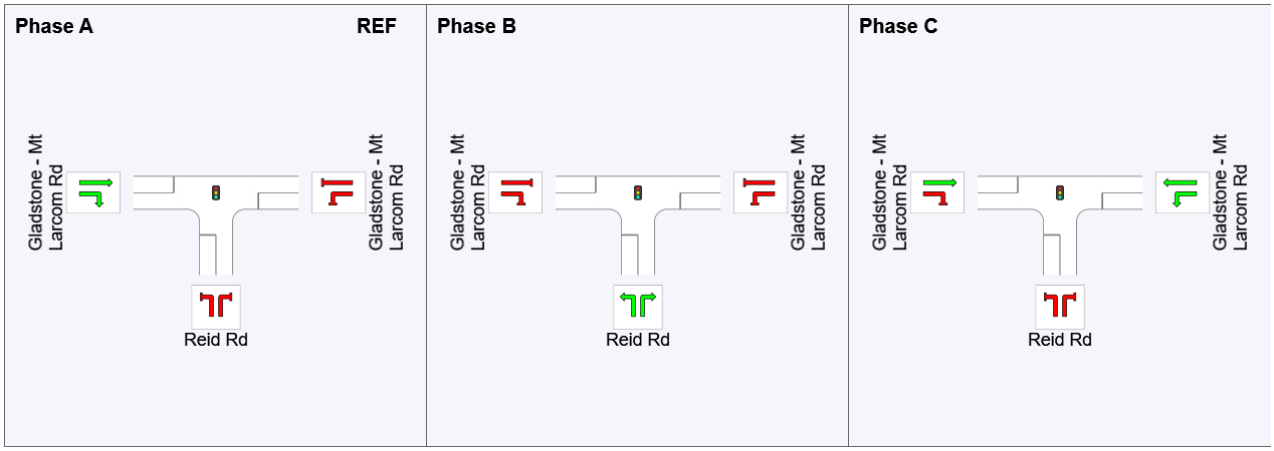
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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.
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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)

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)

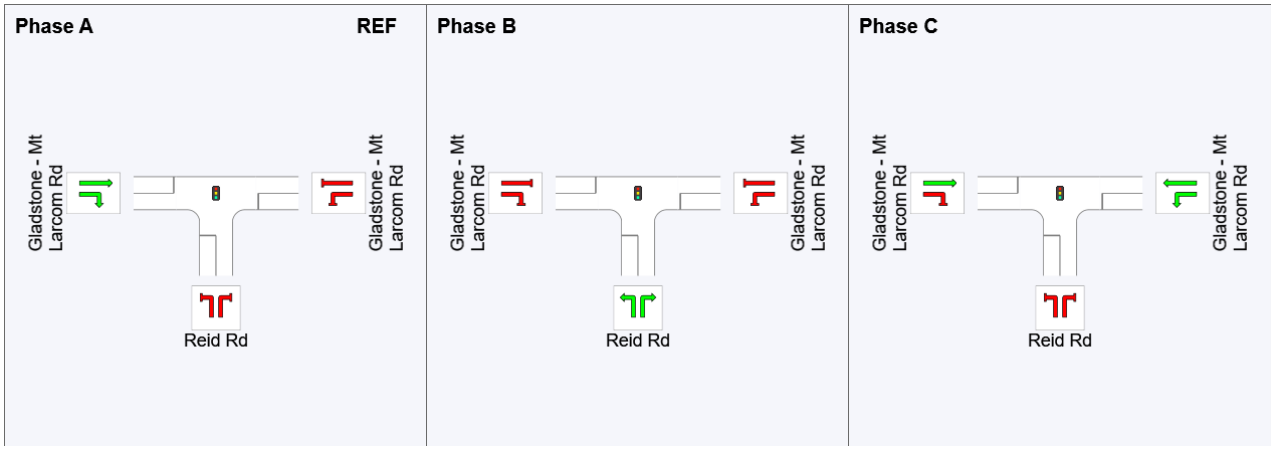
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

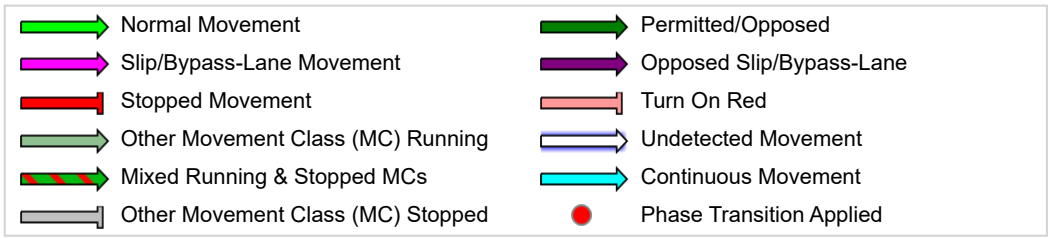
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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.
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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)

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)

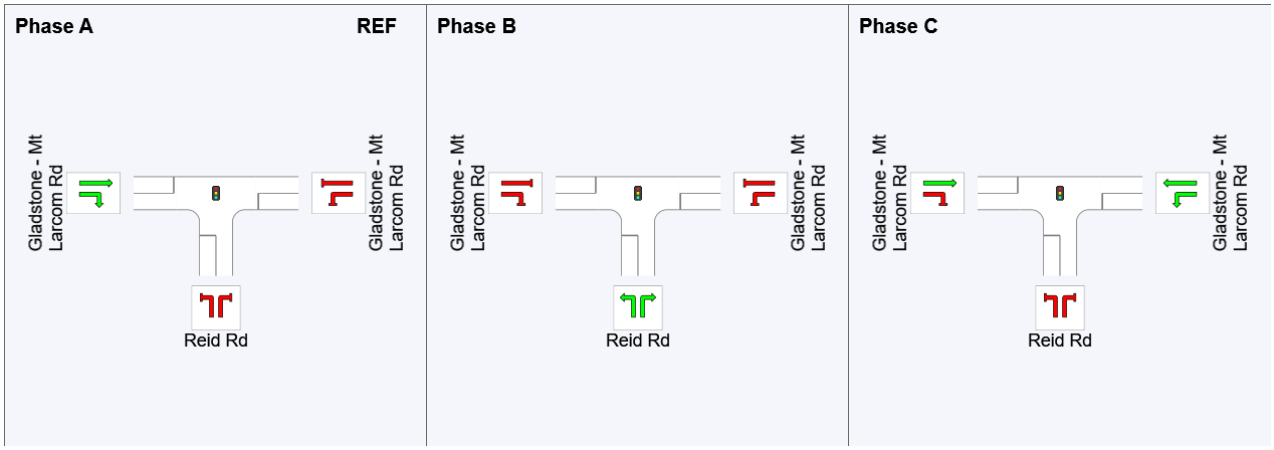
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

