Bushfire Hazard Assessment and Management Plan

104-108 Murrays Road, Tanah Merah

Prepared for Ryjayd Pty Ltd

Prepared by:

Green Tape Solutions / ABN 20 162 130 627
PO BOX 416 Rockhampton QLD 4700 / PO BOX 282 Morayfield QLD 4506
Telephone: 07 5428 6372 / Mobile 0481 848 033
Email: admin@greentapesolutions.com.au / www.greentapesolutions.com.au

DISCLAIMER

Apart from fair dealing for the purposes of private study, research, criticism, or review as permitted under the Copyright Act, no part of this report, its attachments or appendices may be reproduced by any process without the written consent of Green Tape Solutions.

Green Tape Solutions has prepared this report for the sole purposes of the Client. This report is strictly limited to the purpose and the facts and matters stated in it and does not apply directly or indirectly and will not be used for any other application, purpose, use or matter. The reproduction, adaptation, use or communication of the information contained within this report may not be used without the written permission of Green Tape Solutions.

In preparing this report we have assumed that all information and documents provided to us by the Client, or as a result of a specific request or enquiry, were complete, accurate and up-to-date. Where we have obtained information from a government register or database, we have assumed that the information is accurate. Where an assumption has been made, we have not made any independent investigations with respect to the matters the subject of that assumption. We are not aware of any reason why any of the assumptions are incorrect.

In this note, a reference to loss and damage includes past and prospective economic loss, loss of profits, damage to property, injury to any person (including death) costs and expenses incurred in taking measures to prevent, mitigate or rectify any harm, loss of opportunity, legal costs, compensation, interest and any other direct, indirect, consequential or financial or other loss.

Document Records – Quality

TITLE	Bushfire Hazard Assessment and Management Plan for 104-108 Murrays Road, Tanah Merah
FILED AS	PR26031_BHAMP_104-108 Murrays Road, Tanah Merah

Revision	Date	Revision Details	Prepared by (initials)	Reviewed by (initials)	Approved by (name/title)
Version A	15/04/2026	Draft Report	MI	KM	Client

Table of Contents

1 Introduction 4
1.1 Background 4
1.2 Project Area Description 4
1.3 Scope of Work 5
1.4 Qualifications and Experience 5

2 Bushfire Regulatory Framework 7
2.1 National Construction Code 7
2.2 State Planning Policy (SPP) 7
2.3 Logan Planning Scheme 2015 (Version 9.2) 9
2.4 AS3959:2018 Construction of Buildings in Bushfire Prone Areas 10

3 Bushfire Hazard Assessment 11
3.1 Hazard Assessment 12
3.1.1 Step 1 – Fire Weather Severity 12
3.1.2 Step 2 – Vegetation Hazard Classes and Potential Fuel Loads 13
3.1.2.1 Vegetation Hazard Classes 13
3.1.2.2 Potential Fuel Loads 18
3.1.3 Step 3 – Site and Effective Slope 19
3.1.4 Step 4 – Remodelling of Bushfire Hazard 19
3.2 Radiant Heat Exposure and Bushfire Attack Levels 22

4 Bushfire Management Plan 26
4.1 Agencies / Persons Responsible 26
4.2 Owner / Occupier Responsibilities 26
4.3 Reporting and Auditing 26
4.4 Siting of Buildings 27
4.5 Access Roads 27
4.6 Electricity Supply 27
4.7 Water Supply 27
4.8 Climate Change and Fire Weather – Projections for 2050 27

5 Emergency Preparedness and Response 28
5.1 Response 28
5.2 Emergency Response Procedures 28
5.3 Emergency Resources and Information Providers 29
5.3.1 Local Radio Stations: 29
5.3.2 Logan Council – Emergency Dashboard 29
5.3.3 State Government, QFD – Current Warnings 30
5.3.4 Australian Fire Danger Rating System (AFDRS) and Fire Bans 30

6 Assessment Against the Bushfire Hazard Overlay Code 32

7 Conclusion 38

8 References 39

Appendix 1 Proposed Development Layout 40
Appendix 2 State Mapped Regional Ecosystems 41
Appendix 3 Flamesol Method 2 Minimum Distance Calculations 42

TABLES

Table 1: Property Information 4
Table 2: Potential Fuel Loads for Classified Vegetation within the Assessment Area 18
Table 3: Slope Measurements for Assessable Fire Runs to the Project Footprint 19
Table 4: Potential Fireline Intensity Ranges and Bushfire Hazard Classes 20
Table 5: Potential Fireline Intensity for Classified Vegetation Hazard Classes within the Assessment Area 21
Table 6: Bushfire Attack Levels 22

Table 7: Determination of Bushfire Attack Level Minimum Separation Distances for Bushfire-prone Vegetation 23
Table 8: Queensland Fire Department Local Resources 29
Table 9: Fire Behaviour Index Values for Australian Fire Danger Rating System 31
Table 10: Assessment against the Logan Planning Scheme 2025 (v9.2) Bushfire Hazard Overlay Code 33

FIGURES

Figure 1: Project Area Location (Source: Queensland Globe) 5
Figure 2: Excerpt from DSDMIP SPP IMS – Bushfire Prone Area (Source: DSDMIP SPP IMS) 9
Figure 3: Excerpt from Logan Planning Scheme 2015 – Bushfire Hazard Overlay (Source: Logan PD Hub, 2015) 10
Figure 4: Ground-truthed Vegetation Hazard Classes 17
Figure 5: Bushfire Attack Levels Map 25
Figure 6: Australian Fire Danger Rating System 30

PLATES

Plate 1: Vegetation Community 1 – Exotic Grassland (North-facing) 14
Plate 2: Vegetation Community 1 – Exotic Grassland (East-facing) 14
Plate 3: Vegetation Community 1 – Exotic Grassland (South-facing) 14
Plate 4: Vegetation Community 1 – Exotic Grassland (West-facing) 14
Plate 5: Vegetation Community 2 – Degraded Eucalypt woodland (North-facing) 15
Plate 6: Vegetation Community 2 – Degraded Eucalypt Woodland (East-facing) 15
Plate 7: Vegetation Community 2 – Degraded Eucalypt woodland (South-facing) 15
Plate 8: Vegetation Community 2 – Degraded Eucalypt Woodland (West-facing) 15

Acronyms and Glossary

Terms	Definitions
AEP	Annual exceedance probability
AFDRS	Australian Fire Danger Rating System
AO	Acceptable outcomes
APZ	Asset Protection Zone
AS3959:2018	Australian Standard AS3959:2018 Construction of Buildings in Bushfire-Prone Areas
Assessment area	The assessment area includes the project footprint and all land within 150 m of the project footprint.
BAL	Bushfire Attack Level
BHA	Site-specific bushfire hazard assessment
BHAMP	Bushfire Hazard Assessment and Management Plan
BoM	Bureau of Meteorology
BPA	Bushfire Prone Areas
BRC Technical Guide	Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire' October 2019
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DETSI	Department of the Environment, Tourism, Science and Innovation (Qld)
DILGP	Department of Infrastructure, Local Government, and Planning (Qld)
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (Qld)
DSDIP	Department of State Development, Infrastructure and Planning (Qld)
ERP	Emergency Response Plan
FBI	Fire behaviour index
FFDI	Forest fire danger index

Terms	Definitions
FPAA	Fire Protection Association Australia
FZ	Flame zone (Bushfire Attack Level)
GIS	Geographic information system
GTRE	Ground-truthed regional ecosystem
ha	Hectare
HSE	Health Safety and Environment
IMS	Interactive mapping system
IPA	Inner Protection Area
kW/m	Kilowatts per metre
kW/m^2	Kilowatts per metre squared
LGA	Local government area
LCC	Logan City Council
m	Metres
m^2	Metres squared
NCC	National Construction Code 2022
OPA	Outer protection area
PFI	Potential fireline intensity
PFL	Potential fuel load
PO	Performance outcome
Project / Proposed development	The overall action being undertaken including development activities, services, access tracks, and associated infrastructure. It covers the entire range of work and activities necessary to achieve the Project's goals.
Project area	The geographical boundary within which the Project is located. This includes the specific properties, lots, and plans where the Project is being carried out.

Terms	Definitions
Project footprint	The actual physical area impacted by the Project. This encompasses all land affected by construction activities, buildings, and infrastructure.
QDC	Queensland Development Code
QFD	Queensland Fire Department (formerly Queensland Fire and Emergency Services (QFES))
QFES	Queensland Fire and Emergency Services (now the Queensland Fire Department (QFD))
Qld	Queensland
QSpatial	Queensland spatial catalogue
RE	Regional ecosystem
RFSQ	Rural Fire Service Queensland
RoL	Reconfiguration of the lot
RVM	Regulated Vegetation Management
SARA	State assessment and referral agency
SDAP	State development assessment provisions
SPP	State Planning Policy
SPP guidance	SPP State interest guidance material – Natural Hazards, Risk and Resilience – Bushfire
t/ha	Tonnes per hectare
VM Act	*Vegetation Management Act 1999* (Qld)

1 Introduction

1.1 Background

Green Tape Solutions was engaged by Ryjayd Pty Ltd to undertake a bushfire hazard assessment and management plan (BHAMP) for a proposed residential subdivision development (the 'proposed development') at 104-108 Murrays Road, Tanah Merah (formally described as Lot 2 on RP109991) (the 'Project Area'). The proposed development comprises a Reconfiguration of a Lot from 1 into 9 lots, an access access road, swale, turning facilities and a bioretention basin (see **Appendix 1**).

The development has been designed to utilise existing cleared areas; however, some vegetation removal may be required as part of the proposed swale, access access road, lots and bushfire hazard mitigation.

The proposed development area is located within a mapped bushfire-prone area under the Queensland (Qld) State Government State Planning Policy (July 2017) (SPP) mapping for Natural Hazards, Risk and Resilience State Interest (Bushfire), which acts as a trigger for assessment against the SPP assessment benchmarks. The site is also subject to the Bushfire Hazard Overlay under the Logan Planning Scheme 2015. This report has been prepared to inform the preparation of a Development Application for a Reconfiguration of a Lot and provide guidance on bushfire hazard and risk management for the proposal.

1.2 Project Area Description

Table 1 provides property details and development-related information that applies to the Project Area. The Project Area is located on a single lot comprising a total area of approximately 13,640 m^2 (1.36 ha) within the Logan City Council (LCC) LGA (**Figure 1**).

Table 1: Property Information

Address	104-108 Murrays Road, Tanah Merah
Lot / Plan	Lot 2 RP109991
Area	13,640 m^2 (1.36 ha)
Local Government Area (LGA)	Logan City Council
Zone	Low Density Residential
Precinct	Small Acreage
Neighbourhood Plan	Not applicable

The project area comprises a 1.36 ha allotment with frontage to Murrays Road within Logan City. The site is currently vacant and includes a disturbed southern portion dominated by exotic grasses and weeds, together with remnant woodland and a drainage gully across the northern portion of the lot.

Residential development adjoins the site to the east and north-east, with more open land to the south and bushland reserve to the north. This setting places the site within an established urban-bushland interface where future development must respond to both existing hazardous vegetation and the surrounding bushfire landscape context.

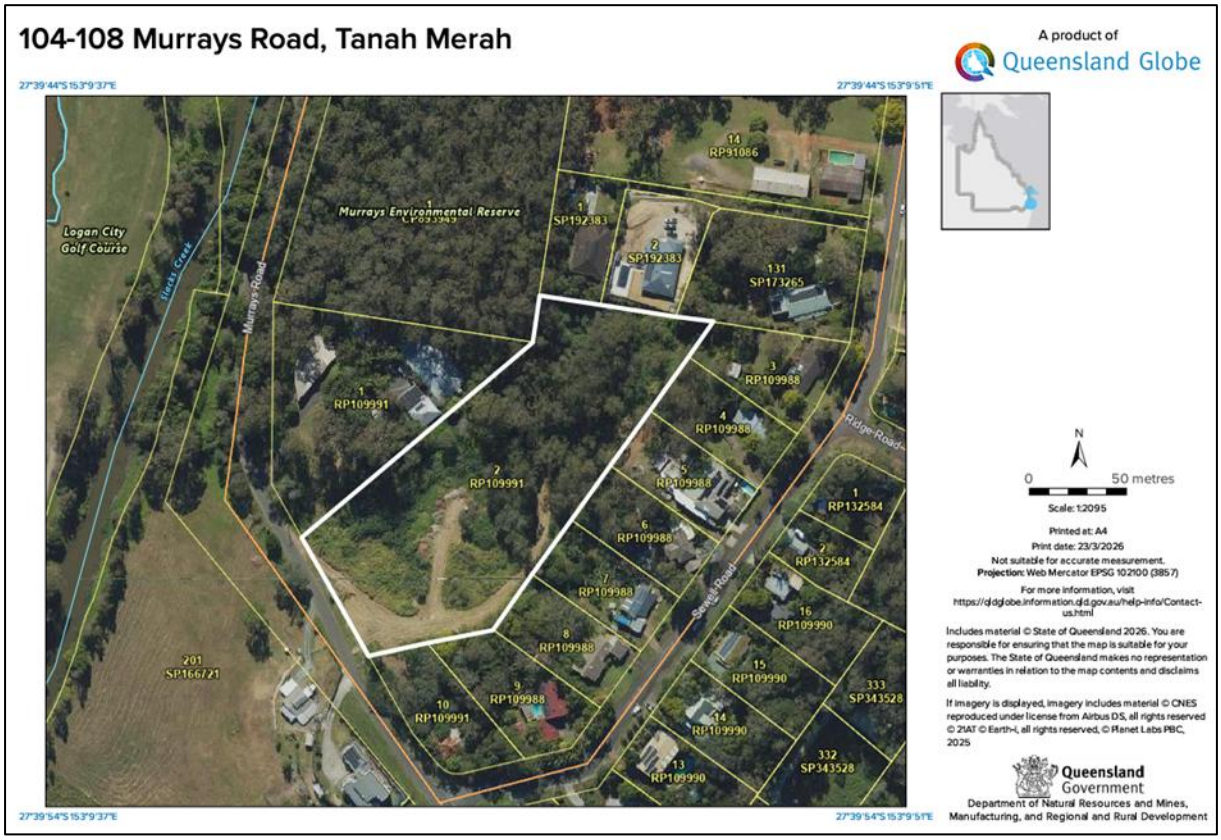


Figure 1: Project Area Location (Source: Queensland Globe)

1.3 Scope of Work

The purpose of this BHAMP is to provide a site-specific assessment of bushfire hazard and to assess compliance of the proposed development with the assessment benchmark and outcomes sought by the SPP and the Logan Planning Scheme 2015 (Version 9.2); in particular, the assessment benchmarks outlined in the Logan Planning Scheme 2015 (Version 9.2) Bushfire Hazard Overlay Code.

