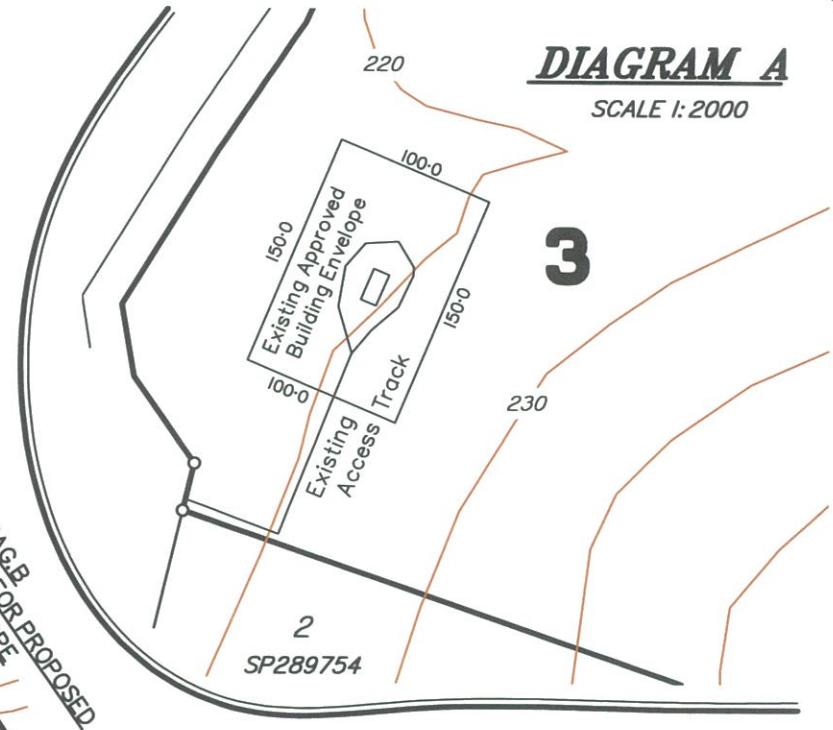
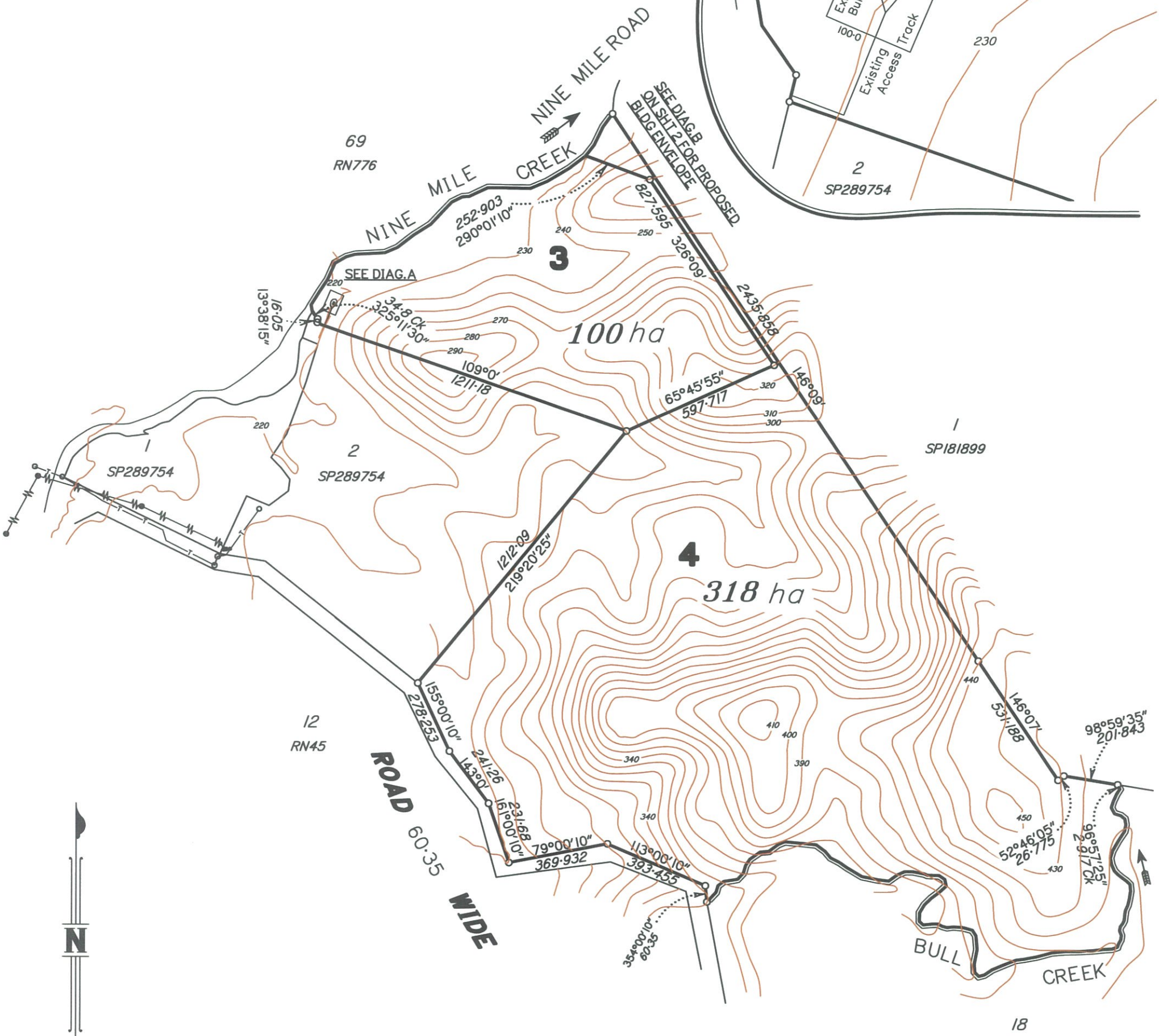
LEGEND

- Boundary
- Contour: 10.0 interval
- Telecom
- Power Line
- Power Pole

DIAGRAM A

SCALE 1:2000





Scale 1:16000 – Lengths are in Metres.

200 0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200

0 50 mm 100 mm 150 mm

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/108-2019

Dated: 28 April 2020

Plan of Proposed Lots 3 & 4 and Proposed Building Envelope in Proposed Lot 4 Cancelling Lot 3 on SP289754

This plan was prepared to accompany a Reconfiguration of a Lot application to Rockhampton Regional Council, and should not be used for any other purpose. The boundary information, dimensions and areas, shown here are approximate only and subject to field survey, therefore, no reliance should be placed on the information shown on this plan , especially for financial dealings. This note is an integral part of this plan.

GSPC

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LOCALITY	Nine Mile Creek
LOCAL GOVERNMENT	Rockhampton R.C.
HORIZONTAL DATUM	CAM
MERIDIAN	SP289754
VERTICAL DATUM	-------
DERIVED vide	-------
MAP REF	8950-12243