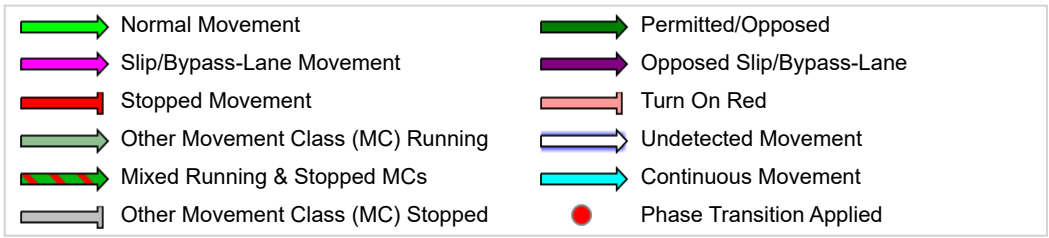
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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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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)

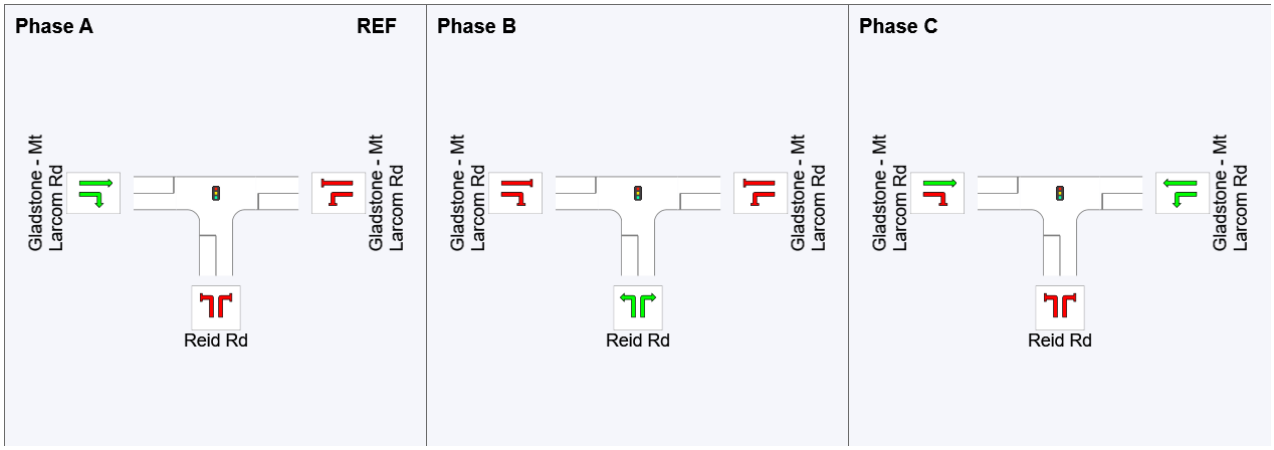
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

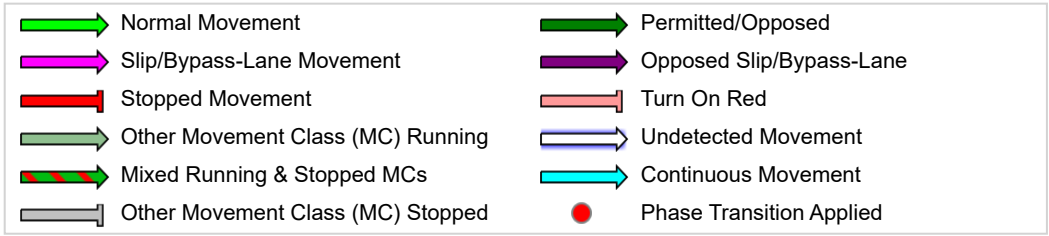
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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)

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)

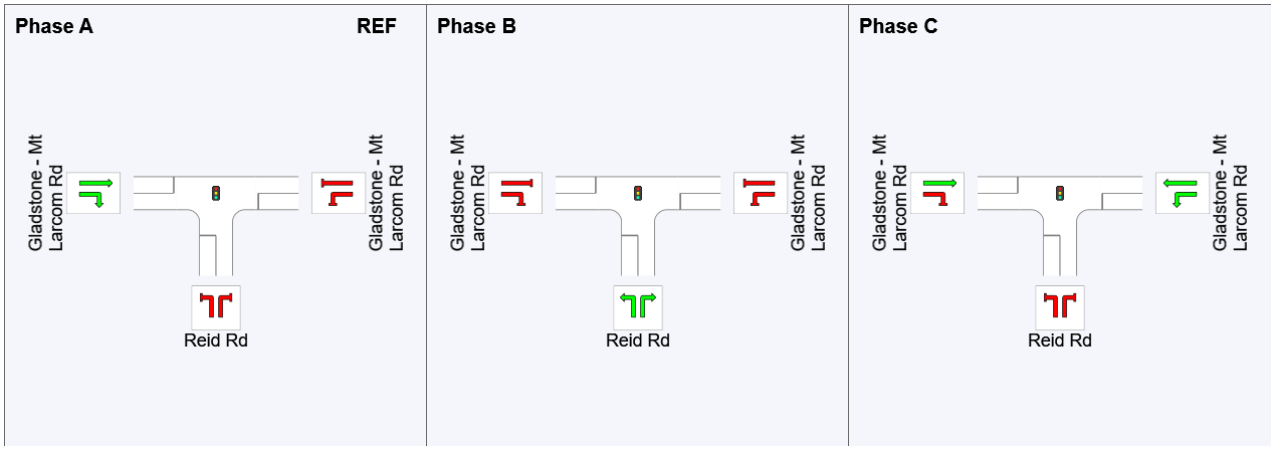
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

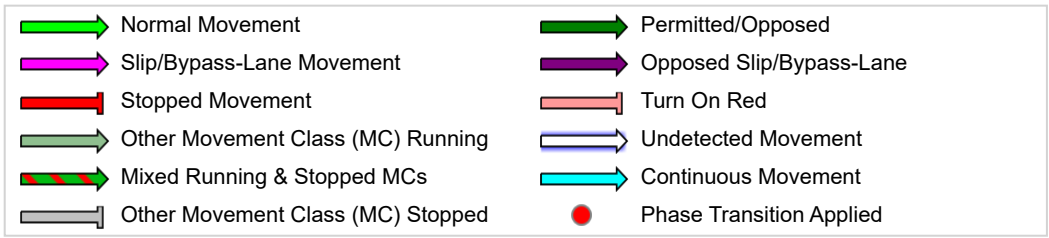
Phase	A	B	C
Phase Change Time (sec)	0	1	14
Green Time (sec)	1	7	10
Phase Time (sec)	7	13	10
Phase Split	23%	43%	33%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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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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)