The BHAMP also provides a plan for bushfire hazard and risk management, including building construction requirements, asset protection zones, fuel management, access requirements, and emergency response measures. Recommendations are consistent with legislative requirements to reduce the risk to life and property.

1.4 Qualifications and Experience

The Queensland Fire and Emergency Services (QFES) *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire' October 2019* ('BRC Technical Guide') (QFES, 2019) provides important guidance on people suitably qualified to undertake assessments identified in the BRC Technical Guide.

Following recent legislative updates and extensive reviews aimed at strengthening disaster management and emergency response capabilities, QFES has transitioned to the newly established Queensland Fire Department (QFD). These changes aim to enhance the State's resilience and responsiveness in managing bushfire hazards and emergencies.

The BRC Technical Guide continues to serve as a key resource, now reflecting the QFD's technical guidance and policy positions for State agencies, local governments, and practitioners. It supports land-use planning and development activities in areas prone to bushfire hazards.

This guidance includes the following recommendations:

- Fine-scale assessment of vegetation communities in accordance with the 'Vegetation Hazard Class' assessment methodology be undertaken by a suitably qualified person with experience in botanical survey methods; and
- Applicant-initiated assessments and reports be prepared or peer-reviewed by suitably qualified person/s with degree (AQF Level 8) qualifications in environmental science, environmental management (or an equivalent discipline), demonstrated experience in botanical surveys and spatial analysis methods, including use of geographic information systems (GIS) software; demonstrated experience in the assessment of bushfire hazards and risks or technical qualifications in environmental science, environmental management (or an equivalent discipline), and demonstrated relevant industry experience in the assessment of bushfire hazards and risks for a minimum of five (5) years.

This report has been prepared and/or reviewed by Green Tape Solutions (the suitably qualified person) who meets Council and QFD's criteria as follows:

- The SQP possesses knowledge and experience in applying relevant legislation, plans, policies, standards and guidelines relating to bushfire hazard and fire ecology relating to Queensland requirements and South-East Queensland conditions;
- The SQP has extensive experience in botanical survey methods and GIS analysis and at least five (5) years' experience in undertaking bushfire hazard assessment and preparing bushfire management plans, including experience in undertaking fine-scale assessment of vegetation communities and application of the QFD Bushfire Hazard Assessment methodology outlined in the BRC Technical Guide; and
- The SQP has qualifications and experience in the field of ecology, environmental management or similar to assess and protect site-based and strategic biodiversity values relating to South-East Queensland.

2 Bushfire Regulatory Framework

Given that bushfire hazards can cause harm to people and social well-being, damage to property and impact the economy and environment, the management of bushfire hazards in Queensland is considered an integral component of land use planning and development decisions.

The following mechanisms/instruments that apply to, or regulate development, to avoid and mitigate potential impacts associated with bushfire hazards are applicable to the project:

- National Construction Code 2022 (NCC)
- State Planning Policy (SPP) and associated guidelines (Department of Infrastructure, Local Government and Planning (DILGP), July 2017);
- Logan Planning Scheme 2015 (Version 9.2); and
- Australian Standard AS3959:2018 – Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).

2.1 National Construction Code

The NCC sets out requirements for the design and construction of a building in Australia, including minimum required levels for the safety of certain buildings. The NCC contains additional requirements for the construction of buildings in designated bushfire-prone areas to address additional risks posed by bushfire attacks. The NCC is given legal effect through the *Building Act 1975* (Qld) and is varied through amendments to the Building Regulation 2006 that adopts the Queensland Development Code (QDC). Logan City Council's Bushfire Hazard Overlay Map designates bushfire-prone areas for the NCC, the Building Regulation 2006 and the QDC.

2.2 State Planning Policy (SPP)

The SPP identifies the Queensland Government's policies about matters of state interest in land use planning and development (DILGP, July 2017). The SPP is a broad statutory planning instrument. It sits above regional plans, standard planning scheme provisions and local government planning schemes within the hierarchy of planning instruments outlined in the *Planning Act 2016*.

The following guidance material supports the SPP:

- The SPP State interest guidance material – Natural Hazards, Risk and Resilience – Bushfire ('SPP guidance') (DSDMIP, 2019), which provides further context to the SPP and explains how the SPP policies can be applied, in particular for local government when making or amending local planning instruments. The SPP guidance is also intended to assist assessment managers and practitioners in applying the SPP assessment benchmarks when State interests have not been integrated into the local planning scheme (where applicable).
- The 'BRC – Technical Reference Guide for the State Planning Policy State Interest – Natural Hazards, Risk and Resilience – Bushfire ('BRC Technical Guide') (QFES, 2019), which provides technical guidance and policy positions of the QFD (formerly the QFES). It includes procedures for undertaking a bushfire hazard assessment (BHA), calculating asset protection zones (APZ) and preparing a Bushfire Management Plan (BMP).

The SPP assessment benchmarks outlined in Part E of the SPP and Section 4.0 of the SPP guidance apply to development to the extent that the development is assessable against a planning scheme and only to the extent that the planning scheme is inconsistent with the SPP.

The SPP is also supported by a state-wide map of bushfire-prone areas (BPA) (also referred to as 'bushfire hazard area') that was developed based on the Commonwealth Scientific and Industrial Research Organisation (CSIRO) modelling of potential fireline intensity (PFI) using the methodology described by Leonard *et al.* (2014). The SPP defines a BPA as land that is potentially affected by significant bushfires, including vegetation likely to support a significant bushfire and adjacent land that could be subject to impacts from a significant bushfire (i.e. potential impact buffer) and is:

(a) Identified by a local government in a local planning instrument as a bushfire prone area based on a localised bushfire study, prepared by a suitably qualified person; or

(b) If the local government has not identified bushfire prone areas in a local planning instrument in accordance with (a) above, shown on the SPP Interactive Mapping System (SPP IMS) as a bushfire prone area.

The BPA mapping identifies areas of Very High (>40,000 kilowatts per metre (kW/m)), High (20,000 – 40 000 kW/m) and Medium (4,000 – 20,000 kW/m) Potential Bushfire Intensity. The Potential Impact Buffer includes all land within 100 metres (m) of any area with a PFI greater than 4,000 kW/m (i.e., within 100 m of Medium, High or Very High bushfire hazard/potential bushfire intensity). This mapping triggers assessment against the SPP Assessment Benchmarks.

An excerpt from the SPP Assessment Benchmark – BPA mapping published on the SPP Interactive Mapping System (IMS) is provided in **Figure 2**. The Project Area is mapped to contain areas of Very High Potential Bushfire Intensity and Potential Impact Buffer. In addition, land to the north and east of the Project Area is mapped as containing areas of Very High and High Potential Bushfire Intensity and Potential Impact Buffer.

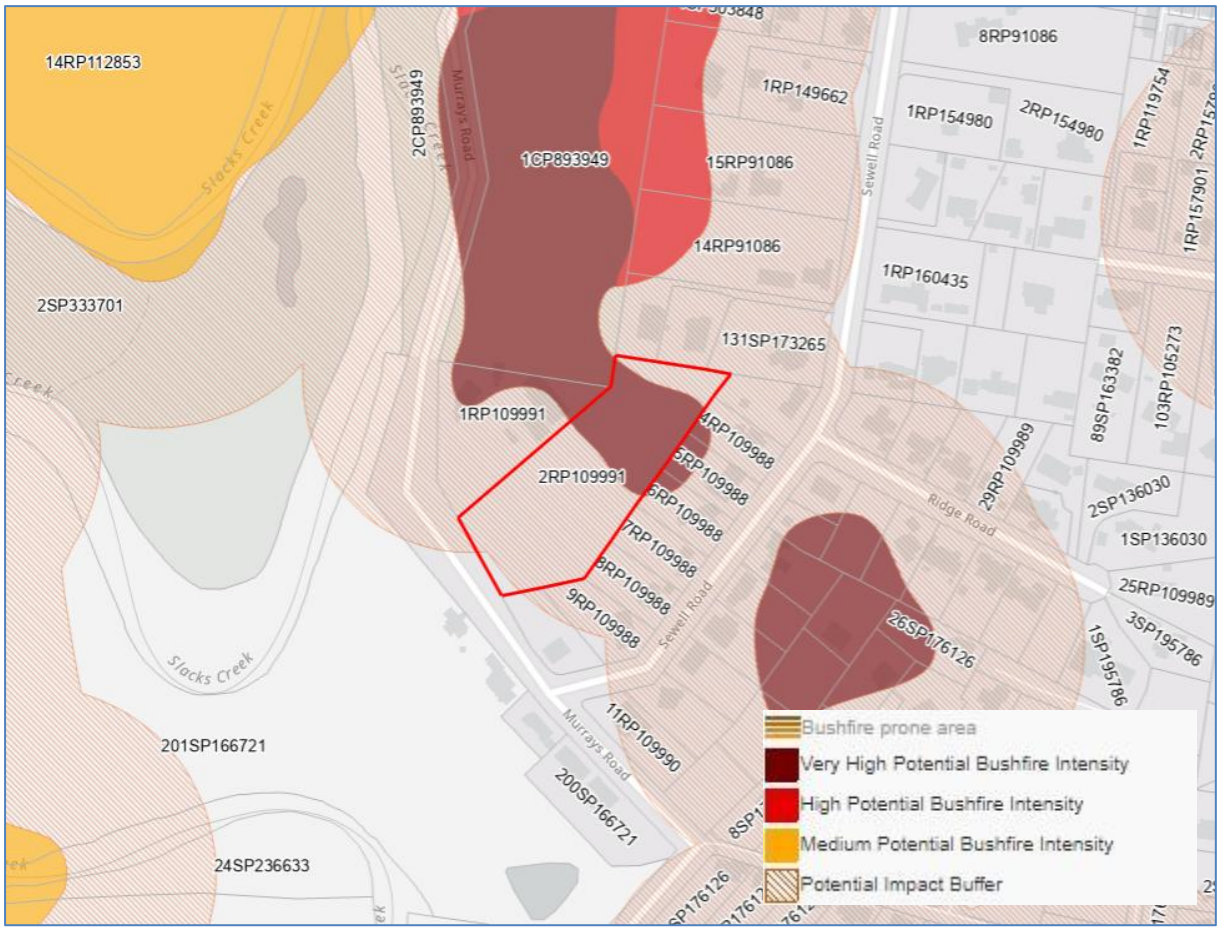


Figure 2: Excerpt from DSDMIP SPP IMS – Bushfire Prone Area (Source: DSDMIP SPP IMS)

2.3 Logan Planning Scheme 2015 (Version 9.2)

The Project Area is located within the Logan City LGA and is subject to the provisions of the Logan Planning Scheme 2015 (Version 9.2). The Logan Planning Scheme 2015 (Version 9.2) Bushfire Hazard Overlay maps the Project Area as containing areas of Bushfire Hazard mapping. An excerpt from the overlay map identifying the mapped bushfire hazard areas in relation to the Project Area is shown in **Figure 3**.

The Logan Planning Scheme 2015 (Version 9.2) Bushfire Hazard Overlay Code requires that development addresses the bushfire hazard determined by a site-specific BHA based on vegetation existing within, adjacent to, and near the Project Area, including any areas subject to, or likely to be subject to, ecological restoration (e.g., Council waterway corridors), revegetation or regrowth, which are to be assessed as if these areas have reached their mature state.

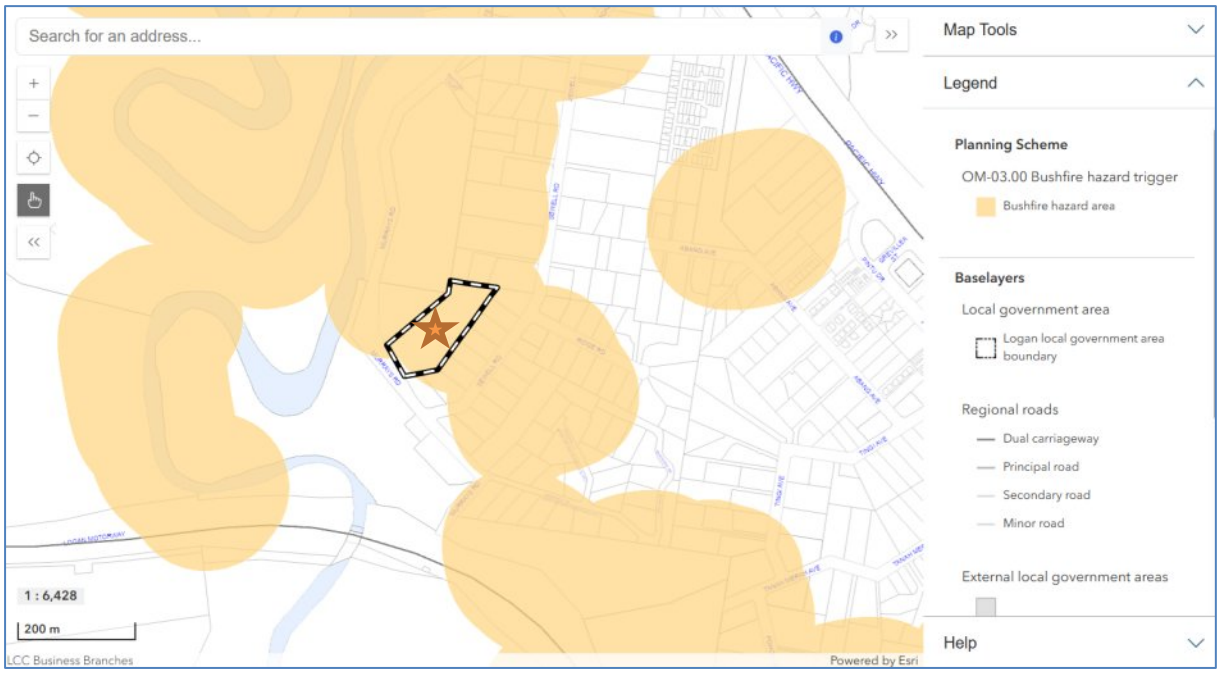


Figure 3: Excerpt from Logan Planning Scheme 2015 – Bushfire Hazard Overlay (Source: Logan PD Hub, 2015)

2.4 AS3959:2018 Construction of Buildings in Bushfire Prone Areas

The Australian Standard *AS3959:2018 Construction of Buildings in Bushfire-Prone Areas* (Standards Australia, 2019) specifies the requirements for the construction of buildings in bushfire-prone areas in order to improve their resistance to bushfire attack. AS3959:2018 applies to those areas where a regulated map (i.e., a planning scheme overlay map) identifies an area as a BPA (or similar), requiring calculation of Bushfire Attack Level (BAL) in accordance with a methodology outlined in the standard.