PLAN SCALE	1:16000
AUTOCAD SCALE	1:1000
DATE	03-04-2020
DRAWN	Bilyaminu

SHEET 1 OF 2

REF. 191027-04

LEGEND

Boundary

Contour: 10.0 interval

BLE – Building Envelope

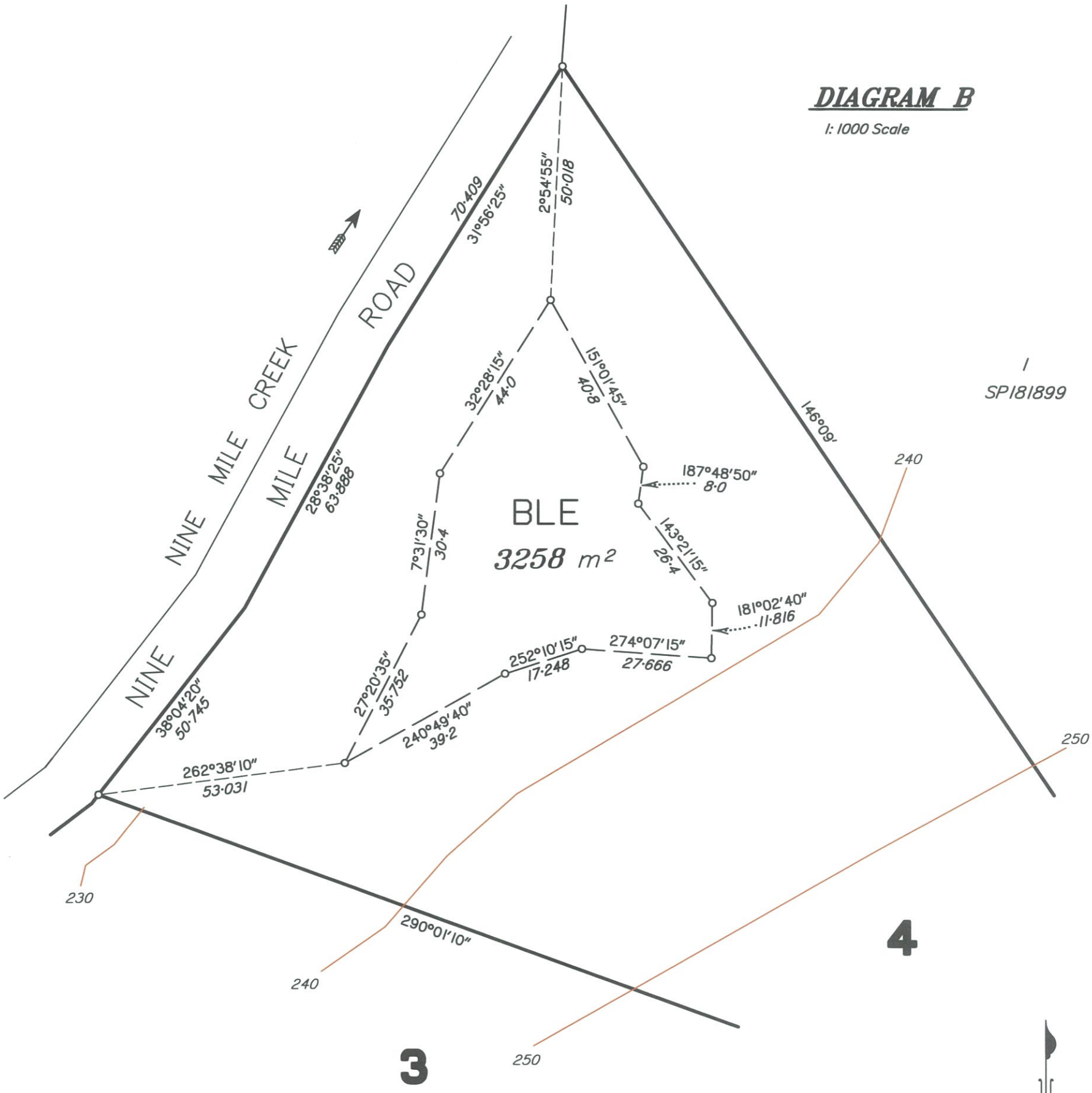

DIAGRAM B

1: 1000 Scale

ROCKHAMPTON REGIONAL COUNCIL

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Development Permit No.: D/108-2019

Dated: 28 April 2020

Scale 1:1000 – Lengths are in Metres.

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Ref. 191027–04

Bushfire Hazard Assessment and Management Plan

Proposed Lot 4 from SP289754 – 270 Nine Mile Road, Mt Morgan

Prepared for June Hood – c/ Gracemere Surveying & Planning Consultants Pty Ltd.

Prepared by:

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Report Number: PR20049_BMP_270 Nine Mile Road, Mt Morgan

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/108-2019

Dated: 28 April 2020

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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 Proposed Lot 4 SP289754 – 270 Nine Mile Road, Mt Morgan
FILED AS	PR20049_270 Nine Mile Road, Mt Morgan

Revision	Date	Prepared by (name/title)	Reviewed by (name/ title)	Approved by (name/title)
Version A	27/03/2020	Joseph Adair, Senior Ecologist	Kelly Matthews, Director and Principal Ecologist	Client

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FIGURE

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1. Introduction

1.1 Background

Green Tape Solutions was engaged by Gracemere Surveying & Planning Consultants Pty Ltd to prepare a bushfire hazard assessment and management plan (BHAMP) for a site located at 270 Nine Mile Road, Mt Morgan (Proposed Lot 4 from SP289754). The BHAMP is a Rockhampton Regional Council (RRC) request for further advice for the proposed reconfiguration of Lot 3 on SP289754 from one into two lots. There is an approved bushfire management plan for the existing Lot 3. A Development Application (D/108-2019) has been made to RRC for reconfiguring a Lot (one Lot into two Lots).

1.2 Site Description

The proposed site is located on a single lot within the Rockhampton Regional Council local government area which covers an area of 318ha. The proposed Lot 4 will sit behind Lot 3 (**Figure 1.1**) and can be accessed via 20m corridor along the Lot 3 northern boundary. Access is provided from Nine Mile Road. The proposed dwelling site on Lot 4 covers an area of about 20,780m^2. The proposed building envelope for Lot 4 is 3,258m^2 (**Figure 1.2**).

Most of the proposed Lot 4 is located within the Category B – remnant vegetation listed as Least Concern under the regulated vegetation management map from the Department of Natural Resource, Mines and Energy (DNRME) (**Appendix 1**). The small area at the northern end about the proposed dwelling site is within Category B listed as Of Concern remnant vegetation along the alluvial flats of Nine Mile Creek. The proposed dwelling site straddles both vegetation community types.

A more detailed description of the vegetation communities on site and surrounding the site is provided in **Section 3.2**.

Figure 1-1: Lot 4 reconfiguration and site for proposed dwelling

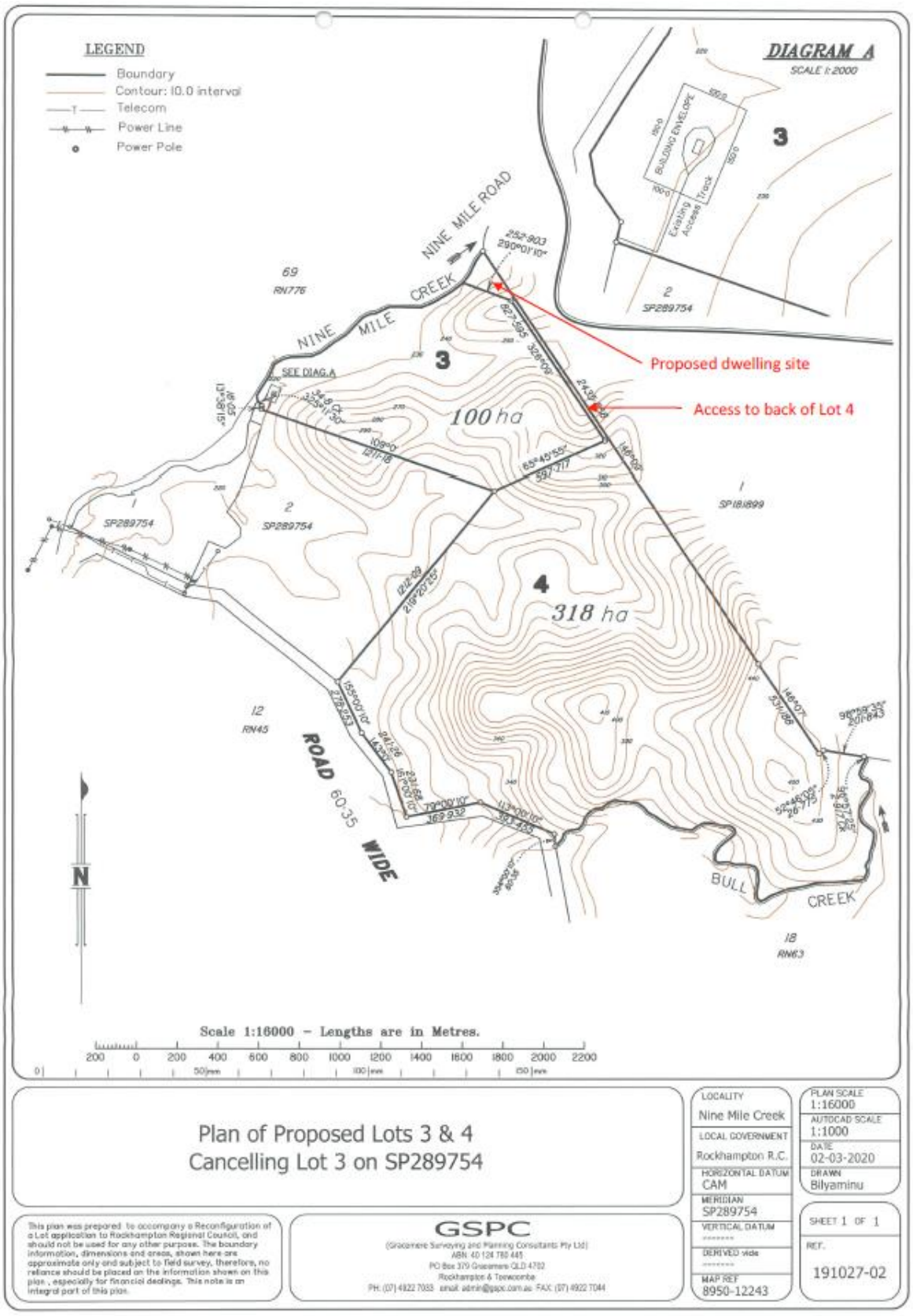
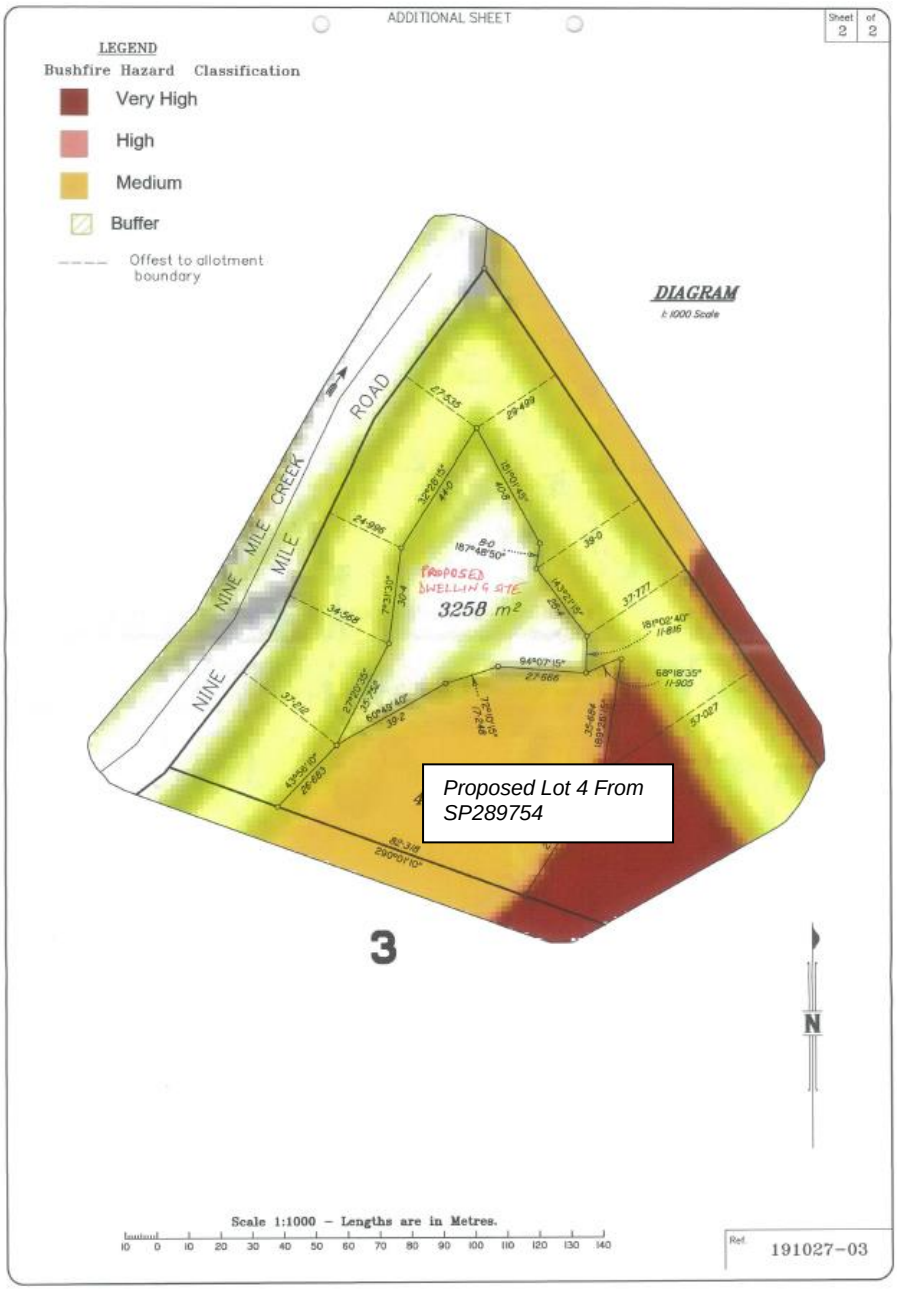