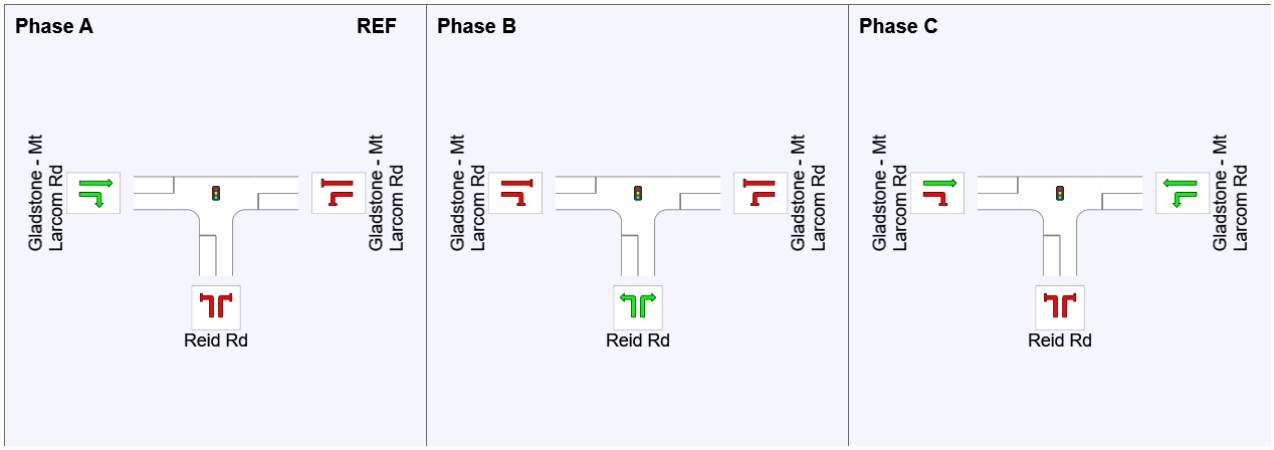
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Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

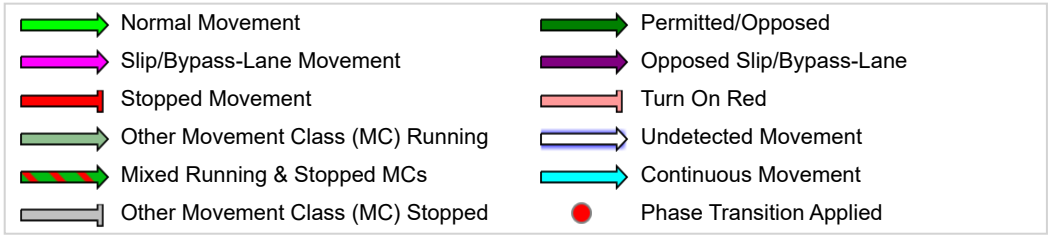
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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 [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
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).
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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

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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)

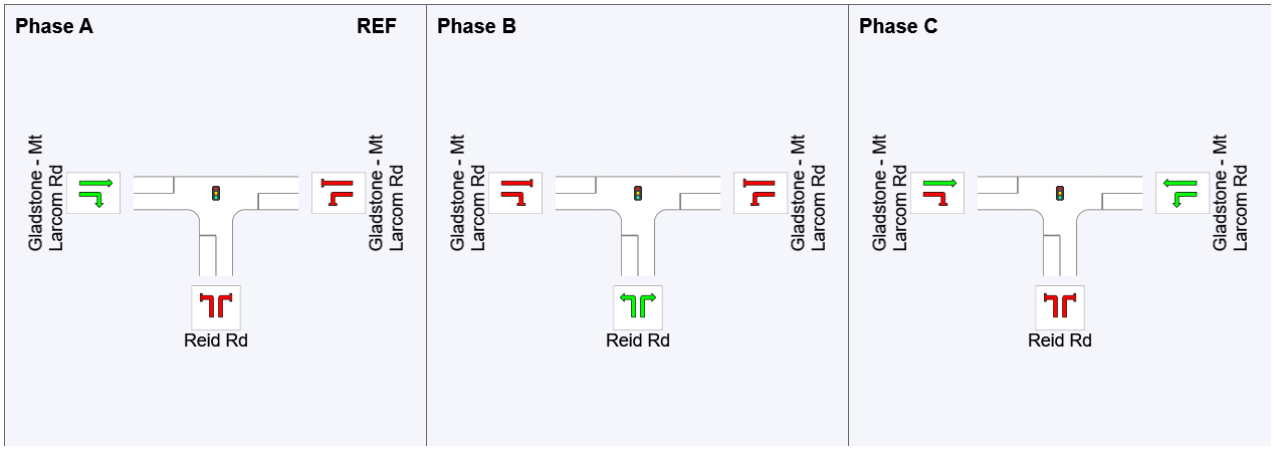
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Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

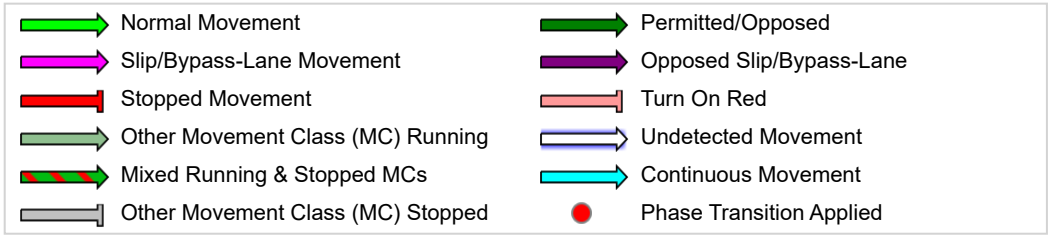
Phase	A	B	C
Phase Change Time (sec)	0	1	13
Green Time (sec)	1	6	11
Phase Time (sec)	7	12	11
Phase Split	23%	40%	37%

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



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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				
			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
		60076	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
			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				
			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
		60076	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
			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
		60076	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
			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

TMR Chainage 9.833km - Gladstone-Mt Larcom / Reid Road

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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