AS3959:2018 thus prescribes the construction details for buildings depending on the calculated BAL. The detailed requirements relating to construction methods and materials are typically dealt with as part of building design and enabled via private certification in accordance with the NCC.

3 Bushfire Hazard Assessment

The site-specific BHA provided in this plan has been undertaken in accordance with the current State-endorsed methodology outlined in the BRC Technical Guide. This methodology utilises the method for calculating PFI outlined in Leonard *et al.* (2014), based on the McArthur (1967) forest fire behaviour model and Byram's fireline intensity (1959). Where required, radiant heat flux modelling has been undertaken utilising Method 2 of the Australian Standard AS3959:2018 – Construction of Buildings in Bushfire Prone Areas.

The methodology underpinning this BHA process consists of three stages:

1. A desktop assessment to verify the reliability of existing BPA/Bushfire Hazard Overlay mapping over the Project Area and land surrounding the Project Area.
2. A hazard assessment involving field investigations to ground-truth the accuracy of the BPA/Bushfire Hazard Overlay mapping for the Project Area, where required. The hazard assessment area must include the project footprint and all land within 150 m of the project footprint (the 'assessment area').
3. Using the results of the site-specific assessment, the APZ width needed to achieve the requisite radiant heat flux levels is calculated using the SPP Bushfire APZ width calculator or Method 2 of AS3959:2018.

Where the precision and/or accuracy of BPA mapping or map input datasets are insufficient (e.g., where there has been changes in land use and vegetation cover within the assessment area or where site-verified Vegetation Hazard Classes (VHCs) have been confirmed to be inconsistent with the mapped VHCs), the process enables applicants to create a local-scale BPA map based on the results of the site investigation and to apply modified input variables that reflect changes that have occurred over time.

The BHA process adapts the method used to generate the state-wide BPA mapping, described in Leonard *et. al.* (2014) with further refinement to allow for the downgrade and/or filtering of small patches and narrow corridors where needed in accordance with contemporary mapping rules outlined in the BRC technical guide and Leonard and Opie (2017).

Where effective fuel loads have been reduced based on patch size and isolation in accordance with the patch and corridor filtering rules outlined in 4.2.6 of the BRC Technical Guide, reduced effective fuel loads can be used as inputs into a Method 2 BAL assessment.

The assessment has been based on vegetation existing within, adjacent to, and nearby the Project Area including any areas subject to revegetation or regrowth, which have been assessed as if these areas have reached their mature state.

A site visit was undertaken by an Ecologist from Green Tape Solutions on 30th March 2026 to verify the reliability of existing BPAs/Bushfire Hazard Overlay mapping, determine the extent of the BPAs/Bushfire Hazard Overlays and the level of risk to which the development is exposed.

Field investigations involved site-based verification of factors affecting bushfire hazard and risk within the defined assessment area, including a site-specific botanical survey to ground-truth vegetation communities within and surrounding the Project Area to support a VHC assessment in accordance with the methodology outlined in the BRC Technical Guide.

Field traverses using GPS equipment were undertaken to spatially capture the boundaries of vegetation communities. The field investigations also included identification of existing firebreaks and management lines and confirmation of site and effective slopes.

3.1 Hazard Assessment

The following steps have been undertaken to assess spatial factors that contribute to potential bushfire intensity for the Project Area and surrounding land:

- **Step 1: Identification of Fire weather severity**

  Identification of all Forest Fire Danger Index (FFDI) values estimated at a 1:20 year (5%) Annual Exceedance Probability (AEP) using the Bushfire Hazard Area – Bushfire Prone Area – Inputs dataset from the Queensland Spatial catalogue (QSpatial).

- **Step 2: Identification of Vegetation Hazard Classes**

  Assessment of vegetation communities to identify the relevant VHCs using a combination of remnant and pre-clearing regional ecosystem (RE) maps, high-resolution aerial imagery, and a ground-truthed assessment of vegetation present within the Project Area and within the required assessment area.

- **Step 3: Slope assessment**

  Identification of Project Area slope and effective slope, and determination of whether proposed buildings are upslope or downslope of hazardous vegetation using Bushfire Hazard Area – Bushfire Prone Area – Inputs dataset from QSpatial and 1 m LiDAR-derived contour data.

- **Step 4: Remodelling of bushfire hazard and calculation of potential fireline intensity**

  Where a change to the distribution, extent and/or classification of VHCs within the assessment area is proposed, remodelling of bushfire hazard is undertaken to determine how the changes to VHCs and associated fuel loads affect PFI. PFI is to be calculated in accordance with the method outlined in Leonard *et. al.* (2014).

VHCs and associated potential fuel loads (PFL) are in accordance with Leonard *et al.* (2017), as provided in the BRC Technical Guide and SPP Bushfire APZ width calculator published by the QFD.

Relevant spatial datasets published by the QFD were accessed via QSpatial and the Queensland Government Redi Map portal (QFES, 2020).

3.1.1 Step 1 – Fire Weather Severity

South-east Queensland has a subtropical climate with warm humid summers and mild winters and is subject to influence from monsoonal climate systems and easterly troughs. Seasonality is not pronounced; however the 'wet' season generally occurs during the December – April period. The fire danger season usually occurs from spring to mid-summer (August/September to December) with the

greatest danger after a dry winter and spring and when deep, low-pressure systems near Tasmania bring strong, hot and dry westerly winds to the coastal districts. (Bureau of Meteorology, 2021). Severe bushfire weather is characterised by days with high temperatures over 35 degrees, low relative humidity and winds from the north to north-west.

The FFDI provides an annual accumulated index of fire weather severity (i.e., the potential danger of a bushfire) based on a combination of vegetation dryness, air temperature, wind speed and humidity. The relevant FFDI for the Project Area was derived from the Fire Weather Severity (FFDI h20) dataset published via the Redi Map portal administered by the QFD.

The FFDI for the Project Area and surrounding land is 54.

3.1.2 Step 2 – Vegetation Hazard Classes and Potential Fuel Loads

3.1.2.1 Vegetation Hazard Classes

Different types of vegetation communities determine the rate at which dry fuel accumulates. Some vegetation communities protect fuel from drying out in all but extreme bushfire seasons and can then be susceptible to very destructive bushfires. Alternatively, vegetation communities may expose fuels to drying and therefore be frequently available for burning. Frequent bushfires can result in the development of bushfire-tolerant grassy woodlands or grasslands and less destructive bushfire behaviour.

The reliability of State-mapped VHCs was assessed through:

- a review of Regulated Vegetation Management remnant and pre-clearing RE mapping published by the Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD) **(Appendix 2**); and
- an assessment of existing vegetation undertaken by Green Tape Solutions on 30th March 2026 as part of site investigations to support preparation of a BHAMP.

DNRMMRRD's remnant RE mapping shows that small patches of remnant vegetation are mapped within the assessment area. These patches are identified as containing the following REs:

- RE 12.11.5 - *Corymbia citriodora subsp. variegata* woodland to open forest +/- *Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua* on metamorphics +/- interbedded volcanics

Pre-clearing RE mapping infers that the entire Project Area previously supported RE 12.11.5.

For the purposes of bushfire hazard assessment, field-mapped vegetation has been consolidated into two (2) functional vegetation hazard communities based on fuel characteristics, structural form and fire behaviour relevance. These have been grouped where vegetation structure and hazard characteristics are materially the same.

3.1.2.1.1 Vegetation Community 1 – Exotic Grassland

Vegetation along the southern interface of the development area (**Plates 1-4**) comprises a non-remnant grassland dominated by exotic species including guinea grass (*Megathyrsus maximus*), lantana (*Lantana camara*), rhodes grass (*Chloris gayana*), bell vine (*Ipomoea plebeian*), Congo grass (*Urochloa eminii*) and giant reed (*Arundo donax*). There is no canopy layer present in this community.

Under the Regulated Vegetation Management (RVM) map published by the DNRMMRRD, this community is mapped as non-remnant vegetation (Category X area). Pre-clear mapping infers that the property previously supported RE 12.11.5 - *Corymbia citriodora subsp. variegata* woodland to open forest +/- *Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua* on metamorphics +/- interbedded volcanics.

This community corresponds to **VHC 39.2** – Low to moderate tree cover in built-up areas



Plate 1: Vegetation Community 1 – Exotic Grassland (North-facing)



Plate 2: Vegetation Community 1 – Exotic Grassland (East-facing)



Plate 3: Vegetation Community 1 – Exotic Grassland (South-facing)



Plate 4: Vegetation Community 1 – Exotic Grassland (West-facing)

3.1.2.1.2 Vegetation Community 2 – Degraded Eucalypt Woodland

Vegetation along the northern interface of the development area comprises of a remnant eucalypt woodland (**Plates 5-8**). This community is dominated by narrow-leaved ironbark (*Eucalyptus crebra*), forest red gum (*Eucalyptus tereticornis*), northern grey ironbark (*Eucalyptus siderophloia*). The canopy

layer within this community ranges from 21 – 28 m with an average canopy height of 26 m and an estimated canopy crown cover of 40 – 60%.

The understorey within this community is dense regrowth canopy species, southern salwood (*Acacia disparrima*) and a mix of invasive species including guinea grass (*Megathyrsus maximus*), lantana (*Lantana camara*), rhodes grass (*Chloris gayana*) and giant reed (*Arundo donax*).

This community is mapped as Category B (remnant) vegetation containing the RE 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- *Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua* on metamorphics +/- interbedded volcanics. The ground-truthed vegetation assessment determined that this vegetation meets the criteria for remnant status and is generally consistent with this RE. This vegetation forms part of a larger patch of eucalypt woodland that extends north to north-east of the Project Area.

This community corresponds to **VHC 10.2** – Spotted gum dominated woodlands



Plate 5: Vegetation Community 2 – Degraded Eucalypt woodland (North-facing)



Plate 6: Vegetation Community 2 – Degraded Eucalypt Woodland (East-facing)



Plate 7: Vegetation Community 2 – Degraded Eucalypt woodland (South-facing)



Plate 8: Vegetation Community 2 – Degraded Eucalypt Woodland (West-facing)

3.1.2.1.3 Summary

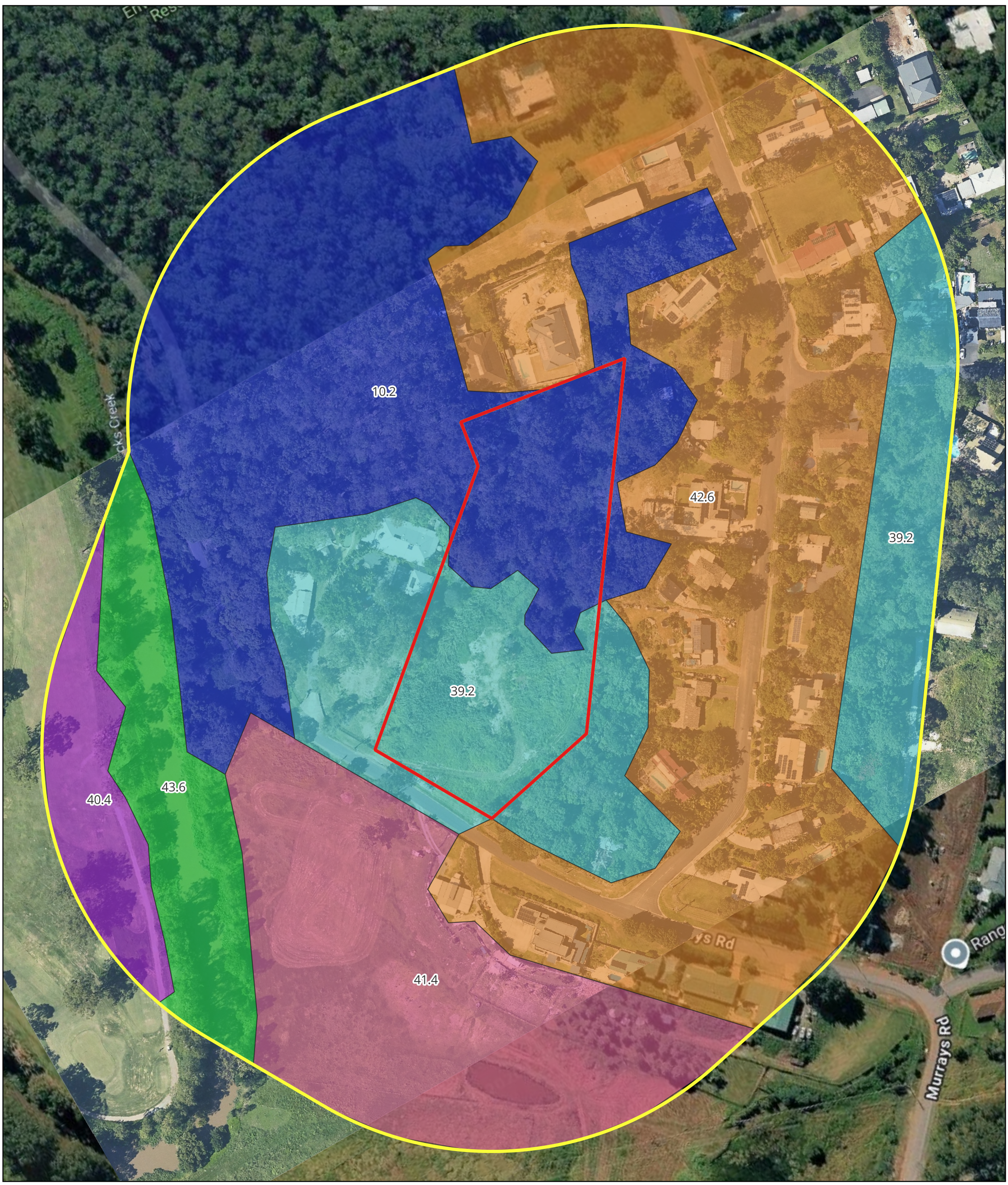
The site assessment verified the presence of the following VHCs within the assessment area:

- 10.2 – Spotted gum-dominated woodlands; and

The remaining areas are composed of residential areas, with low and moderate tree canopy and low vegetation surrounding infrastructure and roads. A creek is also located further south of the Project Area. These areas correspondent to the following VHC:

- 39.2 – Low to moderate tree cover in built-up areas;
- 40.4 – Continuous low grass or tree cover;
- 41.4 – Discontinuous low grass or tree cover;
- 42.6 – Nil to very low vegetation cover; and
- 43.6 – Water bodies or very low vegetation cover.