Figure 1-2: Proposed dwelling site and bushfire overlay



1.3 Scope of Work

The purpose of this BHAMP is to assess compliance of the proposed development with the outcomes sought by the Rockhampton Regional Council, regarding the Bushfire Hazard Overlay Code. It also provides a plan for bushfire risk management including building requirements, assets protection zones, fuel management, access requirements and emergency responses measures. Recommendations are consistent with legislative requirement and the generate needs to reduce the risk to like and property in bushfire prone environment.

2. Bushfire Regulatory Framework

Given that bushfire hazard can cause harm to people and social wellbeing, damage to property and impacts to the economy and environment, the management of bushfire hazard in Queensland is considered an integral component of land use planning and development decisions.

There are three regulatory mechanisms/instruments applicable to the site that regulate development to avoid and mitigate potential impacts associated with bushfire hazard:

- State Planning Policy (SPP) and associated guidelines (DILGP, July 2017);
- Rockhampton Regional Council (Rock e Plan) Bushfire Hazard Overlay (8.2.4) Codes 1.1 and 2.1.2, and
- Australian Standard AS3959-2018 – Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).

2.1 State Planning Policy (SPP)

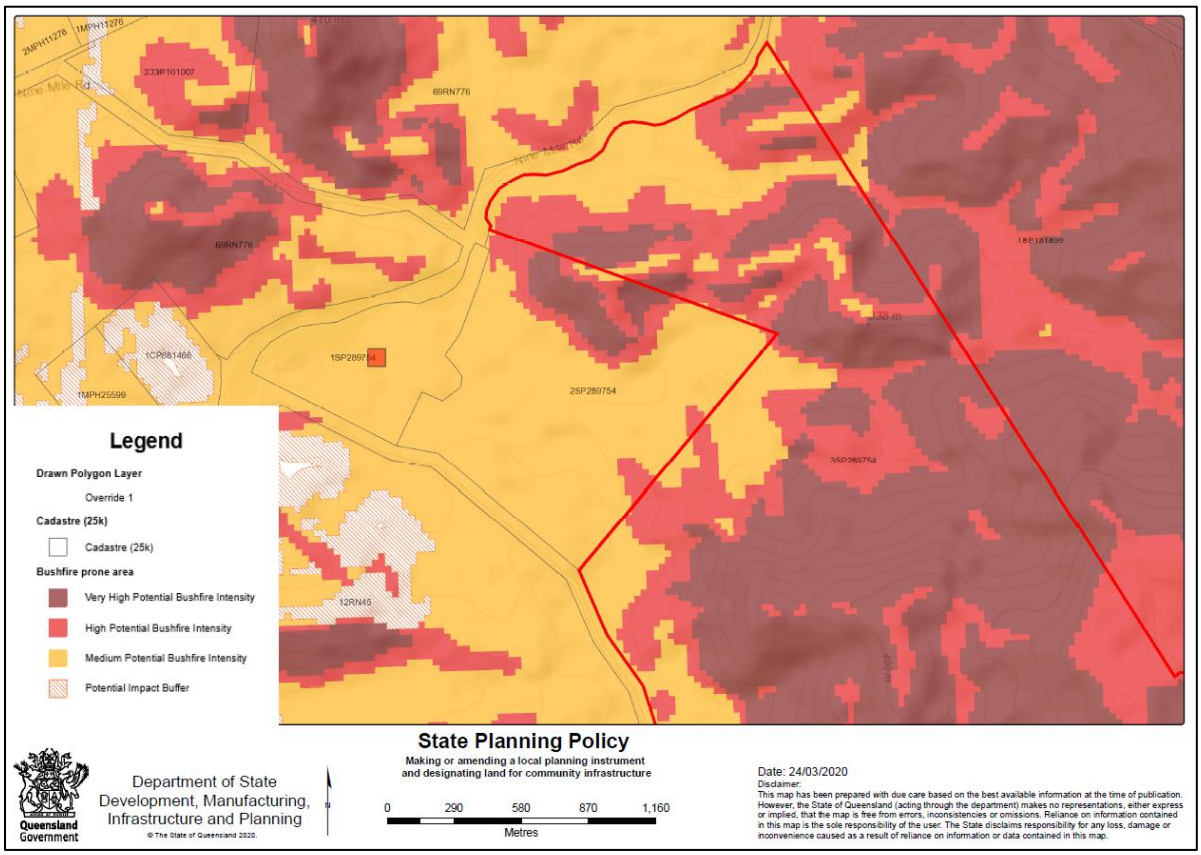
The SPP identifies the Queensland Government's policies about matters of state interest in land use planning and development (DILGP, July 2017). The SPP is a broad and comprehensive statutory planning instrument. It sits above regional plans, standard planning scheme provisions and local government planning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

The SPP is supported by the following guidance material:

- 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 appropriately integrated into the local planning scheme (where applicable).
- The 'Bushfire Resilient Communities – Technical Reference Guide for the State Planning Policy State Interest - Natural Hazards, Risk and Resilience – Bushfire ('BRC technical document') (QFES, 2019a), which provides technical guidance and policy positions of the Queensland Fire and Emergency Services (QFES). It includes technical guidance on procedures for undertaking a bushfire hazard assessment (BHA), calculating asset protection zones and preparing a Bushfire Management Plan.

The SPP is also supported by a state-wide map of bushfire prone areas (BPA) (also referred to as bushfire hazard areas) that was developed based on the CSIRO modelling of potential fire-line intensity using the methodology described by Leonard *et al.* (2014). An excerpt from the SPP Assessment Benchmark – BPA mapping published on the SPP Interactive Mapping System (IMS) is provided in **Figure 2-1**. The site is covered by a Potential Impact Buffer as well as Medium, High and Very High Bushfire Intensity overlay.