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		Project Duration	ESAs / HV	B'ground ESAs		Project Const. ESAs		Project Cons. Incr ESAs	
			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	Gaz	A-Gaz	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	304	3.2	661,733	471,483	2,137	266	0.32%	0.06%
		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	304	3.2	492,366	515,583	2,137	266	0.43%	0.05%
		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	304	3.2	549,100	649,114	2,137	266	0.39%	0.04%
		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	304	3.2	439,672	515,507	2,137	266	0.49%	0.05%
			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	304	3.2	439,672	515,507	72	1,042	0.02%	0.20%
		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	304	3.2	328,137	453,768	72	1,042	0.02%	0.23%
			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	304	3.2	328,137	453,768	0	0	0.00%	0.00%
GRC	Reid Road	-	0.000	0.275	2020	351	351	702	6.84%	6.84%	24	24	1.00%	358	358	716	24	24	304	3.2	23,830	23,830	3,178	338	13.34%	1.42%
			0.275	0.430	2020	306	306	613	3.92%	3.92%	12	12	1.00%	312	312	625	12	12	304	3.2	11,915	11,915	3,178	338	26.68%	2.83%
			0.430	0.505	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	91	12	12	304	3.2	11,915	11,915	3,178	338	26.68%	2.83%
			0.505	0.710	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	91	12	12	304	3.2	11,915	11,915	3,178	338	26.68%	2.83%
			0.710	0.740	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2	304	3.2	1,589	1,589	3,178	338	200.07%	21.26%
			0.740	2.600	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2	304	3.2	1,589	1,589	212	3,064	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		Project Duration	ESAs / HV	B'ground ESAs		Project Oper. ESAs		Project Oper. Incr ESAs	
			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	Gaz	A-Gaz	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	730	3.2	1,604,040	1,142,874	17,138	1,952	1.07%	0.17%
		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	730	3.2	1,193,496	1,249,774	17,138	1,952	1.44%	0.16%
		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	730	3.2	1,331,019	1,573,453	17,138	1,952	1.29%	0.12%
		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	730	3.2	1,065,766	1,249,589	17,138	1,952	1.61%	0.16%
			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	730	3.2	1,065,766	1,249,589	17,138	1,952	1.61%	0.16%
		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	730	3.2	795,403	1,099,933	1,470	21,241	0.18%	1.93%
			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	730	3.2	795,403	1,099,933	0	0	0.00%	0.00%
GRC	Reid Road	-	0.000	0.275	2020	351	351	702	6.84%	6.84%	24	24	1.00%	362	362	723	25	25	730	3.2	57,763	57,763	38,379	3,422	66.44%	5.92%
			0.275	0.430	2020	306	306	613	3.92%	3.92%	12	12	1.00%	316	316	631	12	12	730	3.2	28,881	28,881	38,379	3,422	132.88%	11.85%
			0.430	0.505	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	92	12	12	730	3.2	28,881	28,881	38,379	3,422	132.88%	11.85%
			0.505	0.710	2020	45	45	89	26.85%	26.85%	12	12	1.00%	46	46	92	12	12	730	3.2	28,881	28,881	38,379	3,422	132.88%	11.85%
			0.710	0.740	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2	730	3.2	3,851	3,851	38,379	3,422	996.63%	88.86%
			0.740	2.600	2020	16	16	32	10.00%	10.00%	2	2	1.00%	16	16	33	2	2	730	3.2	3,851	3,851	0	0	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

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) 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

ii) 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

iii) the outcomes of this traffic impact assessment are a true reflection of results of assessment, and that

iv) I believe the strategies recommended for mitigating impacts by this traffic impact assessment,

v) 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	✓

APPENDIX H:

Cultural Heritage Database Register Search

Cultural Heritage Database and Register Search Report

Search report reference number: 182588

The Aboriginal and Torres Strait Islander Cultural Heritage Database (cultural heritage database) and Aboriginal and Torres Strait Islander Cultural Heritage Register (cultural heritage register) have been searched in accordance with the location description provided, and the results are set out in this report.

The cultural heritage database is intended to be a research and planning tool to help Aboriginal and Torres Strait Islander parties, researchers, and other persons in their consideration of the cultural heritage values of particular areas.

The cultural heritage register is intended to be a depository for information for consideration for land use and land use planning, and a research and planning tool to help people in their consideration of the Aboriginal cultural heritage values of particular objects and areas.

Aboriginal or Torres Strait Islander cultural heritage which may exist within the search area is protected under the *Aboriginal Cultural Heritage Act 2003* and the *Torres Strait Islander Cultural Heritage Act 2003* (the Cultural Heritage Acts), even if the Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (the Department) has no records relating to it.

The placing of information on the database is not intended to be conclusive about whether the information is up-to-date, comprehensive or otherwise accurate.

Under the Cultural Heritage Acts, a person carrying out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal or Torres Strait Islander cultural heritage. This applies whether or not such places are recorded in an official register and whether or not they are located on private land.

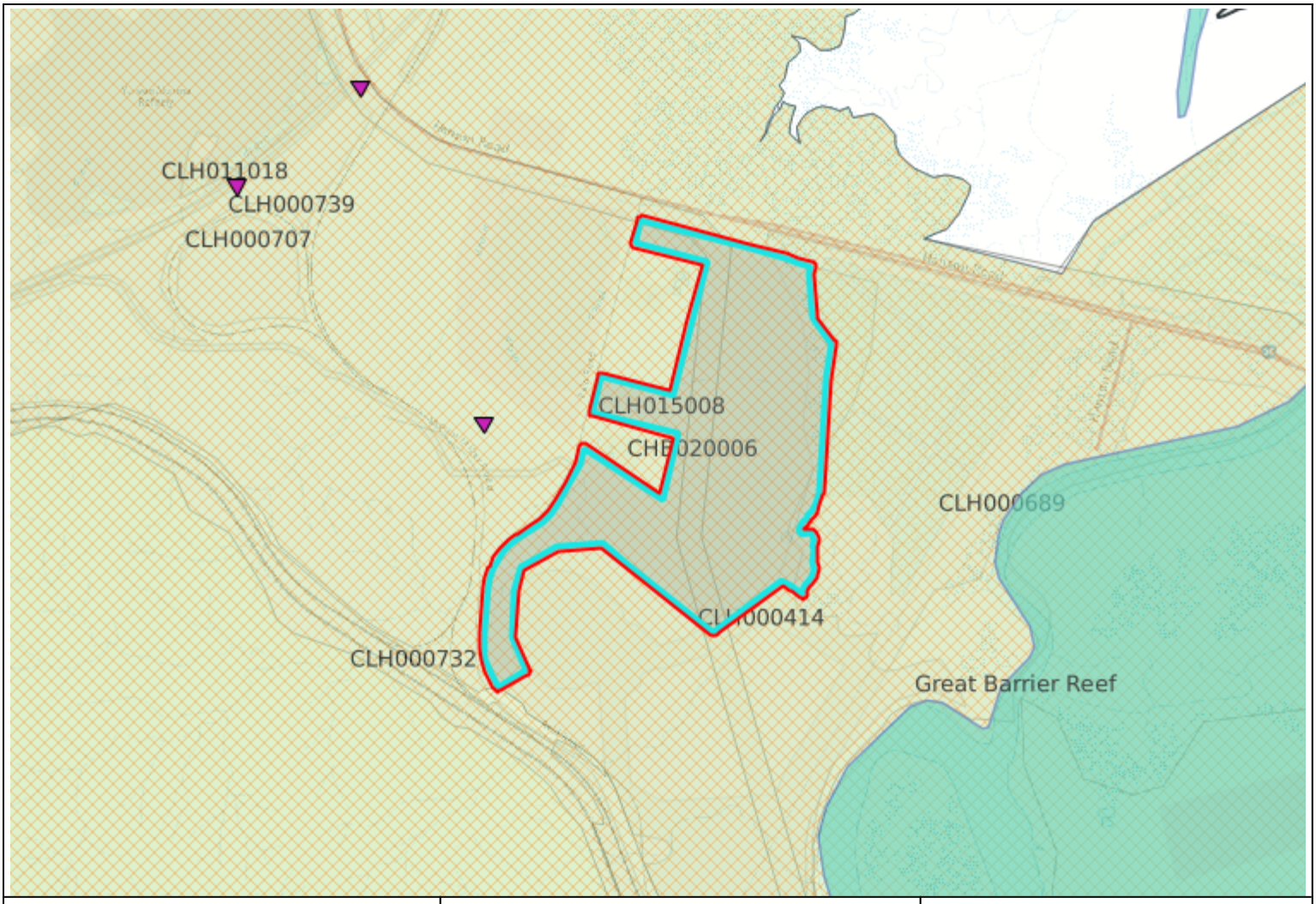
Please refer to the Department website https://www.qld.gov.au/firstnations/environment-land-use-native-title/cultural-heritage/cultural-heritage-duty-of-care to obtain a copy of the gazetted Cultural Heritage Duty of Care Guidelines, which set out reasonable and practicable measure for meeting the cultural heritage duty of care.