Figure 4 depicts the location of the ground-truthed VHCs within the assessment area.



104-108 Murrays Road, Tanah Merah

Figure 4 - Ground-Truthed Vegetation Hazard Classes

Created By: MI **Date: 09/04/2026** **Version: 1**	Project Reference - **PR26031**

Notes: - Survey Data by Green Tape Solutions
- Base map Copyright © Esri and its data suppliers.

Source: C:\OneDrive\Green Tape Solutions\Green Tape Solutions - Documents\GTS Projects\2026\PR26031_104-108 Murrays Road, Tanah Merah\GIS\Map\Master.qgz

Project Area

150m assessment area

Ground-truthed VHCs

- 10.2 - Spotted gum dominated woodlands
- 39.2 - Low to moderate tree cover in built-up areas
- 40.4 - Continuous low grass or tree cover
- 41.4 - Discontinuous low grass or tree cover
- 42.6 - Nil to very low vegetation cover
- 43.6 - Water bodies or very low vegetation cover

GTS

1:1536.782845	(A3) GDA 2020 MGA 56

0 25 50

3.1.2.2 Potential Fuel Loads

Fuel loads have been allocated for each VHC to represent the long-unburnt condition that would be typically exhibited ten (10) years after fire. In accordance with the values provided in Figure 14 of the BRC Technical Guide, the PFL values (in tonnes per hectare (t/ha)) for ground-truthed VHCs within and surrounding the site are provided in **Table 2**.

Table 2: Potential Fuel Loads for Classified Vegetation within the Assessment Area

VHC		Total Potential Surface Fuel Load (t/ha)	Total Overall Potential Fuel Load (t/ha)	Prone Type[1]	Hazard Categories	Fuel Continuity[2]
10.2	Spotted gum dominated woodlands	14.0	17.0	1	Bushfire prone	1, Continuous
39.2	Low to moderate tree cover in built-up areas	5.0	8.0	3	Low Hazard – Not Bushfire Prone	2, Discontinuous
40.4	Continuous low grass or tree cover	4.5	5.0	2	Low Hazard – Not Bushfire Prone	1, Continuous
41.4	Discontinuous low grass or tree cover	2.5	3.0	3	Low Hazard – Not Bushfire Prone	2, Discontinuous
42.6	Nil to very low vegetation cover	2.0	2.0	3	Low Hazard – Not Bushfire Prone	2, Discontinuous
43.6	Water bodies or very low vegetation cover	0	0	0	Low Hazard – Not Bushfire Prone	2, Discontinuous

In accordance with Section 7.6 of the BRC Technical Guide, fireline intensity, radiant heat flux and BAL is not required to be calculated for non-bushfire prone (i.e., grassland VHCs with a prone type of 2) or low hazard VHCs (i.e., VHCs with a prone-type of 3), therefore VHCs 39.2, 40.4, 41.4, 42.6 and 43.6 have been excluded from further assessment. The following sections relate to hazardous vegetation only i.e., VHC 10.2.

[1] Prone type taken from the VHC_Data sheet of the SPP Bushfire APZ Calculator.
[2] Fuel continuity type taken from Figure 14 of the BRC Technical Guide.

3.1.3 Step 3 – Site and Effective Slope

Two slope input parameters are required for estimating fire behaviour and determining separation distances: site slope and effective slope. Site slope refers to the slope of the ground between the edge of the proposed development and the edge of hazardous vegetation, while effective slope refers to the slope beneath the hazardous vegetation. Effective slope is the more significant parameter, as it directly influences the potential rate of fire spread, fuel consumption, and the PFI.

For each bushfire-prone VHC, the effective slope is determined by:

1. Measuring the slope beneath classified vegetation (in degrees) that most influences bushfire behaviour, in accordance with Section 5.4.2 (3) of AS3959:2018.
2. Identifying the slope type – the relative position of land supporting hazardous vegetation in relation to the development (i.e., whether the proposed development is upslope or downslope of hazardous vegetation), in accordance with Section 5.4.2 (3) or Clause 2.2.5 of AS3959:2018.

Where there is more than one slope beneath classified vegetation, each slope should be assessed individually, and the worst-case scenario should be adopted. Slope measurements have been calculated using LiDAR-derived 1 m contour data published by the DNRMMRRD and verified by site measurement.

The proposed development is located on the southern portion of the Project Area and extends over the gully towards the northern boundary. The topography of much of the proposed development and surrounding land to the north is sloped (5-10 degrees) towards a flat plateau (0 degrees) before inclining steeply above the gully (>10 degrees) and is deemed as 'upslope'. The site slope and effective slope for all hazardous vegetation within the assessment area have been calculated and are provided in **Table** 3.

Table 3: Slope Measurements for Assessable Fire Runs to the Project Footprint

Slope Location in Relation to the Project Footprint	VHC	Maximum Effective Slope (Degrees)	Maximum Site Slope (Degrees)	Fire Run in Relation to the Project Footprint	Fire Run Scale
North-East	10.2	-8	0	Upslope	Fully-developed fire

3.1.4 Step 4 – Remodelling of Bushfire Hazard

Given that site-specific assessment determined that the mapped VHCs provided within the BPA – VHC – South-east Queensland spatial dataset do not entirely reflect the ground-truthed VHCs, remodelling of bushfire hazard has been undertaken to determine how the changes to VHCs and associated fuel loads affect the PFI. The PFI has been calculated in accordance with the method outlined in Leonard *et. al.* (2014).

PFI is a standard measure of the rate at which an advancing fire would consume fuel energy per unit time per unit length of the fire front. This metric combines the PFL, maximum landscape slope (slope) and fire weather severity (FFDI) to provide a PFI metric.

The PFI is represented as the following equation:

$$PFI = 0.62\ PFL^2 \times FFDI \exp(0.069 \times slope)$$

Where: PFI = Potential fire line intensity (kW/m), PFL = Potential fuel load (tonnes / ha), FFDI = Potential severe fire weather (FFDI) and Slope = Max slope

Table 4 shows the PFI ranges (in kilowatts per metre (kW/m)) and the corresponding potential bushfire hazard classes.

Table 4: Potential Fireline Intensity Ranges and Bushfire Hazard Classes

Potential Fireline Intensity (kW/m)	Potential Bushfire Hazard Class
40,000+ kW/m	Very high
20,000 – 40,000 kW/m	High
4,000–20,000 kW/m	Medium
0 – 4,000 kW/m	Low/Not Bushfire Prone

Section 4.2.6 of the BRC Technical Guide provides a series of mapping rules ('patch and corridor filtering rules') for modifying the PFI of BPAs to reflect the likelihood of lower PFI in smaller vegetation patches and narrow vegetated corridors. These rules are applied as follows:

1. Remove patches of continuous fuel < 1 ha in area that are surrounded by either no fuel or non-continuous fuel and are further than 100 m from any other continuous fuel greater than 2 ha;
2. Downgrade the effective fuel load of small patches of continuous fuel measuring a. 1 – 2 ha – downgrade by 66% and b. 2 – 3 ha – downgrade by 50 % if the patch is surrounded by either non-continuous fuel or a low-hazard vegetation or land-use type and if the patch is further than 100m from any other continuous-fuel vegetation patch greater than 2 ha;
3. Remove narrow corridors and areas of continuous fuel that are less than 50 m in width; and
4. Remove small fragments of hazardous vegetation of less than 0.5 ha in area. These are downgraded to low hazard.

Based on the results of the site-specific assessment, vegetation within the assessment area does not meet any of the patch and corridor filtering rules outlined in the BRC Technical Guide.

The PFI was calculated for bushfire-prone vegetation within the assessment area of the site using the inputs from Steps 1 – 4. The remodelled PFI for bushfire-prone vegetation within the assessment area are provided in **Table 5**.

Table 5: Potential Fireline Intensity for Classified Vegetation Hazard Classes within the Assessment Area

Location of Classified Vegetation Relative to the Project Footprint	VHC	Vegetation Status	Effective Slope (Degrees)		Fire Weather Severity (FFDI)	Mapped Potential Bushfire Hazard Class	Potential Fireline Intensity (PFI)	Remodelled Bushfire Hazard Class
North-East	10.2	Remnant	-8	Upslope	54	Very High	6,246 kW/m	Medium

The results of the PFI calculations for bushfire-prone vegetation within the assessment area show that vegetation along the north-eastern interface of the proposed development area has a potential bushfire hazard class of 'Medium' (**Figure 8**). Vegetation to the south, west and south-east is not classified as bushfire-prone and therefore, calculation of radiant heat flux/ BAL is not applicable.

Given that the site-specific bushfire hazard assessment has confirmed the development area is potentially subject to 'Medium' bushfire hazard, a bushfire management plan is required to be developed to mitigate the adverse impacts of bushfire. **Section 4** outlines the requirements for management and mitigation of bushfire hazard for the bushfire-prone vegetation within the Project Area.

3.2 Radiant Heat Exposure and Bushfire Attack Levels

BALs are used to quantify the levels of attack (radiant heat exposures/flux) that built structures may experience during a fire event. The BAL is defined as *'a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared, and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire'* (Standards Australia, 2018).

AS3959:2018 adopts six BAL categories, which are based on the level of radiant heat flux to which buildings may be exposed to during a bushfire event (**Table 6**). This level of heat flux generally relates to the type of vegetation, effective slope, and how far a building is from hazardous vegetation. BALs apply to buildings and any attached or adjacent structure within 6 m of the building.

Table 6: Bushfire Attack Levels

Bushfire Attack Level	Heat Flux Thresholds (kW/m^2)	Predicted Bushfire Attack and Levels of Exposure	Construction Section – AS3959:2018
BAL – LOW	See Clause 2.2.3.2 of AS3959:2018 – Low threat vegetation and non-vegetated areas	There is insufficient risk to warrant specific construction requirements.	4
BAL-12.5	≤12.5 kW/m^2	Significant ember attack, burning debris ignited by windborne embers and radiant heat up to a level of 12.5 kW/m^2.	3 and 5
BAL-19	>12.5 – ≤19 kW/m^2	Greater levels of ember attack, burning debris and radiant heat up to a level of 19 kW/ m^2.	3 and 6
BAL-29	>19 - ≤29 kW/m^2	Greater levels of ember attack, burning debris ignited by windborne embers and radiant heat up to a level of 29 kW/m^2.	3 and 7
BAL-40	>29 - ≤40 kW/m^2	Greater levels of ember attack, burning debris ignited by windborne embers and radiant heat up to a level of 40 kW/ m^2. Flames from the bushfire front may intermittently contact the house.	3 and 8

Bushfire Attack Level	Heat Flux Thresholds (kW/m^2)	Predicted Bushfire Attack and Levels of Exposure	Construction Section – AS3959:2018
Flame Zone – BAL-FZ	≥ 40 kW/m^2	The highest level of bushfire attack as a consequence of direct exposure to flames from the fire front, in addition to heat flux and ember attacked. Greater levels of ember attack, burning debris and radiant heat in excess of 40 kW/m^2. Flames from the bushfire front are likely to engulf part or all of the building.	3 and 9

The BRC Technical Guide requires that radiant heat exposure/ BALs are calculated using either the SPP Bushfire APZ calculator (QFES, 2019b), which is the preferred method, or Method 2 of AS3959:2018. Where Method 2 is used, the following inputs are to be used:

- site-specific values for FFDI (Step 1);
- ground-truthed VHCs (Step 2) and their associated fuel loads; and
- site and effective slopes (Step 3).

In accordance with section 7.6 of the BRC Technical Guide, the flame temperature value in the Method 2 model has been adjusted from the default 1090 degrees Kelvin to 1200 degrees Kelvin. Likewise, the Ambient Temperature value has been adjusted from 34.85 degrees Celsius to 35 degrees Celsius.