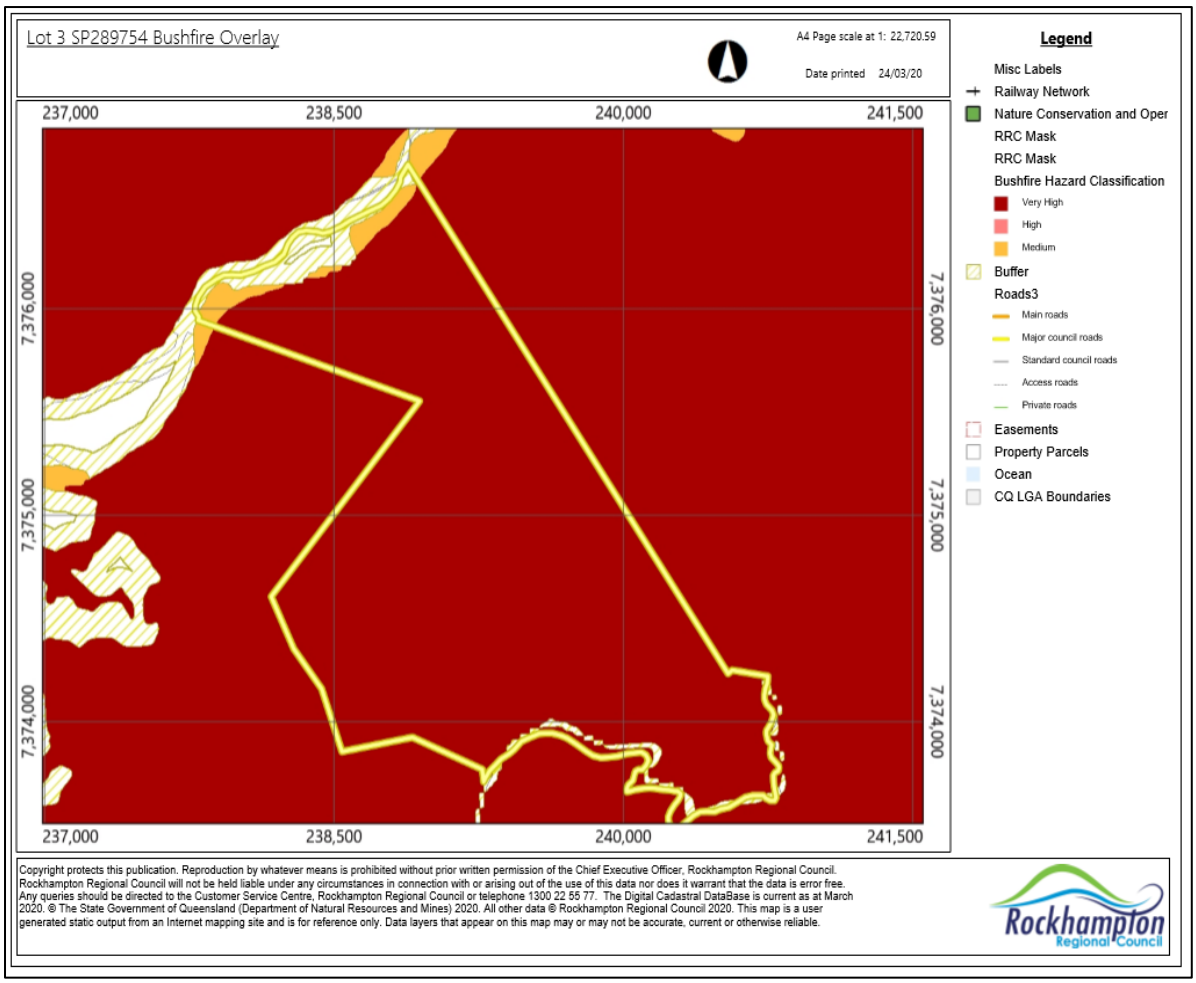
Figure 2-1: SPP Bushfire Overlay



2.2 Rockhampton Regional Council Planning Scheme

The Rockhampton Regional Council Bushfire Hazard Overlay identifies a site as having a Very high Bushfire hazard (**Figure 2-2**). As the site is mapped within a bushfire hazard area, as assessment against the Rockhampton Regional Council Bushfire Hazard Overlay Code has been undertaken.

Figure 2-2: RRC Bushfire Overlay



2.3 Australian Standard 3959-2018 Construction of Buildings in Bushfire Prone Area

The Australian Standard *AS3959:2018 Construction of Buildings in Bushfire-Prone Areas* (Standards Australia, 2009) 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 bushfire prone area (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 Building Code of Australia.

3. Bushfire Hazard Assessment

A site-specific BHA for the site has been undertaken in accordance with the methodology outlined in the 'Bushfire Resilient Communities' (BRC) technical document (QFES, 2019a). The methodology underpinning the BHA process consists of three stages:

1. An assessment to verify the reliability of existing BPA mapping over the site and land surrounding the site (the 'assessment area') and to streamline the detailed BHA process.
2. A hazard assessment involving field investigations to ground-truth the accuracy of the BPA mapping for the site, where required.
3. Using the results of the site-specific assessment, the asset protection zone width needed to achieve the requisite radiant heat levels is calculated using the SPP Bushfire asset protection zone (APZ) calculator or Method 2 of the Australian Standard, 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), 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).

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

- Step 1: Identification of fire weather severity, based on Forest Fire Danger Index (FFDI) estimated at a 1:20 year (5%) Annual Exceedance Probability (AEP) using the Bushfire Hazard Area – Bushfire Prone Area – Inputs dataset from the Queensland Government data portal.
- Step 2: Assessment of vegetation communities to identify the relevant vegetation hazard classes (VHCs) using a combination of remnant and pre-clearing regional ecosystem maps, high-resolution aerial imagery and a ground-truthed assessment of vegetation present within the site and within the required 150 metre distance of the site boundary.
- Step 3: Identification of site slope and effective slope and determination of whether proposed buildings are upslope or downslope of hazardous vegetation.
- Step 4: Based on the inputs from Steps 1 - 3, the radiant heat exposure and required separation distance between hazardous vegetation and development are then calculated.

VHCs and associated potential fuel loads are in accordance with Leonard *et al.* (2017), as provided in the SPP Bushfire APZ width calculator published by the Queensland Fire and Emergency Services (QFES).

Relevant spatial datasets published by the QFES were accessed via the Queensland Spatial Catalogue (QSpatial) and redi-PORTAL (PBSA, 2018).

3.1 Step 1 – Fire weather severity

The relevant Forest Fire Danger Index (FFDI) for the site was derived from the Fire Weather Severity (Forest Fire Danger Index) raster provided as part of the Bushfire Hazard Area – Bushfire Prone Area – Inputs dataset.

The FFDI for the site and surrounding land is 69.

3.2 Step 2 - Vegetation Hazard Classes and Potential Fuel Loads

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.

3.2.1 Vegetation Hazard Class

The vegetation communities are outlined in **Table 1**. These vegetation communities translate to Vegetation Hazard Classes (VHCs) provided within the Bushfire Prone Area – Vegetation hazard class. The Central Queensland dataset was reviewed for the site and surrounding land and the site is mapped as the following VHC:

- 13.2 Dry to moist eucalypt woodlands on undulating metamorphics and granite.
- 16.1 Eucalyptus dominated forest on drainage lines and alluvial plains.

Table 1: Vegetation communities at the proposed dwelling site

RE Composition	Status	Short description	Location on site	VHC
11.3.25/11.3.4 (70/30)	Category B VM Act – Of Concern	• 11.3.25 - Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines • 11.3.4 - Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains.	Adjacent to Nine Mile Road and up to 30-40m within proposed dwelling site.	16.1 Eucalyptus dominated forest on drainage lines and alluvial plains
11.12.1/11.12.6 (80/20)	Category B VM Act – Least Concern	• 11.12.1 - Eucalyptus crebra woodland on igneous rocks. • 11.12.6 - Corymbia citriodora open forest on igneous rocks (granite)	About 40-50m from the road within the proposed dwelling site.	13.2 Dry to moist eucalypt woodlands on undulating metamorphics and granite

The proposed dwelling site is south of both Nine Mile Creek and Nine Mile Road. As described in Table 1, the vegetation communities assessed during the site inspection are consistent with the DNRME mapping (**Appendix 1**) and conform with both VHC 13.2 closer to the road and creek, while

vegetation further away from the creek conforms to VHC 16.1. Both vegetation communities are sparse in structure and there is evidence recent fire in the area. Plates 1, 2 and 3 show the proposed dwelling site location from the road and VHC 13.2 vegetation structure. Plates 4, 5 and 6 show the location of the building envelope and Plate 4 shows the uphill VHC 16.1 vegetation structure. The DNRME mapping shows the vegetation community as 'sparse' and this is confirmed by the site visit.

Much of the native vegetation about Mt Morgan was burnt during the January 2020 wildfires. Grasses in both communities are a combination of exotic and native grass, with green panic (*Megathyrsus maximus*) and Rhodes grass (*Chloris gayana*) predominant within VHC 13.2.

Both vegetation communities pose a fire hazard, the upslope VHC 13.2 is mapped a having a High fire hazard while VHC 16.1 (the proposed dwelling site) is assessed as posing a Medium fire hazard.

Plate 1: View of proposed dwelling site looking south east from Nine Mile Road. VHC 13.2

Plate 2: View looking south from Nine Mile Road - VHC 13.2

Plate 3: View looking north west from Proposed dwelling site showing proposed dwelling site - VHC 13.2 / VHC 16.1 Ecotone

Plate 4: View looking south west across slope from proposed dwelling site - VHC 16.1

Plate 5: View looking south towards road from the site.

Plate 6: View looking north towards road from the site

3.2.2 Potential Fuel Loads

Fuel loads have been allocated for each VHC which represent the long-unburnt condition that would be typically exhibited 10 years after fire. In accordance with the values provided in Figure 14 of the BRC technical document (QFES, 2019a), the potential fuel load datasets for ground-truthed VHCs within and surrounding the site are as follows:

- VHC 16.1 – Eucalyptus dominated forest on drainage lines and alluvial plains: Potential surface fuel load of 10 t/ha and total potential fuel load (in remnant state) of 16 t/ha;

- VHC 13.2 – Dry to moist eucalypt woodlands on undulating metamorphics and granite: Potential surface fuel load of 9.4 t/ha and total potential fuel load (in remnant state) of 14.4 t/ha.