In order to meet your duty of care, any land-use activity within the vicinity of recorded cultural heritage should not proceed without the agreement of the Aboriginal or Torres Strait Islander Party for the area, or by developing a Cultural Heritage Management Plan under Part 7 of the Cultural Heritage Acts.

The extent to which the person has complied with Cultural Heritage Duty of Care Guidelines and the extent the person consulted Aboriginal or Torres Strait Islander Parties about carrying out the activity – and the results of the consultation – are factors a court may consider when determining if a land user has complied with the cultural heritage duty of care.

Should you have any further queries, please do not hesitate to contact the department via email: cultural.heritage@dsdsatsip.qld.gov.au or telephone: 1300 378 401.

Cultural Heritage Database and Register Search Report



LEGEND

- CH Parties
- CH Bodies
- CHMPs
- Study Areas
- DLAs

Reference Number: 182588
Search Type: Lot/Plan
Lot: 1
Plan: SP338512
Shire: Gladstone Regional

Buffer Distance: 20m

Cultural Heritage Sites

- Pre-2015 Point Site
- Post-2015 Point Site
- Mitigated Point Site
- Pre-2015 Area Site
- Post-2015 Area Site
- Mitigated Area Site

Map Projection: Geographic Latitude & Longitude (GDA2020).

The Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (DSDSATSIP) is the custodian of spatial data provided by various third parties for inclusion in the Aboriginal and Torres Strait Islander cultural heritage online portal. This includes spatial data provided by the National Native Title Tribunal and Aboriginal and Torres Strait Islander parties.

Features shown on this map have been obtained from available sources. It is possible that errors and omissions may exist. The DSDSATSIP disclaims any liability for any errors or omissions that appear in this document.

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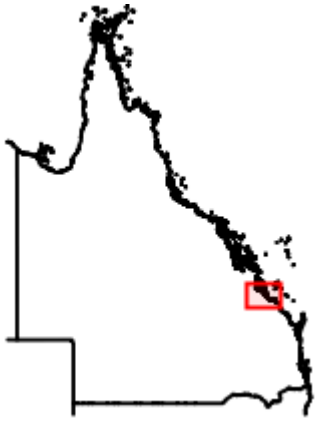
Map produced by the Cultural Heritage Unit, DSDSATSIP, Brisbane, Queensland, Australia on 28 March 2025.

Queensland Government

1:28,698

Metres 500 1,000

LOCALITY



Search report generated on Mar 28, 2025, 11:58 AM

Cultural Heritage Database and Register Search Report

There are no Aboriginal or Torres Strait Islander cultural heritage site points recorded in your specific search area.

There are no Aboriginal or Torres Strait Islander cultural heritage site polygons recorded in your specific search area.

Cultural Heritage Party/ies for the area:

Reference No.	Federal Court No.	Name	Contact Details
	QUD6026/2001	Bailai, Gurang, Gooreng Gooreng, Taribelang Bunda People	First Nations Bailai, Gurang, Gooreng Gooreng, Taribelang Bunda People Aboriginal Corporation RNTBC c/- Port Curtis Coral Coast Trust, Level 1, 3 Maryborough St, BRISBANE QLD 4670 Phone: (07) 4167 0037 Email: nathaniel.robinson@pccctrust.com.au

Cultural Heritage Body/ies for the area:

Departmental Reference No.	Name	Contact Details	Registration Date
CHB020006	First Nations Bailai Gurang Gooreng Gooreng Taribelang Bunda People Aboriginal Corporation RNTBC	First Nations Bailai, Gurang, Gooreng Gooreng, Taribelang Bunda People Aboriginal Corporation RNTBC C/- PO Box 537 BUNDABERG QLD 4670 Phone: (07) 4159 5589 Mobile: 0487 345 763 Email: reception@pccctrust.com.au	17/06/2021

Cultural Heritage Management Plans (CHMPs) for the area:

Departmental Reference No.	Project	Sponsor	Party	Registration Date
CLH000245	Approved CHMP - Central Queensland Gas Pipeline	Queensland Power Trading Corporation Trading as Enertrade	On their own behalf and on behalf of the Southern Barada & Kabalbara people QC00/4; Mr John Smith, Mr Jeff Smith, Ms Rhede Kelly, Ms Margaret Hornagold, Ms Ethel Smith, Mr Alick Smith, Mr Toby Smith, Mr Clarry Smith Senior, Ms Mona Keilly and Ms Amy Lest	May 12, 2006

Cultural Heritage Management Plans (CHMPs) for the area:

Departmental Reference No.	Project	Sponsor	Party	Registration Date
CLH000414	Approved CHMP - Gladstone Nickel Project	Gladstone Pacific Nickel Ltd	Port Curtis Coral Coast QC01/29	Jul 25, 2006
CLH000689	Approved CHMP - Greenfield Coal Terminal - Wiggins Island	Gladstone Ports Corporation	Port Curtis Coral Coast People	Nov 27, 2008
CLH015008	Approved CHMP - Aldoga South Road Extension Project	Department of State Development	Port Curtis Coral Coast People	Nov 4, 2015

There are no Designated Landscape Areas (DLA) recorded in your specific search area.

There are no Registered Cultural Heritage Study Areas recorded in your specific search area.

There are no National Heritage Areas (Indigenous values) recorded in your specific search area.

Glossary

Cultural Heritage Body: An entity registered under Part 4 of the Cultural Heritage Acts as an Aboriginal or Torres Strait Islander cultural heritage body for an area. The purpose of a cultural heritage body is to:

- identify the Aboriginal or Torres Strait Islander parties for an area
- serve as the first point of contact for cultural heritage matters.

Cultural Heritage Management Plan (CHMP): An agreement between a land user (sponsor) and Traditional Owners (endorsed party) developed under Part 7 of the Cultural Heritage Acts. The CHMP explains how land use activities can be managed to avoid or minimise harm to Aboriginal or Torres Strait Islander cultural heritage.