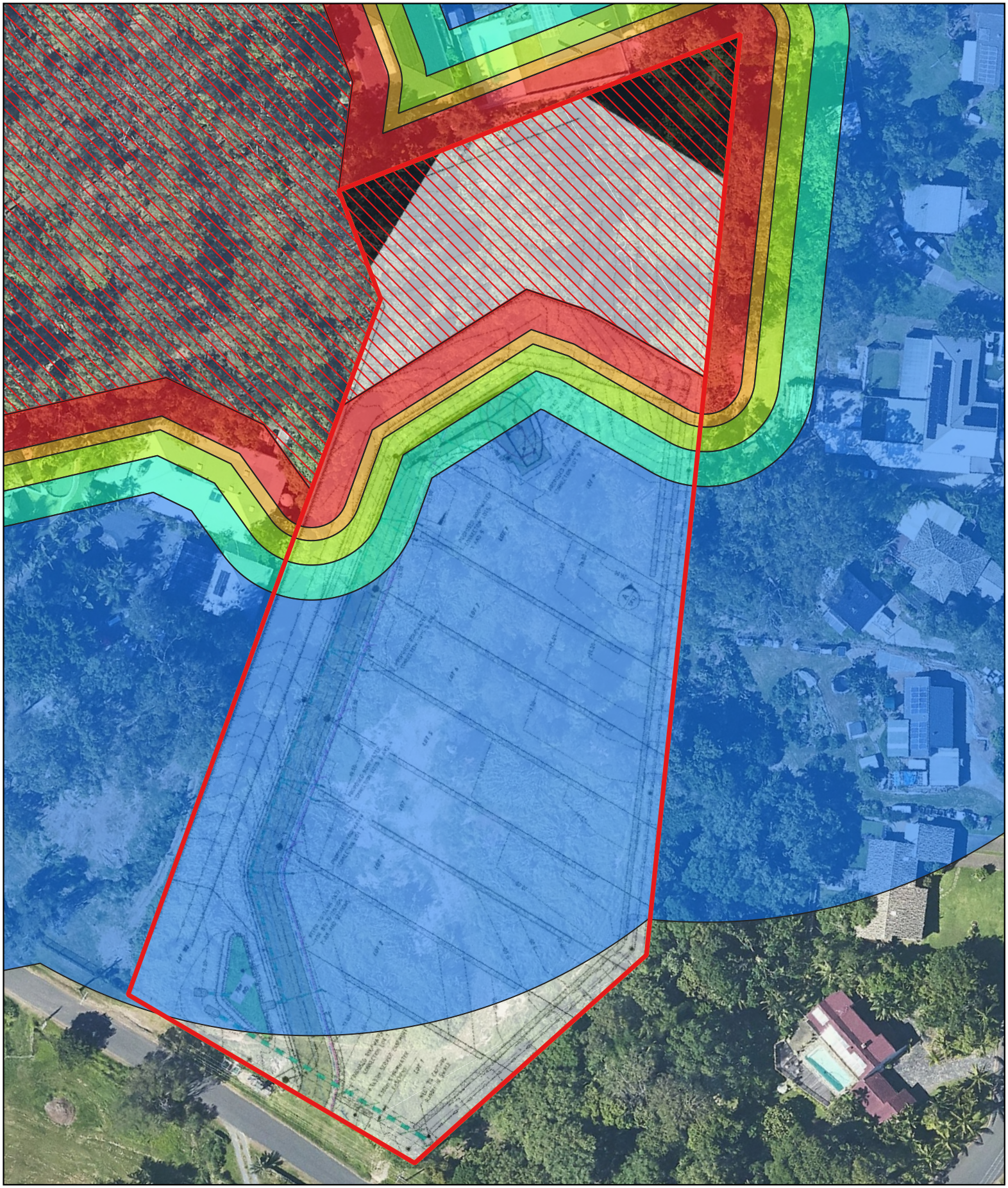
The Flamesol Method 2 Minimum Distance calculator has been used to calculate the minimum separation distance required between the development and bushfire-prone vegetation for each BAL. These results are provided in **Appendix 3** and **Figure 5** and summarised in **Table 7**.

Table 7: Determination of Bushfire Attack Level Minimum Separation Distances for Bushfire-prone Vegetation

Bushfire Attack Level →	VHC	BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
North-East	10.2	0 – <6.7 m	6.7 – <9.1 m	9.1 – <13.6 m	13.6 – <20 m	**20 – <100 m**

PO1 of the Logan Planning Scheme 2015 Bushfire Hazard Overlay Code requires that the development maintains the safety of people and property from the adverse impacts of bushfire. The development will materially increase the number of people congregating on the premises. Given that the site-specific remodelled mapping of bushfire-prone areas shows that the northern half of the Project Area is either 'Medium' hazard or 'Potential Impact Buffer' area, there is no opportunity to site the development outside of a bushfire prone area. A detailed bushfire emergency management and evacuation plan shall be prepared to ensure the safety of people is maintained.

The Logan Planning Scheme 2015 Bushfire Hazard Overlay Code specifies a maximum radiant heat/BAL of 29 kW/m^2 (BAL - 29) for a development to achieve an acceptable risk to align with recommendations provided in the SPP Guidance Material for the Natural Hazards, Risk and Resilience – Bushfire State Interest (DSDMIP, 2019). In their current location, **the proposed lots are potentially subject to a radiant heat exposure of BAL – 12.5. The separation distances to achieve a radiant heat flux of BAL-12.5 are shown in bold in Table 7.**



104-108 Murrays Road, Tanah Merah

Figure 5 - Bushfire Attack Levels

Created By: MI
Date: 15/04/2026
Version: 1

Project Reference - **PR26031**

Notes: Survey Data by Green Tape Solutions
- Base map Copyright © Esri and its data suppliers.

Source: C:\OneDrive\Green Tape Solutions\Green Tape Solutions - Documents\GTS Projects\2026\PR26031_104-108 Murrays Road, Tanah Merah\GIS\Map\Master.qgz

Project Area

Hazardous Vegetation

Bushfire Attack Levels

- Flame Zone
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5

1:889.666466

(A3) GDA 2020 MGA 56

0 10 20 m

4 Bushfire Management Plan

The SPP requires that where it is not possible to avoid a BPA, development mitigates bushfire risk to people and property to an acceptable or tolerable level. This can be achieved through development design and siting, hazard reduction measures, building construction to improve the ability of buildings to better withstand bushfire attack and emergency management and evacuation measures. These practices and measures include fuel reduction and management (for example, vegetation clearing and ongoing vegetation management to maintain areas in a low fuel state), road infrastructure to provide safe access and egress, appropriate building design and construction standards, procedures for fighting bushfires, and fire intensity reduction management measures.

4.1 Agencies / Persons Responsible

The responsible fire authority is the Rural Fire Service Queensland (RFSQ). The Project Area is located within the Logan Fire Warden Area (South East Operations Area). It is recommended that consultation be undertaken with QFD, the local RFSQ brigade and any other relevant land manager (e.g., the department within Logan City Council responsible for bushland reserve management).

It is the responsibility of the proponent to ensure that the relevant measures required by this plan are in place prior to inspection by the building certifier, and to ensure that measures are in place prior to enacting the approval, and for the duration of the specified use of the premises. Furthermore, it is the responsibility of the proponent to ensure that a copy of this report is always on hand at the site.

4.2 Owner / Occupier Responsibilities

It is the responsibility of the relevant lot owner to maintain each lot in accordance with the conditions outlined in this report. The owner / occupier responsibilities include:

- All access routes are to remain clear of obstacles to enable effective emergency vehicle access and egress;
- No burning is to be undertaken within the Project Area without a Permit to Burn as issued by the local Fire Warden (and approval if required, in writing, from Council).

4.3 Reporting and Auditing

This report is a controlled working document that is to be updated and revised to reflect adaptive management and constructive feedback. Some sections of the plan may be modified, new procedures may be implemented, and responsibilities altered, depending on feedback and application.

This report will only ever be modified in consultation with and upon the agreement of all relevant stakeholders. This agreement allows for changes to the plan scope, as determined through consultation and the acceptance of the proponent. That is, where further actions are deemed necessary or where actions can be reduced in scope.

4.4 Siting of Buildings

In accordance with the SPP 2017 (and associated SPP guidance material) and the Logan Planning Scheme 2015, the proposed design has considered the following key principles when siting development:

- Utilising land that is predominantly cleared to minimise ecological impacts to native vegetation;
- Maximising where practicable building frontage setbacks from any hazardous vegetation; and
- Siting of buildings so that elements of the development that are least susceptible to fire are situated closest to the bushfire hazard (e.g., access roads, parking areas, and protective landscape treatments).

4.5 Access Roads

Primary access and egress shall be provided via the main access access road off Murrays Road along the southern boundary. The construction of a 5m access road shall be required to meet and maintain QFD vehicle access requirements and any other relevant requirements; including requirements under PO4 of the Logan Planning Scheme 2015 Bushfire Hazard Overlay Code and PSP6 Management of bushfire hazards.

The proposed configuration of the development allows for passing and turning of fire-fighting appliances and emergency services vehicles. The proposed design shall also provide safe and efficient access for emergency services and safe and efficient egress for occupants of the premises away from the most likely direction of an approaching bushfire. The access road shall have a cleared minimum width of 5 m which will be maintained at all times via vegetation management (e.g., through branch trimming or removal of unstable trees). Access roads shall also be maintained to ensure safe and unobstructed access for emergency services and egress for occupants of the premises.

4.6 Electricity Supply

The proposed development will have access to mains electricity supply. Where practicable, electrical transmission lines will be installed underground.

4.7 Water Supply

The proposed development will have access to the reticulated water supply.

4.8 Climate Change and Fire Weather – Projections for 2050

Climate change can act in two ways to affect fire behaviour. First, it is likely to exacerbate the fire-weather risk on any given day, leading to increased frequency or intensity of extreme and very extreme fire-weather days particularly within the fire season. Secondly, an increase in the accumulated fire risk over a year might represent a longer fire season and a reduction in the number of days suitable for prescribed burning.

It is recommended to review this document and associated bushfire procedures for the Project Area over the coming decades in response to any potential increases of bushfire risk from climate change.

5 Emergency Preparedness and Response

5.1 Response

If a fire starts on-site, residents or occupants trained to extinguish fires can attempt to do so with a fire extinguisher or fire blanket if they assess that it is safe to do so at the time. If the fire cannot be safely extinguished with a fire extinguisher, the following RFSQ procedure will be followed.

1. Assess the fire situation.
2. If there is any doubt regarding whether there is a fire situation, the RFSQ should still be called.
3. Ensure the safe evacuation of all occupants from the whole of the Project Area.
4. Account for all occupants at the assembly area.
5. Ensure occupants do not attempt to re-enter the whole of the property until it is safe to do so.
6. Meet the RFSQ and advise them of any information relevant to the situation.

If a fire occurs adjacent to the Project Area, residents and occupants will assess the fire situation in consultation with adjacent landholders and contact the RFSQ and other relevant authorities to report the fire. Personnel shall continue to assess and monitor the fire situation. If the fire has the potential to move into the Project Area and impact upon infrastructure or human and environmental values, emergency response procedures should be implemented and liaison with the relevant adjacent landholder/s, RFSQ, and other relevant authorities should occur where necessary.

If residents or occupants are required to evacuate, specific emergency egress routes according to the proposed access roads and easements to be used have been outlined in **Section 4.5**.

5.2 Emergency Response Procedures

An on-site bushfire management and evacuation strategy should be developed and available to implement in the event of an emergency. In the event of a pending bushfire emergency, assistance is to be obtained by contacting emergency services by dialling **000** and evacuating all residents or occupants to a safe evacuation zone within the property.

Access to the lots within the Project Area will be provided via a access road from the southern boundary to Murrays Road and the Pacific Motorway. This access road shall provide safe and effective access and egress for emergency vehicles and occupants away from the direction of an approaching bushfire from the north or north-east.

Table 8 illustrates local QFD resources.

Table 8: Queensland Fire Department Local Resources

Queensland Fire Department	
Region: South East Region	
South Eastern Headquarters	Level 2, 239 George Street Brisbane QLD 4000 Ph: 07 3635 3311
Zone: South Coast / Brisbane Zone (Logan Area)	
Loganholme (Permanent Station)	Corner Pacific Highway & Bryants Road Loganholme QLD 4129 Ph: 07 3290 2200
Loganlea (Permanent Station)	26–28 Haig Road Loganlea QLD 4131 Phone: 07 3442 8200
Beenleigh (Permanent Station)	23 George Street Beenleigh QLD 4207 Ph: 07 3807 5000

5.3 Emergency Resources and Information Providers

5.3.1 Local Radio Stations:

- ABC Brisbane - https://www.abc.net.au/listen/live/brisbane
- Switch Brisbane 1197 AM - https://switchbrisbane.com.au/
- KIIS 97.3 - https://kiis973.com.au/

5.3.2 Logan Council – Emergency Dashboard

The Logan City Council operates an Emergency Dashboard. The platform provides information in regards to emergency news, road conditions, weather warnings and power outages.

The Emergency Dashboard is accessible on the website (https://disaster.logan.qld.gov.au/).

It is also recommended that residents and other frequent visitors are signed up to the “Opt-In Notifications” to receive SMS messages from LCC regarding information on arising local disasters, severe weather and emergency events within the Logan region.

5.3.3 State Government, QFD – Current Warnings

The QFD publishes the current warnings and incidents across Queensland. This is available on the website (https://www.fire.qld.gov.au/Current-Incidents).

In the event of a bushfire emergency, do not rely on a single source of information, check multiple places to stay up to date.

5.3.4 Australian Fire Danger Rating System (AFDRS) and Fire Bans

Following recommendations from the 2020 Royal Commission into National Natural Disaster Arrangements, the Australian Fire Danger Rating System (AFDRS) was introduced nationwide as a transformative tool to improve risk communication and support evidence-based fire management across Australia.

The AFDRS incorporates advanced fire behaviour models and updated data to produce four (4) distinct fire danger ratings, covering a broad range of Australian landscapes (**Figure 6**). AFDRS signs are now posted in key locations across Queensland and Australia to help communities understand fire risks more effectively.

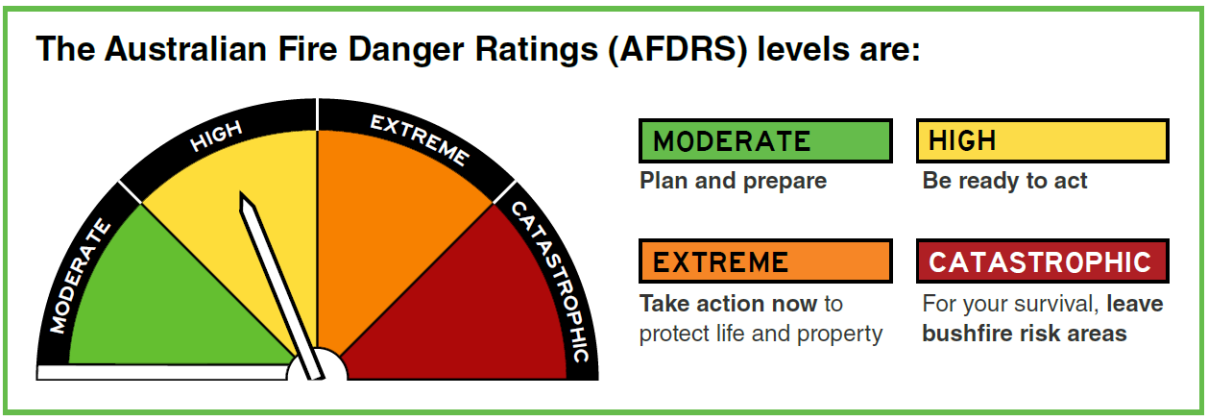


Figure 6: Australian Fire Danger Rating System

The AFDRS uses data from the Australian Bureau of Meteorology (BoM) to establish fire danger ratings for different regions across Australia. The Fire Behaviour Index (FBI), based on McArthur's (1967) research, is a scale of potential fire behaviour ranging from 0 to over 100. The FBI informs QFD operational decisions, such as the enforcement of total fire bans within the region.