3.3 Step 3 - Site and Effective Slope

Two slope input parameters are required for the estimation of fire behaviour and separation. Site slope is the slope of the ground between the edge of the proposed development (or site boundary) and the edge of hazardous vegetation. Effective slope refers to the slope of the land beneath hazardous vegetation. Effective slope is the more important parameter as it has a direct influence on the potential rate of fire spread, fuel consumption and thus, potential fire-line intensity. The effective slope is based on the slope of all land (in degrees) within the assessment area (including the slope beneath each VHC) and the relative position of land supporting hazardous vegetation in relation to the development sites i.e. upslope or downslope.

Site slope can be determined from the state-wide map of maximum landscape slope, local government data or based on the post-development site slope, for example after earthworks are completed. Given the likely requirement for earthworks to create a level building pad, the site slope is assumed to be 3 degrees.

The site and surrounding area are characterised as hilly terrain with slope variations between zero to 19 degrees. The site is located at the toe of the hill rising to the south with the maximum slope increasing to 13 degrees 150 metres upslope. Remnant native vegetation (VHC 16.1) located to the south east of the development sites is located upslope of the site. The site itself has a slope beneath hazardous vegetation of 3 degrees.

3.4 Step 4 – Separation and Radiant Heat Exposure

The BRC technical document requires that radiant heat exposure be 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 site-specific values for FFDI (Step 1), the ground-truthed VHCs (Step 2) and their associated fuel loads (provided in Figure 14 of the BRC technical document) and site and effective slopes are to be used.

The proposed dwelling site will likely consist of a residential house and associated shed(s) for vehicles and / or storage of equipment. The area available for the site is approximately 3,258 sq/m. Given this Method 2 Minimum Distance calculator published by the Fire Protection Association of Australia (FPAA) has been used to calculate the minimum distances required to achieve the range of radiant heat levels (represented by Bushfire Attack Levels or BALs), using the following inputs:

VHC 16.1 – Downslope from proposed dwelling site

- Fire danger index of 69;
- Effective slope of 6 degrees;
- Site slope of 3 degrees; and
- Vegetation classification of Forest with surface fuel load of 10 t/ha and overall fuel load of 16 t/ha.

VHC 13.2 – Upslope of the proposed dwelling site

- Fire danger index of 69;
- Effective slope of 11 degrees;
- Site slope of 3 degrees; and
- Vegetation classification of Forest with surface fuel load of 9.2 t/ha and overall fuel load of 14.4 t/ha.

The results of the radiant heat exposure calculations (or associated Bushire Attack Level) are provided in **Table 2.**

Table 2: Determination of Bushfire Attack Level (BAL) minimum distances for hazardous vegetation

VHC 16.1					
BAL	**12.5**	**19**	**29**	**40**	**Flame Zone**
Minimum separation distances required	25m - < 29m	17m - < 24 m	12m - < 24 m	9m - < 12m	< 9m
VHC 13.2					
BAL	**12.5**	**19**	**29**	**40**	**Flame Zone**
Minimum separation distances required	11m -< 14m	8m -< 10m	5m -< 7m	4m -< 5m	< 4m

Figure 4-1 depicts the BALs based on these minimum distances in relation to the location of proposed development using the values outlined in **Table 2**.

The proposed dwelling site is situated within VHC 16.1 and this vegetation is downslope of the site assessment benchmarks for this community are applied.

The assessment benchmarks outlined in the SPP State Interest Guidance Material (Natural hazards, risk and resilience – Bushfire) (DSDMIP, 2019) adopt a radiant heat flux of 29 kW/m2 (BAL-29) as an acceptable outcome for assessable development. To reach BAL 29, a minimum clearance of 12 metres would be required between the dwelling and the vegetation. As the proposed BLE which will be 3258sq/m, can achieve a BAL 29 or less at all boundaries.

Future dwelling within the BLE can also achieve a BAL 12.5 if a 25-metre separation clearance is provided.

Figure 3-1: Bushfire Attack Levels (BALs)

FIGURE 3.1:
VEGETATION HAZARD CLASS MAP

Project: 270 Mile Nile Road, Mt Morgan

Site_boundary
Cadastral

Vegetation Hazard Class

VHC 10.1
VHC 13.2
VHC 16.1

0 310 620 Meters

N

Notes:

-Site Infrastructure and Impact Areas from Client 2020
-Base map Copyright (c) Esri and its data suppliers.

Author: KM

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4. Bushfire Management Plan

The SPP requires that where it is not possible to avoid a bushfire prone area, development mitigates the bushfire risk to people and property to an acceptable or tolerable level. This can be achieved through development design and siting, hazard reduction practices and emergency mitigation measures for any buildings bordering potentially bushfire-susceptible vegetation. These practices and measures include fuel reduction and management, road infrastructure to provide safe access and egress, appropriate building design and construction standards, procedures for fighting bushfires and fire intensity reduction management measures.

This section has been provided for information purposes and should be refined where necessary (e.g. including any requirements for Asset Protection Zones and the required widths of these zones) based on the final designs.

4.1 Agencies / Persons Responsible

The responsible fire authority is the Queensland Fire and Emergency Services (QFES), with the Rural Fire Brigade being responsible for bushfires and the Fire and Rescue Service being responsible for structural fires within urban areas. It is the responsibility of the proponent to ensure that the relevant measures required by this hazard report are in place prior to inspection by the Council and the building certifier, and to ensure that the measures are in place prior to enacting the approval. 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 owner of the proposed development to maintain the property in accordance with the conditions outlined in this report. The owner / occupier responsibilities include:

- Specified Asset Protection Zones (APZs) are to be maintained between buildings and retained vegetation. Details of the APZ are provided in Section 4.5;
- Low fuel loads are to be maintained surrounding the development by using low flammability or non-combustible species and mulches within any landscaped areas, undertaking regular vegetation management and maintenance where necessary and practicable (e.g. brush-cutting, weed removal etc.) and removal of debris and rubbish;
- All access routes are to remain clear of obstacles to enable effective emergency vehicle access and egress; and
- No burning is to be undertaken on-site 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 bushfire 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 bushfire report will only ever be modified with the agreement of QFES or Rockhampton Regional Council. 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 2019 and Rockhampton Regional Council Planning Scheme, the proposed site design has considered the key principles when siting facilities. The relevant clauses that have been considered are:

- Maximise where practicable the building frontage setbacks from any hazardous vegetation; and
- Site buildings so that elements of the development that are least susceptible to fire, are situated closest to the bushfire hazard (e.g. parking areas, swimming pool, non-living areas, etc).

4.5 Asset Protection Zones

The use of an APZ is the most effective defence against flame and radiant heat and to a lesser extent, ember attack. The APZ, closest to buildings, incorporating the defendable space and for managing heat intensities at the building surface is to be cleared of large trees and maintained as cleared area that is free of flammable material.

The APZ for the site are composed of two areas:

1. Inner Protection Area (IPA) or inner zone, closest to the dwelling, incorporating the defendable space and for managing heat intensities at the building surface. The IPA is to be cleared of large trees and maintained as cleared area that is free of flammable material. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 metres from an exposed window or door. Other trees should have lower limbs removed up to a height of 2 metres above the ground. And,

2. Outer Protection Area (OPA) or outer zone, for reducing the potential length of flames by slowing the rate of spread, filtering embers and suppressing the crown fire. The OPA shall provide a tree canopy cover of less than 30% and shall have understorey managed (mowed) to treat all shrubs and grasses on an annual basis in advance of the fire season. The OPA is located between 10 and 20m from any exposed window or door.

4.6 Access Roads

Access to the site is via Nine Mile Road, about 30 metres for the building envelope. The access shall provide clear entry and exit from the property and be a minimum of 6m wide to allow fire appliances easy access to the site.

4.7 Electricity Supply

The proposed development will have access to off-grid electricity supply.

4.8 Water Supply

As the entire proposed lot is 318 hectares, the proposed dwelling must provide at least 20,000 litres of fire response water available (on construction of the dwelling) with ready access to ensure that any bushfire emergency can be dealt with quickly by the relevant fire team.

4.9 Climate Change and Fire Weather – Projections for 2050

Climate change can act in two ways to affect fire behaviour. First, it might exacerbate the fire-weather risk of any given day, leading to increased frequency or intensity of extreme and very extreme fire-weather days. Second, 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 or fuel reduction burning.

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

4.10 Emergency Response Procedures

An onsite fire management and evacuation strategy should be developed and available to implement in the event of an emergency. In the event of a pending fire emergency, assistance is to be obtained by contacting dialling 000.

5. Assessment against the Bushfire Hazard Overlay Code

The site is overlayed by the Bushfire Overlay designations under Rockhampton Planning Scheme QPP V3.1, which triggers a response to the Bushfire Hazard Overlay Code. An assessment against this Bushfire Hazard Overlay Code is provided in **Table 3**.