Cultural Heritage Party: Refers to a native title party for an area. A native title party is defined as:

- Registered native title holders (where native title has been recognised by the Federal Court of Australia).
- Registered native title claimants (whose native title claims are currently before the Federal Court of Australia).
- Previously registered native title claimants (the 'last claim standing') are native title claims that are no longer active and have been removed from the Register of Native Title Claims administered by the National Native Title Tribunal. Previously registered native title claimants will continue to be the native title party for that area providing:
    - there is no other registered native title claimant for the area; and
    - there is not, and never has been, a registered native title holder for the area.

The native title party maintains this status within the external boundaries of the claim even if native title has been extinguished.

Cultural heritage site points (pre 2015): Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as point data **before** 1 July 2015.

Cultural heritage site points (post 2015): Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as point data **after** 1 July 2015.

Cultural heritage site points (post 2015 mitigated): Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as point data after 1 July 2015 where the recorder has advised the department that the site has been mitigated.

Cultural heritage site polygons: Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as a polygon.

Designated Landscape Areas (DLA): Under the repealed *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987*, an area was declared a 'designated landscape area' (DLA) if it was deemed necessary or desirable for it to be preserved or to regulate access.

Indigenous Protected Areas (IPA): Areas of land and sea managed by Indigenous groups as protected areas for biodiversity conservation through voluntary agreements with the Australian Government. For further information about IPAs visit https://www.environment.gov.au/land/indigenous-protected-areas

National Heritage areas: Places listed on the National Heritage List for their outstanding heritage significance to Australia and are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. For further information about the National Heritage List visit https://www.environment.gov.au/heritage/about/national

National Heritage Areas (Indigenous values): Places listed on the National Heritage list (Indigenous values) are recognised for their outstanding Indigenous cultural heritage significance to Australia and are protected under the *Environment Protection and Biodiversity Conservation Act 1999.* These areas are now included in the cultural heritage

register.

Registered Cultural Heritage Study Areas: Comprehensive studies of Aboriginal and or Torres Strait Islander cultural heritage in an area conducted under Part 6 of the Cultural Heritage Acts for the purpose of recording the findings of the study on the register.

Traditional Use of Marine Resources Agreement (TUMRA): Areas subject to agreement between Great Barrier Reef Traditional Owners and the Australian and Queensland governments on the management of traditional use activities on their sea country. For further information about TUMRAs visit https://www.gbrmpa.gov.au/our-partners/traditional-owners/traditional-use-of-marine-resources-agreements

World Heritage Areas: Places inscribed on the World Heritage List pursuant to the World Heritage Convention adopted by the United Nations Education, Scientific and Cultural Organisation (UNESCO) and are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. For further information about World Heritage places in Queensland visit https://parks.des.qld.gov.au/management/managed-areas/world-heritage-areas

Disclaimer: *The Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships is the custodian of spatial data and information provided by various third parties for inclusion in the Aboriginal and Torres Strait Islander cultural heritage online portal. This includes spatial data provided by the National Native Title Tribunal and Aboriginal and Torres Strait Islander parties. Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships is not responsible for the accuracy of information provided by third parties or any errors in this search report arising from such information.*

APPENDIX I:

EMR/CLR database register search

Department of Environment, Science and Innovation (DESI)
ABN 46 640 294 485
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Scott lucke
PO Box 8384
Allenstown QLD 4700

Transaction ID: 51002165 EMR Site Id: 228987 03 April 2025
Client Reference:
Cheque Number:

This response relates to a search request received for the site:
Lot: 1 Plan: SP338512

EMR RESULT

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 141 Plan: CP865942
Address: 52 REID ROAD
YARWUN 4694

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.
CHEMICAL STORAGE - (other than petroleum products or oil under item 29) - storing more than 10 t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.
FOUNDRY OPERATIONS - commercial production of metal products by injecting or pouring molten metal into moulds and associated activities in works having a design capacity of more than 10 t per year.
MINERAL PROCESSING - chemically or physically extracting or processing metalliferous ores.

While sites are listed on the EMR using the lot and plan description, a mining lease may affect only a limited area of the lot. In many instances with rural properties, only a small area may be potentially affected by the mining activities and the ongoing landuse is unaffected. More detailed information relating to the location of the mining activities may be held by the Department of Environment, Science and Innovation or the Department of Natural Resources, Mines and Energy.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated. The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DESI has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DESI has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

APPENDIX J:

OCG Pre Lodgement Meeting Minutes – prepared by CQG

MEETING:	**Pre-Lodgement Meeting – Temporary Laydown Area & Associated Facilities – Office of the Coordinator General**
LOCATION:	1 William Street, Brisbane City QLD 4000 and via MS Teams
DATE / TIME:	4 March 2025 3:00PM – 4:00PM
CQG Project #:	20118

ATTENDEES

	NAME	INITIALS	REPRESENTING
1.	John White	JW	Economic Development Queensland (EDQ)
2.	Karla South (online)	KS	EDQ
3.	Sally Chapman	SC	Office of the Coordinator General (OCG)
4.	Felicity McCann (online)	FM	OCG
5.	Marcus Peck	MP	OCG
6.	Rob Williamson	RW	Alpha HPA
7.	Mark Cornwell (online)	MC	Alpha HPA
8.	Ryan Cook (online)	RC	Alpha HPA
9.	Patrice Brown	PB	CQG Consulting (CQG)
10.	Rebbekah Hearn (online)	RH	CQG
11.	Scott Lucke (online)	SL	CQG

MINUTES

Item#	Notes
1.0	**Introductions**
1.1.	Meeting opened by JW at 3:02PM. Welcome and introductions by all – OCG, EDQ, Alpha HPA (MC, RC), and CQG (SL, RH). Remaining attendees joined meeting in person at 3:05PM (PB, RW, MP) PB noted that Alpha HPA was interested in using the adjacent lot for a temporary laydown area as discussed with SC (OCG) earlier in the week. The lot is currently part of a much larger area which is subject to an EIS by another proponent (H2Hub) for a hydrogen plant. PB declared conflict of interest as CQG had been engaged to do some early work for H2Hub on the EIS terms of reference.
2.0	**PowerPoint Proposal overview**