Table 9 presents the conversion of FBI values to AFDRS ratings. Current fire danger ratings are accessible at https://www.fire.qld.gov.au/prepare/bushfire/fire-danger-ratings.

Table 9: Fire Behaviour Index Values for Australian Fire Danger Rating System

Fire Behaviour Index	Australian Fire Danger Rating System
0 to 11	No rating
12 to 23	Moderate
24 to 49	High
50 to 99	Extreme
100 +	Catastrophic

This plan requires that activities like mowing, slashing, grinding, or any other mechanical operations that could generate significant heat or sparks within bushfire-prone or densely vegetated areas of the Project Area be prohibited on any day with an Extreme fire danger rating (FBI of 50 or above).

Fire Ban Areas may be declared locally, regionally, or statewide based on predicted weather conditions informed by the FBI. These bans are imposed under the *Fire and Emergency Services Act 1990* when conditions indicate that fires could become difficult to control and pose a high risk to communities and life. On total fire ban days, any activities that could increase the risk of ignition should be minimized as a precautionary measure.

6 Assessment Against the Bushfire Hazard Overlay Code

The Project Area is mapped with the Logan Planning Scheme 2015 Bushfire Hazard Overlay, which triggers a response to the Bushfire Hazard Overlay Code. The code assessment has regard to the site-specific bushfire hazard assessment set out in **Sections 3** of this report. An assessment against this code is provided in **Table 10**.

Table 10: Assessment against the Logan Planning Scheme 2025 (v9.2) Bushfire Hazard Overlay Code

Performance outcomes	Acceptable outcomes	Comments
Location, design and siting of development		
PO1 Development is designed to: minimise risk of bushfire hazard; provide safe premises; create efficient emergency access for fire-fighting and other emergency vehicles. *Note - Planning scheme policy 6 - Management of bushfire hazard provides guidelines on how to achieve this outcome.*	AO1 Development: does not increase the number of persons living in, or lots in, the Bushfire hazard area identified on Bushfire hazard overlay map OM-03.00; or is on a site that a bushfire hazard assessment prepared in accordance with the methodology in Planning scheme policy 6 - Management of bushfire hazard determines is of low bushfire hazard.	Complies with PO1 The proposed development is sited within the southern portion of the Project Area, that has been subject to historical clearing, with lots designed along the eastern interface of the boundary. The lots are subject to a maximum radiant heat flux of BAL12.5, which complies with PO1 of the code. Access will be provided via the construction of a 5m wide access road and turning point for emergency services and safe egress from the property.
PO2 Development is sited and constructed to minimise the bushfire hazard and maximise the protection of life and property from bushfire. *Editor's note - Planning scheme policy 6 - Management of*	AO2 Development is located and constructed: where there is no bushfire management plan approved by an existing development approval: such that the bushfire attack level is less than or	Complies with PO2 The proposed development has sited lots along the eastern boundary, away from hazardous vegetation. Additionally, the construction of a swale along the edge of the north and

bushfire hazard contains guidance on the preparation of bushfire management plans.	equal to BAL-29; away from the most likely direction of a fire front; so that elements of the development least susceptible to fire are sited closest to the bushfire hazard; such that asset protection zones are sited on land with a slope less than 18 degrees; such that asset protection zones are entirely within the boundaries of the private property of the development site; or where an approved bushfire management plan directs development to be located. *Note - BAL = Bushfire attack level is the radiant heat flux a building will experience during a bushfire and is a measure of heat energy impacting on a surface expressed as kW/m2. BAL is calculated from the following factors; vegetation type, fuel loads, distance to vegetation, Forest Fire danger Index (FDI), flame length, fire behaviour/intensity and slope. BAL is used to determine the required construction level of a building and the size of asset protection zones (inner and outer radiation zones). Further information on calculating the BAL can be obtained from AS3959-2009.* *Editor's note - Asset protection zones are not located on slopes greater than 18 degrees to ensure maintenance is practical, soil stability is not compromised and the potential for crown/canopy fires is reduced.*	northeastern hazardous veg further reduces fire hazards. These designs have allowed for lots to be constructed to a BAL-12.5. Access to the site is provided via a 5m wide access road that will be constructed as a part of the development. This will allow occupants to egress to the south and south-east, away from the most likely direction of a fire front. The slope of the site is less than 18 degrees which will assist in providing safe access and egress for emergency services and occupants.

PO3 Reconfiguring a lot ensures that lots are designed to minimise bushfire hazard and provide safe sites for people, property and buildings.	AO3 Lots: are suitable for people, property and buildings by: having a bushfire attack level less than or equal to BAL-29; or containing a development envelope area that has a bushfire attack level less than or equal to BAL-29; provide asset protection zones that: are located on land with a slope less than 18 degrees; are located on the same lot.	Complies with PO3 The proposed development has sited lots along the eastern boundary, away from hazardous vegetation. Additionally, the construction of a swale along the edge of the north and northeastern hazardous veg further reduces fire hazards. These designs have allowed for lots to be constructed to a BAL-12.5. This is the lowest bushfire level within bushfire hazard area. Consequently, the reconfiguring a lot ensures that lots are designed to minimise bushfire hazard and provide safe sites for people, property and buildings. The slope of the site is less than 18 degrees which will assist in providing safe access and egress for emergency services and occupants.
Vehicular access and fire maintenance trails		
PO4 Access for fire management and evacuation is provided by access that: separates premises from adjoining vegetation; is safely accessible by fire fighting vehicles;	AO4 Access for fire management and evacuation is provided by vehicular access in the form of a perimeter road: with a minimum reserve width of 20 metres; located between the premises and adjoining	Complies with PO4 The proposed development will provide safe access for emergency services and egress for occupants via the construction of a 5m wide access road and turn. This will be connected to

has regular vehicular access points for bushfire management, response and evacuation; has regular vehicle passing and turning areas for bushfire management, response and evacuation; allows access at all times for fire fighting vehicles; allows for maintenance, burning off and bushfire response; has vehicular links to an alternative through road; is readily maintained. *Editor's note - Planning scheme policy 6 - Management of bushfire hazard provides details on alternative solutions for providing fire management access and evacuation*	vegetation; with a maximum gradient of 12.5 percent; constructed to otherwise comply with section 3.4 - Movement infrastructure standards of Planning scheme policy 5 - Infrastructure; that has a layout that does not include a cul-de-sac.	Murrays Road which will provide access and egress to the north or north-east to the Pacific Motorway.
Water supply		
PO5 Development has access to adequate water supply for fire fighting purposes.	AO5 Development: is connected to a reticulated water supply scheme that has sufficient flow and pressure characteristics for fire fighting purposes at all times with a minimum pressure and flow of 10 litres per second at 200kPa; or has an on-site water storage in accordance with Table 8.2.3.3.2 - Water storage for fire fighting, dedicated or retained for fire fighting purposes that	Complies with PO5 The proposed development will be connected to the reticulated water supply.

	is made of fire resistant materials and is: a separate tank; or a reserve section in the bottom part of the main water supply tank. *Editor's note - The requirement in AO5 is:* *- in addition to the requirement for potable water supply/storage in AO2 in Table 9.4.3.3.1 - Infrastructure code: accepted development (subject to requirements) and assessable development.;* *- reflected in AO5 in Table 9.4.3.3.1 - Infrastructure code: accepted development (subject to requirements) and assessable development.*	

7 Conclusion

This report provides a BHAMP for a proposed subdivision at 104-108 Murrays Road, Tanah Merah. The results of the assessment show that vegetation associated with the eucalypt woodland (VHC 10.2) to the north and north-east of Project Area has a potential bushfire hazard class of 'Medium'. All other vegetation within the assessment area is not classified as bushfire-prone and therefore, calculation of radiant heat flux/BAL is not applicable.

PO1 of the Logan Planning Scheme 2015 specifies that developments are to be separated from hazardous vegetation such that they achieve a maximum radiant heat flux of 29 kW/m^2 (BAL-29). BAL assessment has determined that the proposed lots will be subject to a maximum radiant heat flux of 12.5 kW/m^2 (BAL-12.5), which is compliant with the Bushfire Hazard Overlay Performance Outcomes stipulated under the Logan Planning Scheme 2015.

Direct access to the dwellings is provided via the construction of an access road from the southern boundary of the Project Area to Murrays Road. This access road will be constructed with a minimum width of 5m and sealed. This access road will provide for the egress of dwelling occupants in the event of an approaching bushfire. The access road surface is capable of supporting Rural Fire Service 4WD vehicles and does not exceed at 12.5% incline, which will not impede emergency service access in the event of an emergency.

In the event of a bushfire emergency where a bushfire was to cut off resident egress to the north and north-west, residents can still egress the dwelling/property to the north-east via Murrays Road to the Pacific Motorway.

This bushfire assessment follows the BRC Technical Guide, using QFD-published inputs (FFDI and fuel loads) and the QFD VHC system. The project complies with the SPP Natural Hazards, Risk and Resilience Assessment Benchmarks and the Logan Planning Scheme 2015 (Version 9.2) Bushfire Hazard Overlay Code.

8 References

Department of Infrastructure, Local Government and Planning (DILGP). (July 2017). *State Planning Policy*. Brisbane: Department of Infrastructure, Local Government and Planning (DILGP) Retrieved from https://dilgpprd.blob.core.windows.net/general/spp-july-2017.pdf

DSDMIP. (2019). *State Planning Policy State Interest Guidance Material - Natural Hazards, Risk and Resilience - Bushfire, December 2019*. Retrieved from https://dsdmipprd.blob.core.windows.net/general/spp-guidance-natural-hazards-risk-resilience-bushfire.pdf

Leonard, J., & Opie, K. (2017, 2017). Estimating the potential bushfire hazard of vegetation patches and corridors. Retrieved from https://publications.csiro.au/rpr/pub?pid=csiro:EP167343

Leonard, J., Opie, K., Newnham, G., & Blanchi, R. (2014). *A new methodology for State-wide mapping of bushfire prone areas in Queensland*. Retrieved from Brisbane: https://www.qfes.qld.gov.au/opendata/Bushfire_Prone_Area_Mapping_Report_5_Feb_2014_Low_Res.pdf

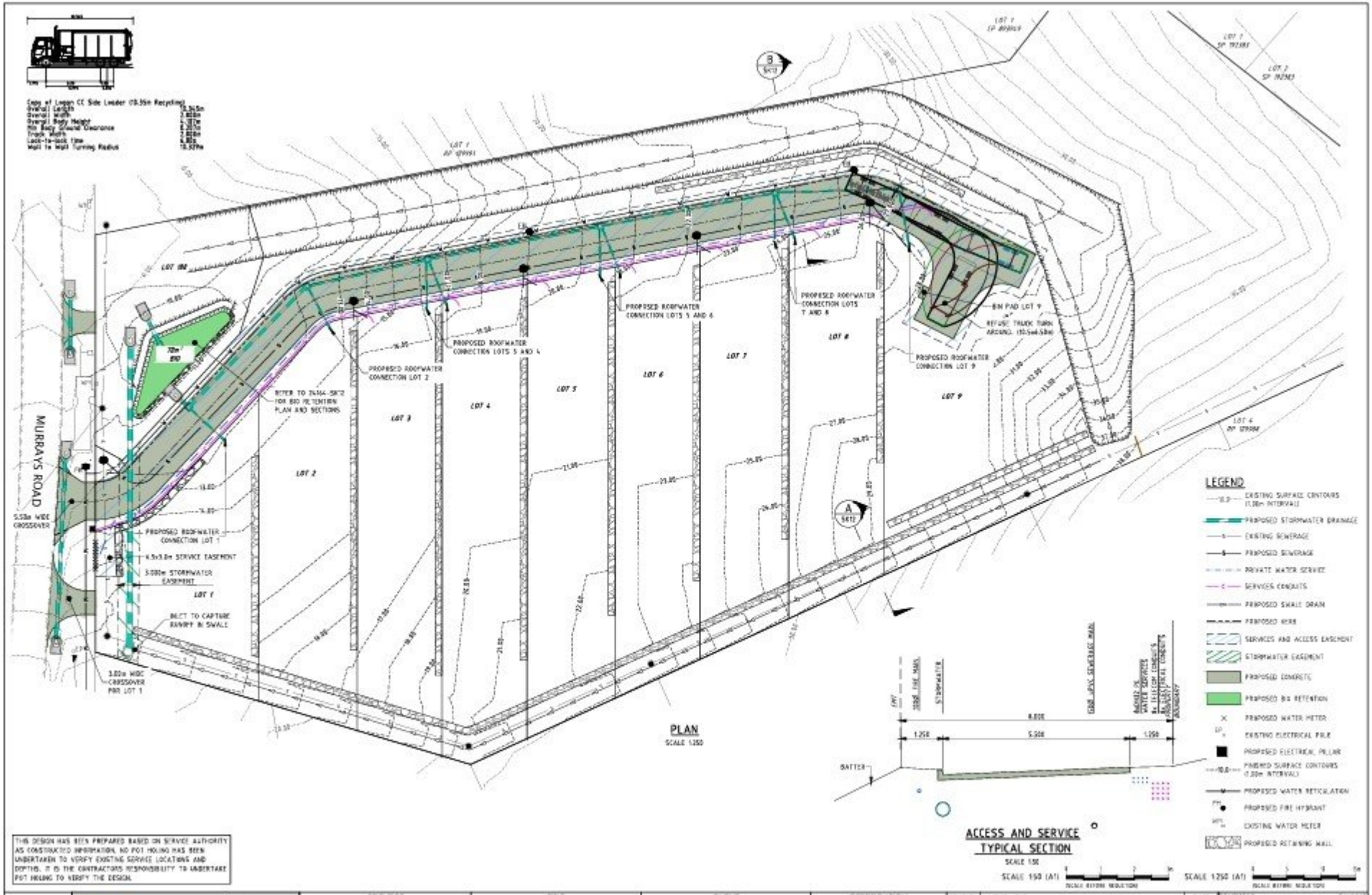
Logan City Council. (2015). Logan Planning Scheme 2015. Retrieved from https://logan.isoplan.com.au/eplan/rules/0/5/0/0/0/203

Queensland Fire Department (QFD). (2019). *Bushfire Resilient Communities: Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience' (October 2019)*. Queensland Fire and Emergency Services Retrieved from https://www.ruralfire.qld.gov.au/Bushfire_Planning/Pages/Bushfire-Resilient-Communities.aspx

Standards Australia. (2018). *AS 3959-2018 Construction of buildings in bushfire-prone areas*. Retrieved from Sydney: https://law.resource.org/pub/au/ibr/as.3959.2009.pdf

Appendix 1

Proposed Development Layout



THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY THE DESIGN.