Table 3: Assessment against the Bushfire Overlay Code

Access: Table 8.2.4.3.1 Development outcomes for assessable development and requirements for accepted development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO1 Development ensures that the location, siting, and design of development and associated driveways and access routes: a) avoid potential for entrapment during a bushfire; b) facilitate safe and efficient emergency services to access and egress the site during a bushfire; and c) enables safe evacuation of the site during a bushfire for site occupants.	**AO1.1** AO1.1.1 Where the development is located in an urban area, the development: a) has direct access to a constructed, all-weather, public road capable of carrying emergency service vehicles; b) has a maximum single access driveway length of sixty (60) metres from the street to the development; and c) access driveways have a maximum gradient of 12.5 per cent **AO1.1.2** Where the development is located in a non-urban area, the development: a) has direct access to a constructed, all-weather, public road capable of carrying emergency service vehicles; b) is separated from hazardous vegetation by a public road or fire trail with a minimum width of four (4) metres and at least six (6) metres clear of vegetation, with a minimum of 4.8 metres vertical clearance and a maximum gradient of 12.5 per cent; and c) has: i. a maximum single access driveway length of sixty (60) metres from the street to the development; or	**AO1.1.1** Not applicable as the site is not in an urban area **AO1.1.2 – Compliant:** The proposed dwelling site has direct access to an all-weather public road (Nine Mile Road) which is capable of carrying emergency vehicles. Access to the building envelope will be via a 6m wide driveway. The driveway length is approximately 30metres to the BLE. The proposed Lot 4 building envelope is 3,258 sq/m allowing adequate room for turning circles and clearances for emergency vehicles.

	ii. access driveways that are greater than sixty (60) metres from the street to the dwelling provide a turning circle with a minimum radius of eight (8) metres every sixty (60) metres.	
Water for fire fighting purposes: Table 8.2.4.3.1 Development outcomes for assessable development and requirements for accepted development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO2 Development provides adequate and accessible water supply for firefighting purposes which is safely located and freely accessible for firefighting.	**AO2.1.2** Where a reticulated water supply is not available or the development is not within eighty (80) metres of a hydrant, a water tank is provided within ten (10) metres of the building or structure, and the water tank has: a) a take-off connection from the building to the tank which is at a level that provides on-site water storage of not less than the water requirement outlined in Table 8.2.4.3.3; b) a hardstand area allowing heavy rigid fire appliance access within six (6) metres of a tank; and c) fire brigade tank fittings consisting of: i. for above ground tanks, 1. fifty (50) millimetre ball valve and male camlock coupling; and 2. above ground water pipe fittings that are metal; or ii. for underground tanks, an access hole of 200 millimetre diameter (minimum) to allow access for suction lines. Note—Plastic tanks are not recommended, however if they are fully submerged with above ground access points they are acceptable.	**Compliant:** The proposed dwelling will be constructed to comply with this standard, or any future standard at the time of design. A dedicated fire water supply will be provided when a dwelling is constructed and fire resistant tanks will be used for water storage on the site. The water tank will be located within ten (10) metres of the future dwelling. The water tank will have: d) a take-off connection from the building to the tank which is at a level that provides on-site water storage of not less than 20,000 litres; e) a hardstand area allowing heavy rigid fire appliance access within six (6) metres of a tank; and iii. fire brigade tank fittings consisting of: for above ground tanks, 1. fifty (50) millimetre ball valve and male camlock coupling; and 2. above ground water pipe fittings that are metal; or iv. for underground tanks, an access hole of 200 millimetre diameter (minimum) to allow access for suction lines.

	Note—Where water tanks are required, swimming pools, creeks and dams should not be used as a substitute for a dedicated static supply as these sources of water are not reliable during drought conditions.	
Activities involving hazardous materials: Table 8.2.4.3.1 Development outcomes for assessable development and requirements for accepted development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO3 Public safety and the environment are not adversely affected by the impacts of bushfire on hazardous materials.	**AO3.1** Development does not involve the manufacture or storage of hazardous materials within a bushfire hazard area. Editor's note—Refer to the Work Health and Safety Act 2011 and associated regulation, the Environmental Protection Act 1994 and the relevant building assessment provisions under the Building Act 1975 for requirements related to the manufacture and storage of hazardous substances.	Not applicable
Development within the high and very high bushfire hazard areas		
Avoiding the hazard: Table 8.2.4.3.1 Development outcomes for assessable development and requirements for accepted development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO4 The development is compatible with the level of risk associated with the bushfire hazard.	**AO4.1** The development has a Bushfire Attack Level of less than 12.5. Editor's note—The Bushfire Attack Level is calculated in accordance with the methodology described in the Australian Standard AS 3959 — Construction of buildings in bushfire prone areas.	**Compliant** – A total clearing of 25 m is required to achieve BAL 12.5. This separation distance is achievable as the BLE is 3258sq/m wide. We note that Section 5.5 also provide asset protection zone that must have maintained to reduce any bushfire risk.
Land Use: Table 8.2.4.3.2 Development outcomes for assessable development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO5 Essential community infrastructure and community facilities are highly vulnerable development are located, designed and sited to:	**AO5.1** The following uses are not located in high or very high bushfire hazard areas: a) childcare centre;	Not applicable as the proposed dwelling site is not to be used for these purposes.

a) protect the safety of people during a bushfire; b) not increase the exposure of people to the risk from a bushfire event; c) minimise the risk to vulnerable populations; and d) ensure essential community infrastructure can function effectively during and immediately after bushfire events.	b) detention facility; c) educational establishment; d) emergency services; e) hospital; f) industrial use involving manufacture or storage of hazardous materials; g) multiple dwelling; h) outstation; i) relocatable home park; j) residential care facility; k) retirement facility; l) rooming accommodation; m) shopping centre; n) short-term accommodation; o) telecommunications facility; p) tourist park; q) tourist attraction; r) transport depot; and s) utility installation.	
Reconfiguring a lot		
General: Table 8.2.4.3.2 Development outcomes for assessable development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO6 Where reconfiguration is undertaken a separation distance from hazardous vegetation is provided. Editor's note—The preparation of a bushfire management plan in accordance with SC6.5 — Bushfire management planning scheme policy can assist in demonstrating compliance with this performance outcome.	**AO6.2** In non-urban areas a building envelope of reasonable dimensions is provided on each lot which achieves a Bushfire Attack Level of twenty-nine (29) or less at all boundaries Editor's note—Where a separation distance is proposed to be achieved by utilising existing cleared developed areas external to the site, certainty must be established (through tenure or other means) that the land will remain cleared of hazardous vegetation. For staged developments, temporary separation distances,	**Compliant –**To reach BAL 29, a minimum clearance of 12 m would be required between the dwelling and the vegetation. As the proposed BLE which will be 3258sq/m, the development can achieve a BAL 29 or less at all boundaries. A firebreak will be maintained within the building envelope.

	perimeter roads or fire trails may be absorbed as part of subsequent stages.	
PO7 In urban areas development includes a constructed perimeter road between the lots and hazardous vegetation with reticulated water supply. The access is available for both fire fighting and maintenance works.	**AO7.1** In urban areas lot boundaries are separated from hazardous vegetation by a public road which: a) has a two lane sealed carriageway; b) contains a reticulated water supply; c) is connected to other public roads at both ends and at intervals of no more than 500 metres; d) accommodates geometry and turning radii in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; e) has a minimum of 4.8 metres vertical clearance above the road; f) is designed to ensure hydrants and water access points are not located within parking bay allocations; and g) incorporates roll-over kerbing.	**Not applicable** The site is not located within the urban area
PO8 In non-urban areas development includes a perimeter road or an all-weather fire access trail which is available for both fire fighting and maintenance/hazard reduction works.	**AO8.1** In non-urban areas the development includes a perimeter road or an all-weather fire access trail which: a) separates the development from the hazardous vegetation with a width of at least twenty (20) metres; b) with a minimum formed width of four (4) metres; c) a minimum of 4.8 metres vertical clearance above the road; d) has a turning circle with a minimum radius of eight (8) metres every sixty (60) metres; e) has adequate drainage and erosion control devices; f) has a gradient no greater than 12.5 per cent and a cross fall of no greater than ten (10) degrees;	**Compliant:** Nine Mile Road provides dedicated access to the proposed building envelope. An access driveway (6m wide – 30 m long) will provide access to the site. The gradient to the site is approximately 3 % and will have minimal cross fall. Nine Mile Road is a public road regularly maintained by the Rockhampton Regional Council.

	g) has access at each end of the perimeter road or the fire trail from a public road; h) has the access point signed and direction of travel identified; and i) has a suitable arrangement in place to ensure maintenance in perpetuity.	
PO9 Road widths and construction within the development are adequate for fire emergency vehicles.	No acceptable outcome is nominated.	**Compliant:** The access driveway to the site will be 6m in width allowing adequate room for emergency services vehicles to the site.
Emergency services access: Table 8.2.4.3.2 Development outcomes for assessable development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO10 Development facilitates the safe and efficient access and egress of emergency services during a bushfire event.	**AO10.1** The development includes a perimeter road or a fire access trail which: a) separates the development from the hazardous vegetation; b) is a minimum of ten (10) metres in width, with a minimum formed width of four (4) metres; c) is a minimum of six (6) metres clear of standing flammable vegetation; d) has passing bays twenty (20) metres long by three (3) metres extra trail width, or turning facilities every 200 metres; e) has adequate drainage and erosion control devices; f) has a gradient no greater than 12.5 per cent and a cross fall of no greater than ten (10) degrees; g) has access at each end of the perimeter road or the fire trail from a public road; h) has the access point signed and direction of travel identified; and	**Compliant:** A fire break will be constructed and maintained about the perimeter of the building envelope and APZ. Slopes on the building envelope are 3 % and comply with AO10.1.

	i) has suitable arrangements in place to ensure maintenance in perpetuity.	
Avoiding the hazard: Table 8.2.4.3.2 Development outcomes for assessable development (part)		
Performance Outcomes	**Acceptable Outcomes**	**Compliance**
PO11 Road widths and construction within the development are adequate for fire emergency vehicles to gain access to a safe working area close to dwellings and near water supplies whether or not on-street parking spaces are occupied.	**AO11.1** Road access minimum clearances of 3.5 metres wide and 4.8 metres high are provided for safe passage of emergency vehicles. Editor's note—For further information on how to address the above criteria please see Queensland Fire and Emergency Service: Fire hydrant and vehicle access guidelines for residential, commercial and industrial lots.	**Compliant:** The access driveway (30m long) will be 6 m wide and 4.8m canopy vegetation clearance will be maintained to allow emergency vehicle access to the site.
PO12 Hydrants are suitably identified so that fire services can locate them at all hours.	**AO12.1** Hydrants are identified as specified in Queensland Fire and Emergency Service: Fire hydrant and vehicle access guidelines for residential, commercial and industrial lots. Editor's note—Fire hydrants are designed and installed in accordance with Australian Standard 2419.1 Fire hydrant installations – system design, installation and commissioning, unless specified by the relevant water entity.	There are no fire hydrants near the proposed dwelling site.