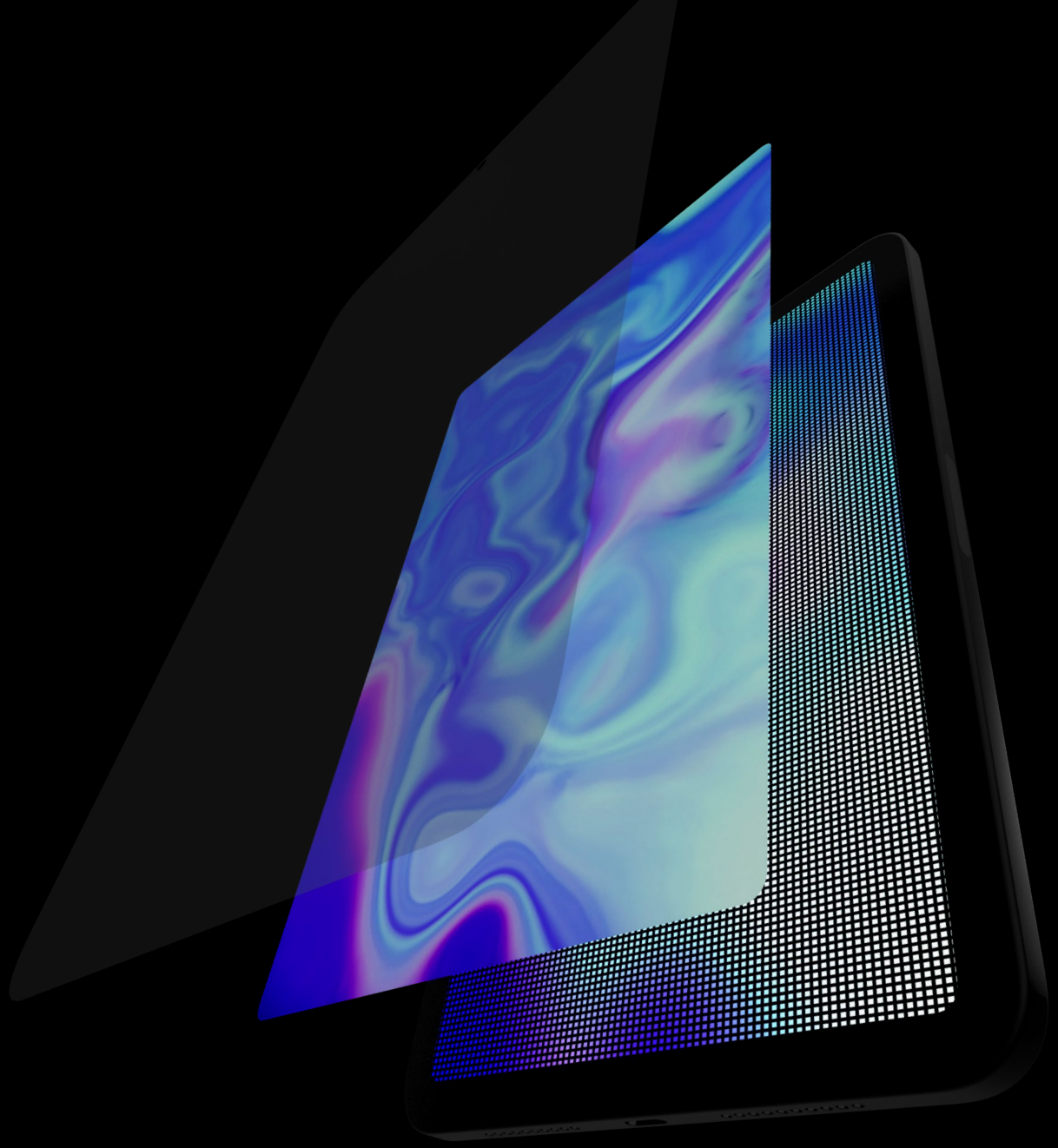
Item#	Notes
2.1.	RW ran through a Power Point presentation which gave an overview for the need for a temporary laydown area with manoeuvring areas, associated facilities and temporary buildings to support construction of Alpha HPA Stage 2 project (the Proposal) over part of Lot 1 on SP338512 (the Site). Summary: • Existing land use vs proposed Alpha HPA land usage as part of Stage 2; • Proposed access locations and preference for use of existing established access to Alpha HPA facility although consideration would be given to separate access if required; • Confirmation of development application submission to OCG as not being affected by the current EPBC referral over the Site; and • Summary of ecological survey findings carried out by CQG on 13/02/2025 confirming vegetation consistent with remnant regional ecosystem and classified as areas of least concern under the *Vegetation Management Act 1999.* OCG officers asked why the current approved laydown area within the Alpha HPA site was not adequate. RW explained that the Site is very tight and Alpha is having to pay for offsite storage at other locations. Having the temp laydown adjacent to the construction site would save time and reduce double handling/trucking equipment. RW reiterated the financial benefit for temporary laydown to reduce overall construction timeframes for Stage 2. MC confirmed that preference is to use the existing established access if acceptable for all vehicular traffic to minimise additional disturbance and the need for a separate intersection based on the use being of a temporary nature. RW asked PB to inform the meeting of the discussions with the Commonwealth regarding proposing an action on the same lot that is subject to an existing EPBC referral and EIS. PB explained that contact was made with DCCEEW and advice given that each action is to be considered stand alone in terms of potential impacts to matters of national environmental significance (MNES) and there was no hindrance for another proponent to propose an action if they are not associated with the EPBC applicant (in this case H2Hub). RW confirmed Alpha HPA is not associated with H2Hub. RH spoke to the findings of the recent ecology survey, including thee need to avoid a mapped threatened ecological community (TEC) at the edge of the lot and to avoid or translocate grass trees found on the lot. The survey and assessment found that the proposed action for the laydown area would not cause significant impact to MNES.
3.0	**EDQ Land availability**
3.1.	JW advised commercial arrangement with EDQ for land will be subject to Material Change of Use (MCU) approval. No issues with requested land area or for the purpose requested.
3.0	**Development Application Submission**
3.1.	Discussions were held by all regarding the most streamlined approach to obtain relevant development approvals to establish the Proposal. FM advised there were provisions for accepted development for temporary laydown facilities (defined as warehouse) in accordance with the Gladstone State Development Area (GSDA) Scheme – Port Related Industry Precinct (Site Location), however this is limited to a duration of no more than three months in any twelve-month period. Duration required will exceed this, as such development approval is likely required. PB & SL queried OCG representatives on the most efficient way to address the likely required MCU development application and considerations for vegetation clearing. FM initial thoughts were leaning towards a change application to the existing MCU approval APC2024/005. PB raised concerns on opening up the existing MCU to reassessment or jeopardising any already approved components.

Item#	Notes
	FM confirmed that this would not be an issue and that the proposed changes would only be assessed if this was the approach taken. PB asked SL thoughts on the best approach. SL initial thoughts would be a standalone MCU application for the Proposal may be the cleanest approach, however, would need to investigate pro's and con's of each further. **Action Item #1** PB suggested SL / FM have a follow up session to discuss options and the best pathway moving forward. FM would be open to this although acknowledged that the choice would ultimately be up to Alpha HPA. **Action Item #2** SL queried FM R.E. any public consultation requirements triggered by either a change application or standalone DA for the Proposal. FM confirmed public consultation would likely not be required, however the final decision for this rests with the OCG. SL queried FM R.E. mapped amber waterway over the Site and any considerations for accepted development requirements or otherwise development approval for waterway barrier works (WWBW). FM clarified that the OCG do not regulate WWBW and this would need to be confirmed with the Department of Primary Industries (DPI). SL suggested measures be put in place not to not present a barrier. Alpha HPA team reiterated that the waterway had been diverted upstream. SL queried if there would need to be any considerations for referral to the Department of Transport and Main Roads (DTMR) for proposed heavy vehicle numbers and tonnages. FM advised she did not believe so. RC / MC confirmed there were considerations for this based off the current existing access to Alpha HPA under the current MCU approval.
4.0	**Close**
4.1.	Meeting closed at 4:00PM