HCE Engineers Pty Ltd
ABN 42 664 382 610
mail@hce-engineers.com.au
07 3809 1389

PROJECT	TITLE	CLIENT	CERTIFICATION
104 - 108 MURRAYS ROAD, TANAH MERAH QLD 4128 LOT 2 ON RP 109991	CONCEPT REAR ACCESS AND STORMWATER DRAINAGE PLAN	RYJAYD PTY LTD	

REVISION	AMENDMENT	DATE
A	ISSUED FOR COMMENT	23/12/25

Designed	Drawn	Date
MN	HL	15/12/25
Approved by		Scale
-		AS SHOWN
Drawing No.		Rev.
24164-SK11		A

Appendix 2

State Mapped Regional Ecosystems

Queensland Government

Department of the Environment, Tourism, Science and Innovation

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest
Lot: 2 Plan: RP109991

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 Natural Resources and Mines, Manufacturing and Regional and Rural Development website https://www.nrmmrrd.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.

CC BY

Table of Contents

Summary Information 4
Regional Ecosystems 5
1. Introduction 5
2. Remnant Regional Ecosystems 6
3. Remnant Regional Ecosystems by Broad Vegetation Group 7
4. Technical and BioCondition Benchmark Descriptions 8
Maps 9
Map 1 - Location 9
Map 2 - Remnant 2021 regional ecosystems 10
Map 3 - Pre-clearing regional ecosystems 11
Map 4 - Remnant 2021 regional ecosystems by BVG (5M) 12
Map 5 - Pre-clearing regional ecosystems by BVG (5M) 13
Map 6 - Wetlands and waterways 14
Links and Other Information Sources 15
References 15
Appendices 16
Appendix 1 - Source Data 16
Appendix 2 - Acronyms and Abbreviations 17

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: 2 Plan: RP109991, with area 1.36 ha

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Logan City	Logan-Albert	Southeast Queensland	Moreton Basin

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	0.00	0.00
Of concern	0.00	0.00
No concern at present	0.58	42.44
Total remnant vegetation	0.58	42.44

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 Natural Resources and Mines, Manufacturing and Regional and Rural Development website https://www.nrmmrrd.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
12.11.5	Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics	No concern at present	0.58	42.44
non-remnant	None	None	0.78	57.55

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
12.11.5	Pre-clearing 86000 ha; Remnant 2021 53000 ha	10b	Not a Wetland	High
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
12.11.5	12.11.5: Habitat for listed plant species including Cycas megacarpa and Sophora fraseri. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus). 12.11.5a: Habitat for listed flora species including Sophora fraseri. 12.11.5e: Habitat for listed flora species including Cycas megacarpa and Sophora fraseri. 12.11.5h: Habitat for listed flora species including Sophora fraseri. 12.11.5j: Habitat for listed flora species including Sophora fraseri. 12.11.5k: Habitat for listed flora species including Sophora fraseri.
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	0.78	57.55
10b	Moist open forests to woodlands dominated by Corymbia citriodora (spotted gum).	0.58	42.44

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/

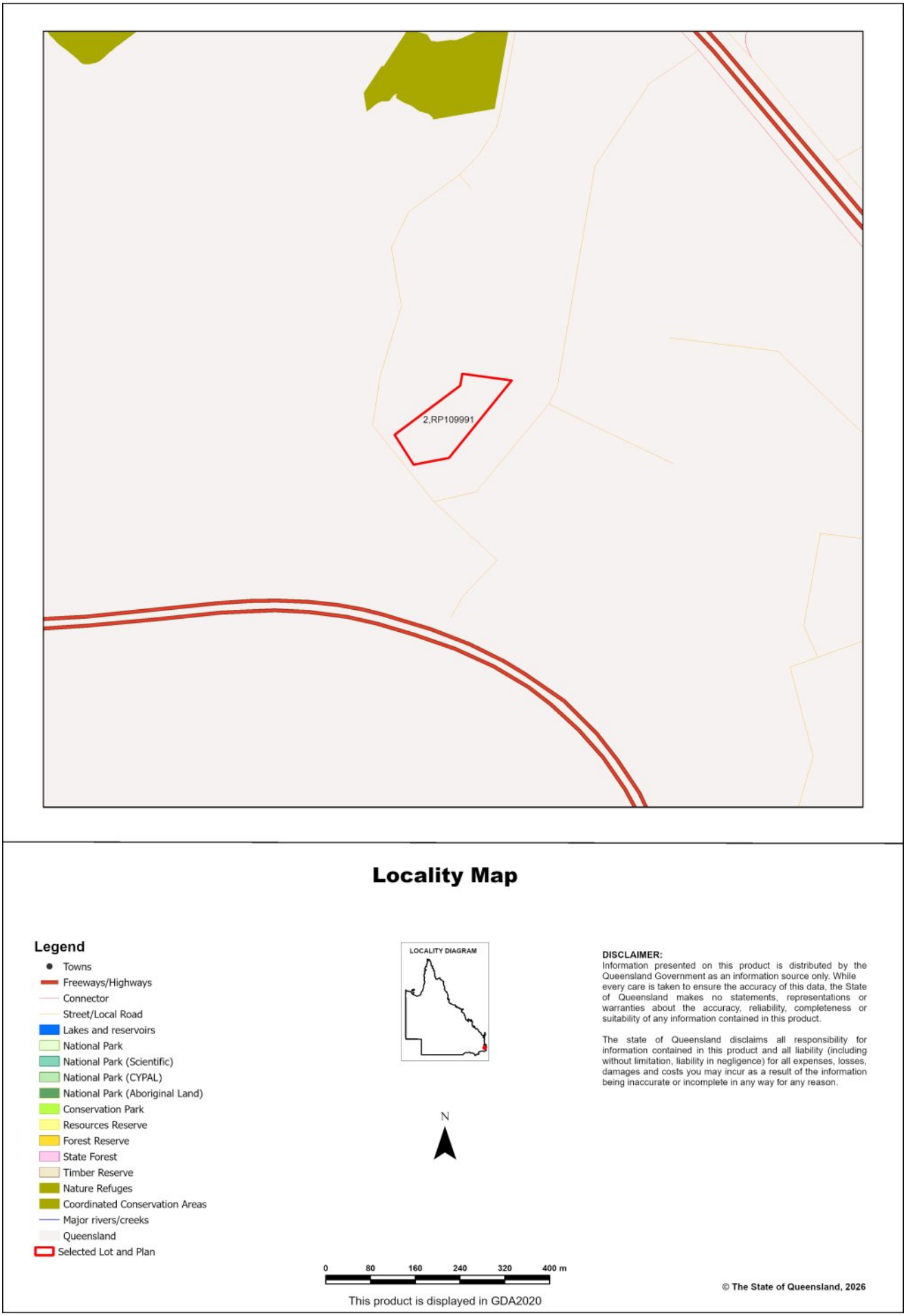
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance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

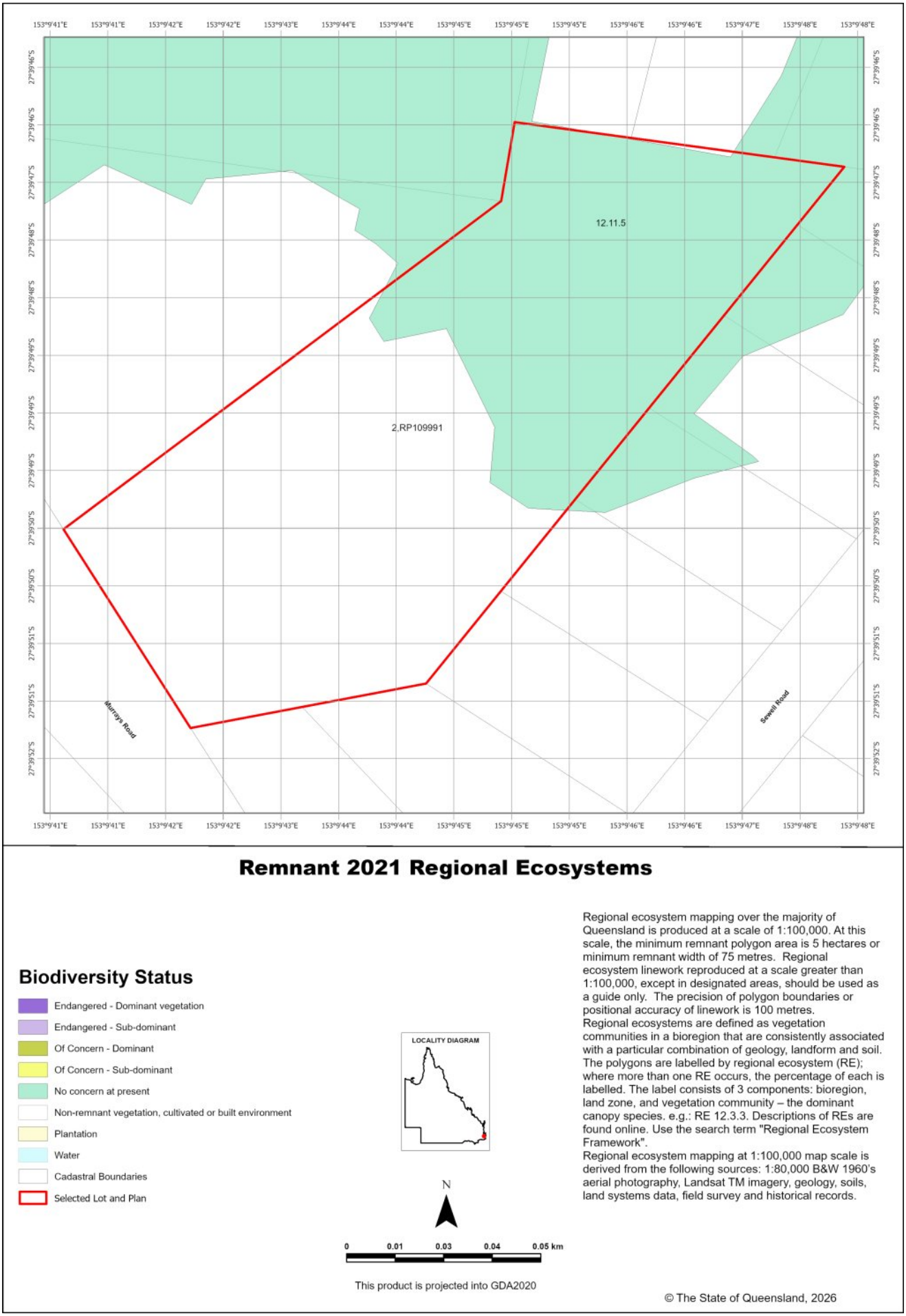
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
12.11.5	Not currently available	Available
non-remnant	Not currently available	Not currently available