6. Conclusion

This report has been prepared to provide a site-specific bushfire hazard assessment to assess the bushfire risk for the 1 into 2 subdivision at 270 Nine Mile Road, Mt Morgan.

The assessment benchmarks outlined in the SPP State Interest Guidance Material (Natural hazards, risk and resilience – Bushfire) (DSDMIP, 2019) adopt a radiant heat flux of 29 kW/m^2 (BAL-29) as an acceptable outcome for assessable development. Based on the distances outlined in **Table 1**, separation distance of 25m must be provided to achieve a BAL 12.5 and 12m to achieve a BAL 29. The dimensions of the proposed BLE are sufficient meet this clearing requirement.

Based on the bushfire hazard assessment provided in this report, we confirm that the proposed development complies with the requirement of the Rockhampton Region Planning Scheme 2015, in particular the Bushfire Overlay Code.

7. References

DILGP. (July 2017). *State Planning Policy*. Brisbane.

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. *CSIRO, Australia*.

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

QFES. (2019a). *Bushfire Resilient Communities - Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience - Bushfire', October 2019*. Retrieved from https://www.ruralfire.qld.gov.au/Bushfire_Planning/Documents/Bushfire-Resilient-Communities.pdf.

QFES. (2019b). *SPP Bushfire Asset Protection Zone Width Calculator*. Retrieved from https://www.ruralfire.qld.gov.au/Bushfire_Planning/Pages/Bushfire-Resilient-Communities.aspx.

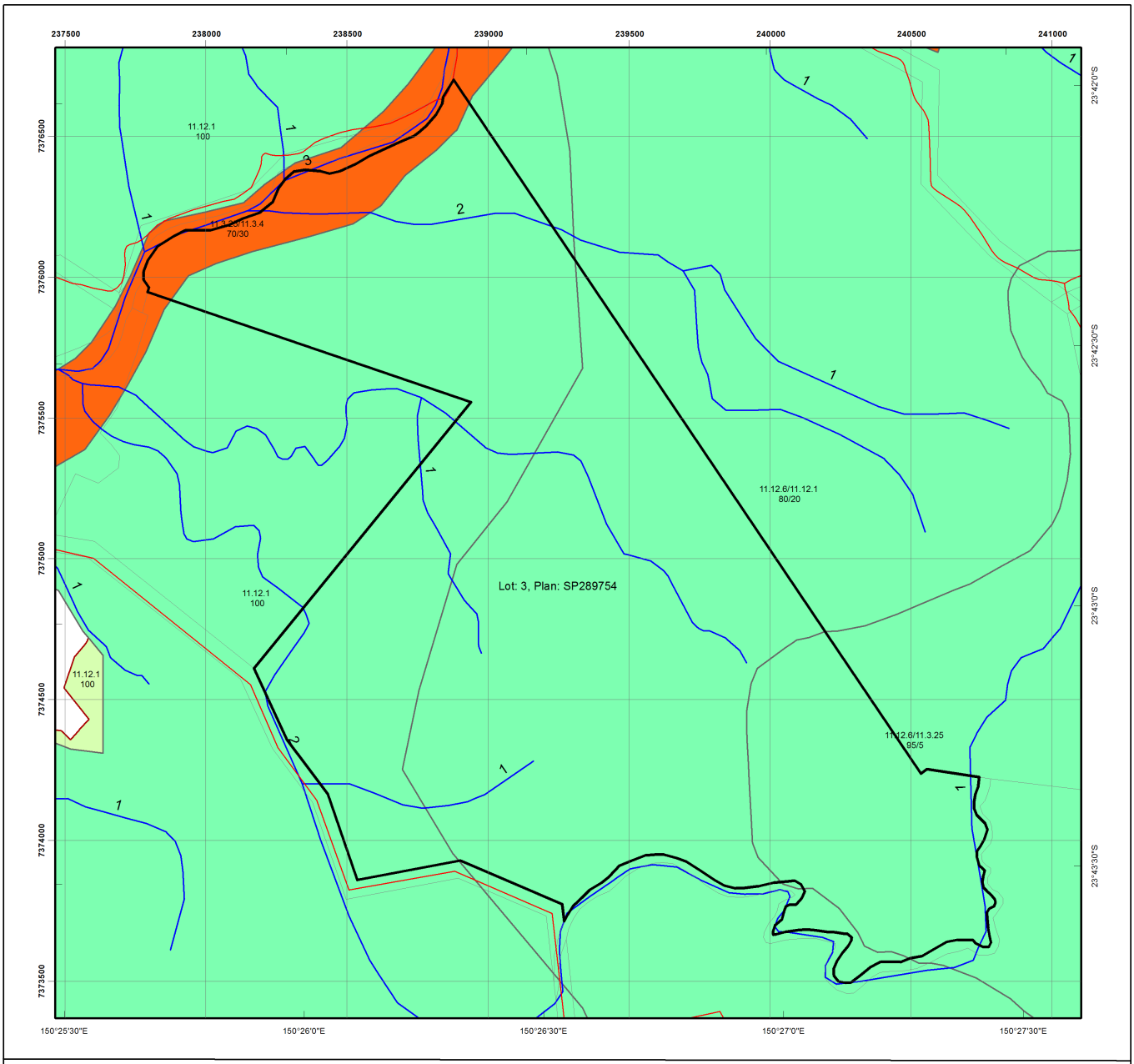
Rockhampton Region Planning Scheme (2015), version 2.1.

Standards Australia. (2018). AS 3959-2009 Construction of Buildings in Bushfire-prone Area. In *Construction of Buildings in Bushfire-prone Area*. Sydney: Council of Standards Australia.

Appendix 1

DNRME Regulated Vegetation Management Map

5.2 Vegetation management supporting map



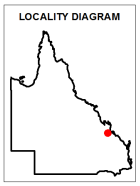
Vegetation Management Supporting Map

Legend

- Lot and Plan
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category A or B area under Section 20AH
  These areas are edged in yellow and filled with the remnant RE Status
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category C area under Section 20AI
  These areas are edged in purple and filled with the remnant RE Status
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map
  (Stream order shown as black number against stream where available)
- Roads
- National Parks, State Forest and other reserves
- Cadastral line
  Property boundaries shown are provided as a locational aid only

Queensland Government

LOCALITY DIAGRAM



N

0 140 280 420 560 700 m

This product is projected into:
GDA 1994 MGA Zone 56

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

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

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources, Mines and Energy makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

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

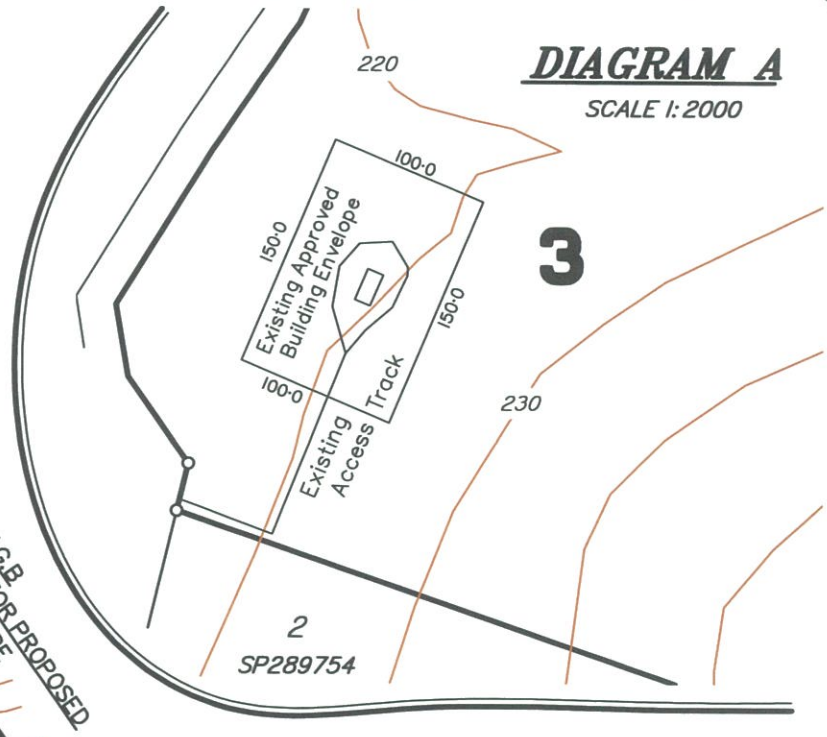
Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