SUMMARY OF MEETING ACTIONS

Item#	Action Item	Responsible Person	Date for completion
1.	Prepare list of pro's and con's of a change application vs a standalone MCU application versus an amendment to the existing MCU.	SL	11/03/25
2.	Follow up liaisons with OCG based on findings and agreement by Alpha HPA of **Action Item #1** to confirm mutual understanding and any additional considerations.	SL	TBC / ASAP
3.	Post meeting action – Prepare relevant application documentation and proceed with submission following **Action items #1 and #2**.	SL	TBC / ASAP

Attachment 1 – Alpha HPA Phase 2 Project PowerPoint Presentation



Alpha HPA Phase 2 Project - MEDQ Land Usage

Alpha HPA



Agenda Items

- Alpha HPA MEDQ Land Use
- Land Usage
- EPBC Act
- Ecological Investigation

Alpha HPA

Alpha HPA MEDQ Land Use

To support the development and construction of Alpha HPA's First Project it will be necessary to temporarily secure additional land outside the footprint of the Projects permanent facilities. The parcel of land immediately to the south of the proposed Project site, has been identified as being suitable to support the construction phase of the project.

Intended Use

- Site Access
- Light Vehicle Parking
- Truck Staging for Deliveries
- Site Laydown / Hardstand
- Site Offices

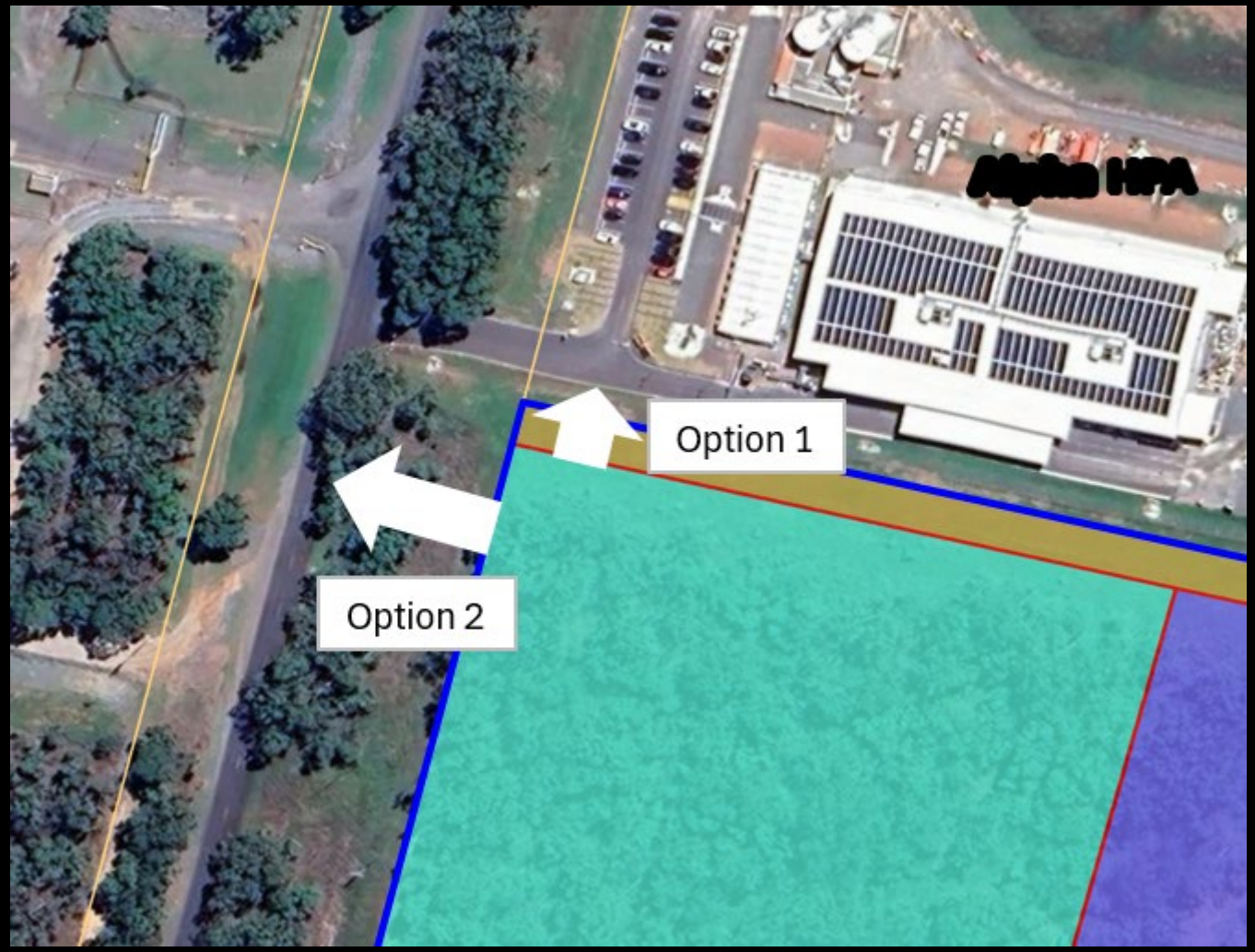
Site Access

- Dedicated access to southern block (GRC Permit obtained)
- Possible combined use of existing PPF entry, with intersection

Land Use


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

Access Option



EPBC Act

Department of Climate Change, Energy, the Environment and Water Advice

Under section 74AA of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), it is an offence to commence an action that has been referred, and is still under consideration (i.e. not approved, withdrawn or determined to be clearly unacceptable or not a controlled action). The offence relates to the action, not the area.

There is no legal impediment to taking other actions on the same area as the referred action (assuming they are not separately actions that should be referred for consideration under the EPBC Act). Separately, we would not hold a proponent responsible for any action by a third party on land under their control, unless acting under the authorisation of the proponent

Ecological Investigation

Summary of Results

The results of an ecological investigation undertaken by CQG Consulting ecologists on 13 February 2025 include:

- 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 intended activities on the proposed area.
- No species listed as critically endangered, endangered, vulnerable or near threatened under relevant state and commonwealth acts were recorded.
- 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 and classified as areas of least concern under the *Vegetation Management Act 1999* (Qld).

Ecological Investigation

- Confirmation of clearing requirements under the Gladstone State Development Area Development Scheme is required from the Office of the Coordinator-General.
- A small region of endangered threatened ecological community exists along the boundary of proposed laydown recorded and can 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.
- The proposed laydown area is intersected by a medium risk waterway barrier works drainage feature (in accordance with the *Water Act 2000* (Qld)).
- Development of the area 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).

Rockhampton
180 Quay Street Rockhampton Q 4700
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