Maps

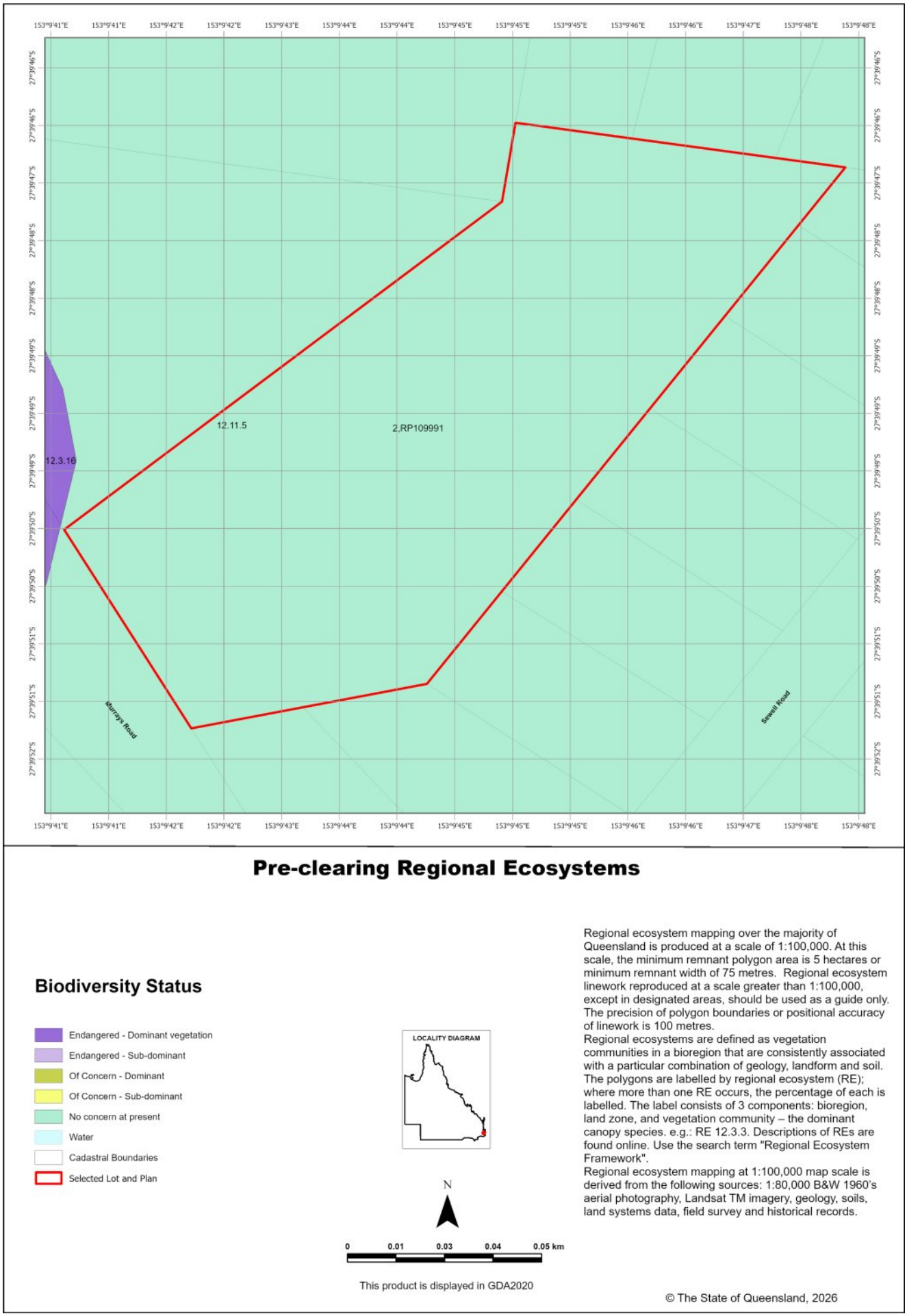
Map 1 - Location



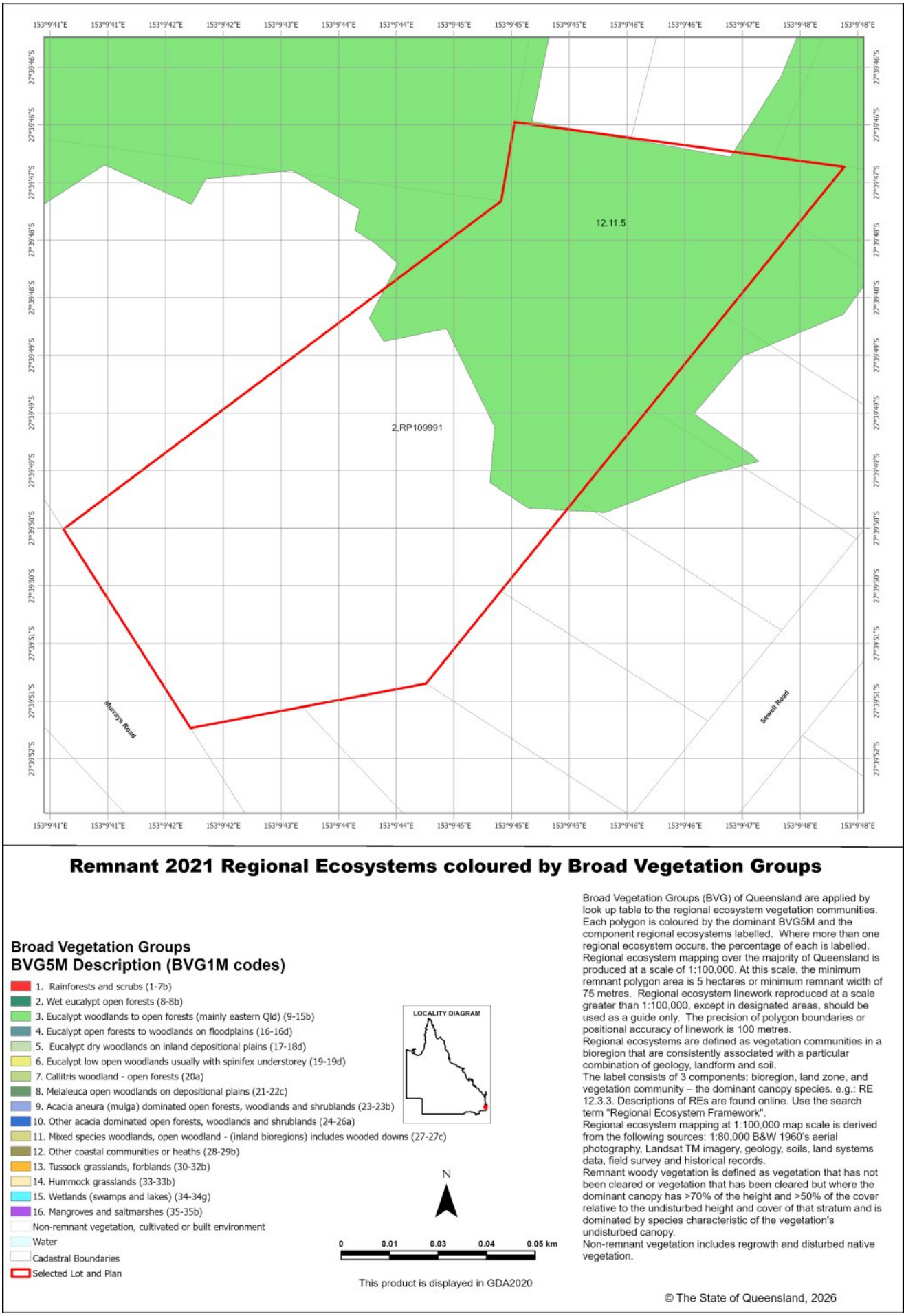
Map 2 - Remnant 2021 regional ecosystems



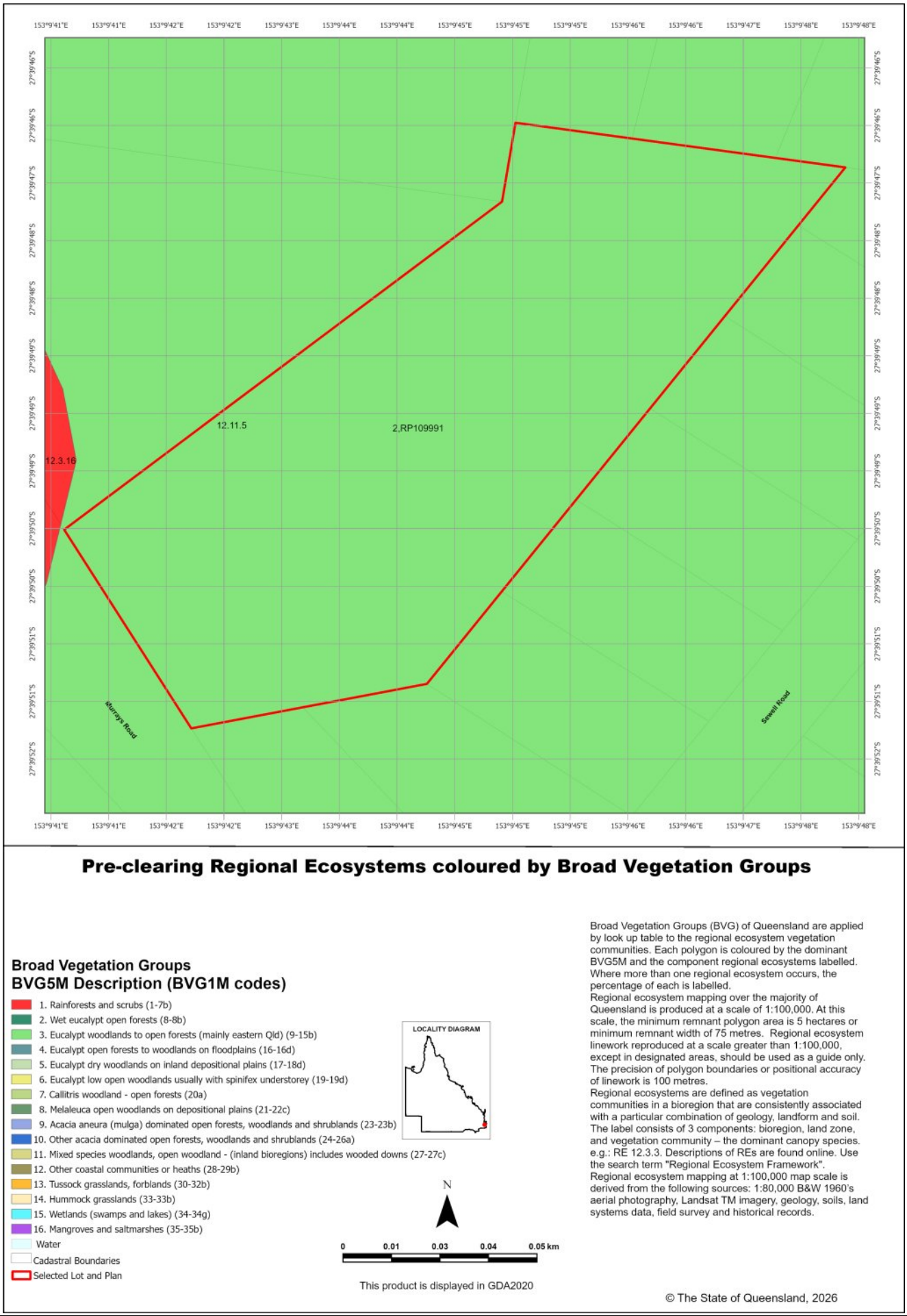
Map 3 - Pre-clearing regional ecosystems



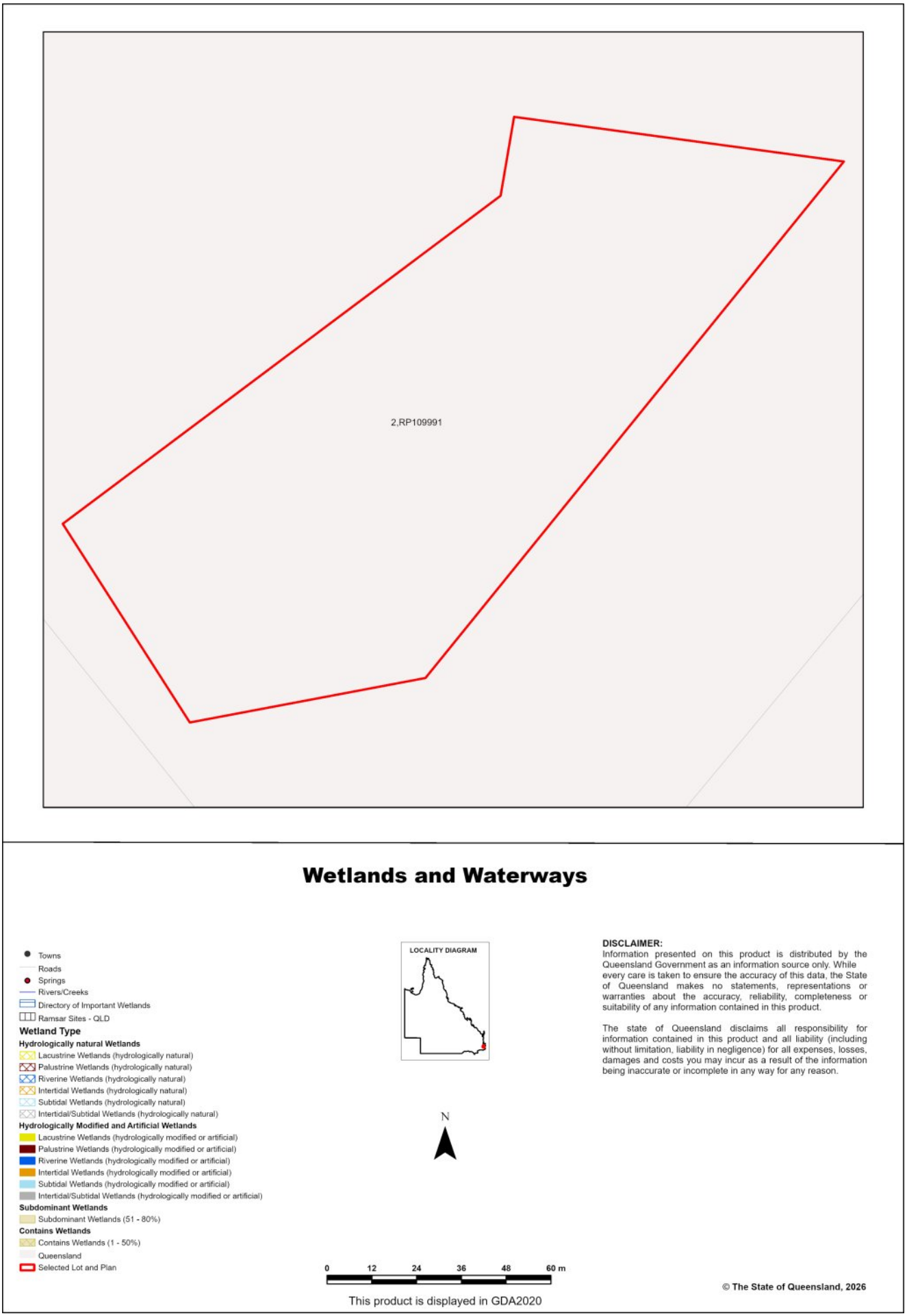
Map 4 - Remnant 2021 regional ecosystems by BVG (5M)



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



Map 6 - Wetlands and waterways



Links and Other Information Sources

The Department of the Environment, Tourism, Science and Innovation's Website - http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/ provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from: https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/broad-vegetation

The methodology for mapping regional ecosystems can be downloaded from: https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

Technical descriptions for regional ecosystems can be obtained from: http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

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

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

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*

Appendix 3

Flamesol Method 2 Minimum Distance Calculations

104-108 Murrays Road, Tanah Merah

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	54	Rate of spread	0.52 km/h
Vegetation Classification	Woodland	Flame length	5.43 m
Understorey fuel load	14 t/ha	Flame angle	66 °, 73 °, 78 °, 82 °, 83 ° & 86 °
Total fuel load	17 t/ha	Elevation of receiver	2.48 m, 2.59 m, 2.65 m, 2.69 m, 2.69 m & 2.71 m
Vegetation height	n/a	Fire intensity	4,588 kW/m
Effective slope	-8 °	Transmissivity	0.886, 0.876, 0.859, 0.839, 0.827 & 0.758
Site slope	0 °	Viewfactor	0.3993, 0.2947, 0.1969, 0.1329, 0.1077 & 0.0294
Flame width	100 m	Minimum distance to < 40 kW/m²	6.7 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	9.1 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	13.6 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	20 m
		Minimum distance to < 10 kW/m²	24.3 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005