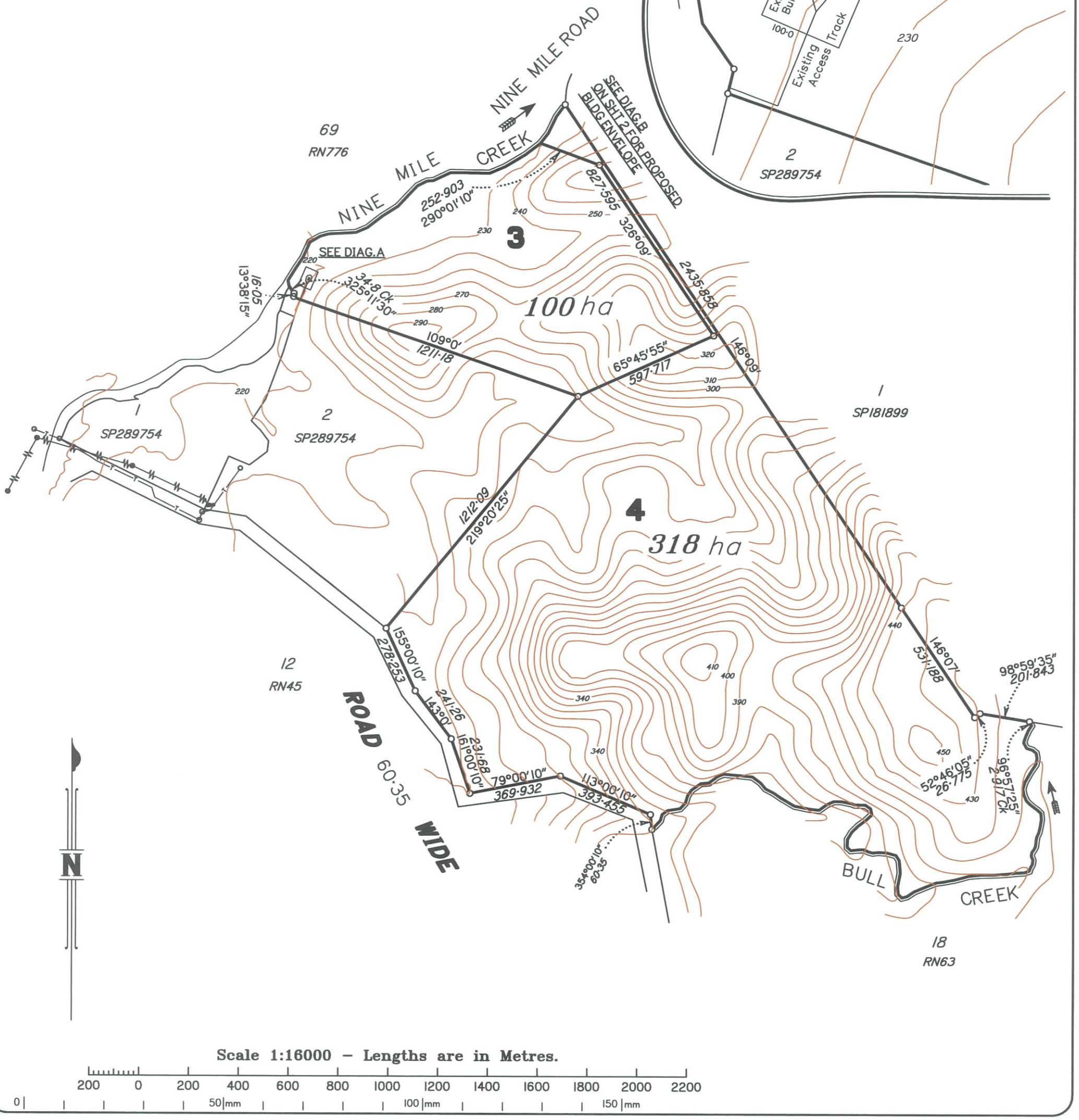
LEGEND

- Boundary
- Contour: 10.0 interval
- Telecom
- Power Line
- Power Pole

DIAGRAM A

SCALE 1:2000





Scale 1:16000 – Lengths are in Metres.

200 0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200

0 | 50 mm | 100 mm | 150 mm

Plan of Proposed Lots 3 & 4 and Proposed Building Envelope in Proposed Lot 4 Cancelling Lot 3 on SP289754

This plan was prepared to accompany a Reconfiguration of a Lot application to Rockhampton Regional Council, and should not be used for any other purpose. The boundary information, dimensions and areas, shown here are approximate only and subject to field survey, therefore, no reliance should be placed on the information shown on this plan , especially for financial dealings. This note is an integral part of this plan.

GSPC

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PH: (07) 4922 7033 email: admin@gspc.com.au FAX: (07) 4922 7044

LOCALITY	Nine Mile Creek
LOCAL GOVERNMENT	Rockhampton R.C.
HORIZONTAL DATUM	CAM
MERIDIAN	SP289754
VERTICAL DATUM	-------
DERIVED vide	-------
MAP REF	8950-12243

PLAN SCALE	1:16000
AUTOCAD SCALE	1:1000
DATE	03-04-2020
DRAWN	Bilyaminu

REF. 191027-04

LEGEND

Boundary
Contour: 10.0 interval
BLE – Building Envelope

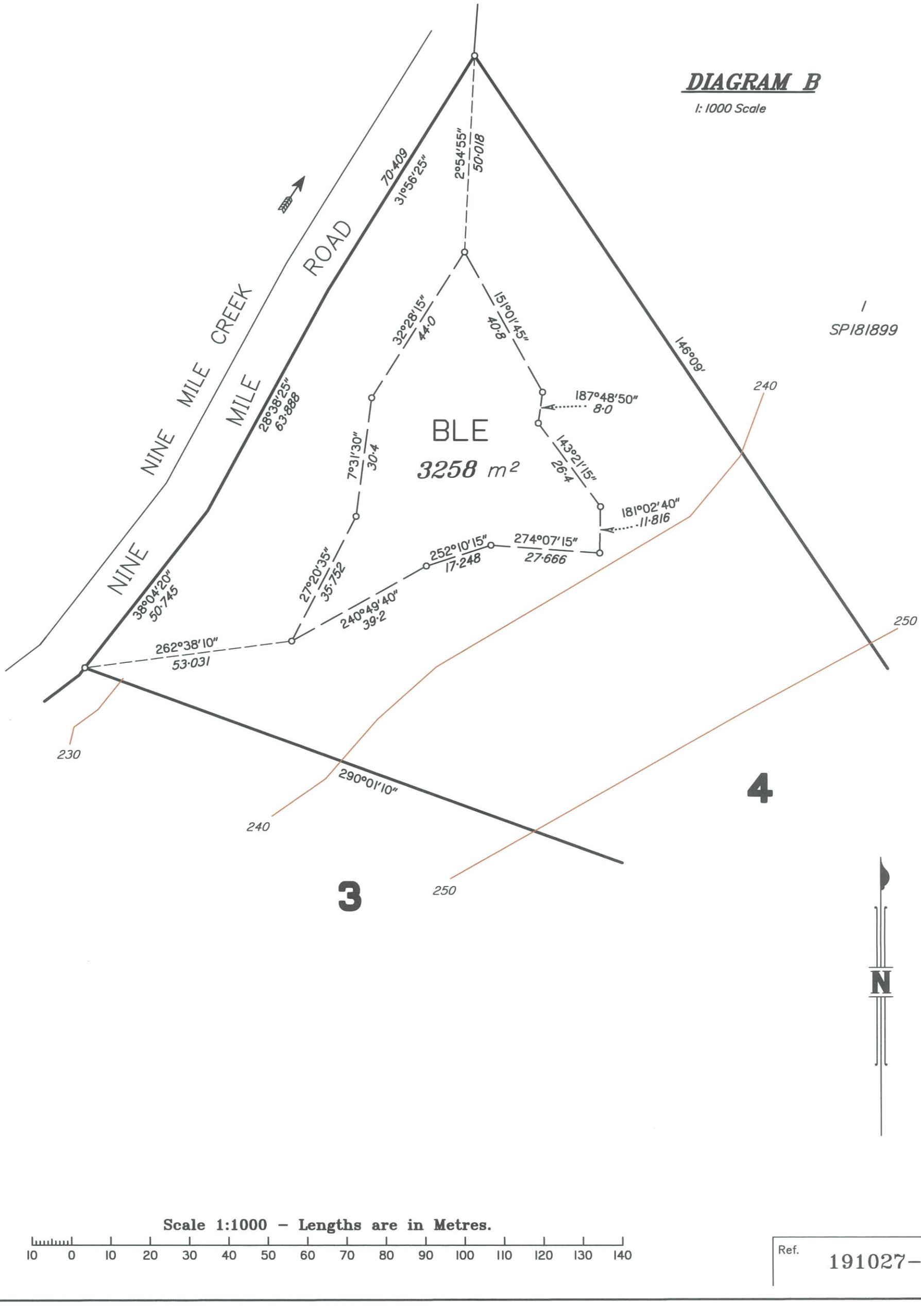

DIAGRAM B

1: 1000 Scale

Scale 1:1000 – Lengths are in Metres.

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

N

Ref. 191027-04